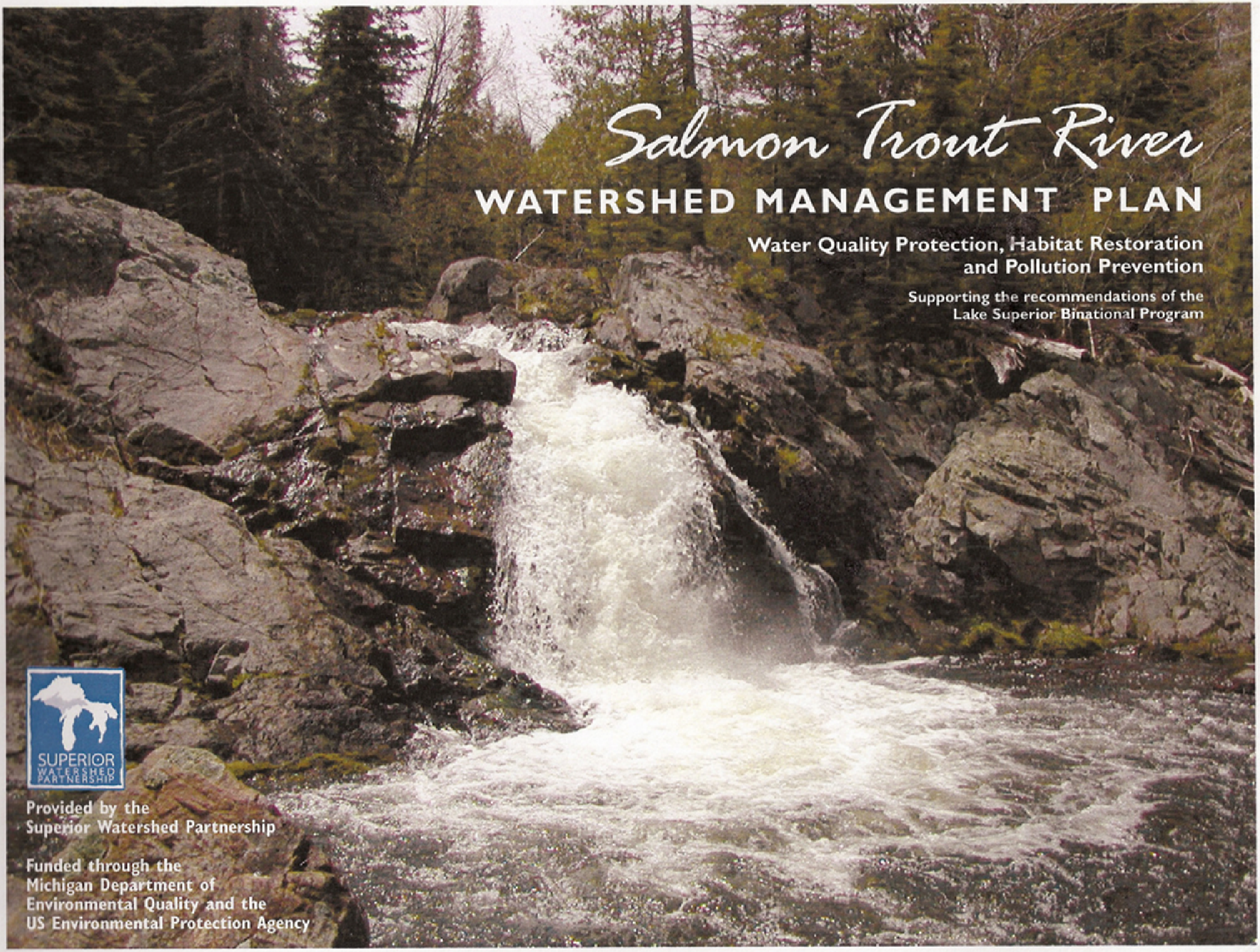

Salmon Trout River

WATERSHED MANAGEMENT PLAN

Water Quality Protection, Habitat Restoration and Pollution Prevention

Supporting the recommendations of the Lake Superior Binational Program

SUPERIOR WATERSHED PARTNERSHIP

Provided by the Superior Watershed Partnership

Funded through the Michigan Department of Environmental Quality and the US Environmental Protection Agency

Salmon Trout River

WATERSHED MANAGEMENT PLAN

July 2007

Salmon Trout River Technical Advisory Group:

Carl Lindquist	*Superior Watershed Partnership*
George Madison	*Michigan Department of Natural Resources*
Peter Dykema	*Huron Mountain Club*
Todd Warner	*Keweenaw Bay Indian Community*
Dan Hornbogen	*Superior Watershed Partnership*
Dr. Ron Sundell	*Northern Michigan University*
Dr. Casey Huckins	*Michigan Technological University*
Lee Newman	*U.S. Fish and Wildlife Service, Retired*
Mike Farrell	*Superior Watershed Partnership, Longyear Realty Corporation, and Marquette County Drain Commissioner*
Bill Deephouse	*Trout Unlimited*

Technical Support Staff:

Geraldine Larson	*Senior Planner, Superior Watershed Partnership*
Vicki Baldini	*Grant Administrator, Superior Watershed Partnership*
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Robert Sweet	*319 Grants Specialist, Michigan Department of Environmental Quality*
Mitch Koetje	*Project Administrator, Michigan Department of Environmental Quality*
Agnes Moore	*Financial Analyst, Michigan Department of Environmental Quality*

Stakeholders:

Riparian landowners and local residents
Powell Township
Champion Township
Michigamme Township
Huron Mountain Club
Longyear Realty Corporation
Plum Creek Timber Company
U.S. Fish and Wildlife Service
Great Lakes Fishery Commission
Central Lake Superior Land Conservancy
Marquette County Conservation District
Superior Watershed Partnership
Michigan Department of Natural Resources
Michigan Department of Environmental Quality
Keweenaw Bay Indian Community
Marquette County Road Commission
Michigan Technological University
Northern Michigan University
The Nature Conservancy
Fred Waara Chapter of Trout Unlimited
Yellow Dog Watershed Preserve

EXECUTIVE SUMMARY

The Salmon Trout River watershed includes high quality aquatic and terrestrial ecosystems of regional significance and should be protected and maintained as such. Because of its unique natural state and significant natural resources, the Salmon Trout River watershed is a haven for scientific study and a topic of interest for a diverse group of stakeholders. The recommendations of this plan are intended to promote coordinated and collaborative actions among these stakeholders and to provide guidance for implementation of actions that will reduce existing water quality impacts and provide a basis for protection from future impacts.

The first step in the creation of this plan was to analyze the character and condition of the natural features of the watershed. Next, an analysis of the human environment was completed and factors that could prevent the natural features from meeting their potential were identified. The final step was to develop management strategies that will help protect and enhance water quality and improve the quality of life for current and future residents.

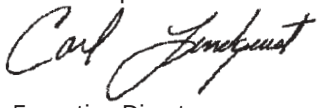
Key recommendations were based on prioritized sources of pollutants and other environmental stressors that are currently threatening designated and desired watershed uses. They include:

- Work with local, state, and federal partners to prohibit sulfide-based mining
- Protect and restore habitat for fish and aquatic organisms including critical habitat for coaster brook trout
- Control and minimize sources of sediment to the Salmon Trout River and its tributaries
- Promote responsible land use practices by corporate and private land owners
- Promote coordinated and collaborative efforts by stakeholders
- Inform and involve the public

The most important factor in achieving the goals identified in this plan is the continued involvement of local residents and regional stakeholders, who will ensure the long-term health and sustainability of this unique watershed.

We thank the members of the Salmon Trout River Watershed Technical Advisory Group for their continued dedication and commitment to this project and many others for their valuable insight and contributions over the past decade and during the development of this plan

Carl Lindquist



Executive Director
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Geraldine Larson

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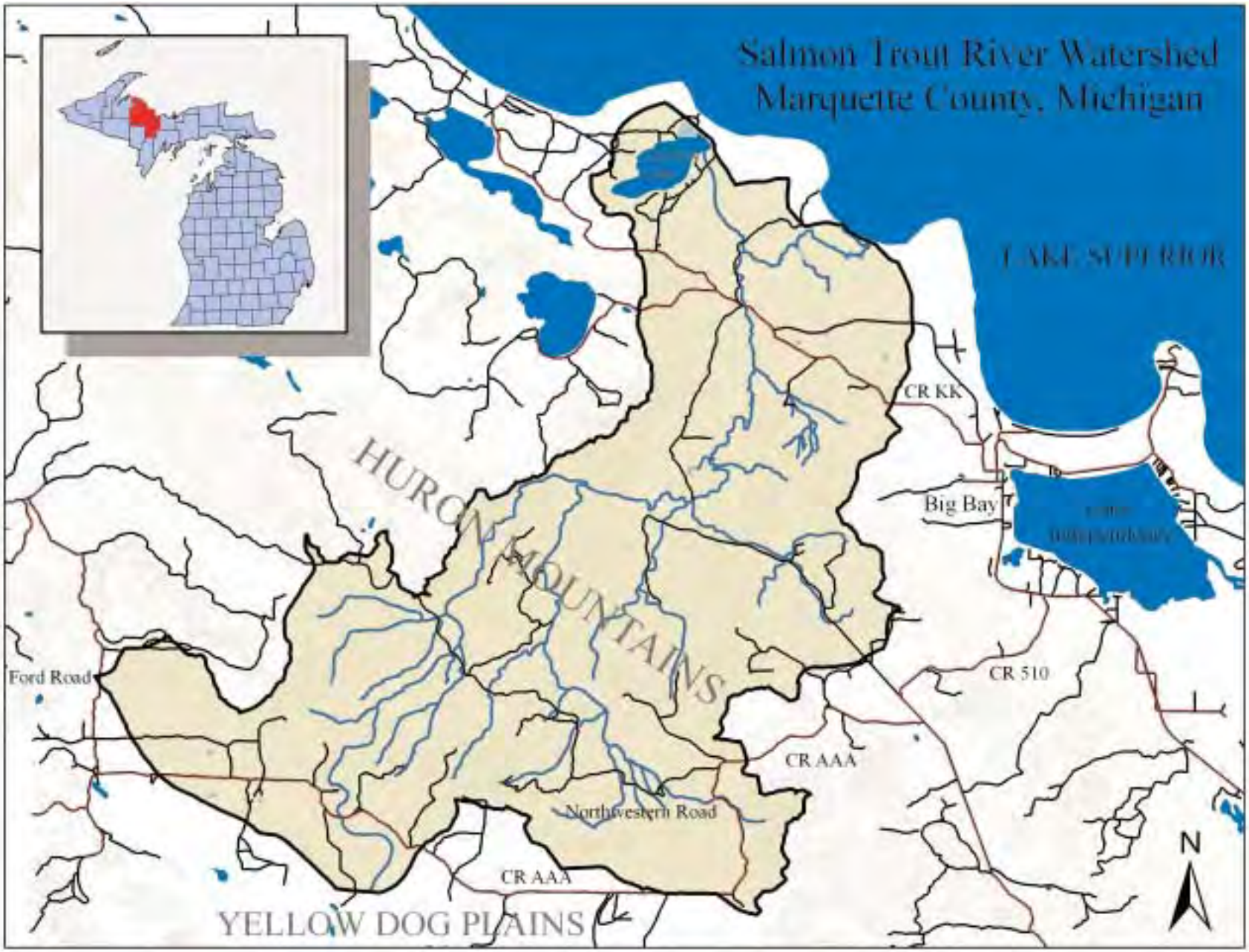
Figure 1.1 Location Map



Chapter One

INTRODUCTION

The Salmon Trout River watershed is a located in the northwest portion of Marquette County, Michigan (Figure 1.1). It is part of the much larger Dead-Kelsey Watershed, United States Geological Survey (USGS) Cataloging Unit: 04020105. The watershed covers a 49.5 square mile area (31,687 acres) which flows northerly from the Yellow Dog Plains, an area of glacial sand deposits, through a heavily wooded and largely unpopulated area known as the Huron Mountains, until finally making its way to Lake Superior.

In the summer of 2004, the Superior Watershed Partnership (SWP), formerly the Central Lake Superior Watershed Partnership was awarded a grant from the Michigan Department of Environmental Quality (MDEQ) to develop a watershed management plan for the Salmon Trout River watershed. The intent of this plan was to unite stakeholders in a concerted effort to address water quality issues across jurisdictional boundaries and to build upon previous work in the watershed by the SWP and its partner's. The SWP served as the lead agency and coordinated with key partners and stakeholders, other organizations, and the public throughout the process of developing this plan.

Partners and Stakeholders

Partners and stakeholders in the Salmon Trout River Watershed are a diverse group. They include representatives from state and local units of government, private and corporate land owners, and concerned citizens. Members of the Salmon Trout River Watershed Technical Advisory Group met regularly and provided valuable information on local geologic and surface water features, land use issues, and other important components of the management plan. Mitch Koetje served as the MDEQ Project Administrator and provided valuable oversight and assistance. Members of the Salmon Trout River Technical Advisory Group along with individuals and agencies that provided support and assistance or have interest in this important project are provided below.

Salmon Trout River Technical Advisory Group:

• Carl Lindquist	Superior Watershed Partnership
• George Madison	Michigan Department of Natural Resources
• Peter Dykema	Huron Mountain Club
• Todd Warner	Keweenaw Bay Indian Community
• Dan Hornbogen	Superior Watershed Partnership
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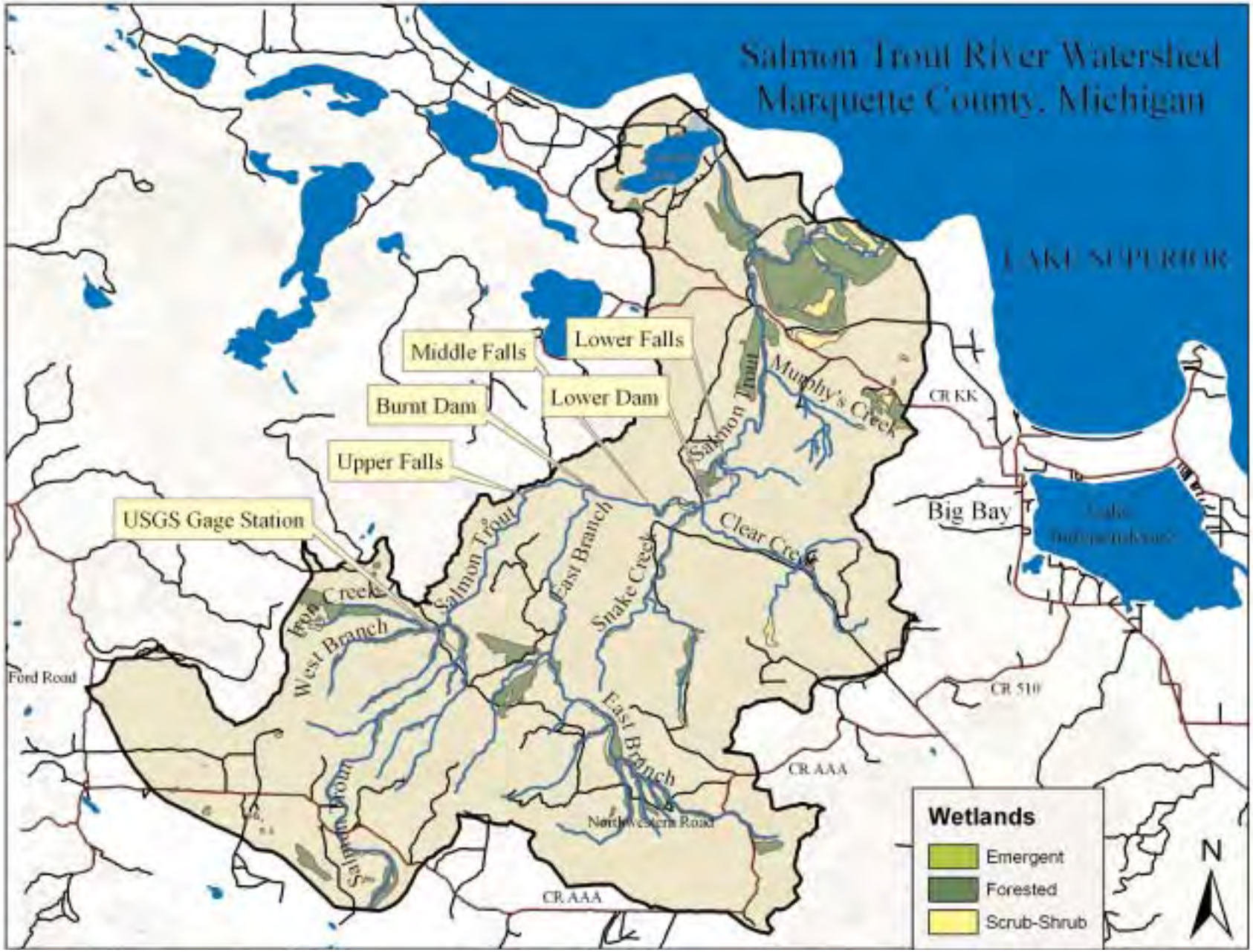
• Bill Deephouse	Trout Unlimited

Salmon Trout River headwaters

Mouth of Salmon Trout River

Figure 1.2 Hydrology Map



Technical Support Staff:

- Geraldine Larson — Senior Planner, Superior Watershed Partnership
- Vicki Baldini — Grant Administrator, Superior Watershed Partnership
- Joe Wagner — Watershed Planner, Superior Watershed Partnership
- Robert Sweet — 319 Grants Specialist, Michigan Department of Environmental Quality
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Figure 1.3 Daily mean discharge in the Salmon Trout River.

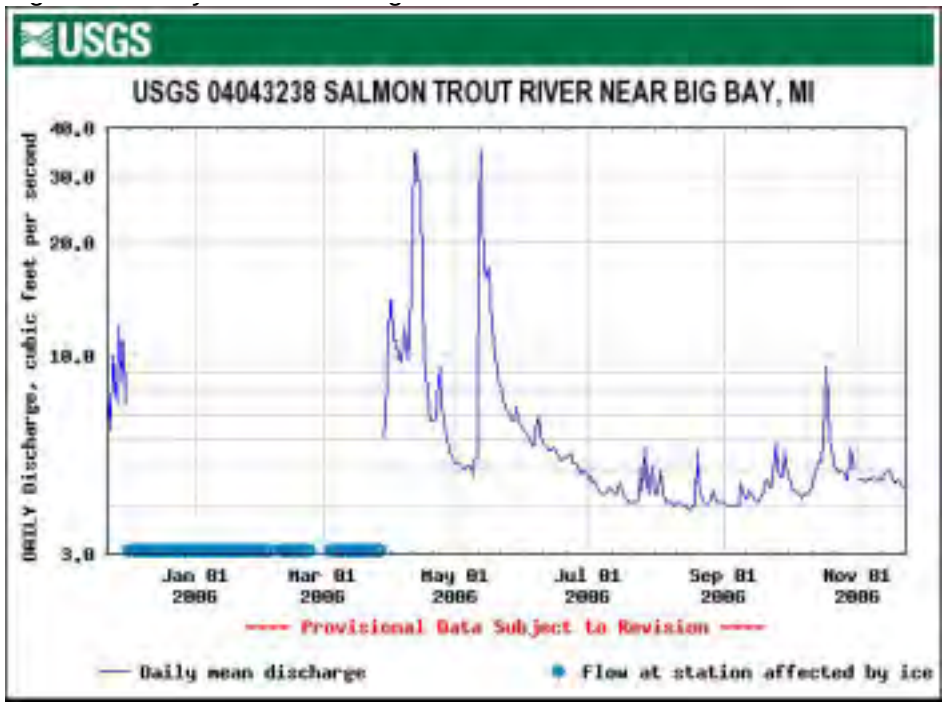
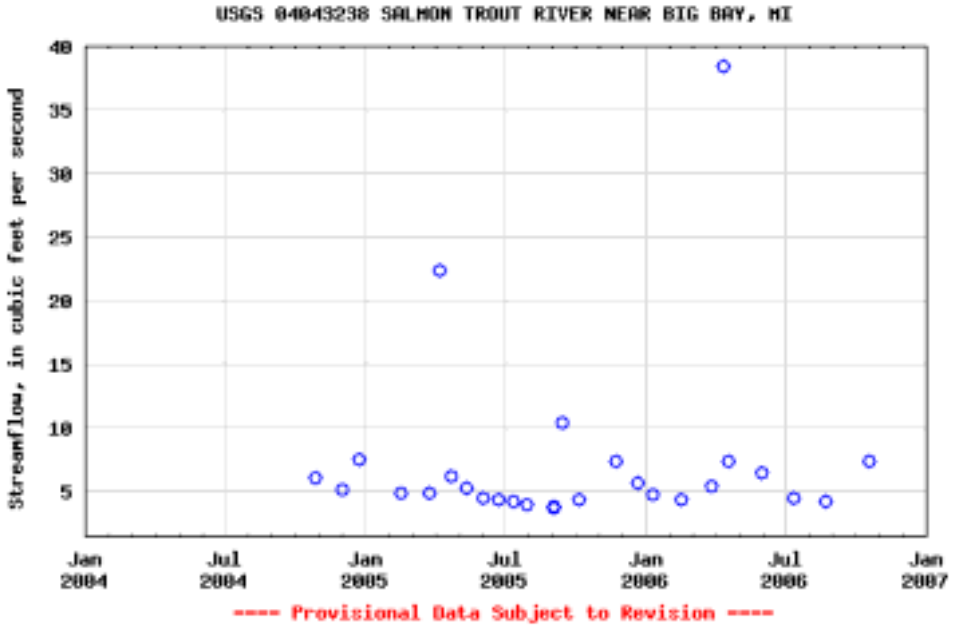


Figure 1.4 Stream flow in the Salmon Trout River.



THE NATURAL ENVIRONMENT

The following sections summarize the natural character and condition of the Salmon Trout River watershed based on the results of an inventory of natural features. Included are general descriptions of the hydrology, geology and topography, sediment transport capacity, water quality, and significant natural resources.

Hydrology

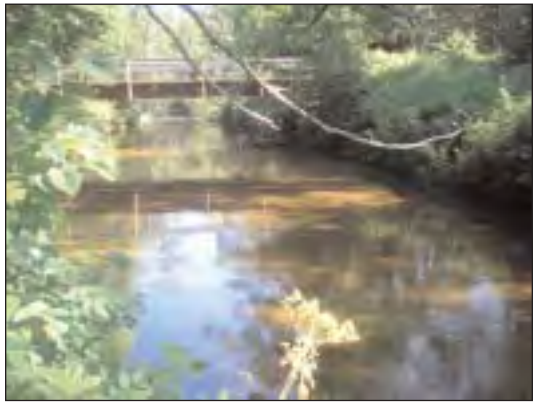
The Salmon Trout River watershed includes approximately 250,000 linear feet of streams including the Main Branch of the Salmon Trout River, several main tributaries, and numerous unnamed streams (Figure 1.2). Conway Lake, a 352 acres inland lake, is the only major surface waterbody in the watershed. There are three series of waterfalls on the Salmon Trout River (Upper, Middle and Lower Falls) and two remnant dams (Burnt and Lower Dams). All are located on private property. A general description of the main tributaries to the Salmon Trout River including headwater location, average length, and typical substrate material is provided in Table 1.1.

Table 1.1 Descriptions of the Main Tributaries of the Salmon Trout River

Name	Headwater Location	Average Length (Miles)	Substrate Material
Main Branch	T50N R29W Section 14	17.9	Gravel, sand, cobble, bedrock, boulder
East Branch	T50N R28W Section 3	9.0	Gravel, sand, cobble, bedrock
Clear Creek	T51N R27W Section 29	3.1	Gravel, sand
Snake Creek	T51N R28W Section 34	3.1	Gravel, sand
West Branch	T51N R28W Section 31	2.1	Gravel, sand, cobble
Iron Creek	T51N R28W Section 30	1.5	Sand, silt, gravel

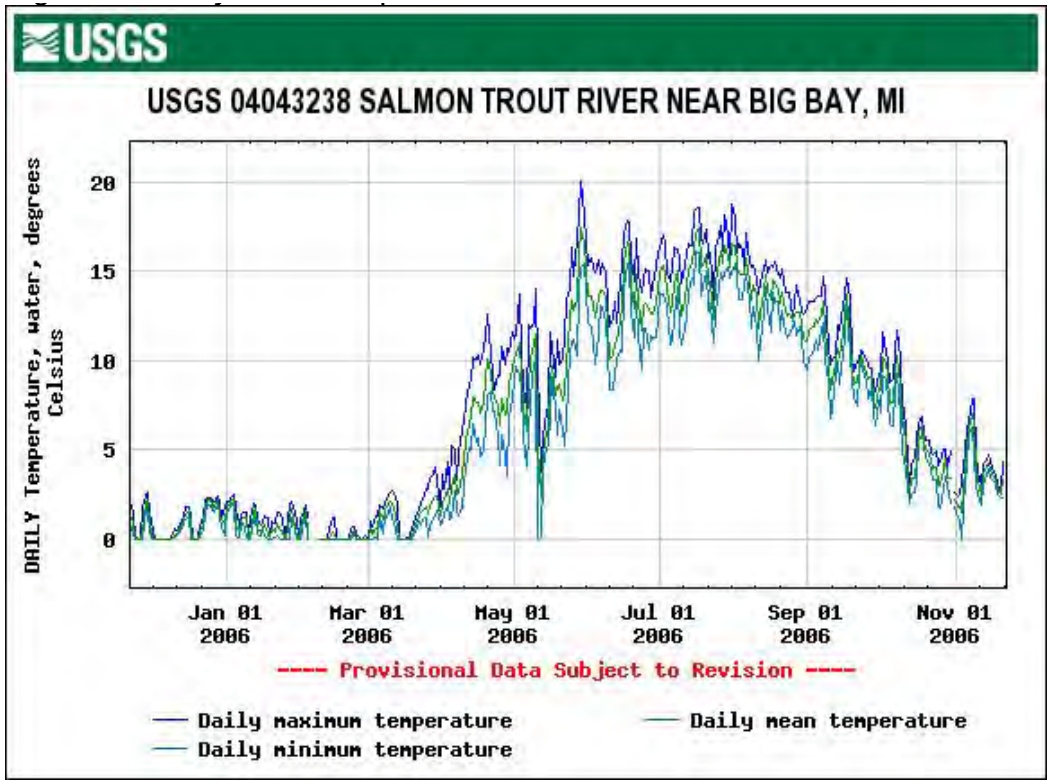
The majority of the tributaries of the Salmon Trout River are groundwater fed, providing consistent base flows throughout the year. A United States Geology Survey (USGS) water stage recorder and crest stage gage are located in the Main Branch (USGS station number: 04043238) 0.6 miles upstream from the confluence with the West Branch (T51N, R28W, Sec. 29), and 7.5 miles southwest of the Town of Big Bay (Figure 1.2). The gages are located on the right bank, 50 feet downstream from a crossing of the Northwestern Road at an elevation of 1,080 feet above sea level. The drainage area for these gages is 6.74 miles. The station is operated in cooperation with the Keweenaw Bay Indian Community.

East Branch of the Salmon Trout River



Main Branch of the Salmon Trout River

Figure 1.5 Daily water temperatures in the Salmon Trout River.



Gage stations record stream characteristics such as stream discharge, flow, and water temperature (USGS 2006). Figure 1.3 shows the variability in daily mean discharge for the Salmon Trout River at the gage location with peaks exceeding 30 cubic feet per second during spring snow melt and significant rain events. These peaks are also visible in stream flow data generated by USGS field measurements at the gage station (Figure 1.4). This data also shows the effect of groundwater in providing consistent base flows throughout the year.

Daily water temperatures in the Salmon Trout River at the gage location range from 0 to 21 degrees Celsius (C) with major increases occurring during April (+4.5 degrees C), May (+4.2 degrees C), and June (+5.4 degrees C) (Figure 1.5). While trout may be able to survive certain fluctuations in temperature, the food they rely on, mainly aquatic insects, may not. In one study it was determined that many coldwater insect species would be eliminated or reduced by the thermal enrichment of a stream and important species to trout, such as stoneflies, mayflies, and caddisflies, may be severely impacted or stressed by stream temperature fluctuations. Thus stream temperature fluctuations have not only the potential to stress the trout directly, but indirectly through their food source as well. Ideally, cold water trout streams should rarely exceed 22 degrees C in the summer (Galli 1990). Based on the data provided by the USGS, water temperatures in the Salmon Trout River at the gage location are within acceptable ranges.

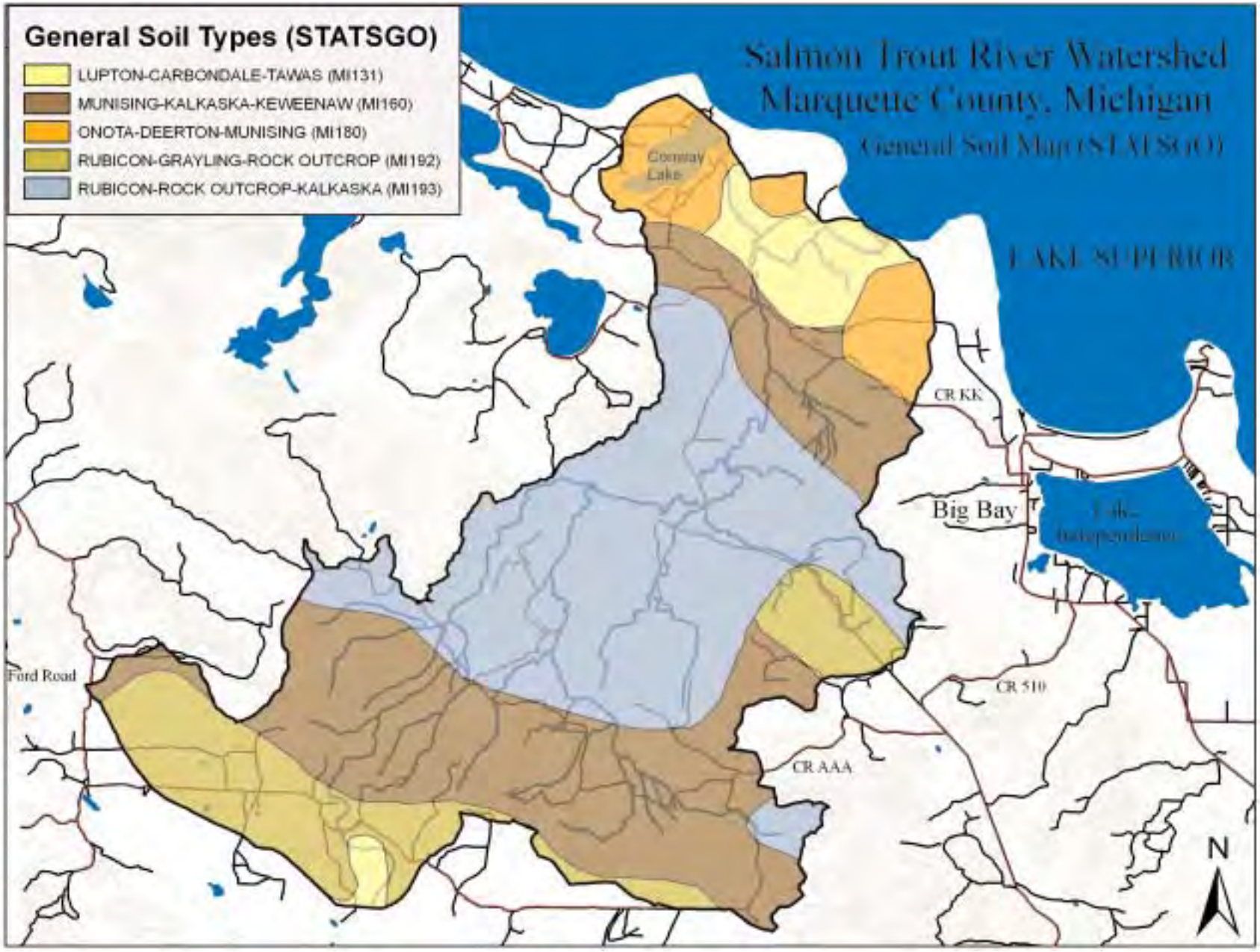
Freshwater wetlands occupy roughly 835 acres or 2.6% of the land in the Salmon Trout River watershed (Figure 1.2). They provide cool water sources to streams, shade, flood storage, wildlife habitat, and water quality protection. Wetlands within the boundaries of the watershed were delineated using aerial photography of the area, the Marquette County Soil Survey, topographic maps of the watershed, and U.S. Fish and Wildlife Service National Wetlands Inventory maps. There are four general types of wetlands in the Salmon Trout River watershed (USFWS 1977). They include: forested, scrub-shrub, lake, and emergent. Most occur as combinations of two or more types. By far the largest and most common, forested/scrub shrub wetlands are typically contiguous with the Salmon Trout River and its tributaries. Similarly, large lake/forested wetland complexes occur around the lowest reaches of the river near Lake Superior.

Scrub-shrub wetlands are most often found in groundwater seep areas adjacent to tributaries and occasionally form the headwaters. Groundwater seeps and groundwater fed wetlands are of primary importance to the maintenance of stream ecosystems and flow regimes. This source of water is maintained through recharge, or the infiltration of water from the ground surface down to the water table. Although relatively small and less common in the watershed, emergent wetlands occur in topographically depressed locations having suitable soils and hydrology. Freshwater ponds occur in even lesser dominance and are found in only a few locations in the watershed.

Geology and Topography

The Salmon Trout River watershed is typical of recently glaciated systems in the region. Outcrops of igneous bedrock are common and soils are dominated by sand. The upper and lower portions of the watershed are generally level and consist of sandy soils formed by glacial deposition. The loose sand

Figure 1.6 General soil types of the Salmon Trout River watershed



presents limitations for woodland management and building and the poor filtering capacity of these soils for septic tank absorption fields can lead to the pollution of groundwater. The sandy, but moderately well drained soils of the middle watershed present moderate to severe erosion hazards, especially for roads and trails. These soils are generally thin and dominated by bedrock outcrops or near surface bedrock. In fact, bedrock controls much of the stream channels in this area. The erosion hazards and equipment limitations of these soils present concerns for woodland management and building. In addition, they often have perched water tables that present concerns for septic absorption. However, filling or mounding with suitable material helps to raise the absorption field above the water table and enlarging or pressurizing the absorption field or installing alternating drain fields helps to overcome the restricted permeability. The Carbondale and Tawas soils found in the headwaters and mouth of the Salmon Trout River have one or more components that meet the criteria established for hydric (wetland) soils. These soils are often saturated and contain a high content of muck, making them unsuitable for most land uses (Figure 1.6, NRCS 2003).

The drainage network of the Salmon Trout River watershed is geologically young. This is reflected in long profiles of the main tributaries of the Salmon Trout River (Gough 2001, Figure 1.7). These long profiles, plotted using USGS 7.5 minute series maps, show that stream gradient varies considerably, indicating both lack of adjustment since the glaciation, and strong control of channel elevation by bedrock and coarse bed materials left after glaciation (Gough 2001).

The topography of the Salmon Trout River watershed is best described in terms of the upper and lower watersheds. The upper watershed consists of the area from the base of the Lower Falls upstream to the headwaters and includes the Main Branch of the Salmon Trout River, several main tributaries, and numerous smaller streams. The majority of these streams originate south of the Huron Mountains at the northern base of the Yellow Dog Plains. Tributaries of the upper watershed are characterized by high gradient reaches that descend rapidly. The Main Branch of the Salmon Trout River, for example, descends approximately 690 feet from its headwaters to the Lower Falls, an average of 86.25 feet per mile. Due to its steep gradient, this reach is capable of transporting large quantities of sediment but is also highly vulnerable to erosion. Similarly, the East Branch descends approximately 410 feet with an average gradient of 53 feet per mile (Figure 1.7).

While steep gradients make stream reaches in the upper watershed vulnerable to erosion, most banks are well vegetated and remain stable. There are only two sites in the watershed that are known to have experienced major stream bank erosion not associated with a road/stream crossing. Both are naturally occurring and are located near the Lower Falls in an area that is accessible only by foot. One site consists of a large-scale bank failure that was likely a result of a significant run-off event in an area with steep slopes and soils that highly vulnerable to erosion. The other is quite minor in comparison and while this site remains un-vegetated, it appears to be stable and not a significant source of sedimentation to the Salmon Trout River.

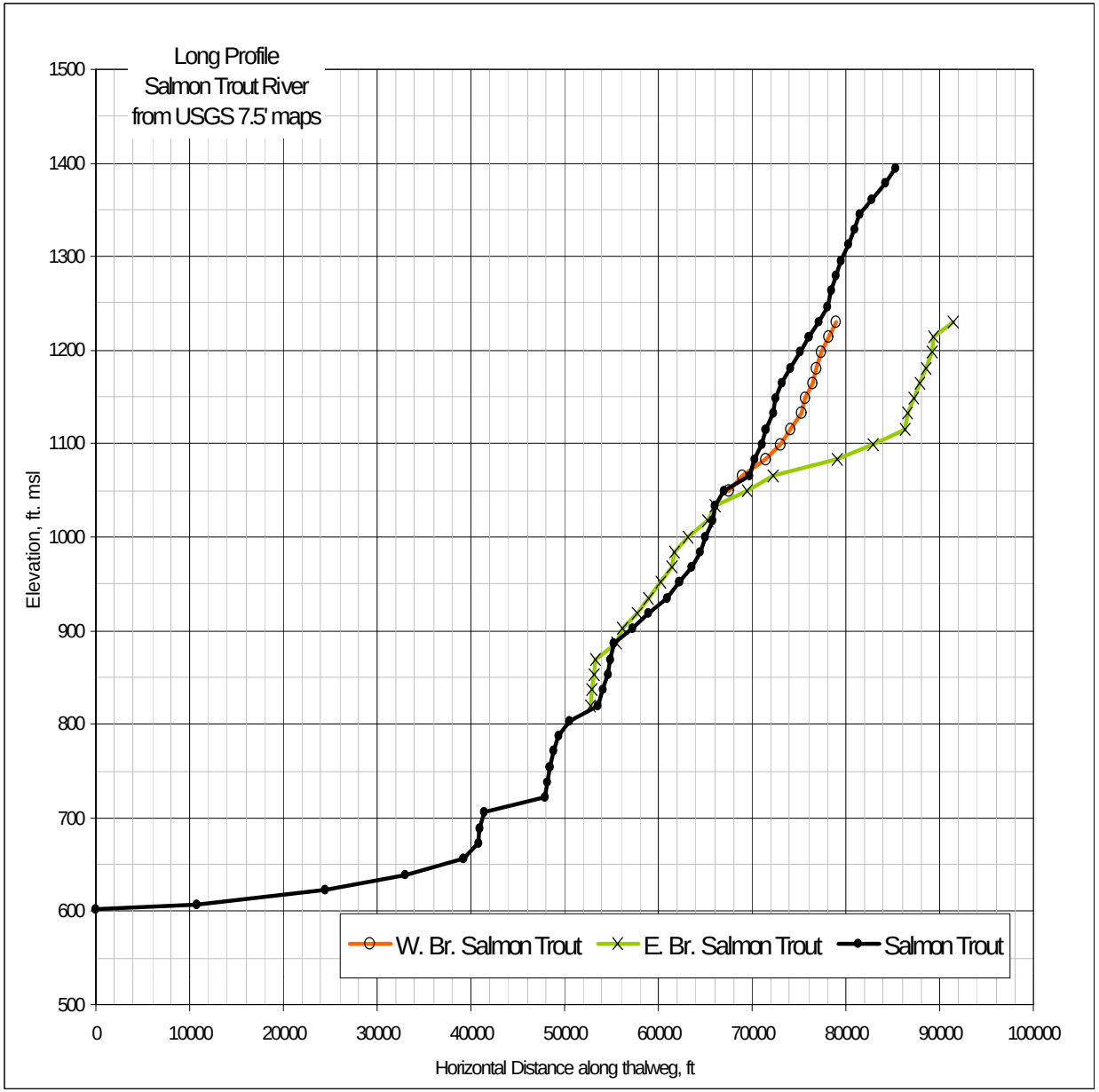
The lower Salmon Trout River watershed is quite different. The lower watershed includes the area downstream from the Lower Falls to Lake Superior. At this point, all of the major tributaries have been

Stream bank erosion site on the Main Branch of the Salmon Trout River near the Lower Falls.

Aerial photograph of the same site on the Main Branch.

Additional stream bank erosion site on the Main Branch near the Lower Falls.

Figure 1.7 Long profiles of the main tributaries of the Salmon Trout River.



consolidated into one river course and the stream gradient levels out dramatically to approximately 6 feet per mile. Such a low gradient in this reach makes the task of transporting sediments from the upper watershed difficult. This reach also includes the entire distribution of spawning and nursery habitat for coaster brook trout. Coaster brook trout habitat is usually located in lower-river and river mouth areas (White 1940; Vladykov 1942; Slade 1994) with nearshore, lacustrine and estuarine settings often being used where suitable conditions exist (Scott and Crossman 1973; Weed 1934). This includes areas consisting of loose, silt-free gravel or coarse sand over strong groundwater seepage. As such, it is critical to minimize sediment from upstream sources before it reaches the slow moving water of the lower watershed. Fortunately, naturally occurring large woody debris are common in the stream channel of this reach. This debris causes scouring of bed sediments, exposing substrate suitable for coaster brook trout.

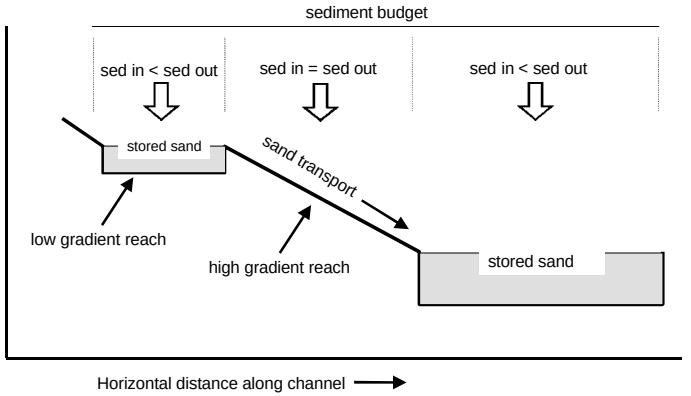
Sediment Transport Capacity

Excess erosion of sand sediment is broadly regarded as the most serious pollutant of trout streams in Northern Michigan (Tonello et al. 2003) and the Salmon Trout River is no exception. Most of the environmental problems facing the Salmon Trout River can be attributed to sedimentation. Sedimentation has been a negative factor identified in recent and past analyses of the river. The USGS has characterized the system as a young watershed that is naturally cutting into its glacial outwash landmass. Sedimentation is therefore a natural event within the Salmon Trout River watershed; however human influence over the past 50 years has exacerbated the degree to which this occurs (Madison 1998).

To understand and manage sediment in this watershed, it is important to consider sediment sources, sediment routing through the drainage network, and sediment storage capacity. Taken as a whole, these processes define the watershed's sediment budget. The impact of sand input, for example from a road crossing, varies greatly depending on its position in the watershed, the local and watershed-wide sediment budget along and the sand transport capacity of its waters. The sand transport capacity of water is dependent on the channel's downstream slope, or gradient. Low gradient reaches may store sediment such that the net sediment budget is positive. In other words, sediment inputs to these reaches may be less than outputs, resulting in stream beds that are dominated by sand. In contrast, high gradient reaches are able to carry sediments downstream with little or no deposition (i.e. sediment entering equals sediment leaving) (Gough 2001, Figure 1.8).

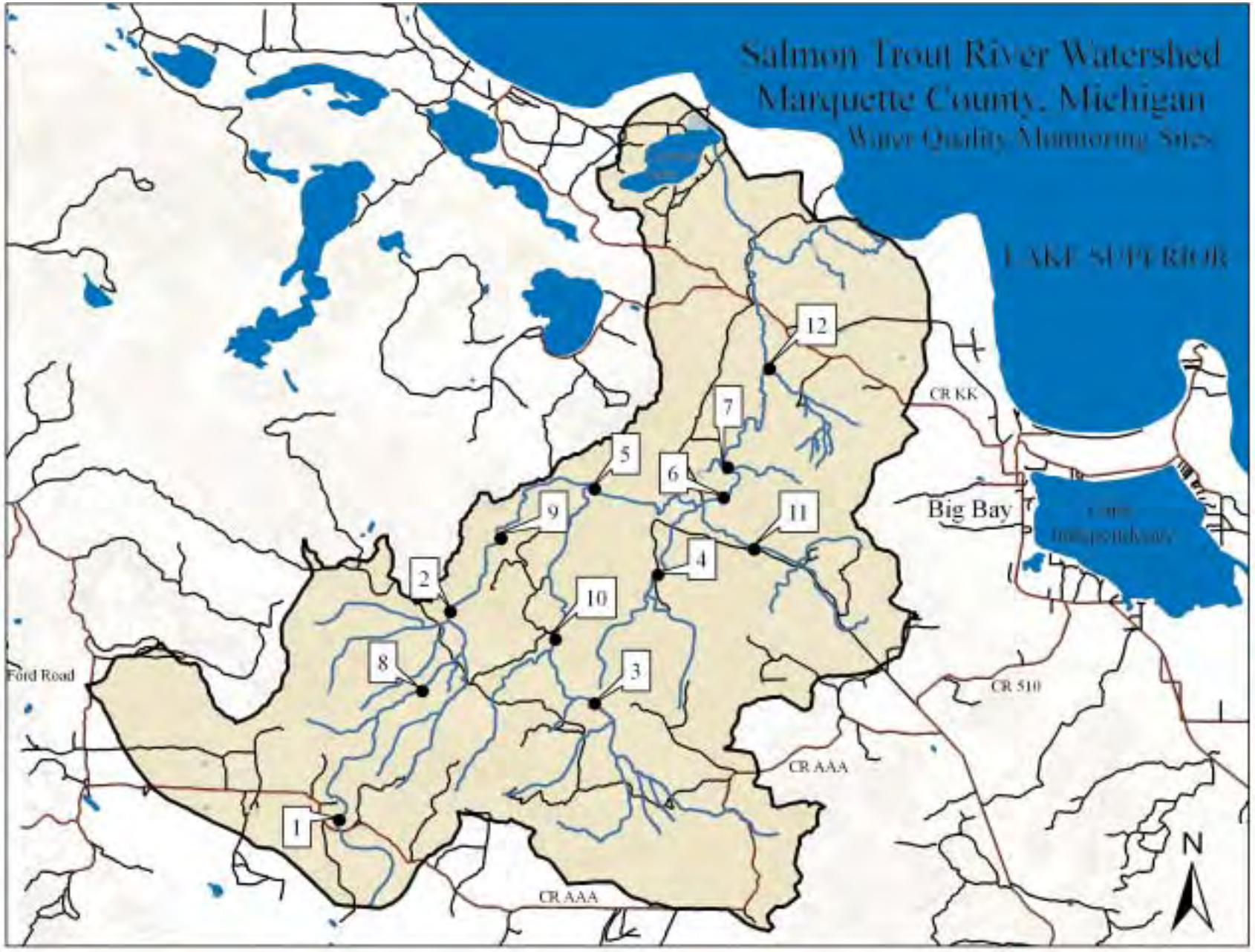
There are several low gradient reaches in the Salmon Trout River that pass very little of the sediment input they receive, and thus act as traps or storage areas. This is especially true in the lower river from the Lower Falls to the mouth at Lake Superior, where stream channel gradient is very low. This reach stores a large volume of sediment both in the channel bed and banks. Bed sediment in this reach typically exceeds one foot in depth. Sand bars are also frequently seen, further indicating a positive net sediment budget (sediment entering is less than sediment leaving). Most of this sediment is believed to originate from upstream sources. However, Murphy's Creek, a small intermittent tributary to the lower Salmon Trout River, may also contribute sediment to the Main Branch of the Salmon Trout River. Sediment loads from this source were not calculated because of intermittent flows and an unknown history of events.

Figure 1.8



Sand delta at the mouth of Murphy's Creek

Figure 1.9 Water Quality Monitoring Sites



In addition to local geology (typically boulder and bedrock controls), low gradient reaches occur in areas having road crossings with undersized culverts and/or beaver dams or other in-stream obstructions. Large volumes of sediment are frequently stored above these obstructions (Gough 2001).

Water Quality

Since 2000, the Superior Watershed Partnership has conducted annual water quality monitoring at sites throughout the Salmon Trout River watershed. This effort began with seven (7) sites and was expanded to twelve (12) sites during 2001 (Figure 1.9). Water quality monitoring is conducted during the spring and fall at times of low or moderate flow. The procedure utilized consists of evaluation of physical and biological parameters including stream substrate composition, channel morphology, bank structural features, riparian vegetation, cover, and the macroinvertebrate community. The biological integrity of each monitoring site is based on the results of the macroinvertebrate community evaluation, which provides a qualitative rating of water quality (excellent, good, fair, or poor). Water quality ratings are based on scores for the number of sensitive, somewhat sensitive, and pollution tolerant taxa present. Scores are assigned to each group (sensitive, somewhat sensitive, tolerant) based on the number of rare (1-10) and common (11 or more) organisms present. The total stream quality score for each site is a sum of the scores for each group. A total stream quality score less than 19 indicates water quality is poor, 19 to 33 is fair, 34 to 48 is good, and a score greater than 48 indicates excellent water quality.

Average annual water quality monitoring scores for the Salmon Trout River watershed from 2000 to 2005 indicate water quality is fair to good at most sites (Figure 1.10). Table 1.2 provides water quality monitoring scores by site and sampling year for each of the twelve established sites (2000-2005). Table 1.3 includes macroinvertebrates present at the twelve sites during the 2004 and 2005 monitoring events. Appendix A provides complete monitoring data collected during 2004 and 2005 including photographic documentation of site characteristics.

Table 1.2 Water quality monitoring scores by site and sampling year for each of the twelve established sites (2000-2005).

WQM Scores	Year					
Site Number	2000	2001	2002	2003	2004	2005
1	34.3	39.1	36.5	35.6	27.8	30.3
2	33.1	36.4	42.5	38.9	39.6	39.3
3	34.4	34.2	24.7	34.0	33.5	30.3
4	29.9	43.3	33.3	40.7	46.4	35.7
5	21.8	39.0	33.8	32.1	38.1	41.8
6	37.1	41.8	41.6	50.6	45.6	43.7
7	28.2	44.0	40.9	41.7		45.1
8		30.9	33.8	37.4	35.2	30.6
9		38.6	32.8	42.4	39.6	34.8
10		33.5	34.0	43.1	37.3	39.1
11		28.1	34.3	38.2	32.9	30.9
12		33.3	34.2	36.5		31.5

Figure 1.10 Average annual water quality monitoring scores for the Salmon Trout River watershed (2000-2005).

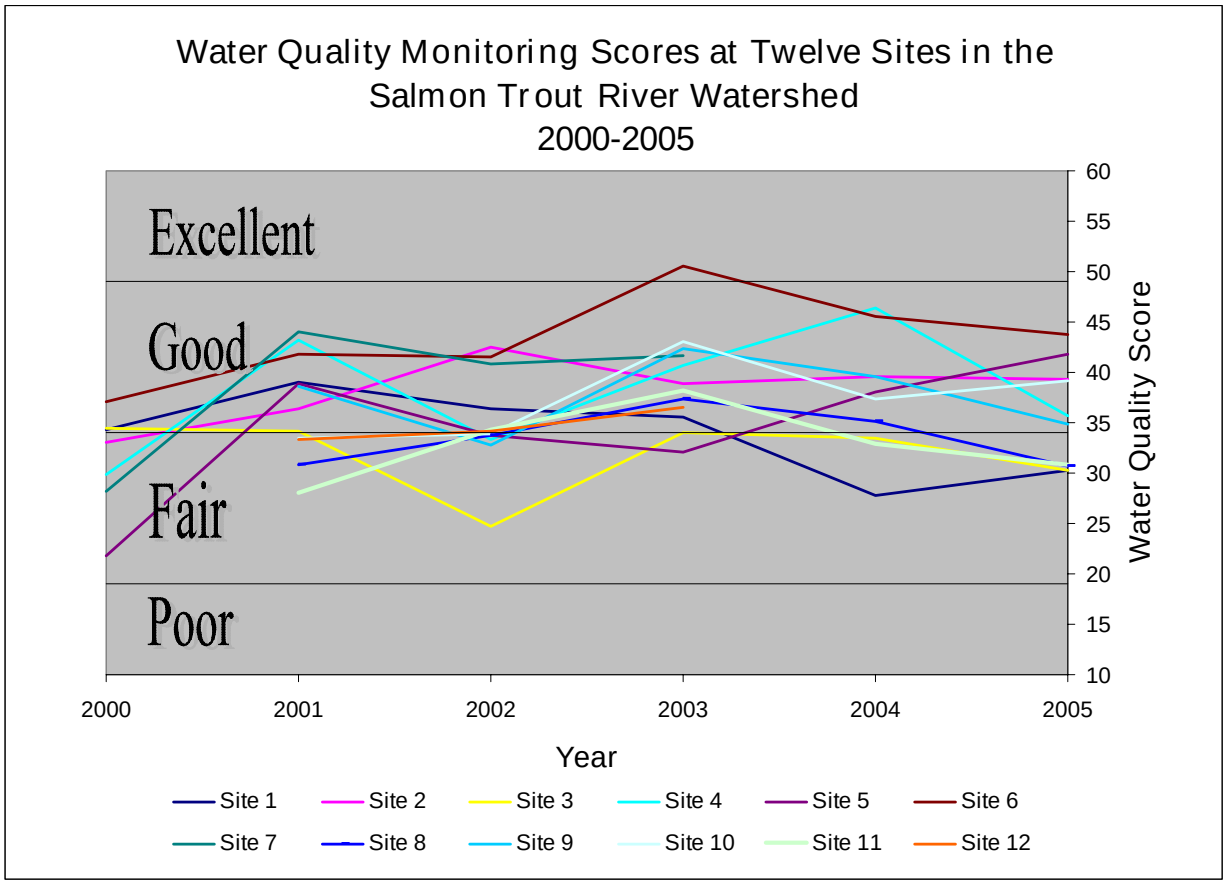


Table 1.3 Macroinvertebrates present at twelve sites in the Salmon Trout River watershed (2004-2005).

	WATER QUALITY MONITORING SITE											
TAXA	1	2	3	4	5	6	7	8	9	10	11	12
Group 1 Sensitive												
Coleoptera (Adult beetles)		X		X	X	X	X	X	X	X		X
Coleoptera (Water penny)												
Diptera (Black fly larvae)		X	X	X			X		X		X	
Ephemeroptera (Mayfly nymphs)	X	X	X	X	X	X	X	X	X	X	X	X
Gastropoda (Gilled snails)										X		
Megaloptera (Hellgrammites)		X			X	X	X					
Plecoptera (Stonefly nymphs)	X	X	X	X	X	X	X	X	X	X	X	X
Trichoptera (Caddisfly larvae)	X	X	X	X	X	X	X	X	X	X	X	X
Group 2 Somewhat sensitive												
Amphipoda (Scuds)	X		X	X		X	X				X	
Coleoptera (Beetle larvae)		X		X	X	X	X	X		X	X	
Decapoda (Crayfish)												
Diptera (Crane Fly larvae)	X	X	X	X	X	X	X	X	X	X	X	X
Megaloptera (Alderfly larvae)				X						X		
Odonata (Damselfly nymphs)	X									X		
Odonata (Dragonfly nymphs)	X	X		X	X	X	X	X	X	X	X	
Pelecypoda (Clams)	X	X	X	X	X	X	X	X	X	X	X	X
Group 3 Pollution Tolerant												
Diptera (Midge larvae)	X	X	X	X	X	X	X	X	X	X	X	X
Diptera (Other)	X	X		X	X	X	X	X	X	X	X	X
Gastropoda (Pouch snails)		X		X	X	X	X		X	X		
Hemiptera (True bugs)		X		X				X		X	X	X
Hirudina (Leeches)					X					X		
Isopoda (Sowbugs)					X							
Oligochaeta (Aquatic worms)	X	X	X	X	X	X	X	X	X	X	X	X

Kirtland's warbler
Photo by Scot Stewart

"The rarity of the Kirtland's warbler is due mostly to their limited habitat. They nest only in stands of jack pines 5-20 feet tall and 5-20 years old". Scott Swanson, The Mining Journal June 5, 2006.

Mature hemlock forest

Significant Natural Resources

The Salmon Trout River watershed encompasses a unique diversity of terrestrial and aquatic ecosystems and an array of unusual geological features. The Huron Mountains, along and inland from the southern shore of Lake Superior, exhibit a stunning diversity of hemlock-northern hardwood forest ecosystems, including some of the oldest maple-hemlock forests in the Midwest, and terrestrial ecosystems ranging from rocky, dry, and exposed sites to forested swamps and marshes. Remaining old growth forests contain scattered individuals of very large size (Barnes et al. 1990).

Because of the area's remoteness and isolation, substantial tracts remain undeveloped and provide diverse and un-fragmented habitat for wildlife. This includes habitat for one of the rarest birds in North America, the federally endangered Kirtland's warbler, which was recently sited in the jack pine forests of the upper watershed. Only about 1400 specimens remain worldwide. They are primarily located in 10 Michigan Counties (4 in the Upper Peninsula) (Olson 2002). Other wildlife observed in the watershed includes, but is not limited to, whitetail deer, black bear, marten, fisher, and snowshoe hair, with an occasional moose, timber wolf, or lynx reported, along with numerous birds and waterfowl.

The Salmon Trout River, a cold water trout stream, is home to the only known breeding population of the native coaster brook trout on Lake Superior's south shore. Coaster brook trout differ from other brook trout in that they spend part or all or their life cycle in a Great Lake. Historical catches of coaster brook trout in the Salmon Trout River during the late 1800s and early 1900s often exceeded 200 fish per day. Ongoing studies, sponsored by the Huron Mountain Wildlife Foundation, indicate the total spawning population is now fewer than 200 individuals each year. Many factors have been implicated in the reduction of coaster brook trout in the Great Lakes including over-exploitation (angling, commercial and tribal netting), logging effects, other habitat losses including loss of spawning areas, pollution, loss of genetic diversity, man-made barriers to migration, and competition with exotic salmonines (Newman et al. (ED) 2003).

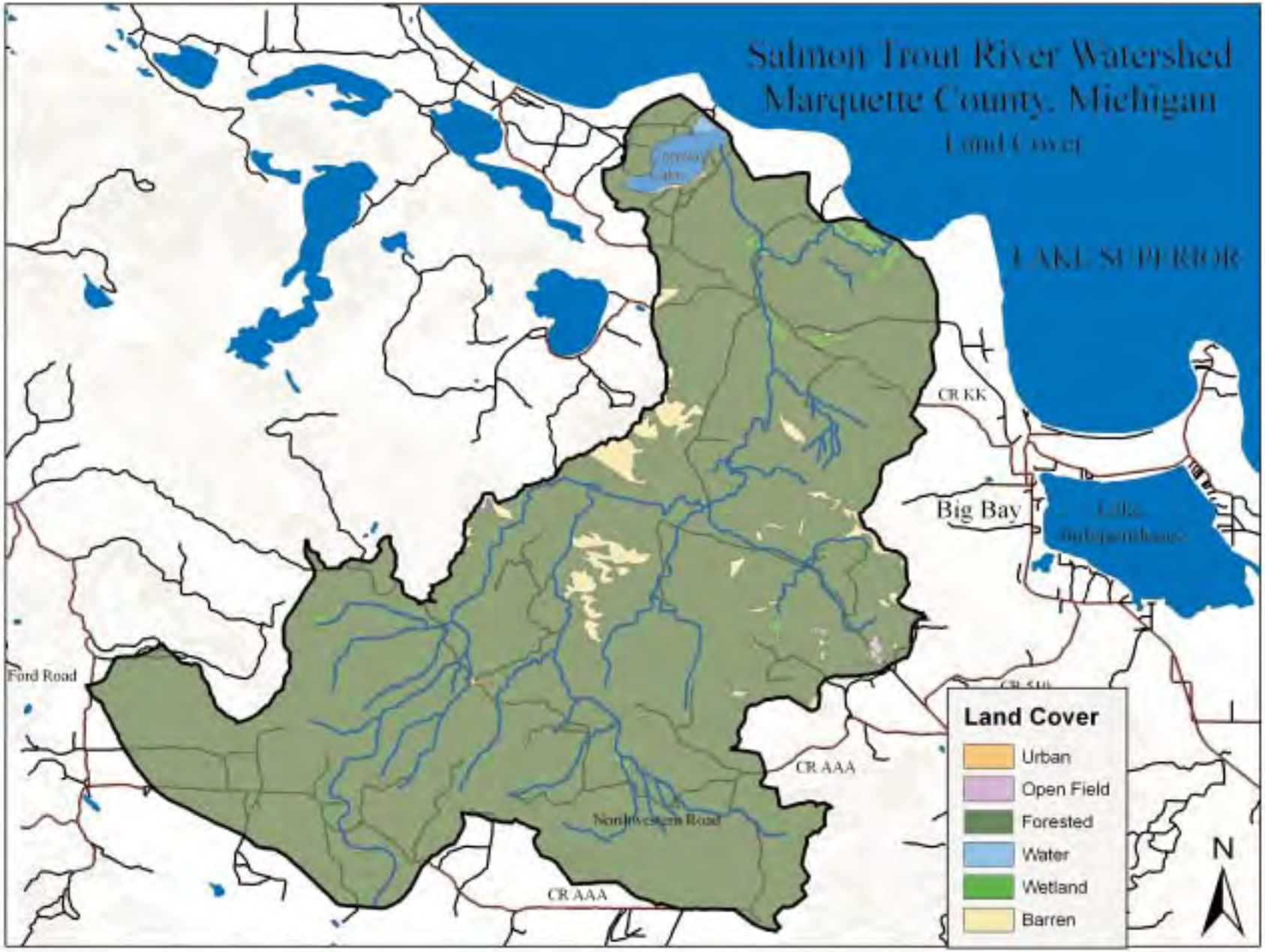
In February 2006, the Sierra Club Mackinac Chapter and the Huron Mountain Club filed a petition to the U.S. Fish and Wildlife Service to list the naturally spawning anadromous (fish that ascend rivers to spawn) coaster brook trout as an endangered species throughout its known historic range in the conterminous United States, and to designate "critical habitat" under the Endangered Species Act (16 U.S.C. Sec. 1531 et seq. (1973) as Amended). Since 1995, the Huron Mountain Club, owners of the land surrounding the entire reach of the Salmon Trout River used by coaster brook trout, has prohibited its members from killing coasters and supported closure of the river to fishing by the Michigan Department of Natural Resources during seasons when coasters are present, as well as the adoption of stricter take limits in Lake Superior. The Huron Mountain Club also encourages and supports academic research and long term studies of coaster brook trout population dynamics and health in the Salmon Trout River.

Other state threatened, endangered, and special concern species with known occurrences in the Salmon Trout River watershed include; Calypso or Fairy-slipper (Threatened), Narrow-leaved Gentian (Threatened), Northern Gooseberry (Special Concern), spruce grouse (Special Concern), Common loon (Threatened), and Bald Eagle (Threatened, and federal status). State listed high quality natural communities found in the watershed include the Mesic Northern Forest, Rich Conifer Swamp, and Wooded Dune and Swale Complex ecosystems (MNFI 2006).

Salmon Trout River Coaster Brook Trout

Bob Moore and wife with string of coasters, May 1947

Figure 2.1 Land cover types in the Salmon Trout River watershed



Chapter Two

THE HUMAN ENVIRONMENT

The following sections summarize the human environment in and around the Salmon Trout River watershed including community profile, existing land uses, transportation routes, the political landscape, and future growth areas.

Community Profile

In addition to the gated community of the Huron Mountain Club and private recreational cabins (camps), the closest community to the Salmon Trout River watershed is located a few miles away in the Town of Big Bay. Big Bay was founded in 1875 around a saw mill and over the years, logging camps supplied several sawmills in Big Bay including a central mill complex so large it had four smokestacks. There, the Brunswick Lumber Company mill made bowling pins and hardwood flooring, among other things. In 1930, three large sawmills were built on the north side of Marquette, a more cost effective location, and Brunswick closed its Big Bay operations in 1932.

Big Bay was nearly a ghost town when Henry Ford bought the mill in 1943 at the age of eighty. Ford also purchased the power plant and almost everything else in the town including the town's fifty-two houses for his employees at the mill, and an inn that he used as a summer hotel for Ford Motor Company executives and friends. Big Bay was abandoned by the Ford family in 1951, after the deaths of Henry and his wife Clara however a hundred or so people remained. In 1959, the picturesque hotel once owned by Ford was used as the setting for the movie Anatomy of a Murder, which was based on a real murder that had taken place in the nearby Lumberjack Tavern. The author of the book on which the movie was based, Robert Traver (John Voelker), was a Michigan Supreme Court Justice and avid fly fisherman who lived in the nearby City of Ishpeming (Hunts 2006).

Today, Big Bay is an unincorporated community with a population of 265 (US Census 2000). The town now supports a number of service related industries and three sawmills. It remains a popular destination for fisherman, hunters, tourists, and recreational enthusiasts of all kinds.

Existing Land Uses

Land cover in the Salmon Trout River watershed is dominated by forests, which occupy 29,678 acres or 94% of the watershed. Wetlands, covering the next highest area, occupy roughly 835 acres or 2.6% of the watershed. Similarly, rock outcroppings occupying 795 acres (2.5%) show the range of diversity of terrestrial ecosystems within the watershed (Figure 2.1).

Figure 2.2 Property Ownership and Political Boundaries

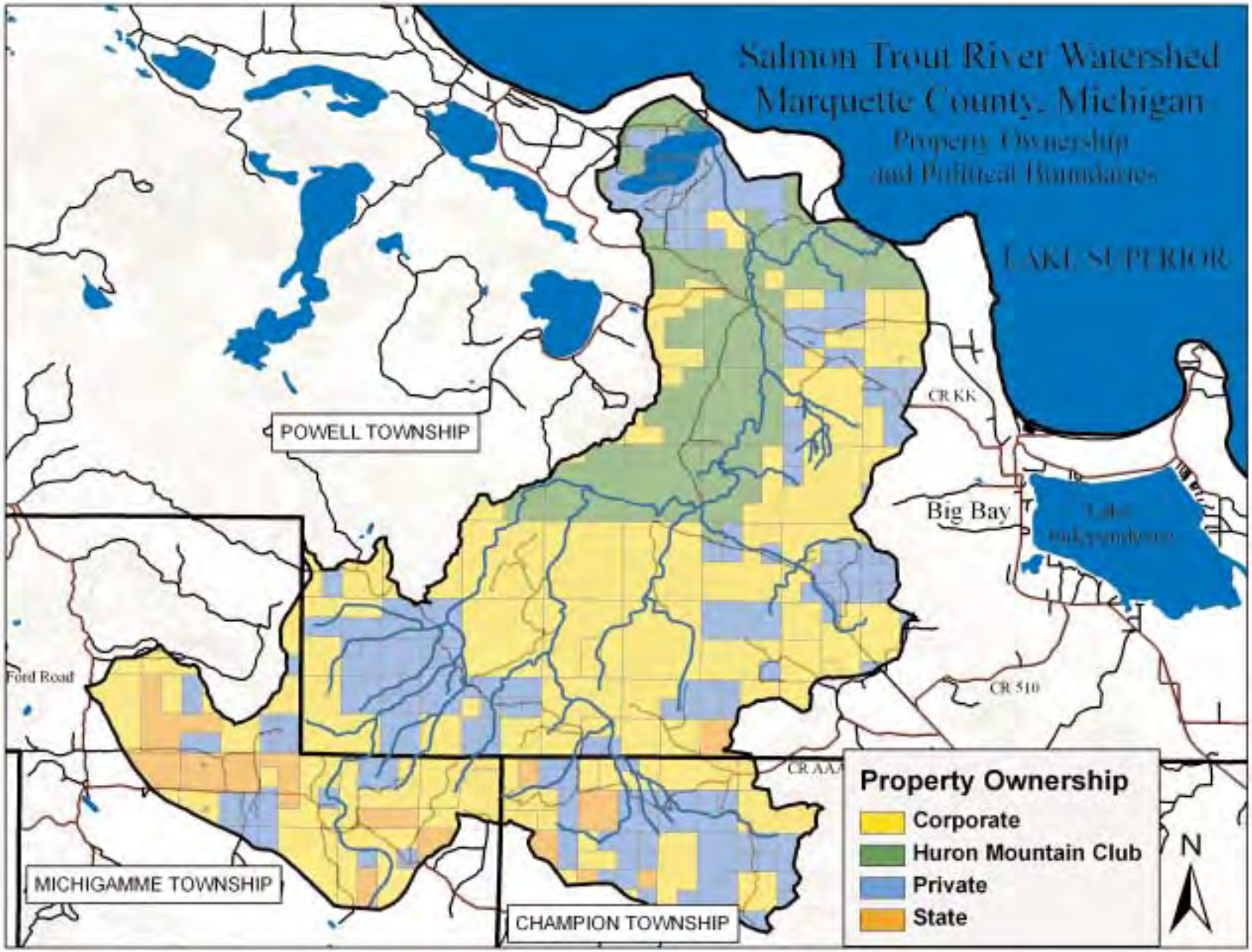


Table 2.1 Land cover types in the Salmon Trout River Watershed.

Land Cover Type	Size		Percent of Watershed
	Acres	Square Miles	
Forested	27,977	43.7	88.2
Wetland	1920	3.0	6.2
Barren (rock outcrop)	1380	2.2	4.4
Open Water	357	0.56	1.2
Open Field	31	0.05	0
Urban	22	0.00	0
Total Watershed	31,687	49.51	100

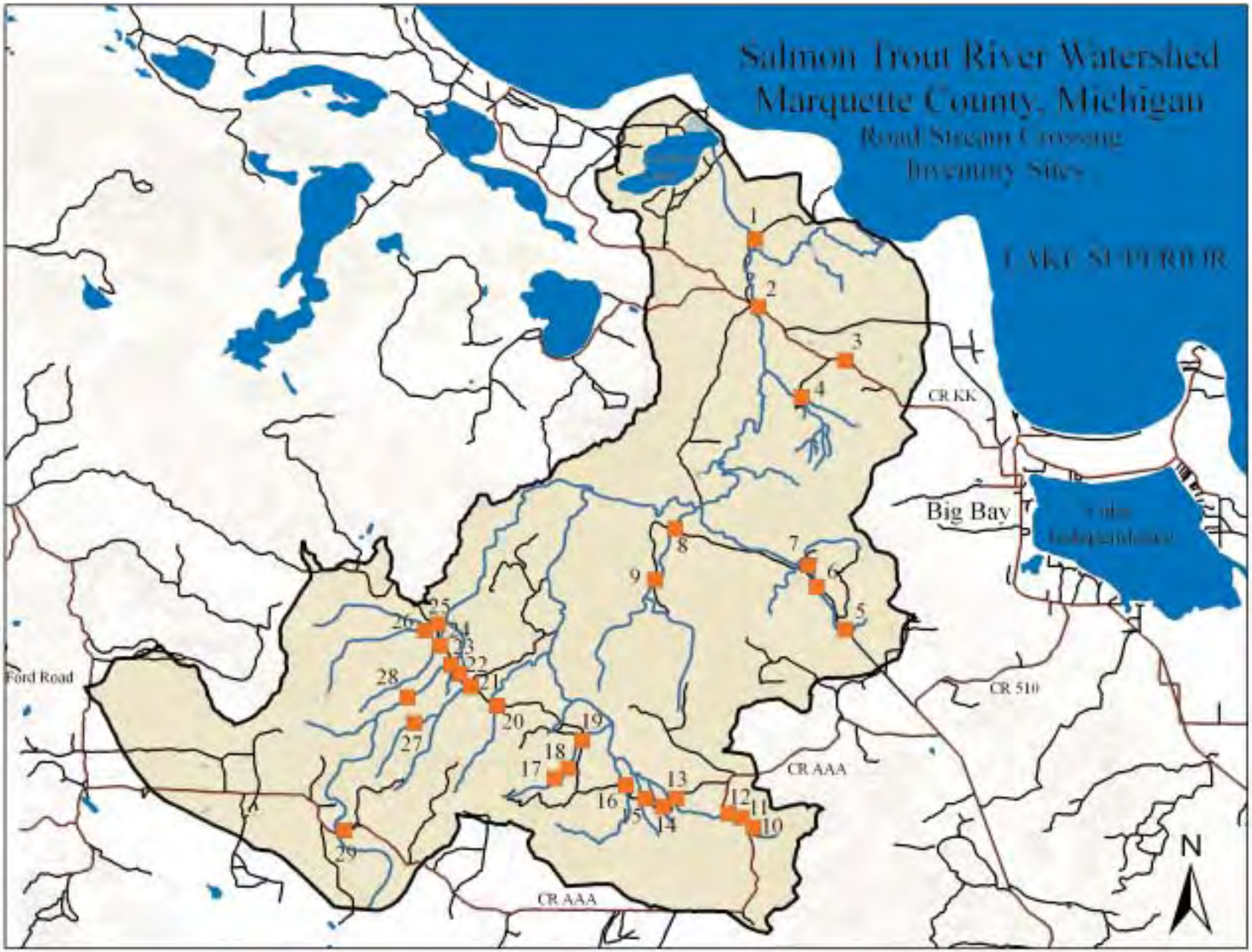
Logging has been the primary land use in the Salmon Trout River watershed due to the dominance of forest lands, large corporate holdings, and historically, its close proximity to the community of Big Bay. Logging has also been identified as one component that has increased the degree of in-stream sedimentation to the Salmon Trout River and its tributaries. While logging practices have improved over the years, the steep topography and numerous water drainages of the watershed make harvest practices difficult and stream crossings often result in increased sedimentation to the watershed system. Old logging sites in the upper watershed show evidence of numerous crossings, constructed simply by bulldozing earthen material into the stream or by utilizing hollow logs as culverts. High water events have washed most of these crossings and their sediments into the stream system (Madison 1998).

Land ownership in the Salmon Trout River watershed is comprised of corporate forest products producers (16,100 acres), private land owners (8,200 acres), the Huron Mountain Club (5,300 acres) and State of Michigan (1,800 acres) (Figure 2.2). The Longyear Realty Corporation, a forest products company, owns approximately one quarter of the Salmon Trout River watershed. Longyear's long-term plan for their holdings includes sustainable forestry management as they have done for over 80 years. Similarly, private parcels ranging in size from one acre to several hundred acres occupy approximately 25% of the total watershed area. Many of these parcels have rustic camps that are used for hunting, fishing, and other outdoor activities. It is also common for private landowners to manage their property for timber resources.

The Huron Mountain Club, another major land owner, has great interest and policy for protecting significant natural resources in the watershed. Portions of the Club's property have remained virtually undeveloped for over 100 years and the current land use plan prohibits future development in these areas. The State of Michigan owns approximately 1,800 acres of land in the Salmon Trout River watershed that falls under the Gwinn Management Unit of the Michigan State Forest System. Management of this unit involves passive and active recreational uses and natural resources protection including sustainable forest management practices.

Typical hunting camp

Figure 2.3 Road / Stream Crossing Inventory Sites



The watershed also contributes to the livelihood of the Keweenaw Bay Indian Community (KBIC). The area is included in KBIC's ceded territories, established through a treaty in 1842, and the tribe retains traditional rights to hunt and fish within this territory.

Recreational opportunities are abundant in the Salmon Trout River watershed. Miles of flowing streams, the Huron Mountains, and numerous trails make the watershed a desirable location for the outdoor enthusiast. It is a popular destination for activities such as hiking, fishing, bird watching, hunting, kayaking, and back country camping. Fishing is a popular sport in the watershed and generally consists of back woods brook trout fishing. All of the tributaries to the Salmon Trout River are classified as Designated Trout Streams by the Michigan Department of Natural Resources (MDNR). The lower Salmon Trout River from the Lower falls (T51N, R28W, Sec. 13) to Lake Superior is a MDNR Research Area and is closed to all fishing from August 15th to the Friday before the last Saturday in April. Hunting and fishing opportunities are available to the public on thousands of acres of State owned and corporate lands. While the Huron Mountain Club property is not open to the public, members and guest are able to hunt in certain areas. Common game animals include whitetail deer, ruffed grouse, and snowshoe hare.

Transportation Routes

Transportation routes in the Salmon Trout River Watershed can be described as generally passable in most conditions. These contemporary back roads consist primarily of a few seasonal county roads and numerous secondary "two-track" roads that provide limited access to otherwise remote areas. The Northwestern Road serves as the main artery to access the upper watershed landmass for logging, recreation, and private camps. With the exception of a portion of County Road KK leading to the Huron Mountain Club, all are gravel roads subject to continuous erosion. Most are heavily traveled by logging trucks.

Since 2000, twenty-nine road/stream crossing sites in the Salmon Trout River watershed have been monitored annually by the Superior Watershed Partnership (Figure 2.3). This effort has identified the permanent road infrastructure as a significant contributor of sedimentation to the system. The steep relieve combined with sandy soils has been a bad combination for erosion during snowmelt, rain events, and grading operations. In addition, most of the crossings have been constructed with undersized culverts and many are perched and inhibit passage of fish and aquatic organisms.

There are often large volumes of sediment stored above road/stream crossings due to the damming effect of the crossing itself or beaver activity. In addition, almost all of the crossings in the Salmon Trout River watershed are situated at the lowest elevation point of the road that they service. As a result, they function as a focal point to funnel sediment into the river (Madison 1998). Some crossings are made of old or improvised materials (hollow logs or timbers) or have no crossing structure at all, with vehicle traffic driving directly through the steam.

While some road/stream crossings have been recently improved with new structures and appropriate

East Branch of Salmon Trout River along County Road AAA

East Branch of Salmon Trout River during rain event

Road Crossing Inventory Site #12 Culvert at County Road AAA

sediment control measures, many others are still acting as direct sediment inputs to the system. Among the worst of these crossings are the three crossings of the East Branch of the Salmon Trout River by County Road AAA (Triple A) in Champion Township. These crossings consist of single culverts that are of insufficient diameter and length. In addition, the stream meanders under the road three times in less than 1/2 mile in this area, resulting in large amounts of sediment input to the stream bed, especially during snow melt, rain events, and road grading operations. Similarly, the nearby crossing of the East Branch by the Northwestern Road consists of dual culverts that are also of insufficient diameter and length. In addition to severely eroding road slopes, this crossing is overwhelmed by spring run off, which forces the river to flow over the road, washing tons of sediment into the stream.

Road/stream crossing inventory data were used to evaluate and prioritize sites for improvements based on the condition of the structure(s) and approaches, the estimated quantity of materials (sand) reaching the stream, and ability to pass fish and other aquatic organisms. Erosion was measured directly in the field and annual sediment loads calculated using Natural Resources Conservation Service methods (USDA NRCS 2002). A summary of the road/stream crossings in the Salmon Trout River watershed, including level of erosion (minor, gross, or stable), estimated annual sediment loading, and site description is provided in Table 2.2. Appendix B includes road crossing inventory data sheets and photographic documentation of sites evaluated during 2004 and 2005.

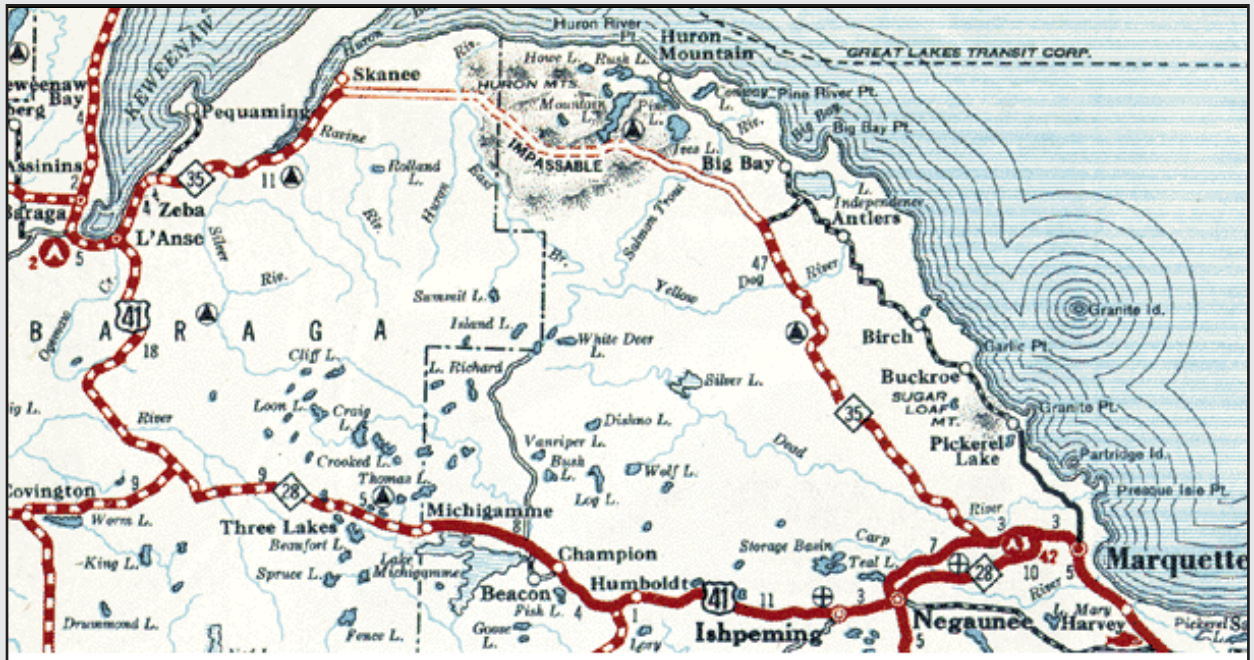
Table 2.2 Summary of Road/Stream Crossings in the Salmon Trout River Watershed.

Site Number	Location	Tributary Name	Road Name	Crossing Structure	Erosion (minor, gross, stable)	Annual Sediment Load*	Description
1	T52N, R28W, Sec 36	Conway Creek	Private Road	Plastic Culvert	Stable		Crossing and approaches are stable
2	T51N, R28W, Sec. 1	Main Branch Salmon Trout	County Road KK	Steel Bridge w/wood deck	Gross erosion	33.2 Tons	Sediment input to stream from north road approach
3	T51N, R27W, Sec. 6	Sullivan Creek	County Road KK	CMP Culvert	Stable		New culvert and stormwater improvements in 2001
4	T51N, R27W, Sec. 7	Murphy's Creek	Unnamed Two-track	Plastic Culvert	Stable		New culvert and stormwater improvements in 2001. Some gravel has washed into stream from north approach
5	T51N, R27W, Sec. 30	Clear Creek	Blind 35	CMP Culvert	Stable		Crossing is shown on most maps but culvert and stream channel are not visible
6	T51N, R27W, Sec. 19	Clear Creek	Blind 35	Three CMP Culverts	Stable		All three culverts are perched (6 inches). Inlets are buried in sediment. Road slopes are very steep. Unable to calculate sediment load due to condition of site. Majority of sediments are likely from upstream sources
7	T51N, R27W, Sec. 19	Clear Creek	Unnamed Two-track	ORV Ford Crossing/wood Foot bridge	Minor erosion	11.0 Tons	Wood foot bridge and ORV ford crossing. Minor erosion of stream banks and approaches. ORV tracks through stream
8	T51N, R28W, Sec. 23	Snake Creek	Blind 35	Concrete Bridge	Stable		Old bridge with recent work (2004) to west approach. Crossing and approaches are stable
9	T51N, R28W, Sec. 23	Snake Creek	Unnamed Two-track	Armored ORV Ford Crossing	Stable		No structure. Crossing and approaches are well armored and stable. Stormwater diversion ditches present and functioning well
10	T50N, R28W, Sec. 3	East Branch Salmon Trout	County Road AAA (Triple A)	Corrugated Steel Culvert	Gross erosion	45.4 Tons	Undersized structure (length), severe erosion of road slopes and approaches
11	T50N, R28W, Sec. 3	East Branch Salmon Trout	County Road AAA (Triple A)	Corrugated Steel Culvert	Gross erosion	119.8 Tons	Undersized structure (length), severe erosion of road slopes and approaches
12	T50N, R28W, Sec. 4	East Branch Salmon Trout	County Road AAA (Triple A)	Corrugated Steel Culvert	Gross erosion	59.4 Tons	Undersized structure (length), severe erosion of road slopes and approaches

Site Number	Location	Tributary Name	Road Name	Crossing Structure	Erosion (minor, gross, stable)	Annual Sediment Load*	Description
13	T50N, R28W, Sec. 4	East Branch Salmon Trout	Northwestern Road	Two Corrugated Steel Culverts	Minor erosion	10.5 Tons	Very little fill over culverts. Evidence of road washout during heavy rain and runoff events (sediment from road surface during washout)
14	T50N, R28W, Sec. 4	Unnamed Tributary to East Branch	Northwestern Road	Two Corrugated Steel Culverts	Stable		One of two culverts is perched (2 inches). Crossing and approaches are stable
15	T50N, R28W, Sec. 5	Unnamed Tributary to East Branch	Northwestern Road	Corrugated Steel Culvert	Stable		Crossing and approaches are stable
16	T50N, R28W, Sec. 5	Unnamed Tributary to East Branch	Northwestern Road	Steel Bridge w/wood deck	Stable		New bridge and stormwater improvements in 2001. Crossing and approaches are stable
17	T50N, R28W, Sec. 6	Unnamed Tributary to East Branch	Unnamed Two-track	Two Corrugated Steel Culverts	Stable		One of two culverts is perched (6 inches). Road slope steep but well vegetated. Crossing and approaches are stable
18	T50N, R28W, Sec. 6	Unnamed Tributary to East Branch	Unnamed Two-track	Two Corrugated Steel Culverts	Minor erosion	8.1 Tons	Newer crossing on private road. Minor erosion on north and south approaches reaching stream
19	T51N, R28W, Sec. 34	Unnamed Tributary to East Branch	Northwestern Road	Steel Bridge	Stable		New bridge and stormwater improvements in 2002. Crossing and approaches are stable
20	T51N, R28W, Sec. 33	Unnamed Tributary to East Branch	Northwestern Road	Steel Bridge w/wood deck	Stable		New bridge and stormwater improvements in 2002. Crossing and approaches are stable
21	T51N, R28W, Sec. 28	Unnamed Tributary to Main Branch	Northwestern Road	Corrugated Steel Culvert	Stable		Stormwater improvements in 2002. Crossing and approaches are stable
22	T51N, R28W, Sec. 28	Unnamed Tributary to Main Branch	Unnamed Two-track	Plastic Culvert	Minor erosion	8.1 Tons	New culvert installed during 2001 is now perched (6 inches). Minor erosion of road slope on downstream end (outlet)
23	T51N, R28W, Sec. 29	Main Branch Salmon Trout	Northwestern Road	Steel Bridge w/wood deck	Stable		New bridge and stormwater improvements in 2001. Crossing and approaches are stable
24	T51N, R28W, Sec. 29	Unnamed Tributary to West Branch	Northwestern Road	Aluminum Arch Culvert	Stable		New culvert and storm water improvements in 2003. Crossing and approaches are stable

Site Number	Location	Tributary Name	Road Name	Crossing Structure	Erosion (minor, gross, stable)	Annual Sediment Load*	Description
25	T51N, R28W, Sec. 29	West Branch Salmon Trout River	Northwestern Road	Wooden Bridge	Stable		Timber bridge and abutments. Bridge deck boards repaired in 2001. Crossing and approaches are stable
26	T51N, R28W, Sec. 29	Iron Creek	Unnamed Two-track	CMP Culvert	Minor erosion	11.0 Tons	Perched culvert (6 inches), evidence or road washout during high water events (sediment from road surface during washout)
27	T51N, R28W, Sec. 32	Unnamed Tributary to Main Branch	Unnamed Two-track	Hollow Log	Stable		Hollow log used as culvert – stream has undermined and flow in uninhibited by structure (perched 24 inches)
28	T51N, R28W, Sec. 32	Main Branch Salmon Trout	Unnamed Two-track	Timber Bridge	Minor erosion	16.2 Tons	Minor erosion on south approach reaching stream. Crossing impedes fish migration
29	T50N, R29W, Sec. 11	Main Branch Salmon Trout	County Road AAA (Triple A)	Elliptical CMP Culvert	Minor erosion	N/A	New culvert installed by landowner during 2005. Heavy riprap. Minor erosion on west road approach not reaching stream
ESTIMATED ANNUAL SEDIMENT LOAD						322.7 TONS	

*Estimated annual sediment loads were calculated for only those sites with sediments reaching the stream.



Portion of 1932 Official Michigan Highway Map from the Michigan State Highway Department showing incomplete M-35 segment through Huron Mountains as "IMPASSABLE."

M-35: The Highway Henry Ford Stopped

During 1919, the State of Michigan Highway Department designated a new trunkline route from Negaunee to L'Anse through the Huron Mountains of northwestern Marquette and northeastern Baraga Counties. The new highway was given the designation M-35. At the time the area was only served by logging roads and two-track trails. The state Highway Department decided to approach construction of the route from each direction, eventually meeting in the middle in the most challenging portion of the route, the Huron Mountains. It was not until 1926 that work was completed on a major portion though Marquette County and 1932 that similar work was completed in Baraga County. During this time, state highway maps showed the highway with a dashed line through the Huron Mountains and the label "IMPASSABLE". During this time, industrialist Henry Ford had purchased hundreds of thousands of acres of land in the Upper Peninsula and was using wood harvested from the land in the manufacture of his automobiles in Detroit. Ford loved to travel to the U.P. and had his eye set on becoming a member of the ultra-exclusive Huron Mountain Club. At the time, the Club limited its membership to only 50 primary members (those who were allowed to own their own cabin) and 80 "associate" members (those not allowed to own a cabin). Since the membership roster was full, Ford was forced to wait until a club member either resigned or died for an opportunity to join. To help his cause of gaining membership to club, Ford purchased additional acreage in Marquette County adjacent to the club's holdings including land along the proposed route of M-35. Ford worked to stop construction of the highway through his holdings and within a decade, the uncompleted portion of the highway through the Huron Mountains was cancelled and the entire route from Negaunee to L'Anse was removed from the state trunkline system. Due to his assistance in getting the state highway past the Huron Mountain Club cancelled, Henry Ford was granted full-time membership. Shortly after his acceptance, he hired Alber Kahn to design and build a $100,000 "cabin", which in 1929, was a large sum of money. Today, no navigable road exists through the Huron Mountains along the line of the proposed M-35. The only passable route providing access to the constructed portions of the proposed M-35 route in this area utilizes the Triple A, Ford, Northwestern, and Erick Roads (Bessert 2006).

Political Landscape

Zoning in the Salmon Trout River watershed is regulated by Powell, Michigamme, and Champion Townships (Figure 2.2). All are under the jurisdiction of Marquette County. Powell Township occupies the majority of the watershed (22,600 acres) and includes zoning districts for Timber Production, Rural Residential, Lake Shore and River, Recreation Structures, Agriculture Production, Resource Production Ten, and Resource Production Twenty. Each of these zoning districts includes regulations that specify minimum parcel size, along with intended, permitted, and conditional uses.

Powell Township zoning provides protection for water quality in the Salmon Trout River watershed through environmental protection strips or buffers 100 feet wide measured from the high water mark along the Main, East, and West Branches of the Salmon Trout River. This ordinance also protects portions of the Yellow Dog, Big Garlic, Little Garlic, Alder, Iron, and Pine Rivers located within the township boundaries. Within these environmental protection strips, a minimum residual tree stand density of 70 basal feet per acre is required. In addition, a fifty foot wide environmental protection strip is required for all other non-intermittent streams and permanent water bodies, exceeding five (5) acres in size. While selective cutting is permitted within these environmental protection strips, the ordinance requires specific practices as established by the MDNR Forest Management Division.

Michigamme and Champion townships occupy 5,100 and 3,900 acres (respectively) of the Salmon Trout River watershed. Zoning in these townships consists of districts established for natural resource production including timber production and mining. While both Michigamme and Champion Townships have jurisdiction over areas that include the headwaters of the Salmon Trout River and its tributaries, neither have provisions for environmental protection strips (buffers) along tributaries or water bodies.

Future Growth Areas

Human settlement within the Salmon Trout River watershed has been characteristically represented by large tract corporate land holdings and few private parcels. However, real estate values have risen within the last ten years and the high value of water front property has increased the attractiveness of lands within the watershed. In addition, improvements to the road infrastructure leading from the population centers of Marquette, Negaunee, and Ishpeming have increased the public's access to the Salmon Trout territory. Currently, many large land holdings are being subdivided into smaller units. These small tracts are being converted into vacation homes and modern camps. While this type of development is somewhat limited, it continues to be a threat to water quality due to the remote and pristine nature of the land. Construction of secondary access roads, installation of septic systems, logging, and loss of wetlands are a few of the potential impacts from this type of development. Land held by the Huron Mountain Club and the State of Michigan is less likely to be developed per current long-term land use plans.

Table 3.1 Designated uses for all surface waters of the State of Michigan.

In Michigan, all surface waters of th e state are designated for and shall be protected for all of the following uses:
1. Agriculture 2. Industrial water supply 3. Public water supply and the point of intake 4. Navigation 5. Warmwater fishery (or coldwater fishery) 6. Other indigenous aquatic life and wildlife 7. Partial body contact recreation 8. Total body contact recreation between May 1 and October 31 Citation: R323.1100 of Part 4, Part 31 of the Natural Resources and Environmental Protection Act, 1994 PA 452, as amended

Chapter Three

DESIGNATED USES AND POLLUTANTS OF CONCERN

The first step in establishing goals for this watershed planning project was to evaluate the current condition of water quality in the watershed. The primary criterion for water quality is whether the waterbody meets designated uses. Designated uses are recognized uses of water established by state and federal water quality programs. In Michigan, all surface waters of the state are protected by water quality standards for specific designated uses (Table 3.1). These standards and designated uses are designed to 1) protect the public's health and welfare, 2) to enhance and maintain the quality of water, and 3) to protect the state's natural resources.

Impaired and Threatened Designated Uses

The DEQ uses a rotating watershed cycle for surface water quality monitoring where each of the 58 major watersheds in the state is scheduled for monitoring at least once every five years. Data from this monitoring along with other readily available water quality data and information are used to assess surface water quality conditions. Each assessed waterbody is placed in at least one of five reporting categories based upon: 1) the degree of designated use support, 2) how much is known about the waterbody's water quality status, and 3) the type of impairment preventing designated use support. If a body of water or stream reach is not meeting the water quality standards set for a specific designated use, then it is said to be in "nonattainment". An annually published listing of bodies of water and stream reaches in the state of Michigan that are in nonattainment can be found in the Water Quality and Pollution Control in Michigan 2006 Sections 303(D), 305(B), and 314 Integrated Report (DEQ 2006). The Salmon Trout River watershed is listed in two of these categories in the 2006 Integrated Report (Table 3.2).

While some designated uses in the Salmon Trout River watershed may not be supported, none are known to be impaired on a watershed wide scale. Elevated mercury levels in the Salmon Trout River are likely due to atmospheric deposition from nearby coal fired power plants in the City of Marquette but may also be a result of natural attenuation of mineral deposits or from a combination of sources. Air pollutants can reach water bodies as direct deposition (falling directly into the water) or as indirect deposition (falling onto the land and washing into a waterbody). The impacts of atmospheric deposition of pollutants such as mercury on land and surface waters are well documented. There is also some evidence atmospheric pollutants can affect groundwater (USEPA 2006).

Other activities within the Salmon Trout River watershed have been identified as threats to designated uses and water quality. Threatened water bodies are defined as those that currently meet water quality standards, but may not in the future. This plan focuses on three designated uses that are currently threatened. They include the coldwater fishery, other indigenous aquatic life and wildlife, and public water supply (Table 3.3).

Table 3.2 DEQ 2006 Integrated Report listings for the Salmon Trout River watershed.

Reporting Category	Location	Water Quality Status	Designated Uses Affected	Reason for Listing
Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported	Snake Creek T51N, R28W, Sec 23	Attainment	Coldwater fishery Other indigenous aquatic life and wildlife	Habitat Rating Fair (moderately impaired)
Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened and a TMDL is needed	Main Branch Salmon Trout River: Northwestern Road to CR AAA T51N, R28W, Sec 29 to T50N, R29W, Sec10/11	Nonattainment	Coldwater fishery Other indigenous aquatic life and wildlife Public water supply	Water quality standards exceeded for mercury (atmospheric deposition)

Table 3.3 Threatened Designated Uses in the Salmon Trout River Watershed.

Designated Uses	Status
Coldwater Fishery	Threatened
Other Indigenous Aquatic Life and Wildlife	Threatened
Public Water Supply (groundwater)	Threatened

Desired Uses

The Salmon Trout River watershed Technical Advisory Group also identified a number of locally determined desired uses for the watershed. Desired uses are factors important to the watershed stakeholders. They reflect the way stakeholders want to use the watershed and their desire to maintain it for future generations. In the course of consultation with the Technical Advisory Group and stakeholders of the Salmon Trout River watershed, one overarching desired uses became apparent - the preservation of this unique natural watershed. Specific factors, important to the stakeholders were protecting critical habitat for coaster brook trout, limiting development to areas outside the riparian corridor, and promoting sustainable and environmentally sound land use management practices to provide long-term protection of water quality.

Pollutants, Sources, and Causes

There are a number of pollutants in the Salmon Trout River watershed that adversely affect designated and desired uses or have the potential to (Table 3.4). The sources and causes of these pollutants were ascertained through scientific research reports, water quality monitoring data, road/stream crossing inventory data, field observations, land use analysis, and personal contact with watershed residents and experts.

As discussed in previous sections of this plan, sediment is the greatest pollutant of concern in the Salmon Trout River watershed. Sand and sediment harm fish and other aquatic life by covering the natural stream substrate they rely upon. Excessive inputs of sediment also fill in stream channels, making them shallower and wider and more susceptible to changes in hydrologic flow and increases in water temperature. It is estimated that over 300 tons of sediment reaches surface waters of the Salmon Trout River and its tributaries each year from road/stream crossings. Much of this sediment is deposited in the low gradient reaches of the lower river where it degrades critical habitat for coaster brook trout. While other sources such as forest management practices and recreational activities are currently contributing additional sediment to surface waters, these sources were either minor or not quantified due to unknown history of events. Mining and development have the potential to increase sediment loads as does any kind of excavation, earth moving, drainage, crossing, tunneling, or other activity in which soil is disturbed and transported to nearby streams.

The potential for sulfide-based mining poses a significant threat to water quality and designated and desired uses in the Salmon Trout River watershed. Some mines extract underground mineral deposits containing sulfur or sulfide. When the mineral or waste rock is brought to the surface and exposed to air, it oxidizes and creates sulfuric acid, commonly referred to as acid mine drainage. This acid can run off in rain or snow melt events and contaminate large areas of surface and ground water resulting in serious impacts to water quality and aquatic ecosystems. Contaminated groundwater also poses problems for private property owners that rely upon wells for their drinking water. This poses a risk to human health and often requires difficult and costly cleanup measures. Additional risks to water and air quality from sulfide-based mining include industrial site construction, truck traffic, heavy

equipment operation, power generation, groundwater draw down and treatment, fuel storage and acid rock storage.

Heavy metals, nutrients, and toxins (herbicides, pesticides, oils, gas, grease, salts/chloride, etc.) often enter water bodies unnoticed via runoff, making them difficult to locate and quantify. The potential exists for these pollutants to contaminate both surface water and groundwater sources in the Salmon Trout River watershed due to current and anticipated future land uses. These pollutants have the potential to impact terrestrial and aquatic ecosystems as well as public health if the concentrations are high enough. Heavy metals, nutrients and toxins often attach to soil particles, thus linking them to sediment pollution. Mercury levels exceeding water quality standards were recently detected in the Salmon Trout River from the Northwestern Road upstream to CR AAA. Mercury contamination is a widespread problem in waterbody's across the Upper Peninsula of Michigan and should be monitored during future stream evaluations. Methods to determine the presence and extent of mercury and the other potential pollutants listed above were not employed during this project.

Table 3.4 Known and potential pollutants, sources, and causes in the Salmon Trout River watershed.

Threatened Designated Use	Pollutants	Sources	Causes
Coldwater fishery Other indigenous aquatic life and wildlife	Sediment (k, p)	Road stream crossings (k)	Poor design/construction/maintenance (k) Lack of erosion controls (k) Steep approaches (k) Culverts not aligned to stream bed (k) Undersized culverts (k) Lack of crossing structure (k) Road grading operations (k)
		Forest management practices (k)	Removal of riparian vegetation (lack of riparian buffers (k) Clearing by landowners (k) Equipment problems due to steep topography (k) Numerous crossings of small streams and drainages routes (k)
		Recreational activities (k)	Off Road Vehicle crossings of wetlands and streams (k)
		Mining (p)	Construction of industrial sites and roads (p)
		Development (k, p)	Removal of riparian vegetation (lack of riparian buffers) (p) Clearing by landowners (p) Construction of secondary access roads (p)
Coldwater fishery Other indigenous aquatic life and wildlife Public water supply	Acid mine drainage (p)	Sulfide-based mining (p)	Extraction of underground deposits containing sulfur or sulfide (p)

Threatened Designated Use	Pollutants	Sources	Causes
Coldwater fishery Other indigenous aquatic life and wildlife Public water supply	Heavy metals (mercury and others) (p)	Mining (p)	Extraction of underground deposits containing heavy metals (p)
		Atmospheric deposition (p)	Nearby coal fired power plants (p) Other Industries (p) Forest fires (p) Use of burn barrels (p)
Coldwater fishery Other indigenous aquatic life and wildlife Public water supply	Nutrients (p)	Septic systems (p)	Poorly designed/maintained systems (p) Unsuitable sites/soils (p)
		Residential fertilizer use (p)	Improper application (amount, timing, frequency, location, method, chemical content (p)
Coldwater fishery Other indigenous aquatic life and wildlife Public water supply	Toxins (herbicides, pesticides, oils, gas, grease, salts/chloride, etc.) (p)	Forest management practices (p)	Improper application of herbicides and/or pesticides (amount, timing, frequency, location, method, chemical content (p) Hazardous waste spills from heavy equipment (p)
		Mining (p)	Hazardous waste spills from heavy equipment (p)
		Atmospheric deposition (p)	Use of burn barrels (p) Industries (p)

k=known, p=potential

Priority Pollutant Ranking

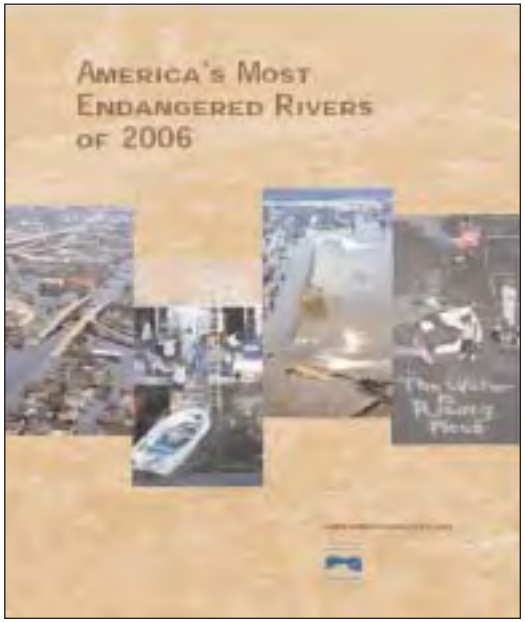
The pollutants listed in Table 3.4 were ranked and prioritized based on how they most affect or have the potential to affect water quality and the watershed's designated uses (Table 3.5). Overall, sediment is the highest priority pollutant with known sources occurring from most land uses within the watershed. Without implementation of corrective actions as well as improved zoning and land use practices, sedimentation problems will likely result in further degradation of water quality and designated and desired uses in the watershed.

Sulfide-based mining poses a serious threat to water quality, designated uses, and significant natural resources in the Salmon Trout River watershed. Over the last decade, mineral exploration companies have been investigating this region for deposits of nickel, copper, and gold. Most recently, a substantial nickel deposit containing sulfur or sulfide was identified directly beneath the headwaters of the Salmon Trout River and the neighboring Yellow Dog River to the south. The Kennecott Mineral Company has purchased hundreds of acres of land surrounding this deposit and leased mineral rights to others. In the spring of 2006, Kennecott submitted a permit application to the Michigan Department of Environmental Quality, proposing to extract the nickel from this deposit. The risks to the environment from this type of mining are well documented. While the proposal includes provisions to contain acid mine drainage, it remains a risk to water quality and the quality of all life in the watershed. In May 2006, the American Rivers organization designated the Salmon Trout River as the fourth most endangered river in the United States due to the threat of sulfide mining in its headwaters. Each year since 1986, American Rivers, a leader in nationwide river conservation, and dozens of partners have released the America's Most Endangered Rivers report to spotlight those rivers across the country facing critical and near-term threats. The report is not a list of the nation's "worst" or most polluted rivers, but rather it highlights ten rivers confronted by decisions in the coming year that could determine their future (American Rivers 2006).

The potential for impacts from heavy metals, nutrients, and toxins also pose threats to water quality and designated uses in the Salmon Trout River watershed. Future water quality monitoring efforts should include periodic sampling for these pollutants. While each pollutant has a different effect on water quality and threatened designated uses in the Salmon Trout River watershed, all are important and should be priorities.

Priority Source Ranking

Pollutants were also ranked by their sources because implementing corrective actions at the source is often the most effective way to remediate problems (Table 3.6). Also, because pollutants are often interconnected with each other, implementing corrective actions at one source can result in reductions of pollutants from other sources. This is especially true when corrective actions include a public education component that addresses numerous pollutants and their sources.



Michigan

#4 Salmon Trout River

Threat: Acid Mine Drainage

Summary

The pristine Salmon Trout River, in the heart of one of Michigan's largest remaining wilderness areas, provides critical natural, economic, and drinking water benefits to the nearby communities and the region. A mining operation is poised to convert part of the Salmon Trout's headwaters into an industrial zone, creating a risk of acid mine drainage that could contaminate the river and seep into Lake Superior. Unless the Michigan Department of Environmental Quality (MDEQ) denies the operation's mining permit application, this recreational and natural jewel could be ruined.

The River

The Salmon Trout River flows through the Huron Mountains and empties into Salmon Trout Bay on Lake Superior. The headwaters of the river begin in the Yellow Dog Plains, known for its remoteness, wild areas, and abundant wildlife, such as moose and wolves. The Salmon Trout River is currently in excellent ecological health, and this vast expanse of forest and wetlands is one of the Midwest's few and most significant remaining wilderness areas. The river is home to the only known breeding population of the native coaster brook trout on Lake Superior's south shore. The plight of the coaster brook trout recently prompted several groups to petition for the species to be designated as endangered under the Endangered Species Act.

Residents in the Salmon Trout watershed rely on the river and groundwater for part of their drinking water supply, including the use of public artesian wells. Tourism, fishing, and recreation account for 70 to 90 percent of the local economy. The river and surrounding areas contribute to the livelihood of the local Keweenaw Bay Indian Community, and is included in their Ceded Territories, established through a treaty in 1842. Within these territories, the Tribe retains traditional rights for hunting, fishing, and gathering.

The Threat

The Kennecott Minerals Company's proposed Eagle Project would convert roughly 92 acres of forest and wetlands at the Salmon Trout River's headwaters into an industrial zone. The underground mine would extract about four million tons of sulfide ore containing nickel and copper from bedrock below the surface. Kennecott, a subsidiary of London-based Rio Tinto, plans to operate the mine for six to eight years, and then spend another two years attempting to restore the area to its natural state.

When the high-sulfide ore comes in contact with air and water, it forms sulfuric acid. The acidic solution leaches harmful heavy metals, like copper and cobalt, creating what is commonly known as acid mine drainage. Rivers and groundwater become contaminated when acid mine drainage seeps from a mine site into the ground and streams.

The proposed mine poses a significant threat to the water quality of the Salmon Trout and nearby shores of Lake Superior.

The Salmon Trout River, home to the rare Coaster Brook Trout, empties directly into Lake Superior, the most pristine of the Great Lakes.

18 ◆ America's Most Endangered Rivers of 2006

Table 3.5. Priority ranking of pollutants in the Salmon Trout River watershed.

Pollutant	Priority Ranking
Sediment	1
Acid mine drainage	2
Heavy metals	3
Nutrients	4
Toxins	5

Table 3.6. Priority ranking of sources of pollutants in the Salmon Trout River watershed.

Pollutant	Sources	Priority Ranking
Sediment	Road/stream crossings (k) Forest management practices (k) Recreational activities (k) Development (k, p) Mining (p)	1 2 3 4 5
Acid mine drainage	Sulfide-based mining (p)	1
Heavy metals	Mining (p) Atmospheric deposition (k, p)	1 2
Nutrients	Septic systems (p) Residential fertilizer use (p)	1 2
Toxins (Pesticides/herbicides, oils, gas, grease, salt/chloride)	Forest management practices (p) Mining (p) Atmospheric deposition (p)	1 2 3

k=known, p=potential

Chapter Four

WATERSHED GOALS AND OBJECTIVES

The main goal of the Salmon Trout River Watershed Management Plan is to promote and facilitate coordinated, collaborative action among stakeholders in order to improve and protect water quality and preserve the unique nature of the watershed. The watershed inventory and analysis identified and prioritized the causes and sources of pollution affecting or having the potential to affect water quality and designated and desired uses in the watershed. The following goals and management objectives provide guidance for implementation of actions that will reduce these affects and provide a basis for protection from further impacts.

Goals and Objectives

The following goals and management objectives were developed as strategies to address current threats to water quality and designated and desired uses in the Salmon Trout River watershed (Table 4.1). They provide a basis for protection of significant natural resources and reflect the desires of the stakeholders for the future state of the watershed.

Text for Pages 36-40

Table 4.1. Goals of the Salmon Trout River watershed management plan: Threatened designated or desired use addressed and pollutants address.

Goals	Threatened Designated or Desired Uses Addressed	Pollutants Addressed
1. Protect the integrity of aquatic and terrestrial ecosystems within the watershed.	<u>Designated Uses:</u> Coldwater fishery Other indigenous aquatic life and wildlife Public water supply <u>Desired Uses:</u> Protect coaster brook trout Limit development to areas outside the riparian corridor Promote sound land use practices	All

2. Protect and improve the quality of water in order to support all designated and desired uses.	<u>Designated Uses:</u> Coldwater fishery Other indigenous aquatic life and wildlife <u>Desired Uses:</u> Protect coaster brook trout Limit development to areas outside the riparian corridor Promote sound land use practices	All
3. Establish and promote information and education programs that support watershed planning goals, objectives and tasks, and increase stewardship.	<u>Designated Uses:</u> Coldwater fishery Other indigenous aquatic life and wildlife Public water supply <u>Desired Uses:</u> Protect coaster brook trout Limit development to areas outside the riparian corridor Promote sound land use practices	All

Goal # 1

Protect the integrity of aquatic and terrestrial ecosystems within the watershed

Designated Uses Addressed:
Coldwater fishery, other indigenous aquatic life and wildlife, and public water supply

Desired Uses Addressed:
Protect coaster brook trout, limit development to areas outside the riparian corridor, and promote sound land use practices

Pollutants Addressed:
All

Objective 1:

Assist local units of government with master planning and zoning ordinances to protect water quality and sensitive areas

- Prohibit sulfide-based mining
- Provide guidance and tools for planning, ordinance development, and zoning enforcement
- Encourage the use of effective riparian buffers
- Encourage the use of land use restrictions in areas sensitive to environmental degradation
- Encourage appropriate provisions for water quality and sensitive areas in the approval process for new development or redevelopment

Objective 2:

Protect and restore desirable habitat areas for fish and aquatic organisms in the Salmon Trout River and its tributaries including critical habitat for coaster brook trout and preserve the biodiversity of aquatic communities

- Reduce sedimentation from priority sources
- Improve passage for fish and aquatic organisms (road/stream crossings)
- Improve habitat for coaster brook trout in the lower Salmon Trout River (reduce sedimentation)
- Promote proper riparian land use practices including the use of buffers (reduce sedimentation, protect sensitive areas)
- Support efforts to improve and maintain naturally reproducing native fish populations

Goal # 2

Protect and improve the quality of water in order to support all designated and desired uses

Designated Uses Addressed:
Coldwater fishery, other indigenous aquatic life and wildlife, and public water supply

Desired Uses Addressed:
Protect coaster brook trout, limit development to areas outside the riparian corridor, and promote sound land use practices

Pollutants Addressed:
All

Objective 1:

Control and/or minimize sediment input to the Salmon Trout River and its tributaries from the following sources:

- Road/stream crossings
- Land use practices
- Recreational access
- Development

Objective 2:

Promote voluntary arrangements and regulatory incentives to help prevent degradation of natural resources and water quality

- Avoid development that encroaches on sensitive or biologically important areas
- Preserve high quality natural communities
- Protect critical riparian areas
- Properly manage working lands (forest lands)

Objective 3:

Discourage land use practices that have the potential to negatively impact water quality

- Eliminate and/or and/or minimize risks for surface and groundwater contamination by acid mine drainage, heavy metals, nutrients, and toxins through improved zoning and increased landowner education and stewardship
- Discourage development in sensitive areas (riparian corridors, wetlands, and areas with unsuitable soils, slope, etc.) through improved zoning and increased landowner education and stewardship

Goal # 3

Establish and promote information and education programs that support watershed planning goals, objectives, and tasks and increase stewardship

Designated Uses Addressed:
Coldwater fishery, other indigenous aquatic life and wildlife, and public water supply

Desired Uses Addressed:
Protect coaster brook trout, limit development to areas outside the riparian corridor, and promote sound land use practices

Pollutants Addressed:
All

Objective 1:

Regularly inform local landowners and the public about watershed, activities, study findings, and opportunities for involvement

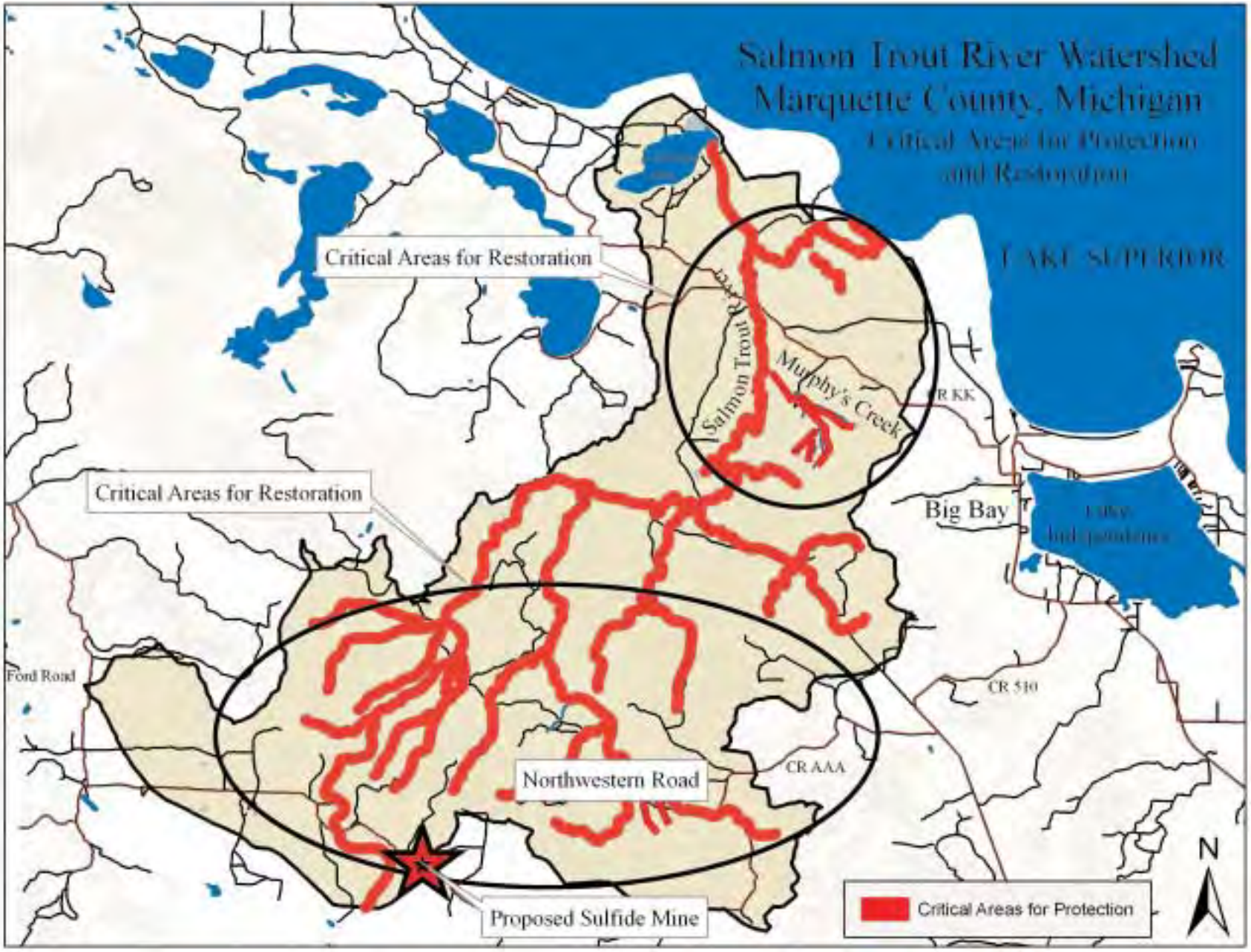
Objective 2:

Involve citizens, public agencies, stakeholders, and landowners in implementation of the watershed management plan through meetings and workshops with individuals or groups

Objective 3:

Provide focused information to residents, visitors, local governments, and other target audiences on priority topics

Figure 5.1 Critical Areas for Protection and Restoration



Chapter Five

CRITICAL AREAS

Critical areas in the Salmon Trout River watershed are defined as the portions of the watershed that are most sensitive to environmental degradation and those areas having the most impact or potential to impact water quality and designated and desired uses. They include areas that may contribute the greatest amount of pollutants to the watershed, either now or in the future, and where preservation and restoration efforts will have the most profound results.

Critical areas were identified through a detailed analysis concerning protection potential, current and future land uses, pollutant loading, and anticipated load reductions from particular Best Management Practices. The goal of this analysis was to target specific strategies to those areas most in need of protection or restoration. It should be noted that these critical areas are by no means the only areas in need of protection and restoration efforts; they are simply those with the highest priority. Without implementation of the strategies outlined under the Goals and Objectives section of this management plan, the future negative impacts in critical areas of the Salmon Trout River watershed will be significant and the mitigation very costly.

Critical Areas for Protection

Headwaters areas, riparian corridors, and wetlands should be considered critical areas for protection since these areas are most sensitive to human activity. Protection efforts in the Salmon Trout River watershed should focus first on the headwaters as this area experiences the most impact from failing road crossings and increasing pressures from forest management practices, recreation, and development (Figure 5.1). The headwaters are also critical because impacts in this area have the most potential to affect the entire watershed, including critical habitat for coaster brook trout and the recently discovered Kirtland's warbler. Sedimentation from transportation crossings in this area directly impacts the Salmon Trout River and its tributaries, including the lower river area, which currently stores excessive sediment in its bed and banks.

Riparian corridors of the Salmon Trout River and its tributaries are also critical areas in need of protection. Because much of the watershed, including riparian corridors, is owned by corporate entities and the Huron Mountain Club, they will play a role in management recommendations and implementation. Land owned by private individuals is also very important. Increasing demand for land in the area and rising property costs often results in splitting of parcels to be sold as smaller lots. It is also common for private landowners to harvest trees quickly after acquiring a parcel to recoup some of the investment and make space for construction of seasonal camps or cottages. When this type of activity occurs in or near riparian corridors, it can result in water quality impacts such as increased sedimentation from runoff and stream bank erosion.

Along with this development comes construction of new secondary roads that permit access to previously remote areas and often result in additional sources of sediment to nearby surface waters. Undersized culverts intensify the problem by backing up water and allowing suspended sediments to settle to the bottom, thus decreasing depth, widening the stream, and increasing water temperature. In some cases, there is no crossing structure at all with vehicle/off road vehicle traffic driving directly through the stream bed. Another potential impact includes increased traffic, which contributes to wear on the existing road system, usually with no additional maintenance to compensate. Loss of wetlands and fragmentation of habitat for local wildlife are also major concerns associated with development in most areas of the Salmon Trout River watershed.

Coordinated planning and zoning can have the most profound positive impact on land use decisions. There are a variety of proven preservation and protection strategies that communities can implement that allow landowners to utilize their property to the maximum extent practicable while protecting sensitive areas, water quality and significant natural resources. The goals and objectives of this watershed management plan provide the mechanisms for stakeholders within the watershed to engage in such planning on a regional basis. These efforts can be highly effective and lay the groundwork for expanded future efforts.

Other goals and objectives of this plan are designed to increase protection of this unique natural watershed at the local level by working directly with corporate and private landowners and the public. Specific objectives include promoting voluntary arrangements and incentives, increasing awareness of watershed issues, and involving citizens, public agencies, stakeholders, and landowners in implementation of the watershed management, as well as other public information/education mechanisms.

Critical Areas for Restoration

Restoration efforts should also focus first on the headwaters as this area experiences the most impact from human development. This area was prioritized for restoration based on analysis of water quality and stream monitoring data as well as other factors such as increasing development, current and anticipated future land use practices, and recreational activities.

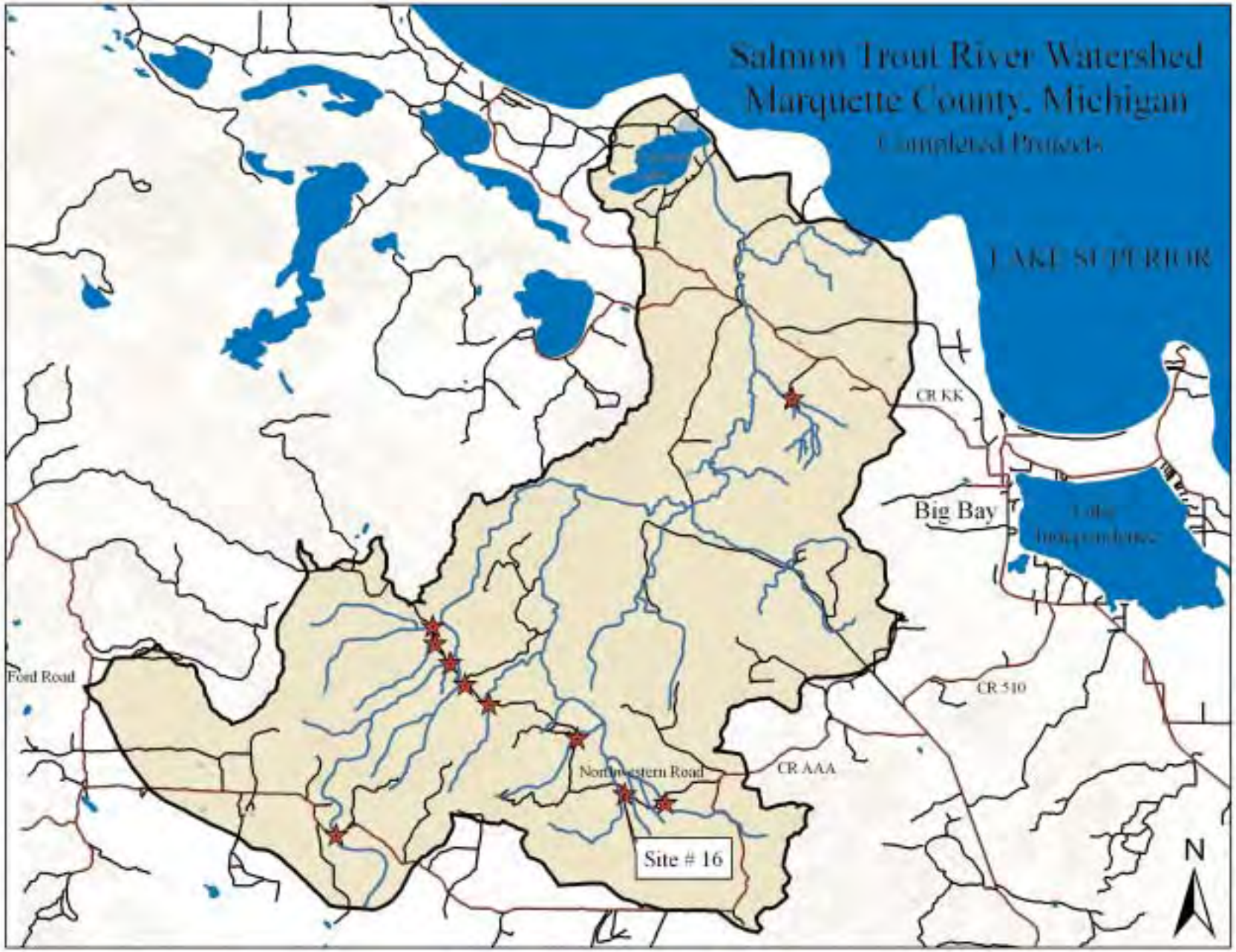
The majority of the road/stream crossings in the Salmon Trout River watershed are located in the headwaters and upper watershed. These crossings are the primary source of sediment input to the Salmon Trout River and its tributaries. Through coordinated efforts and dedication of partners and stakeholders, many of these crossings have recently been improved (see Completed Projects below). Others, including the three crossings of the East Branch of the Salmon Trout River by County Road AAA (Triple A), remain as a significant source of sedimentation to the upper and lower watershed. Strategies for implementation of Best Management Practices will improve these crossings along with others in the watershed and further reduce sources of impact to water quality and designated and desired uses.

Off-road vehicles pose a serious threat by accessing remote, sensitive areas that are prone to erosion or by simply driving through tributary streams often causing stream bank erosion and sedimentation.

The addition of crossing structures (bridges or bottomless culverts) to heavily used ford areas will reduce impacts while maintaining suitable crossing locations.

The lower Salmon Trout River is also in need of restoration to reduce sedimentation and improve critical habitat for coaster brook trout. While the majority of the sediment loading should be reduced at the source (headwaters and upper watershed), opportunities exist to improve conditions in the lower river (placement of large woody debris, installation of sediment traps, channel width restoration, etc.). Any in-stream modifications however, should be undertaken only after careful consideration and coordination with the Michigan Department of Natural Resources and other agencies responsible for coaster brook trout management.

Figure 6.1 Completed Projects in the Salmon Trout River watershed



Chapter Six

MANAGEMENT STRATEGIES

Since 1999, the Superior Watershed Partnership and other partners have implemented a number of corrective actions and management strategies to protect and improve water quality and natural resources in the Salmon Trout River watershed. On the ground restoration projects consisted of improvements to 14 road/stream crossings, including 8 crossings of the Northwestern Road that were identified as significant sources of sedimentation to the Salmon Trout River and its tributaries (Figure 6.1). In addition, a variety of means were used to inform and educate landowners, stakeholders, and the public about watershed issues and implementation progress. Public information and education efforts focused on land use management practices, conservation planning tools, and other methods to preserve and protect water quality and natural resources in the Salmon Trout River watershed. A brief summary of projects completed along with other strategies implemented between 1999 and 2006 are provided in Table 6.1.

Table 6.1 Salmon Trout River Watershed Implementation Progress 1999-2006.

1999
∉ Watershed-wide inventory of road crossings and erosion sites begins.
2000
∉ With the help of 10 Marquette area youth, erosion control and storm water improvements were completed at nine road/stream crossings of the Northwestern Road.
∉ Water quality monitoring begins at seven sites with funding from MDEQ.
∉ Completed a natural features inventory for the Lake Superior coastline including portions of the Salmon Trout River watershed.
2001
∉ Water quality monitoring was expanded to twelve sites and continues through 2005.
∉ Worked with Longyear Realty Corporation to replace failing culverts at two road/stream crossings of the Northwestern Road. This included installation of clear span bridges and storm water diversions at crossings of the Main Branch and a main tributary of the East Branch of the Salmon Trout River.
∉ Worked with Longyear Realty Corporation to improve a series of logging road crossings of seasonal streams and drainages in the vicinity of Murphy's Creek, one of the only tributaries of the lower Salmon Trout River. This included installation of culverts, storm water diversions, and bank stabilization (riprap and vegetative plantings) at 10 crossing sites.

Site#16 before improvement

Site#16 culverts before improvement

Site#16 crossing after improvements

2002

- Clear span bridges were installed at two additional crossings of tributaries of the East Branch of the Salmon Trout River by the Northwestern Road with funding from the U.S. Fish and Wildlife Service.

- Worked with the Natural Resources Conservation Service to install a 150 foot long storm water diversion ditch along a steep approach of the Triple A Road near the crossing of the Main Branch of the Salmon Trout River. The entire crossing, along with the approach ditches was replaced in 2004 by the landowner, who had recently acquired the land.

- Hosted a public riparian buffer workshop targeting waterfront landowners with information on stream bank protection and restoration practices.

2003

- Installed an aluminum arch culvert and storm water diversions at a crossing of the West Branch of the Salmon Trout River by Northwestern Road.

- Develop land use planning guide and CD for Marquette County including a resource inventory (GIS maps) for the Salmon Trout River watershed.

- Developed a model riparian buffer ordinance for area townships and other local units of government.

2004

- Installed a sediment trap on the Main Branch of the Salmon Trout River, upstream of the lower dam. The project was coordinated with and approved by MDNR Fisheries and had previously been recommended by MDNR and the U.S. Fish and Wildlife Service following a 1998 survey of the watershed.

- Provided support to the Presque Isle Power Plant (City of Marquette) for a variance to install a mercury abatement facility, which resulted in a 90% reduction in mercury emissions.

- Hosted a public workshop on working forest conservation easements with emphasis on riparian property owners (over 100 in attendance).

- Mailing completed to riparian property owners with information on conservation easements and overview of watershed protection practices for landowners.

2005

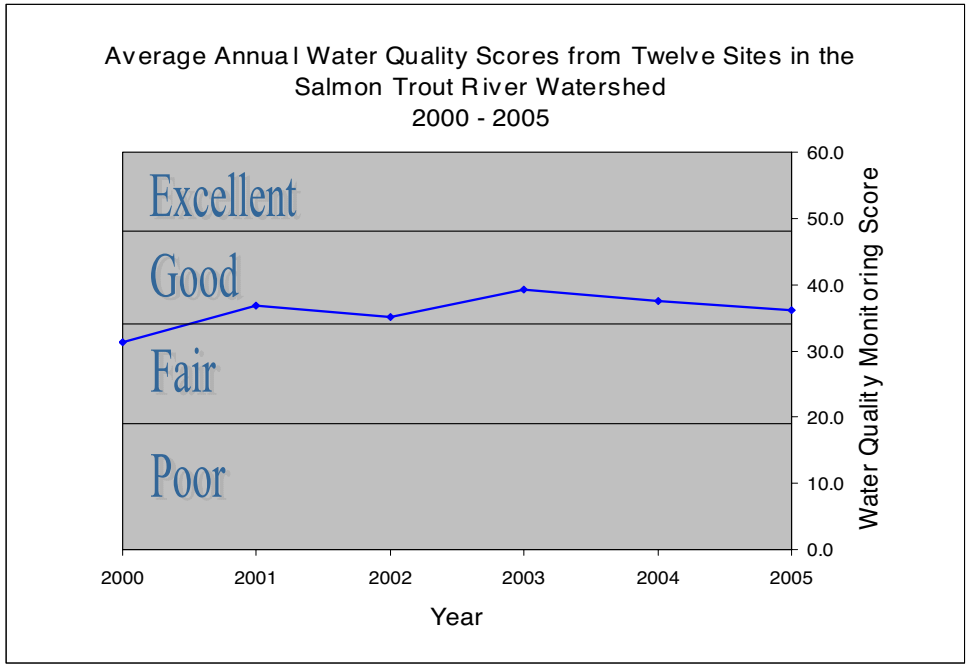
- Much of the watershed was photographed during a low altitude aerial survey conducted for development of the Superior Watershed Partnership “Shoreline Viewer” land use planning project www.superiorwatersheds.org/aerial.php

2006

- Plans are underway to further reduce sedimentation in priority areas and begin implementation of other plan recommendations during 2007.

Improvements in water quality as a result of this progress can be seen in the average annual water quality monitoring scores for sites monitored during 2000 to 2005. While water quality scores have improved over time, the slight declines in average scores observed during 2004 and 2005 are likely a result of continued deterioration of road crossings in the upper watershed (Figure 6.2).

Figure 6.2 Improvements in water quality monitoring scores (2000-2005) as a result of implementation progress.



Implementation Recommendations

The strategies for protection, restoration, and public involvement outlined under the goals and objectives of this watershed management plan will be implemented through a suite of recommendations or tasks. These tasks were developed based on the prioritization of watershed pollutants, sources, and causes, and critical areas of the watershed. A ten year timeline was used as the schedule for implementation. Tasks that should be done in the short term were given a completion timeline of 3 years. Tasks that should be undertaken annually were given a timeline of "ongoing". Estimated costs for implementation tasks do not include staff oversight or administrative costs. A summary of implementation tasks and milestones is provided in Table 6.2.

Task 1: Improve protection of riparian corridors and other sensitive areas

Define the functional riparian corridor for the Salmon Trout River and its tributaries to include flood plains, high quality natural communities, areas that are sensitive to environmental degradation, and areas unsuitable for various land use practices. This includes a Geographic Information Systems (GIS) analysis of land features (soils, land use, slope, etc.) and development of feature specific land use planning tools and management recommendations, including but not limited to, zoning overlay map(s), GIS databases, and zoning recommendations (development of draft ordinances and land use restrictions). Work with local units of government on master planning and adopting new or improved zoning ordinances related to specific land uses.

Goals Accomplished:

Goal #1: Aquatic and terrestrial ecosystems
Goal #3: Quality of water

Estimated Cost: $35,000

Timeline: 3 years

Priority: High

Milestones:

- Coordinate project partners (Years 1-3)
- Conduct GIS analysis and field verification of model data (Years 1-2)
- Develop land use recommendations and tools (zoning overlay maps, draft ordinances, etc. (Year 2)
- Assist townships with adoption of new or improved zoning ordinances (goal TBD following development of recommendations (Years 2-3)
- Provide public information/notification regarding any proposed zoning changes (Year 3)

Measurements:

- Improved protection of sensitive areas (number of acres protected)
- Number of zoning ordinance adopted/improved
- Number of partners participating
- Number of public notices issued
- Improved water quality (ratings of good or better at all monitoring sites by year 10)
- Improved habitat for coaster brook trout (goal TBD from Task 3 below)

Potential Partners: The Huron Mountain Club, Longyear Realty Corporation, The Nature Conservancy, Northern Michigan University, and Powell, Michigamme, and Champion Townships.

Task 2: Reduce sedimentation from road/stream crossings

Improve, repair, or replace priority road/stream crossings and recreational access fords (ORV crossings) by implementing appropriate BMPs including, but not limited to the following:

- Remove obstructions that restrict flow through culverts
- Replace undersized (too small or too short) culverts
- Replace culverts with a length that allows for stable embankments
- Remove or replace perched or misaligned culverts
- Install bottomless culverts and bridges where possible
- Plant native vegetation on disturbed or bare soil areas
- Create diversion outlets and spillways to direct road runoff away from surface waters
- Minimize the number of access roads needed for land use practices such as timber harvest, mine exploration activities, private development, and recreational activities
- Avoid stream crossings when constructing new roads

Goals Accomplished:

Goal #1: Aquatic and terrestrial ecosystems
Goal #2: Quality of water

Estimated Cost:

Main tributary affected	Number of sites to be improved	Estimated Cost	Estimated sediment load reduction (Tons/ year)
East Branch	5	$320,000	243.2
Main Branch	3	$65,000	57.5
Clear Creek	1	$30,000	11.0
Iron Creek	1	$30,000	11.0
Total	**10**	**$445,000**	**322.7**

Timeline: 10 years

Priority: High

Milestones:

- Implement improvements at 1-2 sites/year (Years 1-10)
- Implement pre and post BMP field evaluations (Years 1-10)
- Achieve 50% reduction in sediment load (Year 5)
- Achieve 100% reduction in sediment load (Year 10)
- Achieve water quality ratings of good or better at all monitoring sites (Year 10)

Measurements:

- Number of sites improved
- Number of partners participating
- Quantity of sediment reduced – pre and post BMP field data (overall reduction goal of 322.7 Tons/year)
- Improved Water quality ratings (annual stream monitoring)

Potential Partners: The Marquette County Road Commission, Northern Michigan University, Longyear Realty Corporation, Huron Mountain Club, and other private land owners.

Task 3: Restore critical habitat for coaster brook trout

Evaluate in-stream habitat conditions and availability of coaster brook trout habitat (e.g. large wood and stream substrate) and identify areas that are degraded by sedimentation, recommend alternatives for improving these areas, and implement improvements. Best management practices may include, but are not limited to, enhancing the availability of in-stream large woody debris and installation of sediment basin(s) to decrease sediments and increase the amount of habitat and in-stream cover.

Goals Accomplished:

Goal #1: Aquatic and terrestrial ecosystems

Estimated Cost: $45,000

Timeline: 3 years

Priority: High

Milestones:

- Coordinate project partners (Years 1-3)
- Develop scope and parameters for field evaluations (Year 1)
- Conduct field evaluations (Year 1)
- Develop and implement recommendations (Year 2)
- Evaluation of BMPs (Year 3)

Measurements:

- Number and location of BMPs implemented
- Quantity of sediments reduced (reduction goal TBD following field evaluations)
- Amount of additional fish habitat rehabilitated (goal TBD following field evaluations)
- Measurable changes in substrate composition, stream cover, and stream channel morphology (short-term and long-term)
- Increases in fish populations (long-term)

Potential Partners: Michigan Technological University, the Michigan Department of Natural Resources Fisheries Research Division, the Huron Mountain Club, Keweenaw Bay Indian Community, U.S. Fish and Wildlife Service (Region 3), and Trout Unlimited

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Task 4: Host annual watershed conference

Develop and coordinate an annual watershed conference to increase communication and strengthen partnerships between stakeholders and other local, state, tribal, and federal agencies working in the watershed and to provide opportunities to eliminate program duplication, maximize human, financial, and institutional resources.

Goals Accomplished:

Goal # 3: Information/education programs

Estimated Cost: $5,000/year

Timeline: ongoing

Priority: Medium

Milestones:

- Identify conference participants (Year 1-10)
- Plan and hold annual watershed conference (Years 1-10)
- Conduct survey of conference participates (Years 2, 5 and 10)

Measurements:

- Number of individuals and/or agencies participating
- Increased communication and partnerships between stakeholders (conference evaluation surveys)

Potential Partners: Michigan Technological University, the Michigan Department of Natural Resources Fisheries Research Division, the Huron Mountain Club, Keweenaw Bay Indian Community, U.S. Fish and Wildlife Service (Region 3), and Trout Unlimited

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Task 5: Develop voluntary arrangements and regulatory incentives for landowners

Work with private land owners and local units of government to develop and promote voluntary arrangements and regulatory incentives to avoid development in sensitive or biologically important areas, preserves high quality natural communities, protects critical riparian areas, and/or involves improved land use management practices.

Goals Accomplished:
Goal #2: Quality of water
Goal #3: Information/education programs

Estimated Cost: $30,000

Timeline: 3 years

Priority: Medium

Milestones:
- Develop voluntary landowner arrangements and incentive programs (Year 1)
- Work with townships to adopt incentive programs (Years 2-3)
- Work with landowners to improve land use management practices (Years 2-3)

Measurements:
- Number of landowners participating
- Number of volunteer/incentive programs adopted
- Number of acres protected
- Number of improved land use management practices

Potential Partners: The Huron Mountain Club, Longyear Realty Corporation, corporate and private landowners, and Powell, Michigamme, and Champion Townships.

Task 6: Develop and distribute information/education materials to watershed stakeholders and the public

Develop information/education materials to disseminate information to public and private sector partners, corporate and private landowners, other local, state, tribal and federal agencies, and the public. Topics include, but are not limited to:
- Watershed related issues (land use practices: forest management, development, recreation, etc.)
- Protecting riparian corridors
- Non-point source pollution prevention and reduction (sediment, nutrients, heavy metals, nutrients, etc.)

Goals Accomplished:
Goal #3 Information/education programs

Estimated Cost: $3,500/year

Timeline: ongoing

Priority: High

Milestones:
- Create contact lists of focus groups and target audiences (Years 1-10)
- Develop and distribute a minimum of two I/E materials (articles, newsletters, brochures, etc.) per year to target audiences (Years 1-10)
- Conduct survey of recipients (Years 2, 5 and 10)

Measurements:
- Number of information/education materials developed and distributed per year
- Number of recipients per year (number of target audiences and individuals)
- Number of requests for more detailed information and/or technical assistance
- Number of people surveyed with increased knowledge of watershed issues, etc.
- Number of people surveyed with changes in behavior

Potential Partners: The Marquette County Conservation District, Michigan Department of Environmental Quality, and Powell, Michigamme, and Champion Townships.

Task 7: Develop and maintain a project website

Develop, maintain, and promote a web-based project site to serve as a centralized clearing house for all data and knowledge gained from the project. Project partners, state, federal, and local agencies, other watershed groups, and the public will be able to access the site to gain detailed information about the watershed including data, studies, reports, photos, historical datasets, projects implemented, and any other available data.

Goals Accomplished:
Goal #3 Information/education programs

Estimated Cost: $3,500/year

Timeline: ongoing

Priority: Medium

Milestones:
- Develop project website and post all existing information (Year 1)
- Update website (post new information, data, reports (Years 1-10)
- Evaluate website use/effectiveness (Years 2, 5 and 10)

Measurements:
- Number of website hits
- Number of contacts made and/or requests for information

Potential Partners: The Superior Watershed Partnership

Table 6.2 Implementation tasks and milestones.

	Timeline (years)									
Task	1	2	3	4	5	6	7	8	9	10
1. Improve protection of riparian corridors and other sensitive areas	X	X	X							
⋐# Coordinate project partners	X	X	X							
⋐# Conduct GIS analysis and field verification of model data	X	X								
⋐# Develop land use recommendations and tools		X								
⋐# Assist townships with adoption of new or improved ordinances		X	X							
⋐# Provide public information/notification regarding proposed changes			X							
2. Reduce sedimentation from road/stream crossings	X	X	X	X	X	X	X	X	X	X
⋐# Implement improvements at 1-2 sites/year	X	X	X	X	X	X	X	X	X	X
⋐# Implement pre and post BMP field evaluations	X	X	X	X	X	X	X	X	X	X
⋐# Achieve 50% reduction in sediment load					X					
⋐# Achieve 100% reduction in sediment load from present sources										X
⋐# Achieve water quality ratings of good or better at all sites										X
3. Restore critical habitat for coaster brook trout	X	X	X							
⋐# Coordinate project partners	X	X	X							
⋐# Develop scope and parameters for field evaluations	X									
⋐# Conduct field evaluations	X									
⋐# Develop and implement recommendations		X								
⋐# Evaluate BMPs			X							
4. Host annual watershed conference	X	X	X	X	X	X	X	X	X	X
⋐# Identify conference participants	X	X	X	X	X	X	X	X	X	X
⋐# Plan and hold annual watershed conference	X	X	X	X	X	X	X	X	X	X
⋐# Conduct survey of conference participates		X			X					X
5. Develop voluntary arrangement s and regulatory incentives for landowners	X	X	X							
⋐# Develop voluntary landowner arrangements and incentive programs	X									
⋐# Work with townships to adopt incentive programs		X	X							
⋐# Work with landowners to improve land use management practices		X	X							
6. Develop and distribute information/education materials to watershed stakeholders and the public	X	X	X	X	X	X	X	X	X	X
⋐# Create contact lists of focus groups and target audiences	X	X	X	X	X	X	X	X	X	X
⋐# Develop and distribute a minimum of two I/E materials per year to target audiences	X	X	X	X	X	X	X	X	X	X
⋐# Conduct survey of recipients		X			X					X
7. Develop and maintain a project website	X	X	X	X	X	X	X	X	X	X
⋐# Develop project website and post all existing information	X									
⋐# Update website (post new information, data, reports)	X	X	X	X	X	X	X	X	X	X
⋐# Evaluate website use/effectiveness		X			X					X

Potential Funding Sources

Increased communication between stakeholders and other local, state, and federal entities will provide a means to find more effective solutions, eliminate program duplication, and maximize human, financial, and institutional resources. However, these resources alone will not be sufficient to implement all the goals and objectives of this watershed management plan.

The following are some of the possible funding sources (grant, loan, and cost share programs) available to stakeholder agencies and non governmental organizations for implementation of this plan. This list is not exhaustive and many other funding sources exist, especially on the local level. Information on these funding sources can be found on the internet or by contacting the agency or nonprofit.

- Clean Michigan Initiative - Nonpoint Source Pollution Control Grants
- Federal Clean Water Act, Section 319(h)
- EPA Targeted Watersheds Implementation
- EPA Environmental Education Grants
- EPA Five Star Restoration Program
- Michigan Department of Natural Resources Forest Land Enhancement Program
- Great Lakes Basin Program for Soil Erosion and Sediment Control
- Great Lakes Commission MiCorps Volunteer Stream Monitoring Program
- Volunteer Stream Monitoring Grants
- Private Foundations
- Donations

Chapter Seven

EVALUATION

Evaluation provides stakeholders with an opportunity to assess the effectiveness and appropriateness of the original goals and objectives of this plan as tasks are implemented and conditions change over time. Evaluation also provides a feedback mechanism for periodically assessing the effectiveness of management practices and allows stakeholders to identify areas where program improvements are possible.

The measurements identified in relation to the goals and objectives of this plan provide helpful tools for local stakeholders to asses the effectiveness of their implementation projects or educational/outreach efforts. These measures however, are by no means exhaustive. Many other evaluation measures exist and local stakeholders must ensure evaluation programs and protocols meet local needs.

Evaluation programs typically include two types of measures: quantitative and qualitative. Quantitative attributes are those which it is possible to measure. Qualitative measures try to shed light on changes in attitudes, perceptions and knowledge levels. Examples of the two approaches as they related to the goals and objectives of the Salmon Trout River Watershed Management Plan are provide below.

Quantitative Measures

- Biological monitoring of surface waters (e.g. macroinvertebrate communities)
- Chemical monitoring or surface waters (e.g. temperature, dissolved oxygen)
- Stream flow monitoring (e.g. volume, velocity)
- Sediment monitoring (e.g. deposition, quantity)
- Number of buffer ordinances adopted by townships
- Number of acres protected (conservation easements)
- Educational workshop attendance levels
- Number of storm water Best Management Practices implemented
- Number of restoration projects completed

Qualitative Measures

- Workshop evaluation surveys
- Public opinion surveys (e.g. increased awareness of impacts of nonpoint source pollutants on aquatic habitats, etc.)
- Increased cooperation and networking between stakeholders and other entities
- Level of enthusiasm expressed about revising zoning ordinances and master plans
- Public confidence that groundwater is safe
- Belief that information from the Salmon Trout River Technical Advisory Group is accurate, non-partisan, and valuable

Whether using quantitative or qualitative measures, measuring the effectiveness of the Salmon Trout River Watershed Management Plan will be two-tiered. First, individual agencies and communities will monitor certain projects and programs on the agency and community levels. Secondly, there will be a need to monitor progress and effectiveness on a regional watershed level in order to assess the health of the Salmon Trout River and its tributaries as a result of administrative, environmental, and social effects of collective community and agency actions. This responsibility will most likely fall to the Salmon Trout River Technical Advisory Group.

Previously established water quality and road/stream crossing monitoring programs provide valuable information and offer a fairly objective and verifiable way to evaluate water quality trends, water quality differences related to land use, or to relate improvements in water quality to specific implementation objectives over time. Ideally, this data would be consistently incorporated into a data management system for sharing with other interested stakeholders and policy makers but at the present time is not. It is also critical to continue these programs in a consistent manner that ensures the data are reliable and useful to stakeholders throughout the watershed.

Although a common and valuable approach, water quality and road/stream crossing monitoring may not be sufficient for evaluation of all implementation efforts. Both natural and man-made factors affect water quality and limit the ability to attribute improvements to any specific Best Management Practice or educational tool. A combination of quantitative and qualitative measures should be an integral part of any evaluation program to provide a more comprehensive picture of the success of implementation.

In general, implementation activities should be reviewed and compared to results with interim milestones to ensure smooth implementation and to measure progress toward meeting goals. A sense of what messages, delivery mechanisms, and Best Management Practices are working and not working and why is dependent on conscientious evaluation and reporting by all stakeholders responsible for implementation of the watershed management plan. As the objectives outlined in this plan are implemented in subsequent years, an assessment based on trends as compared to previously established baseline data will be possible. Such an assessment is needed if the plan is to remain flexible, relevant, and effective for those who use it.

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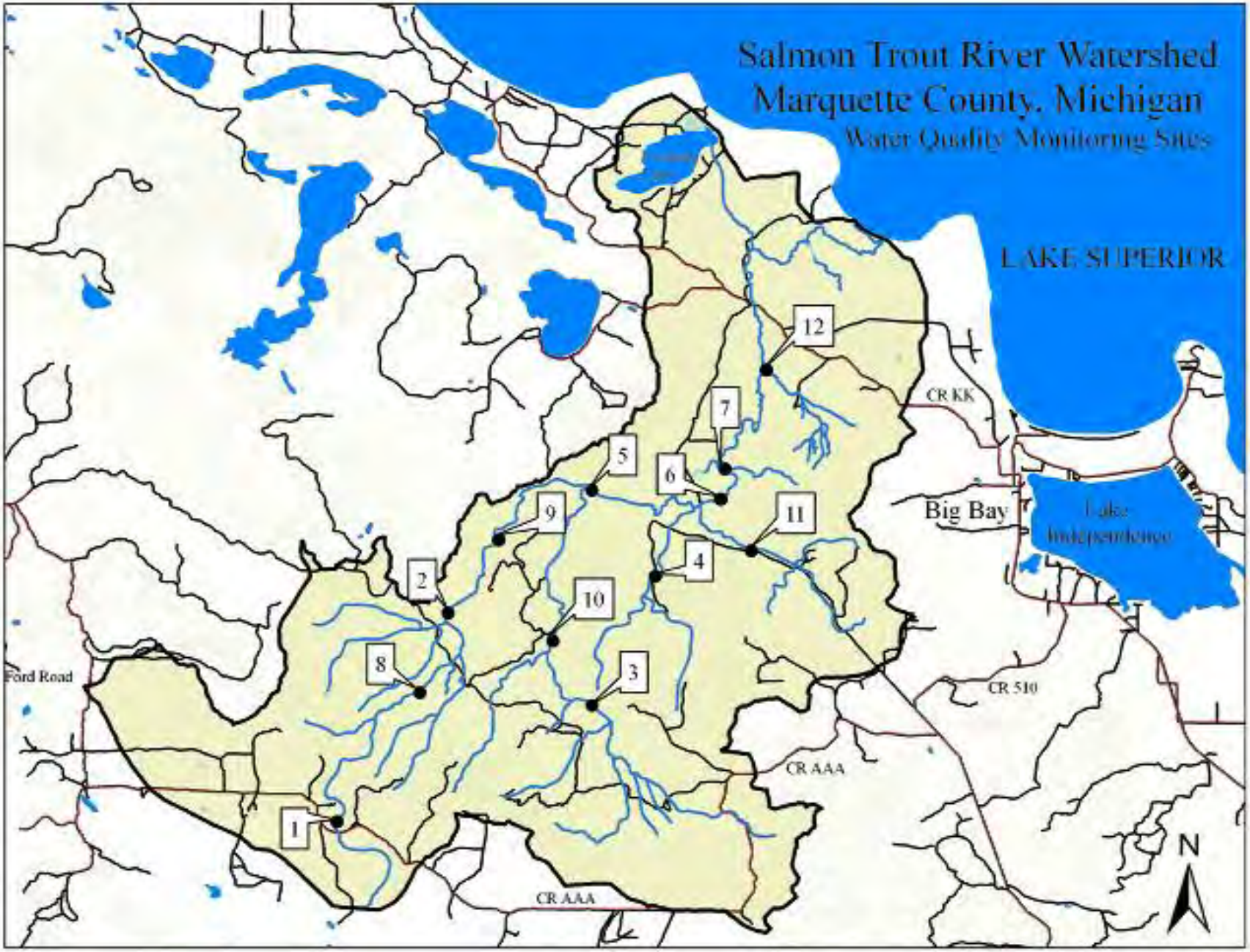
APPENDIX A -
2004-2005 Stream Monitoring Data for the Salmon Trout River Watershed


Salmon Trout River Watershed
Marquette County, Michigan
Water Quality Monitoring Sites
LAKE SUPERIOR
Big Bay
Lake Independence
CR KK
CR 510
CR AAA
CR AAA
Ford Road
1
2
3
4
5
6
7
8
9
10
11
12
N

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/09/04 Time: 08:30
Waterbody Name: Salmon Trout River Station #: 1
Location: C.R. AAA Township: Michigamme Sec3 T50N R29W SE¼ of SE¼
Investigator: Joe Wagner Lat: 46° 45' Long: 87° 54'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☐ 2 ☐ 3 ☒U
Water temp./d.o./pH *	34*F
Water color	☒Clear ☐Gray ☒ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☒<10 ☐10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☒<1 ☐1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	5%
Sand – course grain	85%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☒<1 ☐1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☐Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses			
Wetlands	☒L ☒R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2004. Site #1 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 1
Date:11/09/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☒ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☒ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Site #1 near CR AAA. Seems to have more sand here than in previous years. Culvert at CR AAA was replaced in August 2004. The new structure appears to be set lower in the stream bed releasing sediments from upstream of the crossing. Few caddis flies found and only two stoneflies.

2

Instream Survey Data Sheet

Average Water Depth (ft.): <1'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☐ Riffles ☒ Runs ☒ Pools
   ☐ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
R	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
R	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1
2 # of R's X 5.0 = 10.0
1 # of C's X 5.3 = 5.3
Group 1 Total = 15.3

Group 2
2 # of R's X 3.0 = 6.0
1 # of C's X 3.2 = 3.2
Group 2 Total = 9.2

Group 3
3 # of R's X 1.1 = 3.3
0 # of C's X 1.0 = 0
Group 3 Total = 3.3

Total Stream Quality Score (sum of totals for Groups 1-3) = 27.8

☐ Excellent (>48) ☐ Good (34-48) ☒ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Salmon Trout River Monitoring, November 2004.
Site #2 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/09/04 Time: 12:00
Waterbody Name: Salmon Trout River Station #: 2
Location: Voepel's Property Township: Powell Sec 29T 51N R 28W E1/2 of NE¼
Investigator: Joe Wagner Lat: 46°47' Long: 87°53'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☐ 2 ☐ 3 ☒U
Water temp./d.o./pH *	34*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	15%
Cobble/Gravel – 10 to .08 in. diam.	60%
Sand – course grain	10%
Silt/Detritus/Muck –fine grain/organic matter	
Hardpan/Bedrock – solid clay/rock surface	15%
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☒L ☒R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 2
Date:11/09/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☒ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Low water and very cold. There is what appears to be a remote data logger on the Main Branch upstream of this station.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☐ Yes ☒ No
Substrate Embeddedness: ☒ 0-25% ☐ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	C	Diptera (Other)
C	Diptera (Black Fly larvae)		Decapoda (Crayfish)	R	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
R	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1
1 # of R's X 5.0 = 5.0
4 # of C's X 5.3 = 21.2
Group 1 Total = 26.2

Group 2
1 # of R's X 3.0 = 3.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 9.4

Group 3
2 # of R's X 1.1 = 2.2
2 # of C's X 1.0 = 2
Group 3 Total = 4.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 39.6

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/12/04 Time: 16:00
Waterbody Name: East Branch Salmon Trout River Station #: 3
Location: Bear Swamp Township: Powell Sec 34 T 51N R 28W SW¼ of NE¼
Investigator: Joe Wagner Lat: 46°46' Long: 87°50'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	38*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	
Sand – course grain	90%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

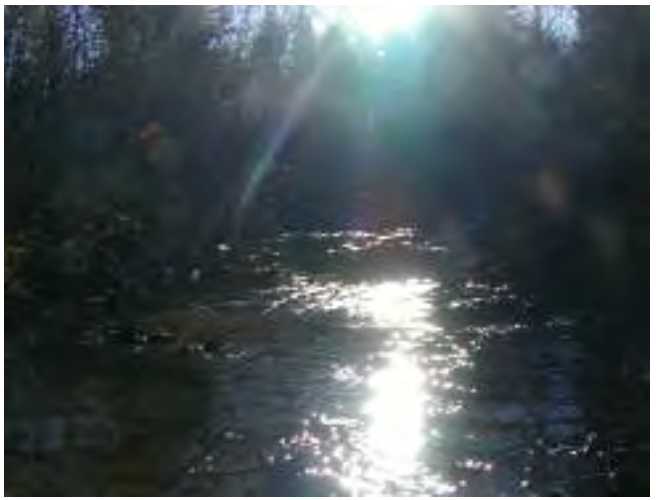
Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☐Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses

Wetlands	☒L ☒R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☐L ☐R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2004. Site #3 East Branch Salmon Trout River



Downstream looking upstream

Upstream looking downstream

Station #: 3
Date:11/12/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

A few spruce and cedar tree have fallen in the stream. No gravel but some coarse sand in scoured areas.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☐ Riffles ☐ Runs ☒ Pools
   ☐ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)		Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1
1 # of R's X 5.0 = 5.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 20.9

Group 2
1 # of R's X 3.0 = 3.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 9.4

Group 3
2 # of R's X 1.1 = 2.2
0 # of C's X 1.0 = 0
Group 3 Total = 2.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 33.5

☐ Excellent (>48) ☐ Good (34-48) ☒ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Salmon Trout River Monitoring, November 2004. Site #4 Snake Creek

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/09/04 Time: 13:30
Waterbody Name: Snake Creek Station #: 4
Location: Forks Township: Powell Sec 23 T 51N R 28W SE¼ of SW¼
Investigator: Joe Wagner Lat: 46°48' Long: 87°50'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☐ 2 ☐ 3 ☒U
Water temp./d.o./pH *	33*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☒<1 ☐1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	10%
Cobble/Gravel – 10 to .08 in. diam.	10%
Sand – course grain	65%
Silt/Detritus/Muck –fine grain/organic matter	15%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☒25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

1

Station #: 4
Date:11/09/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

There is a new bridge downstream of the station, at the location of the old ATV ford. It is a steel beam, timber deck structure on abutted with large concrete blocks.
The old foot bridge, located in the middle of this station, is sagging and restricting stream flow and causing some minor bank erosion. This station is sandy and low gradient, with only a few riffles. All stonelies captured are very small, and scuds out number all other inverts 10 to 1.

Instream Survey Data Sheet

Average Water Depth (ft.): <1'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☐ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	R	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)	R	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)	R	Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
R	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1
2 # of R's X 5.0 = 10.0
2 # of C's X 5.3 = 10.6
Group 1 Total = 20.6

Group 2
5 # of R's X 3.0 = 15.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 21.4

Group 3
4 # of R's X 1.1 = 4.4
0 # of C's X 1.0 = 0.0
Group 3 Total = 4.4

Total Stream Quality Score (sum of totals for Groups 1-3) = 46.4

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/10/04 Time: 12:00
Waterbody Name: Salmon Trout River Station #: 5
Location: Upper Dam Township: Powell Sec 15 T 51N R 28W NW¼ of SE¼
Investigator: Joe Wagner Lat: 46°49' Long: 87°50'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	39*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	5%
Cobble/Gravel – 10 to .08 in. diam.	25%
Sand – course grain	60%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Nat ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☒L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☒L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2004.
Site #5 Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 5
Date:11/10/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Several beaver/otter slides down to the river. There are some fresh beaver cuttings, but no dams or lodges. No riffles in this stretch but a good flow over LWD providing good cover and gravel in scoured areas.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   - ☐ Riffles ☐ Runs ☒ Pools
   - ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   - ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   - ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)	C	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
R	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)	C	Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	C	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1
1 # of R's X 5.0 = 5.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 20.9

Group 2
3 # of R's X 3.0 = 9.0
1 # of C's X 3.2 = 3.2
Group 2 Total = 12.2

Group 3
0 # of R's X 1.1 = 0.0
5 # of C's X 1.0 = 5.0
Group 3 Total = 5.0

Total Stream Quality Score (sum of totals for Groups 1-3) = 38.1

☐Excellent (>48) ☒Good (34-48) ☐Fair (19-33) ☐Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☒ Yes ☐ No
   If yes, please describe (if possible): Flushed two grouse

3

Salmon Trout River Monitoring, November 2004.
Site #6 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/10/04 Time: 14:15
Waterbody Name: Salmon Trout River Station #: 6
Location: Lower Dam Township: Powell Sec 13 T 51N R 28W NW¼ of SW¼
Investigator: Joe Wagner Lat: 46°49' Long: 87°49'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	41*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	20%
Cobble/Gravel – 10 to .08 in. diam.	65%
Sand – course grain	10%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

1

Station #: 6
Date:11/10/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Site is downstream of the lower dam. Substrate is mostly 3”-12” diameter rocks, with some larger boulders.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☐ Yes ☒ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
C	Coleoptera (Adult Beetles)	R	Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)	C	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
R	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	C	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1
1 # of R's X 5.0 = 5.0
4 # of C's X 5.3 = 21.2
Group 1 Total = 26.2

Group 2
4 # of R's X 3.0 = 12.0
1 # of C's X 3.2 = 3.2
Group 2 Total = 15.2

Group 3
2 # of R's X 1.1 = 2.2
2 # of C's X 1.0 = 2
Group 3 Total = 4.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 45.6

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☒ Yes ☐ No
   If yes, please describe (if possible): 1 grouse

3

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/10/04 Time: 15:30
Waterbody Name: Salmon Trout River Station #: 7
Location: Lower Falls Township: Powell Sec 13 T 51N R 28W SE¼ of NW¼
Investigator: Joe Wagner Lat: 46°49' Long: 87°48'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	41*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	35%
Cobble/Gravel – 10 to .08 in. diam.	45%
Sand – course grain	15%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2004. Site #7 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 7
Date:11/10/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

At the upstream end of this station is a recent landslide, apparently natural in origin. That bank is steep, red clay and gravel. There is minimal erosion at this bank, but minimal revegetation. Stream is restricted to 15'-18' feet wide at the toe of this bank, but the adjacent streambanks are stabile and the opposite bank is low allowing relief in over-bank events. Because this site is in know coaster brook trout habitat, no inverts were collects. No coasters were observed. Abundant caddis flies were seen on the rocks in this station.

2

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/09/04 Time: 10:30
Waterbody Name: Salmon Trout Station #: 8
Location: Log Bridge Township: Powell Sec 32T 51NR 28W NE¼ of NW¼
Investigator: Joe Wagner Lat: 46°47' Long: 87°53'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☐ 2 ☐ 3 ☒U
Water temp./d.o./pH *	34*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☒<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	30%
Sand – course grain	65%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X (few)
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses

Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2004. Site #8 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 8
Date:11/09/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:
Lots of caddis flies on the submerged rocks. Boulders are few, less than 1% of substrate. Deep pools and gravel beds occur around LWD masses.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)		Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
1 # of R's X 5.0 = 5.0	3 # of R's X 3.0 = 9.0	1 # of R's X 1.1 = 1.1
3 # of C's X 5.3 = 15.9	1 # of C's X 3.2 = 3.2	1 # of C's X 1.0 = 1.0
Group 1 Total = 20.9	**Group 2 Total** = 12.2	**Group 3 Total** = 2.1

Total Stream Quality Score (sum of totals for Groups 1-3) = 35.2

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Salmon Trout River Monitoring, November 2004.
Site #9 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Watershed Survey Data Sheet

Date: 11/12/04 Time: 11:30
Waterbody Name: Salmon Trout River Station #: 9
Location: Sec 21 Township: Powell Sec 21 T 51N R 28W SE¼ of NW¼
Investigator: Joe Wagner Lat: 46°48' Long: 87°52'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	35*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	5%
Cobble/Gravel – 10 to .08 in. diam.	85%
Sand – course grain	5%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☐<25 ☒25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☒L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 9
Date:11/12/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Difficult to locate due to the numerous logging roads to the east. Some newer beaver cuttings and a small beaver dam about 100 yards downstream of the site.

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☐ Yes ☒ No
Substrate Embeddedness: ☒ 0-25% ☐ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	C	Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)	R	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1
2 # of R's X 5.0 = 10.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 25.9

Group 2
1 # of R's X 3.0 = 3.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 9.4

Group 3
3 # of R's X 1.1 = 3.3
1 # of C's X 1.0 = 1.0
Group 3 Total = 4.3

Total Stream Quality Score (sum of totals for Groups 1-3) = 39.6

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/12/04 Time: 14:30
Waterbody Name: East Branch Salmon Trout River Station #: 10
Location: Sec 27 Township: Powell Sec 27 T 51W R 28W NW¼ of SW¼
Investigator: Joe Wagner Lat: 46°47' Long: 87°51'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	39*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	5%
Cobble/Gravel – 10 to .08 in. diam.	25%
Sand – course grain	50%
Silt/Detritus/Muck –fine grain/organic matter	20%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☐Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses

Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☒L ☒R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2004. Site #10 East Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 10
Date:11/12/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

There is a remote data logger about 50 yards downstream of this site, of unknown ownership. There are some very deep holes (over 3 feet) at this station.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)		Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)	R	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)	R	Hemiptera (True Bugs)
R	Gastropoda (Gilled Snails)	R	Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)	C	Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
R	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1
2 # of R's X 5.0 = 10.0
2 # of C's X 5.3 = 10.6
Group 1 Total = 20.6

Group 2
2 # of R's X 3.0 = 6.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 12.4

Group 3
3 # of R's X 1.1 = 3.3
1 # of C's X 1.0 = 1.0
Group 3 Total = 4.3

Total Stream Quality Score (sum of totals for Groups 1-3) = 37.3

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Salmon Trout River Monitoring, November 2004.
Site #11 Clear Creek

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/09/04 Time: 15:00
Waterbody Name: Clear Creek Station #: 11
Location: Blind 35 Township: Powell Sec 24 T 51N R 28W SW¼ of NE¼
Investigator: Joe Wagner Lat: 46°48' Long: 87°48'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☐ 2 ☐ 3 ☒U
Water temp./d.o./pH *	39*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☒<10 ☐10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	50%
Sand – course grain	45%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☐Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses

Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 11
Date:11/09/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Best example of stable stream banks on a small stream in the watershed. High sand bedload, but this station appears to transport the sediment well.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)		Oligochaeta (Aquatic worms)
R	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1
1 # of R's X 5.0 = 5.0
2 # of C's X 5.3 = 10.6
Group 1 Total = 15.6

Group 2
4 # of R's X 3.0 = 12.0
1 # of C's X 3.2 = 3.2
Group 2 Total = 15.2

Group 3
1 # of R's X 1.1 = 1.1
1 # of C's X 1.0 = 1
Group 3 Total = 2.1

Total Stream Quality Score (sum of totals for Groups 1-3) = 32.9

☐ Excellent (>48) ☐ Good (34-48) ☒ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/10/04 Time: 16:40
Waterbody Name: Salmon Trout River Station #: 12
Location: Murphy's Landing Township: Powell Sec 12 T 51N R 28W NE¼ of NE¼
Investigator: Joe Wagner Lat: 46°50.202' Long: 87°47.742'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	41*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	20%
Sand – course grain	70%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☐3-5 ☒5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☒25-50 ☐>50

Adjacent Land Uses

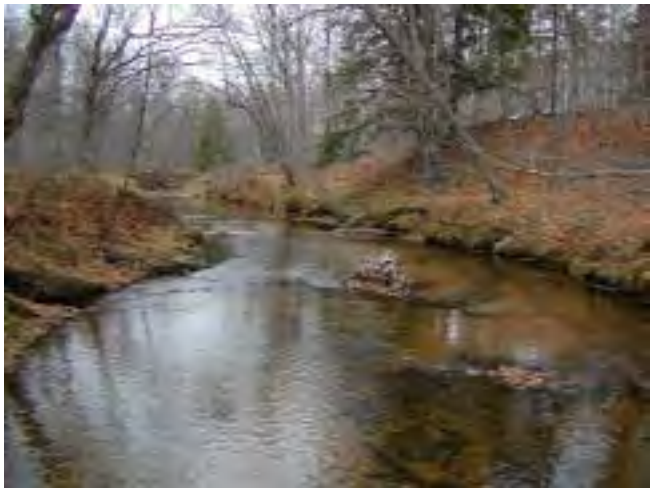
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2004.
Site #12 Salmon Trout River

Downstream looking upstream

Upstream looking downstream



Station #: 12
Date:11/10/04

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

No invert sampling was conducted as coasters were present at this site. Site appears to have more exposed gravel and LWD present than any visit during the last five years. The sand delta usually present at the mouth of Murphy's Creek was gone.

2

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/09/05 Time: 13:00
Waterbody Name: Salmon Trout River Station #: 1
Location: CR AAA Township: Michigamme Sec 3 T 50 R 29 SE ¼ of SE ¼
Investigator: Joe Wagner Lat: 46° 45.107' Long: 87° 54.481'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	58° F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☒<10 ☐10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☐1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	15%
Sand – course grain	80%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☒? ☐Y ☐N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses

Wetlands	☒L ☒R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, May 2005. Site #1 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 1
Date: 05/09/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☒ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: County Road AAA, upstream of this site, washed out on 04/13/05. There appears to be more sediment at this station than in previous visits and may be a result of the road wash out. Gravel is still present in localized areas of scouring and near LWD.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☐ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	R	Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)		Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)	R	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)	R	Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)	R	Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
R	Plecoptera (Stonefly nymphs)	C	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
1 # of R's X 5.0 = 5	3 # of R's X 3.0 = 9.0	4 # of R's X 1.1 = 4.4
2 # of C's X 5.3 = 10.6	2 # of C's X 3.2 = 6.4	0 # of C's X 1.0 = 0.0
Group 1 Total = 15.6	**Group 2 Total** = 15.4	**Group 3 Total** = 4.4

Total Stream Quality Score (sum of totals for Groups 1-3) = 35.4

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☒ Yes ☐ No
   If yes, please describe (if possible): Brook Trout fingerling

3

Salmon Trout River Monitoring, May 2005.
Site #2 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Watershed Survey Data Sheet

Date: 05/10/05 Time: 11:45
Waterbody Name: Salmon Trout River Station #: 2
Location: Voeple's Camp Township: Powell Sec 29 T 51 R 28 NE 1/4 of NE ¼
Investigator: Joe Wagner Lat: 46°47.394' Long: 87°52.750'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)

Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	58° F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)

Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)

Boulder – 10 in. diam.	45%
Cobble/Gravel – 10 to .08 in. diam.	35%
Sand – course grain	5%
Silt/Detritus/Muck –fine grain/organic matter	
Hardpan/Bedrock – solid clay/rock surface	15%
Artificial – manmade	
Unknown	

Instream Cover (X = present)

Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology

Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor

Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☐<25 ☒25-50 ☐>50

Adjacent Land Uses

Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☒L ☒R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 2
Date: 05/10/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: Site looks very healthy, substrate is mostly 8-12” diameter rock. Good flow through here with very little instream LWD.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☐ Yes ☒ No
Substrate Embeddedness: ☒ 0-25% ☐ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	R	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)		Diptera (Crane Fly larvae)	R	Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
R	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	C	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
2 # of R's X 5.0 = 10.0	1 # of R's X 3.0 = 3.0	4 # of R's X 1.1 = 4.4
3 # of C's X 5.3 = 15.9	2 # of C's X 3.2 = 6.4	0 # of C's X 1.0 = 0.0
Group 1 Total = 25.9	**Group 2 Total** = 9.4	**Group 3 Total** = 4.4

Total Stream Quality Score (sum of totals for Groups 1-3) = 39.7

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/11/05 Time: 10:30
Waterbody Name: East Branch Salmon Trout Station #: 3
Location: Bear Swamp Township: Powell Sec 34 T 51 R 28 SW¼ of NE¼
Investigator: Joe Wagner Lat: 46°46.331' Long: 87°50.185'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	47°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	
Sand – course grain	90%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses			
Wetlands	☒L ☒R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☐L ☐R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, May 2005.
Site #3 East Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

No picture available

Station #: 3
Date: 05/11/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: Slow moving sediment storage area. Substrate mostly soft sand. Site is surrounded by tag alders and several holes are over 3 feet deep.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☐ Riffles ☒ Runs ☒ Pools
   ☐ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)		Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)	R	Megaloptera (Alderfly larvae)	R	Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
R	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	C	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)		Pelecypoda (Clams)		

Group 1	Group 2	Group 3
2 # of R's X 5.0 = 10.0	2 # of R's X 3.0 = 6.0	2 # of R's X 1.1 = 2.2
2 # of C's X 5.3 = 10.6	1 # of C's X 3.2 = 3.2	2 # of C's X 1.0 = 2.0
Group 1 Total = 20.6	**Group 2 Total** = 9.2	**Group 3 Total** = 4.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 34.0

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Salmon Trout River Monitoring, May 2005.
Site #4 Snake Creek

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/09/05 Time: 14:20
Waterbody Name: Snake Creek Station #: 4
Location: Forks Township: Powell Sec 23 T 51 R 28 NE ¼ of SW ¼
Investigator: Joe Wagner Lat: 46°47.884' Long: 87°49.568'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	55°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☒Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	35%
Cobble/Gravel – 10 to .08 in. diam.	20%
Sand – course grain	40%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☒? ☐Y ☐N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☐Gr ☐Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 4
Date: 05/09/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☒ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: The newer bridge downstream of the station appears to be contributing sediment to the stream. There also seems to an excess of sediment up stream of the station as well.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☐ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and, Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)		Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)	R	Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
R	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)		Pelecypoda (Clams)		

Group 1
2 # of R's X 5.0 = 10.0
2 # of C's X 5.3 = 10.6
Group 1 Total = 20.6

Group 2
3 # of R's X 3.0 = 9.0
1 # of C's X 3.2 = 3.2
Group 2 Total = 12.2

Group 3
3 # of R's X 1.1 = 3.3
0 # of C's X 1.0 = 0.0
Group 3 Total = 3.3

Total Stream Quality Score (sum of totals for Groups 1-3) = 40.736.1

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/12/05 Time: 10:00
Waterbody Name: Salmon Trout River Station #: 5
Location: Upper Dam Township: Powell Sec 15 T 51 R 28 NW¼ of SE¼
Investigator: Joe Wagner Lat: 46°48.821' Long: 87°50.453'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	40°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	5%
Cobble/Gravel – 10 to .08 in. diam.	25%
Sand – course grain	55%
Silt/Detritus/Muck –fine grain/organic matter	15%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses

Wetlands	☒L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☒L ☐R	Impervious surfaces	☐L ☐R
Forest	☐L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, May 2005. Site #5 Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 5
Date:05/12/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: Water is very cold here today. No new beaver chews noted. Many holes over 3' deep, station average depth is about 2.5'.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☐ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
C	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)	C	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)	R	Hirudina (Leeches)
R	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)	R	Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	C	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
1 # of R's X 5.0 = 5.0	2 # of R's X 3.0 = 6.0	4 # of R's X 1.1 = 4.4
4 # of C's X 5.3 = 21.2	2 # of C's X 3.2 = 6.4	2 # of C's X 1.0 = 2.0
Group 1 Total = 26.2	**Group 2 Total** = 12.4	**Group 3 Total** = 6.4

Total Stream Quality Score (sum of totals for Groups 1-3) = 45.0

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Salmon Trout River Monitoring, May 2005.
Site #6 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Marquette County Conservation District
Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 5/12/05 Time: 14:20
Waterbody Name: Salmon Trout River Station #: 6
Location: Lower Dam Township: Powell Sec 13 T 51 R 28 NW ¼ of SW¼
Investigator: Joe Wagner Lat: 46°48.744' Long: 87°48.658'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	43°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	10%
Cobble/Gravel – 10 to .08 in. diam.	70%
Sand – course grain	15%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

1

Watershed Survey Data Sheet

Station #: 6
Date: 05/12/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:
Minimal LWD.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☐ Yes ☒ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
C	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)	C	Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)	C	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)		Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
R	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	C	Odonata (Dragonfly nymphs)		Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
1 # of R's X 5.0 = 5.0	1 # of R's X 3.0 = 3.0	0 # of R's X 1.1 = 0.0
4 # of C's X 5.3 = 21.2	3 # of C's X 3.2 = 9.6	3 # of C's X 1.0 = 3.0
Group 1 Total = 26.2	**Group 2 Total** = 12.6	**Group 3 Total** = 3.0

Total Stream Quality Score (sum of totals for Groups 1-3) = 41.8

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/12/05 Time: 12:00
Waterbody Name: Salmon Trout River Station #: 7
Location: Lower Falls Township: Powell Sec 13 T 51 R 28 SE¼ of NW¼
Investigator: Joe Wagner Lat: 46°48.977' Long: 87°48.167'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	42°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	25%
Cobble/Gravel – 10 to .08 in. diam.	70%
Sand – course grain	5%
Silt/Detritus/Muck –fine grain/organic matter	
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☐Gr ☐Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, May 2005. Site #7 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 7
Date:05/12/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☒ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: Land slide upstream of this station still appears to be stable. Though the banks are stable, the river is restricted to about 12'-15' wide at the base of the slide, were as the station width is closer to 35'-40' wide. Substrate is nearly all boulder, cobble, gravel. Hundreds of white fish eggs, ID to be rainbow trout eggs by USFWS biologist from a photograph.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3"
Is the substrate covered with excessive silt? ☐ Yes ☒ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)	R	Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)		Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
R	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)		Pelecypoda (Clams)		

Group 1
3 # of R's X 5.0 = 15.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 30.9

Group 2
3 # of R's X 3.0 = 9.0
0 # of C's X 3.2 = 0.0
Group 2 Total = 9.0

Group 3
1 # of R's X 1.1 = 1.1
2 # of C's X 1.0 = 2.0
Group 3 Total = 3.1

Total Stream Quality Score (sum of totals for Groups 1-3) = 43.0

☐Excellent (>48) ☒Good (34-48) ☐Fair (19-33) ☐Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☒ Yes ☐ No
   If yes, please describe (if possible): Sculpins, porcupine, and hundreds of rainbow trout eggs

Salmon Trout River Monitoring, May 2005.
Site #8 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Marquette County Conservation District
Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/10/05 Time: 10:00
Waterbody Name: Salmon Trout River Station #: 8
Location: Log bridge Township: Powell Sec 32 T 51 R 28 NE¼ of NW¼
Investigator: Joe Wagner Lat: 46°46.586' Long: 87°53.260'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	54°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☒<10 ☐10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	20%
Sand – course grain	75%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses			
Wetlands	☒L ☒R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

1

Watershed Survey Data Sheet

Station #: 8
Date:05/10/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: Looks like an old beaver meadow, starting to become forested again. A sprinkle of rain fell this morning. High sand load. Sand substrate is soft, lots of LWD present.

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☐ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)	R	Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)		Pelecypoda (Clams)		

Group 1	Group 2	Group 3
1 # of R's X 5.0 = 5	2 # of R's X 3.0 = 6.0	3 # of R's X 1.1 = 2.2
3 # of C's X 5.3 = 15.9	0 # of C's X 3.2 = 0.0	1 # of C's X 1.0 = 1
Group 1 Total = 20.9	**Group 2 Total** = 6.0	**Group 3 Total** = 3.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 31.2

☐ Excellent (>48) ☐ Good (34-48) ☒ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Marquette County Conservation District
Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/10/05 Time: 13:30
Waterbody Name: Salmon Trout River Station #: 9
Location: Sec.21 Township: Powell Sec 21 T51 R28 SE ¼ of NW ¼
Investigator: Joe Wagner Lat: 46°48.262' Long: 87°52.008'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	58°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☐Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	85%
Sand – course grain	5%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses

Wetlands	☒L ☒R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, May 2005. Site #9 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Watershed Survey Data Sheet

Station #: 9
Date: 05/10/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: Very stable substrate. There is a remnant campsite on river right. Undercut bank habitat is minimal, but present.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☐ Yes ☒ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
2 # of R's X 5.0 = 10.0	2 # of R's X 3.0 = 6.0	3 # of R's X 1.1 = 3.3
3 # of C's X 5.3 = 15.9	0 # of C's X 3.2 = 0.0	0 # of C's X 1.0 = 0.0
Group 1 Total = 25.9	**Group 2 Total** =6.0	**Group 3 Total** =3.3

Total Stream Quality Score (sum of totals for Groups 1-3) = 35.2

☐Excellent (>48) ☒Good (34-48) ☐Fair (19-33) ☐Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Salmon Trout River Monitoring, May 2005.
Site #10 East Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/11/05 Time: 13:00
Waterbody Name: E. Branch Salmon Trout Station #: 10
Location: Sec 27 Township: Powell Sec 27 T 51 R 28 NW ¼ of SW ¼
Investigator: Joe Wagner Lat: 46°47.136' Long: 87°51.128'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	46°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	20%
Cobble/Gravel – 10 to .08 in. diam.	15%
Sand – course grain	50%
Silt/Detritus/Muck –fine grain/organic matter	15%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☐Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☒25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

1

Station #: 10
Date: 05/11/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: There is another unknown remote data logger about 50 yards downstream of this station. Boulder substrate, many deep holes.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3 '
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
C	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)	R	Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	C	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1
0 # of R's X 5.0 = 0.0
4 # of C's X 5.3 = 21.2
Group 1 Total = 21.2

Group 2
2 # of R's X 3.0 = 6.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 12.4

Group 3
2 # of R's X 1.1 = 2.2
2 # of C's X 1.0 = 2.0
Group 3 Total = 4.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 37.8

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/09/05 Time: 16:00
Waterbody Name: Clear Creek Station #: 11
Location: Blind 35 Township: Powell Sec 24 T 51 R28 SW¼ of NE¼
Investigator: Joe Wagner Lat: 46°48.223' Long: 87°47.936'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	52°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☒<10 ☐10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	30%
Sand – course grain	60%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☒? ☐Y ☐N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☐Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses

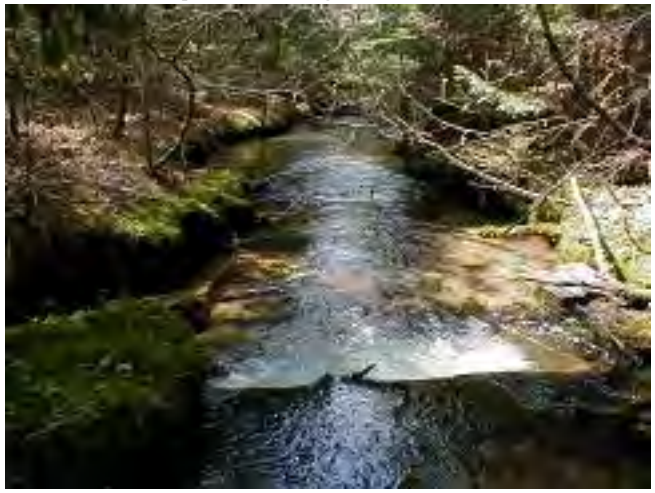
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, May 2005. Site #11 Clear Creek

Downstream looking upstream

Upstream looking downstream



Station #: 11
Date: 05/09/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: Site is very stable with good banks. High sand bed load with embededness.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☐ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)	R	Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
1 # of R's X 5.0 = 5.0	2 # of R's X 3.0 = 6.0	4 # of R's X 1.1 = 4.4
3 # of C's X 5.3 = 15.9	1 # of C's X 3.2 = 3.2	0 # of C's X 1.0 = 0.0
Group 1 Total = 20.9	**Group 2 Total** = 9.2	**Group 3 Total** = 4.4

Total Stream Quality Score (sum of totals for Groups 1-3) = 34.5

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Salmon Trout River Monitoring, May 2005.
Site #12 Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 05/12/05 Time: 16:20
Waterbody Name: Salmon Trout River Station #: 12
Location: Murphy's Landing Township: Powell Sec 12 T 51 R 28 NE ¼ of NE¼
Investigator: Joe Wagner Lat: 46°50.220' Long: 87°47.770'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	46°F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	5%
Cobble/Gravel – 10 to .08 in. diam.	15%
Sand – course grain	75%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☐3-5 ☒5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 12
Date: 05/12/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☒ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments: Sand delta at the mouth of Murphy's Creek still exhibits sand deposition, but not nearly as much as years past. Several good gravel beds, mostly around LWD causing localized scouring. Some boulders just downstream of station and a large sand deposit just upstream of station, at first inside bend.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☐ Riffles ☒ Runs ☒ Pools
   ☐ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☐ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
C	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)	R	Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
R	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
1 # of R's X 5.0 = 5.0	1 # of R's X 3.0 = 3.0	4 # of R's X 1.1 = 4.4
3 # of C's X 5.3 = 15.9	1 # of C's X 3.2 = 3.2	0 # of C's X 1.0 = 0.0
Group 1 Total = 20.9	**Group 2 Total** = 6.2	**Group 3 Total** = 4.4

Total Stream Quality Score (sum of totals for Groups 1-3) = 31.5

☐ Excellent (>48) ☐ Good (34-48) ☒ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/01/05 Time: 09:30
Waterbody Name: Salmon Trout River Station #: 1
Location: C.R. AAA Township: Michigamme Sec3 T50N R29W SE¼ of SE¼
Investigator: Joe Wagner Lat: 46° 45' Long: 87° 54'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)

Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	41*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☒<10 ☐10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☒<1 ☐1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)

Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)

Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	25%
Sand – course grain	70%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)

Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	X
Logs or woody debris	X

River Morphology

Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor

Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses

Wetlands	☒L ☒R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2005. Site #1 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 1
Date:11/01/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☒ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

High sand deposition. Lots of aquatic plants. Some good gravel beds in scours. A pair of spawning brook trout were observed. There are some forestry flagging and foot trails in the area.

Instream Survey Data Sheet

Average Water Depth (ft.): <1'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☐ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
R	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1
1 # of R's X 5.0 = 5.0
2 # of C's X 5.3 = 10.6
Group 1 Total = 15.6

Group 2
0 # of R's X 3.0 = 0.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 6.4

Group 3
2 # of R's X 1.1 = 2.2
1 # of C's X 1.0 = 1.0
Group 3 Total = 3.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 25.2

☐ Excellent (>48) ☐ Good (34-48) ☒ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☒ Yes ☐ No
   If yes, please describe (if possible): Spawning brook trout

Salmon Trout River Monitoring, November 2005.
Site #2 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/03/05 Time: 09:30
Waterbody Name: Salmon Trout River Station #: 2
Location: Voepel's Property Township: Powell Sec 29T 51N R 28W E1/2 of NE¼
Investigator: Joe Wagner Lat: 46°47' Long: 87°53'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☐ 2 ☐ 3 ☒U
Water temp./d.o./pH *	41*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	20%
Cobble/Gravel – 10 to .08 in. diam.	55%
Sand – course grain	15%
Silt/Detritus/Muck –fine grain/organic matter	
Hardpan/Bedrock – solid clay/rock surface	10%
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☒L ☒R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 2
Date:11/03/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Remote data logger installed upstream of this station, not ours. Lots of boulder habitat and riffles.

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☐ Riffles ☐ Runs ☒ Pools
   ☐ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
C	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)	C	Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)		Pelecypoda (Clams)		

Group 1
0 # of R's X 5.0 = 0.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 15.9

Group 2
0 # of R's X 3.0 = 0.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 6.4

Group 3
2 # of R's X 1.1 = 2.2
2 # of C's X 1.0 = 2.0
Group 3 Total = 4.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 26.5

☐ Excellent (>48) ☐ Good (34-48) ☒ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/03/05 Time: 15:20
Waterbody Name: East Branch Salmon Trout River Station #: 3
Location: Bear Swamp Township: Powell Sec 34 T 51N R 28W SW¼ of NE¼
Investigator: Joe Wagner Lat: 46°46' Long: 87°50'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☐ 2 ☐ 3 ☒U
Water temp./d.o./pH *	41*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	
Sand – course grain	75%
Silt/Detritus/Muck –fine grain/organic matter	25%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☐Trees
Stream canopy %	☐<25 ☒25-50 ☐>50

Adjacent Land Uses

Wetlands	☒L ☒R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☐L ☐R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2005.
Site #3 East Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 3
Date:11/03/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Abundant aquatic plants. Lots of fresh beaver cuttings, but no dams present. The streams thalweg is 3’ deep or more, and channel is very wide at the turns.

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☐ Riffles ☐ Runs ☒ Pools
   ☐ Cobbles ☐ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
C	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)	C	Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)		Pelecypoda (Clams)		

Group 1
0 # of R's X 5.0 = 0.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 15.9

Group 2
0 # of R's X 3.0 = 0.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 6.4

Group 3
2 # of R's X 1.1 = 2.2
2 # of C's X 1.0 = 2.0
Group 3 Total = 4.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 26.5

☐Excellent (>48) ☐Good (34-48) ☒Fair (19-33) ☐Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Salmon Trout River Monitoring, November 2005. Site #4 Snake Creek

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/01/05 Time: 13:30
Waterbody Name: Snake Creek Station #: 4
Location: Forks Township: Powell Sec 23 T 51N R 28W SE¼ of SW¼
Investigator: Joe Wagner Lat: 46°48' Long: 87°50'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	42*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☒<1 ☐1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	5%
Cobble/Gravel – 10 to .08 in. diam.	30%
Sand – course grain	60%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☒25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 4
Date:11/01/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☒ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

The recently installed bridge just downstream of this station has now been removed (installed under a temporary permit in 2004). That site is still being forded by ATVs. The old foot bridge in the middle of the station has collapsed further and as usual, there is a good deal of soft sediments in the stream bed.

Instream Survey Data Sheet

Average Water Depth (ft.): <1'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
R	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)		Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1
1 # of R's X 5.0 = 5.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 20.9

Group 2
3 # of R's X 3.0 = 9.0
1 # of C's X 3.2 = 3.2
Group 2 Total = 12.2

Group 3
1 # of R's X 1.1 = 1.1
1 # of C's X 1.0 = 1.0
Group 3 Total = 2.1

Total Stream Quality Score (sum of totals for Groups 1-3) = 35.2

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/07/05 Time: 10:00
Waterbody Name: Salmon Trout River Station #: 5
Location: Upper Dam Township: Powell Sec 15 T 51N R 28W NW¼ of SE¼
Investigator: Joe Wagner Lat: 46°49' Long: 87°50'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	39*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	5%
Cobble/Gravel – 10 to .08 in. diam.	15%
Sand – course grain	70%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Nat ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses

Wetlands	☒L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☒L ☐R	Impervious surfaces	☐L ☐R
Forest	☐L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2005.
Site #5 Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 5
Date:11/07/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Several beaver/otter slides down to the river, on river left side. One small patch of boulders in this station.

2

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☐ Riffles ☐ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)	C	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)	C	Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1
1 # of R's X 5.0 = 5.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 20.9

Group 2
2 # of R's X 3.0 = 6.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 12.4

Group 3
2 # of R's X 1.1 = 2.2
3 # of C's X 1.0 = 3.0
Group 3 Total = 5.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 38.5

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Salmon Trout River Monitoring, November 2005.
Site #6 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/07/05 Time: 12:15
Waterbody Name: Salmon Trout River Station #: 6
Location: Lower Dam Township: Powell Sec 13 T 51N R 28W NW¼ of SW¼
Investigator: Joe Wagner Lat: 46°49' Long: 87°49'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	39*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☒<1 ☐1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	10%
Cobble/Gravel – 10 to .08 in. diam.	75%
Sand – course grain	10%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 6
Date:11/07/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Some new beaver activity, slides and cuttings. Minimal sediment and some embeddedness.

Instream Survey Data Sheet

Average Water Depth (ft.): <1'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	C	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)	C	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
R	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	C	Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1
2 # of R's X 5.0 = 10.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 25.9

Group 2
3 # of R's X 3.0 = 9.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 15.4

Group 3
1 # of R's X 1.1 = 1.1
3 # of C's X 1.0 = 3.0
Group 3 Total = 4.1

Total Stream Quality Score (sum of totals for Groups 1-3) = 45.4

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible): 1 grouse

3

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/07/05 Time: 14:00
Waterbody Name: Salmon Trout River Station #: 7
Location: Lower Falls Township: Powell Sec 13 T 51N R 28W SE¼ of NW¼
Investigator: Joe Wagner Lat: 46°49' Long: 87°48'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	38*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☒<1 ☐1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	40%
Cobble/Gravel – 10 to .08 in. diam.	30%
Sand – course grain	15%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	5%
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses

Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2005. Site #7 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 7
Date:11/07/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Old land slide upstream of station is still slow to revegetate, but not causing any further erosion problems. Many holes over 1’ deep in the river, but average is less. No invert collection was done to protect coaster the fall coaster run.

2

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/07/05 Time: 10:00
Waterbody Name: Salmon Trout River Station #: 5
Location: Upper Dam Township: Powell Sec 15 T 51N R 28W NW¼ of SE¼
Investigator: Joe Wagner Lat: 46°49' Long: 87°50'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	39*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	5%
Cobble/Gravel – 10 to .08 in. diam.	15%
Sand – course grain	70%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Nat ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☐0 ☒L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☒Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses

Wetlands	☒L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☒L ☐R	Impervious surfaces	☐L ☐R
Forest	☐L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2005. Site #8 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 8
Date:11/01/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:
Channel moderately braided, as it has been since sampling here began. Seems to be a lot more sandy sediments here than before. There is a new beaver dam about 100 feet upstream of the station. There are a few boulders here and lots of LWD.

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☐ 25-50% ☒ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☐ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)	R	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)		Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
1 # of R's X 5.0 = 5.0	0 # of R's X 3.0 = 0.0	3 # of R's X 1.1 = 3.3
3 # of C's X 5.3 = 15.9	2 # of C's X 3.2 = 6.4	0 # of C's X 1.0 = 0.0
Group 1 Total = 20.9	**Group 2 Total** = 6.4	**Group 3 Total** = 3.3

Total Stream Quality Score (sum of totals for Groups 1-3) = 30.6

☐ Excellent (>48) ☐ Good (34-48) ☒ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

3

Salmon Trout River Monitoring, November 2005.
Site #9 Main Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/03/05 Time: 11:30
Waterbody Name: Salmon Trout River Station #: 9
Location: Sec 21 Township: Powell Sec 21 T 51N R 28W SE¼ of NW¼
Investigator: Joe Wagner Lat: 46°48' Long: 87°52'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☐ 2 ☐ 3 ☒U
Water temp./d.o./pH *	
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	5%
Cobble/Gravel – 10 to .08 in. diam.	60%
Sand – course grain	30%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☒<25 ☐25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 9
Date:11/03/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Small feeder stream that enters the river at the middle of this station seems to have become a significant sediment source.

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☐ Yes ☒ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	C	Coleoptera (Beetle larvae)	C	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)	R	Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)	R	Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1
1 # of R's X 5.0 = 5.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 20.9

Group 2
2 # of R's X 3.0 = 6.0
1 # of C's X 3.2 = 3.2
Group 2 Total = 9.2

Group 3
3 # of R's X 1.1 = 3.3
1 # of C's X 1.0 = 1.0
Group 3 Total = 4.3

Total Stream Quality Score (sum of totals for Groups 1-3) = 34.4

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☐ Yes ☒ No
   If yes, please describe (if possible):

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/03/05 Time: 13:30
Waterbody Name: East Branch Salmon Trout River Station #: 10
Location: Sec 27 Township: Powell Sec 27 T 51W R 28W NW¼ of SW¼
Investigator: Joe Wagner Lat: 46°47' Long: 87°51'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☐ 2 ☐ 3 ☒U
Water temp./d.o./pH *	41*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☒10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☒L ☐M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☒Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	10%
Cobble/Gravel – 10 to .08 in. diam.	35%
Sand – course grain	45%
Silt/Detritus/Muck –fine grain/organic matter	10%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	X
Aquatic plants	X
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☒25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2005.
Site #10 East Branch Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 10
Date:11/03/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

There is a remote data logger about 50 yards downstream of this site, of unknown ownership. There are some very deep holes (over 3 feet) at this station. There is some speculation that the USGS will install a flow gauge here.

Instream Survey Data Sheet

Average Water Depth (ft.): 1-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☒ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
R	Coleoptera (Adult Beetles)		Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)	R	Coleoptera (Beetle larvae)	C	Diptera (Other)
R	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	C	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)	R	Odonata (Dragonfly nymphs)		Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	C	Pelecypoda (Clams)		

Group 1
2 # of R's X 5.0 = 10.0
3 # of C's X 5.3 = 15.9
Group 1 Total = 25.9

Group 2
2 # of R's X 3.0 = 6.0
2 # of C's X 3.2 = 6.4
Group 2 Total = 12.4

Group 3
1 # of R's X 1.1 = 1.1
1 # of C's X 1.0 = 1.0
Group 3 Total = 2.1

Total Stream Quality Score (sum of totals for Groups 1-3) = 40.4

☐ Excellent (>48) ☒ Good (34-48) ☐ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☒ Yes ☐ No
   If yes, please describe (if possible): one 8-9" brook trout

Salmon Trout River Monitoring, November 2005.
Site #11 Clear Creek

Downstream looking upstream

Upstream looking downstream

Watershed Survey Data Sheet

Date: 11/01/05 Time: 15:00
Waterbody Name: Clear Creek Station #: 11
Location: Blind 35 Township: Powell Sec 24 T 51N R 28W SW¼ of NE¼
Investigator: Joe Wagner Lat: 46°48' Long: 87°48'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☐ ≤ 1 ☒ 2 ☐ 3 ☐U
Water temp./d.o./pH *	42*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☒<10 ☐10-25 ☐25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	35%
Sand – course grain	60%
Silt/Detritus/Muck –fine grain/organic matter	5
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☒Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☒1-3 ☐3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☐Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☐25-50 ☒>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Station #: 11
Date:11/01/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☒ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

Rather sand this year. Observed one 8-9” brook trout and several salmonid eggs.

Instream Survey Data Sheet

Average Water Depth (ft.): 1'-3'
Is the substrate covered with excessive silt? ☒ Yes ☐ No
Substrate Embeddedness: ☐ 0-25% ☒ 25-50% ☐ >50%

Benthic Macroinvertebrates

1. Try to sample from all of the habitats listed below.
   Check the types of habitats and substrates from which invertebrates were collected.
   ☒ Riffles ☒ Runs ☒ Pools
   ☒ Cobbles ☒ Margins ☒ Undercut banks/over-hanging vegetation
   ☐ Aquatic plants ☒ Leaf packs ☒ Submerged wood
   ☐ Other (please describe):
2. Use letter codes **R** and **C** (Rare = 1-10 and Common = 11 or more) to record the approximate numbers of organisms in each taxa found in the stream reach.

Group 1 Sensitive		Group 2 Somewhat-sensitive		Group 3 Tolerant	
	Coleoptera (Adult Beetles)	C	Amphipoda (Scuds)	R	Diptera (Midge larvae)
	Coleoptera (Water penny)		Coleoptera (Beetle larvae)	R	Diptera (Other)
	Diptera (Black Fly larvae)		Decapoda (Crayfish)		Gastropoda (Pouch snails)
C	Ephemeroptera (Mayfly nymphs)	R	Diptera (Crane Fly larvae)		Hemiptera (True Bugs)
	Gastropoda (Gilled Snails)		Megaloptera (Alderfly larvae)		Hirudina (Leeches)
	Megaloptera (Hellgrammites)		Odonata (Damselfly nymphs)		Isopoda (Sowbugs)
C	Plecoptera (Stonefly nymphs)		Odonata (Dragonfly nymphs)		Oligochaeta (Aquatic worms)
C	Trichoptera (Caddisfly larvae)	R	Pelecypoda (Clams)		

Group 1	Group 2	Group 3
0 # of R's X 5.0 = 0.0	2 # of R's X 3.0 = 6.0	2 # of R's X 1.1 = 2.2
3 # of C's X 5.3 = 15.9	1 # of C's X 3.2 = 3.2	0 # of C's X 1.0 = 0.0
Group 1 Total = 15.9	**Group 2 Total** = 9.2	**Group 3 Total** = 2.2

Total Stream Quality Score (sum of totals for Groups 1-3) = 27.3

☐ Excellent (>48) ☐ Good (34-48) ☒ Fair (19-33) ☐ Poor (<19)

3. During the sampling and evaluation, did you observe fish or wildlife? ☒ Yes ☐ No
   If yes, please describe (if possible): One 8-9" brook trout

Central Lake Superior Watershed Partnership

Watershed Survey Data Sheet

Date: 11/07/05 Time: 16:30
Waterbody Name: Salmon Trout River Station #: 12
Location: Murphy's Landing Township: Powell Sec 12 T 51N R 28W NE¼ of NE¼
Investigator: Joe Wagner Lat: 46°50.202' Long: 87°47.742'
Coordinate Determination Method (check one that applies):
☒GPS ☐GPS w/DBR ☒Digital mapping software ☐Topographic map
☐Other (describe) Map scale (if known)

Physical Habitat

Background Information (check all that apply)	
Event conditions noted at site	☒None ☐Light ☐ Moderate ☐Heavy
Days since rain	☒ ≤ 1 ☐ 2 ☐ 3 ☐U
Water temp./d.o./pH *	40*F
Water color	☒Clear ☐Gray ☐ Brown ☐Black ☐Green
Waterbody type	☒Stream ☐Lake ☐ Impound ☐Wetland
Stream width (ft.)	☐<10 ☐10-25 ☒25-50 ☐>50
Avg. stream depth (ft.)	☐<1 ☒1-3 ☐>3 ☐U
Water velocity (ft./sec.) *	
Stream flow type	☐Dry ☐Stagnant ☐L ☒M ☐H

Physical Appearance (check all that apply)		
Aquatic plants	☐Present	☐Abundant
Floating algae	☐Present	☐Abundant
Filamentous algae	☒Present	☐Abundant
Bacterial sheen/slimes	☐Present	☐Abundant
Turbidity	☐Present	☐Abundant
Oil sheen	☐Present	☐Abundant
Foam	☐Present	☐Abundant
Trash	☐Present	☐Abundant

Substrate (add to 100%)	
Boulder – 10 in. diam.	
Cobble/Gravel – 10 to .08 in. diam.	30%
Sand – course grain	65%
Silt/Detritus/Muck –fine grain/organic matter	5%
Hardpan/Bedrock – solid clay/rock surface	
Artificial – manmade	
Unknown	

Instream Cover (X = present)	
Undercut banks	X
Overhanging vegetation	X
Deep pools	X
Boulders	
Aquatic plants	
Logs or woody debris	X

River Morphology	
Riffle	☐Present ☐Abundant
Pool	☒Present ☐Abundant
Channel	☒Natr ☐Recov ☐Maintained
Designated drain	☐? ☐Y ☒N
Highest water mark (ft.)	☐? ☐<1 ☐1-3 ☒3-5 ☐5-10 ☐>10

Stream Corridor	
Riparian veg. width ft. (L)	☐<10 ☐10-30 ☐30-100 ☒>100
Riparian veg. width ft. (R)	☐<10 ☐10-30 ☐30-100 ☒>100
Bank erosion	☒0 ☐L ☐M ☐H
Sidestream land cover	☐B ☒Gr ☐Sh ☒Trees
Stream canopy %	☐<25 ☒25-50 ☐>50

Adjacent Land Uses			
Wetlands	☐L ☐R	Residential lawns, parks	☐L ☐R
Shrub or old field	☐L ☐R	Impervious surfaces	☐L ☐R
Forest	☒L ☒R	Disturbed ground	☐L ☐R
Pasture	☐L ☐R	No vegetation	☐L ☐R
Crop residue	☐L ☐R		
Rowcrop	☐L ☐R		

* Optional data item

Salmon Trout River Monitoring, November 2005.
Site #12 Salmon Trout River

Downstream looking upstream

Upstream looking downstream

Station #: 12
Date:11/07/05

Potential Sources (Severity: S - slight; M – moderate; H – high)

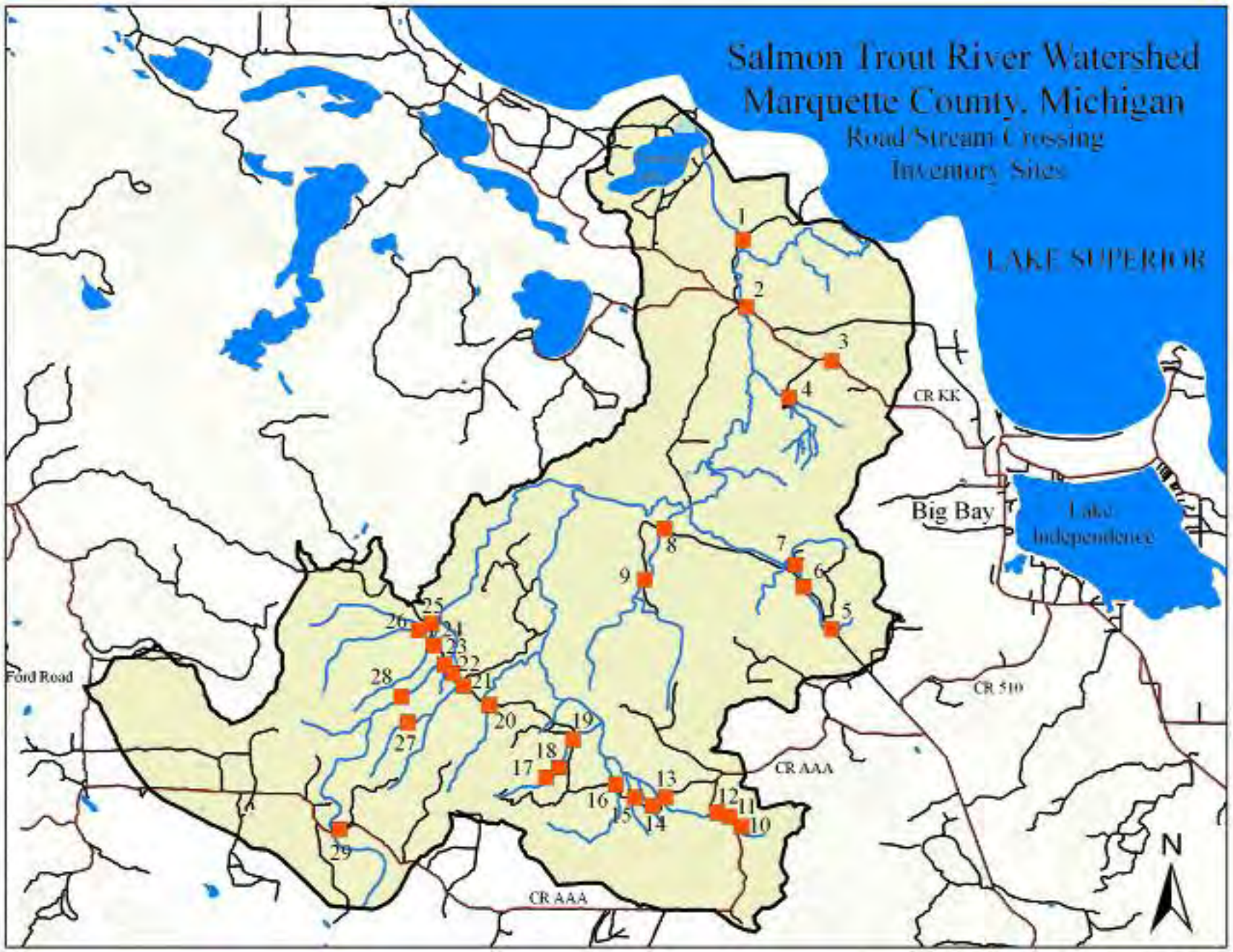
Crop related sources ☐ S ☐ M ☐ H	Land disposal ☐ S ☐ M ☐ H
Grazing related sources ☐ S ☐ M ☐ H	On-site wastewater systems ☐ S ☐ M ☐ H
Intensive animal feeding ☐ S ☐ M ☐ H operations	Silviculture (forestry NPS) ☐ S ☐ M ☐ H
Highway/road/bridge ☐ S ☐ M ☐ H maintenance and runoff (trans. NPS)	Resource extraction ☐ S ☐ M ☐ H (mining NPS)
Channelization ☐ S ☐ M ☐ H	Recreational/tourism ☐ S ☐ M ☐ H activities (general)
Dredging ☐ S ☐ M ☐ H	• Golf courses ☐ S ☐ M ☐ H
Removal of riparian veg. ☐ S ☐ M ☐ H	• Marinas/recr. boating ☐ S ☐ M ☐ H (water releases)
Bank and shoreline erosion/ ☐ S ☐ M ☐ H modification/destruction	• Marinas/recr. boating ☐ S ☐ M ☐ H (bank or shoreline erosion)
Flow regulation/ ☐ S ☐ M ☐ H modification (hydrology)	Debris in water ☐ S ☐ M ☐ H
Upstream impoundment ☐ S ☐ M ☐ H	Industrial point source ☐ S ☐ M ☐ H
Construction: Highway/road/ ☐ S ☐ M ☐ H bridge/culvert	Municipal point source ☐ S ☐ M ☐ H
Construction: Land ☐ S ☐ M ☐ H development	Natural sources ☐ S ☐ M ☐ H
Urban runoff (residential/ ☐ S ☐ M ☐ H urban NPS)	Source(s) unknown ☐ S ☐ M ☐ H

Comments:

No invert sampling was conducted as it is coaster spawning season. This site looks very good. There is no sand delta at the mouth of Murphy's creek anymore, and a very well define thalweg under the foot bridge. LWD is present.

2

APPENDIX B -
Road/Stream Crossing Inventory Data for the Salmon Trout River Watershed


Salmon Trout River Watershed
Marquette County, Michigan
Road/Stream Crossing
Inventory Sites
LAKE SUPERIOR
Big Bay
Lake Independence
CR KK
CR 510
CR AAA
CR AAA
Ford Road
N
1
2
3
4
5
6
7
8
9
10
11
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Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #1 Conway Creek at Private road
Location: T 52N R 28W Sec 36 (SW ¼ of NE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	25 feet	24 Inches	Plastic	No	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 7 feet
Width of span (upstream/downstream): 25 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	Level
South approach	50 Yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		St	N
	Northwest	N		St	N
South	Southeast	N		St	N
	Southwest	N		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #1 Conway Creek @ Private Road
T 52 N R 28 W Sec. 36 SW 1/4 of NE 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #2 Salmon Trout River @ County Rd K
T 51 N R 28 W Sec. 1 NW 1/4 of NE 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #2 Salmon Trout River at County Road KK
Location: T 51N R 28W Sec 1 (NW ¼ of NE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge	54 feet	20 feet	9 feet	wood

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 45 feet
Width of span (upstream/downstream): 20 feet

Road Surface Type:
Gravel:
Paved: X

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	¼ mile
South approach	¼ mile
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		St	N
	Northwest	N		St	N
South	Southeast	N		St	N
	Southwest	N		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06
There are no ditches adjacent to the bridge, but the north approach in the Club is a steep dirt road which contributes sediment to the road deck and ultimately, the river.

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #3 Sullivan Creek at County Road KK
Location: T 51N R 27W Sec 6 (SW ¼ of SE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	50 Feet	48 Inches	CMP	No	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 7-8 feet
Width of span (upstream/downstream): 50 feet

Road Surface Type:
Gravel:
Paved: X

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	1/4 mile
South approach	1/8 mile
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		St	N
	Northwest	N		St	N
South	Southeast	N		St	N
	Southwest	N		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06
Newer Culvert installed by the County Road Commission in 2001

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #3 Sullivan Creek @ County Road KK
T 51 N R 27 W Sec. 6 SW 1/4 of SE 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #4 Murphy's Creek @ Two Track
(Pine Mt. Road)
T 51 N R 27 W Sec. 7 SW 1/4 of NW 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #4 Murphy's Creek at Unnamed two track
Location: T 51N R 27W Sec 7 (SW ¼ of NW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	20 Feet	36 Inches	Plastic	No	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 5-6 feet
Width of span (upstream/downstream): 20 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	150-200 Yards
South approach	75 Yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	Y	150-200 Yards	St	N
	Northwest	Y	150-200 Yards	me	Y
South	Southeast	Y	75 Yards	St	N
	Southwest	Y	75 Yards	St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06
Newer Culvert installed in 2001, very steep north approach causing gravel to wash into the stream

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #5 Clear Creek At Blind 35
Location: T 51N R 27W Sec 30 (SE ¼ of NE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	24 Feet	12 Inches(?)	CMP	No	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): NA
Width of span (upstream/downstream): NA

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	Level
South approach	200 Yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		St	N
	Northwest	N		St	N
South	Southeast	N		St	N
	Southwest	N		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06
This crossing is shown on most maps, but no stream channel is present. Culvert is completely buried.

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #5 Clear Creek @ Blind 35 (1)
T 51 N R 27 W Sec. 30 SE 1/4 of NE 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #6 Clear Creek @ Blind 35 (2)
T 51 N R 27 W Sec. 19 NE 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #6 Clear Creek At Blind 35
Location: T 51N R 27W Sec 19 (NE ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	52 Feet	48 Inches	CMP	Yes	6 Inches
Culvert # 2	52 Feet	48 Inches	CMP	Yes	6 Inches
Culvert # 3	52 Feet	48 Inches	CMP	Yes	6 Inches

Type of Span:
Length of span (bank to bank): 15-22 Feet
Width of span (upstream/downstream): 52 Feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	¼ Mile
South approach	Level
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		St	N
	Northwest	N		St	N
South	Southeast	N		St	N
	Southwest	N		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06
Upstream side of these culverts are buried in sediment. The road side slopes are very steep

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #7 Clear Creek At Unnamed two track trail
Location: T 51N R 27W Sec 19 (NE ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 8-12 Feet
Width of span (upstream/downstream): 12 Feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	100 Feet
West approach	50 Feet

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	N		Me	Y
	Southeast	N		Me	Y
West	Northwest	N		Me	Y
	Southwest	N		Me	Y

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06
This crossings seems to be used by ATV and foot traffic only, but is definitely being used. Fresh ATV tracks where seen

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #7 Clear Creek @ unnamed two track trail
T 51 N R 27 W Sec. 19 NE 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #8 Snake Creek @ Blind 35
T 51 N R 28 W Sec. 23 NW 1/4 of NE 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #8 Snake Creek At Blind 35
Location: T 51N R 28W Sec 23 (NW ¼ of NE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge	23 Feet	19 Feet	7 Feet	Concrete

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 10-12 Feet
Width of span (upstream/downstream): 19 Feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	1/8 mile
West approach	1/4 mile

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	N		st	n
	Southeast	N		st	n
West	Northwest	Y	50 feet	st	n
	Southwest	Y	50 feet	st	n

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06
Very old concrete bridge, there has been some recent work to the approach ditches, lots of rip rap and no apparent erosion

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #9 Snake Creek At Unnamed two track
Location: T 51N R 28W Sec 23 (NE ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 7-8 Feet
Width of span (upstream/downstream): 18 Feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	200 Yards
West approach	60 Yards

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	Y	150 Feet	st	n
	Southeast	Y	50 Feet	st	n
West	Northwest	Y	25 feet	st	n
	Southwest	Y	100 feet	st	n

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06
Historic ATV ford, there was a temporary bridge for logging equipment installed in 2004 and removed in 2005, leaving behind lots of boulder/rip rap armoring and well armored approach ditches

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #9 Snake Creek @ Unnamed two track
T 51 N R 28 W Sec. 23 NE 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #10 East Branch @ Triple A Road (1)
T 50 N R 28 W Sec. 3 SW 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #10 East Branch of Salmon Trout River and County Road AAA
Location: T 50N R 28W Sec 3 (SW ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	38 feet	3 feet	Corr. steel	N	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 5 feet
Width of span (upstream/downstream): 36 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	100 yards
West approach	50 yards

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	N		ME	Y
	Southeast	N		ME	Y
West	Northwest	N		ME	Y
	Southwest	N		ME	Y

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Southern most East branch @ AAA crossing.

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #11 East Branch of Salmon Trout and County Road AAA
Location: T 50N R 28W Sec 3 (SW ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	36 feet	4 feet	Corr. steel	N	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 6 feet
Width of span (upstream/downstream): 36 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	200 yards
West approach	200 yards

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	N		ME	Y
	Southeast	N		ME	Y
West	Northwest	N		ME	Y
	Southwest	N		ME	Y

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Middle of the three AAA @ East branch sites. Sheer banks, short culverts.

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #11 East Branch @ Triple A Road (2)
T 50 N R 28 W Sec. 3 SW 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #12 East Branch @ Triple A Road (3)
T 50 N R 28 W Sec. 4 SE 1/4 of SE 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #12 East Branch of Salmon Trout and County Road AAA
Location: T 50N R 28W Sec 4 (SE ¼ of SE ¼)

Type of Crossing:

	Length	Width	Ht. Above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	36 feet	3 feet	Corr. steel	N	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 4 – 5 feet
Width of span (upstream/downstream): 36 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	100 yards
West approach	100 yards

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	N		ME	Y
	Southeast	N		ME	Y
West	Northwest	N		ME	Y
	Southwest	N		ME	Y

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Sheer banks, short culvert. Northern most AAA crossing of East branch. Upstream side is buried.

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #13 East Branch of Salmon Trout Creek and Northwestern Road
Location: T 50N R 28W Sec 4 (NW ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	21 feet	1 foot	Corr. steel	N	
Culvert # 2	21 feet	3 feet	Corr. steel	N	
Culvert # 3					

Type of Span:
Length of span (bank to bank): 6 feet
Width of span (upstream/downstream): 21 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	40 yards
West approach	100 yards

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	Y		ST	N
	Southeast	Y		ST	N
West	Northwest	Y		ST	N
	Southwest	Y		ST	N

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2006
Crossing #13 East Branch @ Northwestern Road
T 50 N R 28 W Sec. 4 NW 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #14 Tributary to East Branch
@ Northwestern Road
T 50 N R 28 W Sec. 4 NW 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #14 Tributary to the East Branch of Salmon Trout and Northwestern Road
Location: T 50N R 28W Sec 4 (NW ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	30 feet	2 feet	Corr. steel	Y	2 inches
Culvert # 2	22 feet	2 feet	Corr. steel	N	
Culvert # 3					

Type of Span:
Length of span (bank to bank): 6 – 8 feet
Width of span (upstream/downstream): 22 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	50 yards
West approach	100 yards

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	N		ST	N
	Southeast	N		ST	N
West	Northwest	N		ST	N
	Southwest	N		ST	N

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Britton's old camp, with a trout pond downstream of crossing.

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #15 Tributary to the East Branch of Salmon Trout Creek and Northwestern
Location: T 50N R 28W Sec 5 (NE ¼ of SE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	19 feet	1 foot	Corr. steel	N	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 4 – 6 feet
Width of span (upstream/downstream): 19 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	100 yards
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	N		ST	N
	Southeast	N		ST	N
West	Northwest	N		ST	N
	Southwest	N		ST	N

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Small perennial stream near the driveway to the late Dick Anderson's camp. Culvert ends are abutted with railroad ties, looks fairly sturdy.

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #15 Tributary to East Branch
@ Northwestern Road
T 50 N R 28 W Sec. 5 NE 1/4 of SE 1/4

Downstream Looking up
Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #16 Tributary to East Branch
@ Northwestern Road
T 50 N R 28 W Sec. 5 SW 1/4 of NE 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #16 Tributary to East Branch of Salmon Trout Creek and Northwestern Road
Location: T 50N R 28W Sec 5 (SW ¼ of NE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge	36 feet	16 feet	3 feet	Wood

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 5 – 6 feet
Width of span (upstream/downstream): 16 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	Y		ST	N
	Southeast	Y		ST	N
West	Northwest	Y		ST	N
	Southwest	Y		ST	N

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- New bridge was installed in 2001, replaced a failing dual culvert system.

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #17 Tributary to East Branch of Salmon Trout Creek and Unnamed Two Track Road
Location: T 50N R 28 W Sec 6 (SE ¼ of NE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	15 feet	2 feet	Corr. steel	N	
Culvert # 2	15 feet	2 feet	Corr. steel	Y	6 Inches
Culvert # 3					

Type of Span:
Length of span (bank to bank): 6-10 feet
Width of span (upstream/downstream): 15 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	100 yards
South approach	100 yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		ST	N
	Northwest	N		ST	N
South	Southeast	N		ST	N
	Southwest	N		ST	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Steep side slopes from the road down to the stream

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #17 Tributary to East Branch
@ Unnamed Road
T 50 N R 28 W Sec. 6 SE 1/4 of NE 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #18 Tributary to East Branch
@ Unnamed road
T 50 N R 28 W Sec. 6 NE 1/4 of NE 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #18 Tributary to East Branch of Salmon Trout and Unnamed Two Track Road
Location: T 50N R 28 W Sec 6 (NE ¼ of NE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	15 feet	2 feet	Corr. steel	N	
Culvert # 2	15 feet	2 feet	Corr. steel	N	
Culvert # 3					

Type of Span:
Length of span (bank to bank): 6 feet
Width of span (upstream/downstream): 15 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	50 yards
South approach	100 yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		ME	Y
	Northwest	N		ST	N
South	Southeast	N		ME	Y
	Southwest	N		ME	Y
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Private road and newer crossing, less than 10 years old, estimated.

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #19 Tributary to East Branch of the Salmon Trout River at Northwestern Road
Location: T 51N R 28W Sec 34 (SW ¼ of SE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge	30’	12’	5’	timbers

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 9-11 feet
Width of span (upstream/downstream): 12 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	300 feet
South approach	550 feet
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	Y	75-100’		N
	Northwest	Y	75-100’		N
South	Southeast	Y	75-100’		N
	Southwest	Y	75-100’		N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/20/05

- Clear span bridge installed in 2002 by CLSWP, replaced dual culverts system, both were perched.

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #19 Tributary to East Branch
@ Northwestern Road
T 51 N R 28 W Sec. 34 SW 1/4 of SE 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #20 Tributary to East Branch
@ Northwestern Road
T 51 N R 28 W Sec. 33 SE 1/4 of NW 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #20 Tributary to East Branch Salmon Trout River and Northwestern Road
Location: T 51N R 28W Sec 33 (SE ¼ of NW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge	20’	12.5’	4’	Wood beam

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 5-6 feet
Width of span (upstream/downstream): 12.5 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	80 yards
West approach	150 yards

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	N		St	N
	Southeast	N		St	N
West	Northwest	N		St	N
	Southwest	N		St	N

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #21 Tributary to Main Branch Salmon Trout River and Northwestern Road
Location: T 51N R 28W Sec 28 (SW ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	21 feet	3 feet	Steel	N	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 4 feet
Width of span (upstream/downstream): 21 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	200 yards
South approach	200 yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		St	N
	Northwest	N		St	N
South	Southeast	Y		St	N
	Southwest	N		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- First crossing NW of Dodge City near the Albright camp.

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #21 Tributary to Main Branch
@ Northwestern Road
T 51 N R 28 W Sec. 28 SW 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #22 Tributary to Main Branch
@ Unnamed two track
T 51 N R 28 W Sec. 28 SW 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #22 Tributary to Salmon Trout River and Unnamed two track
Location: T 51N R 28W Sec 28 (SW ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	30 feet	3 feet	Plastic	Y	6”
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 5-8 feet
Width of span (upstream/downstream): 30 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	150 feet
South approach	50 feet
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N			N
	Northwest	Y	50’	me	N
South	Southeast	Y	50’		N
	Southwest	Y	50’		N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Crossing 50’ down stream of crossing #X. Culvert was installed in 2001, and was not perched initially, but has become so over the years.

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #23 Salmon Trout River and Northwestern Road
Location: T 51N R 28W Sec 29 (SE ¼ of SE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge	30 feet	15 feet	3 feet	Wood

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 8-10 feet
Width of span (upstream/downstream): 15 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	100 yards
South approach	100 yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	Y		St	N
	Northwest	Y		St	N
South	Southeast	Y		St	N
	Southwest	Y		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05
Comments: Bridge installed in 2001, replaced a very old four culvert system. USGS gauge immediately downstream.

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #23 Salmon Trout River
@ Northwestern Road
T 51 N R 28 W Sec. 29 SE 1/4 of SE 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #24 Tributary to West Branch
@ Northwestern Road
T 51 N R 28 W Sec. 29 NW 1/4 of SE 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #24 Tributary to West Branch Salmon Trout River and Northwestern Road
Location: T 51N R 28W Sec 29 (NW ¼ of SE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	41 feet	10' W X 4.5'H	Aluminum Arch	N	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 10 feet
Width of span (upstream/downstream): 41 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	40 yards
South approach	80 yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	Y		St	N
	Northwest	Y		St	N
South	Southeast	Y		St	N
	Southwest	Y		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Beaver dams upstream.

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #25 West Branch Salmon Trout River and Northwestern Road
Location: T 51N R 28W Sec 29 (SW ¼ of NE ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge	15 feet	14 feet	2 feet	Wood

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 6 feet
Width of span (upstream/downstream): 14 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	80 yards
South approach	100 yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	Y		St	N
	Northwest	Y		St	N
South	Southeast	N		St	N
	Southwest	N		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05

- Sturdy timber bridge, with timber abutments.

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #25 West Branch @ Northwestern Road
T 51 N R 28 W Sec. 29 SW 1/4 of NE 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #26 Iron Creek @ Unnamed two track
T 51 N R 28 W Sec. 29 SE 1/4 of NW 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #26 Iron Creek at Unnamed two track
Location: T 51N R 28W Sec 29 (SE ¼ of NW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	20 feet	24 inches	CMP	Yes	6 inches
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 4-5 feet
Width of span (upstream/downstream): 20 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	Level
West approach	Level

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	N		St	n
	Southeast	N		St	n
West	Northwest	N		St	n
	Southwest	N		st	n

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06

- Low gradient stream, looks like the road washes over every spring

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #27 Tributary to Main Branch at Unnamed two track
Location: T 51N R 28W Sec 32 (NE ¼ of SW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	15 feet	Irregular	Hollow Log	Yes	24 inches
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 3-4 feet
Width of span (upstream/downstream): 15 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	100 Yards
South approach	100 Yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		St	N
	Northwest	N		St	N
South	Southeast	N		St	N
	Southwest	N		St	N
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 5/03/06

- Hollw log used as a culvert in an old logging trail. Water has undermined the log and flows under it. Very large beaver pond upstream and down of this road.

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #27 Tributary to Main Branch
@ Unnamed two track
T 51 N R 28 W Sec. 32 NE 1/4 of SW 1/4

Downstream Looking up

Upstream Looking Down

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #28 Salmon Trout River
@ Unnamed two track
T 51 N R 28 W Sec. 32 SE 1/4 of NW 1/4

Downstream Looking up

Upstream Looking Down

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: #28 Salmon Trout River and Two Track Road
Location: T 51N R 28W Sec 32 (SE ¼ of NW ¼)

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1					
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 8-10 feet
Width of span (upstream/downstream): 18 feet

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	60 yards
South approach	50 yards
East approach	
West approach	

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast	N		St	N
	Northwest	N		St	N
South	Southeast	N		Me	Y
	Southwest	N		Me	Y
East	Northeast				
	Southeast				
West	Northwest				
	Southwest				

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner

Date: 8/15/05

Central Lake Superior Watershed Partnership

Road Crossing Inventory

Site: # 29 Salmon Trout River @ Triple A Road
Location: T. 50N. R. 29W. Section 11 NW ¼ of NW ¼

Type of Crossing:

	Length	Width	Ht. above water	Deck material
Bridge				

	Length	Diameter	Type of culvert	Perched (y/n)	Ht. of perch
Culvert # 1	53’	4’ H x 5’ W	CMP elliptical	No	
Culvert # 2					
Culvert # 3					

Type of Span:
Length of span (bank to bank): 7’-8’
Width of span (upstream/downstream): 53’

Road Surface Type:
Gravel: X
Paved:

Road Approach Distances: Distance from water crossing to top of road approach.

North approach	
South approach	
East approach	0.15 mile
West approach	0.22 mile

Approaches to Crossing:

		Ditches (y/n)	Ditch length	Erosion	Erosion reaching river (y/n)
North	Northeast				
	Northwest				
South	Southeast				
	Southwest				
East	Northeast	Y	140’		
	Southeast	Y	200’		
West	Northwest	Y	580’	me	No
	Southwest	Y	250’	me	No

me = minor erosion
ge = gross erosion
st = stable

Analysis by: Joe Wagner Date: 8/15/05
New crossing installed 4/05, excessive use of rip rap.

Salmon Trout River Watershed
Road Crossing Inventory, Summer 2005
Crossing #29 Salmon Trout River
@ Triple A Road
T 51 N R 29 W Sec. 11 NW 1/4 of NW 1/4

Downstream Looking up

Upstream Looking Down