

STAKEHOLDER NEWSLETTER

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LITTLE ROCK CREEK IMPAIRED WATERS STRESSOR IDENTIFICATION REPORT

The Benton Soil and Water Conservation District (SWCD) is conducting a Total Maximum Daily Load (TMDL) project on Little Rock Creek. The Little Rock Creek watershed is located within Morrison and Benton Counties. The watershed is 67,650 acres.



Above: Adult brown trout

Little Rock Creek is a DNR designated trout stream for Class 2A Brook and Brown trout. Little Rock Creek was listed on the State of Minnesota's 303(d) List of Impaired Waters in 2002 for lack of coldwater fish assemblage. Few trout were captured in a 1999 Minnesota Pollution Control Agency fish survey; there was also an absence of sculpin and burbot.

Before Total Maximum Daily Loads (TMDL) can be developed for Little Rock Creek, a **stressor identification** analysis is necessary to determine the specific physical and/or chemical factors that are causing the biological impairment. This analysis identifies stressors in the Little Rock Creek watershed using a series of logical steps based on the United States Environmental Protection Agency (USEPA) Stressor Identification Guidance Document and the Minnesota Pollution Control Agency Biota TMDL Protocols and Submittal Requirements document. Impairments



were evaluated, candidate causes of impairment were described, relationships between causes, stressors, and biotic conditions were assessed, and probable stressors were identified based on strength of evidence from all available data. This newsletter outlines the findings of the Little Rock Creek Stressor Identification Report. The report is posted at the Benton SWCD website:

<http://www.soilandwater.org>

WHAT IS A STAKEHOLDER?

A stakeholder is a person (or group) who lives, works, or plays in a watershed and is responsible for making or implementing a management action, who will be affected by the action, or who can aid or prevent its implementation.



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LITTLE ROCK CREEK FISH COMMUNITY

Little Rock Creek is lacking a diverse coldwater fish community. A popular coldwater species in the creek is the brown trout. The creek has supported a wild brown trout population since 1908, when 200,000 fry were introduced into Little Rock Lake. The population naturally reproduced based on the fact that brown trout were present in routine DNR stream assessments through the late 1980's. A DNR population assessment conducted in 1992, however, failed to document the presence of brown trout suggesting that population may have become critically low during the drought years of the late 1980's and early 1990's.

In an effort to reestablish a self-sustaining brown trout population in Little Rock Creek, wild brown trout were stocked in the springs of 1995, 1996 and 1997. Adult and yearling brown trout were stocked each year from 2004 through 2008. The DNR has not observed natural reproduction of brown trout since 2001.

Brook trout were stocked annually in the creek between 1962 and 1971, which provided angling opportunities for large size fish although no natural reproduction was documented. Brook trout were stocked each year from 2001 to 2008. The DNR plans to discontinue brook trout stocking in Little Rock Creek.

Trout aren't the only cool/cold water species of concern in the creek. Other sensitive cool/cold water species such as burbot and hornyhead chub have not been seen since the early 1990's. Logperch and longnose dace are currently present in low numbers. Sculpins have not been recorded in contemporary surveys but are present in other streams in the region.

The impairment is also supported by the fact that recent surveys reveal that the fish community is dominated by tolerant warm water species, such as blacknose dace, creek chub, white sucker, central mudminnow, and bigmouth shiner. Very few obligate cold or cool water species were captured, including brook trout, brown trout, longnose dace, and brook stickleback. The presence and increased abundance of sensitive cool/cold water species would be good indicators of improved water quality.



Above: Hornyhead chub



Above: Logperch



Above: Burbot

2008 MPCA FISH SURVEY SUMMARY

<u>Species</u>	<u>Number</u>	<u>Percent</u>
johnny darter	1054	39
blacknose dace	632	23
creek chub	237	9
white sucker	173	6
central mudminnow	134	5
bigmouth shiner	129	5
yellow perch	118	4
northern pike	92	3
common shiner	41	2
central stoneroller	24	0.88
longnose dace	23	0.85
bluntnose minnow	16	0.59
brown trout	8	0.29
black crappie	7	0.26
largemouth bass	7	0.26
pumpkinseed sunfish	7	0.26
black bullhead	4	0.15
logperch	4	0.15
brook stickleback	2	0.07
brook trout	1	0.04
spotfin shiner	1	0.04

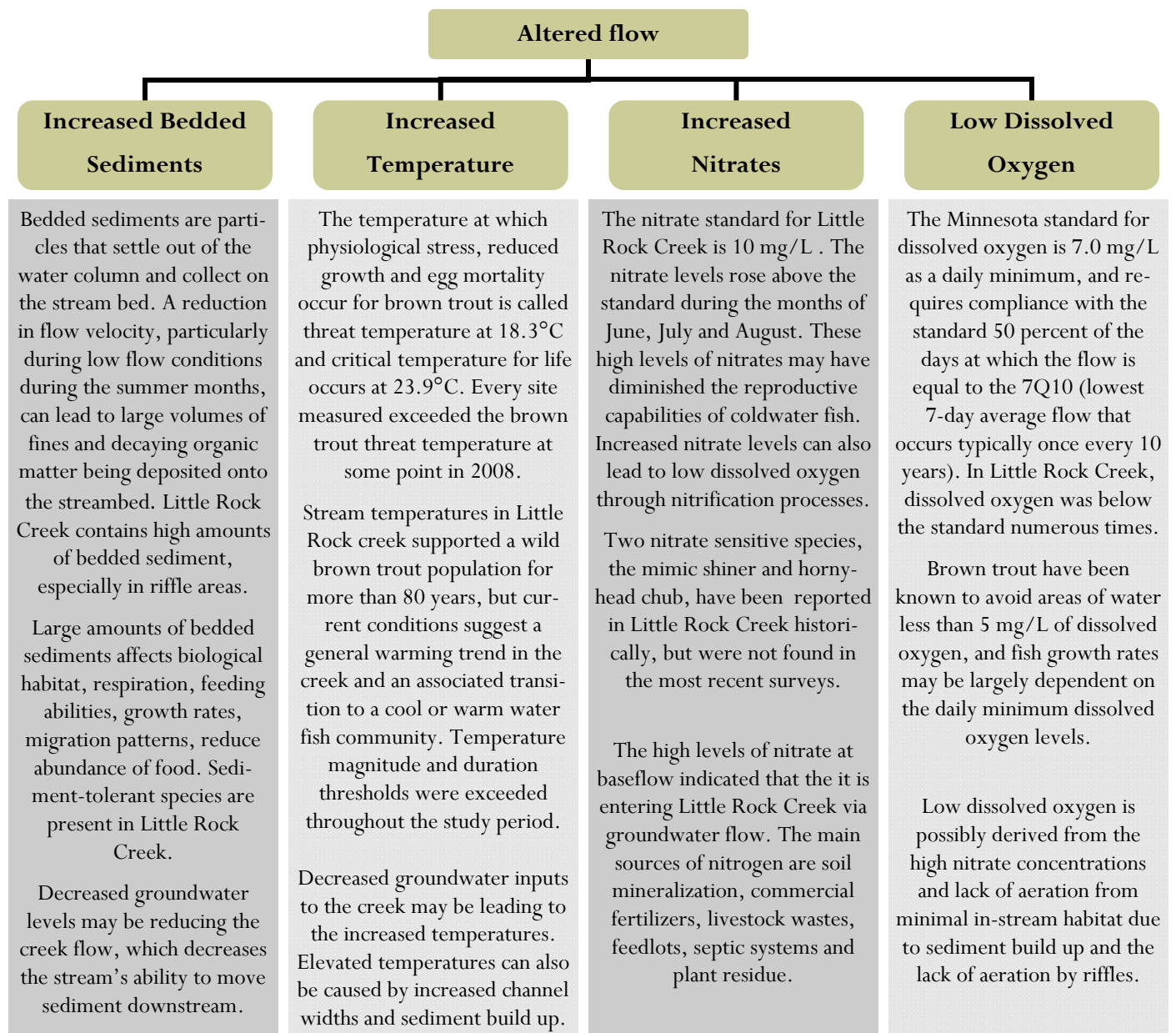
LITTLE ROCK CREEK IMPAIRMENT

The federal Clean Water Act (CWA) requires states to adopt water-quality standards to protect waters from pollution. These standards define how much of a pollutant can be in the water and still allow it to meet designated use(s). "Impaired waters" are those waters that do not meet water-quality standards for one or more pollutants, thus they are "impaired" for their designated use(s) (MPCA). "Designated uses" are the uses that water resources and their associated aquatic communities provide. Little Rock Creek is classified for 3 types of designated uses, including Class 2A: Aquatic Life and Recreation. 2A Waters will be such as to permit the propagation and maintenance of a healthy community of cold water sport or commercial fish and associated aquatic life. Due to the lack of coldwater fish species, Little Rock Creek is not meeting its designed use for Class 2A.

PROBABLE CAUSES FOR THE IMPAIRMENT

Based on the evidence available, it is probable that altered flow, temperature, sediment, dissolved oxygen, and nitrates collectively may be causing the biological impairment in Little Rock Creek. Altered flow is likely a dominant stressor because it serves as a step in the causal pathways of other stressors including bedded sediment and temperature.

Flow alteration in this study refers to the decrease in groundwater flow. One hypothesis for impaired biota in Little Rock Creek is that increased pumping of groundwater near the creek has intercepted water that would otherwise have discharged into the creek. All relevant hydrologic datasets were analyzed for patterns or trends that would explain the change in the condition of the creek. Trends in precipitation, pumping for irrigation, elevation of water in the local aquifer, and streamflow were investigated. Precipitation is increasing in Minnesota (State Climatology Center). Pumping rates from 2000 to 2007 increased by 162.31% in the watershed. The data also shows that stream flow declines dramatically during the pumping season (June-August). Groundwater observation wells in the area show a decline in groundwater surface levels in the past six years.



LITTLE ROCK CREEK TMDL
PROJECT
COORDINATED BY:



14 2nd Avenue West
Foley, MN 56329

Phone: 320-968-5300 ext. 3

WWW.SOILANDWATER.ORG

TECHNICAL TEAM PARTNERS:

BOARD OF WATER AND SOIL RESOURCES
MINNESOTA POLLUTION CONTROL AGENCY
MINNESOTA DNR FISHERIES & WATERS
NATURAL RESOURCES CONSERVATION SERVICE
US FISH AND WILDLIFE SERVICE
NATURAL RESOURCES RESEARCH INSTITUTE
MINNESOTA DEPARTMENT OF AGRICULTURE
MINNESOTA DEPARTMENT OF HEALTH
MORRISON COUNTY AND SWCD
US GEOLOGICAL SURVEY

LITTLE ROCK CREEK TMDL—PHASE 3

Phase 3 of the Little Rock Creek project will consist of TMDL development for temperature, bedded sediment, nitrates, and dissolved oxygen. This will be accomplished by calculating the total pollutant load with reference to flow as the source of impairment. An implementation plan will also be developed to address these stressors and their sources. Phase 3 is anticipated to begin fall 2009.

NEWS

Little Rock Lake Total Maximum Daily Load Project update:

- Water quality data collected in 2008
- Data analyzed in 2009
- Lake models to be completed by Fall 2009

The Benton SWCD offers landowners technical and financial assistance for conservation projects. Call (320) 968-5300 to schedule an appointment.

Check out the Benton SWCD website for updates:
www.soilandwater.org



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