



Minnesota
Pollution
Control
Agency

Byron Township Stop
LCCMR Tour – July 17, 2013
Kevin Stroom, Watershed Ecologist, MPCA – Brainerd



Reasons for concern regarding land conversion from forest to agriculture:

1) Nutrients

- Much of the nitrate that infiltrates into groundwater ends up in streams.
- Elevated nutrients (nitrogen and phosphorus) lead to eutrophication (excess plant/algae growth), which leads to lowered dissolved oxygen in the water.
- Streams in western Cass County have very low natural nitrate levels, but phosphorus is elevated due to natural landscape factors (extensive riparian peat soils). Study is occurring in the vicinity of Byron Township (Tower and Swan Creeks). Phosphorus is limiting in many of these streams, so any addition of nitrate will result in some level of eutrophication. An important protection strategy will be to prevent nitrogen inputs.

Local example: Straight River near Park Rapids (high recreational value) – a TMDL study for dissolved oxygen is underway. Nitrate levels are much higher than typical for the Crow Wing watershed. Irrigated agriculture for potatoes and corn is prevalent in the Straight River watershed. Algal abundance appears to be above normal, and may be responsible for the oxygen levels not meeting the Minnesota standard.

Other current examples of nitrate transport to streams via groundwater being addressed by MPCA: Little Rock Creek, Benton & Morrison Counties, numerous locations in the Whitewater River Watershed (SE MN).

2) Flow alteration

Many aspects of biological habitat can be changed when flows are altered - water velocity, water temperature, channel dimensions and physical streambed features.

Altered habitat = altered biological communities ≠ Clean Water Act goal of biological integrity

Crow Wing Watershed streams receive significant groundwater inputs due to the high water table in the area and are thus at risk if groundwater levels are altered. MPCA investigation of the Little Rock Creek situation has shown that surficial groundwater, which feeds the creek, is decreasing. Groundwater extraction for irrigation has increased rapidly in that watershed in recent years. A TMDL study was completed in 2012 for the creek.

Available soon (<http://www.pca.state.mn.us/index.php/water/water-types-and-programs/watersheds/crow-wing-river.html#restoration-and-protection>)

Crow Wing River Watershed Monitoring and Assessment Report - in final review

Crow Wing River Watershed Stressor ID Report - target date early fall

New Report, USGS – July 2013

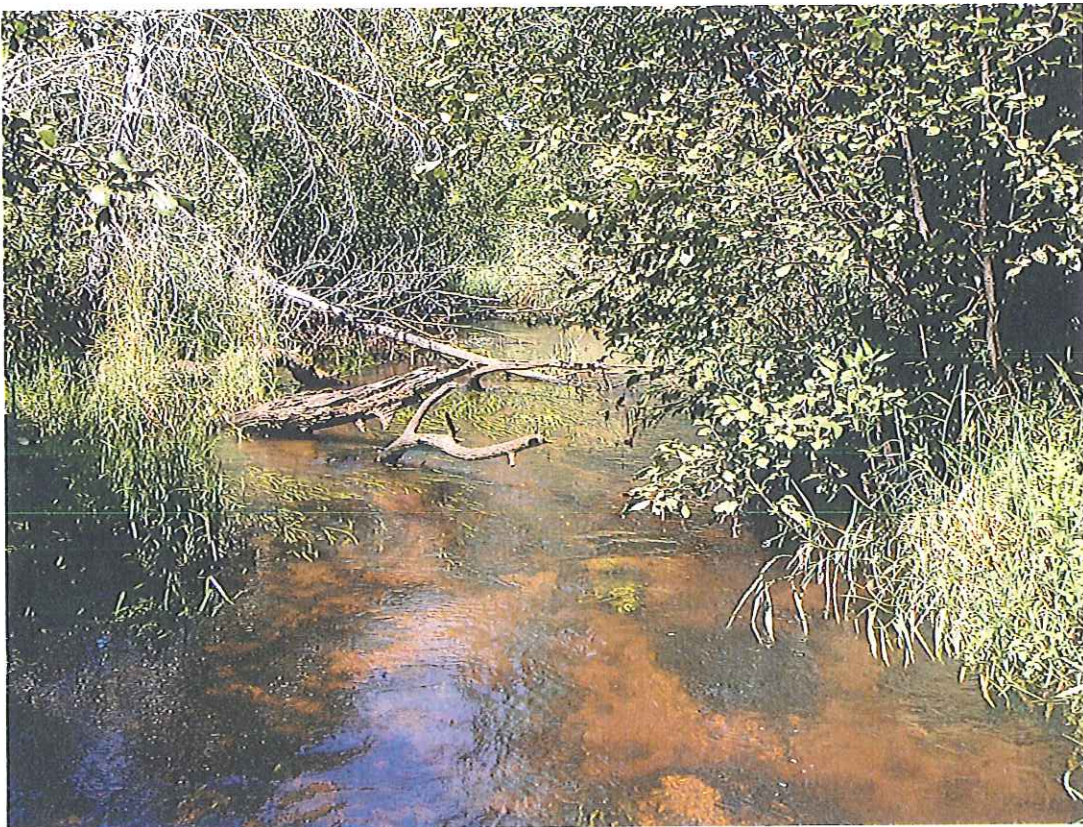
A new USGS report describes how the health of our Nation's streams is being degraded by streamflow modifications and elevated levels of nutrients and pesticides. USGS News Release, July 11, 2013.

(OVER)

Carlisle, D.M., Meador, M.R., Short, T.M., Tate, C.M., Gurtz, M.E., Bryant, W.L., Falcone, J.A., and Woodside, M.D., 2013, **The quality of our Nation's waters—Ecological health in the Nation's streams, 1993–2005: U.S. Geological Survey Circular 1391**, 120 p., <http://pubs.usgs.gov/circ/1391/>.

“Reduced stream health is associated with manmade modifications to the physical and chemical properties of streams, which are a consequence of land and water management. Maintenance of stream health requires that physical and chemical properties of streams remain within the bounds of natural variation. When manmade disturbances push these characteristics beyond natural ranges, such as might occur from increased fluctuation in streamflows or excess nutrients, vulnerable aquatic species are eliminated—ultimately reducing stream health.”

USGS, 2013



Swan Creek, Byron Township, 2.25 miles southwest of where you are standing. MPCA's biological monitoring results from 2010 for both fish and invertebrate communities were excellent here. The creek is a tributary of the Crow Wing River.