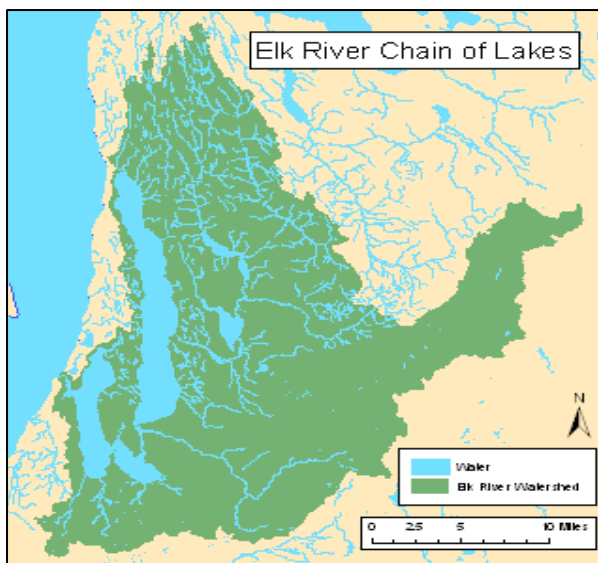


# **CUSTER TOWNSHIP** **WATER QUALITY ACTION PLAN**

## **Elk-River-Chain-of-Lakes Gaps Analysis Project**

The Watershed Center Grand Traverse Bay  
Tip of the Mitt Watershed Council  
Michigan Department of Natural Resources and Environment

February 2011



### **Purpose**

The Grand Traverse Bay watershed spans almost 1000 square miles, including major parts of Antrim, Grand Traverse, Kalkaska, and Leelanau counties. Custer Township sits on the Antrim-Kalkaska county line between Helena and Mancelona Townships. All surface waters within Custer Township flow into the Elk-River-Chain-of-Lakes (ERCOL) subwatershed. Protecting these water resources is important to the quality of life of the residents and the economic vitality of the region.

While the soils in Antrim County are diverse, most are sandy and subject to erosion. Emmet-Montcalm soils are found in 35 percent of the county. Their upper most layers are sandy loams whose uses, according to the soil survey, are limited by erosion, droughtiness and steepness. Kalkaska-Montcalm soils are found in 30 percent of the county. Their upper most layers are sands and loamy sands. Kalkaska-East Lake – Karlin soils are found in 20 percent of the county, and their top layers consist of sand and loamy sand.

Sandy soils drain well and can filter water effectively. However, they are also highly erodible and low in nutrients; once disturbed, they easily erode into our surface water. In addition, excessive levels of nutrients and other pollutants are easily passed through to the near-surface groundwater that feeds our lakes and streams. In some cases, this excessive pollution passes into our groundwater aquifers, contaminating our drinking water.

The ERCOL is a unique series of 14 interconnected lakes and rivers in Antrim and Kalkaska counties, emptying into East Grand Traverse Bay through the Elk River in Elk Rapids. At 500 square miles, the ERCOL subwatershed is the largest tributary to Grand

Traverse Bay and provides about 60 percent of the surface flow to Grand Traverse Bay. The ERCOL watershed area has more than 200 streams, with 138 miles as designated trout streams. More than 10 percent is covered by water. From the uppermost lake in the chain, the waters flow 55 miles and drop 40 feet in elevation on their way to the bay. The Northwest Michigan Council of Governments (NWMCOG) developed a management plan for the ERCOL watershed in 1989, which the Conservation Resource Alliance updated in July 2001. This plan was then incorporated and expanded in the Grand Traverse Bay Watershed Protection Plan written by the Watershed Center Grand Traverse Bay and approved by the Michigan Department of Natural Resources and Environment and the US Environmental Protection Agency in 2005.

Sediments – including sand – are the number one surface water pollutant in the Grand Traverse Bay watershed, as set out in the Watershed Protection Plan. Nutrients, primarily nitrogen and phosphorus, are ranked as the second pollutant of concern throughout the watershed. Sediments and sand smother the habitat that aquatic organisms need to survive and reproduce. The sediments and sand enter our surface waters through stormwater that washes from roads, parking lots, and driveways carrying sediments and sand, as well as nutrients and other forms of pollution along with it.

As a result, one of the best ways for local governments in the Elk-River-Chain-of-Lakes watershed to address water quality protection is to consider how they are managing stormwater in their communities. In this context, protecting water quality is directly related to reducing impervious surfaces and protecting natural areas and natural vegetation. Through a grant from the Michigan Department of Natural Resources and Environment, the Watershed Center Grand Traverse Bay has partnered with Tip of the Mitt Watershed Council to review the regulatory framework in place throughout the ERCOL subwatershed, an analysis that Tip of the Mitt Watershed Council is doing as part of a larger and more detailed regional review.

## **Process**

For the purposes of this project and the emphasis on stormwater management, the Watershed Center staff has focused on three topics:

- Roads and parking lots
- Lot design and development, and
- Protection of natural features.

The roads and parking lot discussion addresses management of most of the impervious surfaces found in a community. The lot development and design discussion considers open space ordinances, cluster ordinances, site plan review, on-site stormwater management, and septic system maintenance. The discussion of protection of natural features focuses on retention of native vegetation generally and around water resources specifically, tree conservation, and management of land clearing.

## **Water Resources in Custer Township**

Within Custer Township lies Lake of the Woods, along with several smaller lakes throughout the area. Several streams in the township also flow into the Grass River which connects Clam Lake and Lake Bellaire which also borders the township's North-Western corner.

## **Suggested Actions for Consideration in Custer Township**

The discussion below provides more detail regarding the three topic areas, as well as suggested actions. In general, the more a local government can do to reduce impervious surfaces and increase the retention or restoration of native vegetation in riparian areas and in open spaces, the better for water quality. The recommendations and targets were based on the Better Site Design resources of the Center for Watershed Protection. The list of *Additional Resources* that accompanies this plan provides links to sample ordinances and information to support implementation of the suggested actions. Finally, we are including a copy of *A Natural Solution*, a guide to low-impact development methods to manage stormwater. Please keep in mind that the following suggestions are for language within a zoning ordinance which should be written and maintained by the Township.

### Roads and Parking Lots

The large majority of paved areas within a community are roads or parking lots. Most road design is significantly influenced by the county road commissions and local fire departments. Townships have the discretion to address the design of private roads. Limiting parking space numbers and space size can reduce paved areas. These savings may seem insignificant on a particular site, but across the village the reductions in paved area could be substantial. The reduction of parking spaces from 10 feet by 20 feet to 9 feet by 18 feet results in a 20 percent savings in impervious surface.

1. Design residential streets for the minimum required pavement width needed to support travel lanes; on-street parking; and emergency, maintenance, and service-vehicle access. These widths should be based on traffic volume.

TARGET: For roads with less than 500 daily trips, consider widths between 18 and 22 feet. See *A Natural Solution* and Sample Private Road Ordinance.

2. Reduce the total length of new residential streets by examining alternative street layouts to determine the best option for increasing the number of homes per unit length.

TARGET: Incentivize shorter new roads.

3. Minimize the number of residential cul-de-sacs and incorporate landscaped areas to reduce impervious cover. The radius of cul-de-sacs should be the minimum required to

accommodate emergency and maintenance vehicles. Allow island to be vegetated and no curbing. Alternative turnarounds such as hammerheads should be considered.

TARGET: Minimize cul-de-sac radius; allow island without curbing and native vegetation to act as bioretention/stormwater treatment. See *A Natural Solution* and DEQ Best Management Practices (BMPs) for catch basin, infiltration basin, extended detention basin, sediment basin.

4. Where density, topography, soils, and slope permit, vegetated (not just turf) open channels should be used in the street right-of-way to convey and treat stormwater runoff. Minimize the size of the right-of-way.

TARGET: No curbing along roads to allow natural vegetation to absorb stormwater. Consider natural solutions such as open swales where curbing might be considered. See *A Natural Solution* and Sample Private Road Ordinance.

5. The required parking ratio governing a particular land use or activity should be enforced as a maximum to reduce excess parking space construction.

TARGET: Maximum of 3 spaces or less per 1000 sq. ft. office space, 4.5 spaces or less per 1000 sq. ft. of shopping mall.

6. Reduce the overall imperviousness associated with parking lots by providing compact car spaces, minimizing stall dimensions, incorporating efficient parking lanes, and using pervious materials in spillover parking areas.

TARGET: Parking stall width of 9 feet, length of 18 feet.

TARGET: Incentivize use of pervious surface for spillover parking (i.e. grass area). See *A Natural Solution*, DEQ BMPs for porous asphalt pavement, modular pavement, and Sample Off-Street Parking Ordinance.

7. Wherever possible, provide stormwater treatment for parking lot runoff using bioretention areas, filter strips and/or other practices that can be integrated into required landscaping areas and traffic islands.

TARGET: No curbing in parking areas; require landscaping with native vegetation to help manage stormwater. See *A Natural Solution*, Sample Off-Street Parking Ordinance, and BMPs for parking lot storage, catch basin, infiltration basin, extended detention basin, sediment basin.

### Lot Design and Development

Lot design and general development provisions in zoning ordinances provide great opportunities to encourage alternatives to and reductions of impervious surfaces, such as shared driveways. Ordinances also can be crafted to address the overall

development design to benefit water quality, such as providing incentives to protect natural vegetation throughout the development site.

1. Allow and encourage open space or cluster development that incorporates smaller lot sizes to minimize total impervious area, conserve natural areas and native vegetation, and promote watershed protection.

TARGET: Provide open space/cluster development that minimizes total impervious surface as by-right development. See *A Natural Solution* and Sample Open Space/Cluster Development Ordinances.

TARGET: Ensure proper management of open space features through enforceable management agreements or through management by third party (i.e. conservation organization).

2. In denser parts of the community such as villages, consider relaxing side yard setbacks and allow narrower frontages to reduce new road lengths and relaxing front setback requirements to minimize driveway lengths.

TARGET: Encourage or incentivize reduction of impervious surface.

3. Reduce overall lot imperviousness by promoting alternative driveway surfaces and designs and shared driveways that connect two or more homes together.

TARGET: Allow and encourage paved two-track driveway, porous pavement, other surfaces. See *A Natural Solution* and BMPs for porous asphalt pavement, modular pavement.

TARGET: Provide a maximum driveway width to reduce impervious surface (i.e. 9 feet for one lane, 18 feet for two lane).

TARGET: Incentivize shared driveways.

4. Direct rooftop runoff to pervious areas such as yards, open channels or vegetated areas and avoid routing rooftop runoff to the roadway or other impervious surfaces. See *A Natural Solution*.

5. Educate residents about proper septic system management and encourage residents to maintain septic systems on a regular basis.

TARGET: For a household of 4 people with a 1000 gallon tank, the septic system should be pumped every 2 to 3 years. See Sample Septic System Ordinance.

## Protection of Natural Features

Protecting natural features throughout the watershed helps to trap sediments and treat stormwater by using nutrients in the stormwater to grow. Native vegetation in riparian areas also helps prevent erosion and protect wildlife habitat. In addition, the soils on sites that have not been cleared or graded remain capable of infiltrating larger amounts of stormwater.

1. Create a naturally vegetated buffer system along all perennial streams that also encompasses critical environmental features such as the 100-year floodplain, steep slopes, and freshwater wetlands.

**TARGET:** Adopt a buffer ordinance that has a minimum buffer width between 50 and 75 feet of natural vegetation from all water resources. See *A Natural Solution*, Sample Riparian Buffer Ordinances, and BMP for buffer/filter strips.

2. The riparian stream buffer should be preserved or restored with native vegetation that can be maintained throughout the plan review, delineation, construction, and occupancy stages of development.

**TARGET:** Adopt site plan review and site development ordinance language that protects natural buffer during the development process. See *A Natural Solution* and Sample Site Plan Review Ordinances.

3. Clearing and grading of forests and native vegetation at a site should be limited to the minimum amount needed to build lots, allow access, and provide fire protection. A fixed portion of any community open space should be managed as protected green space in a consolidated manner.

**TARGET:** Outline clearing areas during site plan review process; monitor site development. See Sample Site Plan Review Ordinances and BMPs on grading and clearing.

4. Conserve trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native plants. Wherever practical, manage community open space, street rights-of-way, parking lot islands, and other landscaped areas to promote natural vegetation.

**TARGET:** Incentivize protection and conservation of trees and tree canopy cover on development sites and on shorelines. See Sample Site Plan Review Ordinances and BMP on tree protection.

## **Next Steps**

Custer Township sits on the south end of the Elk-River-Chain-of-Lakes subwatershed. Specific work on the recommendations set out above is at the discretion

of the Township and will be governed by what the local officials and local residents view as priorities for the community. The list of additional resources accompanying the action plan is designed to support the Township's consideration of implementation.

- *A Natural Solution*
- *Additional Resources* (Internet resources, including best management practices; Center for Watershed Protection resources; *Filling the Gaps*, a Michigan Department Natural Resources and Environment document with sample ordinances; and sample ordinances from within the Grand Traverse Bay watershed and other communities in Michigan.

The Watershed Center will assist as much as possible with work on these recommendations. The DNRE grant that is supporting this work includes time for Watershed Center staff to work with the township on any of these recommendations through June of 2011. We look forward to supporting your work to protect water quality.