
Chapter Seven: Goals, Objectives and Recommendations

Goals and Objectives

At the December 5, 2002 meeting of the Cheboygan River/Lower Black River Watershed Initiative steering committee a discussion of possible goals for the watershed was held, and a list of watershed goals was drafted. The goals are intended to enhance, improve, and protect the quality of the watershed, and to ensure the waters meet all seven of the state mandated designated uses and the desired uses proposed by the community.

On March 5, 2003 this list of goals was posted and reviewed by committee members. A few last minute changes were made to the list before voting took place.

A simple voting method was used. Each committee member present was given four "sticky dots". Members were asked to attach the dots to the goals on the posted list that they felt were most important. Votes were tallied, and only goals that received votes were included in the final list. Goals were prioritized according to the number of votes each received. The following table shows the results of this voting process.

GOAL	VOTES RECEIVED	PRIORITY NUMBER
Reduce the amount of stormwater runoff to the Cheboygan River.	9	#1
Provide for the protection of the watershed through adoption and enforcement of Land Use policies and conservation practices.	9	#1
Reduce the amounts of nutrients entering rivers and lakes of the watershed.	8	#2
Provide for the long term protection of the watershed by addressing Land Use issues.	8	#2
Involve and educate the public on actions they can take to reduce nonpoint source pollution.	5	#3
Reduce the amount of erosion and sedimentation within the watershed.	4	#4
Restore aquatic habitat in the watershed where impairment is suspected.	1	#5

The steering committee also selected the following mission statement for the watershed at the March 5 meeting:

"The mission of the Cheboygan River/Lower Black River Watershed Initiative is to Ensure high water quality and provide the protection of wildlife by reducing amounts of nutrients, sediments, and toxic pollutants entering the River system."

Table 24: Watershed Goals And Objectives

GOAL: Reduce the amount of stormwater runoff to the Cheboygan River.
Objectives:
Implement stormwater BMPs for drains discharging directly to the Cheboygan River.
Ensure new development does not increase amount of stormwater runoff to the Cheboygan River.
GOAL: Provide for the protection of the watershed through adoption/enforcement of land use policies and conservation practices.
Objectives:
Improve local land use planning and zoning standards.
Develop model ordinances and language for adoption into existing master plans and zoning that ordinances should address proper stormwater management, set back provisions, greenbelts, site plan review requirements and other water quality protection measures.
Permanently protect identified sensitive areas through conservation easements, purchase of development rights, and land purchases.
Develop a mechanism for improved enforcement of "no wake" laws.
Sponsor workshops and training sessions to increase local enforcement of regulations.
GOAL: Reduce the amounts of nutrients entering rivers and lakes of the watershed.
Objectives
Install corrective measures to reduce runoff at agricultural sites of concern.
Reestablish greenbelts/conservation buffers at identified sites in critical areas.
Promote the use of structural (retention basins) and nonstructural measures (stormwater ordinances) for water resource protection.
Implement a Drain Stenciling Program and involve the public in the stenciling process.
Reduce, treat, and/or eliminate existing stormwater-associated pollution entering the watershed.
Conduct water quality testing to establish a baseline assessment of the conditions of the watershed.
Develop and implement stormwater BMPs for identified stormwater drains and drainage ditches
GOAL: Provide for the long-term protection of the watershed by addressing Land Use issues.
Objectives
Protect areas that are significant to aquatic resources through a voluntary land protection program.
GOAL: Involve and educate the public on actions they can take to reduce nonpoint source pollution.
Objectives
Provide more information to the public regarding watershed management.
Expand media coverage of the planning process to encourage more public and local agency participation.
Develop and implement a school education program; including a water-sampling program.
Conduct tours of a model stormwater site and hold workshops for developers, contractors, local governments and their personnel.
Develop water quality information packets for distribution to waterfront property owners.
Develop a wetland protection program focusing on citizen involvement and long term protection efforts.
Develop educational tools for the citizens of the watershed to reduce sediment, nutrient and pesticide contributions from lawn care and wastewater practices, and initiate a landowner education program.
GOAL: Reduce the amount of erosion and sedimentation within the watershed.
Objectives
Implement BMPs at road/stream crossing problem sites.
Implement BMPs at streambank erosion problem sites.
Host soil erosion workshop for local excavators, developers, etc.
Implement BMPs at shoreline erosion problem sites.
Work with ag. producers to reduce streambank erosion caused by livestock.
Implement BMPs at recreational access sites.
Restore riparian vegetation in watershed critical areas.
GOAL: Restore aquatic habitat in the watershed where impairment is suspected.
Objectives
Increase amount of woody debris at suitable sites.
Conduct yearly river/lake cleanups.

Recommendations

Even though the Cheboygan River/Lower Black River Watershed currently exhibits high water quality, both remedial and proactive measures are necessary to provide for the protection and enhancement of the river system.

Re-mediation of identified areas of degradation should include streambank erosion control, road/stream crossing upgrades, stormwater controls and installation of BMP's at agriculture areas of concern.

In order to provide for the long-term protection of the Cheboygan River/Lower Black River system, proactive measures need to be implemented. A proactive approach to watershed management includes such measures as information and education programs, land use controls, zoning ordinances, septic maintenance programs and establishment of greenbelts.

Based on inventory results, the Cheboygan River/Lower Black River Watershed steering committee developed the following strategies for reduction of nonpoint sources of pollutants in the river system. The recommendations utilize a combination of both reactive and proactive measures. Each recommendation integrates Best Management Practices (BMPs), information and education strategies, partnerships and intergovernmental coordination. Each task targets a specific objective of the plan. Responsible parties, appropriate BMPs, milestones, a timeline, estimated costs and evaluation methods are outlined below.

Order of implementation of the recommendations will be based on steering committee input, and in many cases the order will be determined by available funds. Considering sediment and nutrients ranked as the highest pollutants of concern, strategies aimed at reducing these nonpoint pollutants will be given higher priority. When installing structural BMP's, the sites ranked most severe will be considered first. **Table 25** indicates the cost of implementation for each inventory, as well as the total for the entire implementation project.

Table 25: Costs of Project Implementation	
Streambank Protection Projects	\$56,000
Road/stream Crossing Treatments	\$148,000
Agricultural Treatments	\$1,270,000
Shoreline Protection Projects	\$17,500
Stormwater Treatment Projects	\$2,538,000
General Education Projects	\$136,000
Total Costs of Implementation	\$4,165,500

Streambank Protection Recommendations

Erosion of streambanks and lake shores can result in sedimentation of lakes and rivers. This can lead to a degradation of water quality and to the impairment of designated uses, particularly uses for wildlife/aquatic habitat and navigation, within the watershed. Streambank erosion can occur in several ways such as foot traffic by humans and

wildlife, boat and canoe access, loss of vegetation to anchor streambanks, among others. **Table 26** below lists streambank protection recommendations for the Cheboygan River/Lower Black River Watershed.

Table 26: Streambank Protection Recommendations		
	Recommendation	Timeline
Objective One	Stabilize priority streambank erosion sites through the installation of corrective measures.	
Task 1	Implement structural BMP's to reduce the amount of sediment from entering the river.	
Milestones	Develop site plans, obtain proper permits and landowner permission for 9 sites recommended for treatment (sites: S001;S003; S004;S005; S010; S012; S014; S015; & S016;) Secure funding and organize materials Organize work crew and install BMP's at each of the 9 sites	♦ 5 yrs. ♦ 1-2yrs. ♦ 10 yrs.
BMP's	Tree revetment, brush placement, re-vegetation, stairways, fencing, bank sloping	
Responsible Parties	Huron Pines RC&D Council, Tip of the Mitt Watershed Council Conservation Districts, NEMCOG	
Estimated Cost	\$58,000 (9 sites)	
Evaluation	Take before and after photographs and document number of sites completed	
Objective Two	Improve existing access sites by creating canoe launch pads, steps etc.	
Task 1	Develop site plans, obtain proper permits and landowner permission for improvement to/ construction of access structures and stairways at sites S014 and S015	♦ 2-5 yrs.
Milestones	Secure funding and organize materials Organize work crew and implement BMP's for 1 site per year	♦ 2-5 yrs. ♦ 3-4 yrs.
BMP's	Provide parking, create launch pads, steps, walkway	
Responsible Parties	Huron Pines RC&D Council, Tip of the Mitt Watershed Council, Conservation Districts, NEMCOG	
Estimated Cost	\$6,000/site (4 sites \$24,000)	
Evaluation	Before and after photographs; document number of sites completed	♦ 3-9 yrs.
Total Streambank Protection Cost: \$56,000		

Road/Stream Crossing Recommendations

Sediments, including dirt and gravel from shoulders of the roads (especially unpaved roads) can be deposited into the river system wherever a road and stream intersect. Sedimentation of streams is a natural process. Excessive amounts of sediments can, however, negatively impact several of the designated uses for the watershed, such as aquatic wildlife and habitat (including the watershed's cold water fisheries), birds and mammals dependent on an aquatic environment and aquatic plant life. Sedimentation can also, by reducing the width and depth of the stream channel, restrict navigation and promote an increase in flooding of the stream. **Table 27** details the recommended actions needed to reduce the effects of the sedimentation process in the watershed.

Table 27: Road/Stream Crossing Recommendations

	Recommendation	Timeline
Objective One	Reduce the amount of sediment by establishing a road/stream crossing improvement program designed to correct identified problems	
Task 1	Stabilize erosion at road/stream crossings	
Milestones	Develop site plans, obtain proper permits and landowner permission for priority sites Secure funding and organize materials Organize work crew and implement BMP's at the selected site	♦ 2 yrs. ♦ 2 yrs. ♦ 2-5 yrs.
BMP's	Replace culverts, reduce grade of approaches, pave approaches, pave curb and gutter, re-vegetation, erosion control structures at 11 sites recommended for treatment: 031I; 034I; 045I; 137M; 139M; 141M; 145M; 148M; 156MK; 161C; 171MK	
Responsible Parties	Huron Pines RC&D, Cheboygan and Emmet County Road Commissions, NEMCOG, County Drain Commissions	
<i>Estimated Cost</i>	<i>\$123,000 (11 sites)</i>	
Evaluation	Before and after photographs; document number of sites completed	♦ 5 yrs.
Objective Two	Provide local road commissions with BMP information regarding road/stream crossings	
Task 1	Obtain or develop informational materials describing road/stream crossing treatment alternatives to be used by road commissions	
Milestones	Organize workshop materials and plan seminar Host seminar for road commissions	♦ 1 yr. ♦ 2 yrs.
BMP's	Informational brochures and workshop sessions	
Responsible Parties	Huron Pines RC&D, NEMCOG, Cheboygan and Emmet County Road Commissions	
Anticipated Products	Program agenda and educational brochures provided to workshop participants	
<i>Estimated Cost</i>	<i>\$1,600 (2 seminars)</i>	
Evaluation	Develop evaluation forms, request participants of the workshops evaluate materials and impact of program	♦ 2 yrs.
Total Road/Stream Crossing Cost: \$148,000		

Agricultural Recommendations

The agricultural community is a vital component of the Cheboygan River/Lower Black River Watershed. The crops and livestock produced locally benefit the economy of the area, and provide a rural atmosphere many visitors and permanent residents alike find aesthetically pleasing. Unfortunately, like many other watershed components, the agricultural industry can contribute significant amounts of pollution to the watershed. Sediments, nutrients, and bacteria natural by-products of farming activities. Best Management Practices such as exclusion fencing to keep livestock out of streams, adequate manure storage facilities, proper livestock crossings, nutrient management and buffers along streambanks can significantly lower the amounts of pollution entering the water system. In many cases, funding to correct these problems may be available

in the form of grants from various agencies and programs working within the watershed.

Actions recommended to reduce the negative impacts of agriculture on the watershed while promoting environmentally sound uses for agricultural lands are listed in **Table 28** below.

TABLE 28: AGRICULTURE RECOMMENDATIONS		
	Recommendation	Timeline
Objective One	Restrict livestock access to the rivers and streams	
Task 1	Develop site plans, provide alternate means for watering livestock and create proper stream crossings	
Milestones	Create site plans for 11 sites recommended for treatment: A003; A017; A018; A028; A030; A043; A061; A062; A067; A076; A082; & A128; Obtain proper permits and landowner permission Secure funding and organize materials Organize work crew and install BMP's	<ul style="list-style-type: none"> ◆ 1-2 yrs. ◆ 1-2 yrs. ◆ 2-3 yrs. ◆ 2-5 yrs.
BMP's	Fencing, stream crossings, watering devices, buffers	
Responsible Parties	NRCS, NEMCOG, Cheboygan and Emmett County Conservation Districts, Huron Pines RC&D Council	
Estimated Cost	\$700,000 (11 sites)	
Evaluation	Before and after photographs; document number of sites completed	◆ 3-5 yrs.
Timeline	2 to 5 years	
Objective Two	Install corrective measures to reduce runoff at agricultural sites of concern.	
Task 1	Develop plans; install devices to reduce runoff.	
Milestones	Select sites and develop plans for identified areas of concern Obtain proper permits and landowner permission Secure funding and organize materials Organize work crew and install BMP's	<ul style="list-style-type: none"> ◆ 1 yr. ◆ 1 yr. ◆ 1-2 yrs. ◆ 2-5 yrs.
BMP's	Planting, nutrient management, fencing, filter strips, livestock exclusion, waste storage/utilization	
Responsible Parties	NRCS, Cheboygan and Emmet County Conservation Districts, NEMCOG	
Timeline	5 years	
Estimated Cost	\$570,000 (11 sites)	
Evaluation	Before and after photographs; document number of sites completed	
Total Agriculture Costs: \$1,270,000		

Shoreline Protection-Riparian Landowner Recommendations

A shoreline inventory of the lakes within the Cheboygan River/Lower Black River Watershed was conducted in summer 2002 to determine the presence, extent and potential habitat of cladophora, a type of algae that occurs naturally in small amounts in northern Michigan waters. Cladophora proliferates in the presence of excessive nutrients and can be used as an indicator species for a decline in water quality.

The full value of a shoreline survey is only achieved when the information is used to educate lakefront property owners about preserving water quality, and to help them rectify any problem situations. A follow-up effort of this nature has occurred on several other lakes where the

Watershed Council has conducted shoreline surveys. **Table 29** lists follow-up actions recommended for Douglas Lake, Long Lake, Munro Lake and Twin Lakes.

TABLE 29: SHORELINE PROTECTION-RIPARIAN LANDOWNER RECOMMENDATIONS		
	Recommendation	Timeline
Objective One	Educate public on identification of Cladophora growths, what they indicate	
Task 1	Send a <u>general</u> summary of the survey results to all shoreline residents, along with a packet of informational brochures to provide information about practical, feasible, effective actions to protect water quality. Keep the specific results of the survey confidential--in other words, do not publish a list of sites where Cladophora growths were found.	
Milestones	Develop and assemble educational packet (septic maintenance, maintaining greenbelts, proper fertilizer application, etc.) to distribute to riparian landowners Help landowners design a site plan to protect their shoreline	♦ 1 yr. ♦ 3 yrs.
BMPs	Produce and distribute educational material, site planning assistance	
Responsible Parties	NEMCOG, Huron Pines RC&D Council, Tip of the Mitt Watershed Council,	
Anticipated Products	Educational packet for riparian landowners	
Evaluation Method	Survey landowners to determine presence or extent of Cladophora growth	♦ 5 yrs.
<i>Estimated Cost</i>	<i>\$500-\$2500 (Approximately \$5 to \$25 per household, depending on complexity and type of materials distributed.)</i>	
Objective Two	Inform those owners of properties with Cladophora growths of the specific results for their property	
Task 1	Ask riparian landowners to fill out a questionnaire in an attempt to interpret cause of the growth, offer individualized recommendations for water quality protection.	
Milestones	Following the questionnaire survey, perform site visits coupled with ground water testing in an effort to gain more insight to the nature of the findings. (keep all information regarding names, specific locations, and findings confidential to encourage property owner participation in this project)	♦ 2-5 yrs.
Task 2	Repeat the survey periodically (every five years or so), coupled with the follow-up mailings in order to promote water quality awareness and good management practices in an ongoing basis.	
Milestones	During each subsequent survey, add more information about shoreline features to the database. The database will greatly facilitate future surveys, resulting in a reduction of staff hours needed for repeating the survey; information can be utilized for other water resource management applications.	♦ Ongoing
BMPs	Educational materials, questionnaires	
Responsible Parties	Huron Pines RC&D Council, NEMCOG, Tip of the Mitt Watershed Council	
Anticipated Products	Improved documentation of Cladophora sites, including causes, extent and location; shoreline database	
Evaluation Method	Survey of landowners, recheck of Cladophora sites	3-5 yrs.
<i>Estimated Cost</i>	<i>\$3,500-\$8,000</i>	
Objective Three	Add information to database to facilitate identifying the locations of Cladophora growths during repeat shoreline surveys and in making property owner contacts.	
Task 1	Compile more accurate parcel and ownership information for the shoreline database from either the Cheboygan County Equalization Department, or based on the knowledge of Association members or shoreline residents.	
Milestones	Encourage lake associations in shoreline monitoring activities Compile and manage water resource information	♦ Ongoing ♦ 2-5 yrs.

BMPs	Shoreline surveys	
Responsible Parties	Tip of the Mitt Watershed Council, NEMCOG, lake association volunteers	
Table 29: Shoreline Protection, continued		
Anticipated Products	Improved shoreline database for use in managing and monitoring the lake shores of the watershed Water resource information clearing house to be shared by various agencies and the public	
Evaluation Method	Keep track of number of times database is accessed by agencies, and water resource information is accessed by agencies, lake associations and other organizations	♦ 5-10 yrs.
<i>Estimated Cost</i>	<i>\$3,000</i>	
Task 2	Create good quality maps showing property parcels, Cladophora locations, and other resource information by linking the shoreline database to a Geographic Information System	
Milestones	Expand database to include other shoreline features such as public access sites, shoreline erosion, wetlands, aquatic plants and type of bottom substrate.	♦ On-going
BMPs	Education, informational materials	
Responsible Parties	Huron Pines RC & D Council, NEMCOG, Tip of the Mitt Watershed Council	
Anticipated Products	Large body of information and maps useful in monitoring and protecting the shorelines of the watershed	
Evaluation Method	Survey agencies using information and materials to evaluate quality and quantity of information available	10 yrs.
<i>Estimated Cost:</i>	<i>\$4,000</i>	
Total Shoreline Protection Costs: \$17,500		

Stormwater Recommendations

The ultimate goal of the Lower Cheboygan River Watershed Project is to prevent or at least reduce pollution. All of the recommended techniques to correct runoff problems will help achieve and enhance water quality of the Lower Cheboygan River Watershed, as well as the community.

There are currently at least 46 outfalls (within the Cheboygan City limits) discharging directly to the river, and additional sites are added each year. With few exceptions, these drainage zones have no treatment. The stormwater simply flows from city streets, rooftops, parking lots, etc., carrying with it oil, grease, trash, and sediment that is sent directly to the Cheboygan River. While this archaic practice has historically occurred and continues even today, *discharging stormwater directly from pavement to surface water is no longer recognized as an acceptable technique*. Stormwater policies currently employed by Cheboygan County that may prevent these harmful practices do not apply to the City. It is vital that an ordinance specifically addressing stormwater runoff problems should be drafted and adopted by the City of Cheboygan. Many forward-thinking municipalities in Michigan have already done this.

In addition to addressing the City's stormwater problem "at the end of the pipe," the City of Cheboygan should work to promote the concept and implementation of low-impact design techniques among private property owners. This approach, using relatively simple BMPs like rain gardens and directing water to grassed swale areas, has been shown to reduce both pollutants and the quantity of runoff. Such a long-term approach makes implementing **Task 3** below much easier, and there are less water and pollutants to be dealt with. (In one large city neighborhood in Seattle, runoff was reduced by 98% through an intensive use of low impact design BMPs.) A nearby Michigan community – Grayling – has already received funding in order to implement this approach to stormwater management.

Future development within the City should incorporate stormwater control measures. While this can be accomplished, in part, through the ordinance mentioned below (**Task 1**), it also requires well-thought-out planning by the City. On the future land use map for the City of Cheboygan, commercial business expansion is planned along Lincoln Avenue, east of the Cheboygan River. Intensive new development in this area will add a burden to the existing stormwater system, and thus should be handled on site, rather than added to the existing system. This is true of other future areas of expansion as well. In addition, within the City limits, there exist a number of parcels that can currently be considered “open land” (or otherwise undeveloped). Many of these will likely be developed in coming years. While encouraging intensive development within the City (rather than contributing to sprawl) is a good approach, the impacts of any development on the stormwater system and the River should be considered. Areas that once filtered pollutants and slowed runoff may, in the future, actually contribute to the problem if development is done poorly. Also, the City should incorporate conservation design in new residential and commercial areas (including existing properties), above and beyond what current regulations require (avoid curb and gutter).

Listed below in **Table 30** are some recommended actions the City of Cheboygan could take to reduce the stormwater impacts to the Cheboygan River.

Table 30: Stormwater Recommendations		
	Recommendation	Timeline
Objective One	Promote the use of structural (retention/detention basins) and nonstructural measures (stormwater ordinances) for water resource protection	
Task 1	Work with City to facilitate immediate adoption of a post-construction stormwater runoff control ordinance in order to prevent the direct discharge of stormwater to surface water.	
Milestones	The City is in the process of revising its stormwater policies Coordinate planning efforts with Cheboygan County and townships surrounding the City of Cheboygan.	<ul style="list-style-type: none"> ◆ 1-2 yrs. ◆ 2-5 yrs.
BMPs	Educational materials	
Responsible Parties	Huron Pines RC& D Council, Tip of the Mitt Watershed Council, NEMCOG	
Anticipated Products	Model stormwater ordinance	
Evaluation Method	The adoption of the stormwater ordinance, monitor outfalls for contaminants.	◆ 2-5 yrs.
<i>Estimated Cost</i>	<i>\$2,000</i>	
Task 2	Retrofit existing storm drains from private businesses so they no longer discharge directly to the river	
Milestones	Encourage riparian businesses to install grassy filter strips between pavement and water, rain barrels to reduce rooftop runoff, and infiltration trenches at storm drain sites Educate riparian property owners and business people of the extent of the problem, and the relatively easy solutions Develop model stormwater site within watershed Conduct tours of model stormwater site for riparian business owners	<ul style="list-style-type: none"> ◆ 1-5 yrs. ◆ 1-2 yrs. ◆ 2-5 yrs. ◆ 2-5 yrs.
BMPs	Detention/retention areas, filter strips, educational materials	
Responsible Parties	NEMCOG, Huron Pines RC&D Council, Tip of the Mitt Watershed Council	
Anticipated Products	Educational packet for riparian landowners and businesses, model stormwater site	
Evaluation Method	Before and after photos, document number of sites completed	◆ 2-5 yrs.
<i>Estimated Cost</i>	<i>\$60,000 (17 sites)</i>	

Table 30: Stormwater Recommendations, continued

Task 3	Retrofitting of the existing City stormwater system may be the most difficult task in reducing the City's contribution of runoff to the river. At least 29 drainage zones have been identified; these carry pollutants from commercial, residential, and light industrial sections of the City and discharge directly to the River. Treatment options for stormwater runoff from the City should be developed on a zone-by-zone basis.	
Milestones	Develop plan and timetable for retrofit Pursue funding for implementation at stormwater drainage zones Complete retrofit on 2-3 sites per year	<ul style="list-style-type: none"> ◆ 1 yr. ◆ 1-10 yrs. ◆ 2-15 yrs.
BMPs	Infiltration basins, constructed wetlands, detention ponds, and mechanical removal of pollutants (oil & grit separator)	
Responsible Parties	City of Cheboygan, Huron Pines RC&D Council, Cheboygan Drain Commission, NEMCOG	
Evaluation Method	Document number of sites completed	◆ 2-15 yrs.
<i>Estimated Cost</i>	<i>\$2,500,000 (While this project is large in scope, it is likely that cost-share funding from the state or the federal government would be available in the coming years to help implement these types of solutions, as well as those listed in Task 4 below.)</i>	
Task 4	Educate citizens on the importance of stormwater management and non point source pollution and promote the concept/ implementation of low-impact design techniques among private property owners.	
Milestones	Mail information to each household in the City limits of Cheboygan, including brochures about non-point source pollution, urban property BMP's, and a map of the City's drainage system. Give presentations where appropriate (e.g., school-aged children, garden clubs, and business owners). Promote a "drain stenciling" day in the City of Cheboygan to increase awareness that storm drains are a direct route for pollutants to enter surface water	<ul style="list-style-type: none"> ◆ 1-3 yrs. ◆ 1-3 yrs. ◆ 1-3 yrs.
BMPs	Rain gardens; redirecting water to grassed swale areas	
Responsible Parties	Huron Pines RC&D Council, NEMCOG, Tip of the Mitt Watershed Council	
Anticipated Products	Brochures, maps, materials for presentations	
Evaluation Method	Send questionnaire to households, classrooms to gauge interest generated by educational programs	◆ 3-4 yrs.
<i>Estimated Cost</i>	<i>\$15,000</i>	
Task 5	Develop emergency response plans and communicate with responders for pollutant spills on City streets. Use the updated sewer maps.	
Milestones	Develop plans and system for reporting/responding to pollution spills Coordinate system with key agencies, departments in City Educate City officials, business owners, and waste/chemical transports on response procedures	<ul style="list-style-type: none"> ◆ 2-5 yrs. ◆ 2-5 yrs.
BMPs	Educational materials	
Responsible Parties	City of Cheboygan, Huron Pines RC&D, Tip of the Mitt and NEMCOG	
Anticipated Products	Emergency response plan	
Evaluation Method	Conduct simulated emergency response events	◆ 2-5 yrs.
<i>Estimated Cost</i>	<i>\$15,000</i>	

Total Stormwater Recommendations Cost: \$2,538,000

General Education Recommendations

Education is the key to a successful watershed management program. The overall goal of the information and education component of the watershed plan is to provide educational information to local officials, shoreline residents, contractors and developers, school children and the general public, enabling them to make decisions that will enhance the protection of the Cheboygan River/Lower Black River Watershed. Informed citizens can greatly affect the outcome of a watershed protection program. **Table 31** indicates projects recommended to increase the public's knowledge and understanding of the watershed and its many components.

Table 31: General Education Recommendations		
	Recommendation	Timeline
Objective One	Develop and assemble an educational packet that covers such topics as septic maintenance, developing and maintaining greenbelts, and proper fertilization application.	
Task 1	Distribute educational packets to riparian landowners and to Realtors for new riparian property owners.	
Milestones	<ul style="list-style-type: none"> ◆ Create logo unique to the Cheboygan River/Lower Black River Watershed Initiative ◆ Develop and assemble educational packet (septic maintenance, maintaining greenbelts, proper fertilizer application, etc.) to distribute to riparian landowners ◆ Help landowners design a site plan to protect their shoreline 	<ul style="list-style-type: none"> ◆ 1 yr. ◆ 3 yrs. ◆ Ongoing
BMPs	Produce and distribute educational material, site planning assistance	
Responsible Parties	NEMCOG, Cheboygan and Emmet County Conservation Districts, Huron Pines RC&D Council, Tip of the Mitt Watershed Council, USDA-NRCS, MSUE	
Anticipated Products	Educational packet including watershed logo, brochures, pencil, note cards, stickers	
Evaluation Method	Document volume of educational materials distributed; conduct survey of landowners on effectiveness of educational materials	◆ 2-10 yrs.
<i>Estimated Cost</i>	<i>\$15,000</i>	
Objective Two	Encourage county road commissions to explore alternatives in road maintenance at road/stream crossings. (Also addressed in Table 27: Road/stream Crossing Recommendations, Objective Two)	
Task 1	Create model road/stream crossing site in cooperation with county road commissions	
Milestones	Meet with road commissions to select model site and plan for implementation of site design	
BMPs	Educational materials	
Responsible Parties	NEMCOG, Huron Pines RC&D Council, Tip of the Mitt Watershed Council,	
Anticipated Products	Brochure that includes BMPs, road/stream crossing facts, and effects of sediments and road chemicals on the designated uses of the waterways; short PowerPoint presentation depicting "before & after" pictures of sites in other watersheds that used the road maintenance alternatives, model road/stream crossing site	
Evaluation Method	Follow up with erosion control officer	2-10 years
<i>Estimated Cost</i>	<i>\$30,000</i>	
Objective Three	Develop brochures and/or information packets that explain the importance of controlling livestock access, establishing fencing, and creating proper stream crossings. Include available funding sources. Distribute information at fairs, trade shows, and agriculture related events.	
Task 1	Develop brochures and/or information packets that explain the importance of controlling livestock access, establishing fencing, and creating proper stream crossings.	
Milestones	Provide educational materials to agricultural community	2-5 yrs.

Table 31: General Education Recommendations, continued

BMPs	Educational materials	
Responsible Parties	NEMCOG, Cheboygan and Emmet County Conservation Districts, Huron Pines RC&D Council, Tip of the Mitt Watershed Council, USDA-NRCS, MSUE	
Anticipated Products	Educational packet including the importance of controlling livestock access, establishing fencing, and creating proper stream crossings. Include a list of potential funding sources available.	
Evaluation Method	Survey agricultural community to assess effectiveness of educational materials	2-5 yrs.
<i>Estimated Cost</i>	<i>\$10,000</i>	
Objective Four	Promote responsible use of access sites	
Task 1	Develop signage for use at water access sites	
Milestones	<ul style="list-style-type: none"> ◆ Post signs at water access sites and provide information to canoe liveries and ORV parking areas to encourage anglers, canoe groups, ORV and motor boat users to protect the rivers by using stairs when available, by staying on designated trails, and by reducing wake speeds. ◆ Develop informational pamphlets that encourage responsible use at access sites, distribute to canoe liveries and boat/ORV dealerships, rentals and parking areas 	<ul style="list-style-type: none"> ◆ 2-5 yrs. ◆ 2-5 yrs.
BMPs	Signage, educational materials	
Responsible Parties	NEMCOG, Cheboygan and Emmet County Conservation Districts, Huron Pines RC&D Council, Tip of the Mitt Watershed Council, USDA-NRCS, MSUE	
Anticipated Products	Signs, informational pamphlets	
Evaluation Method	Survey access sites for increase/decrease in erosion	
<i>Estimated Cost</i>	<i>\$30,000</i>	
Objective Five	Educate the public on stormwater impacts through a drain stenciling program, informative seminars for local officials, brochures for the public, and a tour of a model stormwater site.	
Task 1	Implement a drain stenciling program in the watershed	
Milestones	<ul style="list-style-type: none"> ◆ Develop a brochure explaining stormwater impacts on the watershed and the purpose of drain stenciling. ◆ Hold seminars in both counties of the watershed to educate local officials on the importance of stormwater management ◆ Conduct a tour for local officials and interested community members of a model stormwater site ◆ Hold work bees for stenciling storm drains in the watershed; encourage community participation 	<ul style="list-style-type: none"> ◆ 1 yr. ◆ 2-5 yrs. ◆ 2-5 yrs. ◆ 2-5 yrs.
BMPs	Educational materials, drain stenciling, seminars	
Responsible Parties	NEMCOG, Cheboygan and Emmet County Conservation Districts, Huron Pines RC&D Council, Tip of the Mitt Watershed Council, USDA-NRCS, MSUE	
Anticipated Products	Stormwater brochure, stenciled stormwater drains	
Evaluation Method	Interview city officials/community members to gauge increase of awareness stormwater impacts, BMPs, and compliance	2-5 yrs.
<i>Estimated Cost</i>	<i>\$20,000</i>	
Objective Six	Develop and implement school programs concerning water quality education.	
Task 1	Implement a water testing/monitoring program in area schools	
Milestones	<ul style="list-style-type: none"> ◆ Make SEE-North's water quality testing kits available for classrooms ◆ Establish interactive database to which students can enter classroom data ◆ Facilitate participation by students in conference at U. of M. Biological Station** 	<ul style="list-style-type: none"> ◆ 1-2 yrs. ◆ 2-5 yrs. ◆ 1-2 yrs.
BMPs	Educational materials, hands-on activities	
Responsible Parties	SEE-North, NEMCOG, Tip of the Mitt Watershed Council	
Anticipated Products	Interactive water quality database	

Table 31: General Education Recommendations, continued		
Evaluation	Conduct short survey of teachers whose classrooms participated in demonstration to rate overall educational effectiveness of information, materials, presentation and activities, monitor results of water testing	2-5 yrs
<i>Estimated Cost</i>	<i>\$6,000</i>	.
Task 2	Conduct a water resource curriculum review	
Milestones	Review and compile existing instructional materials for elementary and secondary students that focus on water resources With input from teachers, modify selected materials in ways that make these more locally relevant Compile an on-line resource library for teachers on SEE-North's website for teachers; establish an on-line learning community of people involved in water resources Develop a lesson study project*	♦ 1 yr. ♦ 1 yr. ♦ 2-5 yrs. ♦ 1 yr.
BMPs	Educational materials	
Responsible Parties	SEE-North, NEMCOG, Tip of the Mitt Watershed Council	
Anticipated Products	"Clearing house" of instructional materials, on-line resource library, lesson plans	
Evaluation	Questionnaires distributed to teachers and students	2-5 yrs.
<i>Estimated Cost</i>	<i>\$25,000</i>	
Total Cost of Education Recommendations: \$136,000		

*Teachers from similar grade levels who wish to use the same instructional materials related to water resources can participate in a lesson study. These teachers meet several times and 'dissect' a particular lesson about water resources. One teacher volunteers to teach the lesson while other participants observe that teacher's class. Then the group meets again to share impressions from the observation and revise the lesson. Another teacher then volunteers to teach the lesson and other teachers in the group observe. The group then meets a second time to discuss the classroom observation and revise the lesson a second time. Lesson study is a powerful form of professional development for teachers, and is one of the professional development strategies used in Japan's educational system.

** The conference focuses on interpreting the data and reflecting on the role of inquiry in learning. Students are also introduced to potential careers in water resources and tour a higher education facility that is actively engaged in aquatic research and water resource management. Elementary students may explore water resources through pond studies, stream studies or in-class freshwater aquaria.

Information/Education Strategies

Education is the critical component in a successful watershed management program. The primary function of the Information and Education Strategy for the watershed plan is to provide educational information to local officials, shoreline residents, contractors and developers, school children and the general public. Learning about the watershed that is so fundamental to the sustainability of the region's economy and way of life will enable citizens to make decisions that will enhance and protect the waters of the Cheboygan River/Lower Black River Watershed.

Table 32 lists the information and education strategies based on the goals and objectives stated earlier. Based on the sources of pollution, each educational strategy will be directed towards a specific target audience.

Table 32: Information and Education Strategies	
Pollutant	Organics (Nutrients/Bacteria)
Source	Wastewater/ residential septic systems/lawns
Target Audience	Homeowners, riparian businesses
Message	Properly maintain septic systems to prevent degradation of water quality; discourage improper/over application of fertilizers on lawns; encourage soil tests and the use of low/no phosphate fertilizers
Delivery Mechanism	Create an educational water quality kit for homeowners including brochures for septic system maintenance, environmentally friendly lawn care
Source	Agricultural lands
Target Audience	Agricultural operations; landowners
Message	Unrestricted livestock access to surface water threatens the health of the watershed
Delivery Mechanism	Brochures, work with NRCS, provide information at fair, trade-shows and local events
Pollutant	Sediments
Source	Road/stream crossings
Target Audience	Road Commissions
Message	Explore alternatives to road maintenance at road/stream crossings
Delivery Mechanism	Seminars for County Road Commissions
Source	Streambank erosion
Target Audience	Riparian Landowners, developers, construction companies
Message	Encourage landowners to leave a conservation buffer, provide attractive landscaping for natural vegetation, inform developers, construction companies of importance of greenbelts
Delivery Mechanism	Information material distributed to Real Estate agencies, area businesses, riparian landowners
Source	Uncontrolled livestock access to streams
Target Audience	Landowners, agricultural operations
Message	Control livestock access, establish fencing, create proper stream crossings, information on alternate funding sources
Delivery Mechanism	Brochures, work with NRCS, provide information at fairs, trade-shows and local events
Source	Lake and stream access sites
Target Audience	Fishing enthusiasts, kayak/canoe/tube rentals and sales, ORV users, boat owners
Message	Protect river by using designated access sites and stairs when provided, staying on designated trails, and reducing wake speeds
Delivery Mechanism	Post signs at access points, provide information to canoe liveries, sporting goods stores and at ORV parking
Pollutant	Pesticides
Source	Residential lawns; agricultural operations
Target Audience	Landowners, agriculture managers
Message	Encourage proper application of pesticides to protect aquatic/wildlife habitats; and promote a healthy watershed
Delivery Mechanism	Brochures, work with various agencies such as lake associations, NRCS; provide information at fairs, trade-shows and events
Pollutant	Oils, Grease, Metals and Other Toxic Substances
Source	Stormwater runoff
Target Audience	County Drain Commission; riparian businesses; riparian landowners
Message	Provide surface runoff control to reduce and filter harmful substances from entering the river via stormwater runoff
Delivery Mechanism	Drain stenciling; informative seminars for local officials; brochures covering such topics as hazardous household wastes and where stormwater goes; tours of model stormwater site

Planning & Zoning Recommendations

In general, all three local government units do an effective job of making their zoning ordinances readily available to the general public and have kept their standards up-to-date. Several relatively minor improvements could be made by all three government units in order to improve water quality.

Cheboygan County

Most of the land area within this watershed is in Cheboygan County. The Cheboygan County Planning Commission was created in 1969. (The City of Cheboygan, while located within the county, maintains its own planning and zoning authority, authorized through Public Act 207 of 1921 and Public Act 285 of 1931.) The county's first Planning Commission was established in 1969; the first county zoning ordinance was also adopted at this time. Cheboygan County has recently updated their comprehensive master plan, which includes numerous recommendations that would help to protect water resources; the county should implement these within the new zoning ordinance. Most of the land in this county that is part of the Lower Cheboygan Watershed is zoned Agriculture/Forestry. There are an abundance of water resources in Cheboygan County and intense growth pressure; effectively administering the zoning program is perhaps more than a full-time job. As noted in their newly updated master plan, "Any new development along or near the waterfront will require a greater standard of review to maintain or improve the quality of the County's water resources," (p. B-7).

The County does currently have a Lake & Stream Overlay Protection District, although "protection" is perhaps a poor use of the term. The zoning district does allow uses (with a special use permit) that one would not commonly associate with resource protection, such as retail stores, hotels, and subdivision development. Within this district (a 500 ft zone parallel to the shoreline's ordinary high water mark), the county does have special regulations for septic systems, vegetative buffer zones, structure design standards, agricultural & silvicultural activities, and erosion control.

To better improve the zoning ordinance, areas where commercial development is located along the waterfront should be rezoned to better reflect the fact they are not in a "protection" district. Other lands along the waterfront in the protection district should not be turned into commercial use (change the allowed uses section of the Lake & Stream Protection District). This recommendation has also been made by the County itself, and is within the County Master Plan (page C-2).

According to Section 10.5 of the current zoning ordinance, "Native trees, shrubs, and vegetation *should* be maintained and enhanced along the banks of rivers, streams, ponds and lakes in this district (the Lake & Stream Protection District)." If maintaining aquatic buffers is the goal, the language should be changed to reflect that this is a requirement, not a recommendation. In the following section, the ordinance does note that, "The vegetation strip *shall* be maintained for a distance of 40 feet inland measured horizontally from the ordinary high water mark..." Fortunately, the ordinance also specifies that a lawn is not an acceptable natural vegetation strip. In addition, the ordinance requires that applicants for permits for new waterfront development shall be required to submit their plans for the establishment/maintenance of a natural vegetation strip.

Within the L&S Protection District (Article 10, section 4.8), where existing structures on both sides of a property are within 200 ft of a new building and said structures do not meet waterfront setback standards, the required setback need not be greater than the average setback on the adjoining developed lots.

In addition, the ordinance states that the zoning administrator should annually publicize through local media the desirability and need for the establishment of waterfront natural vegetation strips on existing properties. This would seem to be a key element in getting voluntary compliance from property owners in establishing/maintaining greenbelts.

There is a special natural river designation (implemented by the County, not the State's Natural Rivers Program) for the Upper Black (not within this watershed but potentially impacting it) -- with 100 ft buffer strips along mainstream and 75 ft for tributaries. The Lower Cheboygan Watershed currently has a lot of commercial growth directed toward the waterfront; more attention should be paid to protecting water resources so they remain a source of appeal. The majority of the Lower Black River is zoned agriculture/forestry.

Finally, the County itself would seem to function more efficiently if one board handled planning & zoning (currently there is both a planning commission and zoning commission). The Zoning Board of Appeals would still remain, but the combining of the planning and zoning boards would make both economic and philosophic sense – perhaps better demonstrating the close connection between land use planning and the implementation of the plan, thus resulting in policies and standards that are consistently followed. The County does have their own Planner and should continue to utilize this professional.

City of Cheboygan:

While the City makes up a small area of the watershed geographically, it can have a significant impact on the Cheboygan River by virtue of the fact that the river runs through the heart of the city and is surrounded by intensive commercial, industrial, and residential development.

Some of the “environmental provisions” that are looked at as part of this study may not be as applicable for the city (for example, one should expect to have higher density development within a city), but there are some areas where improvement could be made. One of the most notable is with regard to stormwater management.

Within the City of Cheboygan, much of the land area is currently designated as single family residential. However, within the portion of the city currently discharging directly to the Cheboygan River via the storm sewer system, intensive commercial, waterfront/marina, and light industrial comprise much of the land area. In addition, future expansion of any of these districts is very likely to increase the amount of stormwater runoff to the Cheboygan River unless a stormwater management program is put in place.

The waterfront district includes a broad range of uses and allows for parking right along the waterfront. Currently, stormwater runoff from this area is directed into drains and discharged directly into the Cheboygan River. Redevelopment of some of the waterfront, with more emphasis on parks and open space and less on parking lots adjacent to the river, would benefit the river (and likely the whole community).

In addition to retrofitting the existing stormwater system to incorporate BMPs, future development should no longer be allowed to discharge stormwater directly to the river (as been the practice). This problem may now be addressed, as the County is administering the stormwater control program within the City.

The city does publish their zoning regulations on their internet site, which helps to educate the public, makes the documents readily accessible, and should make amending the ordinance easier/cheaper to do. The City is also currently working to update their land use plan.

Emmet County:

A small part of the watershed is located in Emmet County. Overall, Emmet does have standards within their planning & zoning program that are good from a resource management standpoint. Emmet County does publish their zoning regulations on their internet site, which helps to educate the public, make the documents readily accessible, and should make amending the ordinance easier/cheaper to do. They also have a County Planner and Assistant Planner to help guide the commission and serve the public. Recently the county has also adopted a stormwater management ordinance.

An area of improvement is with regard to vegetative buffer strips (Section 2209), which is as it is currently written, is weak. The language reads, "It is suggested that a minimum shoreline greenbelt of 35 ft be maintained." The ordinance also includes a setback of 60ft for structures along the waterfront; this standard should remain (or be increased) as the county amends their ordinance to improve the greenbelt section.

Evaluating Success

In order to determine the overall effectiveness of the watershed management plan, an evaluation process is essential. Listed below are the evaluation methods for the Cheboygan River/Lower Black River Watershed Initiative, as recommended in the DEQ Handbook: *Developing a Watershed Management Plan for Water Quality*.

- ◆ Physical water quality monitoring
- ◆ Chemical water quality monitoring
- ◆ Biological life measurements
- ◆ Photographic or visual evidence, before and after photos
- ◆ Documentation of site BMPs installed
- ◆ Pollutant loading measurements
- ◆ Stakeholder surveys, evaluate knowledge or change in behavior
- ◆ Focus groups, to determine effectiveness of project activities

Detailed evaluation methods for each task are outlined above in the Recommendations section. Several different evaluation methods were incorporated into the plan to accommodate the variety of strategies recommended for implementation. In order to document the installation of BMP's, before and after photos will be taken at road/stream crossings, streambank restoration sites, newly installed greenbelts and livestock crossings. Focus groups, interviews and surveys will be used when changing viewpoints and management strategies needed to be documented and structural BMP's were not recommended. A timeline for the completion of the evaluations is included in each recommendation table.

To ensure success in the implementation phase, evaluation of the measures being installed will be conducted annually by the steering committee. This will allow for continued monitoring by the steering committee of the overall progress of the project.