

CHAPTER 1 EXECUTIVE SUMMARY

Introduction

The Grand Traverse Bay watershed is one of the premier tourist and outdoor recreation regions in the State of Michigan. Its natural resource base and beauty contributes significantly to the quality of life enjoyed by year round residents accounting for the area's continued growth and prosperity. However, with the rewards of economic achievement come the telling signs of environmental degradation. The same resource base that contributed to this region's desirability as a place to live and work is now under considerable pressure to support continued development.

Watershed Characteristics

The Grand Traverse Bay watershed is located in beautiful northwest Michigan's lower peninsula and drains approximately 976 square miles of land. The watershed covers major portions of four counties: Antrim, Grand Traverse, Kalkaska, and Leelanau. The largest municipality in the watershed is the City of Traverse City. Other towns and villages in the watershed include Northport, Suttons Bay, Kingsley, Acme, Kalkaska, Mancelona, Bellaire, and Elk Rapids. Grand Traverse Bay comprises 132 miles of Lake Michigan shoreline from its northwest tip at the Leelanau lighthouse to its northeast tip at Norwood. The bay spans 10 miles at its widest point, stretches a lengthy 32 miles to its base in Traverse City, and has its deepest point at 590 feet.

The watershed may be broken up into nine distinctive major drainage basins: Elk River Chain of Lakes, Boardman River, Mitchell Creek, Acme Creek, Ptobego Creek, Yuba Creek, East Bay shoreline and tributaries, West Bay shoreline and tributaries, and the Old Mission Peninsula. Section 3.9 gives more detail on each of these subwatersheds. In addition to the six major rivers and creeks entering the bay (Elk, Boardman, Mitchell, Acme, Ptobego, and Yuba), it has been estimated that there are more than 100 additional small streams that enter the bay draining portions of the watershed.

Rich in land and water resources, the Grand Traverse Bay watershed is home to more than 110,000 people sharing their living space with black bear, deer, great blue herons, lady slippers and trillium. Population densities in Grand Traverse Bay watershed are the greatest in the Traverse City region, along the Bay's shoreline, and along the large lakes in the Elk River Chain of Lakes. By far, Traverse City and its surrounding townships are the most highly populated areas of the entire region, with population densities reaching up to 1,730 people per square mile. The Grand Traverse Bay region is currently experiencing tremendous population growth and development pressure, with a predicted 40% increase in population by 2020. Two of the three fastest growing counties in the state, Grand Traverse and Leelanau, are located within watershed boundaries. In addition, the area is one of the most popular tourist destinations in the Midwest, with growing numbers of visitors each year.

Land use and land cover in the watershed is predominantly forest (50%) and agriculture (20%). Other land uses include: open shrub/grassland, water, wetlands, and urban. Patches of forests occur regularly throughout the watershed with the bulk occurring in the Pere Marquette State

Forest (found in the upper Boardman River watershed) and the headwater areas in the Elk River Chain of Lakes watershed. Agricultural lands in the watershed consist mostly of row crops and orchards and vineyards. Apple and cherry orchards and wine producing vineyards dominate agricultural land uses surrounding the bay while row crops (i.e., potatoes, hay, corn, small grains, etc.) are mainly found in outlying watershed areas of Antrim, Kalkaska, and Grand Traverse Counties.

The Protection Planning Process

In September 2001, The Watershed Center Grand Traverse Bay received a watershed management planning grant for the Grand Traverse Bay watershed from the U.S. Environmental Protection Agency and the Michigan Department of Environmental Quality. The grant and awarded funds were authorized by Section 319 of the federal Clean Water Act and were used to develop this protection plan for the Grand Traverse Bay watershed.

The Grand Traverse Bay Watershed Protection Plan provides a description of the watershed (including such topics as bodies of water, population, land use, municipalities, and recreational activities), summarizes each of the nine subwatersheds to Grand Traverse Bay, and outlines current water quality conditions in the bay. Within the initial two-year development phase of the protection plan, water quality threats were identified and efforts to address these issues were researched, developed, and prioritized.

The plan was completed in December 2003 and approved by the DEQ under the Clean Michigan Initiative bond criteria. The plan was then updated in 2005 to meet new EPA criteria for the Section 319 funding program. The 2005 revisions include additional information on pollutant sources and concentrations, load reduction estimates of various BMPs, measurable milestones to guide implementation progress, and a set of criteria to evaluate the effectiveness of implementation efforts.

Designated Uses and Their Pollutants, Sources, and Causes

Michigan water quality standards and identified designated uses for Michigan surface waters were used to assess the condition of the watershed. Each of Michigan's surface waters is protected by Water Quality Standards for specific designated uses (*R323.1100 of Part 4, Part 31 of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended*). 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. Protected designated uses as defined by Michigan's Department of Environmental Quality include: agricultural, industrial water supply, public water supply (at point of intake), navigation, warm water and/or cold water fishery, other indigenous aquatic life and wildlife support, and partial and total body contact recreation.

None of the designated uses for the Grand Traverse Bay watershed are impaired on a watershed wide scale. However, in some cases, activities and resulting pollutants in the watershed may prove to be a threat to water quality and designated uses. Threatened waterbodies are defined as those that currently meet water quality standards, but may not in the future. The Grand Traverse Bay Watershed Protection Plan will focus on five designated uses to protect in order to maintain water quality throughout the Grand Traverse Bay and its watershed. The designated uses include

the cold water fishery, other indigenous aquatic life, total body contact, navigation, and public water supply at point of intake. Threatened designated uses were ascertained through scientific research reports, existing subwatershed management plans, DEQ water quality reports, field observations by the Project Coordinator, steering committee members, and personal contact with watershed residents and scientific experts on the Grand Traverse Bay watershed.

For each designated use to protect in the Grand Traverse Bay watershed there are a number of different pollutants and environmental stressors that adversely affect each of the designated uses, or have the potential to. The term environmental stressor is used to describe those factors that may have a negative effect on the ecosystem, but aren't necessarily categorized as contaminants that change water chemistry. Examples of environmental stressors include changes to hydrologic flow, low dissolved oxygen levels, and loss of habitat.

Sediment and excessive nutrient loading are two of the known factors that are threatening the cold water fishery, aquatic life, and other designated uses in the Grand Traverse Bay watershed. Other pollutants that threaten the watershed's designated uses include thermal pollution, toxins, hydrologic flow, invasive species, pathogens, and loss of habitat. All of these nonpoint source pollutants degrade water quality, destroy aquatic habitat, and reduce the number and diversity of aquatic organisms.

A Comprehensive Watershed Management Table was developed listing sources and causes of watershed pollutants and environmental stressors. This table summarizes key information necessary to begin water quality protection, provides specific targets to act upon for watershed management, and forms the basis for all future implementation projects to protect the quality of the watershed.

It may be used as a reference to distinguish what the major sources of pollutants are on a watershed-wide scale. However, it does not distinguish between pollutants and their sources and causes in individual subwatersheds. Not all of the pollutants listed in the table are a problem everywhere in the watershed. There are differences between the nine subwatersheds making up the Grand Traverse Bay watershed. Each one is unique in the challenges it faces to maintain water quality protection.

An additional Comprehensive Watershed Management Table was developed specifically for the Grand Traverse Bay only. This is because the bay and its watershed are connected, but inherently different. What happens at the extreme outer edges of the watershed will eventually affect the Grand Traverse Bay. However, while the watershed itself encompasses rivers, streams, lakes, and 973 square miles of land, the bay is a large open body of water that is connected to Lake Michigan. Certain pollutants have more of an impact on streams and lakes than on larger bodies of water like the Grand Traverse Bay (i.e., thermal pollution and sediment), but other pollutants are more of a concern for the Grand Traverse Bay and its associated designated uses.

Prioritization of Pollutants

Identified watershed pollutants and sources were ranked and prioritized based on the how they most affect (or have the potential to affect) the watershed's threatened designated uses. Overall,

nutrients are a high priority pollutant for both the Grand Traverse Bay and its tributaries, while sediment is a high priority pollutant in the surrounding watershed. Maintaining the low productivity and oligotrophic status for Grand Traverse Bay will require minimizing the amount of nutrients that enter the lake from adjacent properties and tributaries. Nutrients often attach to soil particles, thereby linking sediment and nutrient pollution. Changes to hydrologic flow, mainly due to stormwater inputs are also a concern throughout the watershed. Along with hydrologic changes, stormwater may carry excessive amount of nutrients, sediments, and toxins to the bay and its tributaries. Additionally, the impact invasive species have on the ecosystem (both currently and in the future) is of great concern for the Grand Traverse Bay. While not a primary concern throughout portions of the watershed just yet, invasive species are already beginning to change the ecosystem and habitat dynamics in Grand Traverse Bay.

The project steering committee noted that it is difficult to rank all the pollutants and their sources in the watershed because all are important and should be priorities for maintaining the health of the bay. The ranking really depends on which area of the watershed is analyzed. In some places, sediment may be the biggest threat, while in others it could be pathogens. Almost always, the pollutants and stressors are interconnected with each other and changes in one causes changes to the others. Additionally, because most of the pollutants and stressors are interconnected, dealing with one source and its causes could actually reduce a number of different pollutants and stressors from affecting a stream or waterbody.

Priority Areas

Priority areas in the Grand Traverse Bay watershed were identified by analyzing the Comprehensive Watershed Management Tables and identifying the major areas where most of the threats to water pollution exist. Priority areas are defined as the portions of the watershed that are most sensitive to environmental impacts and have the greatest likelihood to affect water quality and aquatic habitat. They are areas that may contribute the greatest amount of pollutants to the watershed, either now or in the future, and are considered targets for future water quality improvement efforts. Priority areas for the Grand Traverse Bay watershed include the following areas:

- **Riparian Corridors:** Areas within 1,000 feet of bodies of water.
- **Wetlands:** All wetlands and areas within 1,000 feet of wetlands.
- **City and Village Centers:** Urban areas that drain to surface waters via storm sewers.
- **Headwater Areas:** Areas where there is a greater amount of groundwater recharge.

In addition to the above priority areas, specific priority areas were identified along the Grand Traverse Bay shoreline, throughout the Boardman River watershed, and in Leelanau County. Local land conservancies identified private parcels of land in the Boardman River watershed and Leelanau County for their potential contribution to improving the quality of Grand Traverse Bay and its watershed.

Because of its sheer size and ability to affect the water quality of the bay, the entire shoreline of Grand Traverse Bay is deemed a priority area. As part of the Grand Traverse Bay watershed Planning Project, The Watershed Center (TWC) completed a shoreline inventory of the entire 132-mile shoreline of the Grand Traverse Bay. The Grand Traverse Baykeeper, John Nelson, along with TWC staff and local volunteers, walked and inventoried the bay's shoreline in order

to assess the current conditions surrounding the bay. Results for this survey were compiled into a final report and were placed onto TWC's website (www.gtbay.org) into a searchable database.

Watershed Goals, Objectives, and Recommendations

The overall mission for the Grand Traverse Bay Watershed Protection Plan is to provide guidance for the implementation of actions that will reduce the negative impact that pollutants and environmental stressors have on the designated watershed uses. The envisioned endpoint is to have Grand Traverse Bay and all lakes and streams within its watershed support appropriate designated and desired uses while maintaining their distinctive environmental characteristics and aquatic biological communities.

Using suggestions obtained from stakeholder meetings conducted throughout the watershed and examples from other watershed management plans, the project steering committee developed six broad goals for the Grand Traverse Bay watershed. By working to attain these goals and their corresponding objectives, threatened watershed designated uses will be maintained or improved. The watershed goals are as follows:

- Protect the integrity of aquatic and terrestrial ecosystems within the watershed.
- Protect and improve the quality of water resources within Grand Traverse Bay and its watershed.
- Establish and promote land and water management practices that conserve and protect the natural resources of the watershed.
- Enhance the amount and quality of recreational opportunities and support a sustainable local economy.
- Establish and promote educational programs that support stewardship and watershed planning goals, activities, and programs.
- Preserve the distinctive character and aesthetic qualities of the watershed.

In an effort to successfully accomplish the goals and objectives, specific and tangible recommendations, called implementation tasks, were developed based on the prioritization of watershed pollutants, sources, and causes while also looking at the priority areas in the watershed. The implementation tasks represent an integrative approach, combining watershed goals and covering more than one pollutant at times, to reduce existing sources of priority pollutants and prevent future contributions.

Implementation tasks were summarized by the pollutant and/or source it relates to. In this way, organizations may work on a specific issue (i.e., urban stormwater or shoreline restoration) that may contribute more than one type of watershed pollutant and meet more than one watershed goal. The categories are as follows: Shoreline Protection and Restoration; Road Stream Crossings; Agriculture; Hydrology; Habitat, Fish and Wildlife; Stormwater; Wastewater; Human Health; Wetlands; Invasive Species; Land Protection and Management; Development; Zoning and Land Use; Groundwater; Monitoring; and Desired Uses.

Additionally an Information and Education Strategy was developed with specific recommendations which highlight the actions needed to successfully maintain and improve watershed education, awareness, and stewardship for the Grand Traverse Bay watershed. It lays

the foundation for the collaborative development of natural resource programs and educational activities for target audiences, community members, and residents.

Besides focusing implementation efforts in priority areas, putting special emphasis on reducing and/or eliminating pollution stemming from stormwater runoff, streambank erosion, road stream crossings, fertilizer use, lack of riparian buffers, and the reduction of wetlands, will address the bulk of pollution entering the Grand Traverse Bay and its surrounding watershed. Priority should be given to implementation tasks (both BMPs and educational initiatives) that work to reduce the effects from these sources.

Priority Tasks and Future Efforts for Implementation

The Watershed Center and other project partners will continue to build partnerships with various groups throughout the watershed for future projects involving the implementation of recommendations made in the protection plan. It is expected that this implementation phase will last 10 years or more. Grant funds and other money sources will be used to 1) continue water quality assessment and monitoring, 2) complete initial implementation tasks and installation of Best Management Practices, and 3) complete initial tasks outlined in the Information and Education Strategy.

Priority tasks that should be conducted over the next 1 – 3 years are as follows, with the most important tasks listed first:

- Establishing stormwater BMPs and ordinances
- Streambank and shoreline erosion surveys and stabilization projects
- Establishing riparian buffers
- Complete road crossing inventories and begin improvements using BMPs
- Inventory current master plans and zoning ordinances; assist townships with developing ordinances that protect water quality and natural resources
- Stormdrain mapping
- Wetland assessment, restoration, and protection
- Initiatives to preserve open space and wildlife corridors
- Continuing monitoring programs
- Developing Conservation Plans for farms

Future efforts for the Grand Traverse Bay Watershed Project include:

- Building partnerships and seeking funding for implementation activities.
- Completing initial implementation tasks as well as installing BMPs at selected sites.
- Ongoing monitoring to assess environmental conditions.
- Implementing information and education initiatives.
- Compiling results from ongoing research initiatives.

The plan is intended for use by area watershed groups, lake associations, local governments, volunteer groups, and many others and provides recommendations on how to reduce water quality degradation and protect water quality throughout the Grand Traverse Bay watershed.