

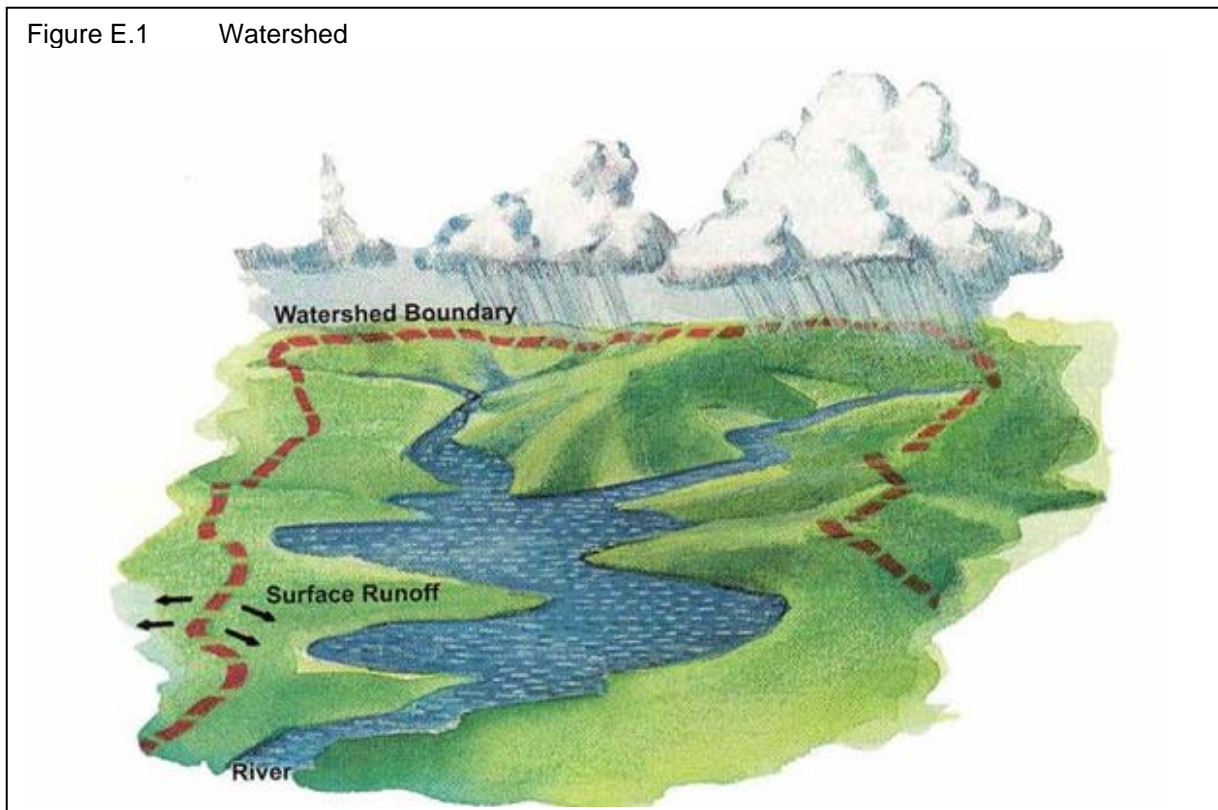
Executive Summary

Nestled in the northwest corner of Lake Huron lies the Les Cheneaux Islands watershed -- a 36-island archipelago, characterized by an intricate complex of channels, shallow bays, and rock-studded peninsulas, and boasting almost 200 linear miles of Great Lakes Shoreline. These natural resource attractions make “the Snows” a popular destination spot for tourists, outdoor enthusiasts, and vacation homeowners, as well as home for over 2,000 full time residents. Fortunately, the Les Cheneaux community is committed to protecting this special place. In November of 2002, a community partnership led by the Chippewa/East Mackinac Conservation District, secured a watershed management-planning grant for the Les Cheneaux Islands area from the U.S. Environmental Protection Agency (USEPA) and the Michigan Department of Environmental Quality (MDEQ). The grant and awarded funds were authorized by section 604(b) of the federal Clean Water Act and were used to develop this management plan for the Les Cheneaux watershed.

Les Cheneaux Watershed Management Plan is a tool for the community to reduce non-point source pollution and plan for the protection of Les Cheneaux area’s natural resources for future generations. The plan provides a description of the watershed including its people and the condition of its aquatic resources. The plan was developed over a two-year period and outlines a detailed strategy for the reduction of point and non-point sources of pollution and the protection of natural features and the designated uses of water.

A watershed is an area of land that drains to a common place (MDEQ; February 2000). Precipitation in the form of rain and melting snow fall on land and that water runs downhill into the lowest areas in the surrounding landscape (i.e. the creeks, inland lakes and wetlands). That water runoff can carry pollutants that exist throughout the landscape, including bare soils, toxins such as oils, and wastes from both animals and humans. These pollutants originate from diverse sources, or *non-point* sources, and

Figure E.1 Watershed



threaten the water bodies where they are deposited. This is the rationale for managing pollution on a watershed scale. If we properly manage activities on lands that drain to our water bodies, we will protect those water resources. If we maintain the integrity of the watershed in our plans for land use, we will guarantee the sustainability of our resources and our way of life (MDEQ 2001).

The Les Cheneaux watershed includes 115 square miles in both Mackinac and Chippewa County in the Michigan's Eastern Upper Peninsula that drains to Lake Huron within the 36-island archipelago known as the Les Cheneaux Islands. That landscape area contains several small creeks, drains, and inland lakes that constitute the area's surface water. Fortunately, these waters are relatively protected by forest cover, which makes up the majority of the watershed's land cover (71%). Wetlands also help to protect these surface waters, with at least 16% of the land cover classified as such. The remaining landscape consists of 8% urban, 1% agricultural, and approximately 4% open or barren. That urban concentration is centered in the two villages of Cedarville and Hessel. The watershed falls within three townships, including Marquette, Clark, and Raber townships (EUPRPDC 1999).



The Les Cheneaux area watershed is highlighted by the 200 mile stretch of shoreline rimming both the north shore of Lake Huron and the Les Cheneaux chain of islands (CTPC 1994). The northern shoreline of Lake Huron at Les Cheneaux can be considered the watershed's most fragile biological indicator. It has been identified in a report of the State of the Lakes Environmental Conference (SOLEC), *Land by the Lakes: Nearshore Terrestrial Ecosystems*, as one of the priority "Biodiversity Investment Areas" in the Great Lakes basin. This area was similarly identified in The Nature Conservancy's report, *Conservation of Biological Diversity*, as an important resource, as well as one of the Conservancy's first *Last Great Places* in the western hemisphere. Biological inventories of the shoreline show nine globally-rare natural communities (for example, Great Lakes marsh, cobble beach, dune and swale, northern fen, alvar) that provide habitat to thirteen federally-listed threatened or endangered species (including bald eagle, grey wolf, Houghton's goldenrod, Hart's tongue fern, Hines emerald dragonfly and hillside daisy), and more than 60 state-listed species. Due to the size of the water bodies and the delayed phenology of the coast, the forested northern shores of Lake Huron provide important stopover areas where neotropical migrant birds concentrate during fall and spring migrations. The coastal marshes and remaining high quality wetlands are important to the health of Great Lakes' waterfowl and fisheries, where they provide nesting and spawning grounds, forage, and protection for numerous species (TNC 1993). In addition, the area contains several Michigan Department of Environmental Quality designated "environmental areas" which are ecologically unique areas that are maintained in their natural state and sheltered from development.

Threats

These resources provide a unique quality of life for year-round residents and draw thousands of visitors each year for aquatic recreational opportunities. Unfortunately, these same resources, which sustain the community, are coming under pressure to support increased activity and development. Development and development's "associated infrastructure" threaten both aquatic and terrestrial wildlife habitat and other components of environmental quality (TNC 1993). Stresses include habitat fragmentation and destruction, altered hydrological processes, and increased pathogens, nutrients, and toxins along the shoreline and other riparian areas. The Les Cheneaux Watershed Management Plan will focus on these

stresses and the designated uses¹ they threaten. The plan will outline a strategy to reduce pollution threats through the promotion of wise land use planning. It will also offer strategies that minimize the negative effects of development on the area's natural resources. Stresses to designated uses were determined through field observations, consultation with local, state, and federal environmental agencies, and through research of local ecosystems.

The Les Cheneaux watershed continues to meet minimum water quality goals set forth in the Federal Clean Water Act and Michigan's Designated Uses for surface water. However, the Luce-Mackinac-Alger-Schoolcraft (LMAS) Environmental Health Department has documented several cases of bacterial contamination in on-site drinking water wells, but a moratorium on installing new wells in the contaminated shallow aquifers has halted that direct impairment. Unfortunately, many existing homes still rely on shallow wells and older non-compliant² on-site septic systems (OSS) as well as use surface water intakes for water supplies, and these residents are in danger of bacterial contamination of their drinking and total/partial body contact use of water. The threat also exists that deeper wells, now mandated by LMAS, could become contaminated if careful consideration is not afforded to the inherent characteristics of the watershed that facilitated the contamination of the shallower aquifers.

Archaic, non-compliant OSS still exist throughout the watershed, including many shoreline properties that are close to the water table and marginal in effectiveness at accommodating wastes. The Les Cheneaux watershed area is part of the Niagaran Escarpment, and much of the project area is characterized by *Karst* topography. Karst is defined as a type of topography that is formed over limestone, dolomite, or gypsum by dissolving or solution, and is characterized by closed depressions or sinkholes, caves, and underground drainage and cracked bedrock at the grounds surface. The accompanying lack of deep filtering soils keep Les Cheneaux waters quite susceptible to contamination from surface and subsurface non-point sources of pollution, including these OSS. Migration of these wastes into surface and ground waters affects both drinking water and total/partial body contact recreation.

The Les Cheneaux area will continue to attract development activity, especially near the Lake Huron shoreline. Development without regard to wise natural resource management threatens other specific designated uses. The Les Cheneaux area's fishery and other aquatic wildlife depend on coastal marshes and stable littoral environments to survive. Activity on or near shore, consequently, results in increasing evidence of pollutants, including boat fuels, sediments from dredging and prop wash, and habitat degradation from building site preparation and other development requirements. Finally, both the fishery and ability to navigate in Cedarville Bay are both threatened by accelerated eutrophication, hastened by nutrient loading from both point³ and non-point sources along Cedarville's waterfront properties.

Solutions

The project steering committee, upon confirming the occurrence and frequency of watershed pollutants, ranked and prioritized them for remediation on the relative importance of each threatened designated use, the ability of the project partners to affect change, and on the availability of resources to realize project goals and objectives. Since all pollutants, sources and causes could be attributed, in part, to poor land use planning, the focus of work for the project partners will be facilitating wise land use planning to guarantee economic and environmental sustainability.

Priority Area

Defining priority areas within the watershed was a necessary task for the project steering committee in order to concentrate resources to reduce the most pollution causes. Priority areas were determined by a) identifying the major areas where pollutant sources and causes were originating and b) by determining

¹ Designated Uses are recognized uses of water established by state and federal water quality programs. Michigan's surface waters are protected by Water Quality Standards for specific designated uses. (*R323.1100 of Part 4, Part 31 of PA 451, 1994, revised 4/99*)

² LMAS On-site septic system codes

³ Clark Township municipal wastewater discharge

the areas most sensitive to pollutant impacts having the greatest likelihood to affect water quality and aquatic habitat. The committee associated all the pollutants with their causes and location of those causes and defined these areas as priority to the focus of watershed management resources. The priority areas of the Les Cheneaux Watershed Project include shoreline and creek riparian areas, urban concentrations, and wetlands.

Several characteristics make the Lake Huron shoreline a tenuous area for human settlement. *Karst* topography, shallow soils, coastal wetlands, and a propensity for habitat for priority species all necessitate careful management of this priority area.

Creek riparian areas were considered by the project steering committee to be the 100 feet of land parallel to the creek's bank. These areas serve as the drainage basin for each subwatershed and maintaining vegetative cover and stream bank stability is key to protecting these priority areas.

Urban concentrations are centered around the villages of Cedarville and Hessel. These municipalities exhibit a concentration of impervious surfaces with a network of storm drains and ditches coursing to Lake Huron. Both villages have marinas with fuel stations, launch areas, and concentrated human activity. These areas are highly susceptible to pollutants associated with human activity.

The Les Cheneaux watershed abounds with wetlands, including interior and coastal, which both provide countless benefits to water quality. Polluted runoff is filtered, stormwater flows are controlled naturally, and wildlife depends upon their productive ecosystems. Unfortunately, Les Cheneaux wetlands are being filled in for homes and other settlement infrastructure. Coastal wetlands and adjacent littoral zones are crucial wildlife habitat and need to be managed as priority areas.

The Les Cheneaux project will focus attention on all these areas to reduce existing and future sources and causes of pollution.

Goals

Early on in the planning process, the steering committee listed a number of watershed concerns. Upon addressing those concerns through observations, research reports, technical advisor consultations, the group formulated a number of goals for the management of the watershed:

- *Protect drinking water quality*
- *Protect partial body contact recreational use*
- *Protect total body contact recreational use*
- *Protect the integrity of aquatic and terrestrial ecosystems within the watershed*
- *Establish, promote, and execute land and water management practices that conserve and protect the natural resources of the watershed*
- *Protect navigation opportunities*
- *Provide appropriate opportunities for public enjoyment of aquatic/terrestrial resources including but not limited to walking trails, scenic overlooks, boat launches, and public access areas*
- *Establish and promote education/information programs that promote stewardship and low impact recreational enjoyment of aquatic and terrestrial resources*
- *Preserve the unique nature-based aesthetic character of the Les Cheneaux Islands area*
- *Identify and protect priority habitat for threatened and endangered species*

The Implementation Plan

To realize these goals, the steering committee has developed a plan of action, called an implementation plan. The implementation plan is organized by a number of pollution objectives organized by the different sources or conditions promoting pollution or habitat degradation. Objectives are organized by source since treating sources can address a number of different pollutants or conditions. To realize the objectives, a number of tasks have been suggested along with responsible partners that will work with the watershed project's lead agency, the steering committee, which has now developed into the non-profit group, the Les Cheneaux Watershed Council (LCWC). LCWC will begin implementing tasks contingent upon available funding and volunteer participation. Activities proposed include the following:

- Road/stream crossing structural improvement
- Streambank structural improvement
- Develop local stormwater management protocols
- Protect priority wildlife habitat with conservation easements and other land protection measures
- Continue monitoring programs that provide environmental indicators of sustainability

A key component of the Les Cheneaux Watershed Management Plan is creating awareness to the causes of water pollution. This component is described in the information and education plan (I/E). Members of LCWC have continuously suggested various I/E strategies during monthly meetings and consultation with other civic groups. The goal of the I/E strategy is to instill a stewardship ethic in the community. Education projects include:

- Workshops for contractors to increase awareness about wetland and other habitat protection
- Work with local schools to implement watershed education in current curriculum
- Provide opportunities for community to enjoy aquatic resource in order to promote environmental stewardship

Successes of the Les Cheneaux Watershed Management Plan will be evaluated based on the completion of the various best management practices (BMP's) and I/E strategies contained within the plan. Success of the project will also hinge on the success of LCWC to obtain funding and human resources to implement the different BMP's suggested in the plan. Success will also be determined by results from ongoing water quality monitoring activities. Finally, the most accurate measure of success will be the longevity of the partnership between the Les Cheneaux Watershed Council, the local conservation district, other regional partners, and the Les Cheneaux community to protect their unique area.