

Introduction

How we inhabit or protect the natural environment is a critical element in how our community develops. The topography, water, soils, agricultural land, wetlands, and woodlands all function, change, and interact as part of a community's ecosystem. Our community must protect the natural world while still allowing the community to grow in a controlled manner. Development must be channeled to areas that will sustain it while integrating it into the natural and physical fabric of the community. Sensitive areas or areas that have been negatively impacted by development must be treated with care to protect or address property needs.

Existing Natural Features

The following sections describe the existing natural features in Holland Charter Township and how they enhance and im-

part our quality of life.

- **Topography**

While Holland Charter Township does **not have “dramatic” changes in topography** it does have elevation changes that span from low elevations of 574 feet above sea level to a maximum elevation of 694, a total elevation change of just 116 feet across the Township (see [Map 2 in Appendix A](#)).

Some of the area along the Macatawa River and some of the small streams and tributaries exhibit elevation changes up to 30 feet over a short distance, so topographic change is often anything but gradual or regular in these areas. The topography of Holland Charter Township generally consists of level ground to gently rolling hills.

In certain areas, removal of hillside vegetation can cause soil erosion which can ultimately contribute to water quality degradation and poor drainage of stormwater.

- **Surface Water**

Holland Charter Township is home to one primary body of water, Lake Macatawa; one primary river, the Macatawa River; and several small streams and drainage channels. Lake Macatawa is approximately 1,780 acres in overall area. It has an average depth of 12 feet with a maximum depth of 40 feet. About 40 percent of the Lake is less than five feet deep. The Macatawa River flows through the lake emptying directly into Lake Michigan in neighboring Park Township. For this reason, Lake Macatawa is considered to be a drowned river mouth lake. Both bodies of water provide many recreational opportunities, such as, boating, fishing, kayaking, etc.



Aside from the recreational and aesthetic benefits, Lake Macatawa offers superior water's edge living environments that have been increasingly attractive to new residents. Efforts to maintain and improve the quality of surface water must be a priority to protect the local aesthetics, recreational opportunities, aquatic and plant life, and local land values.



The Township does not have any other natural lakes, but there are several private manmade lakes and ponds, often hidden behind vegetation.

- **Floodplains**

There are many acres of established floodplains within the Township. Floodplain boundaries were recently modified by the Federal Emergency Management Agency (FEMA) through

the publication of the new Flood Insurance Rate Maps (FIRM). These maps became effective on December 16, 2011. As seen on Map 3 in Appendix A, we currently have 600 acres of our land located in the “floodway”, 908 acres of land in the “100-year floodplain”, and 639 acres of land in the “500-year floodplain”. The Township’s Zoning Ordinance does not allow land which is located within the floodplain to be developed. Properties that were developed prior to the floodplain determination, must be protected through the purchase of flood insurance.

Flooding potential must be considered when reviewing site plans for new development. Any activity within established floodplains will be subject both to local and state approvals.



Floodplain Definitions

- ◆ *Base flood elevation (BFE) means the elevation to which floodwater is anticipated to rise during the base flood. The BFE regulates the required elevation for flood-proofing structures and determines the flood insurance premium.*
- ◆ *Floodway means the channel of a river or stream and the adjacent land areas that must be reserved in order to discharge the base flood without increasing the water elevation.*
- ◆ *The 100 -year Floodplain is an area of land that will have a 1% chance of flooding annually.*
- ◆ *The 500-year Floodplain is an area of land that will have a .2% change of flooding annually.*

- **Ground Water**

Because much of Holland Charter Township is served by public water service, the use of wells for potable water is very limited. There remain some areas that were developed prior to the water system being extended and many of those homes have chosen to keep the well water as their primary resource.

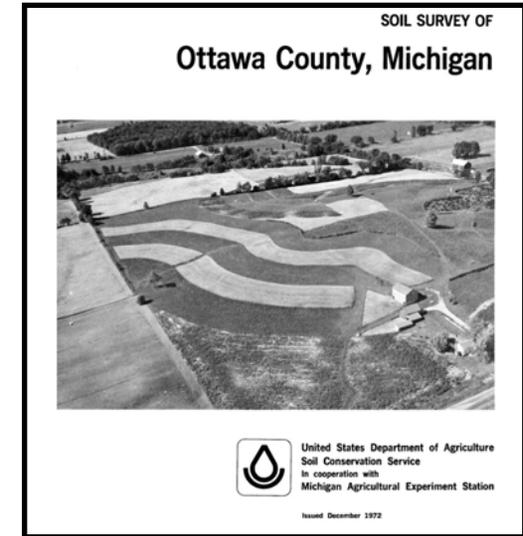


Agricultural and irrigation use of wells which is expected to continue into the future. Recent studies have shown that there has been a significant drop in groundwater levels and an increase in the salinity of groundwater over all of Ottawa County. While some of these issues are caused by natural forces, some are also due to heavy agricultural water well use. The use of deeper wells

and continuing to pump out more groundwater than is being replenished is not sustainable over the long term. Studies have also indicated that the problem is not being caused by less rain, as records show that between the years of 2000 to 2012, the Holland area had more precipitation than in the previous 30 years. Because of the limited number of agricultural wells in the Township, this is not seen as a major detriment to our agricultural area, but the long term results of this situation must be carefully evaluated.

- **Soils**

Most of the soils in Holland Charter Township were formed by materials deposited during glacial activity. Other factors of soil formation include wind-deposited material, alluvial soils in floodplains, and organic soils. A soil survey of Ottawa County was conducted in 1972 by the United States Department of Agriculture. This survey revealed that within the Township, 69 separate soil types can be found. The soil types are categorized into five broad categories – sand, sand-loam, loamy sand, loam and clay (see [Map 4 in Appendix A](#)).



In general, soils in the area are characterized by highly variable permeability, slow runoff, low available water supply for domestic use purposes, high acidity, and medium-to-low fertility. Because of its location near Lake Michigan and its topography, most of the Township lies in an area with a very high water table. This is one of the most important factors controlling the capabilities of the soil.

The Township has significant areas containing soils that are well suited for crop production. There are several working farms in the Township with agricultural land encompassing 28% of the overall

land area. Much of this land, however, is very fragile with respect to high water tables and climatic conditions. During dry periods, these soils are susceptible to wind erosion. Valuable topsoil can be stripped away, making the land less valuable for crop production. During wet periods, water has a tendency to pond on these soils, making cultivation difficult. Proper soil management is essential to produce high quality crops and obtain high yields.



Much of the past development in the Township has occurred primarily in areas of marginal to poor agricultural suitability. However, the best agricultural soils lie in the path of present and future development – east of the City of Hol-

land; and in the northeast quadrant. Maintaining a small amount of agricultural land is desirable as it helps maintain rural character and it also serves a variety of important benefits for the community by providing locally grown food products, preserving open spaces, and by providing important wildlife, flora, and fauna habitats. Given the land areas currently available for infill and developments that still need to be completed, the need to change the use of our current agricultural areas does not seem to be urgent.

Sites being developed in Sections 10, 11, and 12 within the northeast quadrant are within areas depicted as prime agricultural soils on [Map 5 in Appendix A](#). These developments and others planned raise the question of whether farmland preservation methods should be implemented in selected portions of the Township. Because of the availability of urban services, the Township has chosen not to have an aggressive farmland preservation program.



The suitability of soil for on-site wastewater disposal and land development is becoming a moot question in the Township. The 1980 Comprehensive Plan provided data and recommendations regarding septic tanks and construction issues. However, the Township is now served with public water supply and wastewater collection utilities. It is projected that all new development areas are or will be served by these utilities. As such, soil suitability for septic tanks in the Township is not a material issue needing to be addressed. Furthermore, modern road, utility, and building foundation construction technology largely make soil suitability for underground and aboveground construction moot as there are several engineering solutions that can be employed for adverse soil conditions.

- **Wetlands**

Wetland is a term used when referring to marshes, swamps, bogs, and similar features often found between open water and upland areas. Many wetlands and organic soils are typical in the Holland area. While often viewed negatively as a source of mosquitoes and as wasteland, wetlands are a valuable natural resource and are critical in the ecosystem.



Since settlers have occupied our State, it is estimated that the State has lost 50% of its wetlands. Coastal wetlands along Lake Michigan encompassing nearly 400,000 acres have been reduced to about 100,000 acres. With recent regulation, wetland acreage has started to increase which aids in improving water quality.

WETLAND DEFINITION

“Wetlands are areas where water covers the soil, or is present either at or near the surface of the soil all year or for varying periods of time during the year.”

-Environmental Protection Agency

Wetlands provide many direct benefits to the total ecosystem and human habitat. These include:

WETLAND BENEFITS

- ◆ Reducing flooding by absorbing runoff and slowly releasing it into rivers and lakes. (One-acre, flooded to a depth of one foot, contains 325,851 gallons of water.)
- ◆ Contributing to natural nutrient and water cycles, and producing vital atmospheric gases, including oxygen.
- ◆ Recharging groundwater supplies by infiltration to underground aquifers.

Continued >

WETLAND BENEFITS, CONT.

- ◆ Providing commercial and recreational values to the economy, by producing plants, game birds (ducks and geese) and fur-bearing mammals. Survival of certain varieties of fish directly depends on wetlands, requiring shallow water areas for breeding, feeding, and escape from predators.
- ◆ Filtering pollutants from surface runoff, trapping fertilizers, pesticides, sediments, and other potential contaminants, and breaking them down into less harmful substances, improving water clarity, and quality.
- ◆ Serving as nutrient traps when wetlands occur next to the Great Lakes, inland lakes, or streams. The marshy area immediately east of Lake Macatawa near Windmill Island is a good example of a nutrient trap and filter.

The Macatawa River has created significant wetlands in the lands immediately adjacent to it. [Map 6 in Appendix A](#) depicts the locations of existing wetlands in the Township which have been officially designated by action of the Environmental Protection Agency (EPA).



The Michigan Department of Environmental Quality (DEQ) monitors and regulates wetlands in Michigan. The wetlands shown are typically “regulated wetlands,” meaning any modifications or earth change within the area of the wetland must be authorized by a permit from the DEQ. If wetland modification is permitted, such activity most often is accompanied by mitigation measures. Generally, this will involve replacement of lost wetlands in the general geographic area.



The Macatawa Greenway has proposed a major plan for the entire watershed to increase wetlands and impoundments to improve the overall water quality in the watershed. Fundraising and program refinement are proceeding as this plan is being developed.

- **Woodlands**

Much of the Township’s woodlands disappeared during early settlement as farmers cleared existing woodland areas for agricultural purposes. The trees that remained became a natural feature that has not been significantly regulated as development occurs on wooded lands, often resulting in clear cutting as the property is developed.



Woodlands act as buffers and moderators of erosion, flooding, air pollution, and temperature. Specific benefits of woodlands include:

WOODLAND BENEFITS

- ◆ **Protecting watersheds and soils. Forest vegetation moderates the effects of winds and storms, stabilizes and enriches the soil, and slows runoff, allowing the forest floor to filter stormwater.**
- ◆ **Serving as buffers to the sights, sounds, and odors of civilization. Woodlands mute noise from freeways and factories, and absorb air pollutants.**
- ◆ **When adjacent to primary roadways or large parking areas, woodlands can visually complement a developed urban setting.**
- ◆ **Provides a varied and rich environment for plants and animals through its forest layers, including canopy, branches, trunks, shrubs, while plants on the forest floor provide breeding, feeding, and refuge areas for many species of insects, birds, and mammals.**

Much of the woodlands left in Holland Charter Township exist in smaller plots and along the Macatawa River and smaller streams. Woodlands have largely given way to suburban development and agricultural production.

Woodlands generally found within the Township are comprised of the following commonly occurring species: Ash, Beech and Sassafras along Pine Creek, with Oak, Maple, White Pine and Sycamore generally found in woodlands throughout the Township.

As development of woodlands (and open lands) occurs in the Township, policies are needed to assure an adequate level of replacement trees. Cleared woodlands, upon development, should be replanted where practical. Open lands, as developed, should also receive tree plantings. In general terms, replantings should be with commonly occurring mature species that are more likely to grow and remain healthy.



Application of re-planting policies are appropriate for buffers between users or developments, public or private streetscapes, common parking areas, common open spaces within a private development, open yard areas adjacent to public facilities, and existing natural areas to be preserved from active development.

Factors to Consider Based on Natural Resource Analysis

The following sections describe the factors to consider with regard to protecting and enhancing natural resources in Holland Charter Township.

- **High Growth Rates**

The rapid pace of development experienced in Holland Charter Township over the past twenty years (see demographic analysis in [Chapter 6](#)) has raised the issue of how much growth is enough and how this growth may impact natural areas. Development in many rural areas has changed the character of the community and impacted wildlife habitat. It is important that future development is carried out in a manner that conserves the most important environmental features and natural areas. This may require higher density development with more open areas preserved to protect the natural resources.



- **Unique Landscapes**

Holland Charter Township is fortunate to have a unique landscape that includes significant natural resources. To protect these resources requires identification of

threats to the local ecosystem, and action to correct, improve or prevent them.

- **Limited Water Resources**

Township residents have indicated in questionnaire responses that the quality of local water resources, both underground and surface waters must be protected and conserved. It has recently become a concern that agricultural wells are slowly depleting groundwater resources. While this problem is minimal in our Township it is important that our water resource be protected county-wide. It would also be important to carefully monitor new and existing development for potential ways in which they might cause future pollution to either the water or land resource. Best management practices should be developed in all new developments.



- **Community Character**

Residents have continually expressed their desire to see the existing residential character maintained. These desires must be considered while evaluating new planning principals such as cluster development and higher density developments.

Removal of trees for new development and drainage alteration, both of which are typical development practices, can threaten the natural environment that contributes to the community character of Holland Charter Township. It may be necessary to consider a tree preservation or landscaping ordinance to protect that valuable resource.

- **Wetlands Protection**

The power of local communities to regulate wetlands is somewhat limited. Currently, the State regulates wetland impacts and changes to the floodplain. These regulations may have more severe impacts than we sometimes might desire. Careful review of current laws, as well as, continued monitoring of proposed and developing legislation, should be done to ensure the State is adopting

regulations that are appropriate for our Township. Where appropriate, we may wish to develop local regulations that are aimed at providing greater protection of environmentally sensitive areas such as wetlands.

Natural Features Goals & Programs

One of the most important elements of a master plan is the establishment of goals and recommendations that will help attain the states objectives. To be effective, the goals and recommendations must **balance the community's desires with rights of individuals and technical evaluation.**

The following goals and recommendations were developed to give direction to the Township Board, Planning Commission and the community in general when making policy decisions regarding the natural environment. The Township should refer back to these goals and recommendations on a regular basis, or when deciding on critical ordinances or other programs, to ensure **they are managing the community's natural**

resources in a way that is consistent with this Plan.

GOAL

Enhance the quality of life in Holland Charter Township by encouraging the conservation of prime natural amenities such as water bodies, floodplains, open space, wetlands, woodlots, and aquifers.

Recommendations

Develop a Master Plan that addresses the quantity and quality of land use **which insures the protection of the area's** natural features. Protection of Township resources requires the adoption of policies directed toward the specific resource issue including drainage, groundwater quality, natural topography, and vegetation. Resource protection regulations can be incorporated in subdivision, zoning, and other special purpose regulations.

Continue the Township work of active involvement with the Macatawa Greenway in order to increase public access and enjoyment of the greenway network. The

greenway network has provided significant opportunities for the general public to access the waterways and adjacent natural areas and has made significant property improvements, while protecting this valuable public resource. The community has also taken steps to merge the administration of the Greenway with the Outdoor Discovery Center which has resulted in enhanced public access to the greenway network, and allowed for increased uses for public education in addition to the environmental preservation/protection and recreational uses.

Preserve sensitive and important environmental features in the community, such as wetlands and wildlife habitats, open space along riverbanks, and mature woodlots in existing neighborhoods and undeveloped areas.

Work with Ottawa County Water Resources Commissioner to advance Best Management Practices to prevent siltation, contamination of waterways by stormwater run-off and industries, overtaking of drainage systems leading to localized flooding, and costly storm drainage improvements to

be borne by taxpayers. Alternative storm water control systems, including semi-wet ponds, marsh systems, rain gardens, bioswales, permeable pavement, etc. should be considered as a primary approach for storm water control, as feasible, instead of deep detention ponds that often require security fencing. In cooperation with the Water Resource Commissioner explore ways to continue to have the storm water control systems maintained into the future, with minimal expense to the general public. Seek new grant funding opportunities to take advantage of available water quality improvement funding.

Encourage the integration of natural features into new developments as private common open space with covenants in place to assure preservation and maintenance.

Explore new development ideas that maximize the protection of resources, such as New Urbanism development proposals which recommend higher densities with protected open space areas, form based codes, grid type street configurations and fewer cul-de sacs.

Implementation Strategies

The proposed strategies contained in the following tables are concepts and actions that may be undertaken or used to help accomplish the above goals and recommendations.

Natural Resource Implementation Strategies—Collaboration	Priority	*Responsibility
Work with Ottawa County, the Michigan Department of Natural Resources, and other organizations and landowners to identify key environmental and natural features.	Short-Term Ongoing	PC, PD, SA, HA, MACC
Consider the need to create development guidelines with a goal of protecting the natural environment. Engage developers early in planning process for new developments. Study ordinance changes that may be necessary to accomplish this.	Short-Term, Ongoing	PD, PC, TB
Coordinate with the Ottawa County Water Resources Commissioner (OCWRC), adjacent communities, landowners and the Macatawa Area Coordinating Council on watershed and stormwater planning with a goal towards shared systems and natural approaches.	Long-Term, Ongoing	PC, PD, HA, MACC, OCWRC, TB
Continue to explore the extension of the utilities with the Water and Sewer Department to minimize failed septic system impacts.	Ongoing	PD, WS
Partner with the appropriate agencies and/or adjacent communities to determine potential solutions to the water quality problems on the Macatawa River and Lake Macatawa.	Short-Term, Ongoing	PC, PD, TB, MACC

*PC= Planning Commission, TB= Township Board, PD= Planning Department, SA = State Agencies, HA=Homeowners Associations, UC= Utilities Committee, MACC = Macatawa Area Coordinating Council, OCWRC = Ottawa County Water Resources Comm.

Natural Resource Implementation Strategies—Regulations	Priority	*Responsibility
Explore adopting a landscape ordinance that will require vegetation and landscaping that complements the Township. Such an ordinance could have provisions that would limit the number and nature of trees that could be removed during development of parcels. Development incentives might be given for tree preservation.	Short-Term	PC, PD
Work with MACC and OCWRC to determine the feasibility of adopting stormwater management regulations and incorporate best management practices.	Short-Term	PC, PD, MACC, OCWRC, TB
Review the maintenance of detention and retention ponds and other stormwater management systems in the Township and draft regulations for maintenance as the current situation warrants. Consider particular approaches to employ for systems that may require more oversight/proactive maintenance, such as, rain gardens.	Short-Term	PC, PD, MACC, OCWRC, TB
Discourage land uses that have a high risk of pollution from locating adjacent to significant natural features or near underground aquifers or surface water.	Short-Term, Ongoing	PC
Encourage protection of floodplains, wetlands, groundwater resources, natural features, and other environmental features when reviewing development proposals. Prohibit or significantly limit development that would disturb or impact floodplains, wetlands or surface water.	Ongoing	PC, TB

*PC= Planning Commission, TB= Township Board, PD= Planning Department, HA=Homeowners Associations, UC= Utilities Committee, MACC = Macatawa Area Coordinating Council

Natural Resource Implementation Strategies— Improvements and Public Policy	Priority	*Responsibility
Maintain or seek where feasible the acquisition of public access to key natural features and resources.	Long-Term	PC, PD, TB
Ensure the protection of significant natural features by encouraging donation of land to conservancies, open space development strategies, conservation easements, the creation of a land trust, or purchase of land by the Township, County or State.	Ongoing	PD, TB
Evaluate rain gardens and other similar methods as a tool to promote the filtration of runoff from property and to help prevent wetlands and the overall stormwater infrastructure system from receiving discharges that may exceed their capacity.	Short-Term, Ongoing	PC, PD
Continuously refine wetland mapping to accurately depict wetland boundaries and allow all Township staff and the public to have the best information available on the potential location of wetlands.	Ongoing	PD
Explore opportunities to preserve important natural areas and/or features through creative zoning, private open space, conservation easements, and purchase by conservancies, or public acquisition.	Long-Term, Ongoing	TB,PC

*PC= Planning Commission, TB= Township Board, PD= Planning Department, HA=Homeowners Associations, UC= Utilities Committee, MACC = Macatawa Area Coordinating Council