

CHAPTER 3

Natural Resources

Natural Resources and Features

Developmental policies should reflect the influences, advantages, and disadvantages of all natural features in an area. Housing, commercial and industrial development and recreation areas all depend upon the area's natural resources and geologic features. West Traverse Township has a variety of topographic features that must be understood in order to implement the planning process into the form of a Master Plan. The natural resources and features section of the plan should be used as a guide to sound zoning proposals and regulations.

Historic Role of Resources

Historically the area was used by the Native American Indians. The Indians fished the lakes and streams, hunted in the forest, trapped and did some gathering. European settlers were attracted to the area because of trapping and fishing. Later the prime forest within the area attracted lumbering companies. Once the forest was harvested it was either given up for taxes or sold as farms. At the same time the extensive logging was going on, large summer resorts began to be developed, and many of these still exist.

Forest Types and Animals

Maple, beech, birch, red oak and pine are the predominant commercial trees found growing in the well-drained loam soils within the Township. The hardwoods give way to swamp conifers in areas where the soils are not drained and consequently remain wetter.

In the past the variety of forest types gave rise to a variety of wildlife. Pine marten, fisher, otter, beaver, mink, muskrat, deer, squirrel, and black bear were all hunted or trapped by the local people. Logging destroyed most of the natural habitat for wildlife. Only the squirrels and deer remain in large numbers.

Geology

The Geology section is divided into two areas of study, the Subsurface Geology (bedrock) and the Surface Geology (overburden). Bedrock is generally concealed by a mantle of unattached, loose fragmented rock and soil. Surface geology refers to the surface glacial deposits within an area. By categorizing these many deposits into general soil associations, certain assumptions about the material can be made. Those assumptions will be in the area of soil suitability for wells, septic systems, and the soil's ability to support the various types of land uses.

The hilly portions of the Township are called moraines. The steep slopes along the Lake Michigan shoreline are old beach fronts of a much larger Great Lakes Water System, which was in place several thousand years ago. The moraines, like those of the Alps, from which the term was derived, were formed along and to some extent under, the margin of the ice sheet. They contain not only gravelly material, but also a confused mixture of stony clay, sand,

cobblestone, etc. varying greatly in texture and general make-up within a short distance. In general the moraines are thickly strewn with boulders, and thus are in striking contrast with outwash plains, on which small stones and large sandy areas appear. Within this morainic area, however, there are large valley-like lowlands, with flat or very gently undulating beds. Typically the beds are swampy and poorly drained. From these valleys, there is a somewhat abrupt rise to the elevated moranic areas. These valleys appear to have held local lakes during the melting back of the glacier. The swampy areas are generally to the north east of the Township, as an example the center portion of Pleasantview Township.

Soils

The movement of glaciers over bedrock material creates additional soil material which is added to the soils already carried by the glacier. The tons of pressure and slow movement of the ice turned solid rock into an extremely fine ground material. The finely ground soil was deposited and transported by melt water and ice in an unordered fashion. Some of this material came from the Upper Peninsula of Michigan and some from Canada. Thus, we have the scattered patterns of soil types that are seen on the soils map of West Traverse Township. Because of this scattering and mixing of soil types, specific statements have to be made with regard to type and location of soils. Any detailed work dealing with soils should refer to specific data within the Emmet County Soils survey.

The degree of limitation of the soil types provides a measurement by which the impact of a particular soil association can be gauged. Figure 3-1 illustrates which portions of the Township are predominantly covered by which soil association. The following is a brief description of the limitations of the soil associations within West Traverse Township:

Emmet Association: Deep, well-drained, gently sloping to very steep, loamy soils on moraines.

Blue Lake-Leelanau Association: Deep, well-drained, nearly level to very steep, sandy soils on moraines.

East Lake-Blue Lake-Kalkaska Association: Deep, well-drained nearly level, sandy soils on lake beaches and outwash plains.

Deer Park-Dune Land Association: Deep, well-drained, nearly level very steep, sandy soils on lake beaches and dunes.

Emmet Association: This Association makes up most of the sandy loam moraines in the county. It makes up 20 percent of the county. It formed in well-drained sandy loam materials.

Emmet soils make up about 80 percent of this Association. The other 20-percent is made up of minor soils. These minor soils are somewhat poorly drained Charlevoix soils and poorly drained or very poorly drained Ensley soils in the low spots. Some of the larger valleys contain organic Carbondale and Linwood soils.

Most of these soils can be used for crops or pasture. Livestock and dairy enterprises are important. Woodland areas occur throughout the Association, mainly as small farm woodlots. Water erosion is a hazard if the soil is left bare over the winter. Strip-cropping systems are used extensively to control erosion. These soils are suitable for recreation areas and for urban development, having few limitations for these uses.

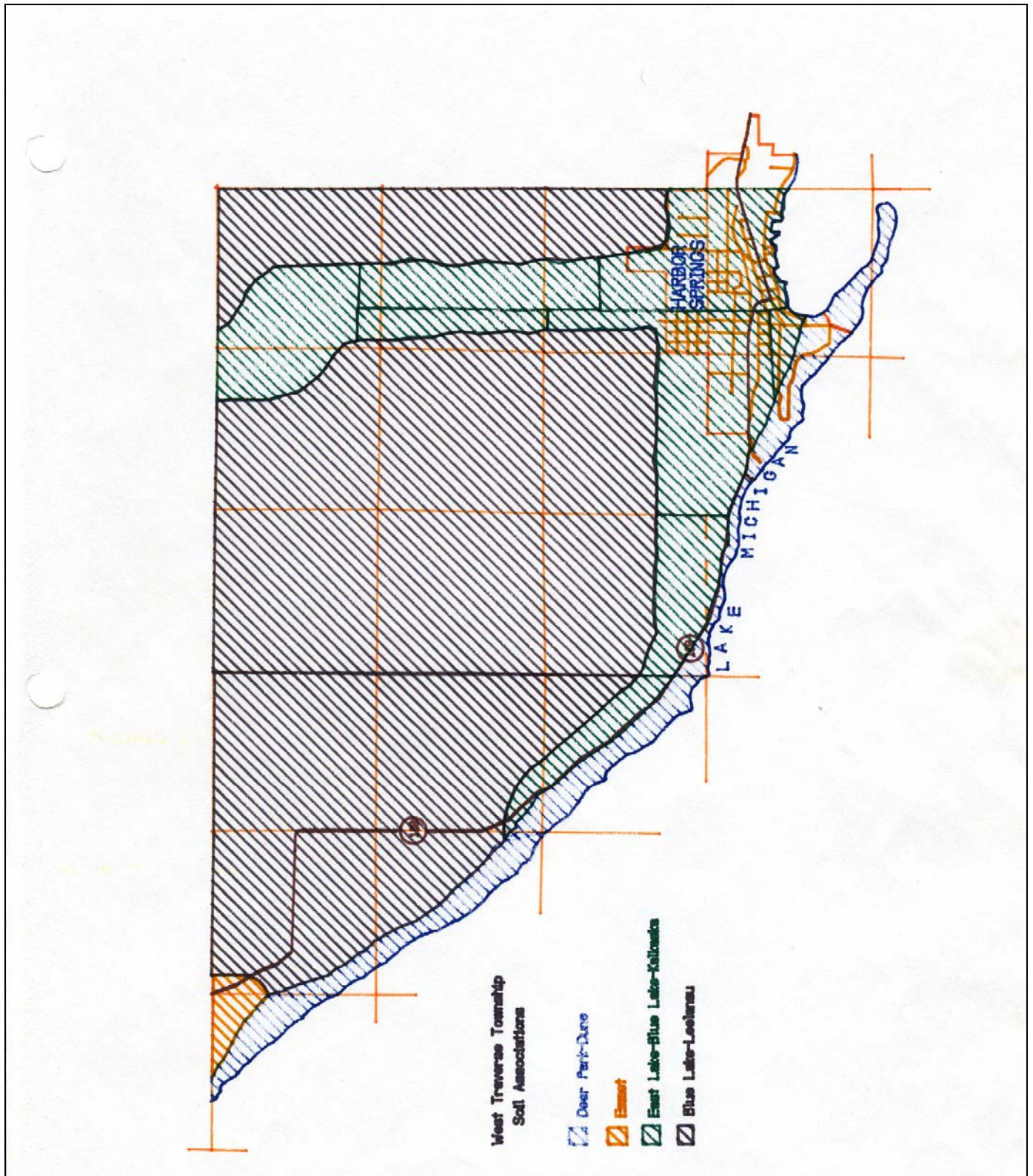


Figure 3-1: West Traverse Township Soil Associations

Blue Lake-Leelanau Association: This Association includes the most hilly areas in the Township. It is the most extensive group of soils within the Township. The soils are nearly level to very steep.

Blue Lake soils make up about 65 percent of this Association, and Leeanau soils, about 25 percent. The rest of the Association consists of well-drained and poorly drained minor soils. Blue Lake and Leelanau soils are well drained and formed in loamy sand and sand. Blue Lake soils have a dark-brown subsoil, and Leeanau soils have a light yellowish-brown to dark-brown subsoil. Both soils have several layers of loamy sand and sandy loam at a depth of 24 to 60 inches. Many of the drainways are occupied by poorly drained or very poorly drained Ensley soils.

The soils in the Association are medium to low in natural fertility. They are somewhat draughty, and they erode easily in areas where the vegetation is sparse. They are subject to both soil blowing and water erosion.

The wooded areas are covered with such northern hardwoods as sugar maple, beech, ash, aspen, paper birch, hemlock and scattered red and white pine. The cleared areas are cultivated and used for pasture and hay or are idle.

The hilly areas are well suited to recreational uses. They have few limitations to use as camping areas, picnic areas, hiking trails, and bridle paths. These soils have a high potential for sustained- yield forests.

East lake-Blue Lake-Kalkaska Association: Deep, well-drained, nearly level, sandy soils on lake beaches and outwash plains.

The soils in this Association lie in outwash plains and valleys and on some of the lake beaches. The soils are nearly level, except for steep escarpments at the edges of some of the outwash plains and lake plains.

East Lake soils make up about 25 percent of the Association: Blue Lake soils, about 25 percent; Kalkaska soils, about 25 percent; and minor soils, the remaining 25 percent. East Lake soils formed in sand and gravel deposits, Kalkaska soils in deep sand, and Blue Lake soils in deep loamy sand and sand. Small areas of somewhat poorly drained Au Gres soils and poorly drained or very poorly drained Roscommon soils and other minor soils are intermixed with the well-drained soils.

The soils in this Association have medium to low natural fertility. They are somewhat draughty and are subject to soil blowing in areas where the soil is exposed.

A large part of this Association was cleared and farmed at one time. Some areas are suited for limited farming. At present many of the cleared areas are lying idle, are pastured, or have been planted to pine. Reforestation is important on these soils.

This Association is well suited for recreational purposes.

Deer Park-dune Land Association: Deep, well-drained, nearly level to very steep, sandy soils on lake beaches and dunes.

This Association consists of sandy and some gravelly shoreline soils along Lake Michigan. The active dune soils are next to Lake Michigan shoreline.

Deer Park soils formed on stabilized dune topography. Dune land is nearly level to very steep. It consists of active sand dune formations.

The soils in this Association have low natural fertility and low available water capacity. They are subject to severe soil blowing if the vegetation is removed. In areas where these soils are stabilized, they are covered with northern hardwoods and a mixture of red and white pine, scattered hemlock, and northern white cedar. These soils are mainly suited to woodland.

Soils Impact on Land Use

The degree of limitation of soils provides a measurement by which the impact of a particular soil Association can be gauged. Major indicators of the ability to use the land can be described as follows:

1. Soils with a high water table at some times of the year have severe limitations for residential development. A high water table makes it difficult to keep dry basements, install and maintain public utilities, and support driveways.
2. Soil texture has an influence on limitation. Clay soils have a high shrink/swell potential, and can cause foundations to shift and crack.
3. Sandy soils, with low available water capacity, provide unique problems when attempting to establish and maintain lawns, shrubs and trees.
4. Bedrock at, or near the surface becomes a major limitation, as it is impossible to construct an operating septic system, difficult to locate basements and foundations.
5. When combined with gradient factors, many soils have a more severe limitation, due to the fact that septic systems located in steep slope areas have side hill seepage.
6. Very sandy soils may allow unfiltered effluent to enter and contaminate shallow ground water supplies. Clay soils prevent proper functioning of septic system drain fields as they do not allow for absorption of effluent.

Each of the above points can be expanded into an economic impact. Because of the influence of the different soil types upon the Township, this natural resource takes on an important significance.

Although this list of soil Associations seems exhaustive it is only the beginning. All large developments proposed within the Township should be analyzed first for their soil Associations and then the individual soils and their limitations should be studied with a summary presented by the applicant to the Planning Commission for review. These limitations are outlined in the Emmet County Soils Survey.

Septic Limitations

Based on the soil types, Figure 3-2 identifies general areas with potential soil limitations for septic systems. The limitations are either related to steep slopes of greater than 18%, hydric (wetland) soils or both. These limitations do not automatically preclude the development of specific sites. Developers should realize, however that construction on some soils may be more costly, in time and money. Due to technological changes, the options for waste disposal systems are evolving, and thus the significance of the identified limitations may be reduced in the future. A more detailed analysis of soils by the District Health Department will determine the suitability for siting a septic system. Health Department approval is required by State law for private systems.

Watersheds

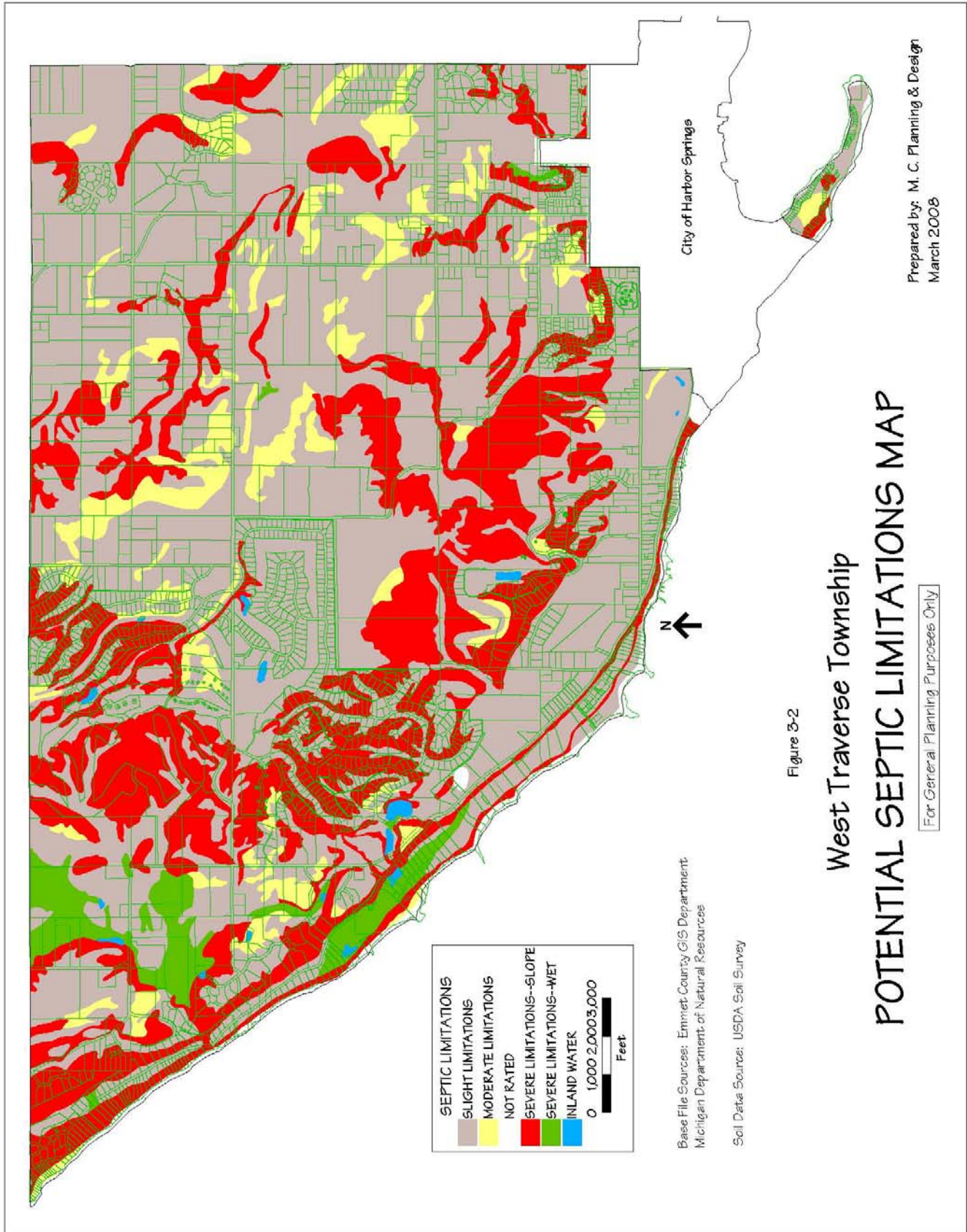
The lay of the land, or topography, determines the direction water falling on the surface will drain. In turn, the topography also outlines the size and shape of these drainage basins. One of these basins is called a watershed. Precipitation accumulated in these watersheds supplies water to streams, lakes, underground reservoirs, and overall water table. The movement of the water through the soils acts as a purifier. Then, man taps the various supplies of water that yield quantities sufficient for his needs. But, after the water is used, it contains impurities that need to be removed before the water can be returned to the natural environment. Inefficiencies or complete neglect of treatment are often the case because of the economics involved in such treatment operations. More conscientious attempts at water purification are coming about now with the increase in legislation and monitoring by governmental agencies. Though regulations can bring unexpected expenses to communities that were unknowingly polluting their water resources, each corrected situation means a better chance for fresh water in the future.

There are several small drain-ways within the Township draining into Lake Michigan. There are two large drain-ways within the Township, Five Mile Creek drains an area in the North West portion on the Township, and the Franklin Park drain-way which drains the Birchwood Farms area and flows east and through Franklin Park and then into drainage ways within the City of Harbor Springs.

Water Features

The enjoyment of outdoor water activities is a well-known recreational attraction. The activities include swimming, boating, and sport fishing. Water sports are available because of the high quality of the water we have in the Township. West Traverse Township has only one useable lake which is Lake Michigan. This Great Lake provides fishing, bathing, boating, sunbathing, water, and it acts as a climate moderator. Lake Michigan is the second largest of the Great Lakes and it is a major contributor to the popularity of the West Traverse Area.

Five Mile Creek, the only creek within the Township which runs year round, is also the only sizeable cold water creek between Harbor Springs and Mackinaw City. Although the stream is also completely under private ownership, part of the watershed is protected under agreements with the Little Traverse Conservancy.



Topography

The surface characteristics of an area are explained by its topography, which is described through the measurement of elevation above sea level. These changes in elevation add character to an area as well as noteworthy considerations for development. The steeper grades may be an enticing location for single-family homes, but the potential hazard to natural areas is greatly increased. Regulations are necessary to manage how and where development can occur in order to ensure the environmental issues associated with building on steep slopes are adequately addressed. Construction costs associated with development on steep slopes rise both for the individual and the public as services are provided. This is not suggesting that all construction should take place on level terrain, but consideration should be given to increased environmental risks and the associated expenses.

West Traverse Township has topography which is similar to other northwestern Michigan Townships which border Lake Michigan. Most seem to have steep old beach fronts with the hinterlands offering heavy relief caused by glaciations. The steep slopes of the old beach fronts offer extreme problems regarding building and caution should be used when building is allowed.