Empire
Environmental Stewardship Assessment
2012

Let Our Resources Work For You.

Northwest Michigan Council of Governments

Workforce • Business • Community

Acknowledgements

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Michigan's Office of the Great Lakes leads policy development and implements programs to protect, restore and sustain our most precious natural resource. The office collaborates with partners to support sustainable use of these coastal resources, coordinate restoration of severely degraded areas, manage water quality and quantity, prevent aquatic invasive species and engage in emerging issues. We are committed to our Great Lakes mission to ensure a healthy environment, strong economy and high quality of life.

2012

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Leelanau County Map

I. Introduction

Environmental Stewardship and Economic Opportunity in Northwestern Lower Michigan's Coastal Cities and Villages

The Northwest Michigan Council of Governments received a grant from the Michigan Coastal Management Program to implement environmental stewardship and economic opportunity in the eleven coastal communities on Lake Michigan in the Northwest Michigan Council of Governments' region. The project work included assessing the current level of coastal environmental stewardship and then provided additional education for the communities on best management practices that would enhance and protect the natural resources. The communities will then learn how the health of the natural resources plays a key role in future economic development strategies in the region.

The eleven (11) coastal cities and villages included:

City of Harbor Springs (Emmet County)
City of Petoskey (Emmet County)
City of Charlevoix (Charlevoix County)
Village of Elk Rapids (Antrim County)
City of Traverse City (Grand Traverse County)
Village of Suttons Bay (Leelanau County)
Village of Northport (Leelanau County)
Village of Empire (Leelanau County)
City of Frankfort Benzie County)
Village of Elberta (Benzie County)
City of Manistee (Manistee County)

The approach of community engagement and content of the training programs for this project fundamentally promoted principles of sustainable development.

Essential Elements of the Project

- Perform stewardship assessments for each coastal city and village to benchmark the current level of environmental stewardship of the natural resources and the overall community health.
- Develop and provide educational programs for city and village officials and staff, citizens, agencies, economic development organizations, businesses and local organizations that focused on strategies and resources that optimize local environmental quality and on the value, benefits and strategies associated with leveraging an environmentally healthy coastal community to increase sustainable economic opportunities, create a sense of place, and attract and retain talent.
- Provide technical assistance to each community to help them adopt policies and implement actions to protect and enhance environmental quality and create and implement sustainable place-based economic development strategies.
- Create a regional report that provided the environmental quality benchmarks and stewardship status of each coastal community, accompanied by a one-stop-shop of coastal best practices and relevant sustainable economic development strategies that can be leveraged from a high quality coastal resource base. Also, create a general implementation strategy for the best management practices.

II. Community Profile: Empire

HISTORY

Located in the southwestern corner of Leelanau County in northwestern Michigan, Empire occupies over a square mile of land which abuts Lake Michigan at the junction of Michigan Highways 22 and 72. Two major sand dunes, contained within the Sleeping Bear Dunes National Lakeshore, are located to the north and south of the Village. Portions of these dune complexes are located within the Village limits.

Evidence of human use of the Empire area dates back more than 10,000 years to when Paleo-Indian people hunted game during the retreat of the last glaciation (Lovis 1984). However, most of the pre-European sites found in the area date from the Late Woodland period between 130 and 1620 A.D. (Haswell and Alanen 1994). Most of these sites were probably short-term hunting camps, but larger agricultural villages have been found to the north, south, and east (Lovis 1984). In the 1700s and 1800s, Ottawa and Ojibwe people began settling in Michigan's LP, including the Empire area. The Ottawa had been displaced from their lands in Ontario as the result of competition among Native American groups for furs to trade with French and Dutch traders (Haswell and Alanen 1994). Intensive human use of the Empire area by Europeans began as early as the 1840s with logging for fuelwood to supply Great Lakes steamers using the Manitou Passage. Agricultural activities followed on the cleared land; subsistence farming was most common at first, but the foundations of the region's fruit-growing activities were laid by the 1870s (Haswell and Alanen 1994). However, by 1910 the forest resources of the area had been largely depleted, and farming declined to fairly low levels by the early 1920s (Vana-Miller 2002).

Empire was incorporated as a Village in 1895. The original village and two additions were platted in 1892. At that time it was a bustling lumber town with a saw mill and loading wharf on Lake Michigan just south of South Bar Lake. At the turn of the century, Empire had a population of 609. In 1917 the lumber mill burned down and the population fell sharply, reaching less than 300 people by 1920. In the two decades following World War II, four other subdivisions were platted. These included South Bar Shores and Bacon's subdivisions along LaCore and Lakeview and Sunset subdivisions at LaCore and M-22. Most of the early settlers were associated with the lumber industry. After the demise of the sawmill, the timberlands were nearly all gone and the village lost many of its people to their original homes, to cities, or to new farms (homesteads) in the surrounding area.

The various nationalities of the early village residents were Irish, Scotch, French, Scandinavian, Belgian, etc. These people started businesses, orchards and farms and became, for the most part, successful in their transitions after the demise of the local lumber industry.

In the 1950's, Empire became the site of an Air Force base that provided some employment opportunities and boosted the Village population by 300. The base was scaled down, then phased out in 1988, but many of the retired personnel have remained in the area. The Air Force base is now a national park maintenance facility, with nine seasonal and year-round housing units on the site. Two Federal Aviation Administration radar domes are in use on the site as well.

The National Park Service (NPS) is a visible, influential part of the Village of Empire. The Sleeping Bear Dunes National Lakeshore was formally established in 1970. Since January of 1987, the NPS administrative offices and Visitor Center have operated in a leased building on the eastern edge of the Village.

The present economic base of Empire is the ever-growing tourism industry. The village is nestled in the midst of the Sleeping Bear Dunes National Lakeshore which attracts over 1.3 million visitors yearly. Tourist

visitation estimates have risen annually since 1984.

Agriculture, specifically apple and cherry orchards, have always been an important source of local employment. Many Empire residents do commute daily to the Traverse City area. It is also important to note that Empire has a growing number of retirees. All these factors must be kept in mind while planning Empire's future.

(Source: Village Of Empire Master Plan Update 2012, Assessment of Natural Resource Conditions Sleeping Bear Dunes National Lakeshore 2009)

CLIMATE

The Empire area climate enjoys the results of a natural phenomenon known as "Lake Effect". Bodies of water retain heat longer during the fall time and absorb heat slower in the spring, thus, the climate is much more temperate during the winter months and noticeably cooler during the summer than the upland areas to the east.

Predominant winds from the west carry moisture from Lake Michigan. As the air rises to pass over the upland terrain, it cools and the moisture condenses into precipitation that tends to fall more often in the upland hills to the east rather than on Empire.

In the Koppen climate classification system, the Empire area is classified as Dfb, also known as the humid continental climate. Summers are moderately warm, winters are cold, and the climate is moist year round (de Blij and Muller 1993). The Lake also increases cloudiness in late fall and early winter, as cold air mixes with warmer, moist lake air and produces snow, rain, and fog near the Lake. The relatively temperate and humid climate of the nearshore environment strongly influences the Empire area's plant communities (NPS 2008b). The mean annual precipitation for the period of record from 1971 to 2000 was 89 cm (NCDC 2004). For the period of record from 1959 to 1980, precipitation was well distributed throughout the year, and approximately 53% of the annual precipitation at nearby Maple City occurred during the growing season, April to September (Michigan State Climatologist's Office n.d.). Annual snowfall totals average 241 cm on the Empire shoreline and 305 to 330 cm inland (Vana-Miller 2002). The prevailing wind is from the southwest, averaging 17.4 km/hr through most of the year; however, prevailing wind direction switches to the northwest in fall and early winter and to northeast in late winter (Vana-Miller 2002).

(Source: Village Of Empire Master Plan Update 2012, Assessment of Natural Resource Conditions Sleeping Bear Dunes National Lakeshore 2009)

GEOLOGY

Overview of Michigan's Geology

The geology of the State of Michigan is dominated by the Michigan Basin, which is an elliptical, intracratonic basin nestled against the southern margin of the Canadian Shield. The Basin occupies approximately 80,000 square miles, and the sedimentary rocks in the Basin, which are predominantly Paleozoic in age, reach a maximum thickness of 16,000 feet.

The Michigan Basin covers all of Michigan's Lower Peninsula and the eastern half of the Upper Peninsula. Strata from Middle Cambrian through Upper Pennsylvanian Periods are well represented throughout the subsurface as seen in the many oil and gas wells drilled throughout the Basin. There are also limited outcrops throughout the Basin, especially at the margins near the Great Lakes. Most of the rocks of the Michigan Basin are buried beneath thick deposits of Pleistocene glacial drift that are the only Cenozoic deposits

known from the Basin. These sands, gravels, and clays are stacked in complex facies relationships and control the patterns of topography seen in much of the Basin. Beneath this veneer of glacial sediments is the eroded bedrock.

Natural resources abound in the Michigan Basin. Oil and natural gas have been produced from subsurface formations in the Basin in Michigan, Ohio, Indiana, and southwest Ontario. Almost 2 billion barrels of oil and 10 trillion cubic feet of natural gas have been produced since the late 1800s. Underground mines near Detroit have produced large quantities of rock salt from Silurian-age evaporite deposits. Solution mining of these salts has occurred nearer the Basin center. Large amounts of potash, bromine, sodium, and chloride have been solution mined from these layers. Limestone, dolomite, and gypsum have been extensively mined from surface quarries in the outcrop areas. Sand and gravel for construction and clay for ceramics and bricks are mined statewide from surficial glacial deposits.

The Great Lakes of Michigan, Huron, and Erie represent the greatest fresh water resources in the region. Along with Lakes Superior and Ontario (which are not geologically part of the Michigan Basin), these five Great Lakes comprise the largest accumulation of fresh water on the earth's surface. There are also vast volumes of fresh water in the glacial drift and shallow bedrock throughout the Basin. The Great Lakes owe their origin to the erosional processes of lobes from the Laurentide ice sheet. The moving ice scoured the areas of softer bedrock, commonly composed of shales.

Quaternary Geology

Formation of the Great Lakes Basins - Episodic glaciation was the major process responsible for creating the Great Lakes basins; however, bedrock (type and distribution), regional structure and paleo-drainage patterns have all influenced the present-day configuration.

The watershed can be divided into two regions. The northern upland region (the Canadian Shield) is underlain by Precambrian granites, gneisses, and metavolcanic and metasedimentary rocks. The southern lowland region (the Michigan Basin) is underlain by relatively soft, Paleozoic sedimentary rocks. These rocks all dip toward the center of the state of Michigan into the structural basin. These rock layers appear as a series of stacked bowls with their truncated edges forming a circular pattern encompassing and forming the state of Michigan (much like a bull's-eye). This region includes the Lake Erie, the Lake Michigan, the western portion of the Lake Huron, and a portion of the Lake Ontario basins. Glacial erosion has scoured out these lake basins following the circular, structural pattern where the Paleozoic rocks crop out at the surface around the Michigan Basin. Here, the pattern is much more controlled and better developed than that formed by glacial erosion on the Canadian Shield granite, gneisses, and metasedimentary rocks. This difference is particularly apparent when observing the semi-circular shape of the western portion of Lake Huron carved out of the Paleozoic rocks, in comparison to the more random shape of the eastern portion (Georgian Bay) glacially scoured from the Precambrian Shield. This semicircular pattern is reflected in the curvilinear shape of Lake Michigan to the west and Straits of Mackinac to the north. The Great Lakes basins simply conform to the outcrop pattern of the soft limestones and shales of Upper Silurian, Ordovician, and Devonian age.

The Great Lakes watershed was subjected to long-term subaerial erosion prior to Quaternary glacial events. Glacial ice was then channeled through the region by this pre-existing drainage system. Relatively weak bedrock, already exploited by valleys of the paleo-drainage system, was increasingly scoured and eroded, thereby exerting one more control upon the formation of the present-day landscape. Glacial scouring varies considerably from lake to lake. The floor of the northern portion of Lake Michigan tends to be somewhat irregular.

Glacial sediments, often greater than 165 feet (50 meters) thick, and in places over 1,150 feet (350 meters) thick, blanket the region. Broad, low, glacial moraines and a few Paleozoic bedrock escarpments provide moderate relief. Quaternary glacial sediments also occur in the basins, often exceeding 330 feet (100 meters) in thickness. These glacial sediments indicate that the present-day Great Lakes Basins are the product of both glacial erosion and post-glacial deposition.

Glacial Events - The glacial history of the Michigan Basin is very complex. Six major ice sheets advanced across the Michigan region probably beginning as early as 2.4 million years ago. The last two advances are the Illinoian and Wisconsinan events. Illinoian events are inferred from deposits found primarily in Illinois. Warm conditions much like today, in a period 125–179 thousand years ago known as the Sangamon interglaciation, existed between the Illinoian and Wisconsinan glacial events. The last glacial episode, the Wisconsinan advance of the Laurentide Ice Sheet, is well documented throughout the Michigan Basin. Three separate sublobes of this last glacial ice sheet advanced and retreated across the Basin (the Michigan, Saginaw, and Erie Lobes).

Wisconsinan glaciation began sometime between 65 and 79 thousand years ago. Glacial ice first invaded the eastern section of the Great Lakes watershed where the ice margin oscillated until approximately 25 thousand years ago. During this time, a boreal forest-tundra environment covered most of the western portion of the watershed (the Michigan Basin). After 25 thousand years ago, the ice sheet advanced from both the north and the east, overriding the western forest-tundra landscape, and covered the entire watershed. Ice eventually reached the Ohio River to the south and northern Wisconsin and east central Min-

nesota to the west. The ice front fluctuated there for nearly 4,000 years. After 18 thousand years ago, the ice margin began to retreat, but experienced a series of re-advances. Ice finally continued its retreat about 10 thousand years ago, and the watershed was completely ice-free by 9 thousand years ago.

Glacial Lakes - Large, glacial, ice-margin lakes (proglacial lakes) were developed during each retreat of the ice sheet. These lakes filled the newly scoured Great Lakes basins. The northern margin of each lake was established by the southern edge of the glacial ice sheet. The extent and elevation of these lakes varied as outlets were blocked by ice or uplifted by isostatic rebound. New outlets formed as rising lake levels found new low spots through ridgelines. Channels were eroded and downcut or melting ice re-opened old channels. Occasionally, catastrophic influx of water from neighboring glacial lakes left a legacy of lake sediments, abandoned spillways and channels, wave-cut cliffs, beach ridges, deltas, and abandoned shorelines. Some of those old shorelines can still be traced from one lake basin to another.

Fed by glacial meltwater during ice retreats, these lakes expanded, often to the point where they merged with one another. Conversely, the lakes contracted as water levels fell due to the opening of new drainage channels, or as glacial ice once again advanced through the various basins of the watershed.

The Lake Michigan Basin became ice free early in its history. Ice retreated from the southern portion of the basin about 16 thousand years ago, and the first of a series of proglacial lakes formed. This early lake, termed Lake Chicago, expanded and contracted in conjunction with a series of glacial retreats and re-advances. Glacial Lake Algonquin formed approximately 12 thousand years ago as ice retreated, the Straits of Mackinac opened, and Lake Chicago (Kirkfield Stage) expanded and merged with waters occupying the Huron Basin. Eventually, with continued ice retreat, waters in the Lake Michigan Basin joined those of Superior and Huron to form glacial Lakes Nipissing and Algoma.

High rates of bluff erosion, development of strong cliffs, and formation of very large sand dunes occurred in association with the Lake Nipissing Great Lakes stage. Mt. McSuba, just east of Charlevoix, is an example of these large Lake Nipissing dune fields. Sleeping Bear Dune, north of Frankfort, Michigan, is partially glacial moraine and outwash deposits covered by windblown sand dunes formed during this same time.

Glacial Landscapes - Glacial landscapes in Michigan result from two opposing processes: deposition and erosion. Thick deposits of glacial debris capped by associated depositional landforms blanket the entire Lower Peninsula of Michigan and the eastern portion of the Upper Peninsula.

Erosional Glacial Landforms - Glacial erratics (of Precambrian age), carried by the glacial ice southward into Michigan from the Canadian Shield, are found in glacial deposits throughout the state. Boulders of Banded Iron Formation (BIF) and pieces of native copper from the Upper Peninsula are occasionally found in Lower Michigan. Although fairly rare, they are easily spotted because they are so distinctive and tend to stand out from the drab sands and gravels. More commonly, rounded pebbles of gray and pink granite, derived from the Canadian Shield, are found in the gravels deposited throughout the Michigan Basin.

Most of the Michigan Basin is blanketed by glacial deposition in the form of diamictons (formerly termed “glacial tills”) and glacial outwash. Landforms, such as drumlins and moraine systems, are composed of diamictons deposited directly from the glacial ice. Diamictons are unsorted and unstratified deposits composed of a heterogeneous mixture of materials in all shapes and sizes.

Outwash, on the other hand, is a very general term applied to sorted and stratified deposits laid down by glacial meltwaters. Depositional glacial landforms such as kames, kame terraces, eskers, and ice-channel fillings are indicative of ice-contact and outwash deposition. Landforms such as outwash plains and valley trains, pitted outwash plains, kettles, and kettle lakes usually indicate deposition near the ice but farther

removed from the immediate ice front.

Diamicton and Drumlins - Numerous, well developed drumlins can be observed along both sides of Grand Traverse Bay. Drumlins in Charlevoix and Antrim Counties, just north of Torch Lake, trend south-southwest, indicating the direction of the ice movement. U.S. Route 31 follows the length of two drumlins between Torch Lake and Charlevoix. The exposed interior of these drumlins is composed of unsorted, unstratified clay and boulder diamicton (till).

Moraines - Moraine systems are the most prominent landscape features across Lower Michigan. Three major ice lobes advanced across Michigan during the Wisconsinan glaciation. These advancing ice masses took on lobate forms, fanning outward in radial patterns along their fronts as glacial ice was channeled through the pre-existing Great Lakes Basins. The Michigan Lobe advanced southward through the Lake Michigan Basin. The Saginaw Lobe advanced southwestward as it was channeled through the Saginaw Bay area. The Erie Lobe advanced westward as it was funneled through the Lake Erie Basin. These three lobes advanced into northern Illinois, Indiana, and Ohio, developing a pronounced terminal moraine (the Cary Border) approximately 16 thousand years ago. The state of Michigan was covered by thousands of feet of ice during this time. Retreat from this position lasted until about 13.5–13.2 thousand years ago, depositing a series of recessional moraines of "Cary" age. The prominent Valparaiso Moraine and Lake Border Moraine that parallel the Lake Michigan coastline through western Michigan, Indiana, Illinois, and Wisconsin formed during this time.

These moraines took on the form of rolling ridges of diamicton and poorly sorted sediments laid down as ice contact deposits, grading into sloping wedges of outwash deposits farther away from the ice front. Minor re-advances interrupted the retreat, often smearing out and re-working the just-deposited recessional moraine system as the advancing ice moved over it.

The last major advance of Wisconsinan glacial ice occurred 11,800 thousand years ago (termed the Valders stadial). Ice, advancing from the north through the Lake Michigan Basin, picked up large quantities of red silt and clay from the Lake Superior Basin (evidence that the Lake Superior Basin must have been a proglacial lake prior to this event) and from the Precambrian iron formations of the Upper Peninsula. The resulting Valders-aged moraines and diamicton deposits, all of which lay north of the older Port Huron Border, are a distinctive red color as a result. This Valders ice advance is also responsible for the formation of the drumlins located in Leelanau and Charlevoix counties.

Proglacial Outwash and Valley Trains - Proglacial outwash is deposited as a sloping, apron-like fan of meltwater laid sediments out in front of an ice-contact recessional moraine being deposited along the ice lobe. Most recessional moraines throughout Michigan occur in association with proglacial outwash aprons that were initially deposited away from the glacial margin. The term "valley train" is applied to these sloping proglacial aprons when they are confined within valley walls. Good examples of valley trains can be observed in the valley extending from Mancelona to Kalkaska, Michigan.

Pitted Outwash, Kettles, and Kettle Lakes - Outwash sediments are frequently laid down around separate blocks of stagnant ice left in front of the retreating ice sheet. Large depressions in the outwash plain result when these ice blocks finally melt. These depressions are termed kettle holes, and the resulting outwash fan, pock-marked by a number of kettle holes, is termed a pitted outwash plain. Kettle holes become kettle lakes when they fill with water. Most of the numerous, small, inland lakes throughout Michigan are kettle lakes, and are associated with pitted outwash plains.

Modern-Day Geologic Processes - The geologic history of the Michigan Basin does not end with the retreat of the most recent glaciers. Rather, landscape development is an evolutionary, ongoing process. For ex-

ample, several distinct types of shorelines exist along the Great Lakes.

High dolomite cliffs are common along the Lake Huron and Lake Michigan shorelines wherever they intersect the Niagaran Series of rocks. The eastern margin of the Door Peninsula, the Garden, Bruce, and Presque Isle Peninsulas, and the western margin of Manitoulin Island are examples of such areas. Rocky headlands and small pocket beaches composed of rounded limestone gravel and sand are found along these shores. Bluffs cut into glacial sediments are especially prominent along the southeastern shore of Lake Huron, the central section of Lake Michigan, and the shores of Lake Erie.

Erosional Shorelines - Coastal bluffs, composed of glacial sediments, are subject to erosion. Low lake levels, as experienced during recent years, have greatly reduced the rate of slope failures along the Michigan coastline. Also, water content of bluff materials is a major controlling factor. Bluff stability is greater, displaying little to no slope movement, during dry periods when water tables are low.

Depositional Shorelines

Sand Dunes - Beaches along the shores of the state of Michigan are some of the best-developed, quartz-rich, sand beaches in the world. Numerous areas of irregular sand accumulations and dune fields occur well inland from current lake shorelines. These areas originated in conjunction with earlier proglacial lakes standing at much higher elevations, and are generally the oldest dunes in the state of Michigan.

Inland, high dunes are common along all the shorelines that ring the state of Michigan. Many of these high dunes are related to high-water levels of Early Glacial Lake Nipissing (9 -2.2 thousand years ago). Along the western side of the state, many of the inland, high dunes are related to the high stages of Glacial Lake Chicago that occupied the Lake Michigan Basin. Generally, these inland dunes are no older than about 13,000 years. They were stabilized by vegetation long ago and are no longer sites of extensive dune growth.

Coastal dunes are younger than inland dunes, having formed along the modern Great Lakes shoreline. They are generally less than 4,500 years old, and are mainly related to Late Glacial Lake Nipissing water levels. Coastal dunes can be divided into two categories. Foredune ridges are low dunes (30–50 feet) that are found close to the water's edge. High dunes (greater than 100 feet) are generally found slightly farther inland behind the foredunes. High dunes may also be found at the water's edge in a few instances. Some of the older high dunes may have been deposited on the tops of glacial moraines and outwash deposits during periods of higher lake levels. These are termed perched dunes. Sleeping Bear Dune is just such a complex, standing 450 feet above the current Lake Michigan water level. Perched dunes tend to be less thick than other foredune types.

Foredunes are the youngest and most active dunes along the Michigan coast. Blowouts occur where dunes lack the stabilizing effects of vegetation. Sand is blown from the windward side of the dune, up and over the crest, to be deposited on the dune's lee side. The dune is observed to "march inland" as this process continues. However, the coastal dunes eventually stabilize as (1) they move away from the beach; (2) the source of sand supply diminishes; (3) they become more protected from the shore winds; (4) they encounter the fronts of the inland high dunes; and (5) vegetation takes hold and provides stabilization.

Beach Ridges - Many beaches along Michigan's shores are marked by a series of recessional beach ridges. These ridges, composed of gravel and coarse sands, were formed along the shorelines by progressively dropping glacial lake water levels. Sets of beach ridges can be observed along the Lake Michigan shoreline in the Sleeping Bear National Lakeshore. Examples can be found between Platte Lakes and the Lake Michigan shoreline evidenced by the closely spaced lines of trees parallel the present-day shoreline. These tree lines reflect former beach ridges, where sediments that favor tree growth have accumulated.

Hooked Spits - Sands necessary for the growth of spits and mid-bay and bay-mouth bars are supplied as beach drift. This beach drift develops as longshore currents erode sands from the beaches they are moving along.

Sand bars and spits grow as beach drift, moving along a shoreline, is deposited into an open embayment as it attempts to extend the beach. Waves, coming into the embayment from offshore, redistribute sediments near the end of the spit, carrying those materials farther into the as the end of the spit "bends" around toward the inner shore of the embayment.

Mid-Bay and Bay Mouth Bars - Waves, longshore currents, and wind action constantly re-shape the shorelines of Michigan. The Upper and Lower Herring Lakes, located in Benzie County about 6 miles south of Frankfort, are good examples of such evolving shorelines. The two lakes lie within a U-shaped depression. This depression is enclosed on the north, east, and south by the Manistee Moraine, but was originally open toward the west as an embayment to Lake Michigan. During late Lake Algonquin time, mid-bay bars developed within the embayment. These bars isolated Upper Herring Lake in the mid-eastern portion of the embayment and another small basin in the very eastern section. This eastern basin was a short-lived lake and is now filled with sediment and vegetation.

The remaining western portion of the embayment drained during the early stages of Glacial Lake Nipissing, but during late Nipissing time, the embayment was once again flooded. During post-Nipissing times, the current bay-mouth bar formed, isolating Lower Herring Lake in the western portion of the embayment. Eventually, during recent times, low foredunes developed on top of this bar and adjacent shorelines. Presently, the two Herring Lakes are isolated from Lake Michigan, being drained only by narrow Herring Creek that cuts across the mid-bay and bay-mouth bar systems.

Crystal Lake, located immediately north of Frankfort, formed in a similar manner. The area originally occupied a topographic low, situated between two east-west trending glacial moraines, and opened to Lake Michigan to the west. Development of a bay-mouth bar isolated the embayment, and complete closure was assured as dunes related to Glacial Lake Nipissing covered the bar.

Geology of Water Resources

Groundwater - Michigan is very fortunate, mostly due to its glacial heritage, that high quality water resources abound throughout the state. The majority of Michigan's water wells tend to be shallow, and can easily be pumped from surficial sands and gravels deposited by glaciers. Much of the groundwater in the Lower Peninsula comes from these glacial deposits, and is "hard" due to the lime ($CaCO_3$) held in solution. Gravels buried beneath impermeable glacial drift in Michigan are responsible for numerous artesian water systems.

Karst Topography Although Michigan is not normally thought of as a region of caves and karst topography, there are limited areas within the state where these conditions do exist. Paleozoic carbonates, now near the surface and only buried by a thin veneer of glacial debris, are readily susceptible to dissolution and karst development.

Surface Water

Rivers - The surface topography of Michigan is primarily the result of glacial events, the last of which ended only 13 to 9 thousand years ago. Therefore, rivers and streams have played a somewhat limited role in the development of Michigan's landscape.

Deltas - Delta growth, where rivers enter standing bodies of water, is an important means of delivering sediments into these glacial lakes.

Many of the delta systems built into earlier glacial lakes have been rejuvenated as water levels dropped and/or as isostatic rebound raised the delta complexes in relationship to the water surface. Distributaries incised the delta floodplains attempting to maintain grade. This has resulted in newly incised river valleys cutting through older, broad, now terraced, deltaic, floodplain deposits.

Inland Lakes - The natural beauty of Michigan is in large part due to the hundreds of inland lakes found throughout the state. Kettle lakes abound and are the most common type of all Michigan's inland lakes.

Other lakes, primarily found in the northern portion of the Lower Peninsula, formed in basins scoured out by the glaciers. Glacial lake levels eventually dropped, causing the shallower portions of these basins to become dry land. Only the deeper portions of the basins remained submerged as inland lakes, now isolated by the shallower dry areas.

Coastal lakes, as already discussed, are the result of embayments being cut off from the surrounding Great Lakes by mid-bay and bay-mouth bars, and later being modified by the development of sand dune systems. Upper and Lower Herring, Hamlin, and Crystal Lakes are typical examples of these lakes.

(Source: Geology of Michigan and the Great Lakes, Robb Gillespie, William B. Harrison III, and G. Michael Grammer, Michigan Geological Repository for Research and Education – Western Michigan University)

MINERAL RESOURCES

Nonfuel Minerals - In 2008, Michigan's nonfuel raw mineral production was valued at $1.99 billion, based upon annual U.S. Geological Survey (USGS) data. This was a $19.7 million, or 1%, increase from the State's total nonfuel mineral production value for 2007, which had increased by $23.8 million, or 1.2%, from 2006 to 2007. With 2.8% of the U.S. total, the State remained ranked 12th in 2008 (11th in 2006) among the 50 States in total nonfuel mineral production value. Sand and Gravel are the Suttons Bay area's main nonfuel raw mineral resources.

From 2007 to 2008, the most substantial decreases in nonfuel raw mineral production took place in portland cement, crushed stone, and construction sand and gravel and was owed to the slowdown in U.S. construction in 2007 and 2008. The value of Portland cement fell by $35 million, or 7%; crushed stone was down $28.7 million, or 22%, with a 21% decrease in quantity produced; construction sand and gravel value fell by $22.4 million while the quantity produced fell by 22%. Smaller, yet significant, decreases also took place in masonry cement, potash, and industrial sand and gravel.

TOPOGRAPHY

Empire sits in a small valley that outlets into South Bar Lake and Lake Michigan. Two large sand dune systems bracket the valley on the north and south. Figure 1-5 maps each of these natural features as well as all wetlands, steep slopes, and forested lands, which are normally more sensitive to urban development than other areas.

The sandy soils in and around the developed portion of the Village were formed as the ancient lake shore terrace and on a glacial outwash plain. The hilly terrain to the south and southeast are glacial end moraines.

South Bar Lake was once a part of the ancient Lake Michigan. However, as the sand dunes began shifting, the cove was cut off from Lake Michigan by the sand deposit. Only a small outlet connects the two lakes.

A portion of the dune areas are state classified as Critical Sand Dune Areas, and as such any development

in this area must be in compliance with the provisions of the state statute and receive state approval in addition to local land use and zoning approvals. Figure 1-6 shows the general areas of Critical Sand Dune Areas within the Village and Empire Township.

WATER RESOURCES

Annual precipitation at Frankfort, 15 miles south of Empire, is 89 cm (NCDC 2004). Measured pan evaporation rates at Frankfort and at Maple City are each 49 cm year-1 (NRCS n.d.), and potential evapotranspiration rates for field crops for the period 2002-2006 were 75-79 cm (MSU n.d.). The annual groundwater recharge rate in the Betsie-Platte hydrologic unit area is 24 cm (Neff et al. 2005). Glen Lake and the Crystal River receive more than 50% of their water supply as direct groundwater input (Heiman and Woller 2003). For the entire Lake Michigan basin, groundwater contributes 79% of streamflow while surface runoff makes up the other 21%; no estimates were specifically made for SLBE streams (Holtschlag and Nicholas 1998)

SOILS

Most of the landscape is blanketed the Leelanau-Kalkaska-Emmet soil association characterized by coarse-textured, deep, and well-drained to excessively well-drained soils that developed in eolian, alluvial, and ice-contact parent materials. Some medium textured (loamy) soils occur on glacial features such as ground moraines, end moraines, and drumlins. Poorly drained (hydric) soils occur sporadically within most areas, and dominate in wetland (NRCS Soil Survey Staff 2007a).

VEGETATION AND WILDLIFE

Village of Empire is host to a number of protected species; a full listing of those species found in Leelanau County is provided in Appendix A. The listed species are protected under federal and/or state law due to their scarcity. Some of these species are found in the Village of Empire, including the Bald Eagle (Haliaeetus leucocephalus), Pitcher's Thistle (Cirsium pitcheri), and Lake Huron Tansy (Tanacetum huronense).

ENERGY

A local citizen group formed in 2009 to advance the goal of providing the Empire area with 100% sustainable energy that is locally owned and produced (current status of the group is unknown).

ECONOMIC ACTIVITY

In 2011 Empire's top 10 economic sectors for total employees (Source: US Census - ACS):

1. Retail trade
2. Educational services, and health care and social assistance
3. Construction
4. Arts, entertainment, and recreation, and accommodation and food services
5. Other services, except public administration
6. Wholesale trade
7. Professional, scientific, and management, and administrative and waste management services
8. Finance and insurance, and real estate and rental and leasing
9. Manufacturing
10. Public administration

Sleeping Bear National Lakeshore Local Economic Impacts

In 2011 Michigan State University conducted an economic impact study entitled "Economic Benefits to Local Communities from National Park Visitation, 2011" for the National Park System. The study included calculations of local economic impacts for each of the NPS Park Units including Sleeping Bear National Lakeshore.

Executive Summary: The National Park System received 278.9 million recreation visits in 2011. Park visitors spent $12.95 billion in local gateway regions (within roughly 60 miles of the park). Visitors staying overnight outside the park (in motels, hotels, cabins, and bed and breakfasts) accounted for 54.9% of the total spending. About half (48%) of the spending was for lodging and meals, 21.4% for gas and local transportation, 9.7% for recreation and entertainment, 8.1% for groceries, and 12.7% for other retail purchases.

The contribution of this park visitor spending to the national economy amounted to 251,600 jobs, $9.34 billion in labor income, and $16.50 billion in value added1. The direct effects of visitor spending are measured at the local level in gateway regions around national parks. Local economic impacts were estimated after excluding spending by park visitors from the local area (9.8% of the total spending). Combining local impacts across all parks yielded a total local impact (including direct and secondary effects) of 162,400 jobs, $4.58 billion in labor income, and $8.15 billion value added. The four local economic sectors most directly affected by non-local visitor spending are lodging, restaurants, retail trade, and recreation and entertainment. Their spending supported 45,200 jobs in restaurants and bars, 34,100 jobs in lodging sectors, 15,500 jobs in retail and wholesale trade, and 20,000 jobs in recreation and entertainment.

In this 2011 study, payroll impacts were not included due to the conversion to a new accounting system for the National Park Service, which prevented obtaining the required inputs for such analysis in time for publication.

Local-Level Impacts of NPS Visitor Spending on Local Economies Except

Park Unit	Public Use Data		Visitor Spending 2011		Impacts of Non-local Visitor Spending		
	2011 Recreation Visits	2011 Overnight Stays	All Visitors ($000's)	Non-local Visitors ($000's)	Jobs	Labor Income ($000's)	Value Added ($000's)
Sleeping Bear Dunes NL	1,348,304	129,973	132,774	129,244	2,288	52,893	102,846

SBNL's 2012 visitation of 1,531,560 was an increase of 208,139 visitations over 2011's numbers, ranking it 9th for total change in visitation among other National Parks, National Seashores, National Lakeshores, or National Recreational Areas in the National Park System.

AIR QUALITY

As of date of this report, the Michigan Department of Environmental Quality does not maintain any air quality monitoring sites in Empire. The nearest MASN Monitoring Site is located in Frankfort.

III. Results of the Environmental Stewardship Assessment

❖ Environmental Stewardship Dashboard

Water Systems	▼	Wellhead Protection/Source Water Protection	
	▲	Water Metering	
Wastewater Treatment	—	Sufficient Capacity	Limited to New Neighborhood
	—	Extends to Surrounding Community	Limited to New Neighborhood
	▲	Non-Combined Stormwater System	
	—	Technology	Community Drainfield - No Pretreat
Solid Waste	▲	Reduction Programs	
	▲	Recycling	
	▲	Reuse	
	▲	Purchase Recycled Content	
Energy Management	▼	EnergyStar Portfolio Manager	
	▲	Energy Conservation	
	▲	Efficiency Updates	
	▼	Renewable Use	
Stormwater Management	▲	Municipal Low Impact Development	
	▼	Stormwater Management Plan	
	▲	Incentives/Requirements for Private Develop LID Use	
Transportation Policy	▼	Complete Streets Policy	
	▲	Street Cleaning	
	▲	Non-Motorized Priority	
	▲	Public Transportation	
Environmental Data	▲	DMR Pollutant Releases	
	▲	TRI Releases	
	▲	MAERS	
	12	WDS Sites	
	2	NPDES Permits	
Planning	—	Smart Growth	
	▲	Open Space Preservation	
	▲	Transportation Options	
	—	Walkable Higher Density Housing	Allowed, but would need sewer cap.
	▲	Placemaking	
Recreation	—	Environmental Management of Recreational Resources	
	N/A	Certified Clean Marina	No marinas in Village
Watershed Protection	▼	Watershed Protection Plan	
	—	Areas of Concern	
Economic Development	▲	Economic Development Strategy	
	—	Economic Sustainability Policy	
	▲	New Economy	

❖ Community Water System

A. Source
4 Ground Water Wells

B. Capacity
Wells 1-4 have capacities of 80, 100, 115, and 280 Gallon per Minute Capacity with a 100,000 Gallon Storage Tank

C. Number of Customers
349 Connections

D. Length of Distribution System
9 miles

E. Wellhead Protection Plan/Source Water Protection Plan
No:

The Village has a Security and Emergency Response Plan in place.

❖ Wastewater Treatment

The Village currently has only one community wastewater system that was installed to service the 47 unit New Neighborhood development. It consists of individual household septic tanks inspected annually that drain to community drain fields

A. Type
Septic Tank with Community Drainfield

B. Size
N/A

C. Service Area
The New Neighborhood Development

D. Length of Distribution System
1 mile

❖ Solid Waste

Leelanau County operates Household Hazardous Waste collections generally in the spring, summer and fall.

A. Source Reduction
Yes. Working to reduce paper consumption

B. Recycling
Yes. Village administration office hauls recycling to drop off location located on Fisher Street operated by Leelanau County

C. Reuse
The Village provides for the pickup or drop off of bush and leaves to a composting center

D. Buy Recycled
The Village purchases copy paper with post consumed recycled content.

❖ Energy Management

A. Consumption/one year
Annual Electric Use: 18,400 (kWh)

Annual Natural Gas Use: 2,500 (CCF)

B. Utilities and Sources
Electrical service provided by Consumers Energy. DTE Energy provides natural gas service.

C. Energy Star® Portfolio Manager
No

D. Energy Conservation
The Village underwent a street light audit to identify areas for energy reductions.

E. Energy Efficiency
The Village installed CFLs in the pumphouse and switched from mercury vapor to high pressure sodium for the Village's street lights.

F. Renewable Energy
No current use of renewable energy

G. Education
N/A

❖ Other Stewardship Activities/Policies

- Passed an ordinance on May 28, 2013 requiring Septic Inspections at the time of real estate sales.
- Water Use Restriction Ordinance

❖ Stormwater

A. Piping—type, length, discharges to

A limited area of the Village of Empire is serviced by a public storm sewer system. The initial system constructed in 1953 collected runoff primarily along Front Street via under-ground storm sewer and with the runoff discharged into a small stream which feeds into South Bar Lake. The Village installed a structural stormwater infiltration system under Front Street to collect the stormwater for the majority of Front Street reducing the discharge into the stream and South Bar Lake. A structural infiltration system installation for Lake and Wilce Streets was examined and determined not to be justified at this time.

B. Low Impact Development

The Village is interested in the creation of low impact development stormwater techniques such as rain gardens

C. Stormwater Management Plan

No.

The Village has instituted an annual clean out of the stormwater sewer system since 2000.

❖ Transportation

The Village is beginning the process of developing a transportation plan that will include internal planning as well as linkages with regional assets including the Sleeping Bear Heritage Trail (SBHT). The Village is divided by State Highways M22 and M72 which tri-sects the community into three areas. These legacy trunklines present challenges to developing neighborhoods, the Sleeping Bear Dunes National Lakeshore Visitor Center, access to natural resources, recreational areas, and services from the main body of the Village. Additionally, the Village anticipates being the southern trailhead to the SBHT posing additional infrastructure issues such as: wayfinding, restrooms, bicycle facilities and so on.

Primary goal is the development of a Village Transportation Plan which will provide the baseline planning guide for the desired transportation network. This community transportation plan will provide a basis for funding opportunity efforts that will enable the identified specific actions in the plan to be implemented. The planning will be comprehensive inclusive of: motorized and non-motorized modes, infrastructure and guidance [wayfinding/signage].

Additional Goals are as follows:

- Create a user friendly, visible transportation system connecting the assets of the Village, the community area and the region;
- Develop connectivity linkages to all Village neighborhoods and assets by developing safe Michigan highway trunkline crossings; Develop and implement the actions and elements to create the friendly and safe transportation network and environment;
- Attract entrepreneurial interests, increase economic activity, stabilize/grow the population, create employment;

❖ Transportation Continued

- Provide functional linkages to the evolving trail system for the residents and visitors; and
- Enhance the experience of visitors and tourists to the Village of Empire.

A. Complete Streets
No

B. Street Cleaning
Yes: Street cleaning is conducted with sweep based equipment.

C. Snow Removal/Storage
The snow is removed and stored on Village owned vacant lots and the compost pile area

D. Non-motorized Transportation Facilities
The Michigan Department of Transportation (MDOT) commissioned the Northwest Michigan Council of Governments to develop the Northwest Michigan Regional Non-Motorized Transportation Plan and Investment Strategy 2008 for the 13 counties of Emmet, Charlevoix, Antrim, Kalkaska, Grand Traverse, Leelanau, Benzie, Manistee, Wexford, Missaukee, Osceola, Lake, and Mason in northwest, Lower Michigan. MDOT has used the Strategy to prioritize funding projects in the region. The guiding vision of this project is to connect existing trails, offering residents and visitors more opportunities for non-motorized transportation and to enjoy more of the region's natural resources.

The project gathered information on existing and future trails from the county, township, city and village board members, planning commissions, parks and recreation commissions, and staff. Sub-regional meetings took place with trail organizations, groups, and stakeholders to review the proposed trail maps for their input. Then the compiled maps were presented to the public at sub-regional trail gatherings for input and to prioritize the proposed trails.

Please see Appendix F. Northwest Michigan Non-Motorized Strategy 2008 – Leelanau County on Page 55

The TART trail system is in the process of being extended through the Village.

E. Public Transportation
Bay Area Transportation Authority (BATA) provides a variety of bus services throughout Grand Traverse and Leelanau Counties. Services are focused on feeding passengers into and throughout downtown Traverse City. The 2011 ridership was 539,384.

BATA established a Fixed Route System in the spring of 2013 with the City and Village Loops. For rural riders unable to access a fixed-route stop, Village Link service connects to Village Loop routes for travel to and from Traverse City. The Glen Arbor Loop provides a connection for Village of Empire riders to the Traverse City Hall Street BATA Station. BATA Dispatch Services helps riders schedule pick-ups and connections. Traditional dial-a-ride services (City Link) are available for Traverse City and the immediate surrounding area.

Please see Appendix I. BATA Glen Arbor Loop (Route 11) Map

❖ Transportation Continued

Leelanau Scenic Heritage Route

◆ Introduction

The Leelanau Scenic Heritage Route begins on the east side of Leelanau County at the Elmwood Township line and traverses north along Grand Traverse Bay/Lake Michigan through the Village of Suttons Bay to Northport, then down the west side of the County turning off on M-109 through Sleeping Bear Dunes National Lakeshore, then back to M-22 through Empire to the Benzie County line. The Route also includes the County connector east-west road M-204 which runs west from Suttons Bay across the center of the County and crosses over Lake Leelanau at the narrows. The Leelanau Scenic Heritage Route was officially designated a Michigan Scenic Heritage Route by the state legislature in 2002.

The Heritage Route Committee works to protect the natural and rural landscape with its many vistas and open spaces such as the orchards, vineyards, fields, hills, valleys, forests, and waterways. And, the historic and recreational attributes. The Committee members include representatives from the Grand Traverse Band of Ottawa and Chippewa Indians, Leelanau County, each township and village including the Village of Suttons Bay, the MI Department of Transportation, Sleeping Bear Dunes National Lakeshore, organizations, and citizens.

◆ Management Plan Update: Goals, Objectives, Actions

1. Preserve and enhance the natural, historic, and cultural resources along the Route.
   A. Preserve Viewsheds
      An on-going project of the Heritage Route Committee would be to continue working with the Townships, Villages, and County along the corridor in an attempt to maintain the integrity of the identified areas and to enhance and improve those areas that visually degrade the natural, historic, and cultural resources along the Route.
      i. Greenbelt and Gateway Conservation Easements/Buffers: This would be accomplished through scenic conservation easements and voluntary land acquisition. Also, utilize setbacks and corridor overlay zones.
      ii. Power Lines and other Utilities: Enhancement of the utility areas or relocation of the utility poles would be a project that would be coordinated with MDOT and the local utility companies. This would include implementation of underground utilities and encouraging the burying of present utility and power lines along the Route. Priority poles and transformer stations could possibly be enhanced by a façade of native shrub and plants.
      iii. Signage: Utilize both regulatory and non-regulatory ways to deal with signage. Some local governments' zoning ordinances regulate signage but they do not include the MDOT right-of-way.

      Through Wayfinding Signs Project:

      - Encourage restriction of large billboards and low impact ordinances on outdoor advertising.
      - Encourage signage that blends with the local character and does not detract from the traveler's experience
      - The Committee will also work closely with MDOT to replace or remove unnecessary signs and oversized signs with more discrete signs that will assist the traveler along the Heritage Route and reflect the natural, scenic, and rural character of the Route.

❖ Transportation Continued

iv. Historical Characteristics:
- Encourage preservation of designated buildings such as barns, historic homes, and other structures that contribute to the character of the Corridor.
- Consider the possibility of historic overlay zones.
- Establish historic districts and/or locations with zoning ordinance guidelines.

v. Lighting: Good outdoor lighting improves visibility, safety and security. Work towards lighting the ground and not the sky or the neighbors' property. Recommended actions include:
- Use a uniform lighting pattern to avoid sharp contrasts
- Choose a light fixture that has a full cut-off design
- Lighting should only be placed where it is really needed
- Retrofit existing fixtures with proper shielding to direct light downward and use bulbs with appropriate wattage

vi. Vegetation Patterns: Maintaining natural diversity of the vegetative features along the corridor can be manifested through on-going monitoring of land use and encouraging participation in land preservation projects along the corridor. Encourage "greenscaping" projects that rejuvenate areas, eradicate invasive plants, and use native plants.

vii. Inland lakes, streams/creeks, wetlands: As with any of the natural areas found throughout Leelanau County, Grand Traverse Bay, lakes, streams, and wetlands should receive high priority for preservation and maintenance of water quality.

viii. Assistance in Site Planning: Providing assistance for planning new developments can help to minimize impacts on the corridor. Examples include discouraging ridgeline development and providing a "natural" screen between the development and the roadway. A site plan review could be incorporated into the existing zoning district requirements.

ix. Zoning: Continue to enforce zoning and develop any new zoning that complements the natural, scenic, and rural features of the corridor.

B. Preservation of Farmlands and Farmsteads: To help with the protection of farmlands, practical alternatives for farmers to reduce the necessity to convert prime farmland to other uses need to be developed and promoted.

i. Conservation Easements: Work with the Leelanau Conservancy to promote donations or purchase of conservation easements to reduce the necessity to convert prime farmland to other uses.

ii. Residential clustering: Promote this tool to reduce the necessity to convert prime farmland to other uses.

iii. Agriculture: Encourage strong, viable farms.

2. Preserve the scenic qualities of the corridor and encourage development that will not detract from these qualities.

Future land use along the corridor will be influenced by a variety of factors: individual land owners' decisions, regulations administered by the local unit of government, the state of the economy, land costs, and pressures resulting from the changing demographics, and recreational and travel patterns.

❖ Transportation Continued

A. Preserve Scenic Viewsheds (off of M-22, M-109, and M-204 views are also protected)
An on-going project of the Heritage Route Committee would be to continue working with the Townships, Villages, and the County in an attempt to maintain the scenic integrity of the identified areas and to enhance and improve those areas that visually degrade the aesthetics of the Route.

B. Continue to plan for future development
The "do nothing" approach is often the least controversial, but that strategy risks that the community will end up with new development that does not complement the existing character of the area.

- Development that is consistent with the County and local governments' master plans should be required and enforced.
- Commercial development should be encouraged in established commercial areas.
- Development should also adhere to design guidelines to ensure that community character would be maintained.

There are many ways to reach these goals, including regulatory measures such as zoning, "overlays" that protect certain features or characteristics of an area, the designation of conservation easements, reviewing site plans of proposed developments, and land acquisition.

i. Assistance in Site Planning: Providing assistance for planning new developments can help to minimize impacts on the corridor. Examples include discouraging ridgeline development and providing a "natural" screen between the development and the roadway. A site plan review could be incorporated into the existing zoning district requirements.

ii. Conservation Easements: Conservation easements are a voluntary long-term protection measure. By designating a piece of property as a conservation easement, it is ensured that the land will not be built up past its present state of development. Work with the Leelanau Conservancy to promote this program.

iii. Land Acquisition: Land acquisition is a very effective long-term strategy for ensuring land protection. The Townships, Villages, and County could prioritize areas for property acquisition and work with the Michigan Department of Transportation and the Leelanau Conservancy to brainstorm creative ways to finance the purchase critical properties along Heritage Route.

iv. Enforce existing regulations: Some of the Heritage Route's existing zoning districts were established to ensure that the area grows in a way that is consistent with community needs and interests. Their enforcement is critical to maintain the essential character of the corridor. It should also be recognized that current regulations might not sufficiently protect natural features or rural characteristics.

v. Develop or expand partnerships: Coordinating with entities such as the Leelanau Conservancy, the Leelanau Historical Museum, the Watershed Center Grand Traverse Bay, Leelanau County, Leelanau Chamber of Commerce, local chambers of commerce, and businesses is essential to ensure that land is properly used, protected, and preserved and will also promote successful project implementation.

❖ Transportation Continued

C. Residential
   i. Adopt an incentive system tailored to meet the unique concerns to encourage environmentally sensitive development.
   ii. Adopt a site plan review procedure that will scrutinize all sites to eliminate fragmented development patterns.
   iii. Incorporate lighting, landscaping, tree protection, consolidation of driveways, visibility from roadways, utility placement, and preservation of scenic views and environmentally sensitive areas into the site plan review.
   iv. Use conservation easements as a means of preserving open space components.

3. Encourage community involvement in monitoring of the route.
   A. Maintain and encourage on-going communication with the local communities
   Public support will be key to the continuing success of the Leelanau Scenic Heritage Route.
      i. The planning document is a tool: The Management Plan is a tool for the residents of Leelanau County to preserve and enhance the scenic quality of the Heritage Route.
      ii. Involve many aspects of the community: Township, Village, and County governments, local conservation groups, local historical groups, and local residents will all play a significant role in the continuing success of the Scenic Heritage Route project.
      iii. Role of the Heritage Route Committee: The ongoing role of the Leelanau Scenic Heritage Route Committee will be one of a facilitator, communicator, and educator.
         - The Committee will consist of representatives from the Townships, Villages, County, and tribal governments, residents, local groups, and the Michigan Department of Transportation.
         - The Committee will prioritize the list of enhancement and improvement projects.
         - The Committee meetings will be open to all interested individuals.
         - Local media will be utilized to inform the greater community.
         - Newsletters and other methods of outreach may be utilized as education and information tools.
      iv. Public meetings: Hold public meetings to discuss such topics as road improvements, signage, traffic congestion, and future developments. This type of public forum will allow all who attend the opportunity to articulate concerns and render direct support for particular concepts or projects.

4. Encourage interpretive programs that describe the natural, historic and cultural features located along the corridor.
   Promotion of a Scenic Heritage Route is an important aspect and creative strategy to inform and educate visitors.
   A. Educational and Interpretive Programs
      i. Establish literature: The Committee will continue to create and distribute educational materials that would highlight the scenic, natural history, historic, and archeological aspects of Leelanau County.
      ii. Discrete roadway interpretive areas: The Committee will create interpretive areas that would highlight the scenic, natural history, historic, and archeological aspects of Leelanau County.
      iii. Educational forums

❖ Transportation Continued

5. Promote the maintenance of the unique and rural feel of the villages and countryside along the Leelanau Scenic Heritage Route.

   A. Preservation of the countryside
   An ongoing project of the Heritage Route Committee would be to continue working with the Townships, Villages, and County along the corridor in an attempt to maintain the scenic integrity of the identified areas and to enhance and improve those areas that visually degrade the aesthetics of the Route.

      i. Township Zoning: Continue to enforce zoning and develop any new zoning that complements the natural, scenic, and rural features of the corridor.

      ii. Assistance in Site Planning: Providing assistance for planning new developments can help to minimize impacts on the corridor. Examples include discouraging ridgeline development and providing a "natural" screen between the development and the roadway. A site plan review could be incorporated into the existing zoning district requirements.

   B. Balancing Roadside Safety with Aesthetics
   Safety is of primary importance along the roadway with agricultural operations and product transport, residential commuting and recreation, and tourist travel.

      i. Communicate regularly with MDOT and other government agencies.

      ii. Should the Michigan Department of Transportation determine that a change to the roadway is necessary to ensure or improve safety, projects should be implemented that balance safety, aesthetics, and cost effectiveness.

      iii. The Leelanau Scenic Heritage Route Committee should partner with MDOT to determine creative ways to solve safety challenges. This partnership will only occur if the interests of the community are effectively communicated to decision-makers. The Road Design Guidebook and Context Sensitive Design Guidelines are used by MDOT to determine where special design considerations and documentation may be required to justify projects that do not meet traditional specifications.

      iv. The Leelanau Scenic Heritage Route Committee should communicate regularly with MDOT and the County Road Commission officials regarding their interests for projects planned in the corridor.

      v. Promote the enforcement of the existing regulations such as posted speed limits and anti-littering laws. Ensuring that regulations related to speed of traffic, noise, and nuisances are enforced will assist in the protection of community character and benefit aesthetics.

      vi. The Leelanau Scenic Heritage Route Committee will work with MDOT and local officials to continually monitor the traffic conditions along the Heritage Route. The Committee will pin-point problem areas and work within the context of MDOT's plan to organize strategies to best deal with areas that have high occurrence of accidents or heavy volumes of traffic at certain times of the year. Any mitigation would then need to remain within the guidelines of maintaining the intrinsic values of the corridor.

      vii. Bike Lanes: There is much interest to provide or enhance bike lanes along the Heritage Route. The scenic beauty and challenge of the Route attracts tourists and bicyclists. Bicycle lanes along the corridor would enable bicyclists to enjoy the scenic beauty of Leelanau County while at the same time increasing safety and relieving traffic pressures during peak times.

❖ Transportation Continued

C. Corridor Beautification Programs
This program would identify and plan beautification projects in the areas of the Heritage Route that could be visually enhanced.

◆ Commerce

The Leelanau Scenic Heritage Route, in addition to being the major roadways in Leelanau County, are also the main routes for commerce. There is a year round influx of visitors with the highest volume occurring in the summer months. Also, there is agricultural traffic during harvest seasons with farm equipment and the transport of agricultural products by large trucks. Heritage Route designation will continue to assist the Michigan Department of Transportation, Leelanau County, and local governments in future roadway planning issues such as utilizing access management techniques and accommodating farm equipment, agricultural products transportation, resident and tourist travel, and pedestrian and bicycle traffic.

◆ Education

Education is an important aspect of the Management Plan. A creative strategy will be used to inform and educate residents and visitors and will focus on developing a sustainable program that will be developed with the local governments, agricultural entities, residents, and business associations. Interpretive materials will provide residents and visitors information on attractions and destinations along the corridor and off the corridor. These educational materials will assist in the streamlining of traffic flow and decrease congestion in certain areas at peak times of the year. The primary goal will be to find a balance that encourages responsible levels of tourism and prioritizes the maintenance of the integrity of the Leelanau Scenic Heritage Route in Leelanau County.

❖ Airport

Cherry Capital Airport (TVC), located in Traverse City and offers the nearest commercial air service and major general aviation facilities. The airport has two runways (Rwy10/28 – 6,500 feet in length, Rwy18/36 – 5,378 feet in length), an FAA operated control towel, and instrument approaches procedures. Currently there are three commercial air carriers offering service at TVC. The United States Coast Guard (USCG) Air Station Traverse City is located at TVC and performs response duties to enforce domestic fisheries law and International fisheries agreements. The USCG Marine Environmental Protection program develops and enforces regulations to avert the introduction of invasive species into the maritime environment, stop unauthorized dumping, and prevent oil and chemical spills. This program is complemented by the Marine Safety program's pollution prevention activities.

Additional general aviation airports near Empire include the Empire Airport. The Empire Airport has two runways (Rwy17/35 – 2,600 feet in length [paved], Rwy09/27 – 2,275 feet in length [grass])

As part of the critical infrastructure system that connects people and goods globally, airports are a valuable asset. An airport's impact on Michigan's economy and quality of life can be compared to that of an interstate highway interchange, a railroad station or harbor.

PA 327 of 1945 established the Michigan Aeronautics Code and created the Michigan Aeronautics Commission with general supervisory authority over aeronautics in the state. The Office of Aeronautics within the Department of Transportation carries out the day to day duties of the Commission per statute and rules. One of the primary roles is implementing the provisions of the Federal Aviation Administration (FAA) Modernization and Reform Act of 2012 in regard to the Airport Improvement Program (AIP) which provides federal funding for airport planning and development through 2015.

❖ Airport Continued

Asset management is a vital component of any strategy to identify airport improvement projects based on criteria established through a process of prioritization. This is accomplished with the Michigan Airport System Plan (MASP) and the Airport Capital Improvement Plan (AICP), which is included in the MDOT 5-year Transportation Plan.

❖ Environmental Data

Environmental Data Descriptions

◆ **National Pollutant Discharge Elimination System (NPDES)**

The Clean Water Act (CWA) requires anyone who wants to discharge pollutants from point sources to first obtain an NPDES permit, or else that discharge will be considered illegal. As authorized by the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. For example, NPDES permits control municipal and industrial sources of wastewater pollution. Permits typically require monitoring and reporting. NPDES permits limit a facility's discharge of water quality parameters, specific chemicals, bulk parameters, and flow.

The permit provides two levels of control: technology-based limits (based on the ability of dischargers in the same industrial category to treat wastewater) and water quality-based limits (if technology-based limits are not sufficient to provide protection of the water body). See EPA's Industrial Water Pollution Controls Web page and Water Quality Standards for Surface Waters Web page for more information. The Water Permits Division of EPA's Office of Wastewater Management directs and organizes the program in cooperation with EPA regional offices, states, tribes, and others.

Since its introduction in 1972, the NPDES permit program is responsible for significant improvements to our nation's water quality.

Source: MDEQ http://www.deq.state.mi.us/owis/Page/main/Home.aspx

◆ **Discharge Monitoring Report (DMR) Pollutant Loading Tool**

The DMR Pollutant Loading Tool ("Loading Tool") is a Web-based tool that calculates and reports facility pollutant discharges in pounds per year or by monitoring period. The tool also weights chemicals by their relative toxicity and calculates the toxic-weighted equivalent amount of each chemical released. With this tool you can rank facilities and pollutants by total amount of each pollutant released each year and by the total amount of toxic-weighted pounds released each year. The tool allows users to quickly identifies the facilities that discharge the largest amount of particular pollutants or pollutant groupings with simple filters

Source: EPA http://cfpub.epa.gov/dmr/ez_search.cfm

❖ Environmental Data Continued

◆ Toxic Release Inventory (TRI)

The Toxics Release Inventory (TRI) program maintains a publicly available database containing information on toxic chemical releases and waste management activities reported annually by certain industries as well as federal facilities. EPA compiles the TRI data each year and makes it available through several data access tools, including the TRI Explorer and Envirofacts. The TRI Comparative Analysis tool uses the most recent official year of TRI data.

This data tool includes wastewater pollutant discharge data from EPA's Toxics Release Inventory (TRI). Data is available for the years 2007 through 2010. Users can search TRI data to find the facilities with the largest pollutant discharges to surface waters or municipal sewage treatment plants.

Source: EPA http://iaspub.epa.gov/triexplorer/tri_release.facility

◆ Michigan Air Emissions Reporting Systems (MAERS)

The Federal Clean Air Act requires that each state maintain an inventory of air pollution emissions for certain facilities and update this inventory every year. Michigan's emission inventory is the Michigan Air Emissions Reporting System (MAERS). The Michigan Department of Environmental Quality (DEQ), Air Quality Division (AQD) maintains MAERS reports for commercial, industrial, and governmental sources of air pollution in Michigan. Emissions data is submitted to the United States Environmental Protection Agency (U.S. EPA) to be added to the national data bank. This information is used to track air pollution trends, determine the effectiveness of current air pollution control programs, serve as a basis for future year projections of air quality, track source compliance, provide information for permit review, and calculate the emissions portion of the air quality fee.

Source: MDEQ http://www.deq.state.mi.us/maers/emissions_query.asp

◆ Waste Data Systems (WDS)

The Waste Data System (WDS) tracks activities at sites regulated by the Solid Waste, Scrap Tire, Hazardous Waste, and Liquid Industrial Waste programs. WDS can provide information on ownership and operation of the site; the status of any required permits, licenses, registrations, or certifications; compliance status; authorized transporters; shipments of hazardous or liquid industrial waste (manifest); and user fees.

Source: MDEQ http://www.deq.state.mi.us/wdspi/AdvancedSearch.aspx

◆ Environmental Permit Counts

National Pollutant Discharge Elimination Systems (NPDES) 2011	2 pemits	
MI Waste Data Systems (WDS) 2013	12 sites	16 pemits

❖ Environmental Data Continued

◆ Environmental Data Report

Discharge Monitoring Report (DMR)	
Pollutant Loading - Top Pollutants by Pounds (2011)	**Total Pounds**
No Reports	

Toxic Release Inventory (TRI)*		
Reported Disposed of or Otherwise Released in 2011	**Total On-site Disposal or other Releases (lbs)**	**Total Off-site Disposal or other Releases (lbs)**
No Reports		
Total	-	-
Zip Codes Searched: 49630		

*TRI data reflect releases and other waste management activities of chemical, not whether (or to what degree) the public has been exposed to those chemicals.

Michigan Air Emissions Reporting Systems (MAERS)	
2010 Emissions	**Tons**
Ammonia	No Reports
Carbon monoxide (CO)	No Reports
Lead (Pb)	No Reports
NOx	No Reports
Particulate Matter (PM)	No Reports
PM-2.5	No Reports
PM10 FIL	No Reports
PM10 PRI	No Reports
Sulfur dioxide (SO2)	No Reports
Volatile Organic Compounds (VOCs)	No Reports

❖ Existing Planning Efforts

The assessment of the Master Plan identified the follow components that addressed environmental stewardship and sustainable economic strategies:

Empire Comprehensive Plan (Excluding the Recreation Plan)

◆ VISION

None Stated

◆ GOALS OF THE PLAN:

- Maintain a sound balance between human activities and the environment to retain the Village's atmosphere.
- Promote Empire as an economically viable community which supports recreation, tourism, and small businesses.
- Maintain, improve, and expand the Village facilities including infrastructure consistent with the community needs.
- Provide and maintain community and recreation lands and facilities for safe access and enjoyment by residents and visitors.
- Work with Empire Township, Leelanau County, Sleeping Bear National Lakeshore, and the Grand Traverse Band of Ottawa and Chippewa Indians as well as other appropriate regional, state and federal agencies to promote sound land use planning.

◆ LONG TERM OBJECTIVES

Policies

- Promote Empire as a walkable community.
- Preserve the beauty of the natural environment.
- Protect water quality –both groundwater and surface water.
- Continue and expand community planting program.
- Promote the preservation and protection of historic sites, buildings and features in the Village.
- Maintain healthy trees on all Village-owned property including parks, road right of ways, alley right of ways, and Village facilities.
- Establish a program encouraging tree replacement when mature trees die and/or are removed.
- Encourage the preservation and continued vitality of Critical Dune Areas, Gateway to Empire, Chippewa Run Natural Area, wooded hillsides, and the Lake Michigan shoreline.
- Provide walkable corridors adjacent to park properties.
- Provide non-motorized pathway connections between downtown and recreation facilities.
- Examine open space issues in the area, and determine how to continue protecting significant open space areas.
- Work with other units of government as appropriate to address specific multijurisdictional issues as they arise, such as issues related to land use planning, recreation, public services, or transportation, especially non-motorized pathways.

❖ Planning Continued

ECONOMIC DEVELOPMENT

- Promote the Village as a tourist/recreation destination essential to the existing and future economy.
- Preserve the tourist-oriented, small town character and pedestrian-scale, for economic viability of the community.
- Preserve primary entrance corridors as a valuable visual resource.

FUTURE LAND USE MAP DESCRIPTIONS

Residential

The Residential future land use category is intended to direct future residential growth to specific areas of the Village. The areas comprise the majority of the Village and are located throughout the Village. See Figure 4-1.

The designated Residential areas should be retained for low-density residential use during the present planning period, since the Village is not currently served by sewer. Additionally, it is recognized that the properties located adjacent to South Bar Lake and Lake Michigan face some unique waterfront and environmental considerations, such as issues concerning the critical dune areas, protected species, water quality and shoreline protection.

Multiple Family Residential

The Multiple Family Residential development category is primarily designed to accommodate single-family, two-family, and multiple-family dwellings on lots varying in size. Higher density residential uses, such as apartments, townhouses, condominiums, and convalescent or nursing homes, would be allowed. Community uses such as parks, churches, schools, libraries, or cemeteries, in-home occupations, and bed and breakfast facilities may also be allowed in this area if designed to be compatible with the residential setting.

Village Core –Mixed Use

The Village Core Mixed Use category is designed to accommodate a mix of residential, commercial, and some public service uses. The existing commercial uses are primarily retail and service types of uses. The designated area incorporates both existing commercial enterprises and provides additional area for expansion. It is desired that new development be located in the heart of the designated area, primarily along Front Street between LaCore and Lake Street. The Village core area is intended to maintain the current pedestrian-friendly atmosphere.

General Commercial

The General Commercial land use category is designated along the LaCore Street portion of M-22, to accommodate commercial uses designed to serve the shopping and service needs of pass-through traffic as well as local residents and visitors.

Design standards should be revised to provide safe routes for pedestrians, encourage shared driveways, shared parking, setback requirements consistent with the Village character, and compatible with adjacent land uses and natural constraints.

❖ Planning Continued

◆ Recreation / Conservation

The Recreation/Conservation category is designed to accommodate existing recreation property, areas for future recreation use, or other sensitive resource areas. This land use category will allow for low-intensity recreation development, as well as low-density residential uses consistent with recreational and conservation uses.

The Recreation/Conservation category incorporates Sleeping Bear Dunes National Lakeshore property. This public property is a highly-valued asset for the residents, businesses, and visitors, and it is the Village's intention to work cooperatively with the Park Service. Also included in this category is the Village-owned beach/park on Lake Michigan, as well as Johnson Park and North Park, and the Chippewa Run preserve, owned and protected by the Leelanau Conservancy.

The Recreation/Conservation land use category is consistent with the Village's goals presented in Chapter 2, including the goal to "Provide and maintain community and recreation lands and facilities for safe access and enjoyment by residents and visitors." Primary uses proposed in the Recreation/ Conservation area include public and private forestry, wildlife habitat, parks and recreation, as well as similar open space uses. Secondary uses include low-density residential development.

Please see Appendix C. Future Land Use Map – Village of Suttons Bay

❖ Existing Zoning Efforts

The assessment of the Zoning Ordinance identified the follow components that addressed environmental stewardship and sustainable economic strategies:

Empire Zoning Ordinance Districts

GR	General Residential District
MR	Mixed Residential District
VR	Village Residential District
CR	Commercial Residential District
LI	Light Industrial District
R/	Recreation/Conservation District
PUD	Planned Unit Development

◆ ARTICLE 3: GENERAL REGULATIONS

◆ Section 3.10 – Water Supply and Sewage Disposal Facilities

All water supply and sanitary sewage disposal systems either public or private, for any building hereafter erected, altered or moved upon any premises shall be subject to compliance with District Health Department sanitary code requirements. Plans must be submitted to and approved by the responsible agencies. The written approval of such facilities by District Health Department shall be filed with the application for a Land Use Permit.

❖ Existing Zoning Efforts Continued

◆ Section 3.11 – Outdoor Lighting

1. All outdoor lighting, whether for illuminating sites, parking areas, buildings, signs and/or other structures shall be shielded, shaded, designed and/or directed away from all adjacent districts and uses; and further shall not interfere with persons and vehicles using public streets.
2. Lighting fixtures are to be of the full cut-off design with horizontally aligned flush mounted (non-protruding) lens, directing light on-site only, no more than twenty (20) feet in height and only to utilize High Pressure Sodium or LED bulbs. (Amended: Ord. #124, 2009)

◆ Section 3.15 – Non-Commercial Wind Turbine Generators

1. Non-commercial wind turbine generators (WTG) and anemometer towers erected prior to a non-commercial wind turbine generator may be located in any district, provided the WTG or anemometer tower is setback from the property line a distance at least equal to the total height of the WTG or anemometer tower.
2. The minimum site area for a non-commercial wind turbine generator or anemometer tower shall be two (2) acres.

◆ Section 3.16.1 Off Street Parking Requirements

8. In order to minimize excessive areas of parking, which may be unsightly and contribute to high rates of storm water runoff, exceeding the minimum parking space requirements by greater than ten percent (10%) shall not be allowed, except as approved by the Planning Commission. In granting such additional space, the Planning Commission shall determine that such parking will be required, based on documented evidence, to accommodate the use on a typical day.

◆ Section 3.18 - Streets, Private Roads and Driveways (Amended: Ord. #121, 2009)

8. There shall be a green space between the paved portion of a street and the sidewalk which is at least four (4) feet in width. Trees shall be planted within the green space. Such trees shall be non-invasive deciduous trees and shall be planted every twenty (20) feet minimum. Such trees shall, at the time of planting, have minimum caliper of three (3) inches and a minimum height of fifteen (15) feet.

◆ Section 3.20 - Grading and Filling

In order to protect adjacent properties, public streets, public watercourses, and to provide for adequate drainage of surface water, the following rules shall apply to all construction activities requiring permits pursuant to this Ordinance.

1. Flow Restrictions: The final grade surface of ground areas surrounding a building or structure shall be designed and landscaped such that surface water flows away from the building or structure and is managed in a manner which avoids: Increased flow onto adjacent properties or public roads, the erosion or filling of a roadside ditch, the blockage of a public watercourse or the creation of standing water over a private sewage disposal drainage field.
2. Elevation Restrictions: Filling a parcel of land with earth or other materials to an elevation above the established grade of adjacent developed land is prohibited without the expressed written approval of the Planning Commission who shall first consult the Village Engineer and the County Drain Commissioner.

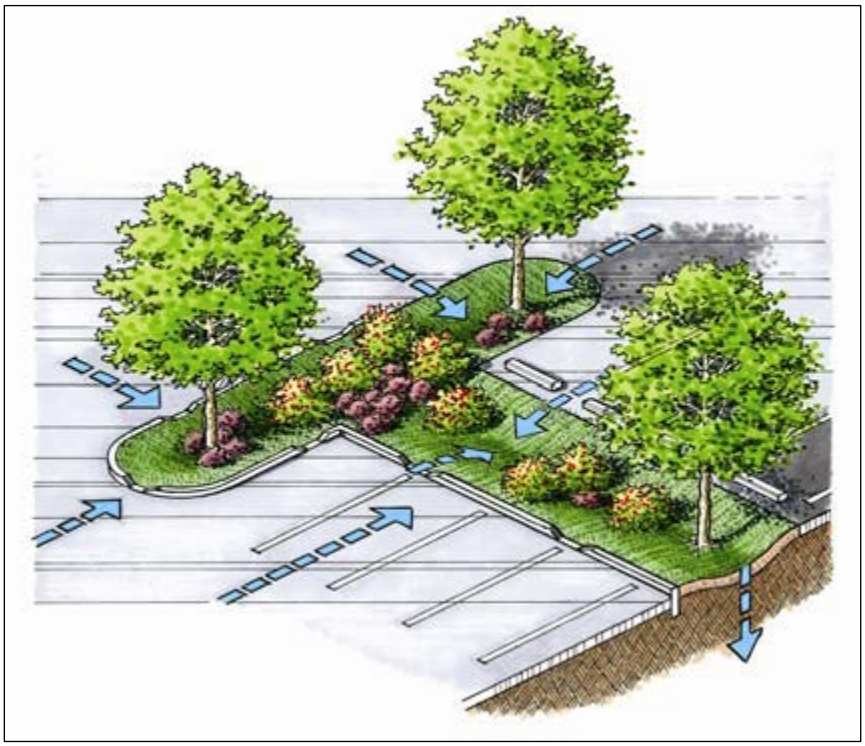
❖ Existing Zoning Efforts Continued

◆ Section 3.21 – Landscaping (Amended: Ord.#127, 2010)

Where landscaping is required by this Ordinance it shall conform to the following standards:

3. Parking and Loading Areas: All off-street parking areas shall be drained so as to prevent drainage onto abutting properties. No more than 50 percent of the required parking area shall be hard surfaced with concrete or asphalt paving. The unpaved parking area shall be maintained in lawn, gravel, or crushed stone and landscaped according to the same standards as the hard surfaced parking areas.

   The intent of this provision is to limit impervious surface area and reduce storm water run-off retention needs. Off-street storage areas shall not be surfaced with impervious materials except as approved by the Planning Commission. Loading areas shall be fenced and screened from adjacent properties.



   For parking lots of 5 parking spaces or more, a canopy tree must be planted for each multiple of 5. This is in addition to greenbelt and buffering requirements. Also, required is a minimum of 60 sq ft landscaped area of at least 6 feet wide into which the canopy tree must be planted. In parking lots of more than 10 spaces the landscaping is to be dispersed throughout the parking lot "in order to break up large expanses of impervious surface. All landscaping areas are to be free of rolled concrete curbs and be engineered in such a way as all stormwater is to be directed to the landscaped areas thus addressing run-off retention needs. The Planning Commission requires that the property owner submit a parking lot plan that shows, among other things, drainage and landscaping.

4. Site Landscaping: In addition to any landscape greenbelt and/or parking lot landscaping required by this Section, ten (10) percent of the site area, of any commercial development, public land use or PUD, excluding existing thoroughfare right- of-way, shall be landscaped.

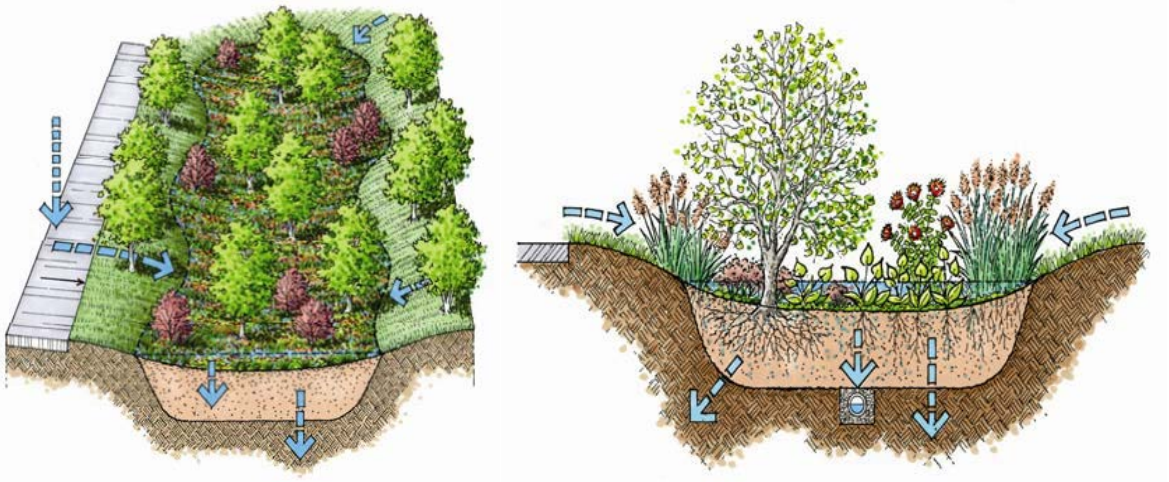
   A. Areas used for storm drainage purposes, such as unfenced drainage courses or retention areas in front or side yards, may be included as a portion of the required landscaped area.

❖ Existing Zoning Efforts Continued

B. Whenever it is deemed necessary by the Planning Commission to protect neighboring properties and/or the general public health, safety and welfare, the Planning Commission may require the installation of bioretention basins, biodetention basins, and/or biodetention swales as follows:

1) Bioretention and Biodetention Basins - Bioretention and Biodetention areas are shallow depressions with suitable natural soils and vegetation that retain, treat and filter water. Sometimes the basins are constructed by replacing unsuitable soil with soil designed to allow more infiltration to the ground water system. These basins are designed to hold water to a maximum depth of 6 to 12 inches, the effective depth for vegetation to remove sediment and nutrients. Biodetention basins have an outlet for release to surface water: bioretention basins have no such outlet and hold runoff.

The most important distinction between these basins and conventional basins is that they mimic the natural hydrologic cycle by holding runoff long enough to allow nutrient and sediment removal, filtration and evaporation. These systems can also provide wildlife habitat, which increases interest and acceptance, especially in residential projects. Bioretention and biodetention basins may not be appropriate for significant quantities of sediment and nutrients that will overload them. In such situations, some type of source control (e.g., streetsweeping) should be incorporated to ensure effectiveness.



2) Biodetention Swales – Biodetention swales are conveyance systems that can complement bioretention and biodetention basins. These shallow vegetated swales are designed with a very flat slope, usually less than 0.5%, to increase retention time: this maximizes filtration and percolation. Unlike conventional conveyance systems, water and nutrients percolate into the ground prior to reaching the bioretention basin. In many cases, it is important to manage sediment quantity flowing into the swale to prolong its life.

5. Landscape Elements: The following minimum standards shall apply to any required landscape elements:

A. Plant materials and grasses shall be of species and varieties which are generally indigenous to the area, and shall be free of insects and diseases, hardy to the climate, conform to the current minimum standard of the American Association of Nurserymen, and shall have proof of any required governmental regulations and/or inspections.

❖ Existing Zoning Efforts Continued

B. A mixture of plant material, such as evergreen, deciduous trees and shrubs, may be required by the Planning Commission as a protective measure against insect and disease infestation. A limited mixture of hardy species may be required by the Planning Commission rather than a large quantity of different species, in order to produce a more cohesive design and to avoid a disorderly appearing arrangement.

C. A landscape buffer may include the use of an earthen berm to a maximum height of three (3) feet. Berms shall be constructed with slopes not to exceed a 1:3 gradient with side slopes designed and planted to prevent erosion, and with a rounded surface a minimum of two (2) feet in width at the highest point of the berm, extending the length of the berm. Berm slopes shall be protected with sod, seed, shrubs or other forms of natural ground cover.

D. Existing Trees:

1) For ecological and aesthetic reasons it is desirable to maintain and increase the tree coverage within the Village. If existing plant material is labeled "To Remain" on site plans by the applicant or required by the Village, protective techniques, such as, but not limited to, fencing or barriers placed at the drip line around the perimeter of the plant material shall be installed during construction. No vehicle or other construction equipment shall be parked or stored within the drip line of any plant material intended to be saved. Other protective techniques may be used provided such techniques are approved by the Village.

2) In the event that healthy trees which are used to meet the minimum requirements of this Ordinance or those labeled to remain are cut down, destroyed, damaged, or excavated at the drip line, as determined by the Village, the Contractor shall replace such trees on a caliper inch per caliper inch basis. A minimum size of replacement trees shall be 3” caliper for deciduous trees and a height of 6 feet for evergreen trees. Example: If an 18” caliper tree is mistakenly cut down, the applicant/contractor shall replace it with trees a minimum of 3” caliper, Article 3: General Regulations Amended: December 8, 2011 Village of Empire Zoning Ordinance 3-21 Effective: December 29, 2011 totaling 18 inches of caliper, such as six trees of 3” caliper size. Such replacement may be planted off site, as determined by the Planning Commission.

◆ ARTICLE 4: DISTRICTS

◆ GR General Residential District

District regulations are designed to encourage lot sizes, land coverage and open space which is compatible with and compliments existing dwelling units. This district is intended to provide for residential development near commercial and public services (post offices or libraries) oriented to serving residential uses.

◆ MR Mixed Residential District

Regulations permit clustering in combination with open space preservation to achieve both economic and aesthetic benefit.

◆ VR Village Residential District

District regulations are designed to accommodate the use of existing small lots, and encourage land coverage and open space which is compatible with and compliments existing dwelling units.

❖ Existing Zoning Efforts Continued

◆ CR Commercial Residential District

This district permits a variety of stores, personal services, offices and residential uses oriented toward pedestrian traffic, while providing for automobile access.

◆ LI Light Industrial District

Section 4.06.2 - Permitted Uses

1. Food processing and packaging
4. Public parks, playgrounds and recreation facilities

◆ R/C Recreation/Conservation District

In the Recreation Conservation District, extreme care shall be taken to preserve and maintain any public facilities for continued and future use. Natural areas cannot be replaced if destroyed, misused or neglected.

◆ PUD Planned Unit Development

The Planned Unit Development District is designated to accommodate planned unit development projects that were approved prior to the adoption of this Zoning Ordinance. New planned unit development projects will be considered by Special Use Permit in specific zoning districts as specified in this ordinance.

◆ ARTICLE 5: SITE PLAN REVIEW

◆ Section 5.03 – Site Plan Review (All Districts)

4. Site Plan Data Required:
   F. The location of existing natural and environmental features, such as watercourses, wetlands, shorelines, man-made drains, mature specimen trees, wooded areas or any other unusual environmental features.

   T. Impact Statement
   The statement shall address itself to the following as applicable to the type of use:

   2) Expected demands on community services, and how these services are to be provided, to specifically include: school classroom needs, volume of sewage for treatment, volume of water consumption related to ground water reserves or community system capacity, change in traffic volume on adjacent streets and other factors that may apply to the particular development.

   3) Statements relative to the impact of the proposed development on soil erosion, shoreline protection, wildlife habitat, air pollution, water pollution (ground and surface), noise and the scale of development in terms of the surrounding environment.

6. Standards for Granting Site Plan Approval:
   B. All elements of the site plan shall be designed so that there is a limited amount of change in the overall natural contours of the site and shall minimize reshaping in favor of designing the project to respect existing features of the site in relation to topography, the size and type of the lot, the character of adjoining property and the type and size of buildings. The site shall be so developed as not to impede the normal and orderly development or improvement of surrounding property for uses permitted in this Ordinance.

❖ Existing Zoning Efforts Continued

C. Special attention shall be given to proper site drainage so that removal of stormwaters will not adversely affect neighboring properties.

G. Pedestrian walkways or sidewalks, shall be provided separate from the streets or roads wherever reasonably possible.

I. Exterior lighting shall comply with the requirements of Section 3.11.

ARTICLE 6: USES SUBJECT TO SPECIAL USE PERMIT

Section 6.02 – Uses Subject to Special Use Permit

3. Standards for granting Special use permit:
   The Planning Commission shall approve, or approve with conditions an application for a special land use permit only upon finding that the proposed special use complies with all the following standards:

   E. Compatibility with Natural Environment
   The proposed special use will not involve uses, activities, processes, materials, or equipment that will create a substantially negative impact on the natural resources of the township or the natural environment as a whole.

ARTICLE 7: SUPPLEMENTAL SITE DEVELOPMENT STANDARDS

Section 7.08 Planned Unit Development, PUD

8. Standards for PUD Approval; Conditions; Waiver of PUD Standards. (Amended: Ord. #102, 2007)

   B. General Standards. The Planning Commission shall recommend approval, or approval with conditions, a PUD application if the Planning Commission finds that the proposed PUD meets all of the following:

      2) The planned unit development shall be designed to preserve public vistas and existing important natural, historical, and architectural features of significance within the development.

      3) The planned unit development shall be designed so that its pedestrian, non-motorized and automobile circulation systems are safely and conveniently integrated with those of abutting property and any linear trail or park systems intersecting or abutting such development.

      4) The planned unit development shall not result in any greater storm water runoff to adjacent property after development, than before. The open space shall be provided with ground cover suitable to control erosion, and vegetation which no longer provides erosion control shall be replaced.

❖ Existing Zoning Efforts Continued

◆ Section 7.10 Sand and Gravel Extraction

4. The sand and gravel operations application shall provide information to confirm compliance with the following standards:

   C. Noise, Dust, Debris
   All processing equipment and activities and all storage areas shall be treated, covered, muffled, or otherwise controlled to prevent excessive dust, debris, or other impacts beyond the property line. Noise levels shall not exceed 60 dBA at the property line. Any trucks hauling material to or from the site shall be enclosed or covered to prevent materials from blowing or falling out of the trucks.

   D. Groundwater Impact
   Extractive operations shall be managed and designed so as to not cause any negative impact on groundwater and potable water supply, whether as a result of contamination or reduction in the rate and volume of flow.

Please see Appendix D. Zoning District Map

❖ Recreational Resources

◆ Recreation Goals

The Village of Empire, because of its environmental attributes, expanses of public (state and federal) land, and the low population density, currently enjoys a favorable reputation as an outdoor recreation area. To sustain and increase the current level of recreational activities for all age groups, the Village should encourage the growth of open-space recreation.

- Encourage the preservation and continued vitality of Critical Dune Areas.
- Develop multi-purpose pathway system in the commercial area and throughout the Village to connect the downtown to the area parks, recreation areas, National Park Service facilities, and other existing trails.
- Work cooperatively to develop the Sleeping Bear Heritage Trail through the Village.
- Pursue the development of bike lanes/designated bike routes where separate pathways are not feasible.
- Through zoning and review procedures, proposed subdivisions, site condominiums, planned unit developments, and commercial developments should be encouraged to provide or participate in the development of neighborhood parks.
- Maintain open space and scenic vistas by encouraging Planned Unit Development, clustering, and conservation easements.
- Maintain existing and establish new trails for biking, cross-country skiing, and walking in the Village and strive to connect to regional trails.

❖ Recreational Resources Continued

The Village of Empire has a system of parks, ball fields, and recreational facilities. To meet the needs of the growing seasonal population and the increased tourist activity, it is important to improve and expand these recreational facilities. Recreational facilities should be developed to meet the needs of the whole community, all age groups, and income levels.

- Encourage the consideration of recreational facilities as an integral part of community development plans.
- Ensure all new playground equipment for Village parks is ADA compliant.
- Provide ADA compliant bathroom facilities at all Village parks.
- Enhance and/or expand public beach and water access facilities.

Community-wide programs that provide opportunities for year-round recreation, personal enrichment, art, musical, and theatrical groups are contributors to the quality of life and attractiveness of the Village. It is important to ensure accessibility to adequate public recreation facilities and cultural activities for area residents and visitors. Coordinated programs and facilities that reflect the character and desires of the community can play a key role in attracting new commercial activities.

- Explore the development of a community center & Greater utilization of the Town Hall.
- Encourage community arts and crafts, musical and personal enrichment programs for all age groups and for seasonal-and year-round residents.
- Encourage and promote cultural facilities and events that meet the needs of the entire community.

◆ Inventory of Recreation Facilities

An inventory of existing recreation facilities located in the Village of Empire is provided below. Sites are grouped according to jurisdictional ownership. Village-owned facilities are listed first, then other public sites, and finally privately-owned recreation sites. Each listing is followed by a brief description of that location. Figure 3-1 illustrates the location of the recreation sites.

Village Owned Parks

Park	Size (acres)	Facilities
Village Beach Park	6.70	**South Bar Lake Side:** Boat Launch Ramp Swimming Dock, Picnic Shelter, Children's Play structure, Picnic Grills, Bathhouse w/ Restroom Facility, Fishing Dock, and Picnic Tables & Benches **Lake Michigan Side** Seasonal Boat Launch Ramp, Basketball Court, Children's play structure
North Park	12.20	Ball fields, Tennis Courts, Walking Path, Children's Play Area, and Restroom Facilities
Downtown Green space	0.14	Wayfinding Kiosk Benches

❖ Recreational Resources Continued

Public Owned Recreation Facilities

Name	Owner	Size (acres)	Facilities
Sleeping Bear Dunes National Lakeshore	National Park Service	107.70	Visitor's facility w/ interpretive center and auditorium (leased), Natural Area, Trails, and Picnic Facilities
Chippewa Run Natural Area	Leelanau Conservancy (Non-profit)	110.00	Natural Area
Johnson's Park	Empire Lions Club	5.3	Picnic Shelter w/kitchen area, Restrooms, Playground Equipment
Township Hall	Empire Township	0.28	Meeting Facilities
Village Nature Preserve (West of Johnson Park, formerly Nature Conservancy)	Village of Empire	13.00	Natural Area with Wetlands

◆ Basis for Action Program

Village Beach Park Facilities and Basis for Action

Existing Conditions	Proposed Action
Park development - Existing parkland well utilized.	Acquire additional adjacent property on south east shoreline of South Bar Lake to allow for the construction of a boardwalk and nature walk with seating. Link into existing village owned adjacent property & Johnson Park.
Pavement Drainage – Runoff from pavement that at present flows into South Bar Lake at boat launch & where runoff forms a pool adjacent to the anchor.	Utilize Bio-Retention Swales – To filter runoff from pavement that at present flows into South Bar Lake at boat launch & where runoff forms a pool adjacent to the anchor. As proposed in Villages Landscape Ordinance.
Picnic Pavilion / Amphitheatre	Create a natural amphitheater on the open space at the south end of South Bar Lake, utilize new pavilion as a stage for events, provide water and power etc.
Parking – Popularity of the improved beach has created parking problems during the height of the season. Cars illegally parked are creating a health and safety issue.	Investigate/introduce alternatives for handling beach overflow parking in peak months to include paid parking either manned or unmanned. Or Do Nothing

❖ Recreational Resources Continued

Village Trail System Facilities and Basis for Action

Existing Conditions	Proposed Action
Separate Trail systems - extensive trail systems exist, but are not connected. These trails include the Michigan Shore-to-Shore trail, which connects to the North Country Trail, and two extensive but separate trail systems in the National Lakeshore.	Form a multi-jurisdictional task force to pursue the linkage of existing trail systems. Create or designate necessary trails/routes to connect existing trails and provide signs to clearly identify connections.
Sleeping Bear Heritage Trail - Non-motorized Trail/Route from M-109 to Empire needed - many recreational and tour group bicyclists use the Lake Michigan Circle Tour route along M-22; without a designated bike path safety is a concern.	Pursue (with MDOT) the completion of the non-motorized trail from M-109 to Empire, to provide for safer routes.
Internal Village Trail System	Plan and attain design and construction costs for a walking and bike trails throughout the Village with connectivity to existing and planned new trails. Promotes a healthier pedestrian year round environment by encouraging more user friendly areas for hiking, jogging, cycling and skiing.

A wide variety of both publicly and privately owned recreation opportunities are available within the region surrounding the Village of Empire. These include:

DNR Boat/Fishing Access Sites. Various sites are located throughout Leelanau County, on lakes including Lake Leelanau and Grand Traverse Bay. Amenities include boat parking, ramp, dock, and rustic restrooms. Sites are approximately 1/2 acre to 1 acre in size.

M-22 Scenic Heritage Route. 60 miles of M-22, M-109, and M-204 have been designated as the Leelanau Scenic Heritage Route. Driving tours, scenic views, and historical sites are accessible on or from the Heritage Route.

Sleeping Bear Dunes National Lakeshore. Located about 15 miles southwest of the Village of Suttons Bay, the Sleeping Bear Dunes National Lakeshore is one of the largest attractions in the region. The park, which covers 50,000 acres in Leelanau and Benzie Counties, provides many opportunities for swimming, hiking, bicycling, hunting, picnicking, camping, and bird and wildlife watching. Attracting over a million visitors annually, positive nationwide press has recently resulted in higher exposure and increased visitation rates.

❖ Recreational Resources Continued

Leelanau State Park. The Leelanau State Park covers about 1,300 acres of woodlands, beaches, and sand dunes at the northern end of Leelanau County, north of Northport. 8.5 miles of trails for hiking, biking, snowshoeing, and skiing, a 42-site rustic campground, two mini-cabins, picnic pavilion and grills, bird watching, hunting, and playgrounds are available. The Grand Traverse Lighthouse museum is also located at the State Park.

Leelanau Conservancy Properties. The Leelanau Conservancy, a 501(c)3 organization, purchases land and easements for the purpose of conservation. The Conservancy owns over 20 properties throughout Leelanau County, many of which provide public access for recreation activities such as hiking, bird-watching, and cross-country skiing.

❖ Marinas

There are currently no marinas located in the Village of Empire

❖ Watershed Protection

◆ BETSIE-PLATTE WATERSHED

Watershed Overview

The Village of Empire lies within the Betsie Platte Watershed. The Betsie-Platte Watershed is an eight digit hydrologic unit code (HUC) watershed located in the northwest corner of Michigan's Lower Peninsula with an area of 812 square miles. It is one of 33 major subwatersheds of the Lake Michigan basin. Its Hydrologic Unit Code (HUC) is 04060104.

The basin was known for a large logging industry in the late 1800s and early 1900s that led to deep sand deposits in the rivers and creeks and roads cut through forests. Attempts at crop farming the cut over land proved largely unsuccessful due to poor soils although the area is known for orchards and vineyards. A majority of the watershed is forested with large stretches being State forest and Federal parklands.

Native plant species in the area range from the extremely drought tolerant species Bearberry (Arctostaphylos uvaursi) and Stiff Coreopsis (Coreopsis palmata) to the wetland species of Blue Flag Iris (Iris veriscolor) and Buttonbush (Cephalanthus occidentalis). More unusual species include the Red Milkweed or Swamp Milkweed (Asclepias incarnata), desired by the Monarch Butterfly as the favorite food source for the larvae.

The watershed is home to critical habitat identified by the Nature Conservancy which includes: Great Lakes Hemlock - Beech - Hardwood Forest, Great Lakes Beachgrass Dune, Great Lakes Shoreline Cattail - Bulrush Marsh, Great Lakes Dune Pine Forest, Great Lakes Beachgrass Dune, Interdunal Wetland.

Critical species identified by the Nature Conservancy and other partners include Prairie Moonwort, Prairie Dunewort, Piping Plover, Pitcher's Thistle, and Michigan Monkey-flower.

❖ Watershed Protection Continued

Watershed Priorities

- Identified Platte River impairments include fertilizers; human and animal waste; oils, toxic chemicals, and salt; sediment; heated runoff; altered stream; pesticides; bacteria; and channel flow.
- The watershed has listed impairments for mercury, PCB and chlordane fish consumption advisories for a limited number of waterbodies (see table on opposite page).
- The watershed has seen significant erosion at stream crossings.
- There is significant sedimentation that has occurred in the watershed.
- Watershed and environmental groups have been undertaking significant projects to protect and restore the watershed. The primary focus of the protection and restoration efforts include:
- Improving water quality and Soil Erosion and Sediment Control.
- Removing manmade drainage features on former farmland to reduce excess storm water runoff.
- Purchase of easements to protect open space and improve environmental functions.
- Protecting ecologically sensitive areas like wetlands and their associated forests as well as undeveloped shoreline.
- Protected sensitive “dune and swale” topography at Sleeping Bear Dunes. The area is recognized by the U.S. Fish and Wildlife Service as “globally rare habitat.”
- Remove invasive species and restore dunes in the Greater Point Betsie landscape. The project facilitates activity at the greater Pt. Betsie landscape to remove invasives and restore dunes to benefit the rare natural communities, including Pitcher's thistle, a threatened species.
- Improve habitat for critical species like the piping plover.

LAKE MICHIGAN LAKEWIDE MANAGEMENT PLAN

Lake Michigan is the second largest Great Lake by volume and the only one located totally within the United States. The northern portion of the basin’s 45,000 square miles, is covered with second growth forest and less developed except for the Fox River Valley. 307 miles to the south, the more temperate southern portion is very developed from Milwaukee through Chicago to Northwest Indiana. Lake Michigan flows into Lake Huron through the straights of Mackinac at a rate that allows for a complete change of water about every 100 years.

Lake Michigan contains the world’s largest collection of fresh water sand dunes along with many wetlands, prairies, and savannas, these all provide essential habitat to a great diversity of life. The aquatic food web supports fish for food, sport and culture. The fertile southern-soils are amenable to agriculture and the coast is home to 25 harbors and hundreds of marinas. The Lake Michigan coastlines also serve as a key North American migratory bird flyway.

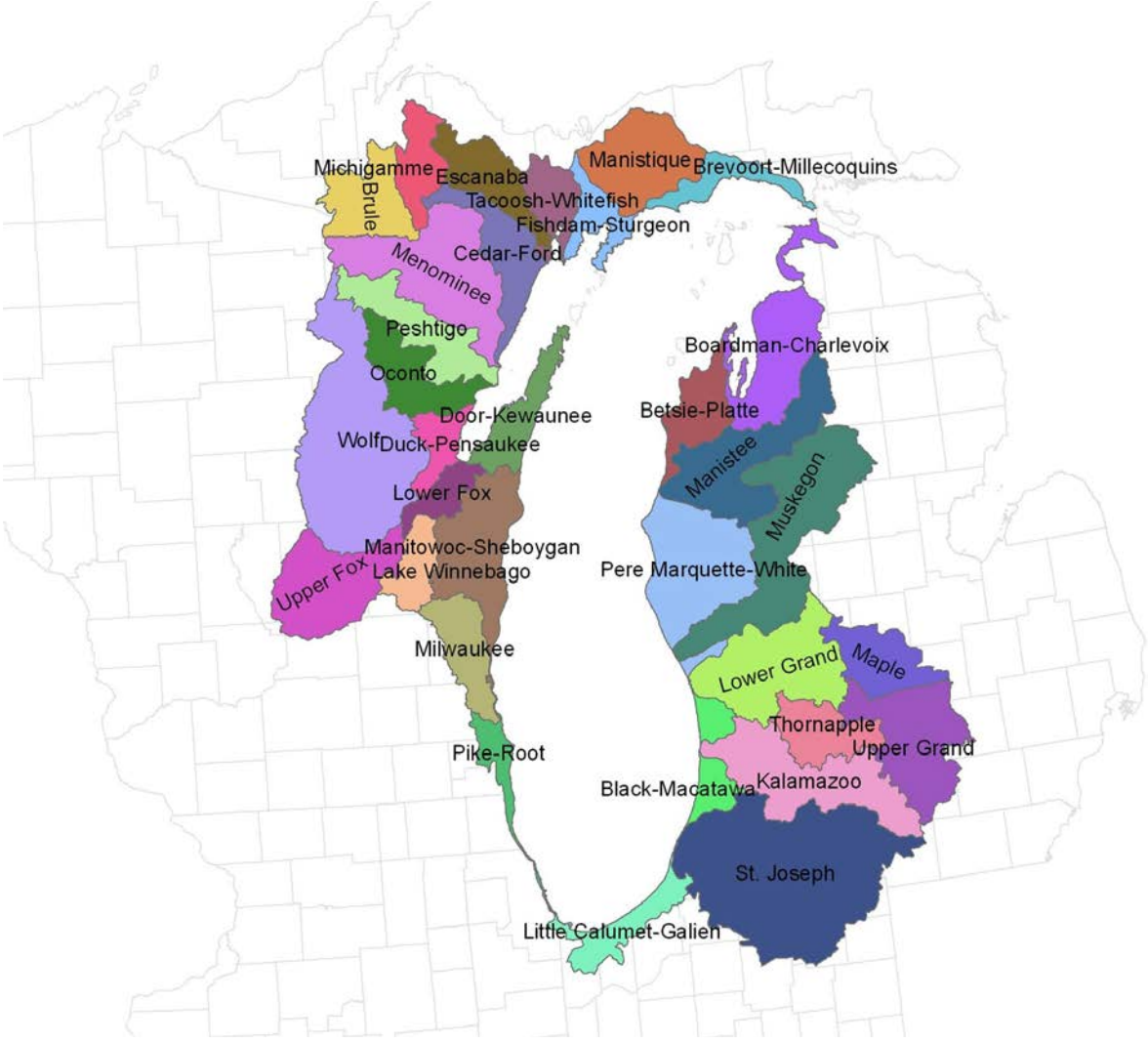
❖ Watershed Protection Continued

The LaMP vision is of "a sustainable Lake Michigan ecosystem that ensures environmental integrity and that supports and is supported by economically viable, healthy human communities." The primary goal "is to restore and protect the integrity of the Lake Michigan ecosystem through collaborative, place-based partnerships." Through a collaborative effort, LaMP projects focus on meeting the vision and goal through monitoring the changing environmental conditions and adapting management strategies by addressing the following 12 sub-goals:

1. Can we eat any fish?
2. Can we drink the water?
3. Swim in the water?
4. Are habitats healthy, naturally diverse, and sufficient to sustain viable biological communities?
5. Does the public have access to abundant open space, shorelines, and natural areas, and does the public have enhanced opportunities for interaction with the Lake Michigan ecosystem?
6. Are land use, recreation, and economic activities sustainable and supportive of a healthy ecosystem?
7. Are sediment, air, land, and water sources or pathways of contamination that affect the integrity of the ecosystem?
8. Are aquatic and terrestrial nuisance species prevented and controlled?
9. Are ecosystem stewardship activities common and undertaken by public and private organizations in communities around the basin?
10. Is collaborative ecosystem management the basis for decision-making in the Lake Michigan basin?
11. Do we have enough information, data, understanding, and indicators to inform the decision-making process?
12. What is the status of the 33 Lake Michigan subwatersheds?

❖ Watershed Protection Continued

Lake Michigan Subwatershed Map



VISION:	**A sustainable Lake Michigan ecosystem that ensures environmental integrity and that supports and is supported by economically viable, healthy human communities.**
STATUS:	**Lake Michigan is an outstanding natural resource of global significance, under stress and in need of special attention.**
GOAL:	**To restore and protect the integrity of the Lake Michigan ecosystem through collaborative, place-based partnerships.**

❖ Watershed Protection Continued

Table 2-1. End Point Subgoals

End Point Subgoals Endpoint subgoals describe the desired levels of ecosystem integrity and ecological services required to restore beneficial uses and provide for healthy human and natural communities in the basin.		
Subgoal 1	We can all eat any fish.	
Subgoal 2	We can all drink the water.	
Subgoal 3	We can all swim in the water.	
Subgoal 4	All habitats are healthy, naturally diverse, and sufficient to sustain viable biological communities.	
Subgoal 5	Public access to open space, shoreline, and natural areas is abundant and provides enhanced opportunities for human interaction with the Lake	
Subgoal 6	Land use, recreation, and economic activities are sustainable and support a healthy ecosystem.	

Table 2-2. Means to End-Point Subgoals

Means to End-Point Subgoals Means subgoals describe the natural and organizational processes required to achieve the endpoint subgoals.		
Subgoal 7	Sediments, air, land, and water are not sources or pathways of contamination that affect the integrity of the ecosystem.	
Subgoal 8	Exotic species are controlled and managed.	
Subgoal 9	Ecosystem stewardship activities are common and undertaken by public and private organizations in communities around the basin.	
Subgoal 10	Collaborative ecosystem management is the basis for decision-making in the Lake Michigan basin.	
Subgoal 11	We have enough information/data/understanding/indicators to inform the decision-making process.	

❖ Watershed Protection Continued

GREAT LAKE RESTORATION INITIATIVE

Plan Overview

This Great Lakes Restoration Action Plan (Action Plan) outlines methods and actions to advance implementation of the Initiative through FY 2014 and will help protect and restore the chemical, physical and biological integrity of the Great Lakes Basin ecosystem.

Five principal focus areas have been identified which encompass the most significant environmental problems in the Great Lakes (other than water infrastructure) for which urgent action is required. These include4:

- Toxic Substances and Areas of Concern
- Invasive Species
- Nearshore Health and Nonpoint Source Pollution
- Habitat and Wildlife Protection and Restoration
- Accountability, Education, Monitoring, Evaluation, Communication and Partnerships

Within the five focus areas, the Action Plan will address the highest priority projects. It is the intent of the Initiative's federal agencies to target efforts and funds to these projects in a way that maximizes results. Targeted, cooperative efforts are necessary to ensure meaningful progress on many of the complex and costly issues that have plagued the Great Lakes for decades. Some issues exist basin wide (e.g., invasive species, nonpoint source pollution,) and require broad, expansive action, while others are more localized (e.g., Areas of Concern, habitat) and will have site-specific remedies.

In each focus area there are efforts which will be given special attention.

- In the focus area of Toxic Substances and Areas of Concern, efforts will be targeted to remediate contaminated sediments and to address other major pollution sources in order to restore and delist the most polluted sites in the Great Lakes basin.
- In the focus area of Invasive Species, efforts will be targeted to institute a "zero tolerance policy" as a long term goal toward new invasions, including the development of ballast water technology, an early detection surveillance program, and a rapid response capability to address threats from new invasive species such as Asian Carp.
- In the focus area of Nearshore Health and Nonpoint Source Pollution, efforts will be targeted geographically to focus on watersheds of extreme ecological sensitivity (such as the Green Bay/Fox River, Genesee River, Maumee River, St. Louis River, and Saginaw River, places where environmental problems and their solutions have been clearly identified).
- Efforts will target implementation of lakewide biodiversity conservation blueprints and restoration of important species such as the Lake Sturgeon and the Piping Plover.

❖ Watershed Protection Continued

- In the focus area of Accountability, Education, Monitoring, Evaluation, Communication and Partnerships, efforts will include implementation priority Lakewide Management Plan projects for restoring the lakes, as well as establishment of quality goals and results-based accountability measures, learning initiatives, outreach and strategic partnerships.

In addition to new federal funding through GLRI, the Initiative will rely on partnerships to leverage and harness a wider set of resources for the protection and restoration of the Great Lakes. In many instances, the most effective solutions to the challenges facing the Great Lakes will require effective use of non-GLRI baseline federal funding, federal regulatory or other policy tools, and the significant regulatory and policy tools and resources of states, tribes, and other non-federal partners. These efforts, summarized below, are complementary to GLRI efforts.

- **Non-GLRI baseline federal funding.** For example, construction of water infrastructure for treatment and conveyance of drinking water and wastewater.
- **Federal regulatory or other policy tools.** For example, national rulemakings and permitting that reduce the risk of future invasions of ANS; permitting activities under the Clean Water Act; or regulatory means to reduce atmospheric mercury deposition to the Great Lakes.
- **Tools and resources of non-federal partners.** For example, stewardship of properties by a state, tribe or non-governmental organization for the purpose of enhancing habitat protection or connectivity; or implementation of source water protection plans for drinking water treatment facilities with intakes that draw from surface or groundwater within the Great Lakes basin.

◆ Long Term Goals

Goal 1: Nearshore aquatic communities consist of healthy, self-sustaining plant and animal populations dominated by native and naturalized species.

Goal 2: Land use, recreation and economic activities are managed to ensure that nearshore aquatic, wetland and upland habitats will sustain the health and function of natural communities.

Goal 3: The presence of bacteria, viruses, pathogens, nuisance growths of plants or animals, objectionable taste or odors, or other risks to human health are reduced to levels in which water quality standards are met and beneficial uses attained to protect human use and enjoyment of the nearshore areas.

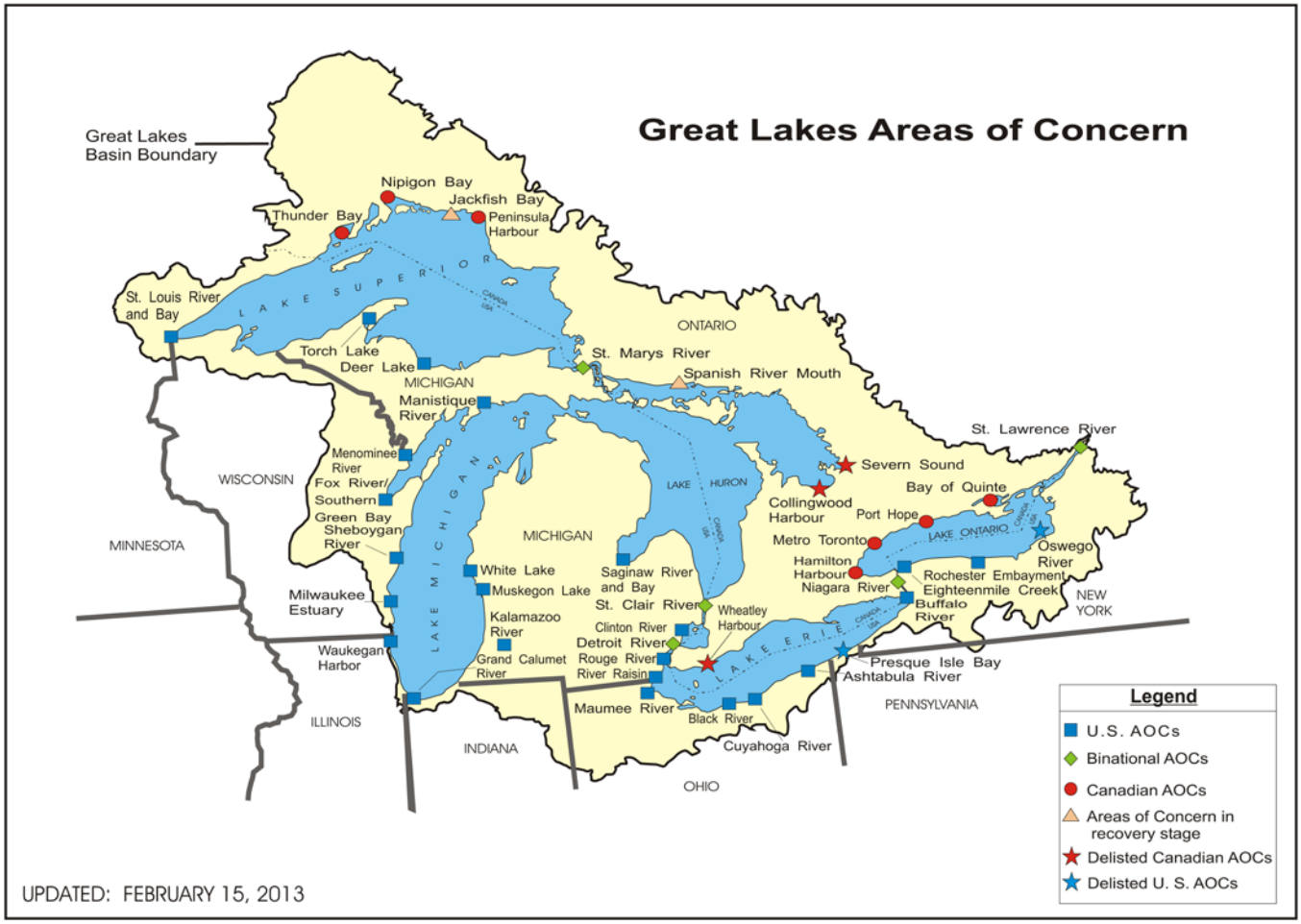
Goal 4: High quality bathing beach opportunities are maintained by eliminating impairments from bacterial, algal and chemical contamination; effective monitoring for pathogens; effective modeling of environmental conditions, where appropriate; and timely communications to the public about beach health and daily swimming conditions.

Goal 5: A significant reduction in soil erosion and the loading of sediments, nutrients and pollutants into tributaries is achieved through greater implementation of practices that conserve soil and slow overland flow in agriculture, forestry and urban areas.

Goal 6: High quality, timely and relevant information about the nearshore areas is readily available to assess progress and to inform enlightened decision making.

❖ Watershed Protection Continued

◆ Great Lakes Areas of Concern



❖ Economic Development

◆ Goal

Promote Empire as an economically viable community which supports recreation, tourism, and small businesses.

◆ Objectives:

- Promote the Village as a tourist/recreation destination essential to the existing and future economy.
- Preserve the tourist-oriented, small town character and pedestrian-scale, for economic viability of the community.
- Preserve primary entrance corridors as a valuable visual resource.
- Strengthen the historic downtown area as the focal point of the community.
- Encourage compatible commercial design standards.

❖ Economic Development Continued

Community/Regional Benefit/Impact

Revitalizing the Front Street corridor areas along the waterfront will benefit the surrounding residential and business neighborhoods, the Village and region, and help the Village and region achieve its vision of making the waterfront an important part of the Village's economy and a safe, healthy and enjoyable place to live, work and visit.

Focusing investment to sustain and support development, and improving certain areas as centers of activities, will aid in enhancing the vitality and quality of life along the waterfront. Development and redevelopment will include measures for restoring and providing more green space and pleasurable vistas to the waterfront, and for protecting existing open landscapes that provide important ecological and scenic value throughout the area. Development and redevelopment efforts will be focused on revitalizing the waterfront in a manner that improves economic activity, bringing business and jobs to the area, but also in a way that invites the public as well.

❖ Sustainable Business Practices

The Traverse City Area Chamber of Commerce distributed a sustainable business practices survey to the coastal communities in their service area - Traverse City, Suttons Bay, Northport, Empire, and Frankfort. The results were not broken down by community and those results are a summary of all the responses. Please see Appendix K. Sustainable Business Practices Survey.

❖ Other Stewardship Efforts

◆ **TAAR Green Solutions 4 (GS4)**

In November of 2007 the Traverse Area Association of Realtors (TAAR) in collaboration with the regional Homebuilders Association developed criteria for the Multiple Listing Service that would reflect green building efforts. Out of this exercise came the realization that in conjunction with this undertaking an educational effort needed to take place as well. In 2008 this program has expanded to include many other areas of sustainable philosophies beyond the original scope of the GS4 to assist in providing real solutions for people to live better healthier lives, save money, reduce their ecological impact, and save our precious resources.

IV. Appendices

Appendix A. Betsie Platte Watershed Map

Appendix B. Betsie Platte Watershed Land Cover Map

Appendix C. Future Land Use Map – Village of

Appendix D. Zoning Map

Appendix E. Recreational Facilities Map

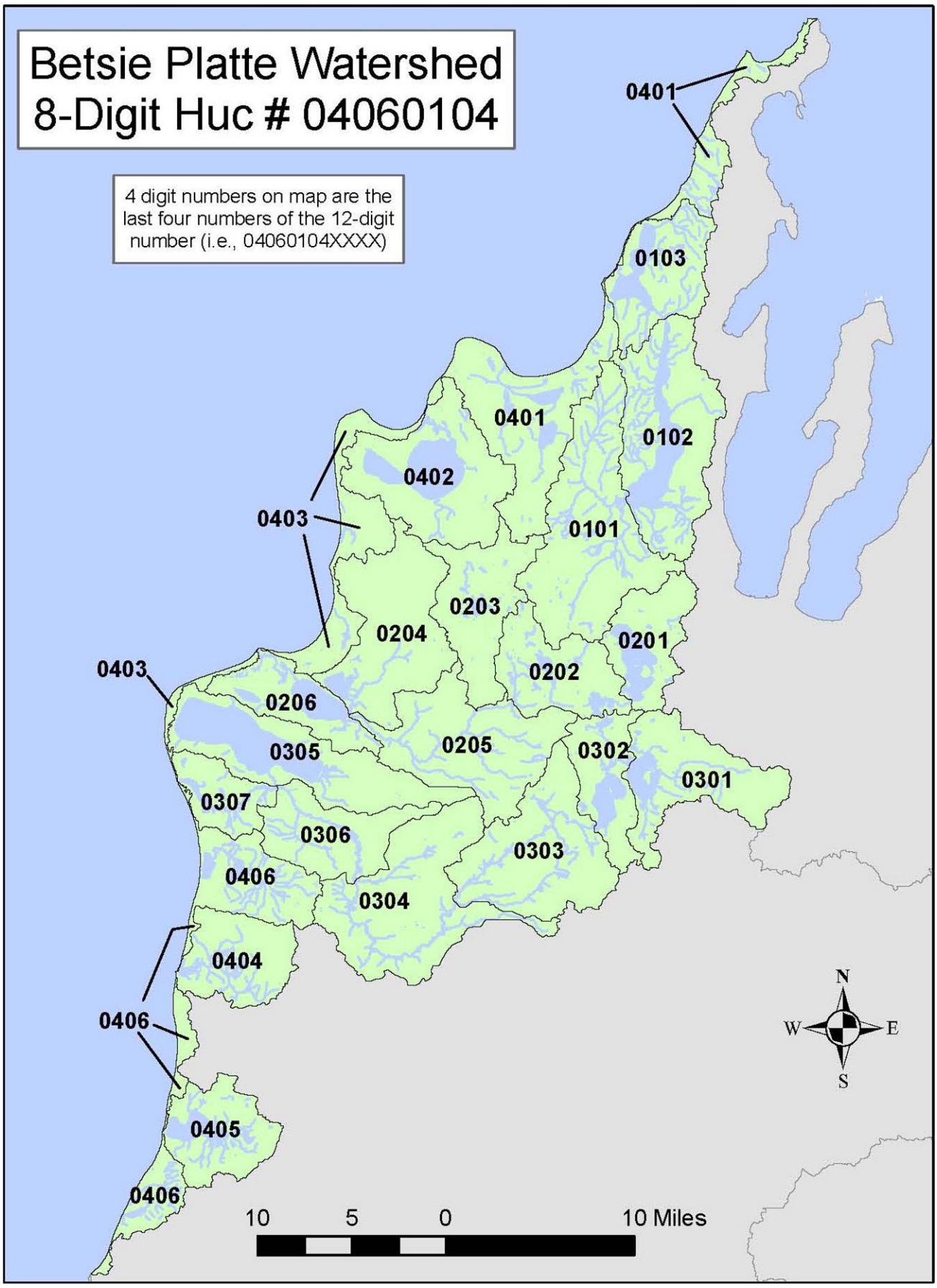
Appendix F. Northwest Michigan Non-Motorized Strategy 2008 – Leelanau County

Appendix G. BATA Glen Arbor Loop (Route 11) Map

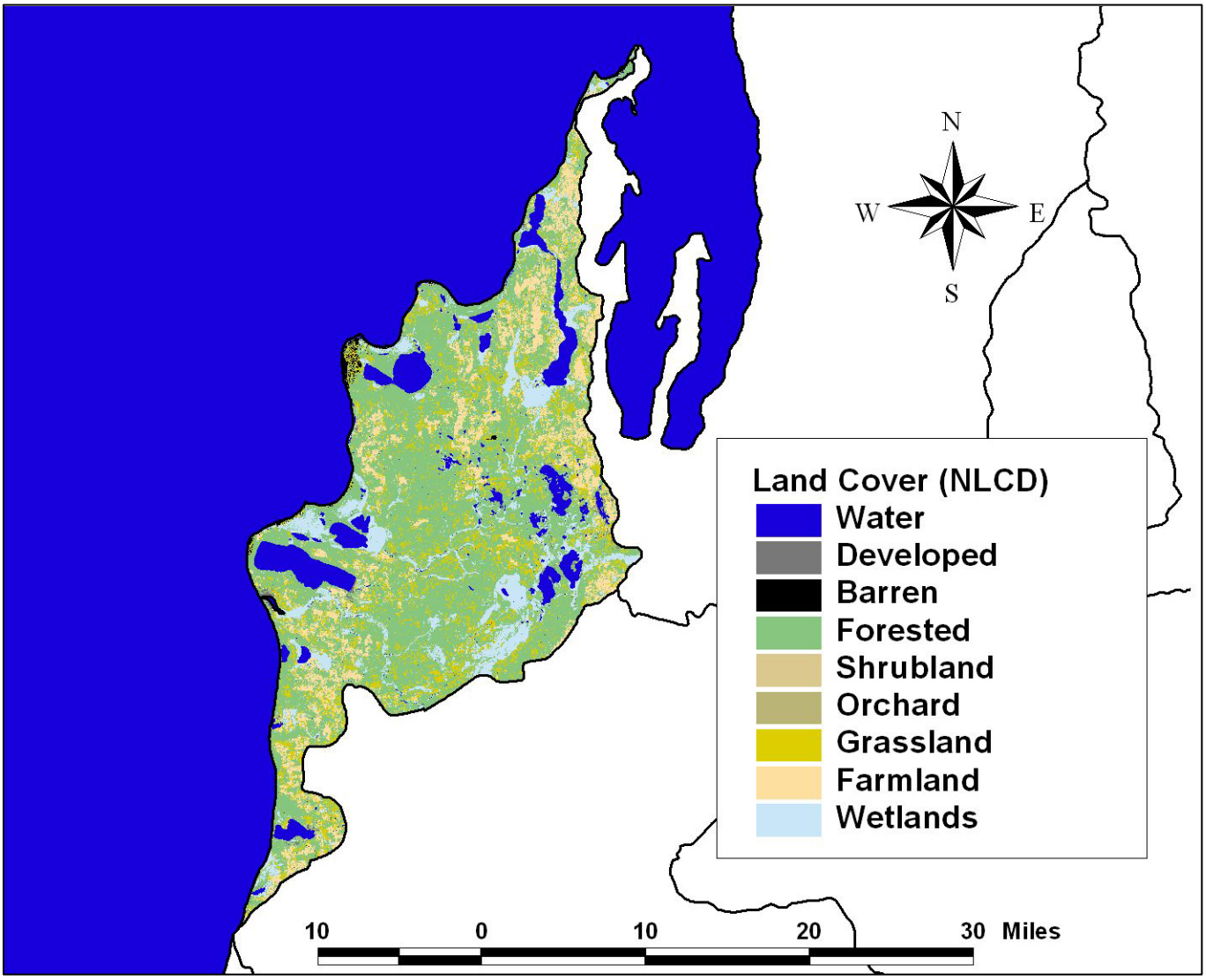
Appendix H. Sleeping Bear Heritage Trail Map

Appendix I. Sustainable Business Practices Survey

Appendix A. Betsie Platte Watershed Map



Appendix B. Betsie Platte Watershed Land Cover Map

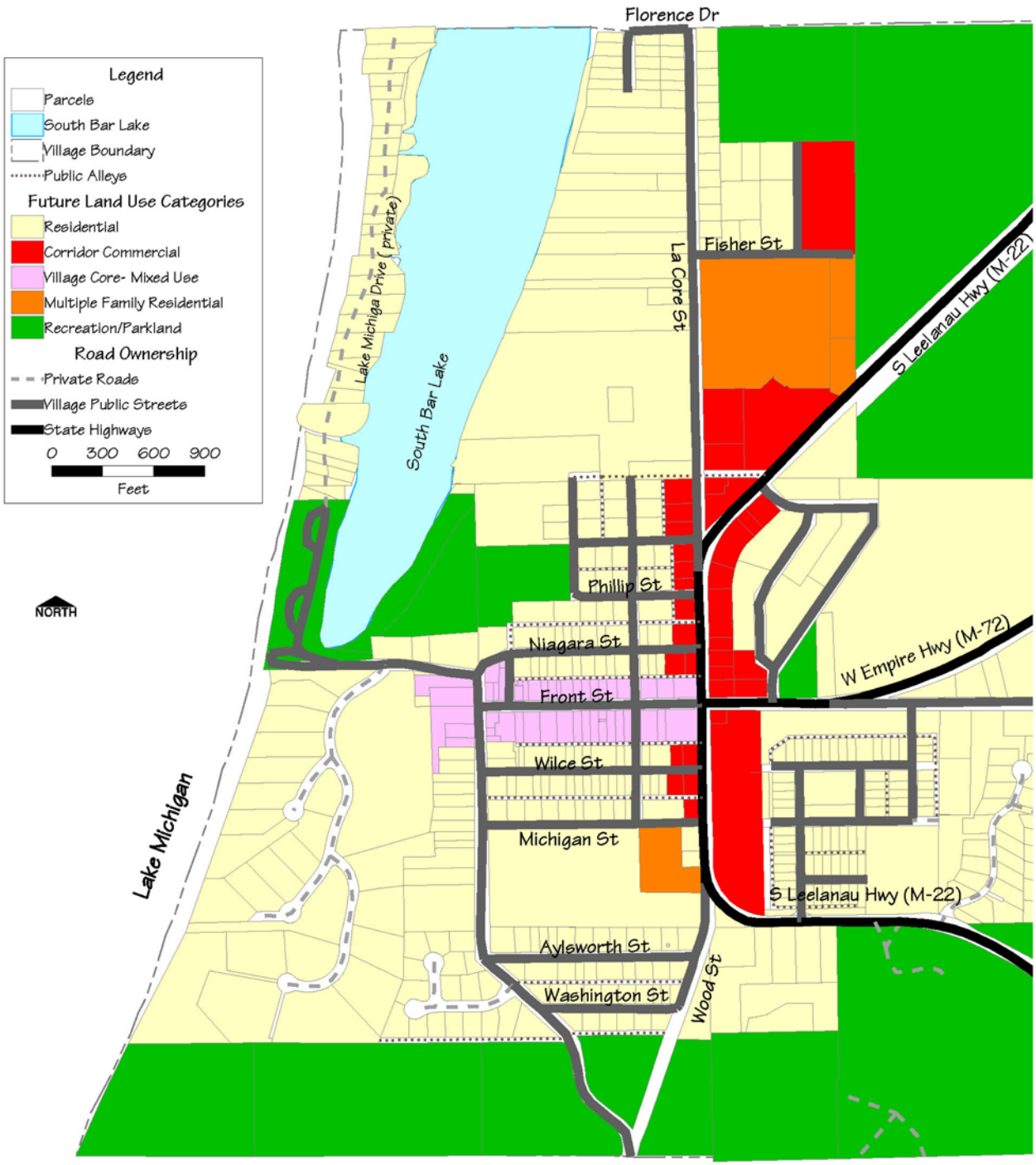


Appendix C. Future Land Use Map – Village of Empire

Village of Empire

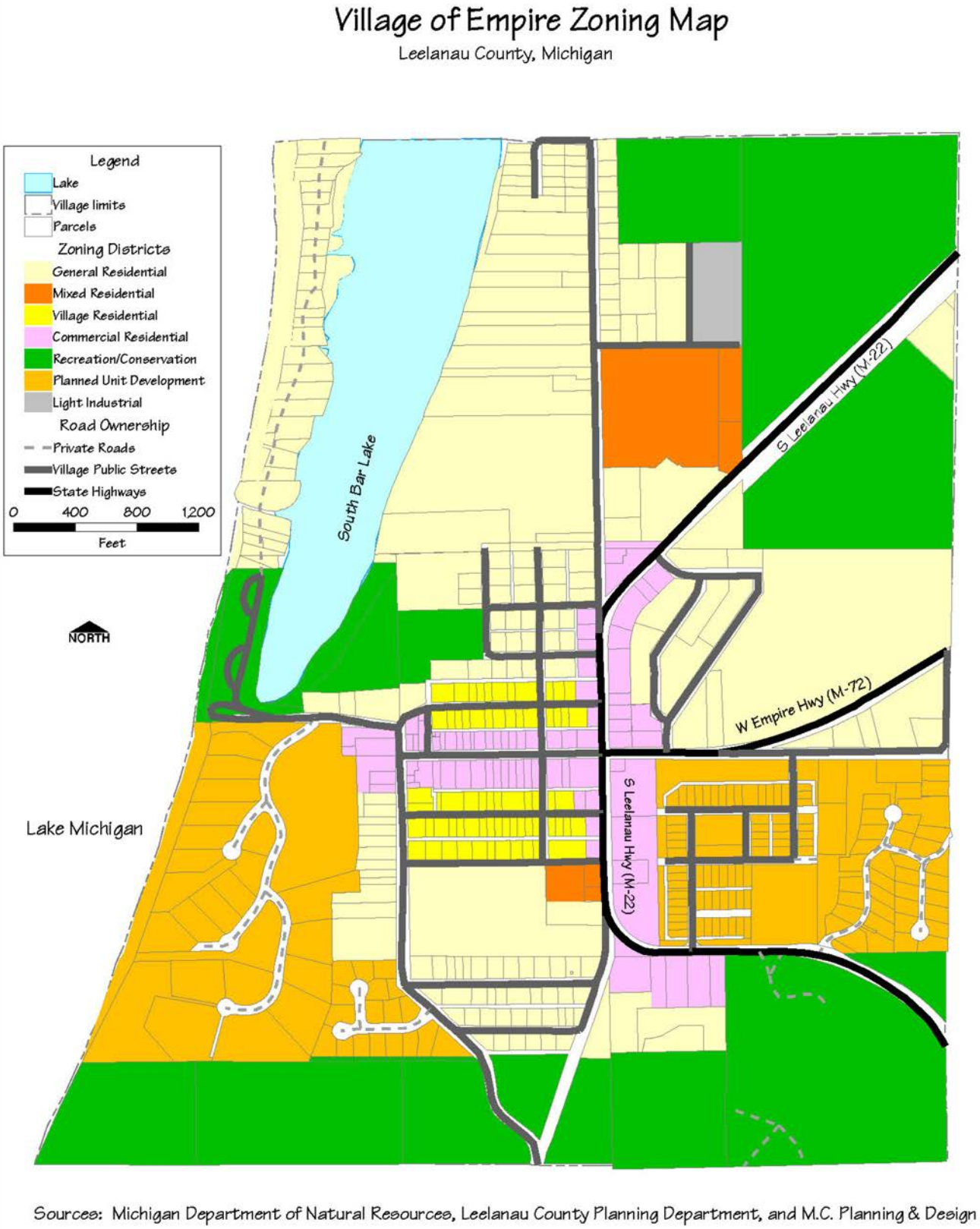
Future Land Use Map

Figure 4-1

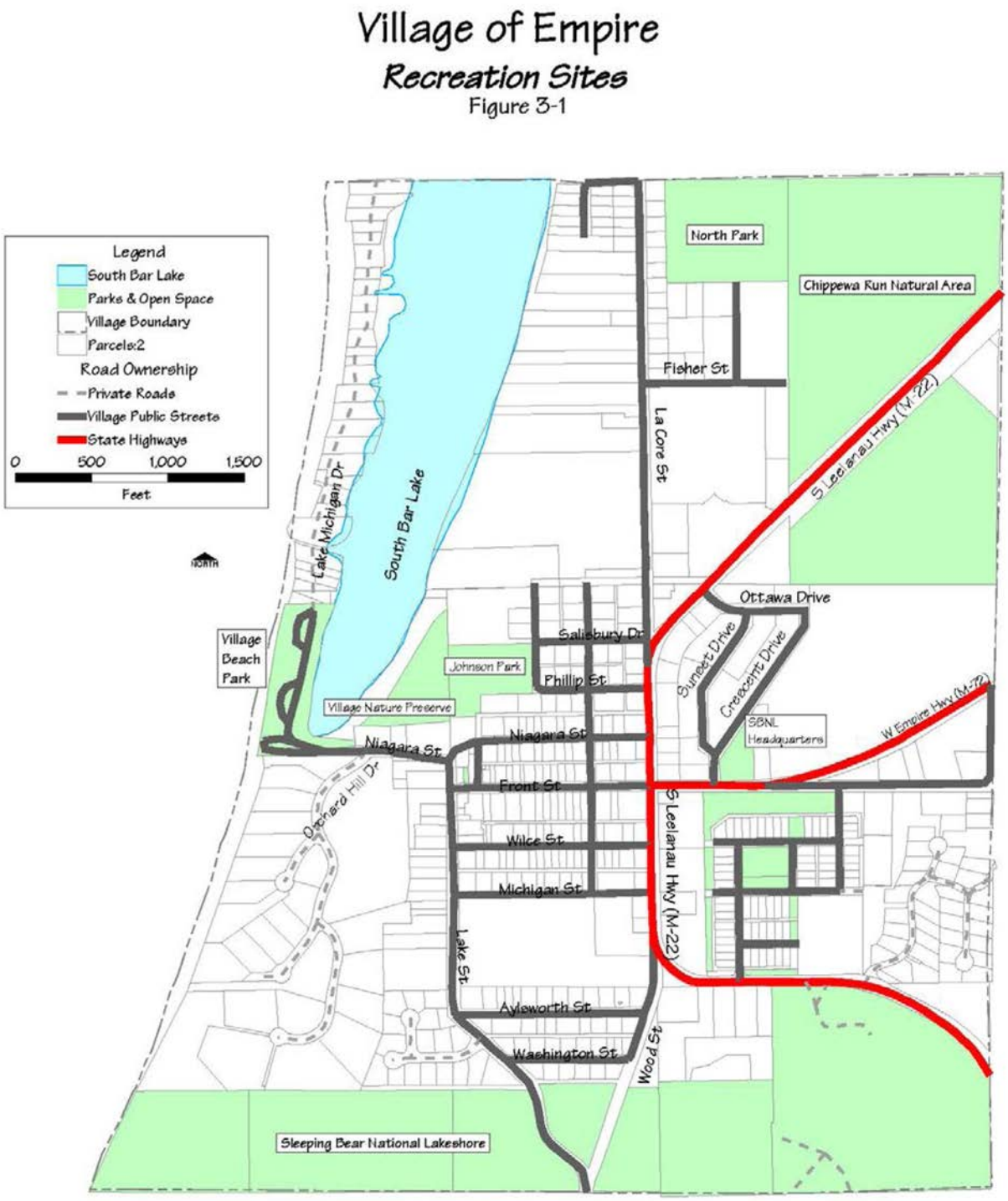


Sources: Michigan Department of Natural Resources, Leelanau County Planning Department, and M.C. Planning & Design

Appendix D. Zoning Map

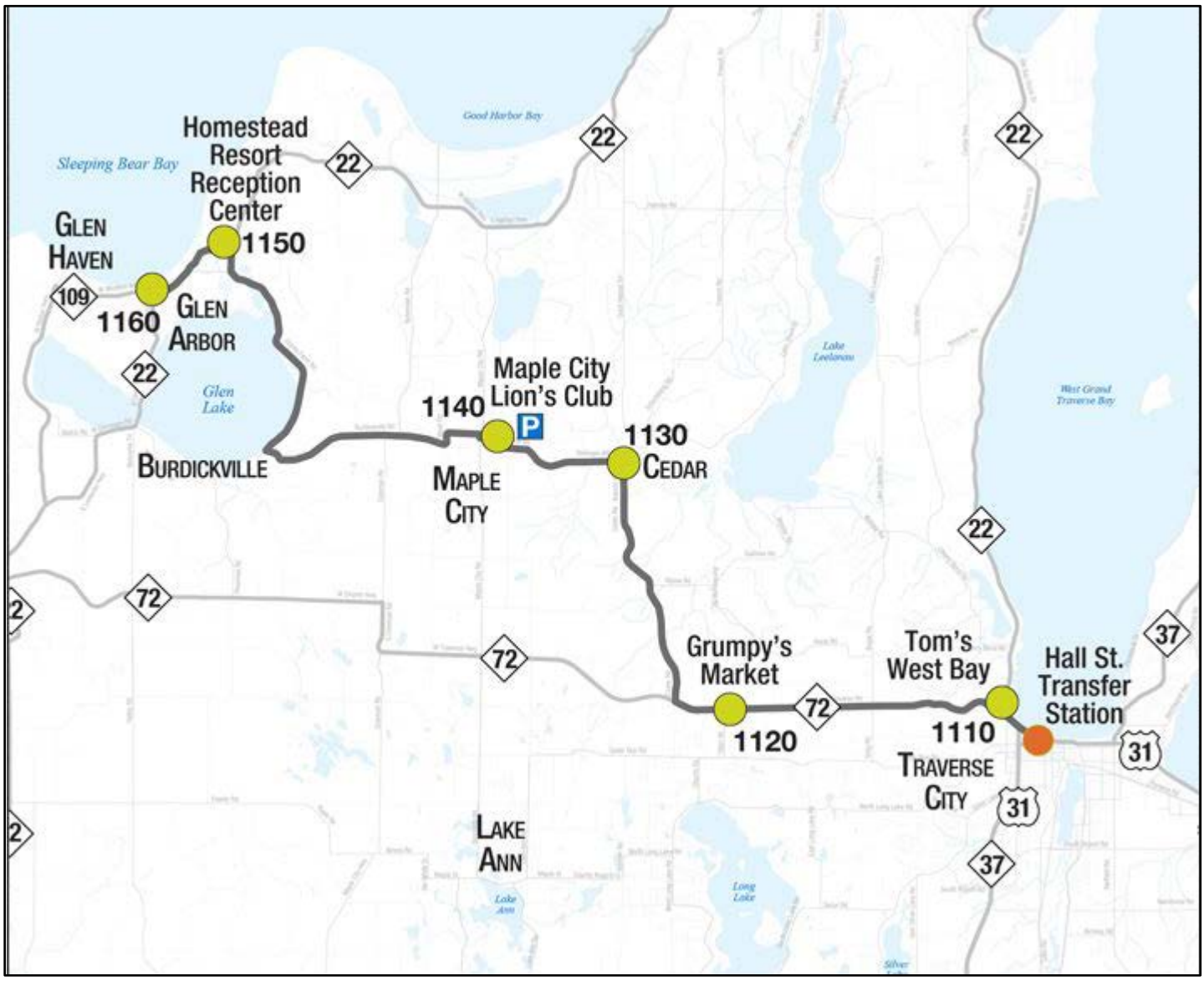


Appendix E. Recreational Facilities Map



Appendix F. Northwest Michigan Non-Motorized Strategy 2008 – Leelanau County

Appendix G. BATA Glen Arbor Loop (Route 11) Map



Appendix H. Sleeping Bear Heritage Trail Map

Appendix I. Sustainable Business Practices Survey

Lake Michigan Coastal Communities-Business Practices TBEDC

1. Has your business ever had an energy audit performed?

Answer Options	Response Percent	Response Count
Yes	36.1%	22
No	63.9%	39
	answered question	**61**
	skipped question	**0**

2. Has your business ever replaced lighting with more energy efficient bulbs?

Answer Options	Response Percent	Response Count
Yes	80.0%	48
No	20.0%	12
	answered question	**60**
	skipped question	**1**

3. Has your business ever replaced heating or cooling devices with more energy efficient systems?

Answer Options	Response Percent	Response Count
Yes	55.7%	34
No	44.3%	27
	answered question	**61**
	skipped question	**0**

4. Has your business ever reduced heating or increased cooling temperatures?

Answer Options	Response Percent	Response Count
Yes	70.5%	43
No	29.5%	18
	answered question	**61**
	skipped question	**0**

5. Has your business ever insulated hot water pipes?

Answer Options	Response Percent	Response Count
Yes	50.8%	31
No	49.2%	30
	answered question	**61**
	skipped question	**0**

6. Has your business ever converted to low flow water fixtures?		
Answer Options	**Response Percent**	**Response Count**
Yes	51.7%	31
No	48.3%	29
	answered question	**60**
	skipped question	**1**

7. Has your business ever purchased energy efficient equipment?		
Answer Options	**Response Percent**	**Response Count**
Yes	71.2%	42
No	28.8%	17
	answered question	**59**
	skipped question	**2**

8. Has your business ever reduced phantom energy loads: for example, completely turning off power to equipment that may always be on standby?		
Answer Options	**Response Percent**	**Response Count**
Yes	44.3%	27
No	55.7%	34
	answered question	**61**
	skipped question	**0**

9. Has your business ever created an energy operations and maintenance plan?		
Answer Options	**Response Percent**	**Response Count**
Yes	21.3%	13
No	78.7%	48
	answered question	**61**
	skipped question	**0**

10. Has your business ever optimized roof performance?		
Answer Options	**Response Percent**	**Response Count**
Yes	26.2%	16
No	73.8%	45
	answered question	**61**
	skipped question	**0**

11. Has your business ever installed a solar generation system?		
Answer Options	**Response Percent**	**Response Count**

Yes	4.9%	3
No	95.1%	58
	answered question	**61**
	skipped question	**0**

12. Has your business ever installed a wind generator?

Answer Options	Response Percent	Response Count
Yes	1.7%	1
No	98.3%	59
	answered question	**60**
	skipped question	**1**

13. Has your business ever installed a geothermal heating/cooling system?

Answer Options	Response Percent	Response Count
Yes	13.3%	8
No	86.7%	52
	answered question	**60**
	skipped question	**1**

14. Has your business ever insulated or re-insulated your building?

Answer Options	Response Percent	Response Count
Yes	50.0%	30
No	50.0%	30
	answered question	**60**
	skipped question	**1**

15. Has your business ever installed more energy efficient windows/doors?

Answer Options	Response Percent	Response Count
Yes	44.3%	27
No	55.7%	34
	answered question	**61**
	skipped question	**0**

16. Has your business ever installed systems that reduce discharges of toxic materials into the water or air?

Answer Options	Response Percent	Response Count
Yes	23.3%	14
No	76.7%	46
	answered question	**60**
	skipped question	**1**

17. Has your business ever found ways to recycle or reuse waste?

Answer Options	Response Percent	Response Count
Yes	75.4%	46
No	24.6%	15
	answered question	**61**
	skipped question	**0**

18. Has your business ever use recycled materials in your business?

Answer Options	Response Percent	Response Count
Yes	80.3%	49
No	19.7%	12
	answered question	**61**
	skipped question	**0**

19. Has your business ever used “green” supplies in your business?

Answer Options	Response Percent	Response Count
Yes	76.7%	46
No	23.3%	14
	answered question	**60**
	skipped question	**1**

20. Has your business ever created a “Green Team” made up of employees and supervisors?

Answer Options	Response Percent	Response Count
Yes	16.7%	10
No	83.3%	50
	answered question	**60**
	skipped question	**1**

21. Has your business ever developed an Environmental Management System?

Answer Options	Response Percent	Response Count
Yes	14.8%	9
No	85.2%	52
	answered question	**61**
	skipped question	**0**

22. Is your business ISO 14000 certified?

Answer Options	Response Percent	Response Count
Yes	4.9%	3
No	95.1%	58
	answered question	**61**
	skipped question	**0**

23. Is your business certified as a "clean corporate citizen"?

Answer Options	Response Percent	Response Count
Yes	3.3%	2
No	96.7%	58
	answered question	**60**
	skipped question	**1**

24. Where is your business located? (select all locations that apply)

Answer Options	Response Percent	Response Count
Traverse City	92.7%	51
Suttons Bay	5.5%	3
Northport	1.8%	1
Empire	3.6%	2
Frankfort	3.6%	2
Elberta	1.8%	1
	answered question	**55**
	skipped question	**6**

V. Resources

❖ Information Collection

The Northwest Michigan Council of Governments collected information about the community through document review of included published information from federal, state and local agencies and organizations. This involved sources of information such as the U.S. Environmental Protection Agency's Toxics Release Inventory (TRI) database, CERCLIS database, pollutant loading; State of Michigan Department of Environmental Quality reports, the Village's master plans and zoning ordinances, and watershed management plans. Also, interviews were conducted of government staff together with the completion of information checklists.

Based on the information gathered, an outline of preliminary findings was developed that summarized the information collected in very general terms and then identified opportunities to enhance environmental stewardship in the coastal community. The Village of Empire Environmental Stewardship Assessment was then presented to the Planning Commission where the public, businesses, and organizations were invited to attend.

1. Village of Empire Website
2. Village of Empire Master Plan 2012 Update Including Recreation Plan
3. Village of Empire Zoning Ordinance
4. Northwest Michigan Council of Governments. *Green Infrastructure Manual*. 2009
5. Northwest Michigan Council of Governments. *Northwest Michigan Regional Non-Motorized Strategy 2008*
6. EPA: Great Lakes Website
7. Great Lake Restoration Initiative Website
8. National Park Service
9. Michigan Clean Marina Program Website
10. US Census
11. Traverse Area Association of Realtors Website

Cover photographs courtesy of Scott Gest and the Northwest Michigan Council of Governments