

Chapter 5: NATURAL RESOURCE INVENTORY

General Characteristics

Edwards Township is 36 square miles in size, and generally rectangular in shape. Its natural resource base is comprised of rolling rural landscapes and productive farmland; beautiful hardwood forests and hillsides; wetlands, river, streams/springs and seeps; and numerous inland lakes. This natural resource base is central to the definition of the quality of life within Edwards Township and the identity of its residents. Residents of Edwards Township are attracted to these areas, yet future development may erode or degrade this natural resource base.

Regionally and throughout the State of Michigan, population within cities is decreasing and rural areas are growing - at least partly because people want to be closer to nature, avoid noise and congestion, enjoy a slower pace of life, send their children to good schools, and/or reside within safe communities. Some argue that we are bringing such problems with us, as we “love rural communities to death.” Population migration in Ogemaw County reflects such trends, with the fastest growing areas around lake shores and surrounding the City of West Branch within Klacking, Churchill, Goodar, Mills, and Ogemaw Townships, according to the 2010 Census. As population grows, conflicts between people and the issues regarding potential impact to Edwards Township’s rural character are likely to increase. These trends, in turn, threaten Edwards Township’s natural resource base, including its rural character and high quality natural resources such as rolling farmland, woodlands, and water resources.

Edwards Township conducted a survey of property owners to gather ideas to inform Master Planning. Results of that survey overwhelmingly indicate that Township respondents place a high degree of importance on the protection of natural resources including: steep slopes, wetlands, streams, forests, and wildlife. Concerning other related natural resources questions, survey results from respondents were typified by:

- A strong majority of respondents feel that overdevelopment of lake shores, rivers and streams; loss of forest and farmland; rapid residential development; deteriorating roadside image; need to control junk yards and nuisances are either very important or important.
- Most strongly agreed or agreed that Edwards Township should address the following issues: cleaning up junk yards; protecting groundwater/drinking water quality; private road development and maintenance; guiding future residential development to blend in with and protect the Township’s rural character; and forest and farm preservation.

The natural resource base of Edwards Township is discussed below to document location, quality, and importance. A summary of perceived threats to Edwards Township's resource base is provided for each category.

Natural areas not only provide us with economic and recreational opportunities, they are also home to fish, wildlife, and a wide variety of plants, shrubs, and trees. These areas also provide us with clean air to breathe and pure water to drink, and leisure enjoyment. These resources are thereby important economic resources within Edwards Township. Specifically, natural areas are used for economic pursuits such as farming, forestry, and recreation. Retention of an intact resource base within Edwards Township is necessary for the protection of the public health, safety, and general welfare. Future development of the landscape should not be conducted at the expense of the Township's natural resource base identified in this chapter. This plan identifies: 1) features that should be protected; 2) areas that exhibit limitations for development; and 3) land that is or may be appropriate for guided development.

Surface Water Resources

Edwards Township is blessed with numerous lakes, rivers, streams and wetlands. The Township possesses over twenty (20) inland lakes, and many miles of rivers and streams – including the headwaters of the regionally significant middle branch of the Tittabawassee River. Lakefront and riverfront property within Edwards Township is highly valued for its scenic beauty, location for home sites, and recreational opportunities.

Threats to Surface Water Resources

The disturbance of trees, shrubs and other shoreline vegetation can increase the potential to for soil erosion and deposition in lakes and streams. Specifically, surface waters and shoreline areas can be degraded by: 1) soil and vegetation deposition from erosion; 2) algae growth enhanced by nutrients from leaching septic systems and/or from over application of fertilizers and pesticides; and 3) increased impervious or sealed surfaces, roof tops, driveways, parking areas, and/or manipulated landscapes.

Threats to surface water should be addressed through Low Impact Development (LID) techniques. LID is a set of approaches to stormwater management that are designed more like how nature handles stormwater than highly engineered and constructed systems. LID approaches tend to be much less expensive for developers and public agencies, do more to purify stormwater, protect groundwater and surface sources of water for domestic use, reduce the temperature of stormwater to protect fisheries, and contribute to a natural or rural scenic quality than hard stormwater systems. LID approaches include the reduction of hard or impervious surfaces, the use of vegetation to filter runoff from developed or cleared areas, natural swales to convey and filter stormwater and simultaneously allow it to soak into the ground.

Historically there have been relatively fewer year-round homes constructed along shorelines and waterfronts within Edwards Township, and current trends indicate new home construction and the conversion of vacation homes to full-time residences on waterfront parcels within the Township. Homes being built today are generally larger than the seasonal cottages originally built in the area. Homes constructed in these areas must be properly designed and constructed to protect the Township's water resource base over the long term.

Geologic and Topographic Setting

Topography refers to the elevations, relief features, and surface conditions of a geographic area. For the purpose of this chapter, subsurface "hydrogeology" is defined as the science of how water is distributed throughout the soil and rocks under the Earth's surface. The dynamics of these natural forces working together form sensitive natural systems along shoreline properties within Edwards Township.

Edwards Township also has noteworthy topographic features present in the non-shoreline areas. For example, anyone driving through western portions of Edwards has experienced the exhilaration of the rolling landscape. These hillsides contribute to the striking rolling rural character, pleasant rural views, and rich recreational opportunities. They are also somewhat sensitive features which can be damaged by development, unless good planning principles are undertaken and adhered to. The topography of the remainder of the Township rolls from hill to valley to hill.

Threats to Other Topographic Township Features

Topographic features such as those found in Edwards Township can often be restrictive to development. The following Table 34 Slope Requirements for Various Land Uses came from the Michigan Society of Planning Conference during the fall of 2001. Generally speaking, level or moderately sloping sites are preferred for home sites and septic drain fields, as well as agricultural uses. Commercial and industrial uses and their driveways and parking lots require flat or nearly level surfaces. Development that occurs on steeper slopes adds to construction costs due to requirements for storm water and erosion control measures, grading, and possible specialized engineering design.

The following represent a summary of threats to natural, economic, and scenic resources when hillsides are developed without consideration of topographic features:

- Disturbance of hillsides can result in the loss of slope and soil stability, leading to increased erosion potential. Removal of vegetation from hillsides deprives the soil of the stabilizing function of roots, as well as the moderating effects leaves and branches have on wind and water erosion. Erosion may impair surface water quality and

wetlands as a result of subsequent siltation. Spring thaws and strong rains on bare or unstable slopes can produce mass movements, such as landslides, slumps, and flaws.

- Disturbance of hillsides can increase the rate of storm water runoff. Development may alter the natural drainage pattern of hillsides, changing runoff and causing erosion. Removal of vegetative cover and the construction of impervious surfaces, such as roads and building roofs, decrease the percolation of precipitation into the soil. Loss of the infiltration of precipitation in turn reduces the amount of groundwater recharge, and contributes additional runoff that would ordinarily be absorbed by trees and other vegetation. Accelerated runoff may also contribute to flooding hazards.
- Disturbance of hillsides can also impair a community's scenic resources. Denuded slopes; significant alteration of site topography; and damage to surface waters, ground waters, and wetlands can result in the loss of valued Township resources and rural character.

Inactive sand and gravel mining operations can leave behind very steep, non-vegetated slopes susceptible to erosion and/or slumps. Edwards Township encourages the restoration, re-contouring and replanting of inactive sand and gravel extraction sites in accordance with Township-approved site restoration plans to prevent erosion/sedimentation to adjoining properties, public roadways, and waterways, and to protect public safety. Man-made waterbodies from sand and gravel operations should be protected and/or utilized in such a manner as to protect public safety and the environment.

Wetland Resources

Edwards Township possesses other important water resources, including wetlands. Michigan's Part 303: Wetland Protection Act, P.A. 451 of 1994, as amended, [MCL 324.30301 *et seq.*] defines wetlands as "land characterized by the presence of water at a frequency and duration sufficient to support, and under normal conditions does support, wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or a marsh."

There are five large wetland areas located in Edwards Township, some of which have intermittent streams running through them. There are six large wetlands within river corridors in Edwards Township, often existing along creeks, streams and rivers as "riparian" wetlands. These important resources provide wildlife habitat, protect groundwater/drinking water, filter pollutants from surface water runoff, possess recreational value, and help in the prevention of flooding. Wetlands are biologically rich and diverse places to observe plants and animals in their natural habitat. See Composite Wetlands Map page 5-4a, to find wetland locations, rivers, creeks and streams located in

Edwards Township.¹

A particularly large wetland known as the Sidney Swamp is located near Sidney Lake between M-30 Highway and Green Road within the northeastern portion of Edwards Township. Other large wetlands exist along lakes, creeks and streams within the northwestern portion of the Township; south and west of Lake George; along the Tittabawassee River in southern portions of the Township; within undeveloped portions at the southeastern corner of the Township; and surrounding portions of Edwards Lake within the center of the Township. Other small, but extremely important wetlands exist throughout Edwards Township.

Some area wetlands likely began as glacial drainage ways and/or shallow lakes within depressions in glacial ice following the end of the ice age approximately 10,000 years ago. These lakes gradually filled in with the remains of the plants that lived and died there. As the organic (dead plant) layers kept building up, the chemistry and hydrology of these areas was altered – creating wetlands.

Wetlands are considered by many as rich areas of natural beauty, within otherwise rapidly changing landscapes within northern Michigan. Such wetland resources are sensitive habitats in which minor changes in water level or chemistry could dramatically alter plant communities and area hydrology.

Threats to Wetland Resources

According to Michigan State University Extension's Natural Resources Inventory (MNFI) Wetland Trends Since 1800 Report, Ogemaw County circa 1840 possessed approximately 68,000 acres of wetlands, or 19% of the county land surface. Nearly all the original wetland resource base within Ogemaw County consisted of cedar swamp. Comparison with existing MiRIS land cover data indicates a net wetland loss of roughly 31,000 acres or 45% since European American settlement. Most historic wetland losses are attributed to agricultural drainage and road construction in eastern and central portions of the County. Importantly, of original Ogemaw County wetlands, it is estimated that 90% of the original cedar swamp has been lost through drainage or conversion to other wetland types (especially lowland hardwoods, shrub swamp, and emergent wetlands).² Due to past and current over-browsing by whitetail deer, the natural restoration of original conifer swamp is considered unlikely. See Page 5-5a for a copy of the MNFI changes in wetlands 1800s–1980s.

¹ Michigan Resource Inventory System (MiRIS) data, Composite Wetland Area and Base Map Data (Projection State Plan NAD83, Feet), 1998.

² *Wetland Trends in Michigan Since 1800: A Preliminary Report*, Michigan Natural Features Inventory, #1996-03, June 1996, p. 53. Report methods are based upon the comparison of the original surveyor's notes with recent MiRIS land cover analyses.

Impacts from human activity and development can threaten complex wetland ecosystems. Care must be taken to ensure an adequate balance of water inputs and natural buffers to wetland environments. Even subtle changes in water level or chemistry can irreversibly change wetland features. Development of land near wetlands should utilize best management practices, such as ensuring adequate groundwater and surface water supply and quality by encouraging on-site storm water treatment techniques utilizing green technologies such as vegetated storm water treatment and infiltration structures, etc.

Groundwater Resources

Groundwater refers to water below the surface of the Earth (called aquifers) trapped beneath layers of soil and bedrock. Importantly, groundwater is the sole source of drinking water for residents within Edwards Township. Currently, there are no public water sources in the Township. Ground water is susceptible to contamination through human activities, including certain land use activities.

There are many locations in Edwards Township where the aquifers of choice that supply drinking water are very shallow to relatively deep, i.e., 16 to 265 feet below the ground surface. Many groundwater wells with Edwards Township possess flow or “artesian” conditions in which the water table rises to or above the well head. Shallower ground water wells in Edwards Township likely extract ground water lying or “perched” above layers of sand and/or gravel above low permeability clays or till. Wells within these perched aquifers are especially susceptible to contamination from activities at the land surface.

Township residents who settled within Edwards Township in the late 1800s likely obtained their drinking water from the creeks, springs, and shallow groundwater wells. Springs bubble up to the ground surface and into wetlands, lakes and streams throughout the Township. Reportedly, some Township residents still utilize the springs as their preferred source of drinking water within their homes.

Threats to Ground Water Resources

Septic systems at homes and businesses can be a source of contamination to groundwater, and must be sufficiently separated from drinking water sources. Furthermore, abandoned agricultural or residential wells should be plugged to prevent aquifer contamination. There are no estimates available of the number of abandoned water wells within Edwards Township. Land uses such as auto repair, salvage yards, and wood treatment are examples of businesses that are potentially hazardous to groundwater because of the chemicals that are routinely used and potentially spilled to the ground surface and/or disposed of within septic systems. Special care must be taken to prevent accidental spills or the mishandling of chemicals at businesses that are serviced by private wells and septic systems.

Golf courses, of to be constructed within Edwards Township, can threaten groundwater due to the use of large quantities of chemical inputs. The over-application of fertilizers (i.e., especially during course construction), fungicides, pesticides, and herbicides represents the potential for groundwater and surface water pollution. Due to these facts and the hydrogeologic setting of Edwards Township, integrated turf grass management, chemical storage and application management, wildlife management, and groundwater and surface water study and monitoring practices are strongly encouraged at golf courses within Edwards Township. Significant tree removal, large areas of soil disturbance, and construction (including septic systems) on slopes are similarly discouraged in Edwards Township.

Individual homes can also be sources of groundwater contamination. Potential contaminants associated with these land uses include the use, storage, and disposal of garden chemicals, paints, solvents, lubricating fluids, and many household cleaners. Auto and equipment maintenance can also cause unnoticed pollution and groundwater contamination. Edwards Township residents and others have the responsibility to properly handle products in accordance with labeling and to safely dispose of household hazardous products. Township residents are encouraged to utilize composting, water conservation, composting/manure fertilization, and integrated pest management, as well as non-toxic household products to prevent groundwater and surface water contamination problems before they occur. Residents may call Ogemaw County to find out when household hazardous waste collection days are scheduled, and for tips on proper disposal.

While acknowledging that farmers have significant economic incentives to properly apply fertilizers, pesticides and other chemical inputs, farms may also be sources of groundwater contamination. Growers within the Township possess the responsibility to properly handle products in accordance with labeling, and to safely dispose of unused, unapproved, or outdated agricultural chemicals. Township farmers are encouraged to use Generally Accepted Management Practices (GAAMPs) as defined by the Michigan Department of Agriculture concerning irrigation/water conservation; manure management; and integrated pest management to prevent groundwater and surface water contamination problems before they occur.

Increasingly communities within Michigan are facing groundwater disputes between landowners and/or proposals for large quantity groundwater extraction operations, e.g. irrigation systems, mineral extraction, and/or water bottling. Edwards Township planners believe that sufficient scientific study (i.e., hydrogeological and soils investigation, pump tests, irrigation plans, etc.) and comprehensive land use planning (i.e., special use permit, impact statement, site plan review, etc.) should be required prior to the approval of large quantity groundwater extraction or any subsurface injection proposals to protect nearby private properties (i.e., well water and future groundwater use), sensitive natural features (i.e., springs, wetlands, etc.), and waterbodies (i.e., rivers, creeks, ponds and lakes, etc.).

Watersheds and Subwatersheds

People usually identify the place they live based on political jurisdictions, such as villages, cities, or townships. Natural features, however, extend beyond political boundaries. Viewsheds, productive farmland, rivers, stream, lakes, and wetlands may cross many political jurisdictions. Planner and residents should consider such natural features and boundaries when making land use decisions in order to protect our natural resource base within Edwards Township.

A “watershed” consists of a defined land area within topographic highs such as ridgelines within which rain and snowmelt flows down to a common point such as a wetland, lake, river, or stream. Water quality protection is an essential planning element to be cooperatively undertaken within political jurisdictions sharing a common watershed. As the land area included in the Tittabawassee River watershed is comprised of thousands of acres across several counties and numerous townships, it is imperative to remember that land use practices we employ can affect the water resources used by many people, locally as well as far downstream. The cool, clear waters of lakes, rivers and streams within Edwards Township contribute significantly to the economy of Edwards Township and nearby municipalities in Ogemaw County. Consequently, watershed protection is necessary not just for the health and environmental quality of Edwards Township, but also for its economic well-being.

Other Threats to Water Resources

One of the greatest threats to groundwater and surface water is non-point source pollution. Unlike pollution point sources such as sewage treatment plants, and industrial discharges, etc., pollution from non-point sources is dispersed and includes runoff of agricultural fertilizer and pesticides; debris and contaminants that collect on impervious surfaces such as roads, rooftops, and parking lots; lawn chemicals; and soil erosion and sedimentation.

Edwards Township’s surface and groundwater are susceptible to non-point pollution sources, and may be addressed as follows:

- Lawn and garden chemicals should be applied strictly in accordance with label directions.
- Used oil, antifreeze, paints, and other household hazardous chemicals should be strictly used in accordance with labeling and disposed of properly at Ogemaw County household hazardous waste collection events.
- Soil erosion from construction sites should be appropriately controlled. Controls should be maintained in accordance with permits and best management practices. Greenbelts consisting of natural shrub and tree buffers, should be retained. Native ground covers, trees, and shrubs should be retained wherever and whenever

- possible. Construction should avoid sensitive areas such as slopes, wetlands, seeps and springs, streams and creek corridors, and groundwater recharge areas.
- Fluids, including battery acid, etc., from vehicle and equipment maintenance should not be disposed of in septic systems, allowed to drain onto the ground, applied to roads or parking areas for dust control, or washed onto roads. Instead, such hazardous materials should be collected and taken to a recycling center. Edwards Township expresses its ongoing interest in promoting, supporting, and participating in Ogemaw County's hazardous materials, solid waste, and recycling programs and initiatives.
 - Erosion control practices should be encouraged throughout the construction, maintenance, and closure of logging roads and skid trails.
 - Drinking water sources should be identified and integrated into land use decision-making to protect drinking water for the long-term in Edwards Township. Non-polluting alternative inputs and practices shall be explored, promoted, and supported by Edwards Township, such as prescription fertilization and irrigation, integrated pest management, etc.
 - Litter shall be prevented from washing into waterways from roads, home sites, beaches, boats, and recreational water activities. Nutrients from pet and other animal wastes, leaf and organic material composting and other debris, and storm water runoff shall be treated on-site, controlled and prevented from flowing directly into lakes, rivers, streams, wetlands, and groundwater recharge areas.

Soils

According to the Ogemaw County Soil Survey, there are a variety of soil associations within Edwards Township. A soil association is a pattern of soils, normally consisting of a major and one or more minor soils type within an area, and is typically named for the major soil type. Each soil type has a characteristic slope, drainage characteristic, suitability for construction and septic disposal, water-holding and nutrient filtration capacity, and erosion potential, etc. The examination of soil characteristics is encouraged prior to development within Edwards Township to provide information regarding soil suitability for various land uses. While many soil types are suitable for development, others limit development of various types, and others are best suited as conservation areas due to slope, wetness/ponding, flooding, high water table, and/or poor nutrient filtration capacity, etc.

Soils along the western portion of Edwards Township are sandy, well to excessively drained soils formed within glacial outwash plains. Moving toward the interior of the Township, soils consist of nearly level to rolling, well drained to somewhat poorly drained sandy loam soils on glacial till plains. "Loamy" soils are equal mixes of clays, silts, and sands and are generally considered productive agricultural and forest soils. This area is typified by the Nester-Menominee-Kawkawlin soil association, considered generally suitable for forest and farm production, recreation, and most development

purposes.

Soils within the center of the Township are generally comprised of two soil categories. Most inland soils consist of Nester-Kawkawlin soils, described as nearly level to steep, well drained and somewhat poorly drained loamy soils. These soils are considered generally suitable for forest and farm production, recreation, and most development purposes. Soils along Mansfield Creek within Section 10, 14 and 15 (i.e., along Lehman Road, west of M-30 Highway) consist of the Lupton-Roscommon soil association described as nearly level, very poorly drained mucky and sandy wetland soils. Lupton-Roscommon soils possesses limitations for development due to a high water table, shrink-swell potential, and slow percolation, etc.

A small area within the southwestern corner of Edwards Township consists of Kawkawlin-Sims-Iosco soils, described as nearly level to undulating, somewhat poorly drained and poorly drained, loamy and sandy soils on glacial ground moraines. These soils are considered generally suitable for forest and farm production, recreation, and some development purposes.

A final category of soils exists within the extreme southwest corner and majority of the southeast corner of Edwards Township, consisting of the Rubicon-AuGres-Roscommon soil association. These soils are poorly and somewhat poorly drained, sandy soils on nearly level to gently rolling terrain that contain wetlands within drainage ways. See the Composite Soils Map on page 5-9a.

Soil Limitations

Soils within Edwards Township with slopes of 18% (~8°) and higher are considered relatively susceptible to erosion. If vegetative cover is removed, erosion may result in the deposition of soil and debris within waterways and/or onto adjacent lands. Soil erosion and sedimentation to waterways is a violation of Michigan's Part 91: Soil Erosion and Sedimentation Control Act, P.A. 451 of 1994, as amended. Appropriate care and engineering measures must be utilized and maintained to avoid degradation of steep slopes within the Township as development occurs.

Inland soils of the Nester, Menominee and Kawkawlin series are generally suited for recreation and development, as well as farming and pastureland. These are also highly productive soils for growing hardwood forests. Only soils with associated slopes of 18% (~8°) or greater present some limitations for development.

Soils of the Lupton-Roscommon and Kawkawlin-Sims-Iosco series may not be suitable for development, due to high organic content, low permeability, and excessively wetness. These soils are most appropriately managed as conservation areas, woodlands, and wildlife habitat. See Soil Associations Map page 5.9a.

Fish and Wildlife

Fish and wildlife are abundant within Edwards Township. It is common to see whitetail deer, wild turkeys, fox, grouse, raccoons, striped skunk, beaver, partridge, woodcock, red fox, snowshoe hare, squirrels, opossum, cottontail, porcupines, mink, and weasels in the Township. Residents also express interest in viewing and preserving habitat for elusive species such as badger, bobcat, pine marten, gray fox, bobcat, and the black bear.

The lawful hunting, trapping, and the viewing of wildlife are important components of the quality of life in Edwards Township. There are several protected species within Ogemaw County, and current federal and state status follows:³

Protected Species in Ogemaw County		
Common Name	State Status	Federal Status
Plants		
Alleghany or sloe plum	Special Concern	
False-violet	Threatened	
Rough fescue	Threatened	
Hill's thistle	Special Concern	
Fragile prickly-pear	Endangered	
Animals		
Channel darter	Endangered	
Birds		
Red-shouldered hawk	Threatened	
Common loon	Threatened	
Bald eagle	Threatened	Threatened in only part of its US range.
Kirtland's warbler	Endangered	Listed Endangered
Osprey	Threatened	
Insects		
Spike-lip crater	Special Concern	
Laura's snaketail	Special Concern	

³ County Elements List – Ogemaw County, Michigan Natural Features Inventory, Michigan State University Extension, September 1999.

Threatened Geographic Feature		
Great blue heron rookery		

Endangered species are in danger of extinction throughout all or a significant part of their range (excluding insects that would, according to the Michigan Department of Natural Resources or Secretary of Department of Interior, represent an overwhelming or overriding risk to humans).

Threatened species are deemed likely to become an endangered species within the foreseeable future throughout all or in a significant portion of its range.

Special Concern species, while not afforded legal protection under the Michigan or federal Endangered Species Acts, are declining or relict populations in Michigan. This category includes rare species. Protection now is prudent before they reach dangerously low population levels, and to prevent listing as Threatened or Endangered.

Threats to Fish and Wildlife

The biggest threat to fish and wildlife within Edwards Township is the loss and fractionalization of habitat. As rural areas of Edwards Township are converted to residential and other uses, habitat loss and fractionalization are inevitable. Conservation planning must include inventorying and mapping of existing natural resources, including wildlife habitat. Retaining large and connected tracts of contiguous open spaces and forests will help to retain wildlife habitat as Edwards Township continues to grow.

Forests

Intact forestlands provide the potential for sustainable timber development, soil erosion and flood control, groundwater recharge, surface water quality improvement and maintenance, wetland and wildlife habitat, scenic values and community character, year-round recreational opportunities, noise buffering, climate moderation, and the reduction of air pollution.

According to the Michigan State University 1999 Land Cover Analysis, 44.2% of Edwards Township’s land base (or 10,103.6 acres) was in Upland Forest in 1999. Upland Forest Lands were defined as Aspen-birch, Pine, Mixed Deciduous and Conifer, Other Upland Hardwood, and Christmas trees within the 1999 MSU study. This total acreage represented a 3% gain (or 683.6 acres) from Upland Forestlands interpreted from 1978 aerial photographs by the MDEQ’s MiRIS.

Threats to Forests

The continued parcelization of private forestlands from large parent parcels to smaller and smaller parcels limits forestland potential for sustainable forest development and other values. Private landowners are encouraged to enter into forest management plans to foster sustainable forestry practices and environmental protection. Poorly planned or

executed forest resource development can also lead to soil erosion and sedimentation to neighboring lands, streams and wetlands; fragmentation of wildlife habitat and migration corridors; flooding of adjacent parcels and public ways; a decrease in nearby land values; and negative scenic impacts. All of which can result in public and private expenditures to prevent and/or remediate damage from poorly planned or indiscriminate forest cutting.

Sustainable forest management and conservation planning must include inventorying and mapping of existing forest resources. Conserving large and connected tracts of contiguous forestland will help to retain economic, environmental and scenic values as Edwards Township continues to grow.

Farmlands

According to the MSU 1999 Land Cover Analysis, 33.8% of Edwards Township's land base (or 7,734.5 acres) was in Agriculture in 1999. Agricultural land was defined as active cropland, active farmland, permanent pasture or other agriculture within the 1999 MSU study. This total acreage represented a loss of 16.4% (or 1,514.4 acres) from agricultural lands interpreted from 1978 aerial photographs by the MDNR's MIRIS.

Threats to Farmlands

The Michigan Society of Planning has determined that Ogemaw County lost 5% or less of its farmland from 1992 to 1997.⁴ This farmland loss rate is reportedly among the lowest in Michigan during this period. However, the Michigan Society of Planning considers future farmland loss in Ogemaw County as "moderate" when compared to other Michigan counties.⁵ Empirical study in Michigan and elsewhere in the Midwest has documented the significant increase in local tax burdens to support rising costs of services associated with rapid conversion of farmland to residential uses. "Farming of the fringe" of residential development is often wrought with conflict between generally accepted farming practices (noise, dust, chemical use, odors, hours of operation, etc.) and the typical expectations of residential landowners.

The gradual loss of farm operations within any locale can lead to the loss of nearby farm support businesses and result in the on-set of an "impermanence syndrome." Within such an environment, farmers are reluctant to reinvest in farm operations – especially in the face of likely increasing land fragmentation and conflict with encroaching non-farm land uses. This trend has been observed throughout the U.S. as leading to the permanent loss/conversion of farmland to residential, commercial, institutional, and other land uses. In the short run, farm fields may be taken out of production or left fallow, and eventually sold for their highest market value – typically residential development. Farms with views and/or intact forestlands face additional development pressure. Moreover, the average age of Michigan farmers has never been higher, new farm starts have never been fewer, and the price for farm products has never been lower within the State. Finally, Michigan remains the only state in the U.S. that taxes agricultural land at its development value. Needed change in Michigan's tax structure regarding farmland will require a new State constitutional amendment, and therefore is unlikely to change in the foreseeable future. Meanwhile, Edwards Township supports the exploration and establishment of voluntary farmland preservation tools in Ogemaw County, and regionally, such as the purchase of development rights, transfer and leasing of development rights, farmland conservation easements, well-connected conservation/farmland conservation developments, and improved local markets for locally-grown agricultural products.

⁴ Michigan Society of Planning, *Trends Future Project – Final Report*, Map 7, p. 24.

⁵ *Id.*, Map 25, p. 54.

Cultural & Historic Resources

Historic structures and culturally significant places within Edwards Township include the Edwards Township Cemetery and Chapel on Greenwood Road. Township residents also value the historic and cultural significance of the Edwards Lake marl plant (i.e., the first business in the County) at the west end of Wickes Road; small Amish cemetery on Rau Road, east of M-30 Highway; former Edwards Schoolhouse at the northeast corner of Edwards and Greenwood Roads; and the former Rau Schoolhouse at the southwest corner of Rau Road and Rau Drive. Both former school structures are currently private residences. Other important historic cultural features within Edwards Township include the Edwards Church (i.e., former Indian church) at Greenwood and McCauley Roads; the Rau Family centennial farm at M-30 Highway and Rau Road; the Green Family centennial farm at Rau and Stillwagon Roads; and the Sheltroun family centennial farm on Tee Lake Road in Section 7.

Threats to Cultural & Historic Resources

Historic structures and locations such as cemeteries, schoolhouses, and other historically significant properties, structures, and features can be lost or irreparably altered by private-ownership uninformed of or uninterested in preserving or enhancing cultural or historic values. Edwards Township supports the exploration and establishment of voluntary historic preservation tools in the Township, Ogemaw County, and regionally, such as historic preservation and conservation easements; the public purchase of historic structures and culturally significant properties; conservation developments that set aside, protect and/or allow some public use of historic structures and culturally significant locales; and seeking private, foundation, and/or government funds to assist in historic structure and cultural preservation projects.

Summary of Findings

Edwards Township is endowed with rich natural, scenic, and cultural resources. However, Edwards Township residents are aware that, lacking voluntary protection, natural resources and historic structures within private ownership are vulnerable to significant alteration or destruction. Further, absent well-crafted, enforced, and fairly applied regulation, scenic resources are also at long-term risk.

It is the position of Edwards Township and its residents that the quality of life, economic welfare and environmental well-being of the Township are tied to the identification, use, and maintenance of public and voluntary private conservation and preservation tools to these important resources.