

PHYSICAL PROFILE

Introduction

Two of the community assets most often praised by the Mayville Community's citizens throughout the comprehensive planning process were the local natural resources and rural character. From its picturesque farms to its beautiful natural features, the landscape of the community plays an important role in the quality of life of area residents. However, recent construction of buildings in rural areas and changes in commercial properties has raised concerns about the long-term protection of the area's natural resources and rural character.

To get a more accurate picture of the current land uses and land use trends in the Mayville Community, LIAA staff members conducted a comprehensive land use/land cover update. LIAA compared 1978 land use maps created by the Michigan Resource Information System (MIRIS) with 2005 ortho-photographs provided by the USDA's Geostatial Data Gateway website, updating land use changes when necessary. Land use/land cover classifications were updated to the second tier category. *Maps 18(a)* and *18(b)* illustrate the updated land use/land cover for the Mayville Community. More information on the land use/land cover update will be provided in chapter seven of this plan.

To avoid duplicative research on several items discussed in this section, portions of the *2002 Tuscola County General Development Plan* and the *1993 Fremont Township Master Plan* were excerpted and incorporated into this chapter or are directly referenced. Where appropriate, these references have been updated to reflect 2006 statistics. These changes and additions to the original text are presented in brackets [].

Climate

Climate data for the Mayville Community was obtained from the Michigan State Climatologist's Office. Due to the lack of specific climate data for the Mayville Community, this plan summarizes climate data collected from the Caro weather station. This summary describes average climate and weather patterns from 1971 to 2000.

Area climate data (*Table 19*) indicates the community climate is continental - characterized by larger temperature ranges than in other areas at the same latitude near the Great Lakes which have more moderate temperatures. Due to prevailing westerly winds, the area rarely experiences prolonged periods of hot, humid weather in the summer or extreme cold weather during the winter. The prevailing winds provide for some lake effect snow showers. However, the prevailing winds primarily provide for increased cloudiness during the fall and early winter seasons.

Temperature data shows summers are dominated by moderately warm temperatures with only 13 days exceeding 90°F. In general, the warmest month of the year is July with an average temperature of 83.9°F. The highest recorded temperature of 101°F was set in July of 1988. Winter's coldest temperatures are moderated by the community's proximity to Lake Huron. The temperature in the Mayville Community has dropped below 32°F for only 155 days at most and below 0°F for 13 days at

most. In general, the coldest month of the year is January with an average temperature of 13.6°F. The coldest recorded temperature of -25°F was set in January 1976.

Due to its proximity to Lake Huron, the Mayville Community has an extended growing season, averaging 123 days annually. The average date of the last freezing temperature in the spring is May 22 while the average date of the first freezing temperature in the fall is September 24. On average, the growing season (April to September) receives 19.33 inches of precipitation annually, approximately 60% of the total annual average. These conditions are favorable for the variety of crops grown in the community.

The average annual snowfall for the community is 35.8 inches. In general, January produces the highest snow levels, with an average of 11 inches annually. The highest recorded monthly total snowfall was 25.7 inches in December of 2000. The greatest seasonal total of 54.5 inches of snow was recorded in 1972. On average, the total annual precipitation water equivalent (rain) is 31.9 inches per year. On average, September produces the highest rain levels, with 4.22 inches. The highest recorded one-day rainfall was 7.28 inches in September of 1986.

Data from the National Oceanic and Atmospheric Administration (NOAA) shows that during the 40-year period from 1965 to 2004, 15 Tornadoes touched down in Tuscola County. However, none of these tornadoes reached a Fujita Scale greater than F2. According to the Fujita Scale, an F2 tornado is a “significant” tornado with wind speeds between 113 - 157mph. On May 24, 1971, the largest tornado recorded in Tuscola County carved a 10 1/2 -mile path about 2-miles northwest of Caro. Only one person was injured. However several structures were either destroyed or damaged. Total damages were estimated around \$50,000.

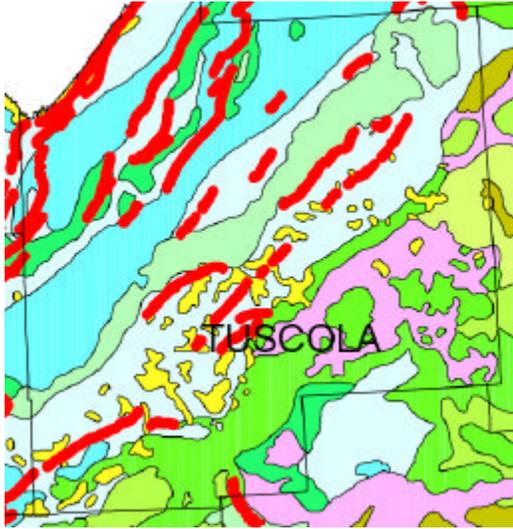
Table 19.					
Mayville Community Average Temperature and Precipitation 1971- 2000					
Period	Average Temperature			Average Precipitation	
	Max	Min	Mean	Rain	Snow
January	29.3	13.6	21.4	1.7	11.0
February	32.0	14.5	23.3	1.3	6.9
March	43.5	23.9	33.7	2.3	5.2
April	57.4	33.8	45.6	2.9	0.9
May	70.7	43.6	57.2	2.9	0.0
June	79.7	53.1	66.3	3.3	0.0
July	83.9	58.0	71.0	2.8	0.0
August	80.9	56.4	68.7	3.3	0.0
September	72.9	49.0	61.0	4.2	0.0
October	60.7	39.0	49.9	2.6	0.1
November	46.0	30.5	38.3	2.6	2.4
December	34.0	20.6	27.3	2.1	9.4
Annual	57.6	36.3	47.0	32.0	36.0

Source: Michigan State Climatologist's Office: Station 1299 Caro, MI

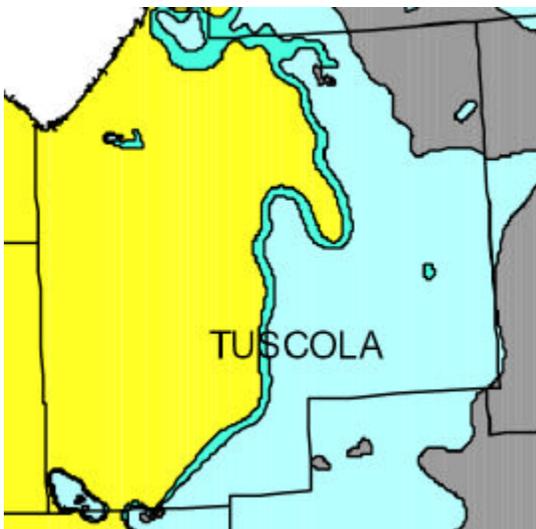


Geology

The 1982 Michigan Department of Environmental Quality (DEQ) *Quaternary Map* (below) illustrates the surface geology of the Mayville Community. As shown, the geological materials just beneath the soil surface are primarily composed of medium to fine texture tills left by glaciers as end-moraine deposits.



The 1987 DEQ *Quality Bedrock Map* (see image) illustrates the bedrock geology of the Mayville Community including portions of the Saginaw Formation, Bay Point Limestone and Michigan Formation.



Michigan Bedrock Map



A thorough description of the geology of Tuscola County and the Mayville Region is provided in the *Tuscola County General Development Plan*. The Plan states,

End moraines were created due to the melting of the ice sheet as it advanced or retreated. The debris-laden ice deposited large amounts of material along this area due to the glacier edge melting as fast as it advanced from the polar ice cap. The southern end of the county is chiefly composed of end moraines of medium-texture till. It is mostly loam and silt-loam in texture and may also contain small areas of outwash material (deposits made by running water from the glaciers.) Thickness of these layers vary locally, but tend to be 60 to 90 feet in depth.

The sub-surface geology of Tuscola County is primarily sedimentary bedrock that was laid down during the Pennsylvanian and Mississippian ages of the Paleozoic Era about 300 and 330 million years ago respectively. Bedrock is covered by glacial deposits and generally, depending upon the thickness of the glacial deposits, is located at a depth from 40 to 300 hundred feet below the surface. The bedrock was formed from ancient seas, which covered the area some 250 to 600 million years ago. During the time the bedrock was forming, these seas began to withdraw from the area leaving sediments from deltas as the land drained.

The seas re-advanced and finally receded at last creating the Michigan formation on the eastern half of the county. The shallow marine seas deposited layers of silt, clay, sediments, marine animals, plants, coral, and other calcareous materials. These deposits formed sandstone, shale, coal and limestone bedrock.

Topography

The Mayville Community is dominated by relatively level areas ranging from 700 feet above sea level in the northwest portion of the community to the “Mayville Hills,” a moderately hilly area rising to nearly 900 feet above sea level in the southeast portion of the community. *Map 9* illustrates the elevation of the Mayville Community.

Soil Conditions

A firm understanding and knowledge of the soil types and soil suitability within the Mayville Community is useful when considering future land use development. For example, some soil types limit infiltration of fluids, presenting limitations to the placement of on-site wastewater treatment systems (e.g., septic tanks and tile fields). These limitations can be vary important to developers since lands outside the Village service area rely on individual wells and on-site wastewater treatment systems.

Based on soil information, several maps were developed for the Mayville Community to indicate those areas subject to development and building constraints. While many of these constraints can be overcome, the engineering costs may be substantial. For example, soils characteristics of high slopes and poor drainage can limit or impede construction efforts. *Map 10* illustrates the probable locations of hydric soils in the Mayville Community – areas with potentially high water tables and poorly drained soils. *Map 11* illustrates areas where slopes may be greater than 12%, presenting construction concerns

such unstable soils and erosion. *Map 12* illustrates areas with limitations for dwellings with basements. *Map 13* illustrates areas with limitations for commercial buildings.

Based upon a 1986 soil survey by the U.S. Department of Agriculture Soil Conservation Service, there are four major soil associations within the Mayville Community. A soil association is a group of soils that commonly occur in proximity to one another. *Map 14* illustrates the general soil associations of the Mayville community. Descriptions of the soil associations within the Mayville Community were provided in the *Fremont Township Master Plan* and are presented below.

Pipestone-Granby-Chelsea Association

This soil association occurs mainly along the western portion of the Township in a narrow band near the central portion. The soil survey describes this association as consisting of nearly level to gently rolling, sandy soils. Drainage ranges from somewhat poor to poor. The survey further states that most areas of this association are used for crops, pasture, or woodland. The suitability for cultivated crops is considered fair. The Granby and Pipestone soils are considered poorly suited to building development due to wetness. However, the Chelsea soils are considered well-suited for building, with the only major limitation being slope.

Perrin-Wasepi-Gilford Association

The survey describes this association as nearly level and gently undulating loamy and sandy soils. Drainage ranges from moderately well-drained to very poor drained. Most areas are used for cropland or woodland, with some areas used for sand and gravel mining. The suitability for cultivated crops is considered fair, with wetness cited as a limitation. The suitability of the Gilford and Wasepi soils is poor for building development, and that of the Perrin soils is fair to poor.

Marlette-Capac-Spinks Association

This association consists of nearly level to steep loamy and sandy soils, ranging from well-drained to somewhat poorly drained. This association is found in the northeast, south-central and southeast portions of the community. The survey states that most areas of this association are used for cultivated crops, pasture or woodland. Wetness, slope and erosion (both wind and water are considered to be major limitations for agricultural purposes. The suitability for building sites ranges from good to poor. Slope and depth to the water table are the major limitations.

Houghton-Adrian Association

This association consists of nearly level organic (muck) soil. These occur in a narrow band running diagonally from the northeast to the central portions of the community. The wetness of these soils generally makes them unsuitable for agriculture or building sites. Major uses are limited to woodlands and wildlife habitat.

Woodlands & Wetlands

The Mayville Community includes a substantial amount of forested land and many wetlands – both wooded and emergent. These features represent important natural resources which can provide critical wildlife habitat, recreation areas, and harvestable timber, as well as providing valuable services such as pollution filtration and storm water detention (e.g., flood control).

Based on LIAA's 2005 land use/land cover analysis, forests of all types cover approximately 7,890 acres or about 34% of the Mayville Community's land area. These wooded acres occur in most parts of the community, but are particularly prevalent in the central and western portions of Fremont Township.

The 2005 land use/land cover analysis shows that wetlands account for approximately 961 acres or about 4% of the Mayville Community's land area. *Maps 15(a)* and *15(b)* illustrate the locations of these wetlands which are most prevalent in north central Fremont Township. Wetlands are unique ecosystems that filter out nutrients and sediments and help to maintain and enhance the clarity of lakes and streams.

Surface Water

The Mayville Community falls within the Cass River Basin Watershed. Streams and drains within the community include Evergreen Creek, Balder Drain, O-Brian Drain and Fremont Drain. According to the *1993 Fremont Township Master Plan*, the Mayville Community also has a number of small ponds and lakes - most the result of past sand and gravel mining operations. According to the 2005 land use/land cover analysis, surface water accounts for 159 acres of the Mayville Community.

Ground Water

Groundwater is the exclusive source of drinking water for the Mayville Community. Therefore, the Mayville Community's groundwater quality is very important to the over-all health of the community, future development options and to the quality of the area's water features. According to the Tuscola County Health Department and the *Tuscola County General Development Plan*, most of the county is fortunate to have an adequate supply of groundwater, generally within 100 feet of the surface. In addition, the vulnerability of drinking water aquifers to surface contamination is moderate to relatively safe.

According to the April 2006 Michigan Department of Environmental Quality's *Public Water Supply Chart*, the Village of Mayville water system is derived from groundwater and serves a retail population of 1055 (the Village does not add fluoride to this public supply). The surrounding areas of the community are serviced through individual wells.

Farmland

One of the Mayville Community's most valued resources farmland. In 2005, approximately 7,880 acres of land or about 34% of the community was in agricultural use. According to the USDA soil survey, most of the land in Tuscola County is considered *prime farmland*. However, *Prime Farmland* makes up a relatively small portion (729.9 acres) of the land in the Mayville Community. Most of the Mayville

Community is considered *Farmland of Local Importance* or *Prime Farmland if Drained*. Maps 16(a) and 16(b) illustrate *Prime Farmland* within the Mayville Community.

Approximately 2,307 acres of farmland operate under the *Farmland and Open Space Preservation Program* (PA 116). This program allows land owners to enter into an agreement with the state promising to keep the land in agricultural use for a minimum of ten years. In return, the land owners are entitled to certain income tax credits and limits on special assessments. About 30% of all farmland has been entered into this program, suggesting a relatively high level of commitment to farming.

Environmental Contamination Sites

The *Tuscola County General Development Plan* provides a comprehensive summary of the environmental contamination sites of Tuscola County. The following section excerpted from the Tuscola County Plan provides a summary of the environmental contamination sites in the Mayville Community. Where appropriate, we have updated the information, showing those changes and additions in brackets [].

The Michigan Natural Resources and Environmental Protection Act (NREPA) 451 of 1994, as amended, provides for the identification, evaluation and risk assessment of sites of environmental contamination in the state. The [Remediation and Redevelopment Division (RRD)] of the Michigan Department of Environmental Quality (DEQ) is charged with [administering programs that facilitate the cleanup and redevelopment of contaminated sites.] A site of environmental contamination is defined by public Act 451, as “the release of a hazardous substance, or the potential release of a discarded hazardous substance, in a quantity which is or may become injurious to the environment or to the public health, safety, or welfare.”

The agency publishes an annual list of environmentally contaminated sites by county, showing the sites by name, site assessment model score, pollutant(s) and site status. This list is available off the RRD website and is regularly updated with new information regarding site reclassifications, site additions, and site deletions. [Table 20 provides the 2004 site identification number, site name, location, pollutants and site severity for one site in the Mayville Community.] Site severity is partially determined by the site assessment model (SAM) score. The score is based upon a 48-point scale with a 48 rating indicating the most hazardous conditions. It should be noted this is not a complete measure of site severity as further investigation is necessary by contacting the [RRD] for each site.

Table 20. Environmental Contamination Sites	
Site ID Number	79000027
Site Name	Maintenance Machine Products
Location	Lobdell Road
Site Activity	Fabricated Metal Products
Type of Pollutant	Pb Fe Ni
SAM Score	14 out of 48
Source: Remediation and Redevelopment Division (RRD) of the Michigan Department of Environmental Quality (DEQ), November, 2006	

Another category of Michigan Sites of Environmental Contamination includes leaking underground storage tank or LUST sites. [According to the DEQ, open LUST sites are locations where a release has occurred from an underground storage tank system and where corrective actions have not been completed to meet the appropriate land use criteria.] According to Michigan State University’s Institute for Water Research, “a leakage of two drops per second can result in the loss of up to 500 gallons of fuel per year and can contaminate up to 500 million gallons of water to the level where odor and taste make it unacceptable for drinking.” *Table 21* provides the *Open* LUST Sites for the Mayville Community. Closed LUST Sites and Active & Closed UST Facilities are not noted in this plan.

This list is updated regularly and can be downloaded from the *Storage Tank Information Center* website: <http://www.deq.state.mi.us/sid-web/>

Table 21. Leaking Underground Storage Tank (LUST) Sites		
Facility ID	Site Name	Site Address
00041818	5980 Fulton St.	5980 Fulton Street
00000661	Peoples Gas & Oil	37 East Main Street
0000032962	Woern Self Serve	104 East Main Street
00016279	Naugle's Service	30 West Main Street
00038883	Old Texaco Gas Station	105 West Main Street
00012135	Werner Perma-Shine	6004 Fulton Avenue
Source: Remediation and Redevelopment Division (RRD) of the Michigan Department of Environmental Quality (DEQ), November, 2006		

Endangered Species

The following summary concerning endangered species is provided in the *Tuscola County General Development Plan*.

Tuscola County is home to numerous plants, birds, and animals that are classified as endangered species. The Nature Conservancy and the Michigan Department of Natural Resources jointly produce and maintain a Michigan Natural Features Inventory (MNFI). The MNFI’s mission is to identify, evaluate and track locations of Michigan’s rarest species and to provide information that can be used in developing land use plans.



The following species are just a few of the endangered plant and animal species found in Tuscola County. A full list of plant and animal species can be found in *Appendix G*.

Common Animal Name

Spotted Turtle
 Silphium Borer Moth
 Channel Darter
 Red-Legged Spittlebug
 Common Tern
 Purple Lilliput

State or Federal Status

Threatened
 Threatened
 Endangered
 Special concern
 Threatened
 Endangered



Common Tern



Red-Legged Spittlebug

Common Plant Name

Sullivan’s Milkweed
 Cooper’s Milk-Vetch
 Prairie Indian-Plantain
 White Lady-Slipper
 Furrowed Flax
 Ginseng
 Prairie Fringed Orchid

State of Federal Status

Threatened
 Special Concern
 Special Concern
 Threatened
 Special Concern
 Threatened
 Endangered/Listed Threatened



White Lady-Slipper



Cooper’s Milk-Vetch