MASTER PLAN
2019

A Joint Master Planning Effort by the Communities of:
Alpena County
Green Township
Ossineke Township
Wilson Township

DRAFT RELEASE:
July, 2019

Chapter 1 INTRODUCTION

What is a Master Plan and why do we have one?

The Master Plan is a blueprint for the future. It guides land use decisions and subsequent development by creating land use goals for the next 10 to 20 years. The communities create a vision so that we always keep in mind how we intend to retain our economic health, conserve our natural resources, meet the needs of residents and business people, ensure an efficient transportation system, ensure compatible land uses, and promote public health, safety, and welfare. In creating this plan the question is asked of our Alpena County Community stakeholders: What do you want our communities to be like in the future? To be best able to answer that question, the plan provides information about what we have now. Goals are identified describing what we want the communities to be like in the future and then objectives are determined which will help achieve those goals.

This Master Plan serves as a policy document used by community leaders, business owners, residents, and developers to make land use decisions. These decisions can be about development, policy, capital improvements, and future growth. This is a Master Plan that has had broad participation due to the partnership between the County and 3 participating townships – Green, Ossineke, and Wilson. These 4 entities have chosen to work together on this Master Plan, having also cooperated on a joint Recreation Plan in this same year.

What does this have to do with zoning?

This isn't a zoning ordinance, which is a law. However, the Master Plan is the guide and the community's policies that are used to make changes to that law. The Master Plan is the vision, the zoning ordinance is the system of rules that make that vision reality. State law requires that any place that has a zoning ordinance must have also have a Master Plan and must use that Master Plan when any changes are made to that zoning ordinance law.

Why should people be involved?

It's important to know that change will happen regardless of whether we plan for it. This Master Plan is an effort to determine what kind of change is desired and how to achieve the desired goals. You can do your part to make sure your community's interests are communicated and the community's goals are included in future updates to this Plan. This will go a long way in making sure that the change that occurs is desired by the community. This Master Plan should be a living document. This means that it should be updated as often as necessary to reflect changing community values, land use trends, and new goals.

The purpose of the Alpena Community Master Plan is to translate community values and goals into a framework for decisions on growth, land use, public facilities and services. It contains a long-range vision of how citizens want their community to look and function in the future and guidelines for achieving those goals. The master plan is a legally recognized framework upon which to base land use decisions in our communities. It is intended to aid a broad range of public and private users, including community groups, builders, developers, township officials and other government agencies.

Regulations such as zoning and subdivision controls are legal standards applied uniformly with little discretion. Although the master plan is adopted by resolution and carries weight when applied to specific land use decisions, it is not considered law. This means that the plan has a certain degree of flexibility that allows review and adjustment should conditions change over time.

This plan is prepared as authorized under the Michigan Planning Enabling Act (PA33 of 2008) and is used to satisfy the requirement of section 203(1) of the Michigan Zoning Enabling Act (PA110 of 2006), MCL 125.3203 for the jurisdictions of the County of Alpena, Green Township, Ossineke Township, and Wilson Township. This Plan will mention the other townships within Alpena County (Alpena Charter Township, Long Rapids Township, Maple Ridge Township, and Sanborn Township) as well as the City of Alpena and Village of Hillman (which is partially in Alpena County).

LOCATION AND HISTORY

Alpena County is located on the shores of Lake Huron in the northeast section of Michigan's Lower Peninsula (see Table 1-1). Covering 568 square miles, the county includes 363,520 acres. It is bordered by Presque Isle County to the north, Montmorency County to the west, Alcona County to the south and Lake Huron to the east.

Alpena County is 24 miles long from north to south. East to west, the county varies from 20.8 miles to 30.8 miles, because of the irregular shoreline of Lake Huron. Additionally, there are several offshore islands in Lake Huron that are a part of the county. The following townships are located within the planning area for this document: Alpena, Green, Long Rapids, Maple Ridge, Ossineke, Sanborn, Wellington and Wilson. Also included in the planning area are the City of Alpena, the Census Designated Place of Ossineke, as well as the unincorporated places of Bolton, Cathro, Herron, Hubbard Lake, Lachine, Leer and Long Rapids.

The first European-American settlers were attracted to the Alpena area in the mid-1830's. Their initial interest was commercial fishing. In 1857 the State legislature organized Alpena County, which included what was later to become the counties of Montmorency, Oscoda and part of Presque Isle, as well as the modern day Alpena County. The area started to grow in 1860's due to extensive logging activities. The Thunder Bay River was the basic transportation from logging sites to sawmills located in the City of Alpena and its port on Lake Huron. Because the harbor is protected by Thunder Bay it became a commercial fishing center. The great wildfire of 1871 damaged a large area in the northern half of Alpena County and areas in Presque Isle County. Several people died when the settlements of Cathro, Metz, and Posen were destroyed along with thousands of acres of forestlands.

With the Thunder Bay River, Lake Huron and the extension of rail lines, Alpena become a hub of transportation. Logging and milling activities flourished. In the early 1900's companies were formed with activities related to paper production and uses of limestone, which is quarried in the area. The population in 1900 was 18,254.

The Fletcher family built their first dam on the Thunder Bay River in 1908, to generate electricity to support their new paper mill. They later built three more hydro dams and also dammed Hubbard Lake and Fletcher's pond to hold water for power generation. They created Alpena Power which still serves the area. These dams were sold in 1990 and are presently operated by the Thunder Bay Power Company under FERC permits.

Today, Alpena County is the hub of transportation, healthcare, education, commercial and retail services for the neighboring three counties of Alcona, Presque Isle, Montmorency and further west.

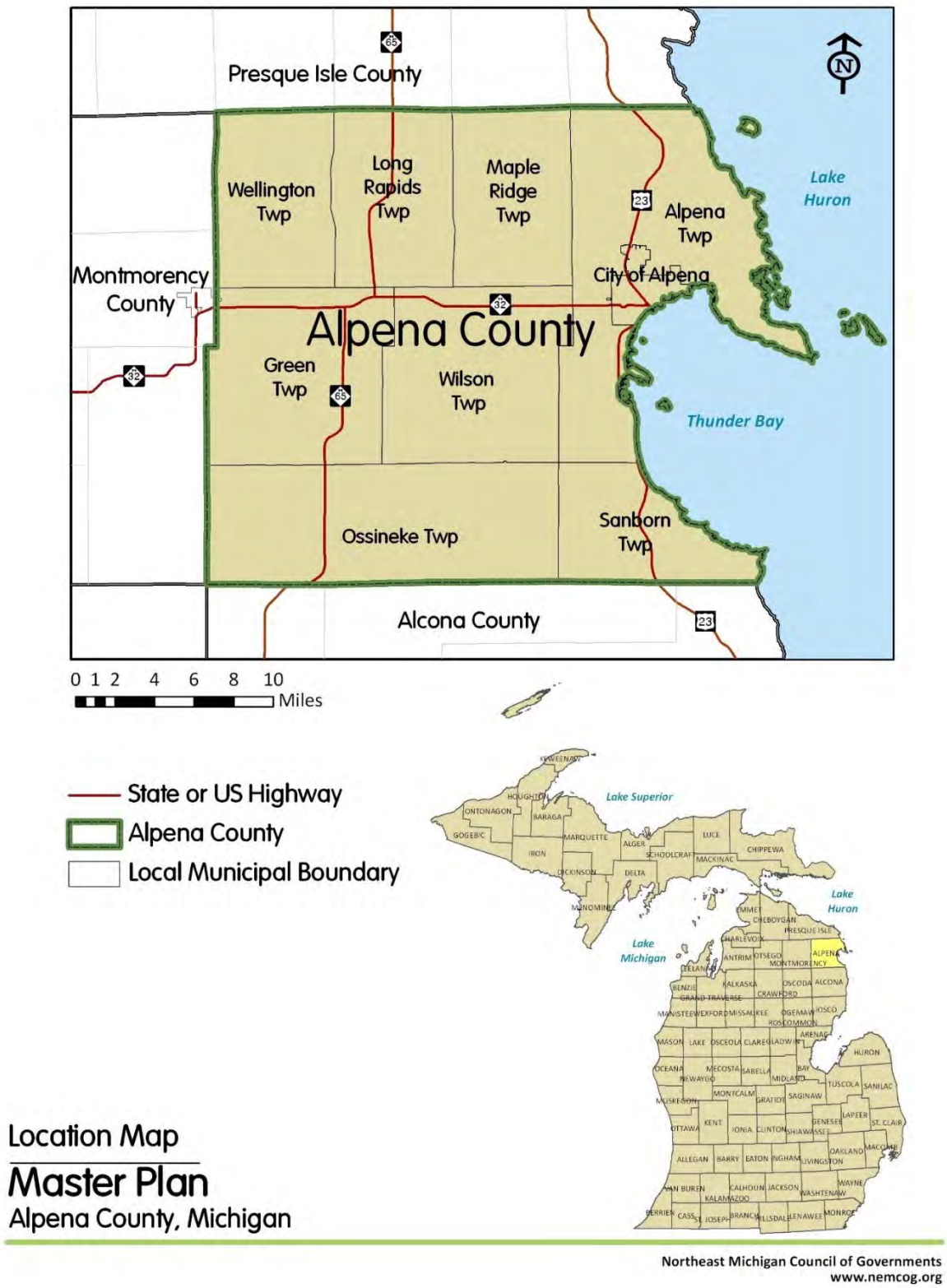


TABLE 1-1 LOCATION MAP

Chapter 2 SOCIAL & ECONOMIC CONDITIONS

POPULATION

The 2017 American Community Survey showed that Alpena County, with a population of 28,730, continues to be the most populated county in the Northeast Michigan region (Emmet County is included in the chart for comparison). Population of the County has decreased by 868 people (-8.3 percent) since 2000. Although the County population density is 50.2 persons per square mile, 66 percent of the population is concentrated in Alpena Township and the City of Alpena (see **Table 2.1**). If the land area and population of the City of Alpena and Alpena Township are excluded, the average density for the remaining seven townships is 21.3 persons per square mile. The County population has increased by 55 percent since 1930 (see Table 2-1) with the peak population occurring in 1980. Since then the county has experienced continual declining population. The largest population increase was 28.7 percent (6,367 people) recorded between 1950 and 1960.

Seven of the eight counties the Northeast Michigan experienced population declines from 2000-2017. Only Otsego County experienced an increase (see Table 2-2). Oscoda County had the highest population loss in northeast Michigan.

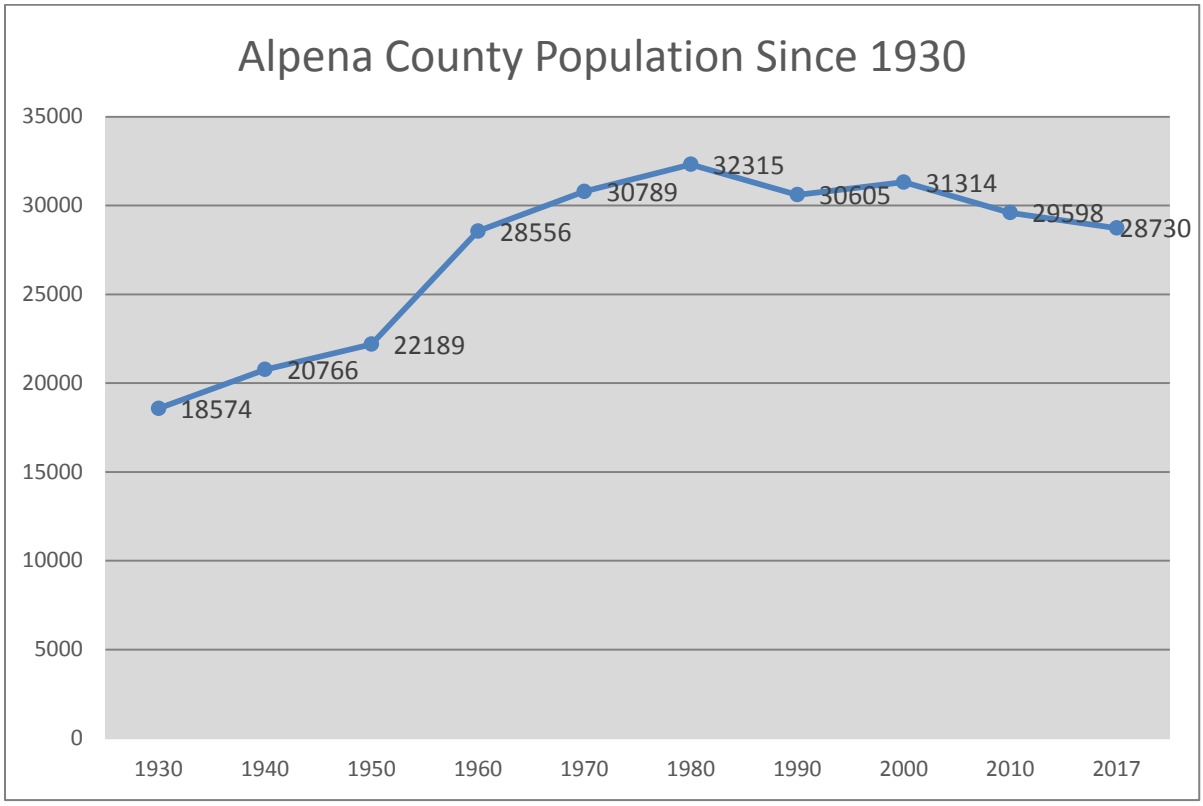
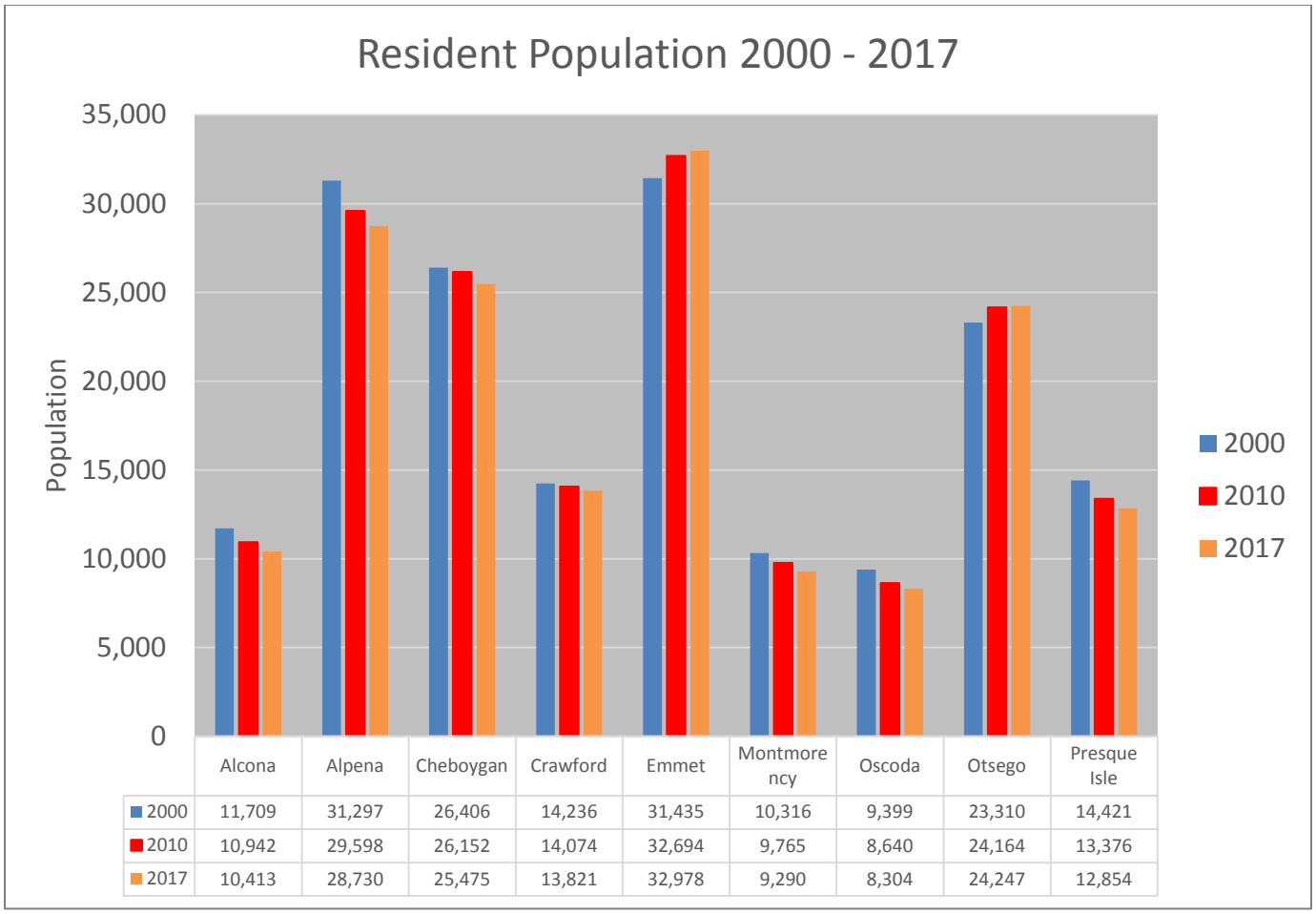


TABLE 2-1 ALPENA COUNTY POPULATION



	Alcona	Alpena	Cheboygan	Crawford	Emmet	Montmorency	Oscoda	Otsego	Presque Isle
2000	11,709	31,297	26,406	14,236	31,435	10,316	9,399	23,310	14,421
2010	10,942	29,598	26,152	14,074	32,694	9,765	8,640	24,164	13,376
2017	10,413	28,730	25,475	13,821	32,978	9,290	8,304	24,247	12,854

TABLE 2-2 RESIDENT POPULATION

TABLE 2-3
POPULATION FOR ALPENA COUNTY & MUNICIPALITIES, 1980-2017

Municipality	1980 Pop.	1990 Pop.	% Change '80-'90	2000 Pop.	% Change '90-'00	2010 Pop.	2017 Pop.	% Change '00 – '17	% Change '80 – '17
Alpena Twp.	10,152	9,602	-5.4%	9,788	1.9%	9,060	8,834	-9.7%	-13.0%
Green Twp.	1,083	1,095	1.1%	1,205	10.0%	1,228	1,138	-5.6%	5.1%
Long Rapids Twp.	1,006	1,021	1.5%	1,019	-0.2%	1,010	989	-2.9%	-1.7%
Maple Ridge Twp.	1,572	1,514	-3.7%	1,715	13.3%	1,690	1,676	-2.3%	6.6%
Ossineke Twp.	1,607	1,654	2.8%	1,761	6.5%	1,675	1,821	3.4%	13.3%
Sanborn Twp.	2,297	2,196	-4.4%	2,152	-2.0%	2,116	2,029	-5.7%	-11.7%
Wellington Twp.	286	269	-5.9%	296	10.0%	307	256	-13.5%	-10.4%
Wilson Twp.	2,098	1,902	-9.3%	2,074	9.0%	2,029	1,864	-10.1%	-11.2%
City of Alpena	12,214	11,354	-7.0%	11,304	-0.4%	10,483	10,123	-10.4%	-17.1%
Alpena County	**32,315**	**30,605**	**-5.3%**	**31,314**	**2.3%**	**29,598**	**28,730**	**-8.3%**	**-11.1%**

Source: U.S. Bureau of the Census 2017 American Community Survey 5-Year Estimates

Between 1980 and 2017, Alpena Township lost 13 percent of its population while the City of Alpena lost 17.1 percent (Table 2-3). The City of Alpena's population loss from 2000-2017 was comparable to the loss of 1980-1990. Sanborn, Wellington, and Wilson Townships also experienced comparable population

losses over that 30 year time period, while Long Rapids Township experienced a slight population loss. Green and Maple Ridge Townships experienced moderate population increases while Ossineke Township experienced a significant population increase of 13.3 percent.

SEASONAL POPULATION

In 2017, the American Community Survey reported that 12.9 percent of the housing units in the County were seasonal. The percentage of Alpena County's housing units that are classified as seasonal is much less than that of the surrounding counties. Obtaining accurate numbers of seasonal residents and tourists is difficult. Because the decennial U.S. Census is conducted in April, the numbers are more likely to reflect those persons who live in the County on a year-round basis. A rough estimate of the number of County seasonal residents can be calculated by multiplying the number of County seasonal housing units (2,073) by the County's average number of persons per household (2.20), for a total of 4,561 persons. Seasonal residents, therefore, may add an estimated 15.9 percent to the County's year-round residents, for approximately 33,291 persons, compared to the actual 2017 American Community Survey figure of 28,730 persons. This figure does not include those seasonal visitors or tourists staying in area motels, campgrounds or family homes. It is impossible to obtain accurate count of the number of the tourists who annually visit the County. However, see Chapter 5 – Economic Development – for a discussion on area tourism.

AGE DISTRIBUTION

The 2017 American Community Survey data shows that 52.7 percent of Alpena County's population was 45 years old or older (see Table 2-5 and Table 2-4).The State of Michigan data estimates that 43.6% of the population was 45 years of age or older and nationally that population is 41% of the total. The age group 45-64 is the most populous age group in all municipalities except Wellington Township (the 65+ age group is larger by 1.4 percent). In Alpena County as a whole, the 65+ age group slightly exceeds the 25-44 age group as a percentage of the total population. Each is more than 20% of the total population.

The median age of residents in Alpena County increased 7.2 years from 40.4 to 47.6 during the period 2000-2017, (see Table 2-5)**.** This is higher than the statewide median age of 39.6 in 2017. In fact, each municipality in Alpena County exceeds the statewide median age. Alpena Township has the highest median age in Alpena County while the City of Alpena has the lowest. From 2010 to 2017, the population of people under age 55 declined and the older population increased. The following graph shows the trend of the aging population of the county.

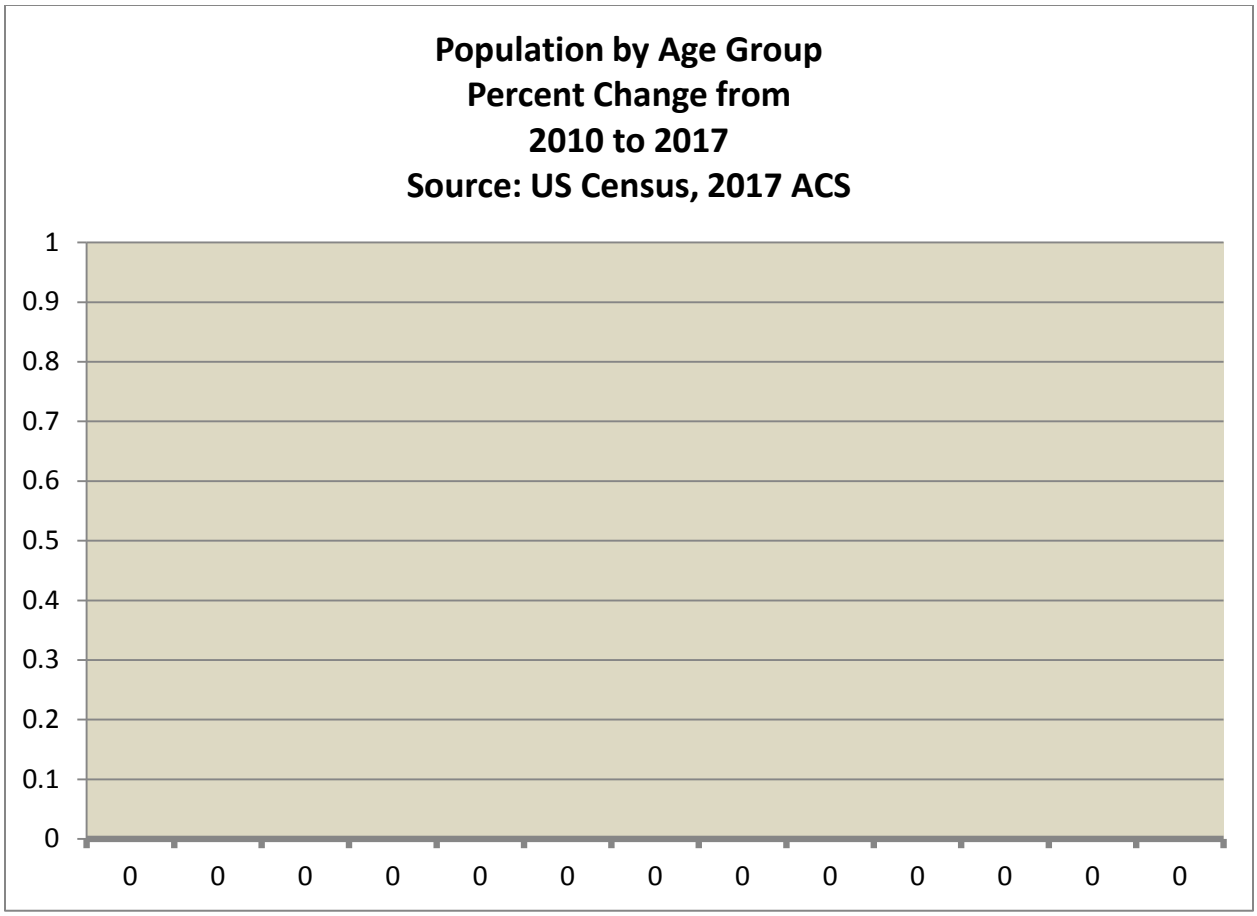


TABLE 2-4 POPULATION BY AGE GROUP

TABLE 2-5 AGE DISTRIBUTION FOR ALPENA COUNTY AND THE STATE OF MICHIGAN - 2017													
	< 5 Yrs.	**%***	**5-19 Yrs.**	**%***	**20-24 Yrs.**	**%***	**25-44 Yrs.**	**%***	**45-64 Yrs.**	**%***	**65 Yrs. & >**	**%***	**Median Age**
Alpena Twp	219	2.5	1,344	15.1	382	4.3	1,625	18.3	2,973	33.7	2,291	26.0	52.4
Green Twp	56	4.9	197	17.3	35	3.1	212	18.6	379	33.4	259	22.8	49.3
Long Rapids Twp	48	4.9	101	10.2	80	8.1	165	16.7	392	39.6	203	20.5	51.7
Maple Ridge Twp	66	3.9	313	18.7	63	3.8	371	22.2	538	32.1	325	19.3	46.1
Ossineke Twp	180	9.9	300	16.5	85	4.7	381	20.9	456	25.0	419	22.9	42.9
Sanborn Twp	133	6.6	400	19.7	98	4.8	464	22.9	605	29.8	329	16.2	42.5
Wellington Twp	10	3.9	32	12.5	12	4.7	54	21.1	72	28.2	76	29.6	52.1
Wilson Twp	52	2.8	294	15.8	127	6.8	276	14.9	743	39.9	372	19.9	49.3
Alpena City	565	5.6	1,767	17.5	666	6.6	2,413	23.9	2,660	26.3	2,052	20.3	42.1
Alpena Co	1,329	4.6	4,748	16.6	1,548	5.4	5,961	20.8	8,818	30.7	6,326	22.0	47.6
Michigan		5.8		19.3		7.3		24.1		27.7		15.8	39.6

Source: U.S. Bureau of the Census 2017 American Community Survey 5-Year Estimates
**Figure shows the percentage each age grouping represents of the local unit's total population.*

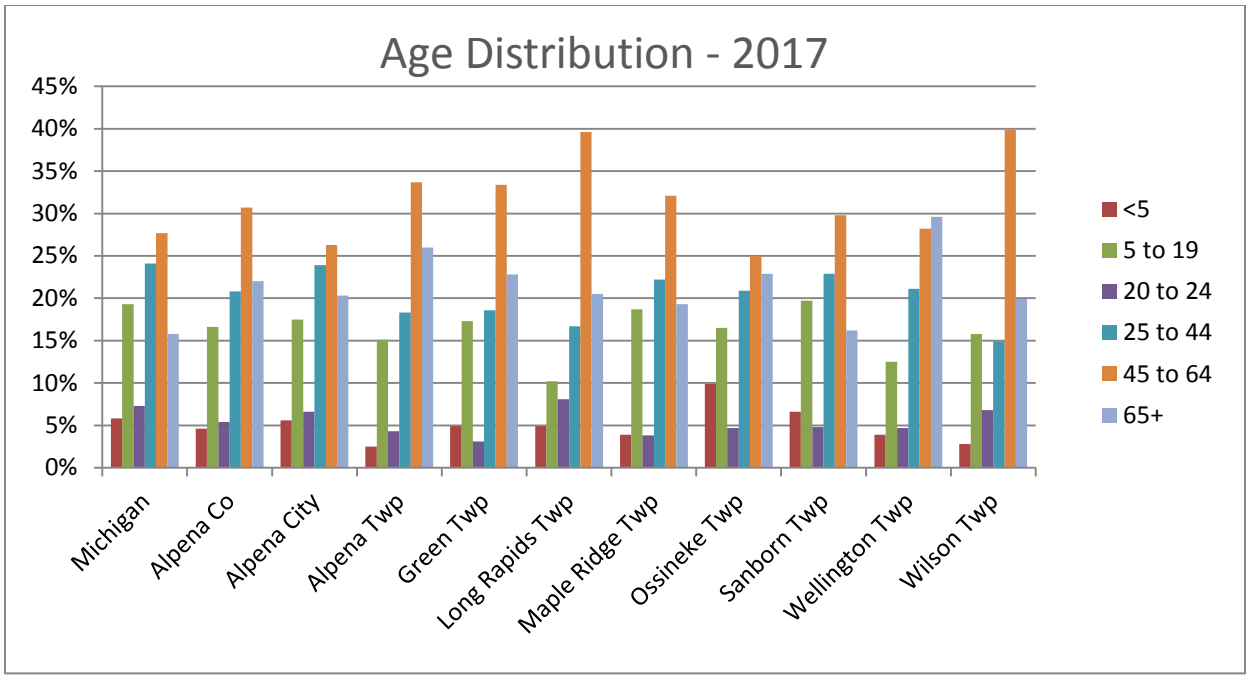


TABLE 2-6

NET MIGRATION

The US Census estimates the movement of people from one county to another across the nation. Their most recent survey provides estimates of the number of people who move into and out of Alpena County between the years 2012 and 2016. The population estimates for Alpena County in 2012 and 2016 shows a net decrease of 516 people. The Census County-to-County Migration Flows: 2012-2016 from the American Community Survey shows a net outmigration of 229 people.

RACE AND ETHNIC COMPOSITION

Information found below on Table 2-7 shows that Alpena County has a very small minority population, a situation that has not changed significantly over the last seventeen years. The number of minorities has increased slightly from 2000 to 2017 with the most significant increase (120.8 percent) in the Black population. Hispanic minorities have also increased (105.5 percent) as have Asians (38.8 percent) and American Indians (4.9 percent). While the percentage changes are quite large, the actual number of people remains low.

Excluding the *two or more races* category, Hispanic was the largest minority group with 1.3 percent of the population, followed by Black, Asian, and American Indian at 0.6, 0.4, and 0.4 percent, respectively. Persons included in the "Two or More Races" category made up 1.4 percent of the population.

TABLE 2-7 POPULATION BY RACE AND HISPANIC ORIGIN FOR ALPENA COUNTY: 2000-2017						
	2000		2010		2017	
	#	% of Total Pop.	#	% of Total Pop.	#	% of Total Pop.
White	30,753	98.9%	28,845	97.5%	27,816	96.8%
Black	77	0.2%	79	0.3%	170	0.6%
Am. Indian	123	0.4%	156	0.5%	129	0.4%
Asian	103	0.3%	152	0.5%	143	0.4%
Two or More Races*	218	0.7%	311	1.0%	421	1.4%
Hispanic or Latino Origin**	181	0.6%	304	1.0%	372	1.3%

** Census 2010 gave respondents the opportunity to choose more than one race category.*

*** Persons of Hispanic or Latino Origin may be of any race.*

Source: U.S. Bureau of the Census 2000 and 2010 Census and 2017 American Community Survey 5-Year Estimates

DISABILITY STATUS

Data relating to disabled status is estimated by the American Community Survey (ACS)[1] and is based on a self-reported sample (Table 2-8 Disability Status in Alpena County). The ACS asks about six disability types: hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, and independent living difficulty. Respondents who report any one of the six disability types are considered to have a disability. There were an estimated 5,340 people who had reported a disability in Alpena County in 2017. This is an estimated 18.8% of the total civilian noninstitutionalized population. There were 5,221 disabilities reported by people between the ages of 18-64 who reported having some type of disability. Ambulatory disabilities were the most common. Cognitive disabilities are the next most common in this age group. It should be noted that a number of people reporting disabilities have reported multiple disabilities; therefore they appear in more than one row in the table. Data obtained from Northeast Michigan Community Mental Health shows that the agency serves 1,078 individuals with disabilities over the age of 26. Also, the Alpena-Montmorency-Alcona Educational Service District serves 63 individuals aged 26 and under with disabilities. The data shown in Table 2-9 gives an indication of the number of disabled people residing in Northeast Michigan. A person was classified as having a disability if they had a sensory disability, physical disability, mental disability, self-care disability, difficulty going outside the home alone, or an employment disability. The high percentage of disabilities in Northeast Michigan indicates a demand for disabled services. The percent of the population of Northeast Michigan over the age of 18 who is classified as having a disability is estimated at 23.3%.

[1] The ACS is an ongoing statistical survey sent to approximately 250,000 addresses across the US monthly.

TABLE 2-8 DISABILITY STATUS IN ALPENA COUNTY	
Population under 5 years	
With a hearing difficulty	19
With a vision difficulty	19
Population 5-17 years	
With a hearing difficulty	15
With a vision difficulty	31
Population 18-64 years	
With a hearing difficulty	595
With a vision difficulty	479
With a cognitive difficulty	1,295
With an ambulatory difficulty	1,350
With a self-care difficulty	493
With an independent living difficulty	1,009
Population 65+ years	
With a hearing difficulty	1,130
With a vision difficulty	427
With a cognitive difficulty	551
With an ambulatory difficulty	1,431
With a self-care difficulty	476
With an independent living difficulty	968
Disabled population age 26+ (serviced by Community Mental Health)*	1,078
Disabled population age 26 and younger (serviced by the Alpena-Montmorency-Alcona Educational Service District)*	63

Source: American Community Survey 2017 5-Year Estimates (self-reported data)
**Data obtained from Northeast Michigan Community Mental Health and the AMA ESD.*

TABLE 2-9 DISABILITY STATUS IN 8-COUNTY REGION* 2017	
% of population with a disability all ages	20.1%
% of population with a disability age 18+	23.3%
% of population with a disability age 18-64	17.2%
% of population with a disability age 65+	37.4%

Source: American Community Survey 2017 5-Year Estimates (self-reported data)
**Region includes Alcona, Alpena, Cheboygan, Crawford, Montmorency, Oscoda, Otsego, and Presque Isle*

EDUCATIONAL ATTAINMENT

Since 2000, Alpena County has experienced increases in educational attainment but still hasn't experienced the share of population with advanced degrees experienced by the State of Michigan and United States. The number of people 25 and older who had a high school diploma or more increased from 73.6 percent in 1990 to 83.1 percent in 2000 to 87 percent in 2010 and continues to rise to 91 percent. The percentage of residents with a Bachelor's degree in Alpena County (11.1 percent) is still lower than the State of Michigan (17.1 percent) and the United States (19.1 percent). The percentage of residents with a graduate degree in Alpena County (6.2 percent) is also approximately half that of the State (11 percent) and the United States (11.8 percent).

TABLE 2-10 GREEN TOWNSHIP, OSSINEKE TOWNSHIP, WILSON TOWNSHIP, AND ALPENA COUNTY EDUCATIONAL ATTAINMENT 2017					
Degree	Green Township	Ossineke Township	Wilson Township	Alpena County	Michigan
Population 25 years and over	850	1,256	1,391	21,105	997,075
Less than 9th grade education	2.7%	4.4%	1.2%	2.6%	3.0%
9th – 12th grade, no diploma	8.8%	10.1%	7.6%	6.4%	6.7%
High school graduate	39.1%	35.4%	33.8%	33.9%	29.3%
Some college, no degree	22.4%	26.0%	29.9%	26.6%	23.6%
Associate degree	10.4%	13.0%	13.0%	13.3%	9.3%
Bachelor's degree	11.2%	8.6%	10.0%	11.1%	17.1%
Graduate or professional degree	5.5%	2.5%	4.5%	6.2%	11.0%
Percent high school graduate or higher	88.5%	85.5%	91.2%	91.0%	90.2%
Percent bachelor's degree or higher	16.7%	11.1%	14.5%	17.3%	28.1%
U.S. Bureau of the Census – American Community Survey 2017 5-Year Estimates					

INCOME AND POVERTY

A reliable measure of the economic health of families is median household income which is the midpoint of income for all households. While all eight counties of Northeast Michigan have generally exhibited a steady increase in median income over the past several decades, Northeast Michigan still lags behind the state as a whole. Table 2-11 presents information on the median household income for counties in Northeast Michigan. According to the U.S. Census Bureau, Otsego County continues to have the highest median household income. The 2017 median household income for Otsego County was $50,823 which was 96.4 percent of State's household income. This is unusual in Northeast Michigan, where the median household income of most counties is much lower than the State rate. Alpena County's median household income is 77.7 percent of the State's and 71 percent of the national median household income.

TABLE 2-11 Median Household Income: Northeast Michigan	
	2017
Alcona County	$39,424
Alpena County	$40,954
Cheboygan County	$42,876
Crawford County	$42,666
Montmorency County	$39,152
Oscoda County	$36,833
Otsego County	$50,823
Presque Isle County	$43,758
State of Michigan	$52,668
United States	$57,652

SOURCE: U.S. BUREAU OF THE CENSUS 2017 5-YEAR ESTIMATES

Generally speaking, individuals who have steady, year-round employment will tend to have higher overall incomes than those who are laid-off for part of the year. As more retirees move into the region and the local economy becomes more reliant on service and tourism job sectors, this trend of widening gaps between regional and state median household incomes is expected to continue. Lower incomes create challenges for balanced economic growth. As expenses for gas, food and housing continue to increase, families may choose to move to areas that offer higher incomes. This could create an imbalance in the labor force necessary for positive economic growth.

TABLE 2-12
Median Household Income: Alpena County & Townships

	2017
Alpena Township	$42,125
Green Township	$52,734
Long Rapids Township	$47,143
Maple Ridge Township	$48,875
Ossineke Township	$44,375
Sanborn Township	$39,205
Wellington Township	$34,375
Wilson Township	$48,208
Alpena County	$40,954
State of Michigan	$52,668

Source: U.S. Bureau of the Census - American Community Survey 2017 5-Year Estimates

Poverty rates continue to be a problem in Alpena County and the Northeast Michigan region in general. 9.9 percent of all families in Alpena County are estimated to be in poverty. When children are present, this percentage increases to 19.3 percent. Again, this number increases dramatically when a female head of household is present (31.7 percent) and goes even higher when children under the age of 18 are in the household (46.3 percent). This means that approximately 789 families with a female head of household (with children) are living in poverty in Alpena County. However, the percentage of householders 65+ years of age living in poverty has decreased from 6.9 percent in 2000 to 3.9 percent in 2017.

EMPLOYMENT AND UNEMPLOYMENT

TABLE 2-13
Green Township, Ossineke Township, Wilson Township, and Alpena County Poverty Rates 2017

Category	Green Township %	Ossineke Township %	Wilson Township %	Alpena County %
Families	4.9	8.2	3.8	9.9
All families w/related children under 18	7.8	15.0	0.0	19.3
Married couple families	2.6	3.6	4.2	4.7
Married couple families w/related children under 18	0.0	3.9	0.0	6.5
Female householder, no husband present	10.7	26.8	0.0	31.7
Female householder, no husband present w/related children under 18	33.3	40.5	0.0	46.3
Householder 65+ years	0.0	3.6	4.0	3.9

Source: U.S. Bureau of the Census American Community Survey 2017 5-Year Estimates

Joblessness in Alpena County has been historically high, as compared to data for the State of Michigan and the United States, but lower than the unemployment rates found in nearby counties. Table 2-14

shows that the county's unemployment rate declined dramatically from 1992 to 2000. After 2000, the rate climbed until 2003, then dropped again. As with the rest of the State and nation, Alpena County's economy suffered job losses due to the downturn in the national economy resulting in extremely high unemployment rates in 2009 (matching the State jobless rate that year). Overall, jobless rates are again declining.

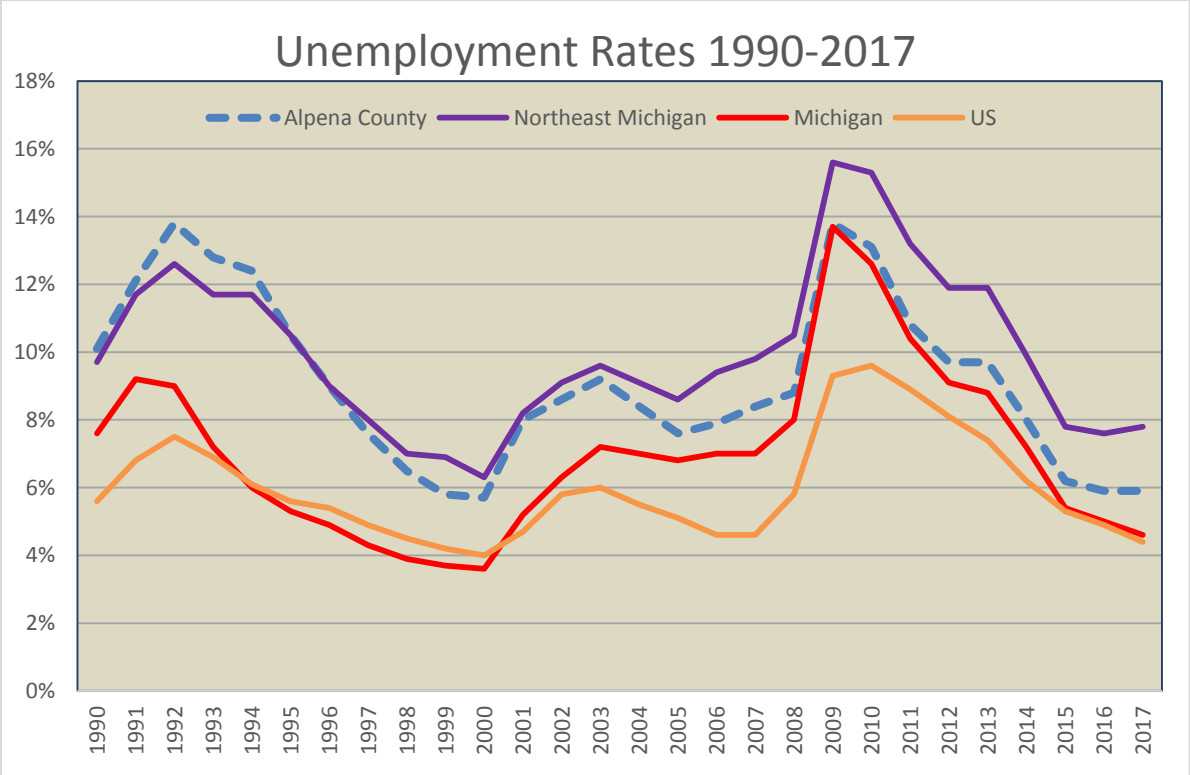


TABLE 2-14

SIZE OF LABOR FORCE

Between 1990 and 2018, the county's civilian labor force remained relatively consistent. Between 1990 and 2000, the labor force was in a general growth trend. Since 2000, the county has experienced 18 years of labor force decline.

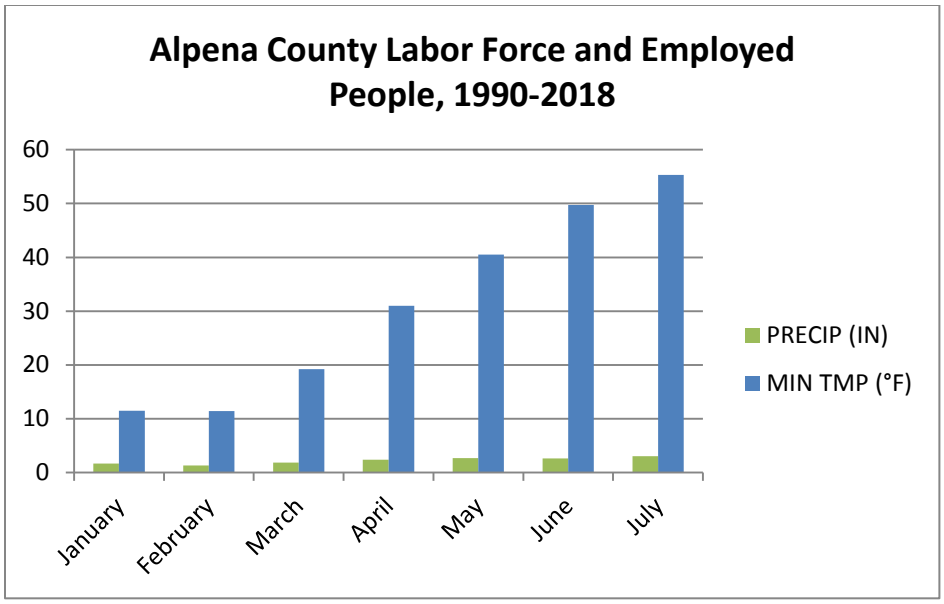


TABLE 2-15

WAGE AND SALARY EMPLOYMENT

Making historical employment sector comparisons is difficult due to the change in classification systems in recent years. Therefore, data is being presented in this Master Plan which represents data gathered by the Michigan Department of Technology, Management and Budget as well as that gathered by the American Community Survey. Each entity classifies sectors differently, therefore comparisons are kept separate. Table 2-16 and Table 2-15 show data from the Michigan Department of Technology, Management & Budget "Industry Census of Employment & Wages." According to this source, government workers make up the largest sector of the Alpena County economy. This is likely due to the fact that the Alpena Regional Medical Center is counted under the "local government" category. Taking that into account, retail trade is the largest employment sector in the County. Retail trade has surpassed manufacturing in the number of people employed; however manufacturing still remains significant in the Alpena County economy. Although not reflected in the data shown, until the middle 1980's Alpena County's economy was centered in the manufacturing sector. The sectors which have made gains in employment from 2000 to 2017 include finance/insurance, health care and social assistance, state government, and federal government. All other sectors in Alpena County have experienced a loss since 2000. Table 2-18 shows that significant losses were experienced by the manufacturing sector and the construction sector.

TABLE 2-16 ALPENA COUNTY ESTABLISHMENTS, EMPLOYMENT AND WAGES - 2017			
Industry	# of establishments	Average employment	Avg weekly wages
Agriculture, forestry, fishing & hunting	18	48	$558
Mining	5	82	$1,458
Utilities	3	*	*
Construction	90	498	$765
Manufacturing	57	1,507	$1,158
Wholesale trade	31	429	$884
Retail trade	125	1,903	$531
Transportation & warehousing	25	212	$731
Information	11	141	$689
Finance & insurance	34	347	$883
Real Estate, rental & leasing	19	109	$435
Professional, scientific & technical services	43	253	$892
Administrative & waste services	28	227	$417
Educational services	4	14	$261
Health care & social assistance	65	1,307	$611
Arts, entertainment, & recreation	12	90	$297
Accommodation & food services	72	998	$265
Other services (except public administration)	105	472	$379
Unclassified	5	30	$592
Federal Government	14	137	$1,149
State Government	10	180	$1,203
Local Government	16	2,426	$885

Source: Michigan DTMB Quarterly Census of Employment & Wages – 4th Quarter 2017
**Data suppressed.*

Table 2-16 depicts wage information from the Michigan Department of Technology, Management and Budget. The sectors paying the highest wages in 2017 are mining, manufacturing, state government, and federal government.

The American Community Survey classifies sectors in a slightly different manner (Table 2-17). According to its findings, the largest sector of the Alpena economy is "educational assistance, health care, and social assistance" which makes up nearly 27 percent of the economy. Retail trade makes up approximately 15 percent of the economy. Manufacturing is the third largest sector making up over eleven percent of the economy of Alpena County.

TABLE 2-17 ALPENA COUNTY RESIDENTS EMPLOYMENT BY INDUSTRY 2017		
	2010	2017
Agriculture, forestry, fishing and hunting, and mining	2.90%	2.90%
Construction	6.30%	5.80%
Manufacturing	11.40%	11.80%
Wholesale trade	3.50%	2.30%
Retail trade	13.60%	15.00%
Transportation and warehousing, and utilities	4.60%	4.60%
Information	2.20%	1.60%

Finance and insurance, and real estate and rental and leasing	5.10%	4.60%
Professional, scientific, and management, and administrative and waste management services	6.80%	6.00%
Educational services, and health care and social assistance	25.90%	26.80%
Arts, entertainment, and recreation, and accommodation and food services	8.70%	9.10%
Other services, except public administration	4.70%	5.50%
Public administration	4.30%	4.00%

Source: U.S. Bureau of the Census American Community Survey 2017 5-Year Estimates

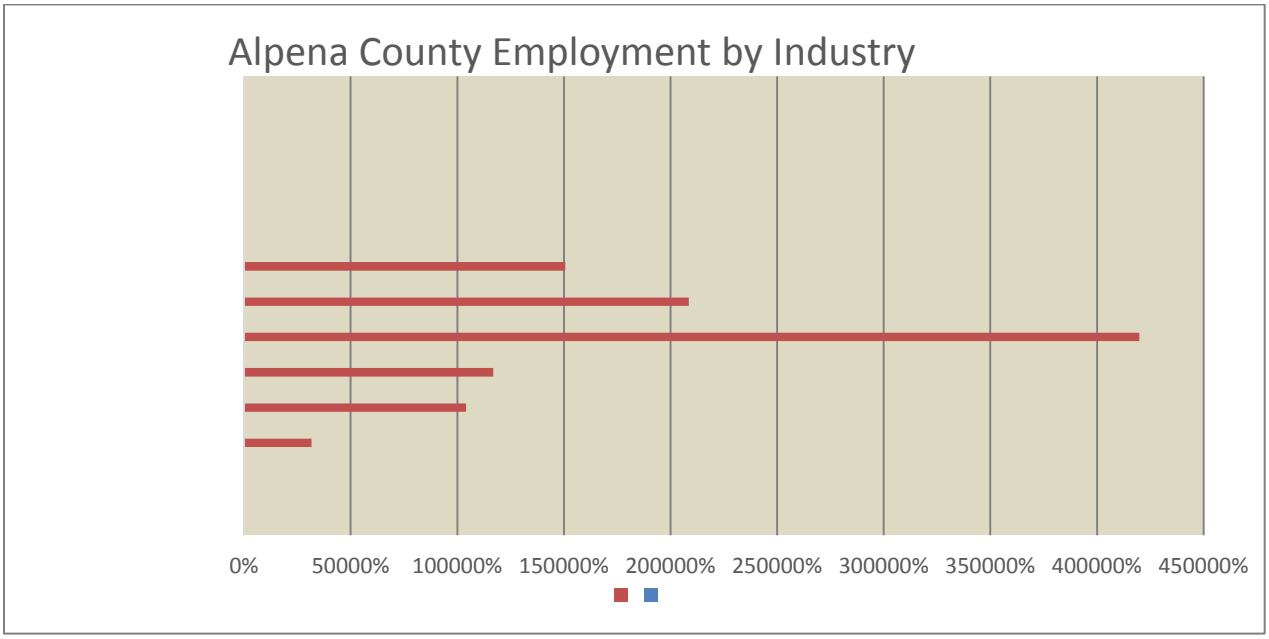


TABLE 2-18

COMMUTING TO WORK

As shown by Table 2-19, the vast majority (82.9 percent) of workers in Alpena County travel to work by driving alone. 8.4 percent of people carpooled, 1.2 percent took either public transportation or a motorcycle to work, 0.7 percent of people rode a bicycle to work, and 2.7 percent of people walked. 3.9 percent of the working population worked at home. Thunder Bay Transportation Authority operates a transit system for the City of Alpena and adjacent commercial and residential areas but this service does not serve the whole county.

TABLE 2-19
GREEN TOWNSHIP, OSSINEKE TOWNSHIP, WILSON TOWNSHIP, AND ALPENA COUNTY WORK COMMUTE 2017

Mode of Transportation	Green Township		Ossineke Township		Wilson Township		Alpena County	
	#	%	#	%	#	%	#	%
Drove Alone	333	78.5%	482	78.0%	757	87.7%	10,285	82.9%
Carpooled	54	12.7%	67	10.8%	63	7.3%	1,042	8.4%
Public Transportation/Motorcycle	0	0.0%	3	0.5%	0	0.0%	149	1.2%
Bicycle	7	1.7%	0	0.0%	0	0.0%	87	0.7%
Walked	24	5.7%	20	3.2%	20	2.3%	335	2.7%

Worked at home	6	1.4%	46	7.4%	23	2.7%	484	3.9%

Source: American Community Survey 2017 5-Year Estimates

HOUSING AND TRANSPORTATION COSTS OF LIVING

Costs of living can be measured in many different ways. The costs of housing as a percent of income is a frequently used benchmark. However, this doesn't take into consideration the costs of traveling from that housing to the place of work and for other necessities such as healthcare, food shopping, and other purposes. The cost of housing benchmark often used is 30% of household income. The Center for Neighborhood Technology (CNT) has developed a Housing and Transportation (H+T) Index which also accounts for transportation costs, a household's second highest expenditure. For housing and transportation expenses combined, the benchmark developed by the CNT is 45% of household income. At this benchmark, only 26% of neighborhoods in America are considered affordable. The city of Detroit has a high affordability and low H+T index, for instance. Alpena County as a whole, has an H+T index of 5

A location-efficient neighborhood has shorter travel times for its residents and closer proximity from home to work for more of its citizens. Rural areas tend to have higher transportation costs for those who live and work in those areas. Alpena County communities have higher transportation costs on average. For those who live and work in the City of Alpena, those costs are lower for most transportation needs. The households in Alpena County average costs of housing and transportation is 58% of their household income. The housing costs are only 27% while the transportation costs are 32% of household income. The average annual transportation costs are $12,255.

HOUSING CHARACTERISTICS

Housing characteristics for Alpena County are found in Table 2-20. The County has a relatively limited amount (12.9%) of seasonal housing. In comparison, many other counties in Northeast Michigan region have close to 40 percent seasonal housing. Seasonal housing in the City of Alpena is almost nonexistent (2.0 percent). The highest percentage of seasonal housing in the County is found in the outlying townships of Ossineke, Green and Wellington. From 80 to 96 percent of the occupied housing units are owner-occupied in the townships of Alpena County. This rate is significantly lower in the City which recorded a 62.4 percent owner occupied rate in 2017. Throughout the county, the number of vacant houses fluctuates depending on location. Wellington Township has the highest vacancy rate followed by Green Township.

TABLE 2-20
ALPENA COUNTY: HOUSING CHARACTERISTICS - 2017

MUNICIPALITY	Total Housing Units	Total Occupied Housing Units	% Occupied Housing Units	Total Vacant Housing Units	% Vacant Housing Units	Total Seasonal Housing Units	% Seasonal*	% Owner Occupied
Alpena Twp	5,102	4,137	81.1	965	18.9	547	10.7	81.1
Green Twp	877	485	55.3	392	44.7	340	38.8	96.3
Long Rapids Twp	679	458	67.5	221	32.5	154	22.7	95.2
Maple Ridge Twp	941	691	73.4	250	26.6	176	18.7	94.2
Ossineke Twp	1,071	686	64.1	385	35.9	340	31.7	88.3
Sanborn Twp	1,049	799	76.2	250	23.8	196	18.7	79.3
Wellington Twp	232	116	50.0	116	50.0	99	42.7	86.2
Wilson Twp	1,005	813	80.9	192	19.1	120	11.9	90.0
City of Alpena	5,075	4,604	90.7	471	9.3	101	2.0	62.4
Alpena County	16,031	12,789	79.8	3,242	20.2	2,073	12.9	80.3

Source: U.S. Bureau of the Census, 2017 5-Year Estimates

**Figure shows the seasonal housing units as a percentage of the municipality's total housing units.*

Information found in Table 2-21 shows the year that housing units were built in Alpena County. Generally speaking, the older a housing unit is the more it is likely to be in need of rehabilitation. As a rule of thumb, any housing unit that is older than 50 years may be in need of at least some, if not a great deal of renovation. 37.9 percent of the housing in Alpena County was built prior to 1960 with 14.5 percent having been built prior to 1940. Data indicates that the City of Alpena has, by far, the largest percentage of older housing units within the County. While many of these homes are beautiful, historic and well-kept homes; several are in need of repair and renovations.

TABLE 2-21
YEAR STRUCTURE BUILT – GREEN TOWNSHIP, OSSINEKE TOWNSHIP, WILSON TOWNSHIP, AND ALPENA COUNTY

Year Structure Built	Green Township %	Ossineke Township %	Wilson Township %	Alpena County %
2000 or later	13.1	7.3	13.4	8.2
1990-1999	17.3	12.0	11.4	8.8
1980-1989	12.8	15.4	9.0	10.2
1960-1979	36.4	42.1	34.3	34.9
1940-1959	12.1	10.9	14.8	23.4
1939 or earlier	8.3	12.3	17.0	14.5

Source: U.S. Census Bureau 2000 and 2010 and American Community Survey 2017

There is not a great deal of older housing stock (housing built prior to 1940) found in other Alpena County municipalities. All local units, except Alpena City, had more than 50 percent of their housing stock built between 1940 and 1970 according to the 2000 census. Due to the age of this housing, some of it is probably in need of rehabilitation. Both the City of Alpena and Alpena County have housing rehabilitation programs that help lower income homeowners undertake needed repairs on their houses.

STATE EQUALIZED VALUE (SEV)

By analysis of the State Equalized Value (SEV), characteristics of property values can be obtained. All values are lower than they were in 2008 with industrial property values holding the steadiest. Agricultural continues to drop, but commercial and residential values have experienced an increase since 2014.

TABLE 2-22
ALPENA COUNTY ASSESSED VALUE: 2008-2018

Year	Agricultural	Residential	Commercial	Industrial	Timber Cutover	Personal Property	Real + Personal Property
	$	$	$	$		$	$
2018	87,612,018	741,155,100	111,743,100	35,638,400	---	69,063,454	1,045,212,072
2017	87,631,400	732,622,600	114,683,700	35,140,000	---	71,666,280	1,041,743,980
2016	90,552,600	705,933,100	112,495,100	34,556,700	---	71,581,286	1,015,118,786
2015	93,847,300	693,910,900	106,692,100	34,282,000	---	89,054,710	1,017,787,010
2014	90,308,300	684,352,000	106,000,900	33,092,100	441,900	82,271,290	996,466,490
2013	92,345,700	680,600,900	109,183,000	32,480,900	4,019,800	87,806,547	1,006,436,847
2012	88,524,900	702,578,200	106,404,600	33,138,600	5,608,700	85,812,109	1,022,067,109
2011	85,737,000	755,954,000	110,167,500	32,744,900	7,873,800	83,012,819	1,075,490,01

							9
2010	108,734,900	781,123,000	125,568,600	35,597,500	5,154,200	82,870,620	1,139,048,820
2009	115,307,700	812,429,300	130,939,300	37,711,300	26,066,700	81,660,263	1,204,114,563
2008	125,308,000	824,634,800	132,441,700	36,478,700	27,717,200	79,234,273	1,225,814,673

Source: Michigan Department of Treasury

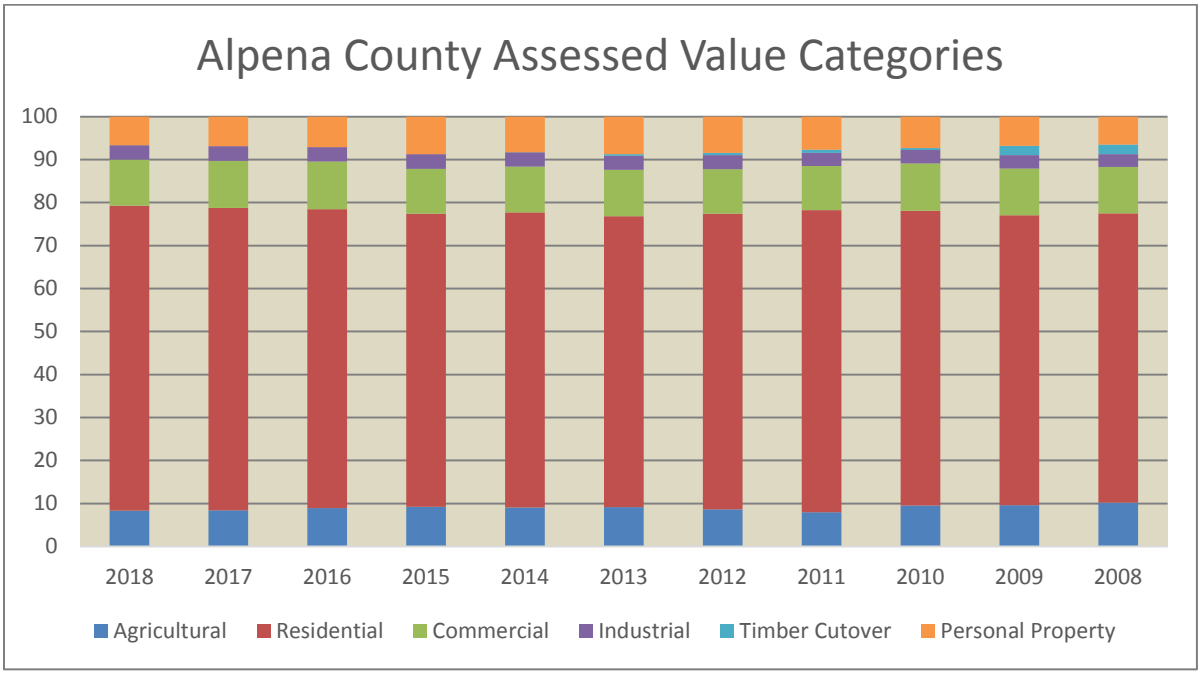


TABLE 2-23

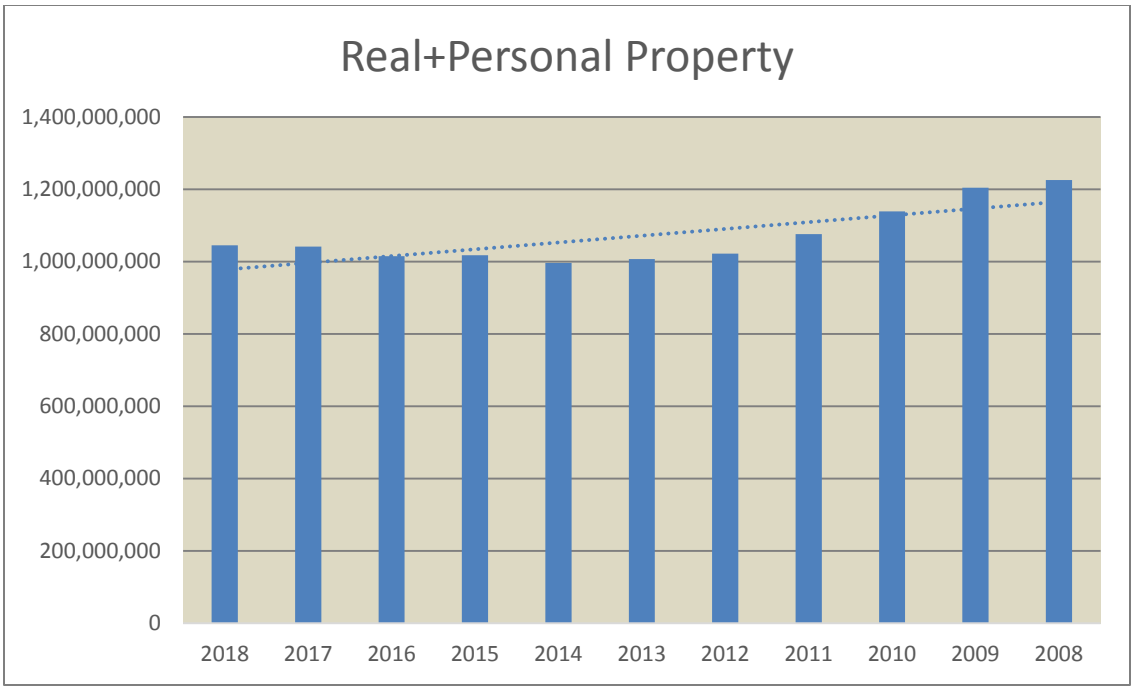


TABLE 2-24

TABLE 2-25
ALPENA COUNTY MUNICIPALITIES ASSESSED VALUE: 2014-2018

	2014	2015	2016	2017	2018
	$	$	$	$	$
Alpena Twp	342,460,000	343,544,100	361,790,900	372,844,100	370,897,800
Green Twp	67,730,500	68,456,800	70,695,300	72,784,100	71,780,900
Long Rapids Twp	42,197,545	46,026,105	42,957,575	40,834,546	39,631,747
Maple Ridge Twp	55,837,800	54,197,000	53,311,500	55,194,200	56,845,900
Ossineke Twp	84,431,400	86,692,100	85,678,100	86,973,000	86,835,700
Sanborn Twp	66,101,473	67,005,666	65,059,558	67,757,034	69,088,407
Wellington Twp	22,871,400	20,707,600	20,020,700	19,536,500	19,946,100
Wilson Twp	71,635,772	76,342,439	77,195,253	78,158,200	81,133,518
City of Alpena	243,200,600	254,815,200	238,409,900	247,662,300	249,052,000
Alpena County	996,466,490	1,017,787,010	1,015,118,786	1,041,743,980	1,045,212,072

Source: Michigan Department of Treasury

and Table 2-26 shows the change in the SEV in the Alpena County municipalities since 2014. Nearly two-thirds of the county's SEV is concentrated in City of Alpena and Alpena Township.

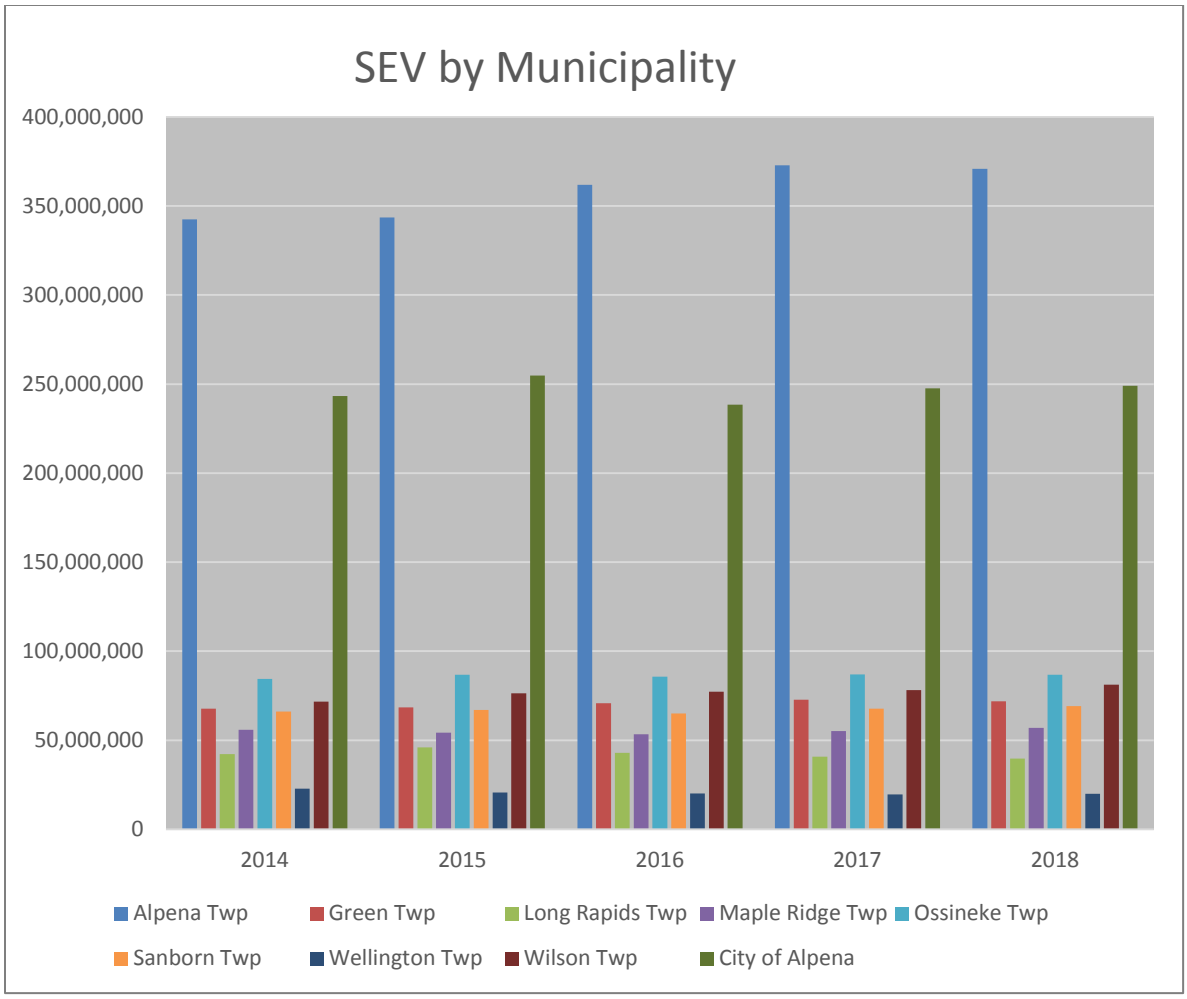


TABLE 2-26

FINANCES

Information contained in this section was generated from F65 forms that the county files with the State of Michigan each year. The data is available through Munetrix LLC because the Northeast Michigan Council of Governments (NEMCOG) is a Munetrix subscriber. This section is intended to give a summary of the financial health of Alpena County.

Revenue

Revenue is generated from tax dollars received from residents and businesses which are generated from the millage rate multiplied by property valuations. Revenue is also generated from other sources such as State and Federal grants, permits, and fees. Table 2-27 through Table 2-30 shows the sources of revenue for Alpena County, Green Township, Ossineke Township, and Wilson Township.

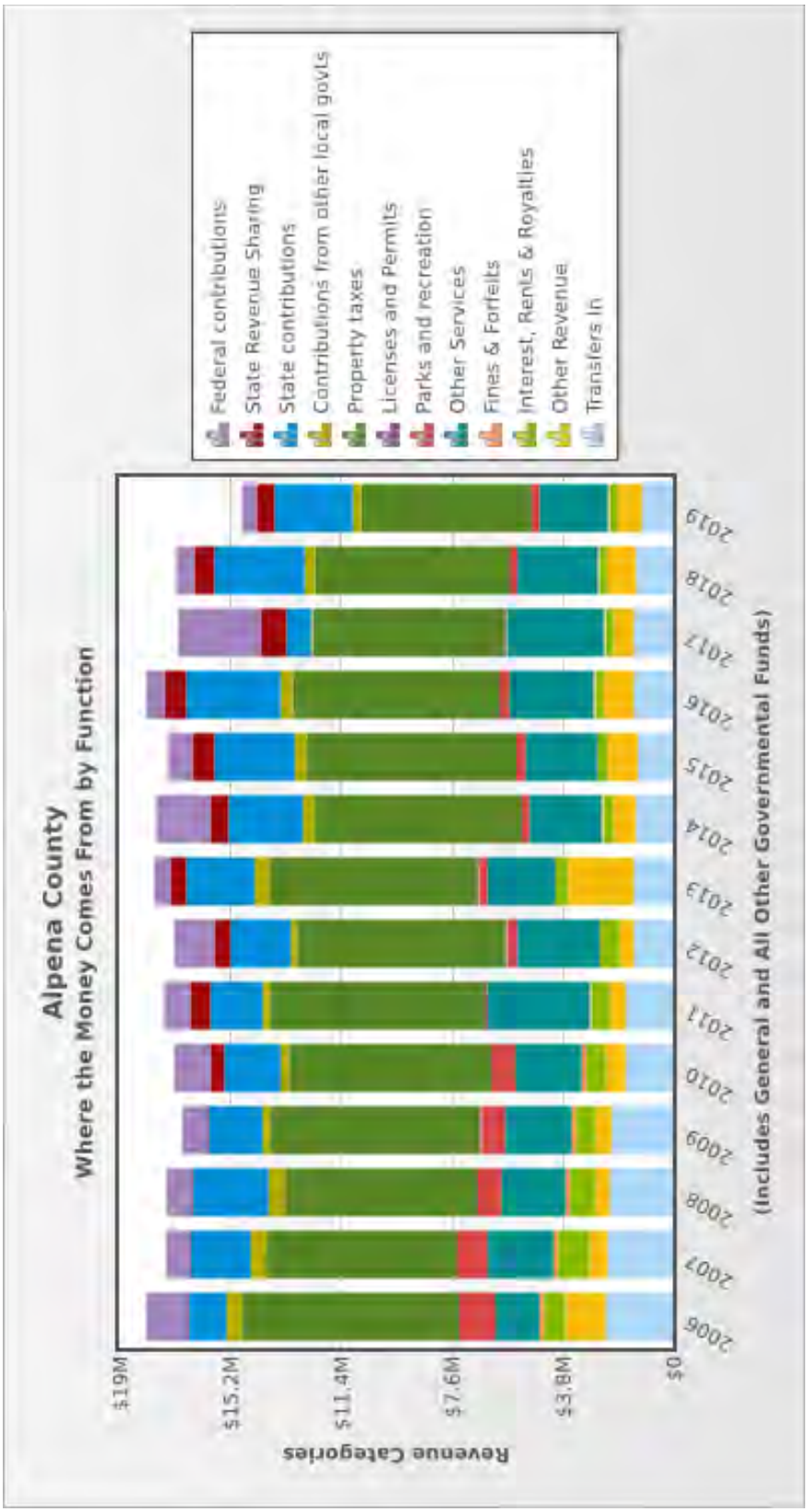

Alpena County
Where the Money Comes From by Function
(Includes General and All Other Governmental Funds)
Revenue Categories
$19M
$15.2M
$11.4M
$7.6M
$3.8M
$0
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
Federal contributions
State Revenue Sharing
State contributions
Contributions from other local govts
Property taxes
Licenses and Permits
Parks and recreation
Other Services
Fines & Forfeits
Interest, Rents & Royalties
Other Revenue
Transfers In

TABLE 2-27

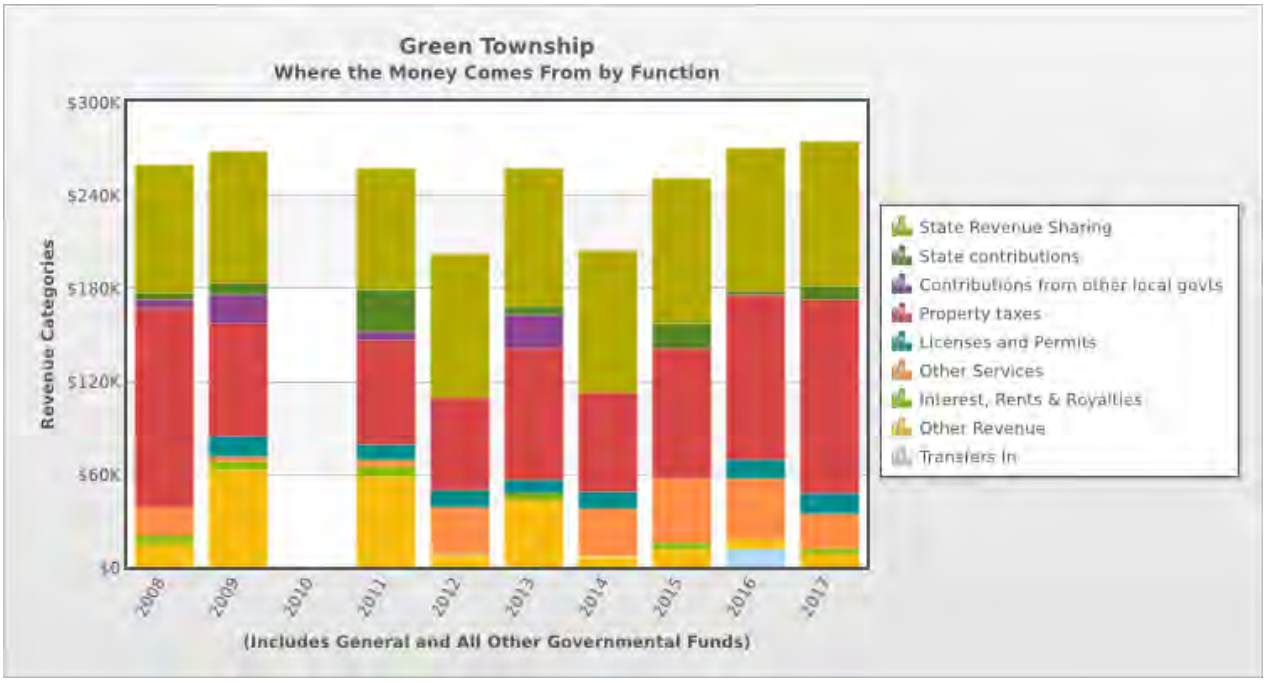


TABLE 2-28

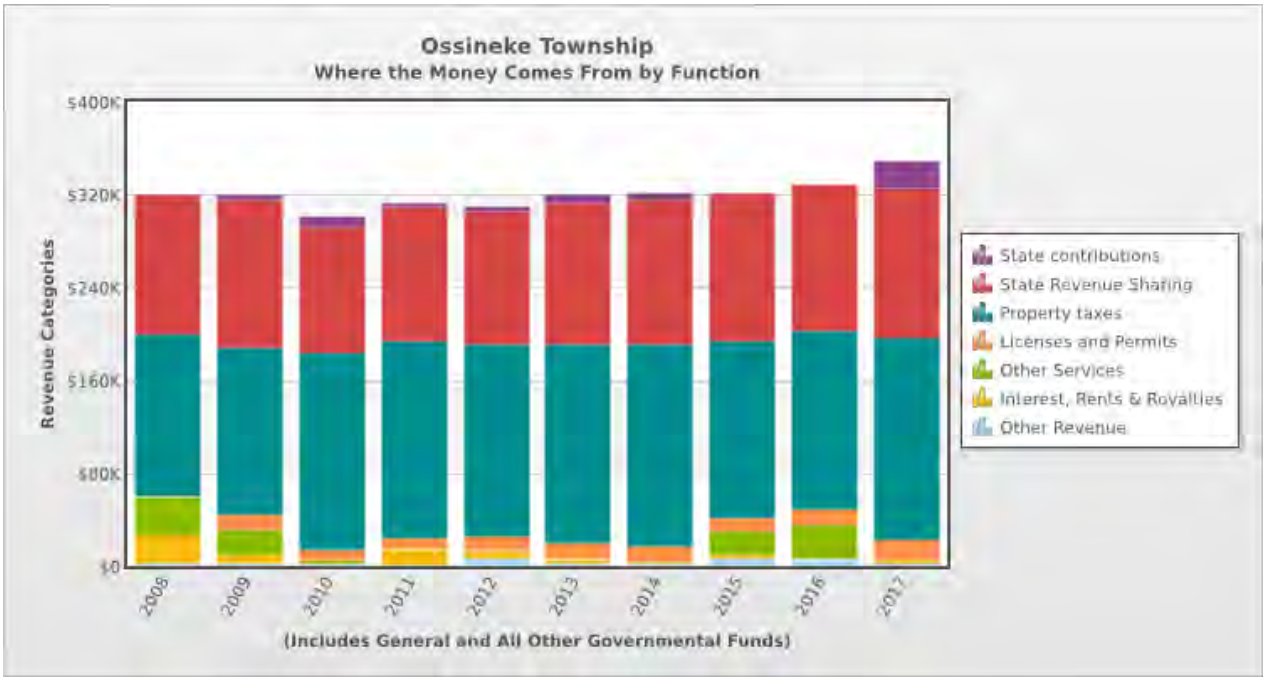


TABLE 2-29

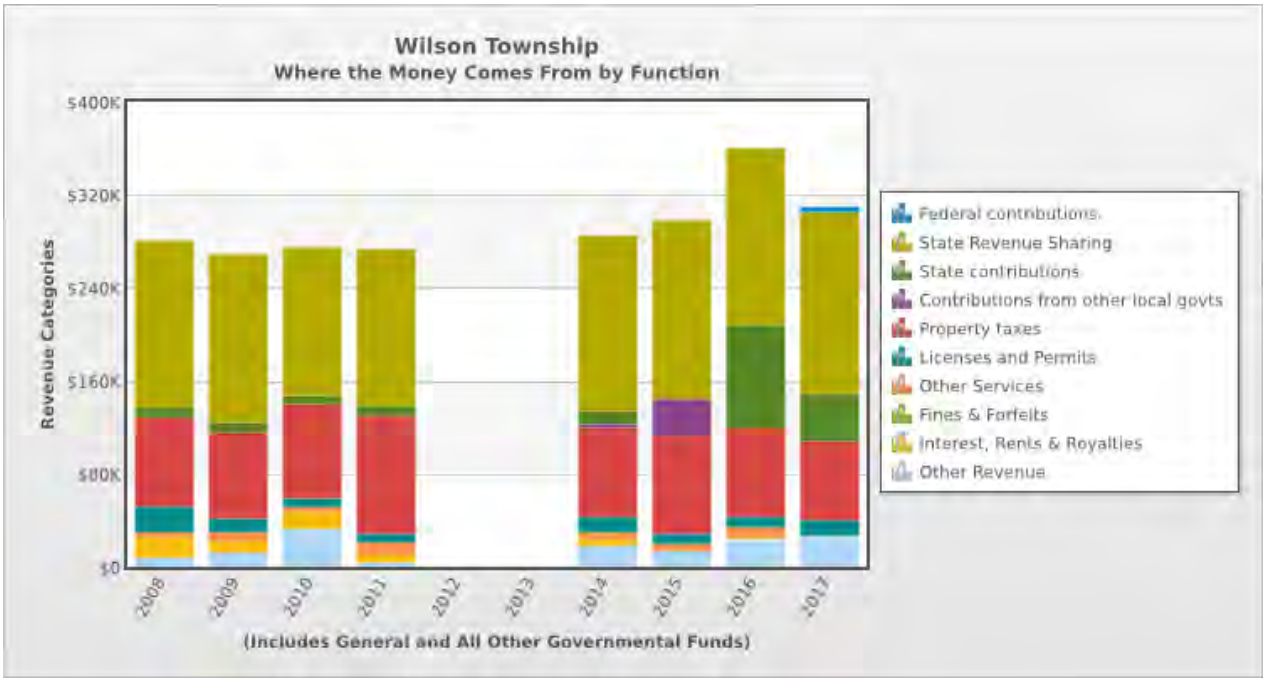

Wilson Township
Where the Money Comes From by Function
$400K
$320K
$240K
$160K
$80K
$0
Revenue Categories
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
(Includes General and All Other Governmental Funds)
Federal contributions
State Revenue Sharing
State contributions
Contributions from other local govts
Property taxes
Licenses and Permits
Other Services
Fines & Forfeits
Interest, Rents & Royalties
Other Revenue

TABLE 2-30

EXPENDITURES

As a service provider for the community, expenses cover the costs associated with running the County government. Table 2-31 through Table 2-34 breaks down how money is spent in each municipality.

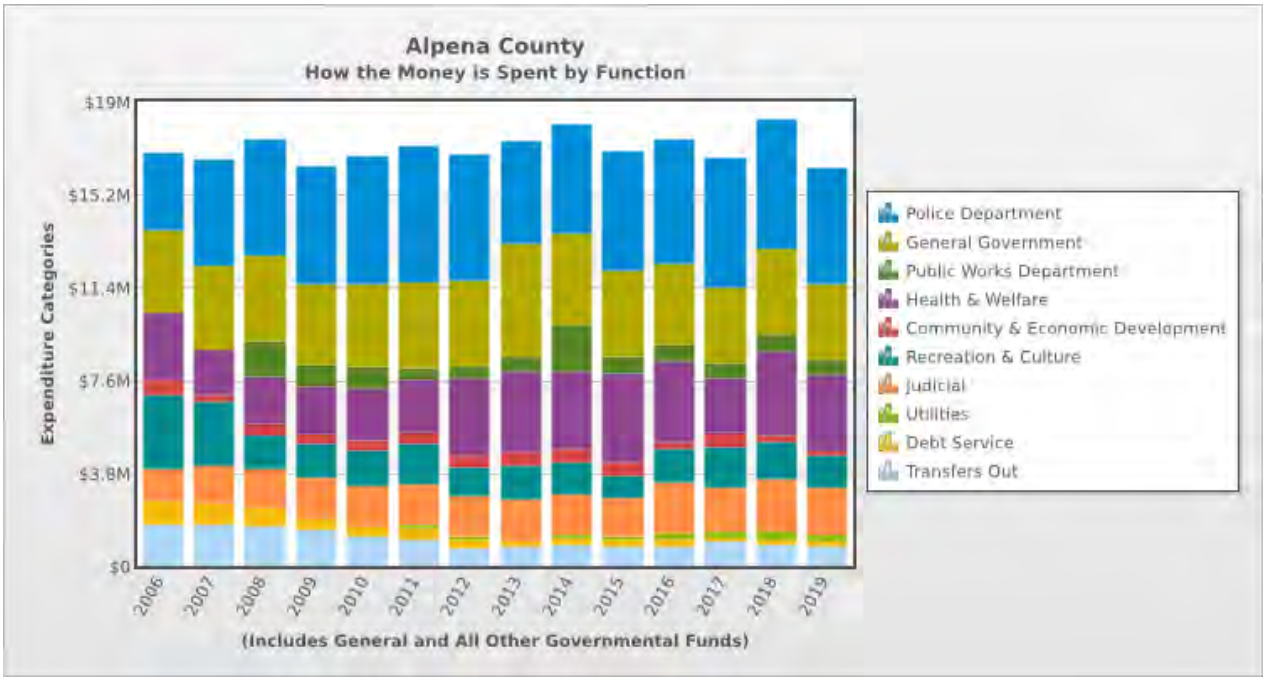


TABLE 2-31

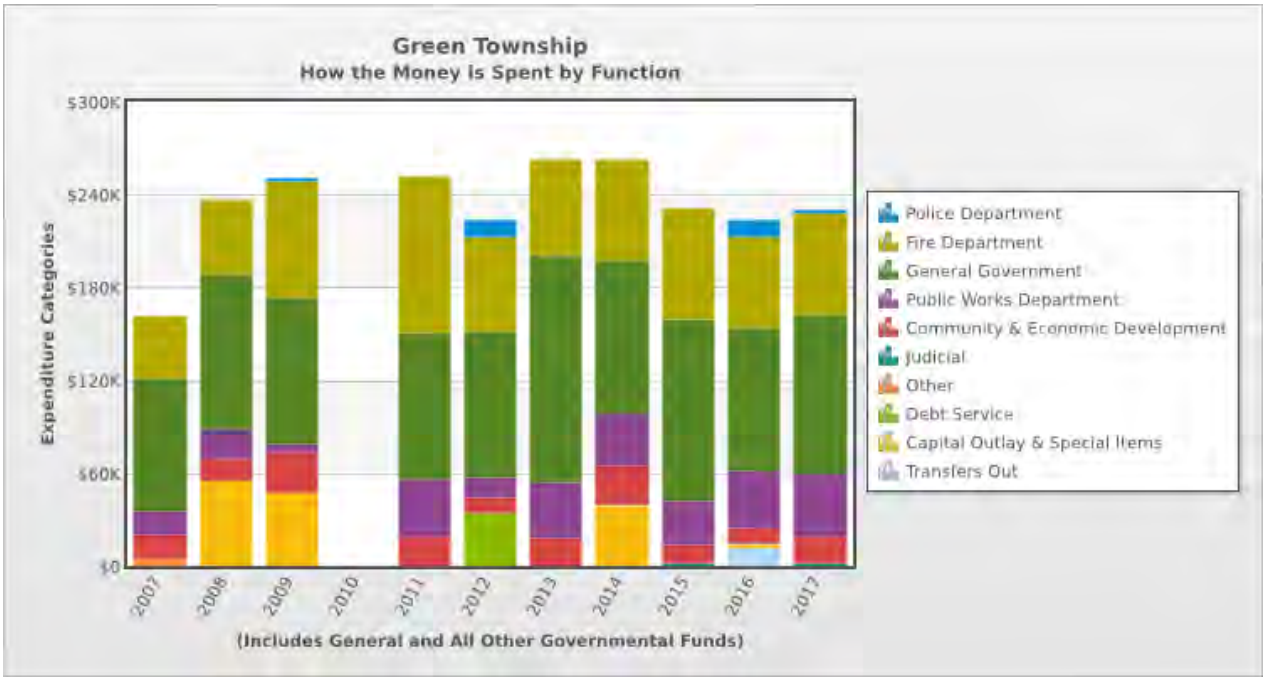


TABLE 2-32

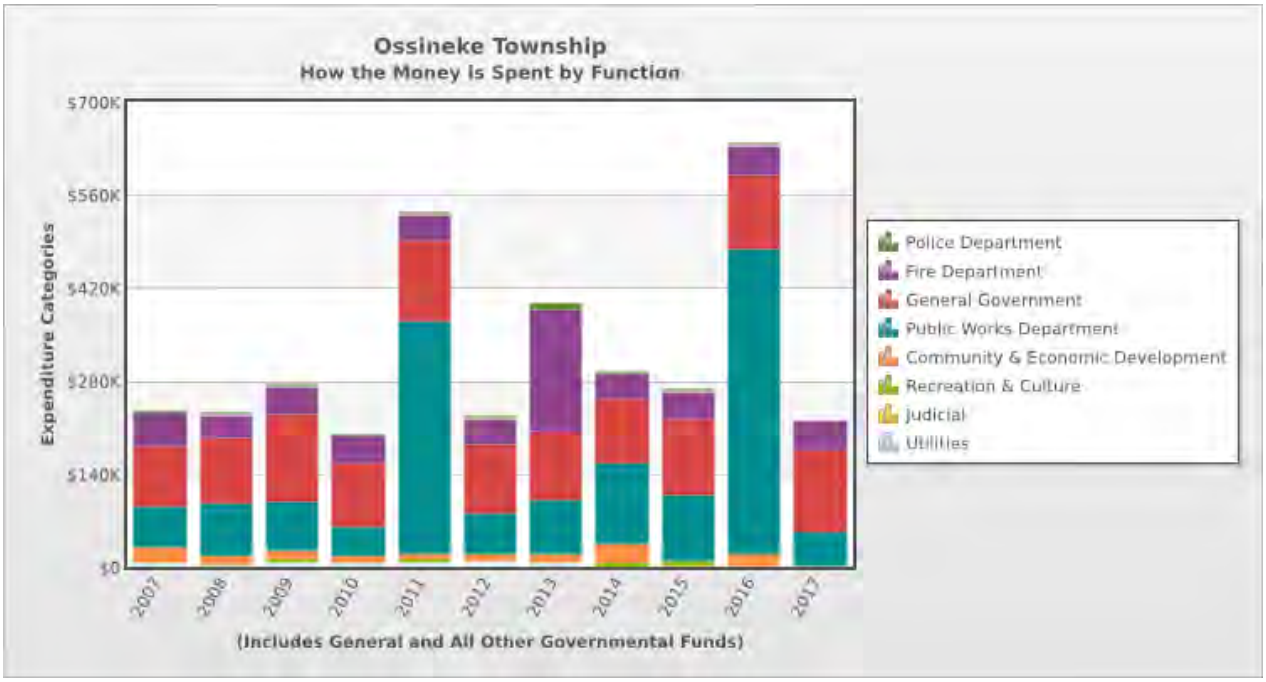


TABLE 2-33

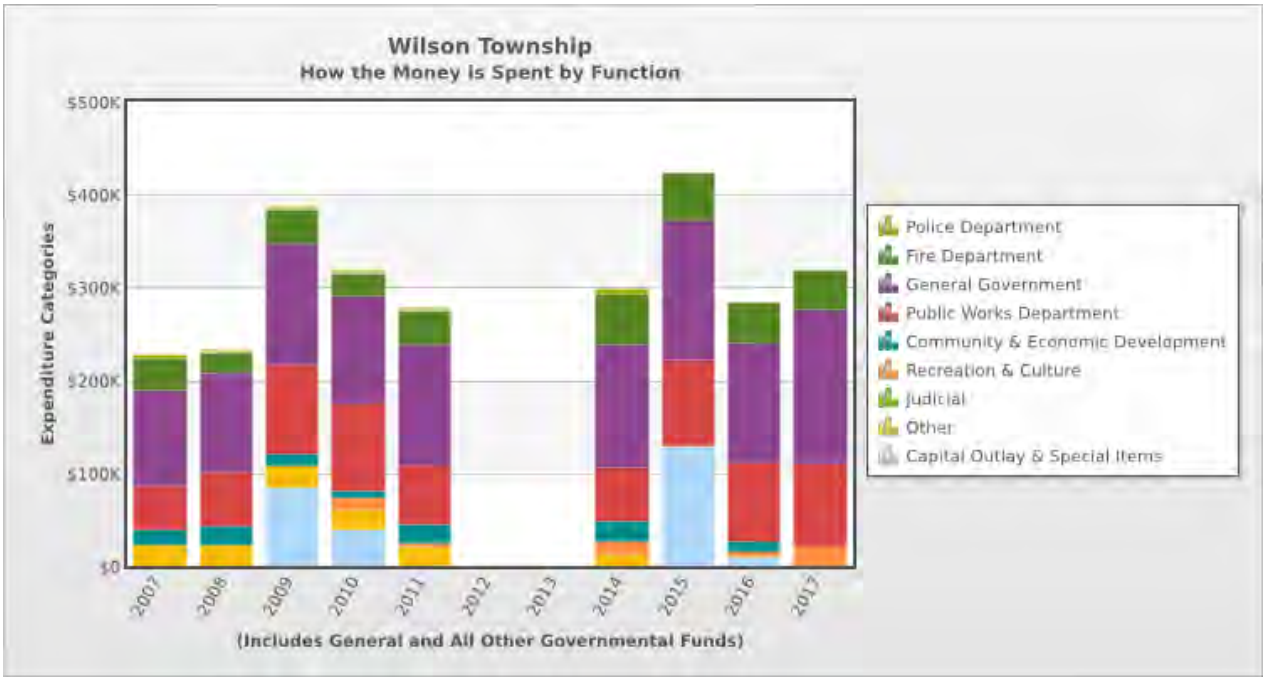


TABLE 2-34

Table 2-35 through Table 2-38 shows the impact of revenue and expenses on total cash and investments for each municipality.

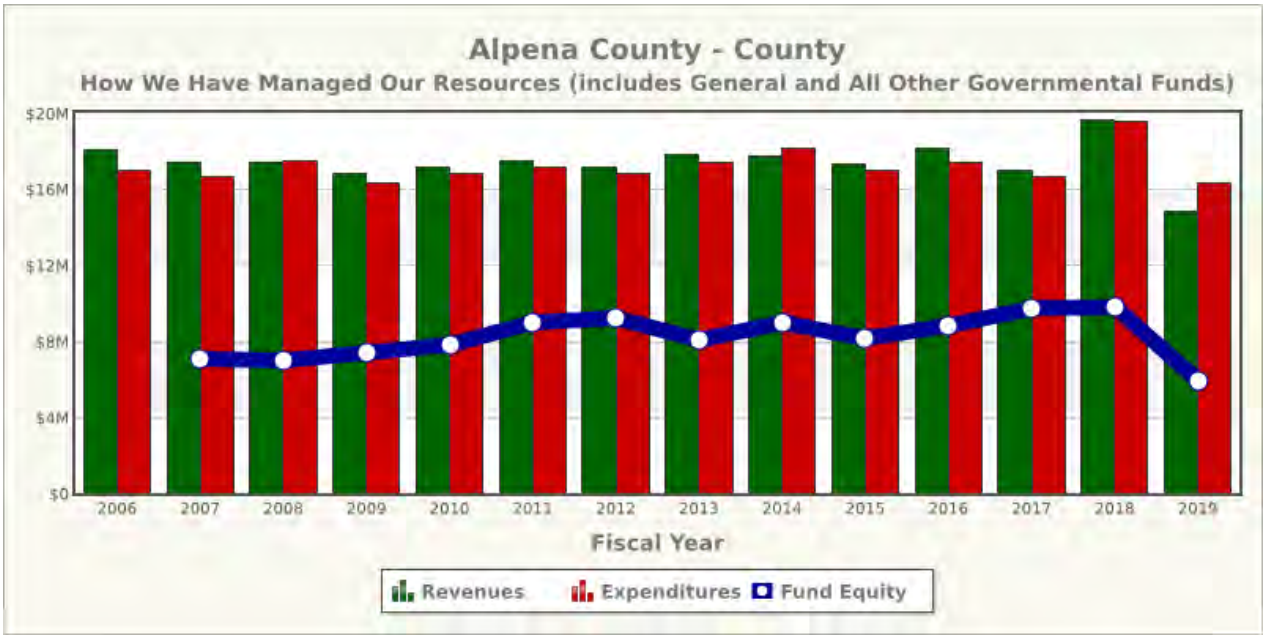
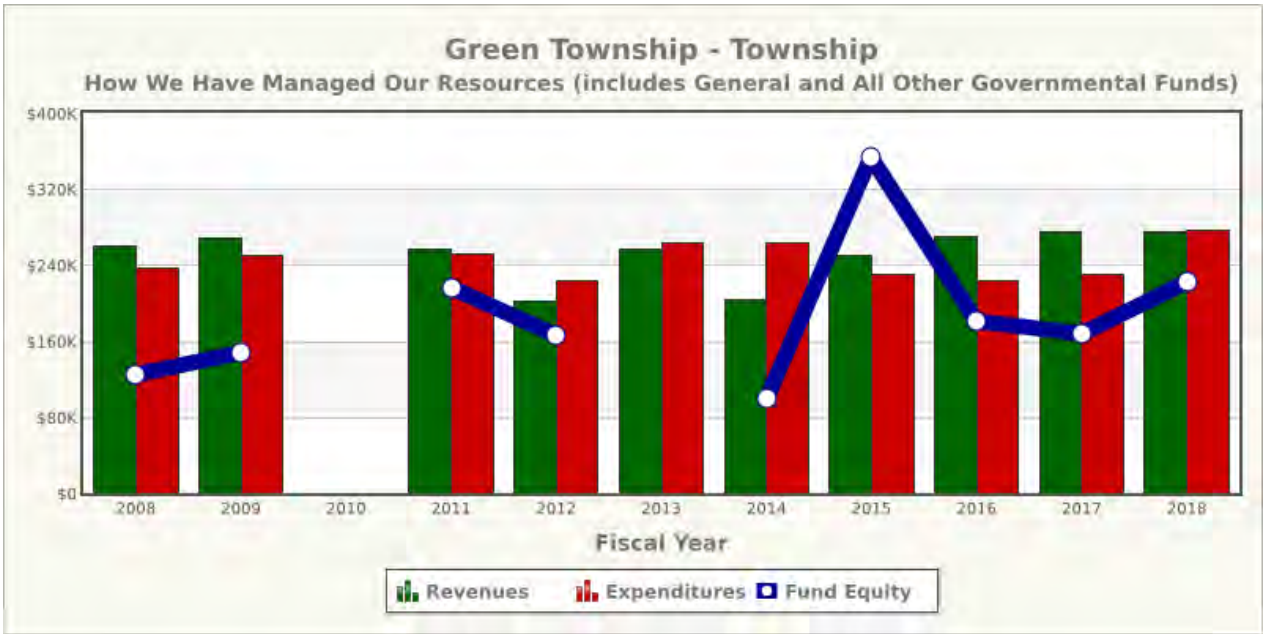


TABLE 2-35



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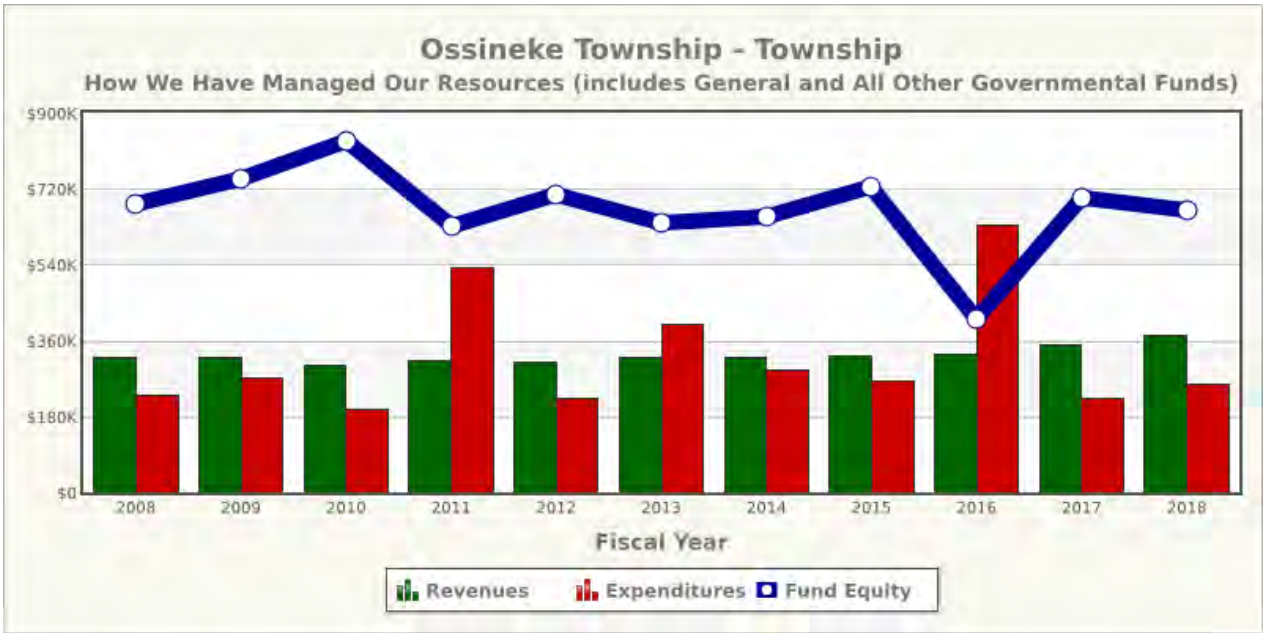


TABLE 2-37

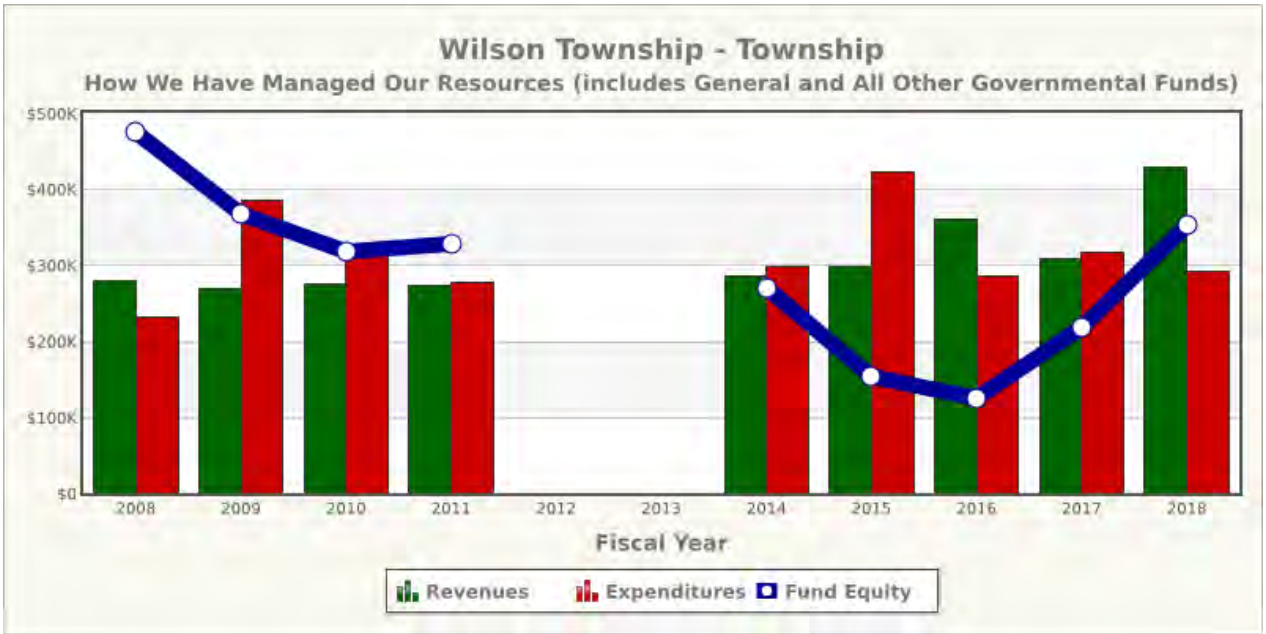


TABLE 2-38

PUBLIC SAFETY COST PER RESIDENT

Table 2-39 through Table 2-42 displays the total cost per resident for public safety from 2006 to 2019.

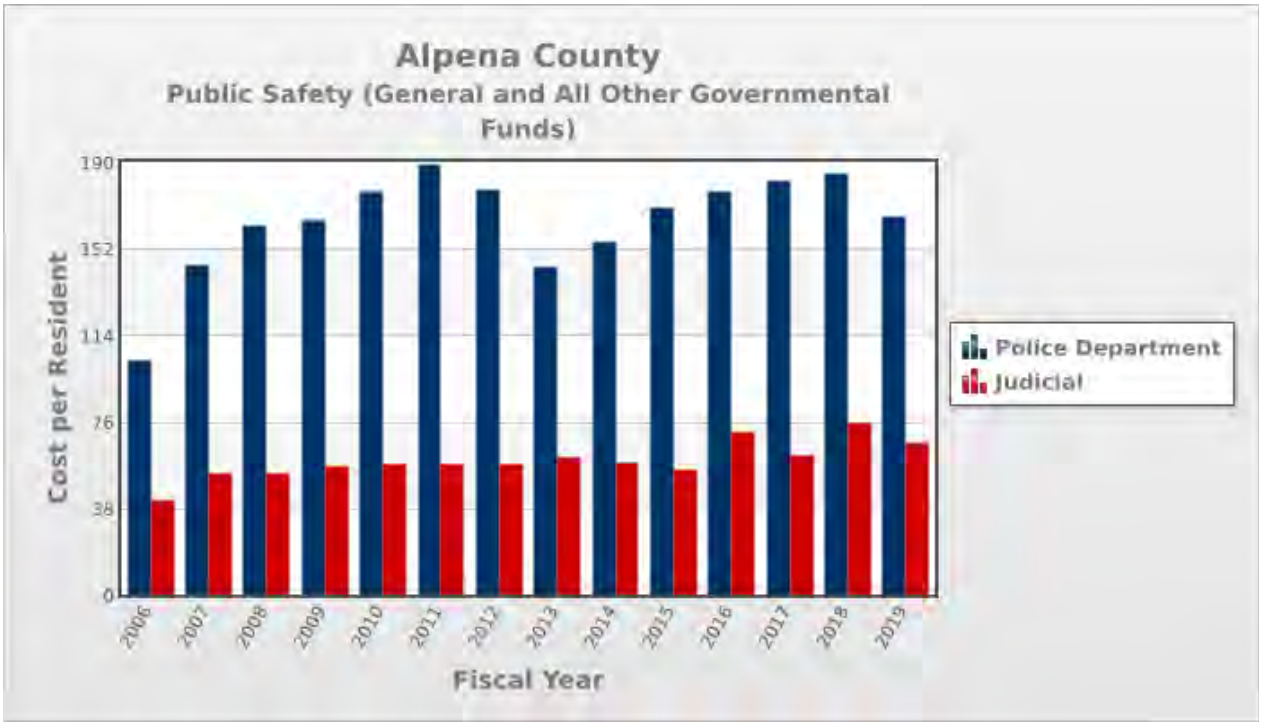


TABLE 2-39

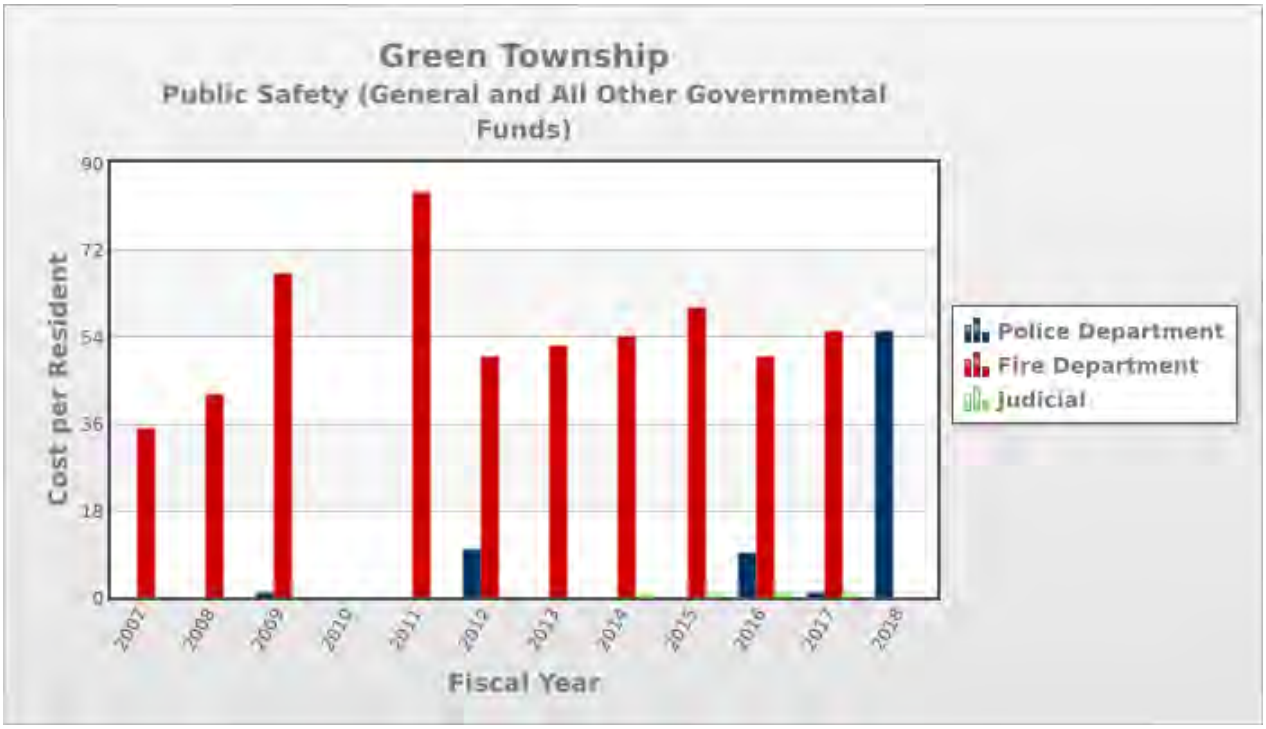


TABLE 2-40

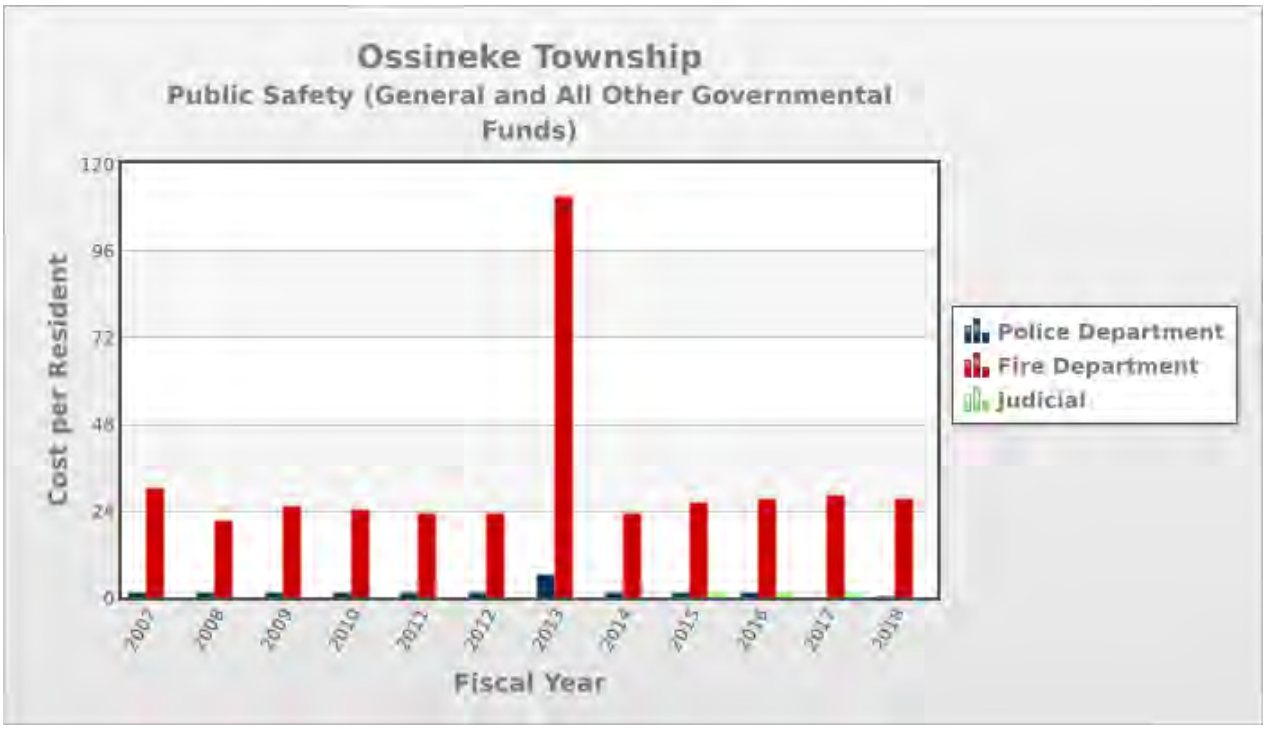


TABLE 2-41

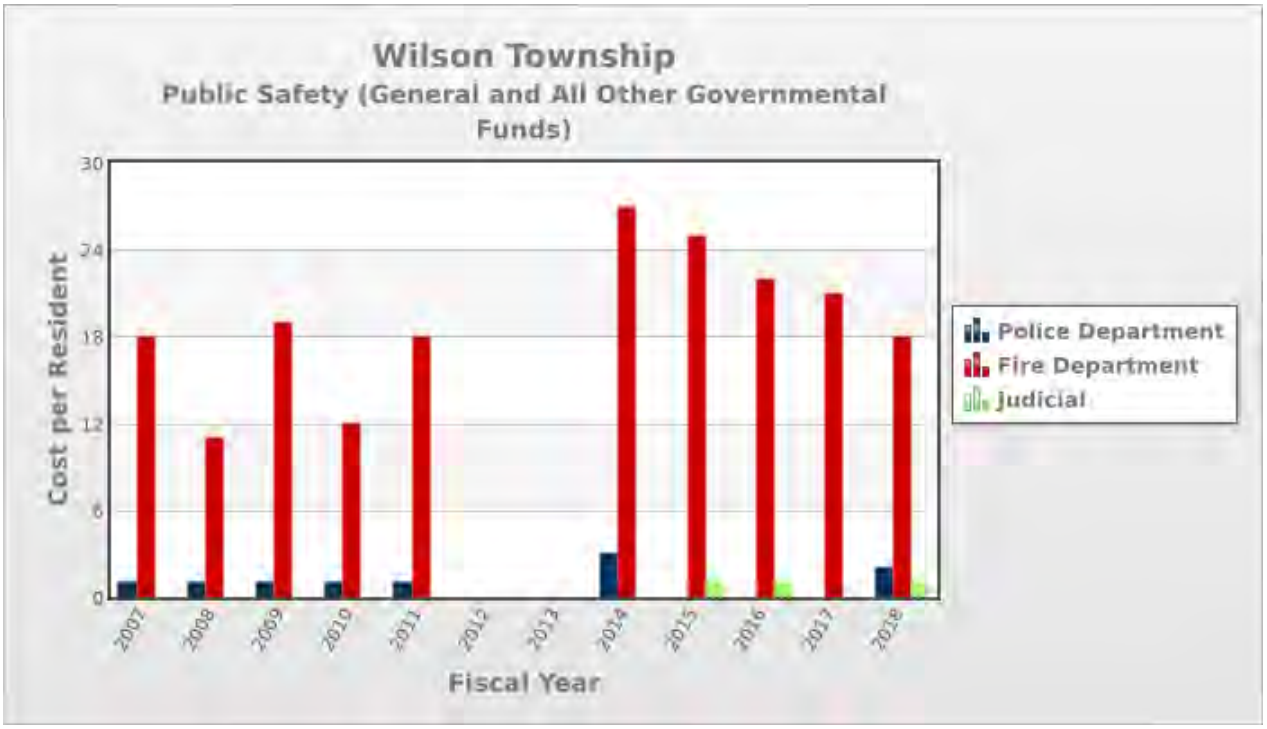


TABLE 2-42

FINANCIAL STRESS

The "Stress Meter" provides an overview of Indicator Scores used to calculate the financial stress of a municipality. The Indicator Score gives an overall picture of the soundness of local governments, the trend of stability over time, and allows the identification of local units that are most in need of help. Scores are generated based on the criteria of population growth, real taxable value growth, general fund expenditures as a percent of taxable value, general fund operating deficit, prior general fund operating deficit, size of general fund balance, fund deficits in current or previous year, and general long-term debt as a percent of taxable value. The lower the number the more fiscally sound a local unit is determined to be. There are three categories of scores grouped by color; shades of green, blue and red. Table 2-43 shows the indicator scores for all municipalities in Alpena County. The graph shows a trend of lighter green (more financial stress) since 2006, but most municipalities remain in the Fiscally Neutral category. However, in 2011, some communities began to appear in the Fiscal Watch category. Table 2-44 shows the fiscal stress for all of Northeast Michigan. As can be seen, some communities in the region were included in the Fiscal Watch category beginning in 2008.

Fiscal Distress Indicator System		
Points from Scale	**Category**	**State Action**
0-4	Fiscally Neutral	No State action needed
5-7	Fiscal Watch	Unit of local government is notified of its relatively high score and is placed on a watch list for the current and following year.
8-10	Fiscal Stress	Unit of local government is notified of its high score, is placed on a watch list for the current and following year, and receives consideration for review.

Source: Munetrix

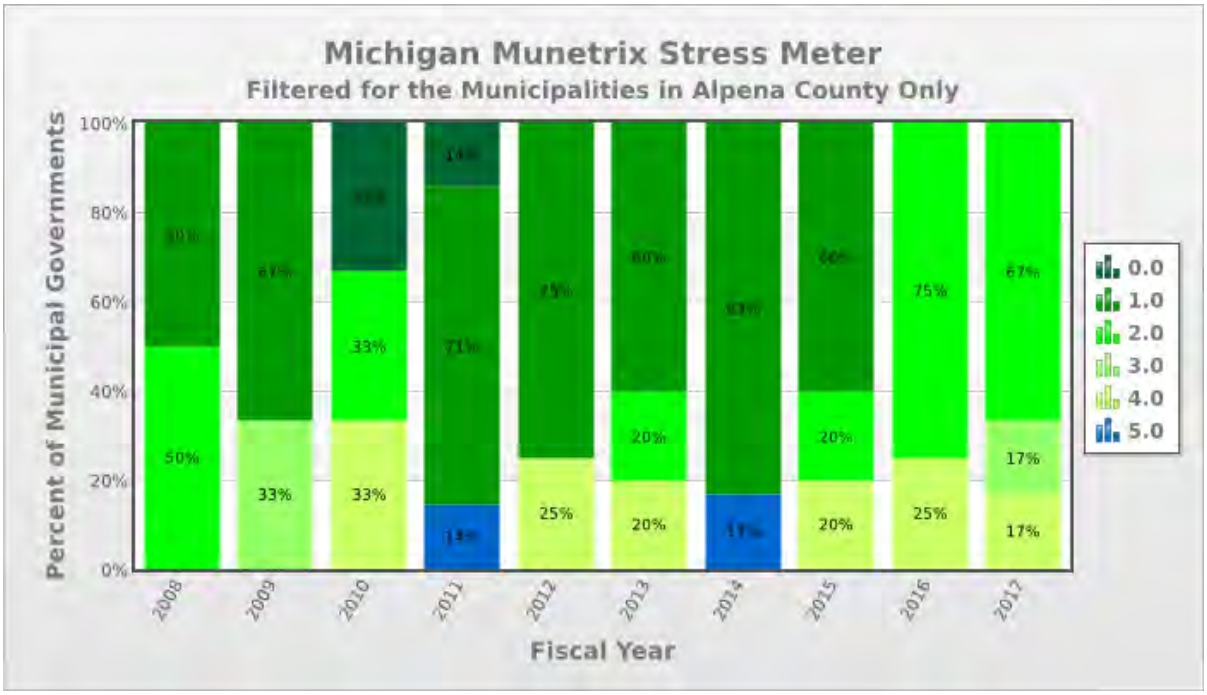


TABLE 2-43

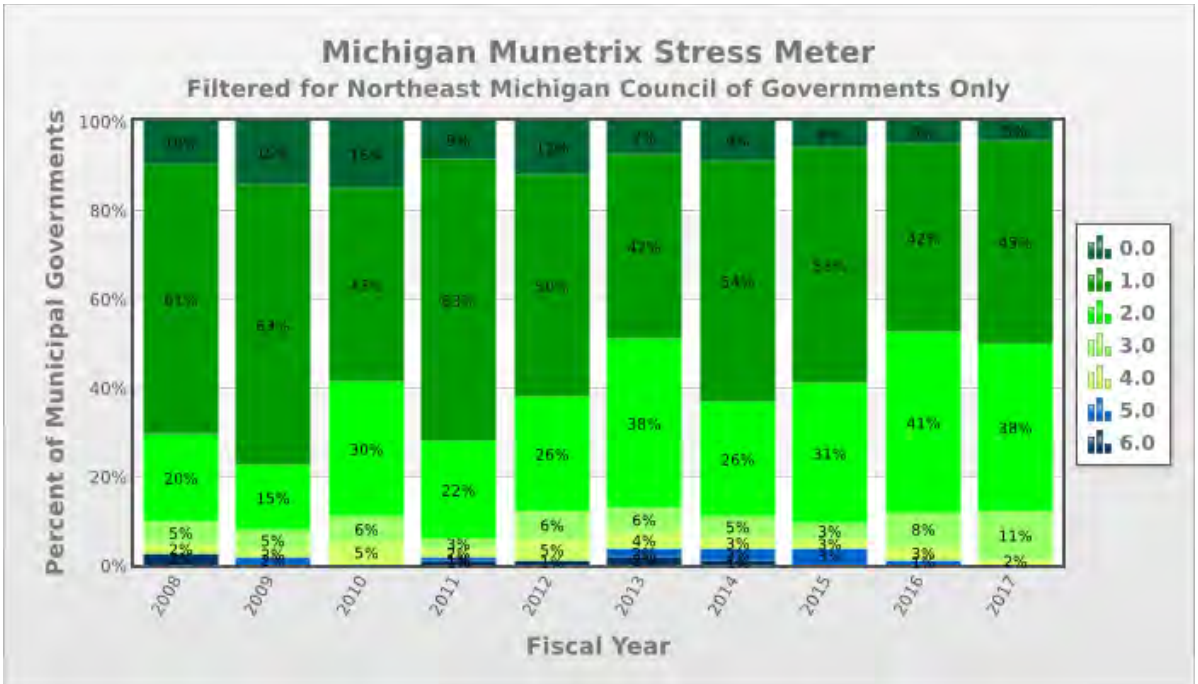

Michigan Munetrix Stress Meter
Filtered for Northeast Michigan Council of Governments Only
Percent of Municipal Governments
100%
80%
60%
40%
20%
0%
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
Fiscal Year
0.0
1.0
2.0
3.0
4.0
5.0
6.0

TABLE 2-44

TABLE 2-45 FISCAL STRESS SCORES 2009-2017									
	2009	2010	2011	2012	2013	2014	2015	2016	2017
Alpena County	1	1	1	2	2	2	1	2	3
Alpena Township	3	4	5	4	4	5	4	4	4
City of Alpena	1	2	1	1	1	1	1	2	2
Green Township	---	0	1	1	---	---	---	2	---
Long Rapids Township	3	---	0	---	1	1	1	---	2
Maple Ridge Township	---	---	---	1	---	---	---	---	---
Ossineke Township	1	---	1	---	1	1	2	---	2
Sanborn Township	1	---	1	---	2	1	1	2	2
Wellington Township	---	---	---	---	---	1	---	---	---
Wilson Township	1	---	1	---	---	---	---	---	3

Source: Munetrix 2018
--- data not available

General Fund Operating Deficit

This variable is computed by subtracting general fund expenditures from general fund revenues for a given year. This figure is then divided by general fund revenues. If the number that results is less than -0.01, this indicates a unit has a nontrivial operating deficit and this unit receives a score of 1. If the unit does not have a general fund operating deficit, or if this deficit is trivial, the unit is given a 0. Table 2-46 shows a comparison of general operating fund deficit averages from all counties in Northeast Michigan.

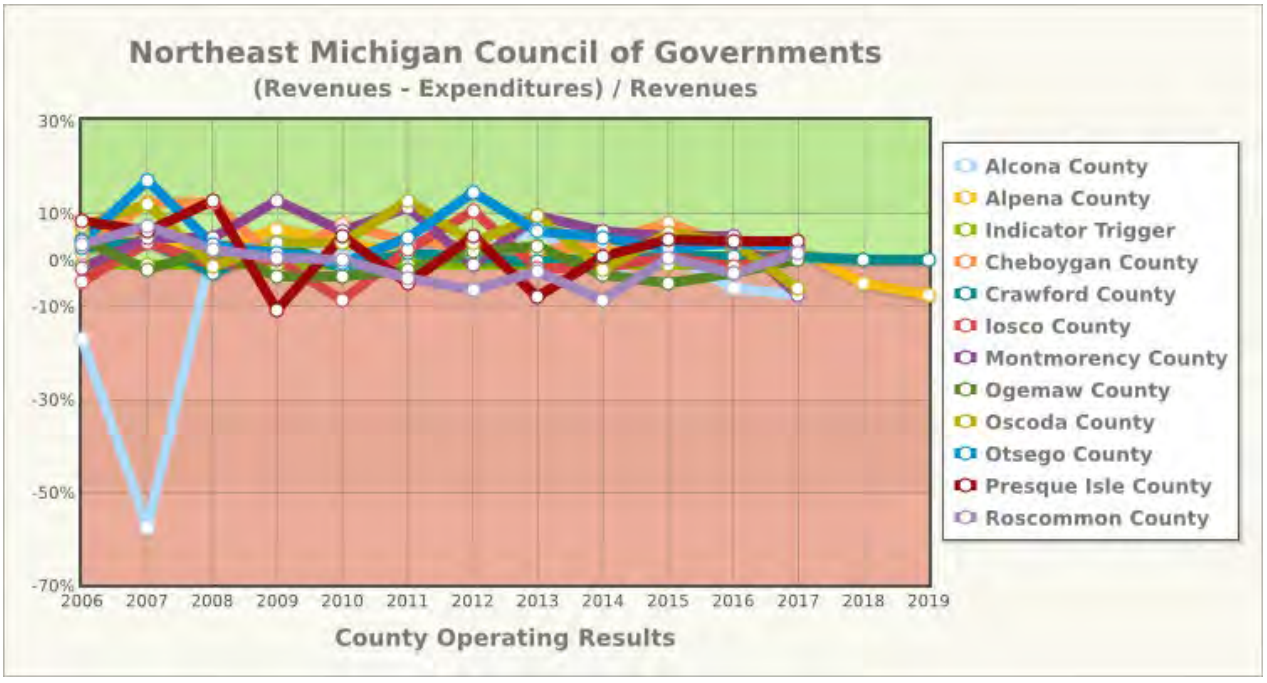


TABLE 2-46

Fund Balance as a Percent of General Fund Revenues

Most units maintain a positive fund balance, and it is a sign of fiscal distress if the fund balance is negative. Units typically find it beneficial to keep the fund balance from declining too greatly as this inhibits their ability to cope with unexpected circumstances in either the revenue or expenditure stream.

The actual variable constructed for this indicator is the general fund balance as a proportion of general fund revenue. If a unit maintains a general fund balance less than 13 percent of its general fund revenue, it scores a 1. Conversely a general fund balance above the 0.13 level scores a 0. Table 2-47 shows fund balance for all of Northeast Michigan.

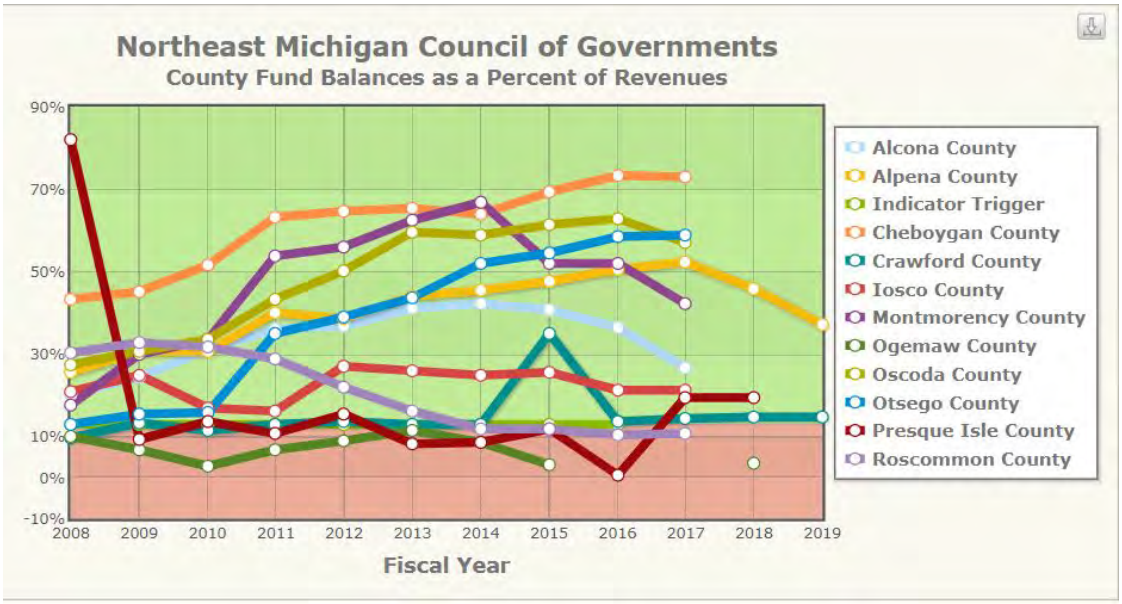


TABLE 2-47

PERCENT CHANGE IN TAXABLE VALUE

Much as with population growth, there appears to be a relationship between declining taxable value of a unit and its fiscal health. Since many local governments rely heavily upon property taxes, it follows that decreases in taxable value will require major adjustments in expenditures. Two-year growth periods of real taxable value for each unit are computed. Units score a 1 if they demonstrate negative real growth and a 0 if they exhibit positive real growth. To compute real taxable value, the current year taxable value is divided by the adjusted deflator. Table 2-48 shows percent change in taxable value for all of Northeast Michigan.

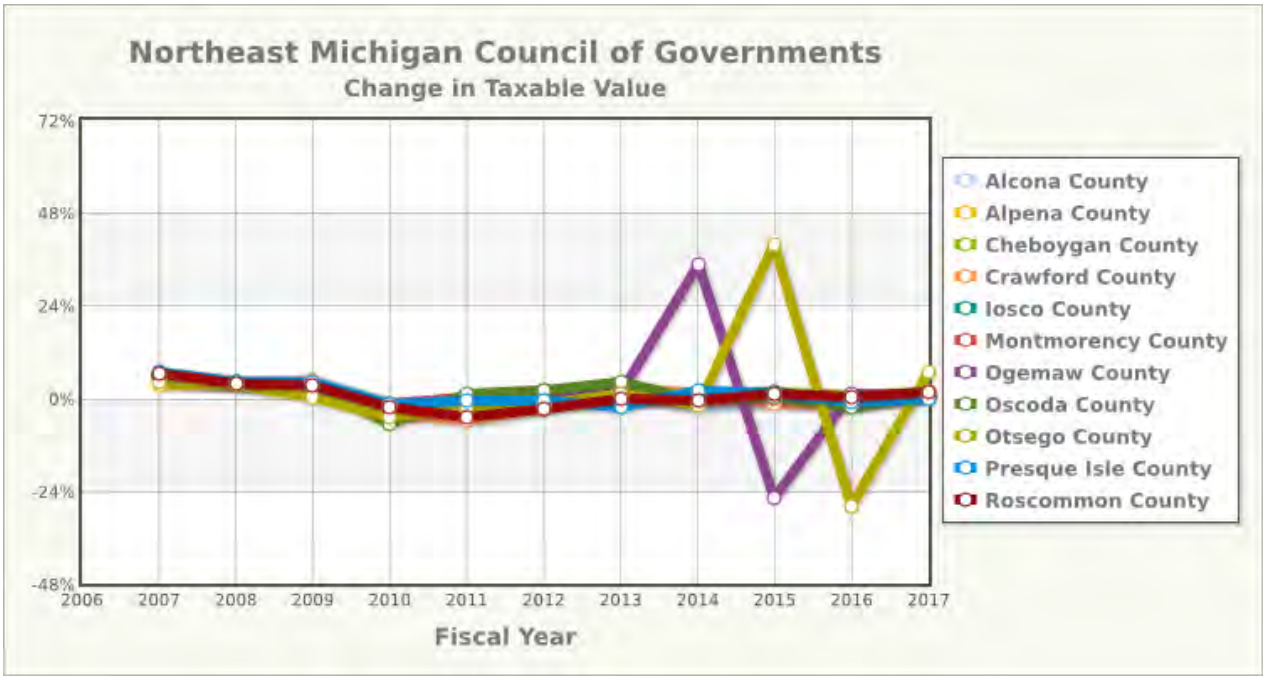


TABLE 2-48

AVAILABLE RESERVES AS A PERCENT OF TOTAL EXPENDITURES

Available reserves is the total equity minus any designated and reserved funds divided by total annual expenditures (includes general fund, enterprise funds, and all other funds but excludes component unit funds). Table 2-49 gives a picture of the available reserves for Alpena County. As can be seen, reserves in the municipalities fall well above the indicator trigger.

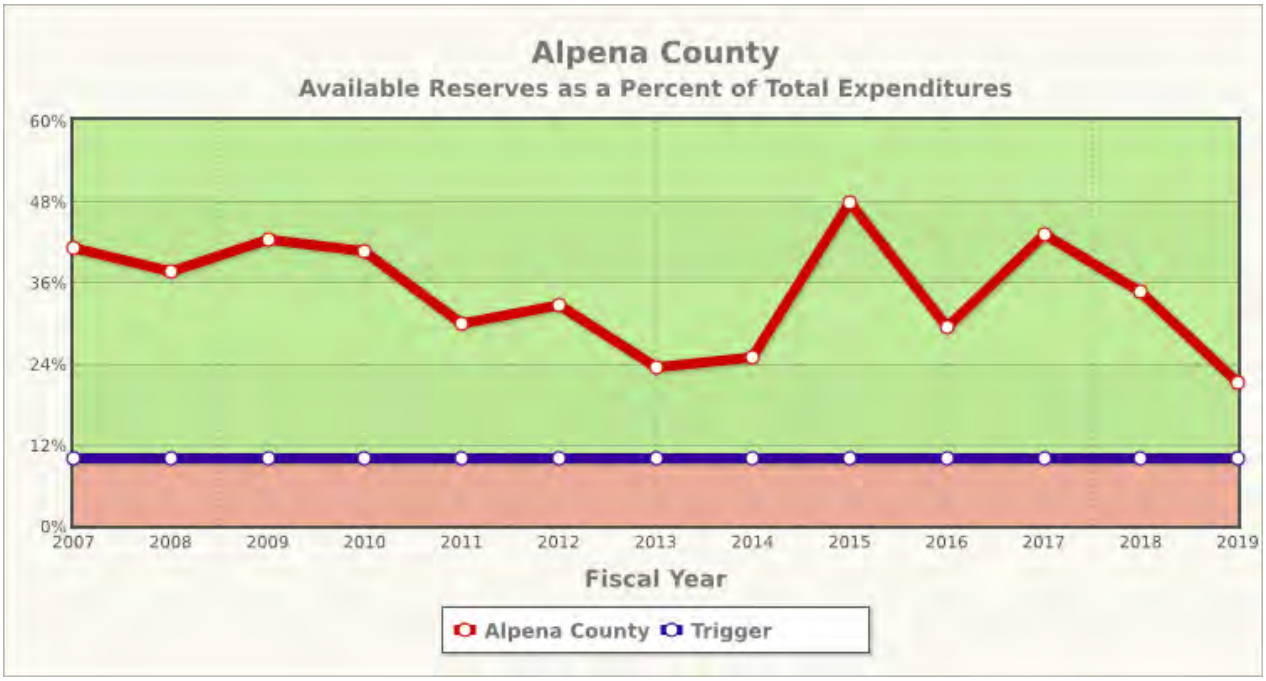


TABLE 2-49

TABLE 2-50

TABLE 2-51

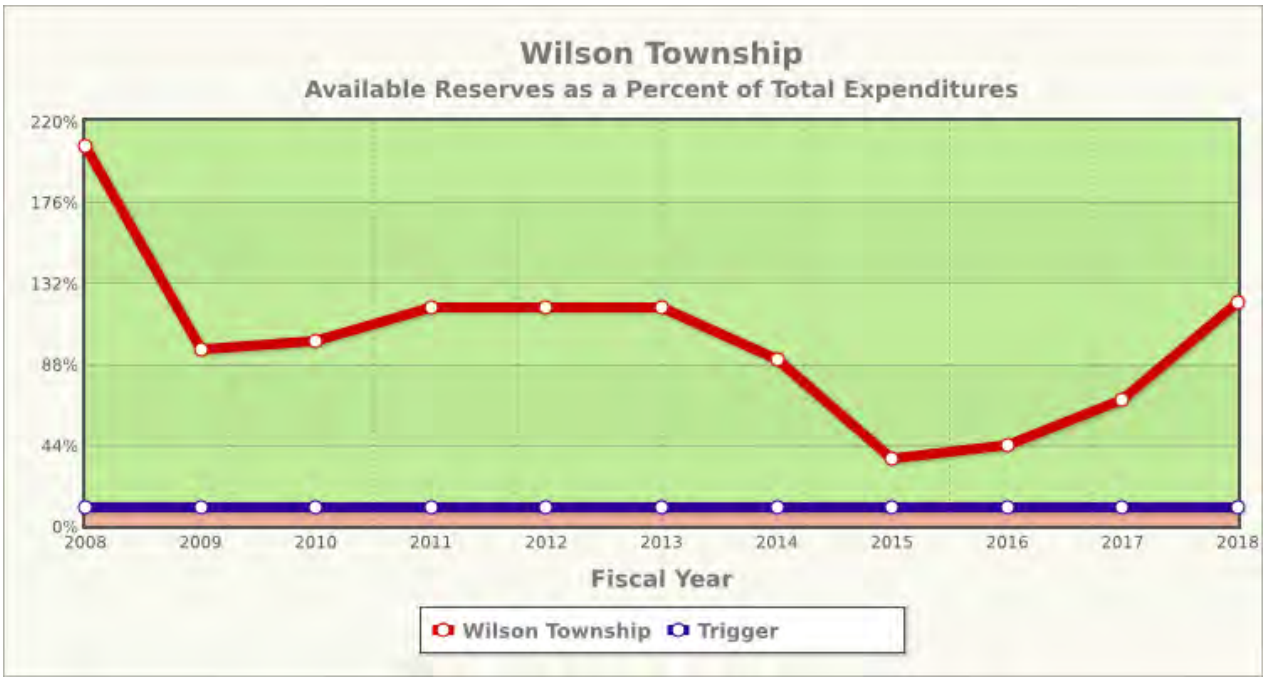

Wilson Township
Available Reserves as a Percent of Total Expenditures
220%
176%
132%
88%
44%
0%
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
Fiscal Year
Wilson Township
Trigger

TABLE 2-52

Chapter 3 COMMUNITY SERVICES AND FACILITIES

Community services and facilities play an important role in maintaining and improving quality of life. The location and level of some services, such as public water, public wastewater, and fiber optic lines, determine the types and intensities of development within a community. These services may be sufficient for the needs of the current population; however, continued growth may require an upgrade or expansion of services and facilities. Often, smaller communities do not have the financial resources to provide the variety of public, semi-public, and private services that would be considered essential in a larger community. For example, many rural communities work cooperatively with adjacent communities to provide essential services.

UTILITIES

The county's utility system includes private suppliers of electric, natural gas, telephone, solid waste disposal and cable television services, along with the publicly owned and operated City of Alpena and Alpena Township water and wastewater systems (Table 3.1).

TABLE 3.1

ALPENA COUNTY UTILITY SYSTEM

Utility	Company	Service Area
Natural Gas	DTE Gas	Alpena Township, Maple Ridge Township, Sanborn Township, Wilson Township
	Presque Isle Electric & Gas Co-op	Green Township, Long Rapids Township, Maple Ridge Township, Ossineke Township
	Liquefied Propane, Fuel Oil, Wood, Corn, Pellets	Green Township, Ossineke Township
Electricity	Alpena Power Company	Alpena Township, Maple Ridge Township, Ossineke Township, Sanborn Township, Wilson Township, Green Township (only in isolated cases)
	Presque Isle Electric & Gas Co-op	Alpena Township, Green Township, Long Rapids Township, Maple Ridge Township, Ossineke Township, Wellington Township, Wilson Township
	Consumers	Ossineke Township, Sanborn Township
Telecommunications	Telephone: Frontier Cellular Service: Numerous providers Internet: Numerous providers Cable: Charter Communications, Allband Multimedia	County Wide
Water and Sewer	City of Alpena Water/Wastewater Utility	City of Alpena, Alpena Township, Wilson Township

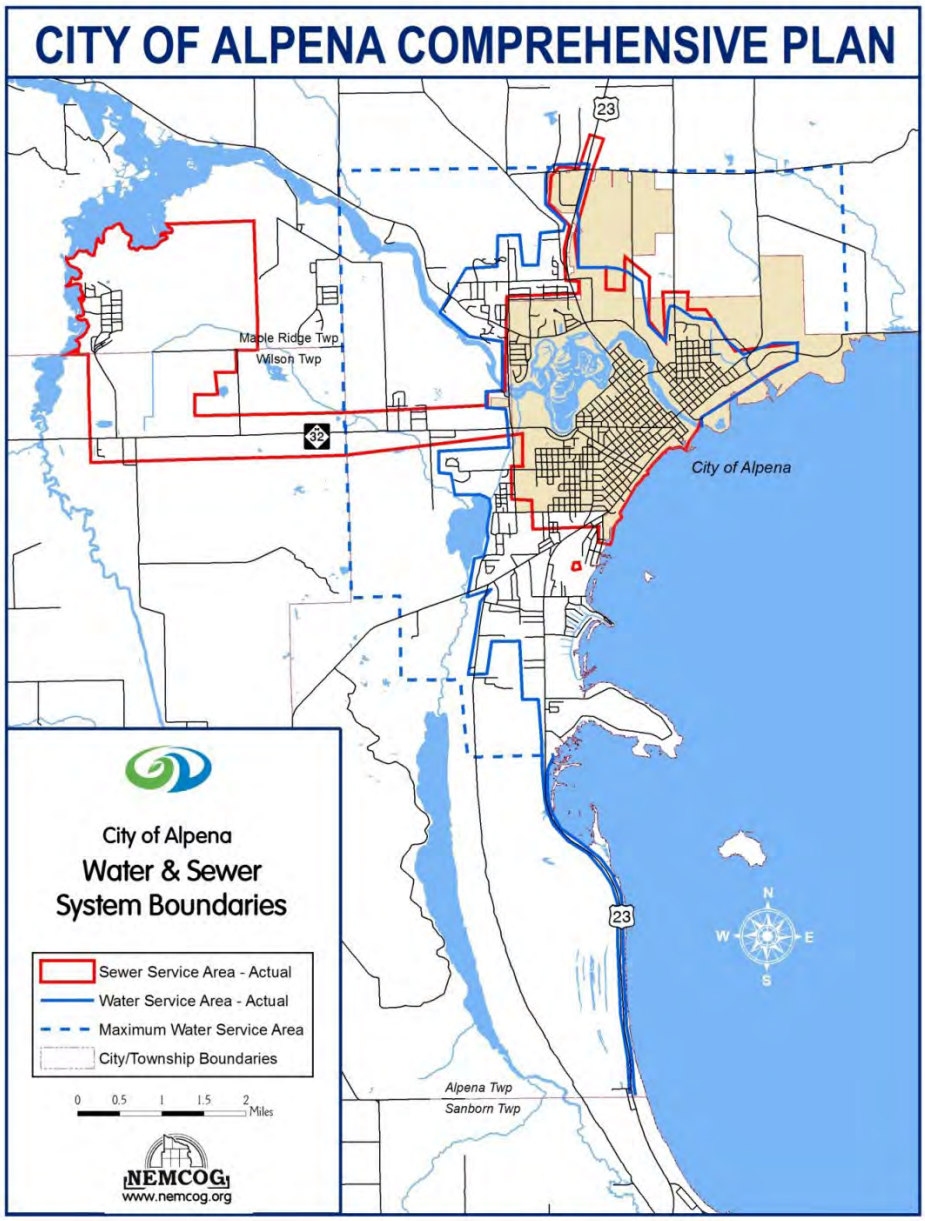
Source: Michigan Department of Licensing & Regulatory Affairs (Michigan Public Service Commission)

PUBLIC WATER & WASTEWATER SUPPLIES

The City of Alpena has the only water treatment and wastewater treatment plants in the County. The City contracts operation and billing for both utilities to United Water. Public water and wastewater is

available throughout the city, portions of Alpena Township and lines have been extended west along M-32 through Wilson Township to the Alpena County Regional Airport. The City of Alpena Water Filtration Plant supplies water, and the City of Alpena Water Recycling Plant treats all wastewater in the public system (Figure 3.1).

Figure 3.1: City of Alpena Water & Sewer System Boundaries



Alpena Township and the City of Alpena each manage, operate and maintain the water facilities within their boundaries. Per a 1977 contract and Master Agreement, signed with Alpena Township, the City of Alpena provides up to 1.5 million gallons of water to the Township per day and accepts up to 2 million gallons of wastewater per day. However, this agreement has expired and is being renegotiated between the City and Township.

According to information from the managing entity of the water systems, the 2017 average daily water usage of both the City and Township was approximately 1.63-million gallons, with maximum daily usage

of 1.77-million gallons. Per the 1977 agreement, service area boundaries were established that limit extension of wastewater and water infrastructure. When initially established, the boundary went north to Bloom Road, East to Wessel Road, West to the Alpena Township Line and south to Partridge Point. The agreement was amended in 1998 to extend the service area to include wastewater and water lines to the Alpena County Regional Airport. In 2006, the water main was extended south along US-23 to the southern Alpena Township line. Within Green Township, a residential development located along the eastern portion of the Village of Hillman receives its public water and sewer services from the Village. The remainder of the County is served by individual wells and septic tanks for which permits must be obtained from District Health Department #4. In addition, Green Township has adopted septic system regulations for properties adjacent to or having access to inland lakes in an effort to protect the nearby drinking water wells and water resources.

Public Water Supply

The Alpena water system serves 4,576 customers in the City of Alpena and 2,298 customers in the adjacent portions of Alpena Township. Thunder Bay is the source for all public water in Alpena County. A groundwater investigation conducted in 1966 by W.G. Keck & Associates determined there is not a water bearing formation in the area adequate to serve as a source for municipal supply. The City of Alpena Water Filtration Plant is located on the shore of Thunder Bay at the south end of the City of Alpena. The water plant is a conventional surface water plant. Coagulation, flocculation, and filtration are used to clean the water.

The water system consists of a Thunder Bay intake, 6.0 mgd filter plant, four elevated storage tanks and eighty miles of distribution piping. The current raw water intake has been in service since 1905 and has two intakes. The intake line is 2,000 feet long and is a 40-inch diameter pipe with a 30-inch polyethylene liner. There are two openings that are anchored by rock and timber intake cribs; one located approximately 1,000 feet from shore in 10 feet of water and the second located approximately 2,000 feet from shore in 17 feet of water. The rated capacity of the intake pipe is 8 million gallons per day at 2.52ft/sec. Control of zebra mussel colonization within the intake pipe is accomplished via chemical addition. Once the water enters the treatment plant, it takes 12 hours to complete the treatment cycle.

During the process, at least 50,000 samples are collected and analyzed per year and fluoride, phosphate, and flocculant aides are added. The plant laboratory is certified by the State of Michigan to test for Total and Fecal Coliform bacteria. These are the primary indicator organisms for water quality, both for drinking and swimming/recreation. The facility also tests for chlorine (disinfectant), pH, hardness, alkalinity, turbidity, fluoride, and other possible contaminants as required.

One 750 KVA diesel powered (1034 HP) generator is available to operate the entire water treatment plant. This generator will produce all of the necessary electricity to meet City needs during any power failure. The auxiliary generator is exercised quarterly.

The treatment plant has a firm capacity of 6.0 million gallons per day with a maximum daily demand of 3.04-million gallons per day. The average daily demand is 1.98-million gallons per day. There are also 80.6 miles of water main within the entire system.

Treated water storage is as follows:

- 1-million gallon ground storage at the Water Treatment Plant
- 750,000 gallons at Ninth Avenue elevated tower
- 750,000 gallons at North Industrial elevated tower.
- 500,000 gallons at Alpena Township M-32 elevated tower.
- 500,000 gallons at Alpena Township Piper Road elevated tower.

- 300,000 gallons at the Alpena Township US-23 South elevated tower

Public Wastewater

The original water recycling treatment plant became operational in 1953 and many of the treatment units remain in use today. In 1972, the plant was upgraded to improve pollutant removal capability. Using grant funds from the USEPA, secondary treatment was added to the facility. A biological treatment process called Activated Sludge was used to enhance removal of dissolved pollutants from the wastewater. This addition improved pollutant removal rates and the plant regularly achieves 90 to 95% pollutant removal efficiency.

The Alpena Water Recycling Plant has a defined service area of a 25-mile radius around the plant and serves 4,798 customers in the City of Alpena and 2,013 customers in Alpena Township. The system consists of 69.3 miles of sanitary wastewater lines and 11 lift stations. The treatment plant has an average design capacity of 5.5 million gallons per day with a maximum pumping capacity of 7.2 million gallons per day. The average daily treatment is 2.3 million gallons per day.

Preliminary treatment accomplishes the removal of screenings and grit from the raw wastewater. The removed grit is collected, stored, and disposed of by land filling. Primary Clarifiers accomplish about 15% to 20% pollutant removal. Aeration reactors and final clarifiers aid in removing more bacteria. A Biosolids Application Program is in place, which utilizes the nutrient-rich residues to beneficially enrich soils for area farmers. Biosolids are also used to regenerate forest growth and to reclaim areas destroyed during industrial mining operations.

Chlorine bleach is added to the treated wastewater after secondary treatment is complete. Any wastewater treatment process generates solids that must to stabilized and recycled. Two 300,000-gallon anaerobic digesters are used to treat the solid material generated by the Alpena Water Recycling Plant. A valuable byproduct of the anaerobic digestion process is methane gas. This energy source is used to fire the plant boiler and fuel a 4-cylinder engine that drives a raw wastewater pump. Utilization of methane gas from the digester saves the Utility about $15,000 per year in energy costs.

Mercury Minimization: The Alpena Water Recycling Plant first implemented mercury minimization in 1986. The focus of the plan was to identify and eliminate mercury discharges from commercial and industrial sources. Utility personnel have assisted in the identification of numerous over-the-counter products that utilize mercury as a preservative. Once identified, mercury free products can be substituted.

Industrial Pretreatment Program: The water recycling plant management staff regulates commercial and industrial wastewater discharges. Chemicals that could upset the biological processes at the plant must be strictly controlled. The indiscriminate discharge of metals and other toxins can also pass through the plant and enter the environment. Customers that have the potential to negatively impact plant processes are issued discharge permits and are inspected annually to insure compliance with limitations.

Odor Control: The equipment and infrastructure necessary to transport and recycle wastewater creates conditions that are inherently prone to the creation of odors. Because of the plant's close proximity to the City Marina, $1.5-million worth of odor control equipment was added to the facility as well as aesthetic upgrades.

Solid Waste Disposal

Alpena County is a member of the Montmorency-Oscoda-Alpena Solid Waste Management Authority (MOASWMA). The MOASWMA landfill in Montmorency County is the primary destination for the County's solid waste. Collection of solid waste is available through private hauling companies with curbside collection being the most common collection method. Residents from Green Township have the option to take garbage to the MOASWMA and pay per bag instead of paying a private hauling company. Industrial waste in Wilson Township is transported to Waste Management's Landfill in Waters, Michigan. Yard waste is picked-up monthly from April to November in the City of Alpena and processed at its composting facility located at the City DPW Facility.

Although the Lafarge Corporation owns and operates its own landfill, many other industries have found ways to recycle all or portions of their wastes. The Alpena City Water Recycling Plant produces 500 dry tons per year of sludge, all of which is used for different applications such as farm fields, forest regeneration and mine reclamation. It is the goal of the plant to keep all sludge out of the landfill.

The Alpena Resource Recovery Program is administered by the Northeast Michigan Council of Governments (NEMCOG) and is overseen by the Alpena Resource Recovery Board that includes representation from various political jurisdictions. The program includes the Resource Recovery Facility (RRF) located on M-32, a leased facility directly across from the RRF plus a number of full-time drop off sites. The primary funding source for the program is a $20 per household surcharge fee. The program accepts electronics, household hazardous waste, paper, tin, batteries, aluminum, plastic, cardboard, garbage, construction debris, mattresses, furniture, appliances, and motor oil. It also participates in the "Cleansweep" program sponsored by the Michigan Department of Agriculture, which is designed to encourage citizens to turn in hazardous materials.

Fiber Optic Network

In January of 2005, the Alpena City Council's Vision Statement and Goals document included the development of a "wired city" and the relocation of all new or reconstructed utilities underground. This led to the development of a plan to develop a fiber optic conduit network that would not only provide the backbone for high-speed telecommunications (voice, video, and data transfer), but would also provide a readymade system within which to place new or relocated aerial utilities.

The City pursued the sharing of these resources within the public/nonprofit sector through the creation of a fiber optic consortium. The City of Alpena, Michigan Works!, Alpena County, Alpena Community College, the Thunder Bay National Marine Sanctuary, Northland Library Cooperative, and Alpena Regional Medical Center were the charter members of this consortium. The consortium's purpose is to enhance voice, video and data communications among all public/non-profit entities and develop a redundant network throughout the greater Alpena area to ensure reliability of service. To further the development of this fiber optic network, the City also adopted a policy to develop this underground conduit system as part of other road construction projects within the City.

To accelerate the development of both the network and the consortium, the City applied for and received a 2006 Center for Regional Excellence designation from the State of Michigan. This designation included a $25,000 micro-grant, which targeted network development in three key target zones (City Hall/City Marina/Northland Library Target Zone; the Community Development Building Target Zone; the

ARMC/Civic Center Target Zone). All construction projects were completed within one year and educational activities were completed by the end of 2007.

Recently the Consortium has reorganized, becoming the North East Michigan Fiber Consortium (NEMiFC). NEMiFC amended its Articles of Association and By-Laws in order to add additional members, gain the ability to own its own fiber optic networks, apply for grant funding and offer more support to its members. *(DRAFT notation: Called Tom Stephenson to get his insight, waiting for response. 248-376-4046; No strategic plan or broadband plan; Will send link with maps of build outs and status of deployment; https://connectednation.org/michigan/county-maps/)*

NEMiFC also developed a policy by which its members can install and own fiber and choose to lease dark fibers to other entities to support the maintenance and expansion of the broader fiber network.

TRANSPORTATION

Streets and Highways

Alpena County

Alpena County does not have an interstate highway; however, it is served by state and federal highways that include approximately 72 miles of M-32, M-65 and US-23 (Figure 3.2). US-23 follows the shoreline of Lake Huron from Mackinaw City to Standish and into the State of Ohio, while M-32 runs east-west through Alpena and connects it with I-75 and US 131. M-65 runs north-south through the western portion of the County. The County Road Commission maintains 660 miles of county roads and is also under contract with the Michigan Department of Transportation (MDOT) for the maintenance of 159 lane miles of state highway in Alpena County.

The Alpena County Road Commission, MDOT, and Northeast Michigan Council of Governments (NEMCOG) using the Pavement Surface Evaluation and Rating (PASER) system to do an assessment of all federal-aid roads. PASER monitors the type and amount of visual defects along a road segment while driving the segment. The system ranges from 1 to 10, with 1 representing a failed road and 10 representing a new road.

Each road rating has a prescribed fix:

- **Routine Maintenance (rating 8-10):** Schedule maintenance activities, including street sweeping, drainage, clearing, shoulder gravel grading, and sealing cracks.
- **Capital Preventive Maintenance (rating 5-7):** Planned cost effective treatments to preserve pavement, delay future deterioration, and maintain or improve the functional condition without increasing structural capacity.
- **Structural Improvements (rating 1-4):** rehabilitation and reconstruction work to address the road's structural integrity.

Over time, Alpena County has seen an increase in roads requiring structural improvements and a decrease in roads requiring routine maintenance. In 2018, 62.02 miles of roads were in need of routine maintenance fixes (33 percent), 81.24 miles of roads were in need of capital preventive maintenance fixes (43 percent) and 46.21 miles of roads were in need of structural improvement fixes (24 percent). The road rating received for roads owned by MDOT and the Alpena County Road Commission can be viewed in Table 3.2. Road information for the City of Alpena is not included in this plan. For more information about the city's roads, The City of Alpena Master Plan can be found at: http://www.discovernortheastmichigan.org/cityalpenamaster.asp

Figure 3.2: Alpena County Roads

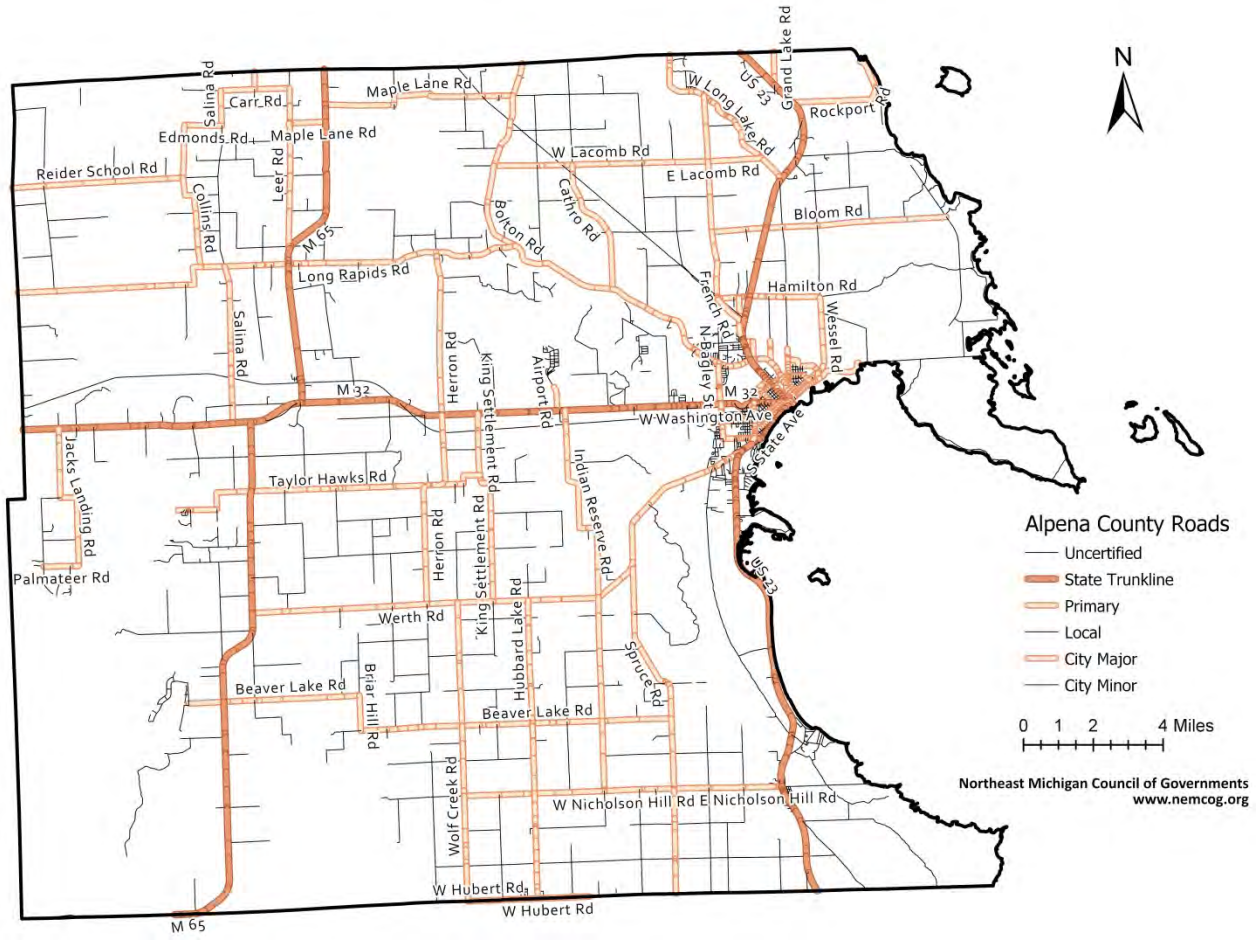


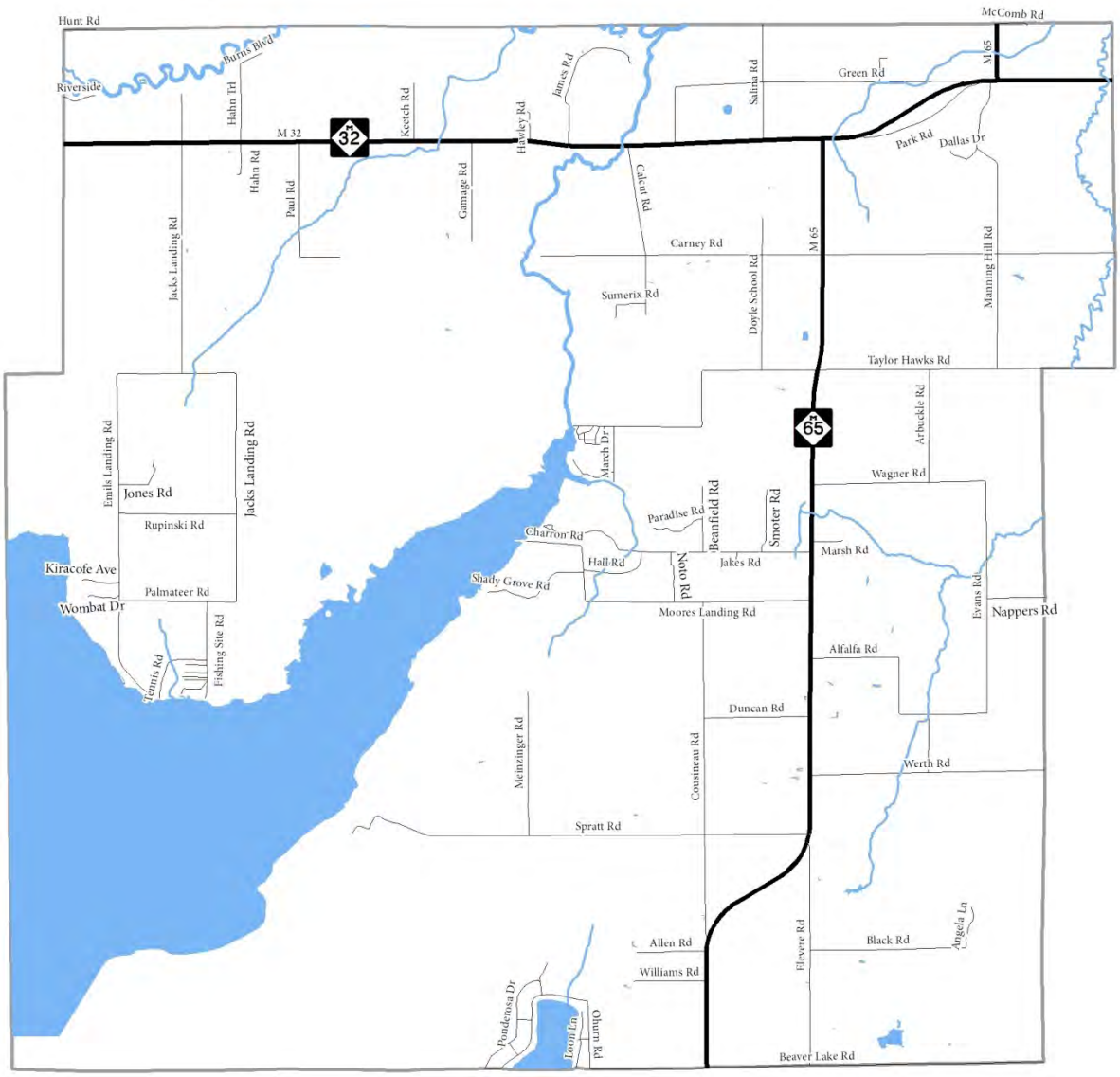
Table 3.2 - 2018 PASER Results by Jurisdiction				
Jurisdiction	**8 - 10**	**5 - 7**	**1 - 4**	**Total Mileage Rated**
MDOT	14.830	36.993	17.596	69.419
Alpena CRC	47.185	44.249	28.618	120.052
Source: NEMCOG				

According to the Michigan State Police Criminal Justice Information Center, Alpena County had 861 crashes in 2017. The majority of the crashes occurred on local streets with 350 accidents being deer related, 50 being distracted driver related, 34 being alcohol related, 21 being police-ambulance-fire related, 13 being drug related, 11 being bicycle related, and 5 being pedestrian related. From 2006 to 2013, the annual average daily traffic volume generally followed the same trends for both M-32 and US-23 according to the Michigan Department of Transportation. In 2017, the annual average daily traffic (AADT) for M-32 ranged between 5,095 and 19,917, and the AADT for US- 23 ranged between 5627 and 13,668. For new developments, a traffic crash and flow analysis should be completed during the site plan review process.

Green Township

In Green Township, M-32 and M-65 intersect for approximately a half mile at Manning Hill (Figure 3.3). M-32 runs east-west across the northern part of Green Township for 10 miles, while M-65 runs north-south along the east side of the Township for 10.5 miles. Local roads are maintained by the Alpena County Road Commission with funding assistance from the Township.

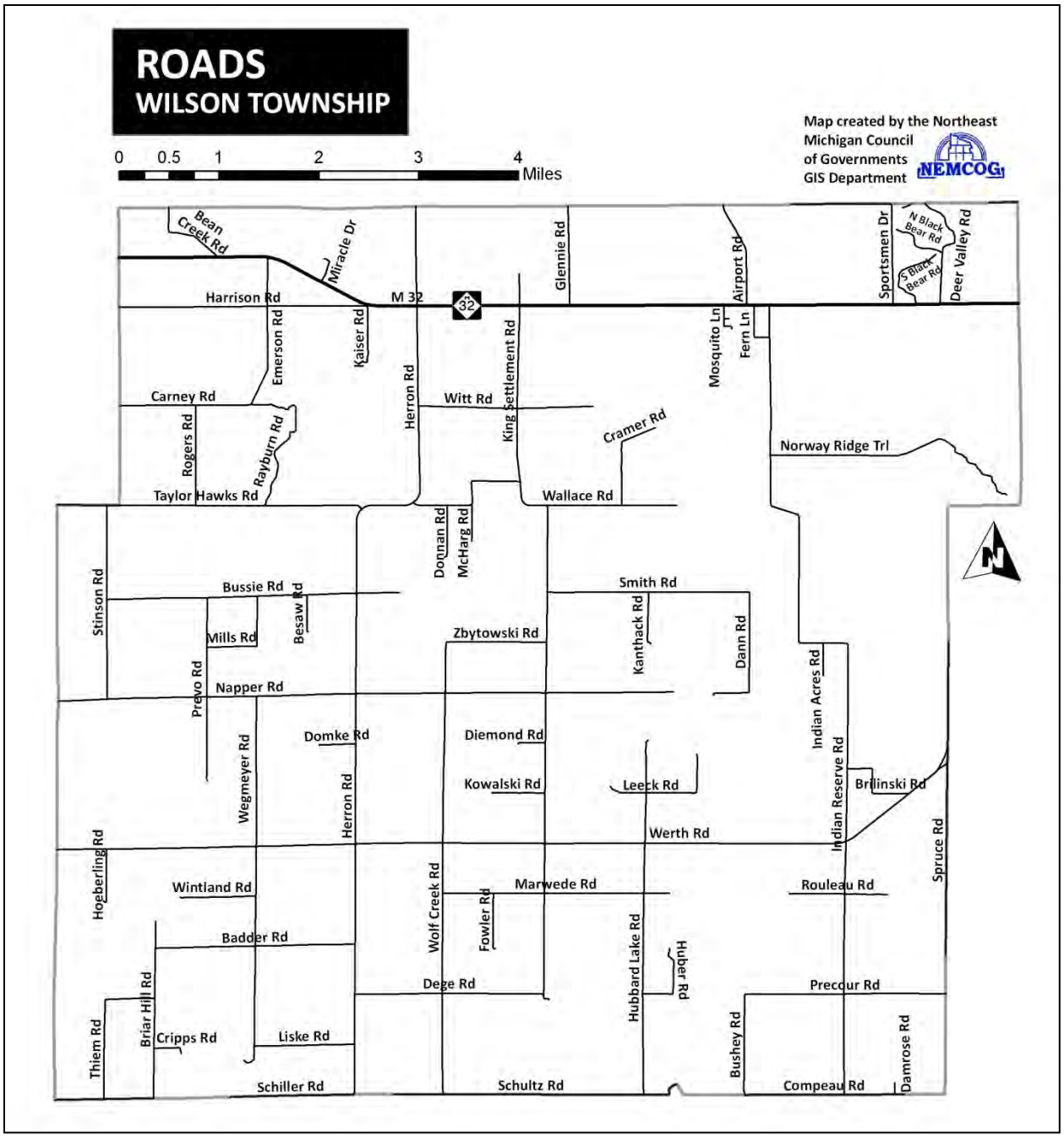
Figure 3.3: Green Township Transportation System



Wilson Township

In Wilson Township, M-32 traverses east-west across the northern portion of the Township for 9.1 miles (Figure 3.4). The remaining roads are county and private roads. The County primary roads include Beaver Lake Road, Herron Road, Hubbard Lake Road, Indian Reserve Road, King Settlement Road, Spruce Road, Taylor Hawks Road, Werth Road, Wolf Creek Road and a portion of Airport Road. The Alpena County Road Commission is responsible for road maintenance, snow removal and improvements. Wilson Township contributes to road funding as funds are available.

Figure 3.4: Wilson Township Roads



Ossineke Township

Roads are scarce in Ossineke Township due to the low population density and large tracts of forested and recreational land. Roads on the eastern side of the township are better developed than roads on the western side that consist of private road and two-tracks (Figure 3.5). State highway M-65 runs north-south through the township for over seven miles. The County primary roads include Beaver Lake Road, Hubbard Lake Road, Indian Reserve Road, Hubert Road, Nicholson Hill Road, and Wolf Creek Road. The Alpena County Road Commission is responsible for road maintenance, snow removal and improvements.

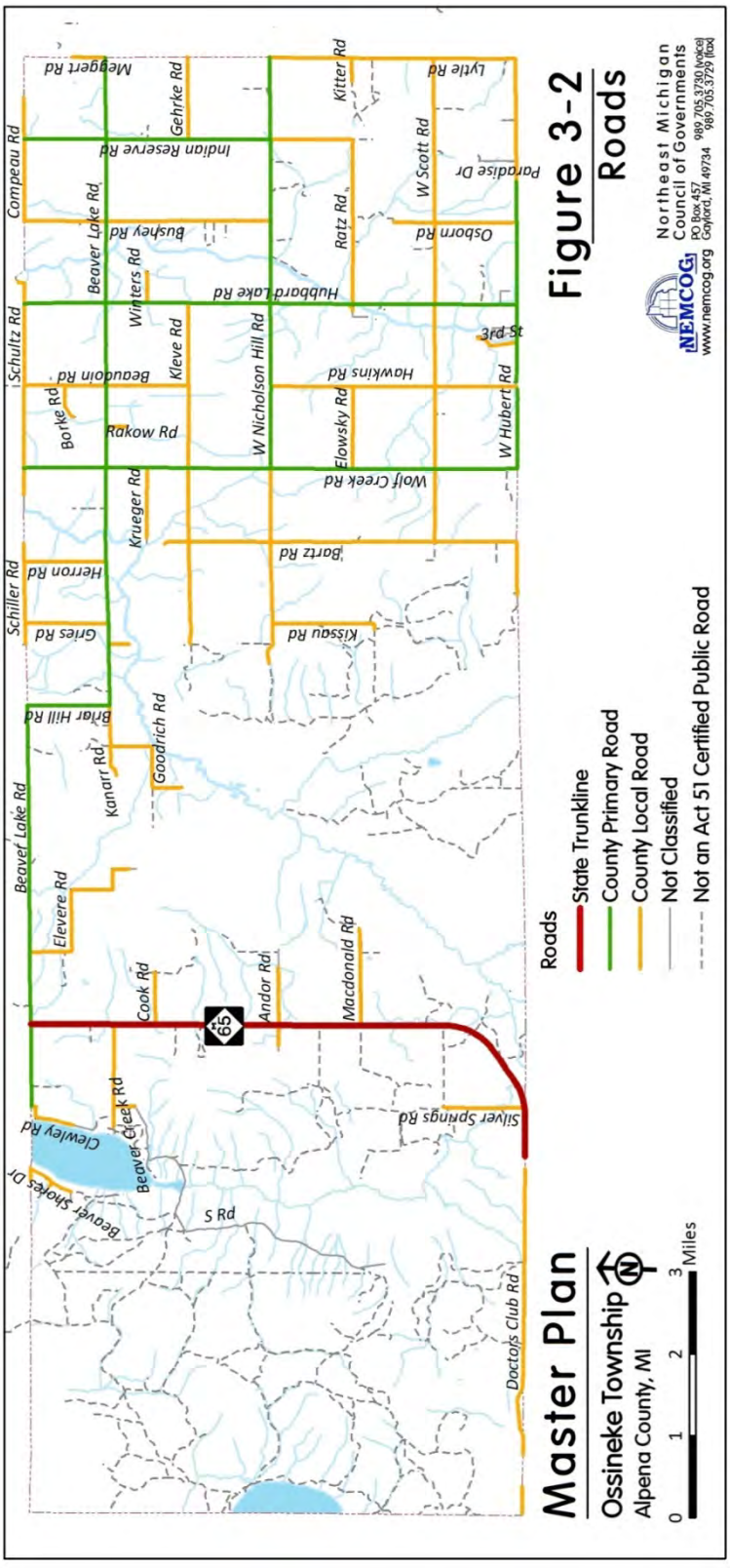


Figure 3.5: Ossineke Township Roads

Air Transportation

Regional air service is available at Alpena County Regional Airport (Phelps Collins), which is located in both Maple Ridge and Wilson Townships. There is a 9001 foot and a 5028 foot concrete runway and state of the art communications and radar systems. The airport has the ability to accommodate any type of commercial or military aircraft and is a U.S. Customs Port of Entry. The airport is also home to the Combat Readiness Training Center (CRTC) of the Michigan National Guard. Passenger service connecting to Detroit and Pellston is provided by Skywest, an affiliate of Delta. Charter, airfreight and medivac services, as well as flight training and aircraft rentals are available from a variety of companies.

In 2019, construction will start on a new airport terminal, parking lot and ramp improvements. The new terminal will be 12,900 square feet and will vastly improve the passenger experience. The new terminal will improve baggage handling, reduce airliner ground time, have more efficient TSA screen and baggage x-ray, and a passenger boarding bridge. The new facility will be energy efficient with all power lines being underground. The former terminal building will be renovated for airport offices, meeting space, and an airport restaurant.

Table 3.3 shows the amount of freight and number of passengers that have traveled through the Alpena Regional Airport from 2005 to 2017. Passenger service at the airport decreased annually from 2005-2008, then began to increase until 2013 when there was an additional flight to Minneapolis. However, the flight was later dropped since Alpena was not considered an essential air service out of Minneapolis. From 2005 to 2017, inbound freight decreased by 44 percent and outbound freight decreased by 43 percent, with inbound freight outpacing outbound freight for every year shown. This would indicate an opportunity to ship more freight out of Alpena on the airplanes that have delivered goods to the area.

TABLE 3.3

ALPENA COUNTY REGIONAL AIRPORT USAGE 2005-2017

Year	Freight (inbound) lbs.	Freight (outbound) lbs.	Commercial Passengers (inbound & outbound)	Other Passengers (inbound & outbound)
2017	696,275	459,285	20,404	908
2016	651,692	415,119	16,975	862
2015	714,117	430,370	19,474	936
2014	696,172	425,654	24,852	880
2013	637,930	412,278	31,292	659
2012	649,524	465,811	25,350	975
2011	631,246	493,640	22,747	1099
2010	657,722	447,923	16,818	n/a
2009	518,930	411,489	14,876	n/a
2008	869,140	583,223	14,608	n/a
2007	963,505	785,840	15,288	n/a
2006	1,132,541	794,543	15,625	n/a
2005	1,244,849	806,391	19,666	n/a

Source: Alpena County Regional Airport

Rail Service

Freight rail service is provided by the Lake State Railroad Company. Rail service is used to deliver raw materials and products to and from the heavy industrial users in the area. No passenger service is offered. Alpena is at the end of the rail line, and Lake State Railroad has only one in-bound and one out-bound train per day, Monday through Saturday. Although the volume of freight is expected to increase, no extension or expansion of the line is anticipated. The rail bridge over the Thunder Bay River was replaced in July 2002, financed partially through a loan from the Michigan Department of Transportation.

MARINE FACILITIES

The Alpena area has two channels used for Great Lakes shipping. One is for the Port of Alpena and the other is for the Lafarge Corporation. The annual shipping season for Alpena Harbor is from mid-March to mid-December. Shipping grew steadily between 1991 and peaked in 1999. In 2010, shipping was at its lowest level since 1991 and in general has stabilized at that lower level through 2016 (**Figure 3.6**). **Table 3.4** shows that cement and concrete are the major commodities being shipped out of Alpena with the major receipts being coal, lignite, crude materials, and nonmetal minerals.

Figure 3.6: Alpena Shipping

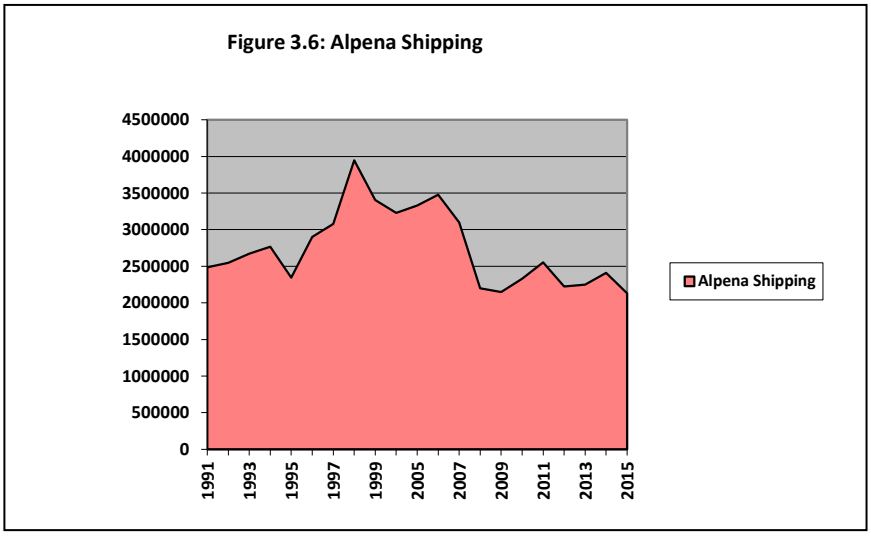


Table 3.4
Alpena Freight Traffic 2016 (short tons)

Commodity	Total	Receipts	Shipments
Coal & Lignite	123,000	123,000	0
Petroleum Coke	129,000	129,000	0
Limestone	38,000	38,000	0
Gypsum	28,000	28,000	0
Aluminum ore	17,000	17,000	0
Cement & concrete	1,718,000	0	1,614,000
Fab. Metal Products	18,000	18,000	0
Salt	17,000	17,000	0
Total	**2,131,000**	**387,000**	**1,614,000**

Source: U.S. Army Corps of Engineers, Waterborne commerce of the United States, Waterways and Harbors, Great Lakes

The City of Alpena Marina is a full-service marina and is the only public or private marina in the area. The marina can accommodate both seasonal and transient boats, of a variety of sizes. The marina is sheltered by a breakwall and access to Lake Huron is made via the mouth of the Thunder Bay River. The marina contains approximately 135 slips (58 seasonal and 77 transient) with full power and water services, launch ramps, courtesy docks, a fuel station, boater restrooms and shower facility, a fish cleaning station, a pump-out station, a marine store, maintenance facilities, and office building. Winter storage and boat launching services are also available. The City of Alpena Marina participates in the State of Michigan Central Reservation System.

PUBLIC TRANSIT

Thunder Bay Transportation Authority

The Thunder Bay Transportation Authority provides scheduled public transportation services to the residents of Alpena, Alcona, and Montmorency Counties, and a small portion of Presque Isle County. The authority operates Monday thru Friday with a fleet of 40 vehicles and 4 hybrid trolley buses. It also provides operational service to the three county areas and the City of Alpena via an operating agreement with a private operator. In 2017, the Thunder Bay Transportation Authority completed its new facility that includes a garage and maintenance facility. In 2017, the authority drove 518,034 annual vehicle miles and had 33,024 annual vehicle revenue hours.

Alpena Dial-A-Ride Transportation ("DART") began operations in 1974 and was the eighth small bus system to be started in Michigan. It is operated as an on-demand transportation service by the Thunder Bay Transportation Authority, which consists of seven wheelchair lift equipped buses. The service runs seven days a week only in The City of Alpena. The boundary limits for city residents are Princeton Street and Henry Street to the north, Hobbs Drive/Bagley Street to the west, and Grant Street and Mich-E-Kewis Park to the South. The boundary limits for non-city residents are Hamilton Road to the north, Walter Street to the west, and Pohl Road to the south.

Since its beginning, the DART system has logged nearly 7.7 million miles and has carried over 4 million passengers. Funding for the system is derived from State and Federal reimbursements, fares, and a 0.65 mill City property tax levy. The property tax levy was first instituted in 1976 by a vote of the City electorate and has been renewed every 4 years by an average 3 to 1 vote margin. In 2005, the levy was renewed and increased from 0.5 to 0.65 mills.

Indian Trails, Incorporated

Indian Trails provides statewide public transportation services on a daily basis. The bus route follows US-23 through Alpena County. Buses operate seven days a week, with a southbound run in the morning and northbound run in the afternoon. Buses are wheelchair lift equipped and have space set aside to accommodate wheelchairs. The Michigan Department of Transportation (MDOT) subsidizes this transportation service for areas in northern Michigan. This system serves as a daily link between select cities and allows people to travel outside the area to other parts of the state and country.

Amtrak Thruway

Amtrak provides Thruway service at a bus stop outside of Walmart along Michigan Highway 32 West. This service uses motorcoaches to connect Amtrak passengers to Amtrak Train stations since Alpena County is not served by Amtrak's railroads.

Taxi/Shuttle/Limousine Services
Demand response public transportation service is provided by private companies operating in Alpena. A shuttle bus is provided by some lodging facilities, such as the Holiday Inn Express and the Ramada Inn, between the Alpena County Regional Airport and its facility. Passenger van schedules coincide with airline arrivals and departures.

Charter/Rental bus service
Charter bus service is provided by Country Line Tours. The services provided vary by company.

Car Rental
Car rental companies are located within the Alpena County Regional Airport, Cliff Anscheutz Chevrolet, and Thunder Bay Chrysler. These companies offer local, state and national rentals.

EDUCATIONAL SYSTEM

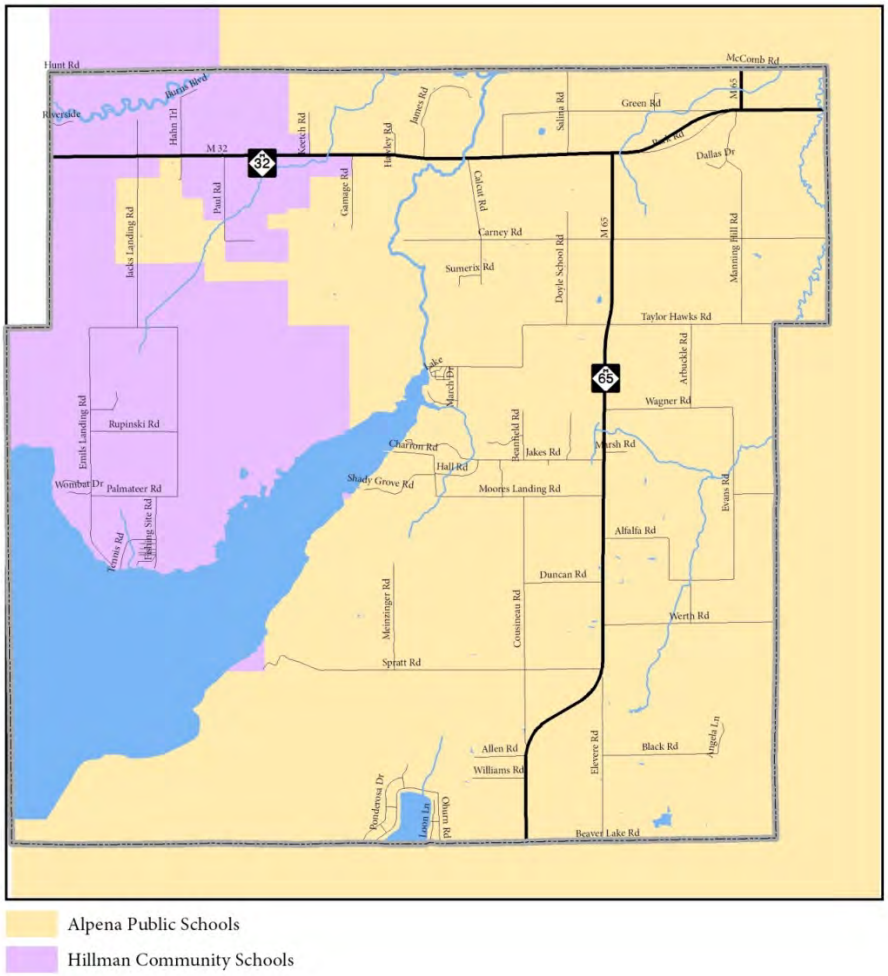
Alpena Public Schools serves the entire county and a small portion of Presque Isle County. It is part of the Alpena-Montmorency-Alcona Educational Service District; which is comprised of Alpena County, Montmorency County, and Alcona County (Table 3.5). A portion of Green Township is served by Hillman Community Schools (Figure 3.7). According to the "Standard and Poor's School Evaluation Services" Alpena Public Schools had a 2018 enrollment of 3,937 students and a student to teacher ratio of 19.76. The report also stated Alpena Public Schools had an operating expenditure of $9,887 per student in 2013. All Alpena Public Schools buildings and facilities are linked by a fiber optic network.

Table 3.5
Alpena Public Schools

School	School Type	Location	Enrollment 2011-2012	Enrollment 2015-2016
Besser School	Elementary	375 Wilson St – City of Alpena	348	425
Ella White School	Elementary	201 N. Ripley – City of Alpena	402	465
Hinks School	Elementary	7667 U.S. 23 N. – Alpena Twp.	193	156
Lincoln School	Elementary	309 W. Lake St. City of Alpena	162	173
Sanborn School	Elementary	12170 U.S. 23 S. Sanborn Twp.	205	183
Wilson School	Elementary	4999 Herron Rd. – Wilson Twp.	261	225
Thunder Bay Junior High	Middle School	3500 West Third Ave – Alpena Township	995	881
Alpena Senior High	Secondary	3303 South Third St. – City of Alpena	1286	1309
Aces Academy	Alternative	700 Pinecrest Street – City of Alpena	173	121
Pied Piper Opportunity Center	Special Education	444 Wilson Street – City of Alpena	34	23

Source: National Center for Educational Statistics

Figure 3.7: Green Township School Systems



From 1980 to 2018 the total number of public and parochial K-12 students in Alpena County has significantly decreased. Enrollment during this period dropped by 49 percent from 7,655 students enrolled in 1980 to 3,937 enrolled in 2018. The district's enrollment has continued to steadily decline since 1980 with 363 less students recorded in the 2018 school year than in the 2012 school year; an 8 percent decline in six years. Given the current age distribution in Alpena County, the downward trend in school enrollment is likely to continue.

Alternative educational choices are available in the Alpena area. Three private schools are available in Alpena that include Immanuel Lutheran School, All Saints School, and Seventh Day Adventist School (Table 3.6). Home schooling is another education option that has grown in popularity. In 2014, Bingham Arts Academy, a no-cost charter school, closed.

The Intermediate School District includes Alpena County, Montmorency County, and Alcona County. Known as the Alpena-Montmorency-Alcona Educational Service District, this agency also oversees the operation of the Pied Piper Opportunity Center.

Table 3.6 Private Schools				
School	School Type	Location	Enrollment 2011-2012	Enrollment 2015-2016
All Saints School	K-6	500 N. 2nd Ave. – City of Alpena	102	81
Seventh Day Adventist School	K-7	4029 US 23 – City of Alpena	9	6
Immanuel Lutheran School	PreK-8	355 Wilson Street – City of Alpena	102	79
Source: National Center for Educational Statistics				

ACES Academy

ACES Academy (Alternative Choices for Educational Success) is housed in the former Oxbow Elementary School in Alpena. ACES Academy offers adult and alternative education, as well as community education programs. Its Alternative Education component serves students who have difficulty with the regular program at the Alpena High School. The Adult Education program helps adults earn a high school diploma equivalent (GED). In 2015-2016, 121 full and part time high school students were enrolled at ACES.

Pied Piper Opportunity Center

Pied Piper Opportunity Center is owned and operated by the Alpena-Montmorency-Alcona Educational Service District. The school serves students who are Moderately Cognitively Impaired, Severely Cognitively Impaired, Severely Multiply Impaired, and Autistic Impaired. Students range in age from 3 to 26 years. Pied Piper, located on Wilson Street, provides individualized instructional programs in personal care, independent living, language, and physical, vocational, academic, and social-emotional education to special needs students. Pupils are served at the center, at home, or in the hospital.

Alpena Community College

Alpena Community College (ACC) is located on 700 acres of land in the City of Alpena. ACC operates two major campuses plus outreach activities in various area public schools. The Main Campus is in the City of Alpena and the Huron Shores campus is located at the former Wurtsmith Air Force Base in Oscoda, Michigan. ACC's enrollment has dropped by 25 percent from 2,155 students enrolled in 2016 to 1,611 students enrolled in 2017. The college has maintained its 50 member full-time faculty; however its part-time faculty decreased from 145 staff members in 2016 to 75 staff members in 2017; a 48 percent decline.

Founded in 1952, ACC will celebrate its 70th anniversary in the 2022-2023 academic year. Accredited by the Michigan Commission on College Accreditation in 1959, ACC was also awarded full accreditation from the North Central Association of Colleges and Secondary Schools in 1963. It has remained continuously accredited, with specific programs in medical assisting, nursing and community corrections.

ACC offers 80 programs of study, degree completion programs, vocational training and community enrichment classes to residents of Alpena County and all of Northeast Michigan. The Madeline Briggs University Center (MBUC) at Alpena Community College houses offices of accredited four-year institutions that are cooperating with ACC to make completion programs for selected bachelor and master's degrees available in Northeast Michigan. The MBUC houses the offices of Ferris State and Northwood universities. Ferris State University offers a Bachelor of Arts in Integrative Studies, with

Organizational Engagement or Social Science Management options. Northwood University has an on-site program center offering Bachelor of Business Administration programs, with focuses on Accounting, Computer Information Management, Health Care Management, and Management. Collaborative transfer programs with U of M Flint Nursing School, Madonna University Social Work, Lake Superior State University Business and Accounting and Eastern Michigan Technology Management provide more opportunities for local students. Additionally, ACC instituted an early college program that allows high school students to opt to take a "thirteenth" year of high school and begin taking college courses during their junior year. When they graduate, students keep the college credits and degrees they earned.

Campus services include veteran's assistance, financial aid, a bookstore, The Learning Center, Stephen Fletcher Library, and the Women's Resource Center. The privately owned "College Park Apartments" are located nearby to provide student housing.

Northeast Michigan Career and Technical Education Center

Housed by the Alpena High School, the Tech-Ed Center provides a wide range of career and technical programs to students from Alpena, Alcona, Hillman, Atlanta, Posen and Rogers City high schools and to those from the ACES Academy. Adults may also participate in programs that range from studies in agri-science to computer specialists.

LIBRARIES & MUSEUMS

George N. Fletcher Library

The George N. Fletcher Library is centrally located in downtown Alpena. Established in 1967, it serves Alpena County from a facility that was constructed in 1974 and fully remodeled in 1997. In 2002, the library was expanded into an adjacent building. This addition can be accessed from the second floor of the library via an enclosed walkway with surrounding windows, which afford a view of the adjacent street and plaza area below.

Library services include books, magazines, newspapers, compact discs, audiotapes, films, videocassettes, digital libraries and an art lending library. Inter-library loan services and computers with Internet access are available for public use. Programs are offered for both children and adults. Special services include the READ (adult literacy program), Job Launch (resume writing, etc.), Books and Brown Bags (lunch hour book review), and the Foundation Grants Center. Authors, musicians, artists, and other specialty speakers are frequently featured. Additionally, the library has informational programs on specific topics, internet training, computer classes and other exhibits. For children, the library offers story hours, a summer book club, and many other individual programs. Visually and physically impaired individuals are accommodated by the library's special materials circulation.

For the calendar year 2017, the library had 69,000 books, 108 magazine subscriptions, 7 newspaper subscriptions, 1,900 videos, 1,837 compact discs- including audiobooks and music, over 3,000 downloadable audiobooks, 8,000 eBooks, and 130 digital magazine titles. The library provides access to 7 databases for research and educational purposes, in some cases both on and offsite.

Special Collections include the Michigan Room where numerous Michigan reference materials (e.g. law, history, and environment) and general materials (e.g. industry, maritime, sports, and wildlife) are available. In addition, genealogy sources with extensive Alpena County records, as well as records from

surrounding counties are also available. The Foundation Center Collection includes private & public foundations listings, grants & funding sources, and how-to books.

In 2004, the Thunder Bay National Marine Sanctuary & Underwater Preserve approved an agreement with the Library to jointly manage the Thunder Bay Sanctuary Research Collection, one of the premiere collections on Great Lakes history in the world. The collection includes over 1,000 published works, 65,000 photographs, 56 linear feet of vertical files, 40 feet of periodicals, 60,000 data cards, 100 navigation charts, and 350 shipbuilding plans. Topics of the collection include wooden shipbuilding technology, Great Lakes ports and waterways, docks, cargoes, ships, shipbuilders, machinery and rigging, notable maritime personalities, and shipwrecks. A special feature of the collection is a card index listing most of the ships on the Great Lakes before the turn of the century, a roster of some 15,000 vessels, complete with descriptive data and highlights of the ships' careers and their ultimate losses. In addition to providing the historical basis for the Sanctuary's archeological research, the collection allows Great Lakes historians and Library patrons' access to documents and photographs not previously available to the public. This collection is also available online.

The Stephen Fletcher Library

The Stephen Fletcher Library is located on the campus of Alpena Community College. Offering a full range of library services, it is available to the public as well as to students enrolled at the college. On site computers provide library patrons with Internet access. Inter-library loans offer additional resources for research and other educational purposes.

The Besser Museum for Northeast Michigan

The Besser Museum for Northeast Michigan is the only museum in Northeast Michigan accredited by the American Association of Museums. Located in the north part of the City of Alpena, it is the regional center for art, history and science. The Besser Museum offers changing exhibits, lectures, workshops and classes in art, history and science. Besser Museum's galleries feature artworks by painters, photographers, potters and other artists drawn from across the area, state and country. Permanent history exhibits include Great Lakes Indian artifacts, lumbering and farming implements, 19th and 20th century decorative arts, an 1890's Avenue of Shops, and 19th and 20th century arts and graphics. The museum has a planetarium, Foucault pendulum, and eight historic structures on the grounds. Guided tours and planetarium programs are available year round.

On the grounds of the Besser Museum is a group of historic buildings that have been developed into an interactive display. These buildings include the Maltz Exchange Bank, Green School, McKay Cabin and Spratt Church. These buildings, all significant to the area's history, are open to the public during special Museum events, such as the annual Fall Harvest Day, an observance on the first Saturday in October. A 1928 commercial fishing tug, the Katherine V. also graces the grounds. The Lafarge Fossil Park, an interactive exhibit, is a simulated limestone quarry that contains fossil material generously donated by Lafarge Alpena Plant and Specification Stone Products of Alpena. Open to the public, this display allows you to learn about the unique features of rocks and rock formations, plus allows an individual to dig in the exhibit and keep all the Devonian fossils they find.

Thunder Bay National Marine Sanctuary & Underwater Preserve

On October 7, 2000, the Thunder Bay National Marine Sanctuary & Underwater Preserve (Thunder Bay NMS/UP) designation was finalized and it became the thirteenth National Marine Sanctuary in a system that extends from American Samoa to Massachusetts. The Thunder Bay NMS/UP protects a nationally

significant collection of over 150 shipwrecks, spanning over a century of Great Lakes shipping history. Thunder Bay NMS/UP represents the first Great Lakes sanctuary, the first fresh water sanctuary, the first sanctuary to focus solely on a large collection of underwater cultural resources, and the first sanctuary located entirely in state waters.

The Thunder Bay National Marine Sanctuary and Underwater Preserve encompasses 448 square miles of Northwest Lake Huron. The landward boundary of the sanctuary/preserve is marked by the northern and southern limits of Alpena County, and the sanctuary extends east from the lakeshore to longitude 83 degrees west.

Lake Huron's cold, fresh waters have created a remarkable state of shipwreck preservation that is unmatched by the other sanctuaries' saltwater environments. Thunder Bay's collection of shipwrecks represents the diversity of vessels that navigated the Great Lakes in the 19th and 20th centuries. These sunken ships reflect transitions in vessel architecture and construction while conveying stories of Great Lakes transportation and commerce. Documented shipwrecks are located at depths ranging from 12 feet to as deep as 180 feet. Some of the wrecks remain largely intact while other sites are only remnants of vessels' boilers, engines, rudders, windlasses, and anchors. However, the documented wrecks are only a small section of the total wreckages believed to have occurred.

The National Oceanic and Atmospheric Administration and the State of Michigan have established a partnership to cooperatively manage the sanctuary's underwater cultural resources. A 15-member Sanctuary Advisory Council (SAC) representing the local community provides recommendations to NOAA and the State of Michigan concerning sanctuary development. The SAC will continue to advise the sanctuary/preserve manager about management issues. Sanctuary activities will focus on resource protection, education, and research. Priority activities include placing mooring buoys at identified shipwrecks, initiating an inventory and documentation of shipwrecks, and developing a maritime heritage education program.

The Great Lakes Maritime Heritage Center is a 20,000-square-foot facility that highlights the maritime heritage of the Great Lakes and the shipwrecks of Thunder Bay. The facility features a maritime heritage "discovery center" featuring more than 8,000 square feet of exhibits on the Great Lakes, shipwrecks, archaeology, and maritime history.

The Great Lakes Maritime Heritage Center, which also has interpretive shipwreck displays relating to the Thunder Bay National Marine Sanctuary, has been developed in a refurbished building within the old Fletcher Paper Mill property along the Thunder Bay River. The exhibits feature a life-size hand-built replica of a portion of a 1800s Great Lakes schooner, a recreation of a shipwreck site, artifact lab, and hundreds of interpretive learning opportunities.

Alpena Civic Theatre

Alpena Civic Theatre (ACT) is located at 401 River Street. This community-based group presents live theatre for area residents from September through May. Special summertime presentations are designed for audiences with children. Children are included in the cast. The building is owned by the City and leased to ACT.

Thunder Bay Theatre

Thunder Bay Theatre (TBT) is located at 400 North Second Avenue. Situated in Alpena's "Old Town" area, this professional theatre group presents live productions on a year round basis. As the only resident professional ensemble in northeast Michigan, the TBT company ranges in size from eight to thirty actors.

Art in the Loft

Art in the Loft is located at 109 N Second Ave and is a premier fine arts center and gallery. Its mission is to enrich the quality of life in Northeast Michigan through an arts center that offers learning opportunities and increases public participation in the arts. Art in the Loft offers art exhibits, visual and culinary art workshops, educational activities, and arts-centered community events.

APlex

The APlex is located on Woodward Avenue across the street from Alpena Community College's student housing and the World Center for Concrete Technology. The facility has a gymnasium, four indoor tennis courts, a fitness facility, conference space, aerobic areas, as well as a spa & sauna. Initially owned by Besser Company, APlex was gifted in 2005 to the Community Foundation for Northeast Michigan. In 2007, the Community Foundation for Northeast Michigan granted the facility to the Park Family Foundation, and the Park Family Foundation remains the owner to this day. APlex is home to the Alpena Tennis Association, and has numerous gym rentals for cheerleading/tumbling, karate, basketball, volleyball, baseball, softball and soccer. APlex hosts numerous events, such as trade shows and social occasions. In 2009, construction of 4 outdoor beach volleyball courts was completed to accommodate and enhance the growing league that utilizes courts at Mich-e-ke-wis.

Thunder Bay Arts Council and Gallery

The Thunder Bay Arts Council and Gallery (TBAC) is located at 127 W Chisholm and has served Alpena and Northeast Michigan since 1971. Its mission is to promote, support, and preserve the arts through performance, education, and leadership. TBAC hosts over twenty visual artists, a display of local student artists, and monthly featured artists on a rotating basis. TBAC also hosts Art on the Bay at Bay View Park, where over 100 artists, crafters, and vendors have merchandise for sale.

MEDIA

Newspaper coverage is provided six days a week by the Alpena News, the County's only local newspaper, which is located in the City of Alpena. Other newspapers circulated to residents include the Detroit News/Detroit Free Press, the Bay Times, USA Today, Alcona Review (in Ossineke Township), Montmorency County Tribune (in Green Township), and various advertising media.

Residents of Alpena County receive full television coverage with network and cable stations. One station (WBKB-TV) has an office located in the county. Cable television service is available throughout much of Alpena County by Charter Communications; however, the more rural portions of the county cannot receive cable service. A wide array of radio stations can be received throughout Alpena County, including WATZ-AM/FM, WHSB-FM/Bay 108 and WQLB/WKJZ (B-Rock).

Medical Facilities

Mid Michigan Medical Center-Alpena is a 146-bed acute care facility located in the City of Alpena. Mid Michigan Medical Center-Alpena is the federally-designated rural Regional Referral Center for Northeast Michigan and part of the University of Michigan Health Systems. The hospital has an emergency department equipped to provide services for minor injuries and illness to trauma. Air and ambulance service is available for patients requiring care not available locally. There are two medical/surgical units that can provide care for adult and pediatric patients. Mid Michigan Medical Center-Alpena and other local medical providers also offer a wide variety of specialized medical services. Examples include a hyperbaric chamber, kidney dialysis, specialized cancer treatments, behavioral treatment, and treatments for sleep disorders, as well as other services. Mid Michigan Medical Center-Alpena has a staff of nearly 100 physicians, over 900 employees, and 300 volunteers.

District Health Department #4's service area includes Alpena, Cheboygan, Montmorency and Presque Isle Counties. Services are provided through four major divisions: Personal Health Services, Home Health Services, Environmental Health Services, and Health Education. Health Department offices are located in Alpena, Cheboygan, Atlanta and Rogers City.

Northeast Michigan Community Mental Health provides support services to developmentally disabled persons and persons needing mental health services. The Northeast Michigan Community Mental Health service area covers Alpena, Alcona, Montmorency, and Presque Isle Counties. In addition, a VA clinic is located near downtown Alpena, which provides primary care to veterans.

Thunder Bay Community Health Service provides primary care for the entire family (from obstetrics to geriatrics) on an out-patient basis to the residents of Alpena, Montmorency, Cheboygan, Otsego, Oscoda, and Presque Isle Counties. The facility is staffed by four physicians, eight physician's assistant, and five nurse practitioners. The clinic is fully equipped with x-ray and laboratory capabilities as well as a pharmacy. There are also three dentists, two eye doctors, fourteen social workers, and one counselor.

Medilodge of Hillman is located in the Village of Hillman and provides long-term nursing care and short-term rehabilitation services. This facility has 84 certified beds, 24-hour skilled nursing care, therapy services, a medical director, a nurse practitioner, a respiratory therapist, a podiatrist, and a dentist.

There are eleven assisted living facilities in Alpena County.

Public Safety

The Alpena County Sheriff's Office serves the areas of the county that do not have municipal police departments. The Sheriff's Office employs 15 certified officers and 13 corrections officers with two open correction officer positions. The Alpena County Jail has a capacity of 69 beds. On November 7, 2017, the residents of Alpena County voted to construct, operate, furnish, and equip a new Alpena County Jail. As of May 9, 2018, the Sheriff's Office was requesting proposals for Construction Manager at Risk Services to provide preconstruction and construction services for the new Sheriff's Office, 106 Bed Jail, and Sheriff's Vehicle Storage Facility.

The City of Alpena employs 17 certified officers who provide law enforcement services to the residents of the city. Michigan State Police post #74 is located in the City of Alpena and works with the Alpena County Sheriff's Department and City of Alpena Police Department to patrol the major roads within the

county. In 2000, the State Police post employed 20 sworn officers including 15 certified troopers, 2 sergeants (desk duty, no patrol), 1 detective/sergeant, 1 motor carrier officer, and 1 lieutenant (Post Commander). The next closest State Police post is located in Gaylord.

Uniform Crime Report data from 2012 to 2017 show that Alpena County has seen a decrease in rape, aggravated assault, burglary, and motor vehicle theft (Table 3.7). However, the county has also seen an increase in murder, robbery, and larceny; while, arson remains steady.

Table 3.7
Crime in Alpena County

Offense	2012	2013	2014	2015	2016	2017
Murder	0	0	0	0	3	2
Rape	3	11	18	19	30	18
Robbery	1	1	1	1	0	2
Aggravated Assault	8	12	21	13	27	17
Burglary	35	28	28	30	33	27
Larceny	75	96	125	120	107	139
Motor Vehicle Theft	2	5	2	3	6	2
Arson	1	0	0	3	1	1

Source: Uniform Crime Report

All fire departments in Alpena County have mutual aid agreements with each other. Additionally, the county has an "all encompassing" mutual aid agreement with the adjoining counties of Iosco, Alcona, and Oscoda that provides assistance outside of the normal emergency services. There are ten fire stations in the county, which are staffed with full time and volunteer firefighters. There are 20 pumpers, 12 tankers, eight rescue units, six airport special units, four boats and other miscellaneous equipment. Alpena Fire Department provides paramedic first response for the City of Alpena, and Alpena, Green, Long Rapids, Maple Ridge, Ossineke, Sanborn, Wellington, and Wilson Townships. The department has two specially equipped mobile intensive care units.

Green Township's fire department is located on Moore's Landing Road near M-65 South and **consists of 18 members. Green Township equipment includes one rescue unit, one air boat, a 3,000 gallon tanker pumper, a 1,200 gallon tanker, a 750 gallon primary pumper, a grass/wild land rig, a 150 gallon ¾ ton truck from the DNR mutual aid program, and an ice and special situations trailer with ice rescue, cold water rescue, and search and rescue equipment.**

Ossineke Township contracts fire services with the Green Township Fire Department and the Hubbard Lake Fire Department. The Hubbard Lake Fire Department consists of 14 firefighters with ten being medically trained. The Fire Hall is 60' X 70' with a classroom and exercise room upstairs. Vehicles owned by the Hubbard Lake Fire Department include an 1,800 gallon Tanker Pumper, a 1,000 gallon Pumper, a 1,000 gallon Pumper Tanker, a rescue van, and a grass rig.

Wilson Township maintains a Fire Department in an 80' X 40' building located on King Settlement Road with 14 volunteer firefighters and six volunteer licensed medical first responders. Wilson Township fire equipment includes two pumpers and two tankers (one 3,000 gallon tanker and one 2,000 gallon

tanker). The Department of Natural Resources (DNR) is responsible for fire protection on State forested land and works with Wilson Township Fire Department.

HUNT

The Huron Undercover Narcotics Team (HUNT) is a multi-jurisdictional narcotics task force serving the Northeast Michigan counties of Alcona, Alpena, Montmorency, and Presque Isle. The team consists of five undercover officers from local police agencies plus two detectives (1 sergeant and 1 lieutenant) from the Michigan State. The team is dedicated to reducing the trafficking and availability of narcotics in the community, as well as the associated violent crime that often accompanies narcotics activity. The team was formed in 1990, and has since arrested nearly 3,000 criminals, and removed over $8 million worth of drugs from area communities. In 2016, they investigated 163 complaints region wide.

Department of Natural Resources

Two Department of Natural Resource Conservation Officers are assigned and living in Alpena County. They are certified law enforcement officers tasked, primarily, with conservation law enforcement. However, they do assist law enforcement agencies within the County on other law enforcement matters and/or investigations.

Combat Readiness Training Center

Located at the Alpena Regional Airport, the Michigan Air National Guard Combat Readiness Training Center (CRTC) provides an integrated, year-round, realistic training environment (airspace, facilities, equipment and instruction) which enable military units to enhance their mission capability and readiness at a deployed, combat oriented operating base. In addition, the CRTC has a full time fire department with complete fire, rescue and HAZMAT capabilities. The military area is isolated from the civilian airport to provide minimal interference between the two operations. The flight line and maintenance facilities are subdued to provide a European NATO type operating environment. Sufficient winterized facilities are available to provide a year-round training capability.

COUNTY FACILITIES

The County of Alpena owns 78 buildings throughout the county, which have an accumulative replacement value of approximately $52 million (Table 3.8).

Built in 1935, the most prominent and well-known building owned by the county is the Alpena County Courthouse. The 19,600 square foot building is located at 720 West Chisholm, and occupies one city block. In 2001, the courthouse underwent extensive renovations, including new hot water boilers, air handling equipment, central air, a new roof membrane, new carpet, furniture and some new office space. Although much of the building has been remodeled, considerable work is still needed to bring the building up to date and compliant with current ADA guidelines. A proposed addition to the building would add an elevator, and barrier free restrooms at an estimated cost of $1.2 million. The building houses offices of the County Clerk, Register of Deeds, Equalization, County Treasurer, Circuit Court, Commissioners Offices, County Coordinator, and MIS director.

Across the street from the County Courthouse is the Alpena County Annex Building located at 719 West Chisholm. The facility was originally built as a Boys and Girls Club in the mid-1960s. Recent renovations

to the building include new entry doors, new membrane on the roof, new carpeting, new air conditioner, new heating controls, and some new furniture. Future plans for the building include new carpet, additional furniture, improved heating for the Friend of the Court, replacement of the steam boiler with standby hot water boilers, improved heat control and interior painting. The 25,800 square foot building houses Probate Court, the Commissioners' meeting room, Friend of the Court, Family Division Circuit Court, District Court, Prosecuting Attorney offices and other miscellaneous offices.

The Department of Corrections and "911" Services are located at 703 West Chisholm. This building is 6,400 square feet and was constructed in the mid-1970s as a Girls' Club. Originally, the building was intended to be connected to the County Annex building. In 1999, the county took possession of the building and in 2001 the Department of Corrections moved into the building. A year later "911" moved into the building.

The Alpena County Sheriff Office and County Jail are located at 320 Johnson Street. Originally constructed in 1955, the 17,044 square foot building had additions completed between 1989 and 1990. The current County Jail is in disrepair, requires continual maintenance, and is not adequate for its current use. Construction professionals determined the building cannot be economically altered or renovated to meet the future needs of the county. In November 2017, the residents of Alpena County voted to construct, operate, furnish and equip a new Alpena County Jail.

The Family Independence Agency (FIA) building is located at 711 West Chisholm Street. The building is a 19,308 square foot single level office building, which was completed and opened in 1993. The building was constructed using bond money and is leased to the State of Michigan. The FIA building has fewer maintenance problems than other buildings in the county inventory. Plans for the building include new carpet and establishing a roof replacement fund.

Table 3.8
Alpena County Building Inventory

Occupancy	Address	Replacement Cost
Court House	720 W Chisholm	$5,374,128
County Jail	320 Johnson	$4,993,644
Court House Annex	719 W Chisholm	$5,373,691
Plaza Pool	3303 Third St	$3,456,278
Fairgrounds/Home	11th Street	$104,223
Fairgrounds/Office	11th Street	$173,245
Fairground Truck Barn	11th Street	$149,363
Fairground Merch Building	11th Street	$1,114,275
Fairground MSU Ext Office	11th Street	$205,402
Fairground Grand Stand	11th Street	$2,132,035
Fairground Animal Control	11th Street	$117,670
Fairground Draft Horse Barn	11th Street	$104,396
Fairground Cattle Barn	11th Street	$260,824
Fairground Horse Barn	11th Street	$207,135
Fairground Rest Rooms	11th Street	$55,368
Rabbit/Poultry	11th Street	$34,487
Fairground Rest Room - East	11th Street	$78,843
Fairground New Poultry	11th Street	$28,835
Fairground Ticket Booth	11th Street	$11,646
Fairground Dugout #1	11th Street	$2,570

Table 3.8 Alpena County Building Inventory		
Occupancy	**Address**	**Replacement Cost**
Fairground Dugout #2	11th Street	$2,570
Fairground Dugout #3	11th Street	$2,570
Fairground Dugout #4	11th Street	$2,570
Fairground Swine Barn	11th Street	$146,502
Fairground Stage/Pavilion	11th Street	$39,607
Sheep Barn	11th Street	$119,335
Transformers/Camping Pedestals	11th Street	$280,170
UG Fiber Optic - MSU Building to the house	11th Street	$1,442
MDOT Building	1540 Airport Rd	$935,564
Airport Radar Facility	1647 Airport Rd	$23,644
Airport Terminal	1617 Airport Rd	$1,061,486
Runway Lights	1617 Airport Rd	$2,060,000
Fuel Farm Tanks/Piping	1617 Airport Rd	$500,000
Airport Maintenance	1601 Airport Rd	$340,951
Welch Hangar	1609 Airport Rd	$365,109
Airport Sand Barn	1485 Airport Rd	$52,311
Airport Snow Removal	1485 Airport Rd	$980,968
EAA Hangar	1475 Airport Rd	$136,223
Long Lake/Home	10002 Hinks Park Rd	$70,555
Long Lake Store	10002 Hinks Park Rd	$19,029
Long Lake Restroom	10002 Hinks Park Rd	$83,054
Long Lake Shower	10002 Hinks Park Rd	$97,359
Long Lake Pavilion	10002 Hinks Park Rd	$16,607
Long Lake Pavilion	10002 Hinks Park Rd	$16,607
Long Lake Storage	10002 Hinks Park Rd	$16,081
Long Lake New Bathhouse	10002 Hinks Park Rd	$141,110
Beaver Lk/Garage	17354 Beaver Lake Rd	$10,620
Beaver Lake Office	17354 Beaver Lake Rd	$12,062
Beaver Lk Showers	17354 Beaver Lake Rd	$83,631
Beaver Lake Cabin	17354 Beaver Lake Rd	$17,991
Beaver Lk Pavilion	17354 Beaver Lake Rd	$16,145
Beaver Lk Storage	17354 Beaver Lake Rd	$11,066
Beaver Lake/Home	17354 Beaver Lake Rd	$96,992
Beaver Lk Teen Center	17354 Beaver Lake Rd	$61,918
Beaver Lake Restroom/Shower	17354 Beaver Lake Rd	$100,263
Sunken Lake/Home	10300 Fletcher Prk Rd	$158,950
Sunken Lk Game Rm	10300 Fletcher Prk Rd	$79,363
Sunken Lk Rest Rm	10300 Fletcher Prk Rd	$83,631
Sunken Lk Pavilion	10300 Fletcher Prk Rd	$10,723
Sunken Lk Bridge	10300 Fletcher Prk Rd	$92,288
Sunken Lk Storage	10300 Fletcher Prk Rd	$10,217
DHS Building	711 1/2 Chisholm	$2,838,503
Probation & Dispatch	703 Chisholm	$738,063
Northern Lights Arena	751 Woodward Ave	$10,960,349
Fiber Optic UG from Courthouse to Annex Building	Chisholm St	$55,472
VA Office	150 N State Ave	$18,911

Table 3.8 Alpena County Building Inventory		
Occupancy	**Address**	**Replacement Cost**
Manning Hill Pavilion	M-32	$21,030
Manning Hill Tower	M-32	$31,000
Fiber Optic UG	M-32/Bagley- Airport Rd	$41,733
District Health Department#4	100 Woods Circle	$4,648,287
Foreclosed Building	1165 DeVere Dr	$39,900
Foreclosed Building	1498 M-32 W	$120,700
Foreclosed Trailer w/Garage	2596 Werth Rd	$15,000
Foreclosed Home	14774 Alfalfa Rd	$25,400
Foreclosed Trailer	485 Geronimo Rd	$9,900
Foreclosed Home	9944 M32 W	$16,600
Foreclosed Home	428 Avery St	$15,800
Airport Hanger	1593 Airport Rd	$501,000
Source: Alpena County, 2019		

Alpena County owns significant recreation properties, such as the Fairgrounds, the Plaza Pool and tennis courts, Northern Lights Arena, Beaver Lake Park/Campground, Long Lake Park/Campground, Sunken Lake Park/Campground and Manning Hill Park. More information can be found in the Joint Recreation Plan for Alpena County, Charter Township of Alpena, Green Township, Ossineke Township, and Wilson Township: http://www.discovernortheastmichigan.org/docview.asp?did=629

Green Township owns the Green Township Hall, which includes ballfields, a basketball court, swings, and picnic tables.

Wilson Township owns the Township Hall, fire station, cemetery, and property on Wolf Creek.

Ossineke Township owns the Township Hall and cemetery. The Ossineke Township Hall was built in 1999 and cost approximately $200,000 to construct. The building is 2,880 square feet with a complete kitchen facility, and is used to host public meetings, community functions, and private events. The cemetery in Ossineke Township is approximately 2.4 acres.

Human Service Agencies Serving Alpena County

The Northeast Michigan Council of Governments Directory provides addresses and phone numbers to the following service agencies. The Directory can be found at the following website: http://www.discovernortheastmichigan.org/regiondirectory.asp

Alpena Senior Center
www.alpenaseniors.com

Alpena Volunteer Center at Alpena Community College
https://alpenacc.galaxydigital.com

Alpena Childcare and Development Center
Boys and Girls Club of Alpena

Catholic Human Services

Child and Family Services of Northeast Michigan, Inc.
www.cfsnemi.org

D.A.R.E. Program
Alpena City Police Department
www.alpena.mi.us/departments/police_department/index.php

Grief Recovery After a Substance Passing (GRASP)
www.grasphelp.org

Habitat for Humanity Northeast Michigan
www.habitatnemi.org

Hospice of Michigan- Northeastern Region
www.hom.org

MSU Extension
www.canr.msu.edu/alpena

Northeast Michigan Affordable Housing
www.publichousing.com/details/MI-Northeast_Michigan_Affordable

Northeast Michigan Community Mental Health
www.nemcmh.org

Northeast Michigan Community Partnership, Inc.

Northeast Michigan Community Service Agency (NEMCSA)
www.nemsca.org

Hope Shores Alliance
https://hopeshores.org

Alpena County Michigan Department of Health and Human Services
www.michigan.gov/mdhhs

Sunrise Centre
www.alpenasunrisecentre.org

Sunrise Mission
www.sunrisemission.com

The Salvation Army
https://centralusa.salvationarmy.org/alpena

UNITED WAY OF NORTHEAST MICHIGAN

www.unitedwaynemi.org

Clement C. Van Wagoner Outpatient Clinic
www.va.gov

Veteran's Affairs
www.alpenacounty.org/veterans%20affairs.html

There are thirteen cemeteries in Alpena County with two located in Green Township, one located in Wilson Township, and one located in Ossineke Township.

POSTAL SERVICE

There are eight postal service buildings in Alpena County located in Alpena, Herron, Ossineke, Lachine, Hillman, Hubbard Lake, Spruce, and Posen.

RECREATION

The lakes, streams, and woodlands provide recreational opportunities that include fishing, boating, camping, hunting and hiking. These activities are important economic factors for the region. In 2019, Alpena County, the Charter Township of Alpena, Green Township, Ossineke Township, and Wilson Township developed a joint recreation plan. For more details, the Alpena Joint Recreation Plan can be found at the following website: http://www.discovernortheastmichigan.org/docview.asp?did=629

Chapter 4 NATURAL RESOURCES

The greatest attractions for residents and visitors of Northeast Michigan are the area's natural environment and rural character. Recreational activities such as hunting, fishing, golfing, snowmobiling, boating and a multitude of other outdoor activities attract people from all over Michigan and from other states as well. The area's natural beauty is one factor that convinces many long time visitors to move to the area upon retirement. Because of the abundant outdoor recreation opportunities, the natural environment is a major economic base and income generator.

At the same time, the environment places constraints upon human activities. Certain critical and sensitive parts of the natural landscape cannot be altered without creating problems that are not easily corrected. Increased flooding and soil erosion due to the filling of wetlands and clearing of land are just two examples. Therefore, it is essential that any future development respect the different characteristics of the natural environment. This is important to preserve the attractiveness of this part of the State, to prevent potential problems related to undue alteration of the land, and to maximize the economic benefits of the tourism and recreation industry. An analysis of Alpena County's physical environment can assist government officials in planning for future land uses.

CLIMATE

Temperature data from the Midwest Regional Climate Center has indicated that the climate along the immediate Lake Huron shore is semi-marine in nature and lacks many of the temperature extremes found inland and only within a few miles of the shore. Although Thunder Bay and the Thunder Bay River are usually free of ice by the first week of April, water temperatures remain low enough to produce cool breezes reducing the maximum daily temperatures during the spring and summer. Summer temperatures have been recorded as high as 106 °F (July 13, 1936) but this is very unusual. Sub-zero temperatures have been recorded as early as November 15th and as late as April 1st. The lowest recorded temperature was –37 °F on February 17, 1979. In a typical year there will be seven days with temperatures above 90 °F and 17 days with temperatures below 0 °F. On average, January is the coldest month with a mean temperature of 17.8 °F and July is the warmest with a mean temperature of 66.7 °F (Table 4-1 Climatological Variables 1981-2010). Mean temperature for 2018 in Alpena County was 44.6 degrees (F).

Summer months are usually mild with considerable sunshine. The average annual total precipitation for the county is 30.37 inches (2017). Most of the summer precipitation consists of rain and thunderstorms which normally occur during the months of June, July and August. There are 3.5 days annually when the temperatures are above 90^{o} F, which is cooler than most places in Michigan. Thunderstorms will occur on an average of 24 days each year. Michigan is located on the northeast fringe of the Midwest tornado belt. The lower frequency of tornadoes occurring in Michigan may be, in part, the result of the colder water of Lake Michigan during the spring and early summer months, a prime period of tornado activity. From 1951-2011, Michigan experienced 968 tornadoes. From 1961-2011, 14 tornadoes occurred within Alpena County. There is an average of one hailstorm per summer. The summer growing season is an average of 156 days, while the average date of the first fall frost is October 4th.

Winter months are generally cloudy with frequent light snow flurries. Nearly all of the precipitation in winter is in the form of sleet and snow, usually accumulating in sufficient amounts to form a ground cover for summer grasses and winter grains. The 1971-2010 average seasonal snowfall was 85.3 inches.

The annual snowfall in 2018 measured at 4 different weather stations varied from 54.4 (Alpena Water Plant) to 91.2 inches (Alpena County Regional Airport). In 2017, weather stations' snowfall measurements varied from 24.5 to 52.9 inches (Midwest Regional Climate Center).

The following snowfall extremes recorded for this area are:

- Greatest observation-day total, 18.2 inches, recorded February 22, 1922.
- Greatest monthly total, 49.4 inches, recorded March 1926
- Greatest seasonal total, 166.3 inches, recorded during 1970-71
- Least seasonal total, 26.9 inches, recorded during 1936-37
- Greatest snow depth, 42 inches, recorded February 22, 1924

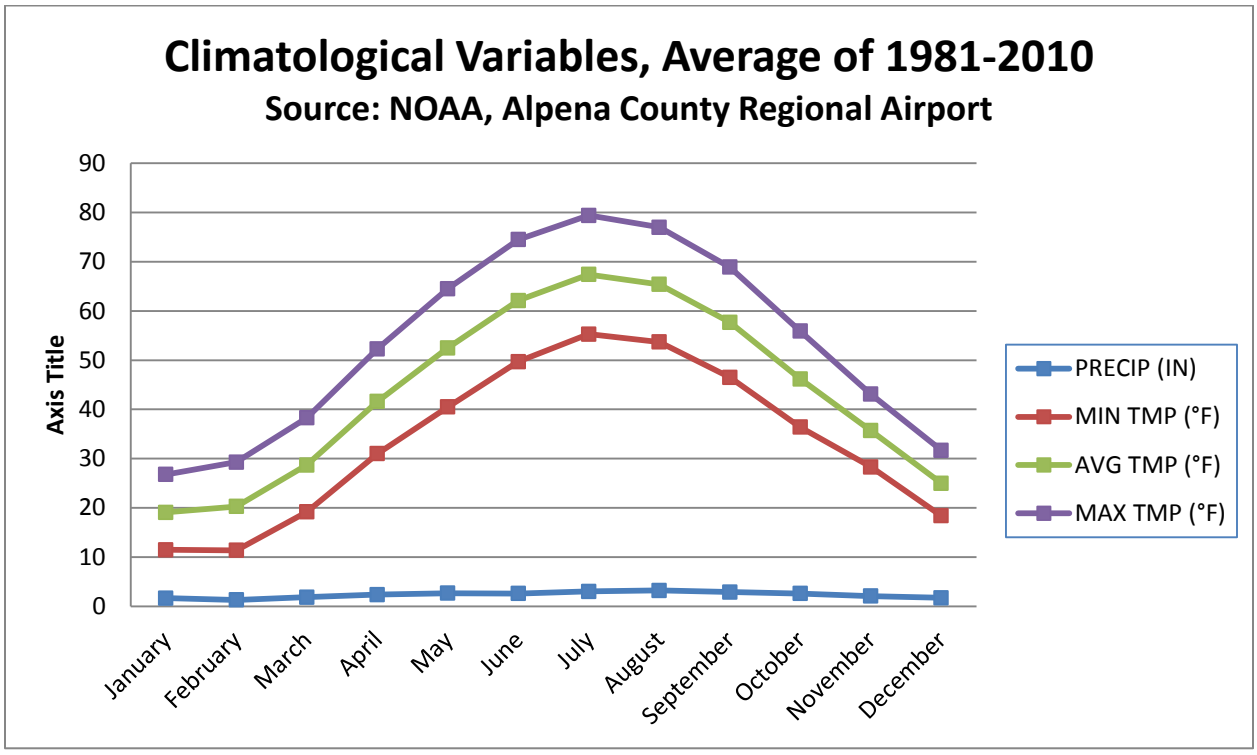


TABLE 4-1 CLIMATOLOGICAL VARIABLES 1981-2010

For most of the county runoff from the spring thaw poses little danger of flooding. However, over the past 45 years, parts of Alpena County have transitioned from farm and forest to subdivisions, apartments, offices, streets and parking lots. The change from semi-porous to impervious surfaces has created some flooding and stormwater runoff problems. Buildings and roads have been built where stormwater once flowed, and critical parts of the natural drainage system have been replaced with a haphazard man-made system. As witnessed in the spring of 1998, the combination of a rapid snowmelt and heavy rains can overwhelm parts of the current drainage system and there are areas in the county that can experience a major flood event.

GEOLOGY

Surface Geology

Starting some two million years ago, in the Pleistocene era, continental glaciers formed in the Hudson Bay area. Several times during this era the massive sheets of ice built up and inched their way south

across what is today Michigan. The massive ice sheets were more than one mile thick, advanced in a southerly direction, and bulldozed their way across the landscape. The glacier pushed material in front of it, incorporated rocks and soil into the debris laden ice; scraped, ground and broke apart the sedimentary bedrock of the Michigan Basin.

Each advance and retreat of the continental glaciers took tens of thousands of years. This reoccurring process shaped and reshaped the land; first obliterating and then creating hills, valleys, rivers and lakes, swamps and marshes. The last glacial period, called the Wisconsin Era, created the modern landscape. The glacier left behind boulders, rocks, cobble, sand, gravel, silt, clay and loam. In some areas the material was deposited in unsorted masses called till plains, ground moraines and end moraines. Water flowing from the melting glaciers also sorted materials, creating outwash channels, sand deltas, kames and eskers. Fine materials, captured in the fast moving glacial meltwater, settled to the bottom of expansive glacial lakes creating lacustrine clay and silt plains.

Table 4-2 from the "Glacial Lakes Around Michigan" by Kell and Farrand, shows the formation of glacial landforms. Some of the landforms found in Alpena County are the ground moraines, eskers, deltas and drumlins. Moraines formed as material picked up by the glacial ice was deposited in large uniform areas. Eskers are drainage tunnels that formed under the ice that later filled with sediment. Deltas were formed where glacial streams emptied into lakes and ponds. Drumlins are spoon-shaped hills composed of glacial till. According to the map prepared by W. A. Burgess and D. F. Eschman (Table 4-3), titled "Landform Units in Northeastern Lower Michigan," Alpena County is divided into several distinct landform units. The two predominant land form types in the county are the Fletcher Pond Channeled Uplands located in the southwestern quarter and the Devils Lake Karst Topography located in the northeastern quarter. Several eskers bisect the midsection of the county and drumlin fields can be found in the northeast and north central areas of the county. In the southern portion of the county, along the Lake Huron shoreline and extending several miles inland, are the Ossineke Beach ridges. This beach ridge and swale complex was formed as glacial lake waters receded and left behind a series of ridges and depressions that parallel the shoreline.

Green Township

Four geologic features can be used to describe the surface geology of Green Township: *Peat & muck*, *moraines*, *till plains*, and *outwash plains* **(Appendix B, Green Township Figure 4-2)**. *Peat* and *Muck* are both comprised of organic soil material, with muck containing more minerals than peat. In peat, the original plant parts are recognizable, but these are indistinguishable in muck. Peat & muck are found at the northern and northwestern edge of Green Township. *Moraines* are shaped like hilly ridges and were formed by the deposition of unsorted sand, gravel, rock and clay at the margins of the glacier. An area of end moraines lies in the northwestern portion of the Township, just south of the peat and muck formation. *Till plains* were also formed from ice deposition; they are the level areas between moraines consisting of unsorted sand, gravel, rock, and clay. *Outwash plains* are water-laid deposits from the melting glacier. Found primarily in the southwestern portion of Green Township, under what is now Fletcher Pond, outwash plains are stratified deposits of sand, gravel, silt, and clay deposited by the melting glacier. Coarse-textured glacial till is the dominant surface geology type found throughout the Township. A small area of fine textured glacial till is located in Section 5 and portions of Sections 6, 7 and 8.

Eskers are another geological feature found in Green Township. An esker is a long, narrow, sinuous, steep-sided ridge composed of irregularly stratified sand and gravel. One such esker is located in the north central portion of the Township, extending through Sections 34 and 26, and into Section 23. Another, longer, esker is located in the extreme southeastern corner of the Township and winds north along the Township boundary until it crosses into Wilson Township.

Ossineke Township

Most of the township is covered with coarse-textured glacial till (Appendix B, Ossineke Township Figure 4-3). Glacial till is defined as unsorted material deposited directly by glacial ice and showing no stratification; containing all sizes of fragments from clay to boulders. The community's farms were able to thrive as a result of better soils formed from the sand, clay and loam till deposits.

Water flowing from the melting glaciers also sorted materials, creating outwash channels, sand deltas, kames and eskers. The lowland areas formed by Beaver Creek and Wolf Creek contain glacial outwash sand/gravel and postglacial alluvium. The southeastern corner of the Township consists of ice-contact outwash sand and gravel.

Wilson Township

Approximately two-thirds of the Township is covered by a till plain consisting of coarse and fine textured glacial till. Glacial till is defined as unsorted material deposited directly by glacial ice and showing no stratification; containing all sizes of fragments from clay to boulders. The community's farms were able to thrive as a result of better soils formed from the sand, clay and loam till deposits.

Water flowing from the melting glaciers also sorted materials, creating outwash channels, sand deltas, kames and eskers. The Lachine Esker is a very prominent feature in Wilson Township. The esker traverses the community, in a southwest-northeast direction, entering the Township in Section 15, T.30N.-R.6E.; crossing Bussie Road; then Taylor Hawks Road in T.31N.-R-6E., Section 35; next crossing M-32 and exiting north through Section 24, **(See Appendix B, Map 4-2: Eskers In Wilson Township**). As defined by the Encyclopedia Britannica, an esker is *"a long, narrow, winding ridge composed of stratified sand and gravel deposited by a subglacial or englacial meltwater stream. Eskers may range from 16 to 160 feet (5 to 50 m) in height, from 160 to 1,600 feet (500 m) in width, and a few hundred feet to tens of miles in length. They may occur unbroken or as detached segments. The sediment is sorted according to grain size, and cross-laminations that show only one flow direction commonly occur. Thus eskers are considered to be channel deposits (left by streams that flowed through tunnels in and below the ice) that were let down onto the ground surface as the glacier retreated. Esker formation presumably takes place after a glacier stagnates, because movement of the ice would likely spread the material and produce ground moraine. Because of ease of access, esker deposits often are quarried for their sand and gravel for construction purposes."* As evidenced by the number of gravel pits along this feature, the deposits generate dollars into the local economy.

Materials, captured in the fast moving glacial meltwater, settled to the bottom of expansive glacial lakes creating lacustrine sand and gravel plains and lacustrine clay and silt plains. A two to eighteen mile wide lake plain, once submerged by post glacial Lakes Warren, Algonquin and Nipissing, and covered with lacustrine sand and gravel deposits, runs along the entire coastal area of the County. This relatively level glacial landform was created by the receding glacial Great Lakes. Some areas are sandy plains covered by pine and aspen forests while other areas consist of poorly drained soils covered with cedar forests. The northeastern one third of the Township is part of the lake plain ((**See Appendix B, Map 4-3: Glacial Geology of Wilson Township**).

Old shorelines and sand dunes are prominent features in the lake plain. Both of these features are present in Wilson Township, (**(See Appendix B, Map 4-4: Old Shoreline Sand Dune in Wilson Township**). Dune sand deposits, in the form of small sandy hills, can be found within the poorly drained lake plain. The sandy knolls provide perfect habitat for red pine and white pine forests that rise above the lowland forests and wetlands.

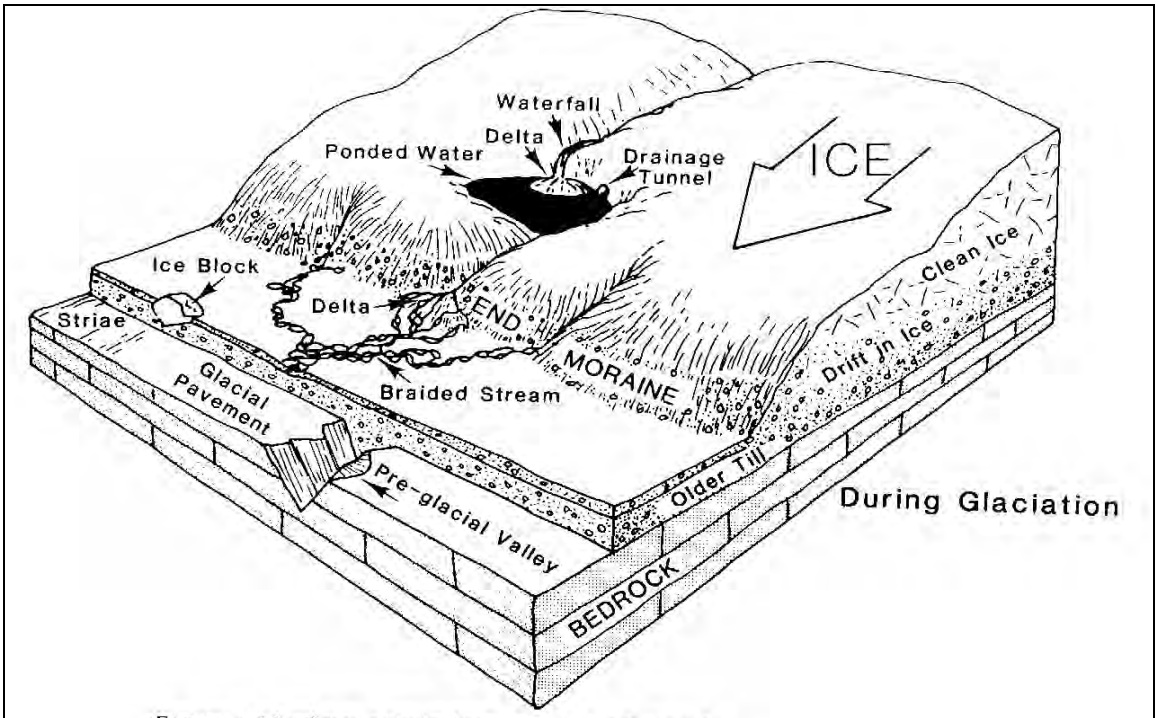
Sand deposits of the old lake shoreline also influenced location of rivers that carved new channels in the newly post glacial landscape. The lower South Branch of the Thunder Bay River meanders across the landscape until it encounters the sandy ridge in Section 11 of T.30N.-R.7E. The river is deflected to the north, flowing along the western edge of the landform for approximately two miles until it veers away and reestablishes a meandering course before emptying into Lake Winyah.

Geological features called drumlins can be found in the central part of the Township. The Township Hall is located within a grouping of drumlins, which are extended, oval hills or ridges of compacted sediment deposited and shaped by a glacier. The drumlins trend in a southeastward direction and record the readvance of the glacier. These streamlined hills, up to a mile long, were molded by overriding ice. **Appendix B, Maps 4-5, 4-6, & 4.7** provide more information on geologic features in Wilson Township and the surrounding area.

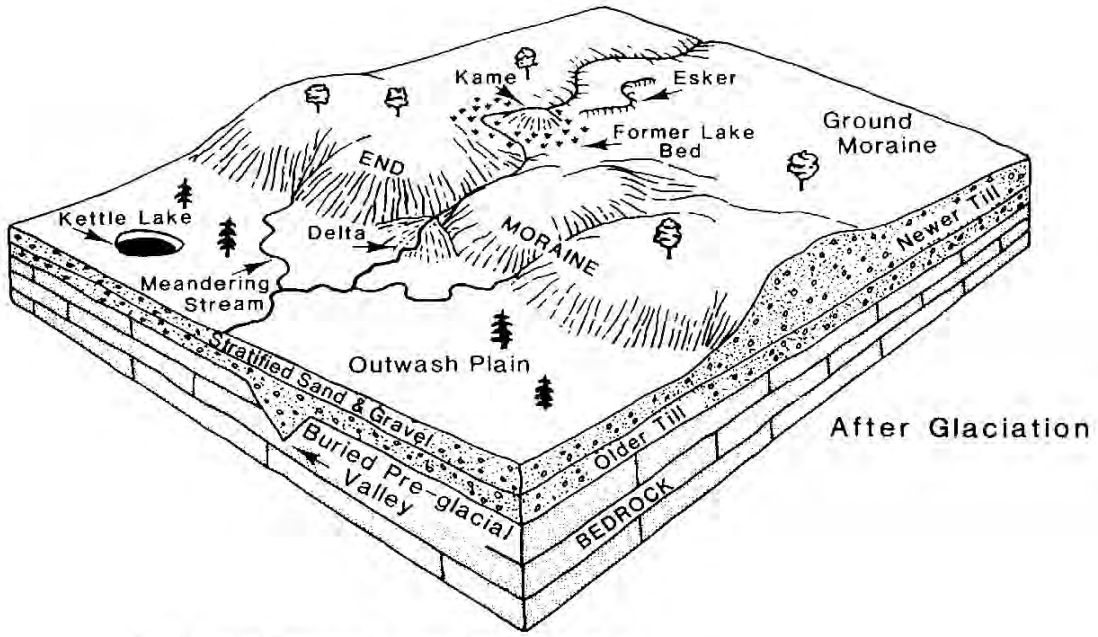
Bedrock Geology

Alpena County is located on the northeastern flank of the Michigan Basin, a depressional bedrock feature centered in Gratiot County. The general dip in this area is toward the center of the basin at less than one degree, or 70 feet per mile. The basin consists of over 5,000 feet of sedimentary rocks. These sediments were deposited as ancient seas slowly entered and ebbed from the basin some 400 million years ago. Sand, silt and clays were carried to the seas. Marine animals took lime from the sea water to make their shells and build reefs. When they died, their shells were added to the lime mud. At times life was scarce and little sediment was brought from the land. The climate was arid and chemical actions caused the deposition of calcium carbonate, dolomite, salt, gypsum and anhydrite. As layer upon layer of sediments accumulated, they squeezed together an eventually compacted to solid rock; sandstone from the sands; shale's from the silt; limestone and dolomites from the limy muds; as well as mixtures of these various sediments. Thus, the bedrock of Alpena County formed.

The bedrock formations underlying the northern part of Alpena County belong to the Traverse Group of middle Devonian age. The Traverse Group consists primarily of limestone formations with some shale beds. The easily soluble limestone formations of the Traverse outcrop are only thinly veiled by glacial drift throughout the area. Because of this and other hydrogeologic factors, the northern portion of Alpena County contains known and suspected karst areas. Karst is defined as a type of topography that is formed over limestone, dolomite, or gypsum by dissolving or solution. Karst is characterized by closed depressions or sinkholes, caves, and underground drainage. Overlying the Traverse Group and subcropping the central and southern portions of the county is the Antrim shale formation of late Devonian age.



Features originating at a glacier front occur in a definite order.



Landforms of continental glaciation are unmistakable.

TABLE 4-2

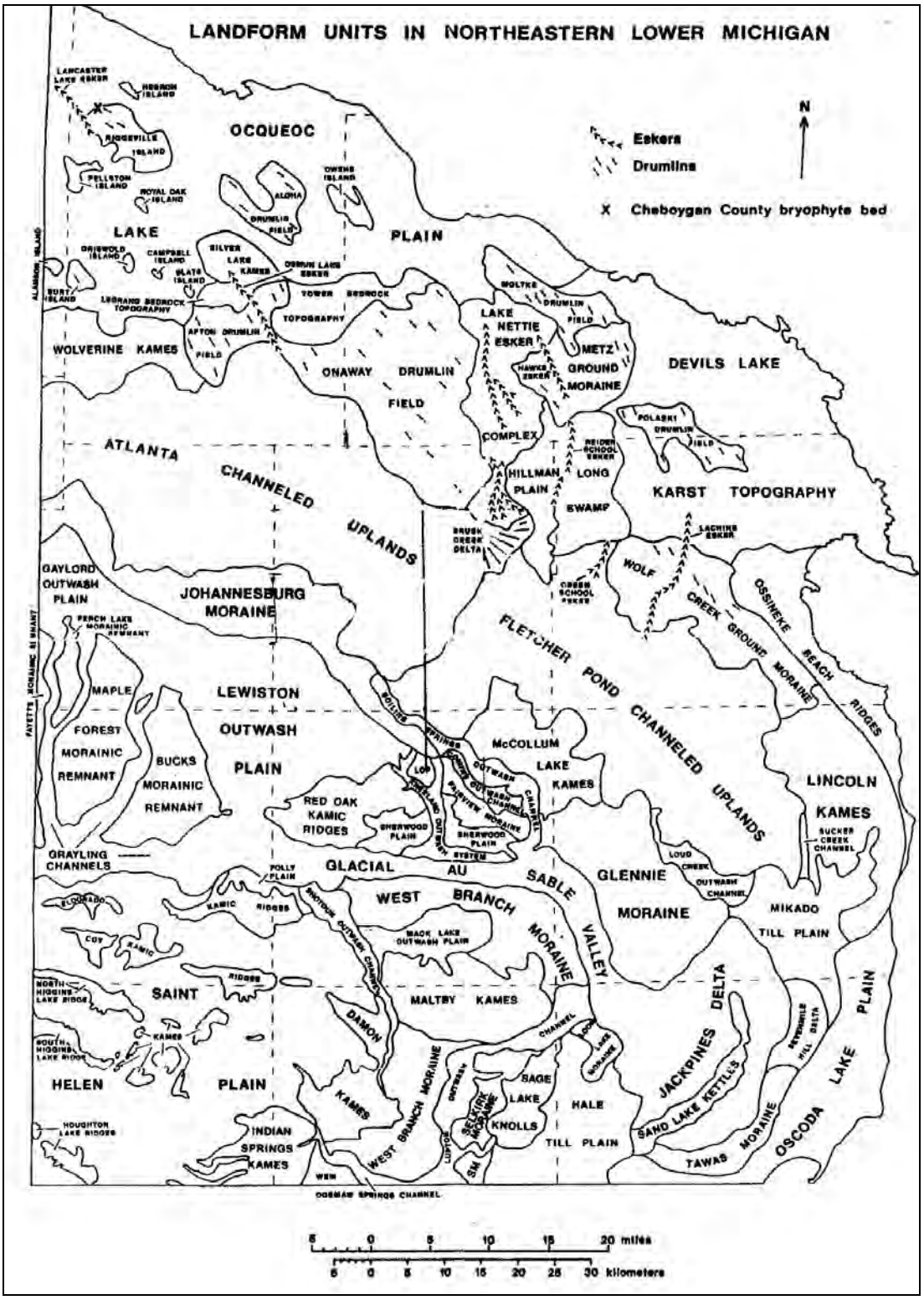


TABLE 4-3

Arguably, the most interesting geologic feature of Alpena County is the karst topography. Sinkholes are perhaps the most dramatic karst features. Sinkholes and sinkhole lakes are found throughout the northeast part of the county. New sinkholes are constantly being formed, taking several decades to appear on the surface. Underground cavities form where underlying rock dissolves more readily than surface rock. As erosion continues, the roof rock is weakened and eventually collapses

into the cavity forming a steep sided collapsed sink. Sinkholes in Alpena County range in size from less than ten feet to more than 1,300 feet in diameter.

The following discussion on sinkholes is from a narrative by Tyrone J. Black, Geologist for the Michigan Department of Environmental Quality, titled “How and Why of Michigan Sinkholes”.

“Geologist believe that a hinge-line fault (Table 4-4), serving as a pathway for subterranean drainage, interconnects several sinkholes and sinkhole controlled lakes before emptying into Lake Huron at El Cajon Bay. There are sinkholes in the bedrock from near the Mackinac Bridge (where rock formations are in general collapse due to wide-spread solution of evaporates) to the general East-West trend of sinkholes that extend from Misery Bay, near Alpena, to Rainy Lake-Shoepac Lake area, to the north-east corner of Otsego County, and toward the northwest edge of Manistee County.

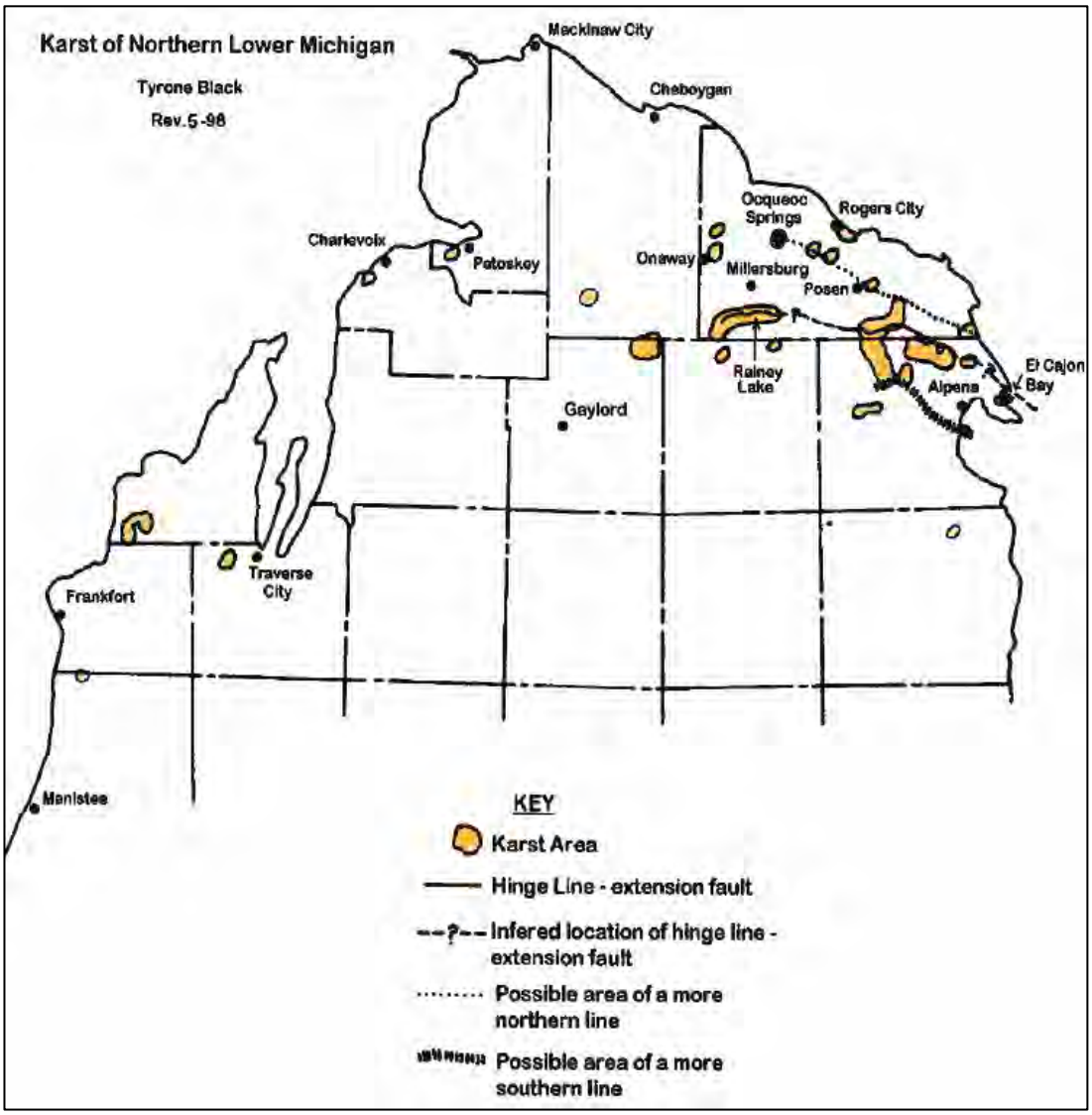


TABLE 4-4

Only sinkholes "active" since the retreat of the last glacier (approximately 10,000 years ago), have become visible at the surface. The active sinkholes appear to be limited to areas of relatively thin

glacial overburden (less than 50 feet with exceptions in Leelanau-Grand Traverse area) or near the major fault line and vigorous groundwater drainage. The area of the fault line and vigorous drainage is marked by the southern extent of sinkholes described in the paragraph above.

"Stagnate" sinkholes have been excavated by all the major rock quarrying operations in Northern Michigan except for in Alpena and the Rockport Quarry. These are sinkholes that have no evidence of swallowing soils or collapse either within or above their rims since the retreat of the last glacier. They may however be swallowing water as it filters through the plugs of glacial drift and collapsed formation. These plugs all date from the last glacial advance or earlier.

Thick drift and rubble have created a "gravel pack" and plug over most of the sinkholes. This condition prevents the active flow or erosion of rock or soil matrix into any voids that may exist. If there is no movement of soil or rock into lower voids, then there is no slumping or collapse of overburden or the surface. There are two types of areas where active sinkholes are found in northern Michigan, areas of thin overburden and areas with active solution of salts in the subsurface along a fault or fracture line.

The first type of area is located where natural acids from rain or organic decay are carried into the ground by water. As these acids travel through the subsurface, they react with and are neutralized by carbonates and other minerals. Chemical erosion, the solution, of the limestone rubble or bedrock is retarded by a thicker overburden. The glacial drift has a high percentage of carbonates, especially in the clays. Where the drift is thick almost all the acids have been spent before they can penetrate to bedrock.

A second type of area where we see active sinkholes is along the edge of places where evaporate minerals (salts) are still present in the Detroit River Group. The Detroit River Group is a bedrock formation made up of a sequence of limestone, shale and evaporates minerals. Natural fissures and faults in the rock have provided a path for ground water to enter the formation and dissolve the evaporates. Once the layers of evaporates are dissolved the formation settles. Some of the settling occurs unevenly and results in localized collapses, sinkholes. These sinks then act as funnels to bring in a greater volume of water focused into the sink area of the formation. This promotes flushing of overburden (materials over the sink) into the cavities developed. This is what is/has happened along the Shoepac Lake-Rainy Lake and Sunken Lake to Misery Bay line of sinkholes and sinkhole lakes.

If the sinkhole has swallowed enough overburden or occurred in the right location, it may capture all or a portion of a stream. The water may then find its way to the bedrock without being acid-buffered by the glacial drift. Active chemical erosion of the carbonate bedrock can then take up where the salt solution left off. But the solution carbonate mineral is a much slower reaction than solution of the salts.

The third area exists toward a cavernous system along a major fault line that in turn drains to Lake Huron. One can easily trace this system through a series of sinkholes and valleys from the Shoepac Lake area to Kelsey Lake and Sunken Lake to Misery Bay by Alpena. There are other faults and probably cavernous systems that branch off of the major system which also act as drains in their areas of influence. This influence is mostly limited to the groundwater at the base of the drift deposits and may not have a significant effect on groundwater flow closer to the surface.

Ossineke Township

The foundation of the lower peninsula, beneath the thin mantel of glacial deposits, consists of layers of sedimentary bedrock that were created during the Paleozoic Era. The bedrock was formed in ancient seas which covered the area some 310-405 million years ago. Shallow marine seas deposited layers of silt, clay, sediments, marine animals, plants, coral, and other calcareous materials. These deposits formed sandstone, shale, limestone, and dolomite bedrock.

The uppermost bedrock in Ossineke Township consists of materials from the late Devonian and early Mississippian series of the Paleozoic era (**Appendix B, Ossineke Township Figure 4-1**). Various strata contain minerals of varied importance. Antrim Shale bedrock formations, from the late Devonian period, subcrop most of the Township. A small portion of Berea Sandstone and Bedford Shale (early Mississipian deposits) lie under the western portion of Ossineke Township. The silty sands of these formations are interpreted as deltaic deposits carried into the eastern side of the Michigan Basin from source areas located east and northeast of the basin. Sunbury Shale is thought to be of a similar age as Berea and Bedford deposits.

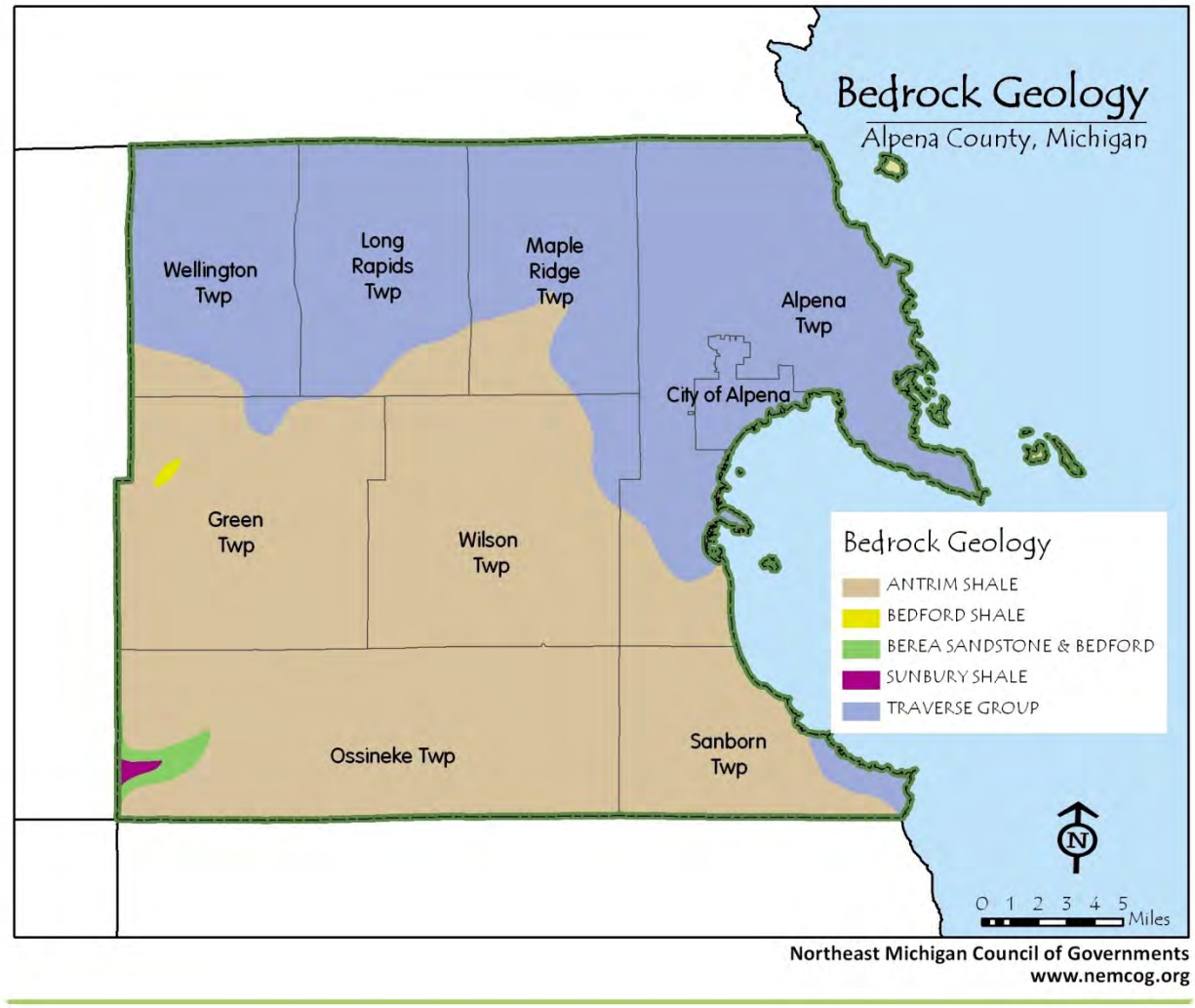


TABLE 4-5

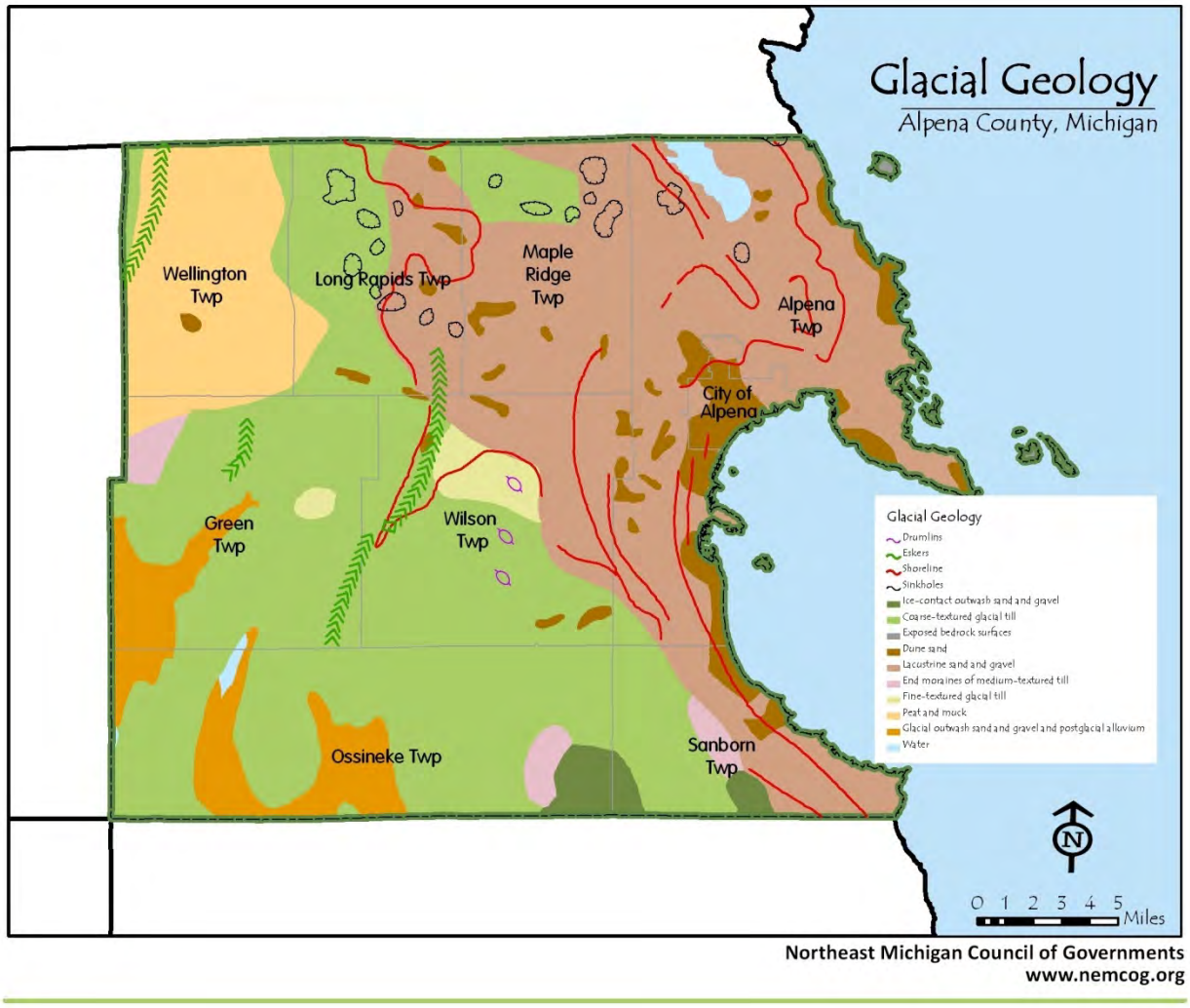


TABLE 4-6

TOPOGRAPHY

The county presents little relief of considerable magnitude as the general elevation ranges from about 580 to 1140 feet above mean sea level, a difference of 560 feet above the level of Lake Huron (Table 4-7). The elevation ranges from a low of about 600 feet above sea level in the City of Alpena area, to a high of 1140 feet above sea level near the southwest corner of the county.

The county is diversified with strongly sloping and choppy areas, gently undulating areas, low swell or ridges, level plains, small areas of swampy soils and numerous streams and lakes. The broader surface features are expressions of glacial activity. The more hilly areas, for the most part are moraines; glacial outwash deposits underlie the level plains. Other parts of the level plains of sandy drift were probably deposited under the ice sheet. This topography is well suited for a diverse agriculture, recreation and forest industry, as well as making for a beautiful setting in which to live.

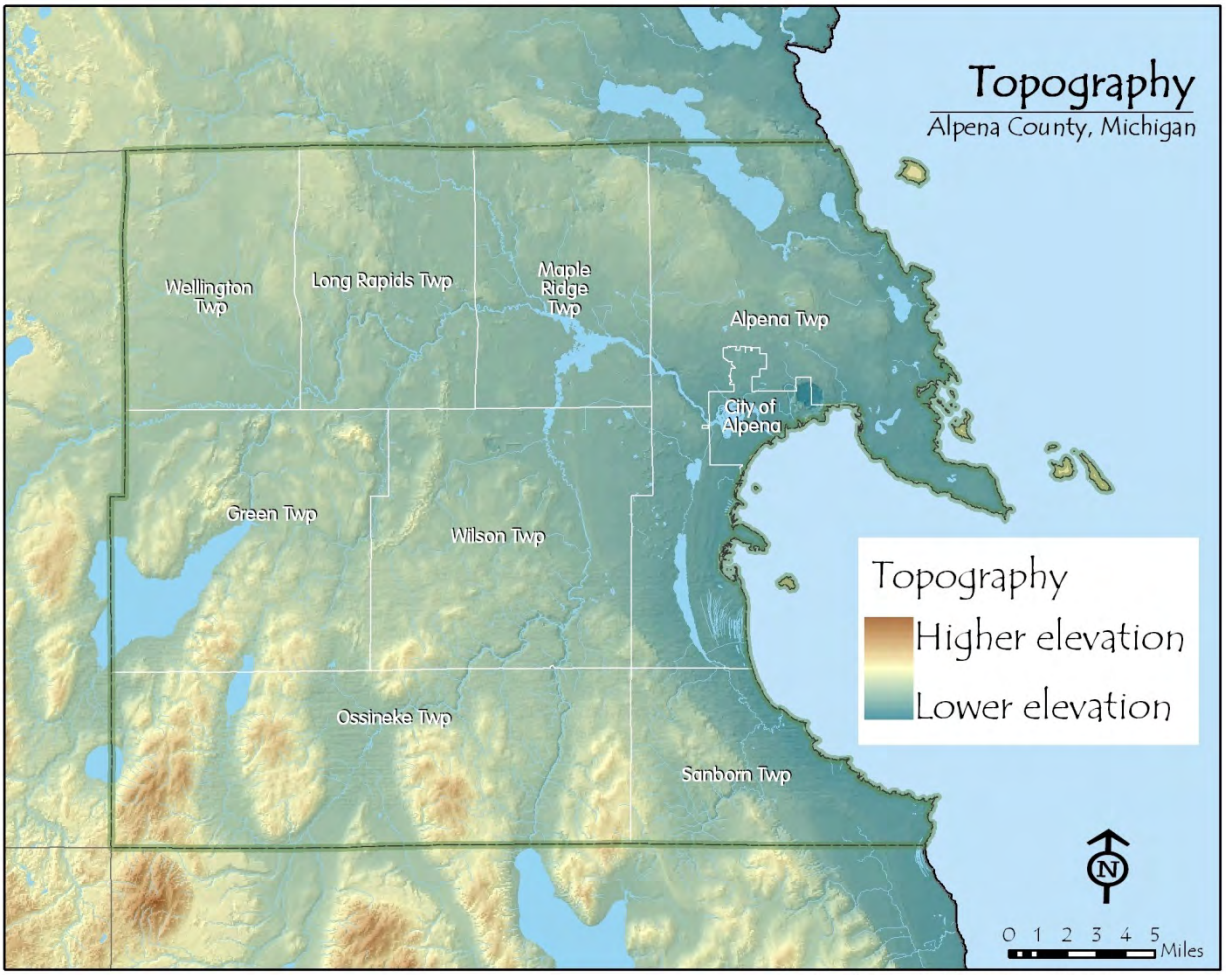


TABLE 4-7

SOILS

Soil characteristics help define the land's capacity to support certain types of land uses. Soils most suitable for development purposes are well drained and not subject to a high water table. Adequate drainage is important to minimizing storm water impacts and to maximize the efficient operations of septic drain fields. An adequate depth to the water table is necessary to prevent groundwater contamination from septic systems. A high water table also limits the construction of basements. Though civil engineering techniques can be employed to improve drainage and maintain adequate separation from the water table, such techniques are expensive to construct and maintain.

Soils play an important role in the food supply system. The Natural Resource Conservation Service identifies soils that are well or uniquely suited to crop production. Table 4-8 shows the soils best suited for agricultural production in Alpena County. When making land use decisions, it is important to consider the value of certain soils for agricultural purposes. Once land is converted from agricultural use to urban uses, the soils are permanently altered and its utility for agricultural production is greatly diminished, if not destroyed. The agriculture industry is important to the local economy. Planners and public officials should carefully consider any development proposals that threaten this non-renewable resource. Soils

most suitable to agricultural production are located in a northwest-southeast trending band across the county. Wilson, Green, Wellington, Long Rapids, Maple Ridge, Sanborn and Ossineke Townships all have significant areas of agricultural soils while Alpena Township and the City of Alpena have nearly none.

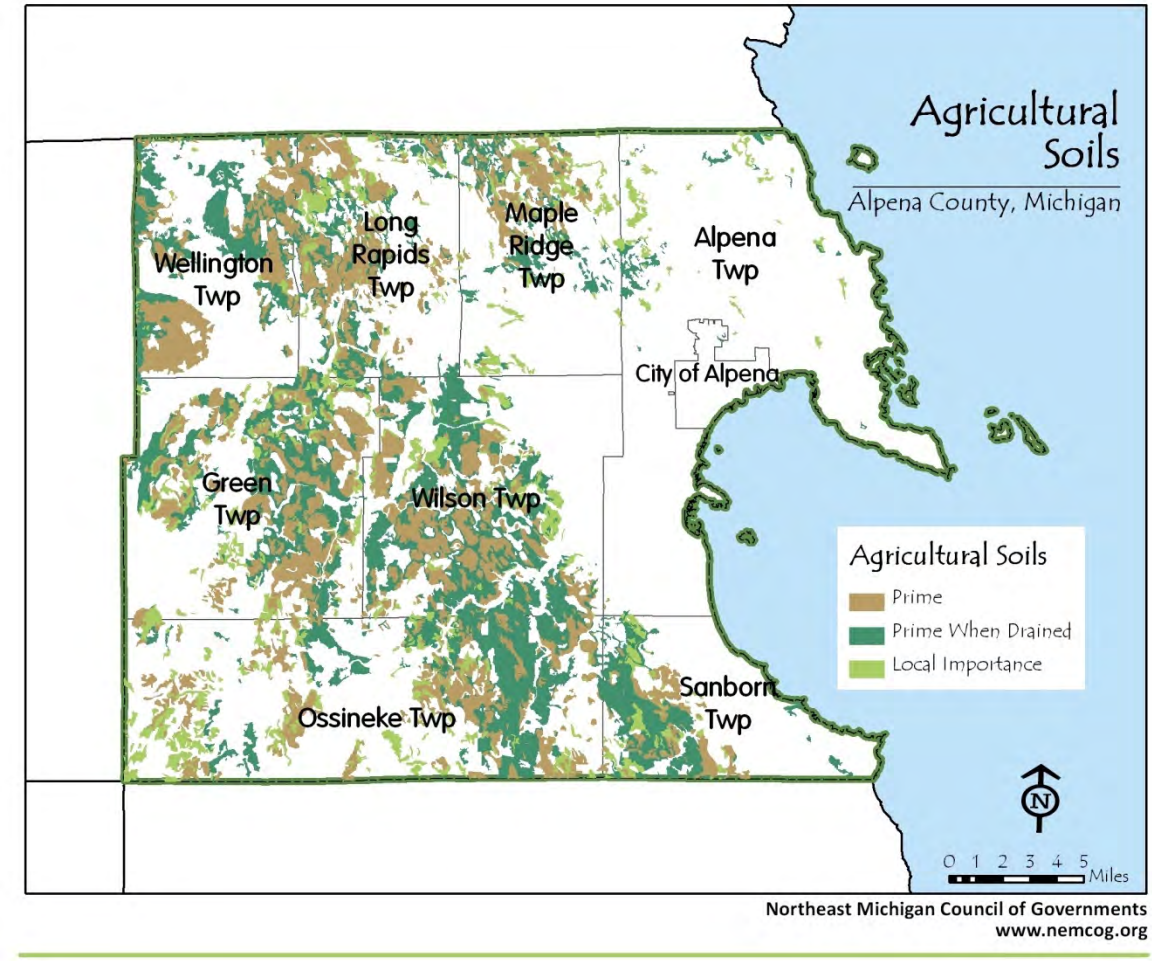


TABLE 4-8

The USDA Soil Survey of Alpena County also rate soils for various uses such as building site development and identifies the limiting factors for building, such as steep slopes, soil types, or high water table (**Figures 4.8, 4.9, and 4.10**). Areas with well drained soils and slopes less than ten percent tend to have slight limitations for building development. Areas with slopes greater than 18 percent, high water tables and organic soils or rocky soils have severe limitations. Based on criteria established by the Natural Resource Conservation Service (NRCS), building constraints maps were developed showing soils with limitations for buildings with and without basements as well as those with steep slopes and hydric characteristics (including hydric inclusions).

Using a geographic information system, soils maps have been color coded to show areas with moderate to severe septic system limitations as defined by the USDA Natural Resource Conservation Service. Criteria include depth to water table, wetness, filtering capacity and ability to perk water. **Figure 4.11** is a septic system limitation map. Generally, most of the county has severe limitations due to poor filtration of septic effluents. This is a critical issue when the water table is close to the surface or when high-density development occurs. Limiting types and density of development or making public water and sewer available for high-density development are the best options for protecting the groundwater resources.

Green Township

As evident in soils maps, agricultural soils dominate Green Township except in the south central portion. The soils in much of Green Township are under severe constraints for development and/or installing septic systems. Nearly half the Township has severe constraints due to hydric soils or steep slopes. Hydric soils are particularly dominant in the area of the Fletcher Pond's southern shoreline. Steep slopes are found throughout the Township, but primarily forming a narrow band in the central portion of the Township, running north and south of Fletcher Pond. Lower density, less intensive development should be directed to areas with these severe building constraints.

Green Township is highly susceptible to septic limitations, with virtually all of its soils exhibiting severe constraints. Since they do not absorb septic effluent efficiently, sand and gravel close to the septic field are considered poor filters. This is a problem when the water table is close to the surface or when high-density development occurs. Soils that are subject to wetness or ponding such as those surrounding Fletcher Pond are also ill suited for use as septic absorption fields due to excessively slow absorption rates. The Township also contains significant areas of soils that perc slowly or that have steep slopes. Conditions such as these increase the Township's vulnerability to ground water contamination. It is possible in some cases, however, to mitigate the impacts caused by development in less than ideal soils. As an example, soils subject to slow absorption rates can be made more effective if fill material is used to raise the absorption field above the water table, or if a subsurface drainage system is installed to lower the water table. In the case of poorly filtering soils, alternatives include the application of fill material to the site, and/or the enlargement of the absorption field.

Ossineke Township

Hydric soils are largely concentrated in the central portion of Ossineke Township in the vicinity of Wolf Creek and Beaver Creek. Hydric soils are fairly evenly distributed in the eastern portion of the Township and are interspersed with soils with hydric inclusions (areas too small to be delineated from the primary soils type). The western portion of the Township contains a large area of steep slopes (slopes greater than 18 percent), but some are also found dispersed throughout the rest of the Township.

The soils in the central and eastern portion of Ossineke Township have severe septic limitations due to wetness. While septic limitations appear to be widespread, if proper engineering and building techniques are utilized, much of the land would be considered suitable for building. However, systems designed to handle severe soil constraints are both costly to construct and difficult to maintain.

Wilson Township

Hydric soils which are fairly well distributed across Wilson Township with significant areas located in the northeast, northern, and southwestern portions of the Township. Most of the steeper slopes are located in the extreme northeastern portion of the township with some located in the western portion and along the riparian corridors in the south. While building and septic limitations appear to be widespread, if proper engineering and building techniques are utilized, much of the land would be considered suitable for building.

Most prime agricultural soils are located in the central and west-central portion of Wilson Township. When soils are included that would be prime when drained, the area expands significantly to include areas to the south and west Township line. The areas of prime and prime-when-drained agricultural soils are consistent with the location of current agricultural land uses.

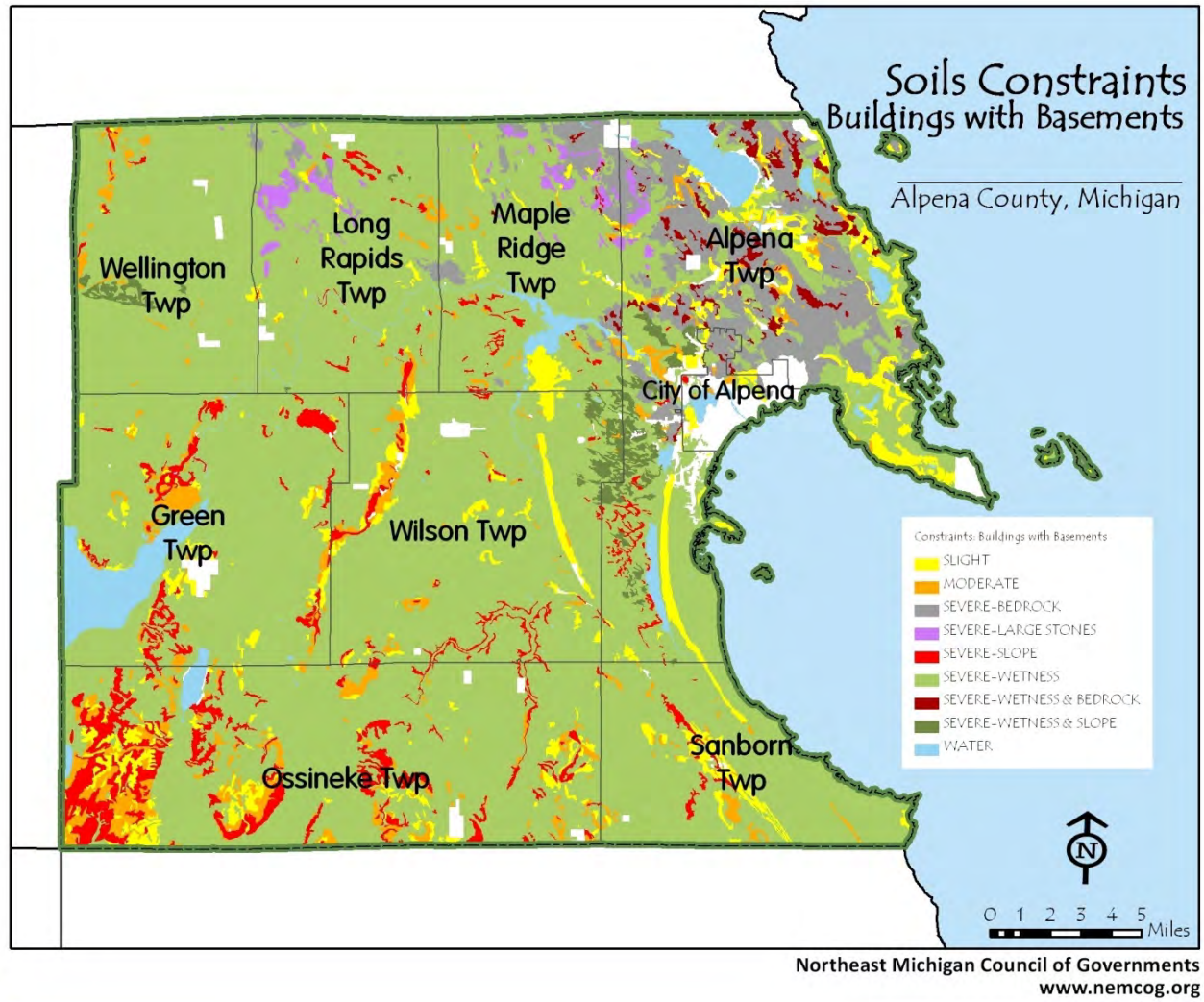

Soils Constraints
Buildings with Basements
Alpena County, Michigan
Wellington Twp
Long Rapids Twp
Maple Ridge Twp
Alpena Twp
City of Alpena
Green Twp
Wilson Twp
Ossineke Twp
Sanborn Twp
Constraints: Buildings with Basements
SLIGHT
MODERATE
SEVERE-BEDROCK
SEVERE-LARGE STONES
SEVERE-SLOPE
SEVERE-WETNESS
SEVERE-WETNESS & BEDROCK
SEVERE-WETNESS & SLOPE
WATER
N
0 1 2 3 4 5
Miles
Northeast Michigan Council of Governments
www.nemcog.org

TABLE 4-9

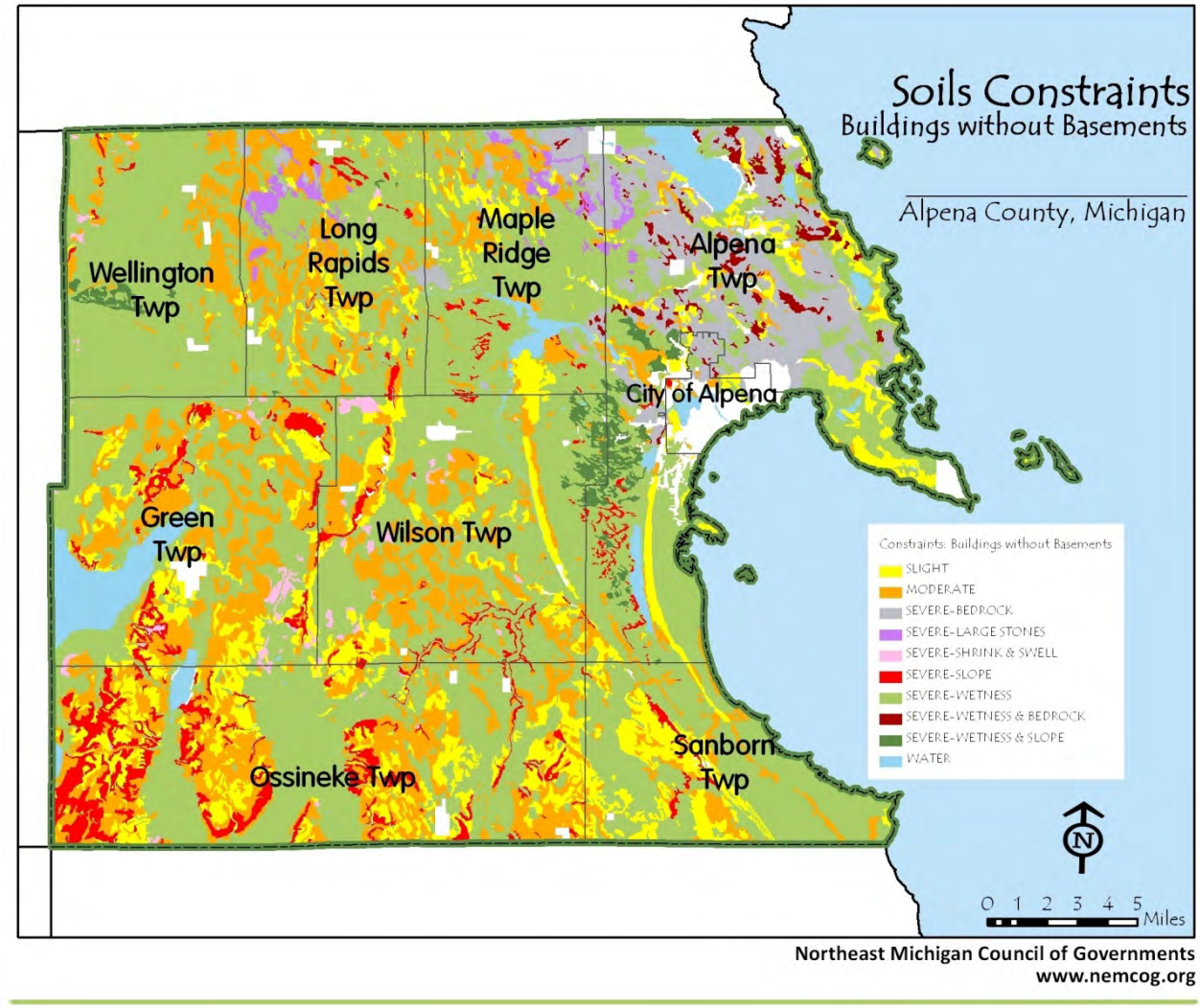

Soils Constraints
Buildings without Basements
Alpena County, Michigan
Wellington Twp
Long Rapids Twp
Maple Ridge Twp
Alpena Twp
City of Alpena
Green Twp
Wilson Twp
Ossineke Twp
Sanborn Twp
Constraints: Buildings without Basements
SLIGHT
MODERATE
SEVERE-BEDROCK
SEVERE-LARGE STONES
SEVERE-SHRINK & SWELL
SEVERE-SLOPE
SEVERE-WETNESS
SEVERE-WETNESS & BEDROCK
SEVERE-WETNESS & SLOPE
WATER
N
0 1 2 3 4 5
Miles
Northeast Michigan Council of Governments
www.nemcog.org

TABLE 4-10

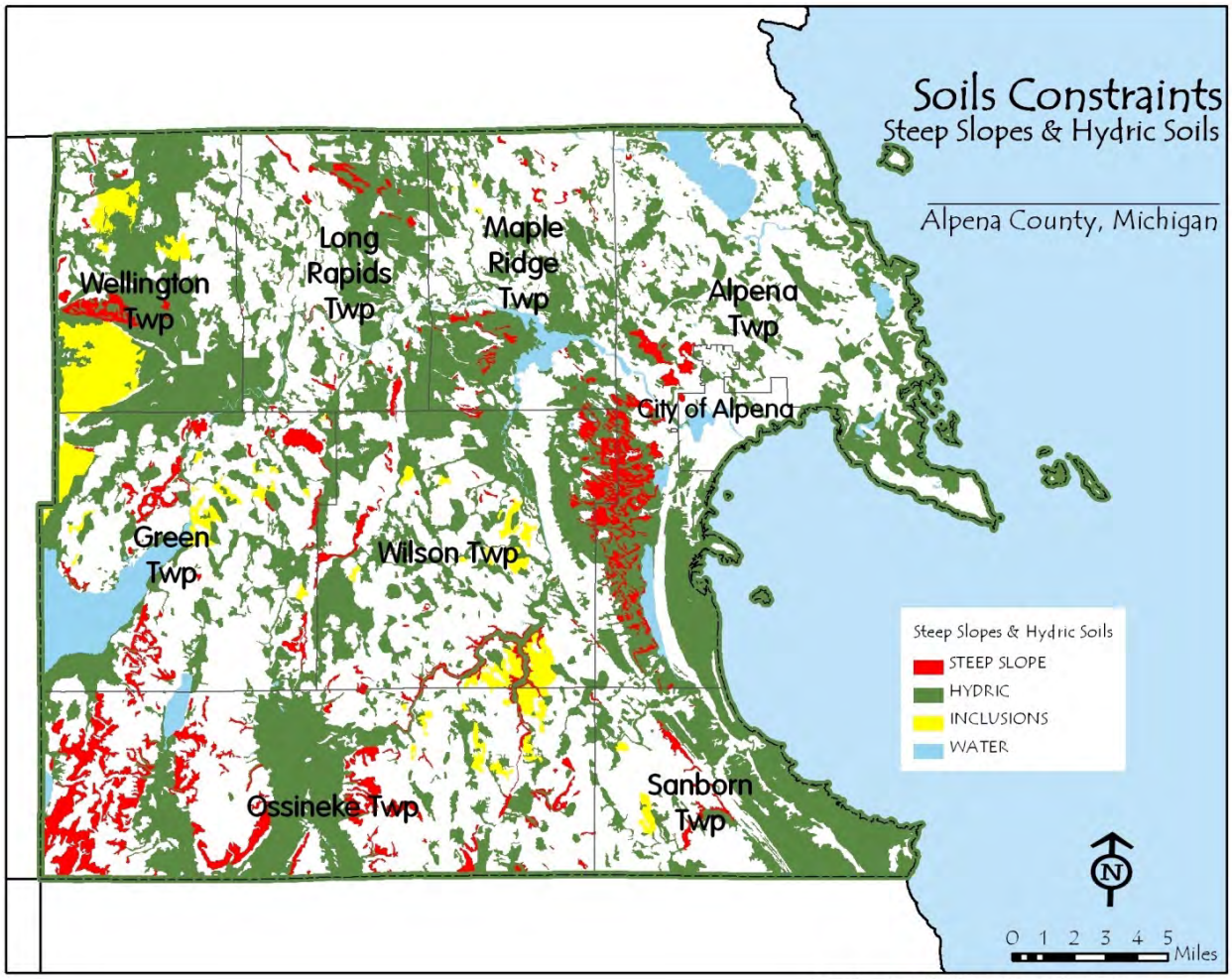

Soils Constraints
Steep Slopes & Hydric Soils
Alpena County, Michigan
Wellington Twp
Long Rapids Twp
Maple Ridge Twp
Alpena Twp
City of Alpena
Green Twp
Wilson Twp
Ossineke Twp
Sanborn Twp
Steep Slopes & Hydric Soils
STEEP SLOPE
HYDRIC
INCLUSIONS
WATER
N
0 1 2 3 4 5 Miles
Northeast Michigan Council of Governments
www.nemcog.org

TABLE 4-11

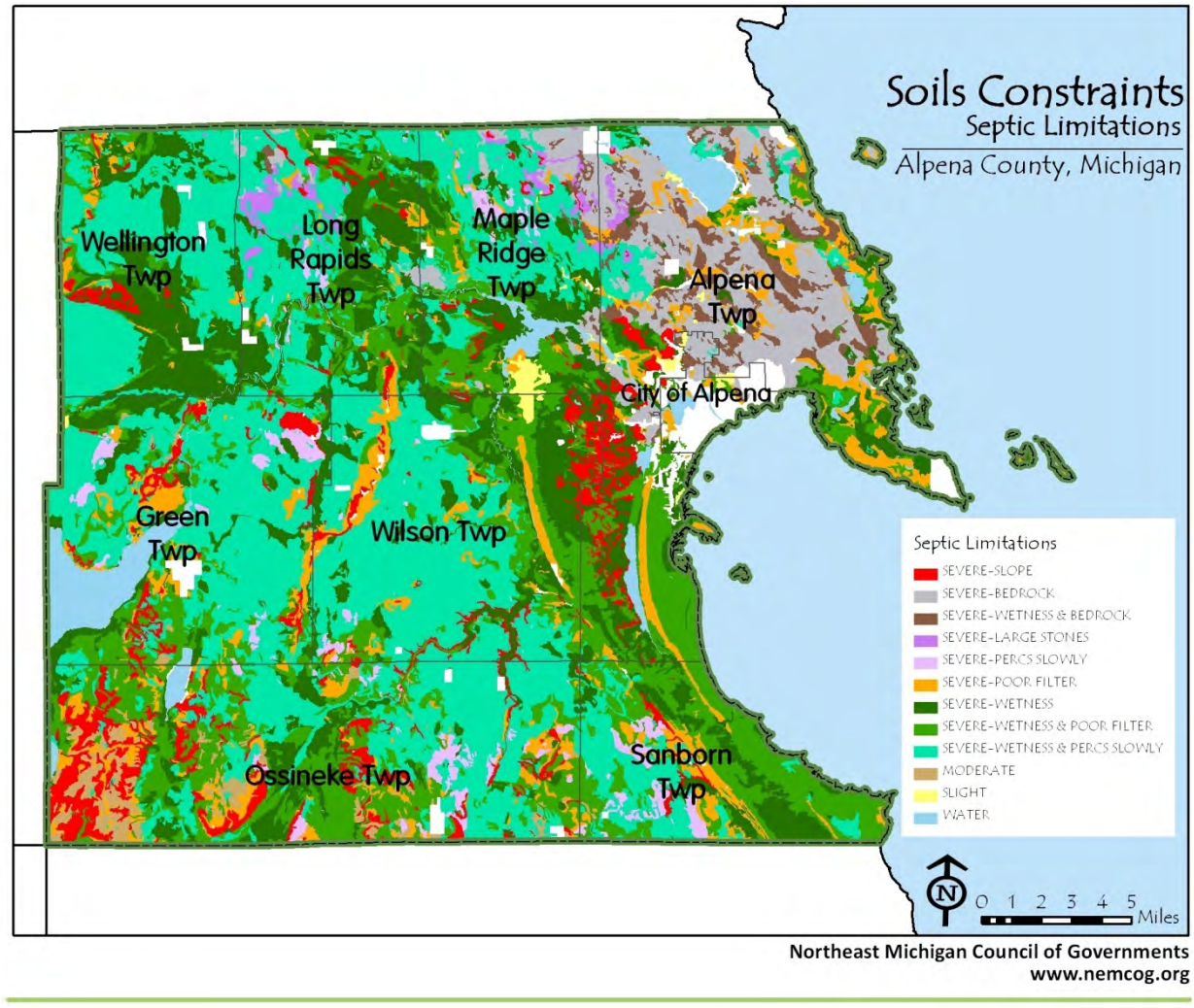


TABLE 4-12

WATER RESOURCES

Alpena County is blessed with a great number and variety of water resources located throughout the county (Table 4.2 and Figure 4.12). Alpena County depends on its water resources for development, recreation and commerce. Because the county is so dependent upon their water resources, it is necessary to identify and review the different types, quantities and qualities of these within the county.

Surface Water

There are 67 natural and artificial water bodies scattered throughout Alpena County that range in size from under one acre to thousands of acres (Table 4-15). The largest water body in the county is Fletcher Pond hydroelectric reservoir. Shared with Montmorency County, the reservoir covers a total of 8,970 acres with 5,310 acres in Alpena County. The largest natural lake is Long Lake that covers 2,750 acres. Other large water bodies in the county include Beaver Lake, Turtle Lake, Devils Lake #1 and #2 ("The Narrows"), Seven Mile Pond, Ninth Street Pond, Sunset Lake, Grass Lake, Crooked Lake and Middle Lake.

The main branch of the Thunder Bay River, with headwaters in Montmorency County, flows from west to east across the county into Lake Huron. Wolf Creek and the Lower South Branch of the Thunder Bay River

drain southern Alpena County. The Upper South Branch of the Thunder Bay River flows from the south to the north and was dammed for a hydroelectric reservoir creating Fletcher Pond. The North Branch of the Thunder Bay River flows from Presque Isle County through the northern portion of the county. All three branches empty into Seven Mile Lake, which is a hydro-electric reservoir.

Although not included as part of the surface water inventory, Lake Huron is vital to the community and economy of Alpena County. Lake Huron is used as a primary source of drinking water for the City of Alpena. Thunder Bay is home to many charter fishing vessels and it serves as a shipping port for Alpena County industries. Shipping in Thunder Bay has a long and tumultuous history, with over 160 shipwrecks occurring over the course of the last century. The rich history of Thunder Bay was recognized as a national treasure and it was designated as the Thunder Bay National Marine Sanctuary and Underwater Preserve, which opened in October 2000.

TABLE 4-13 ALPENA COUNTY SURFACE WATER COMPOSITION

Origin of Surface water	Number of water bodies	Area in Acres
Natural Lakes and Ponds	38	1,631
Natural Lake with a dam	2	3,415
Artificial Lake	1	26
Artificial Pond	20	11
Hydroelectric reservoirs	5	7,389
Fish and wildlife flooding	1	900

Source: NEMCOG

Lakes can be classified into three types based on water quality or the level of productivity. Oligotrophic lakes have very little nutrient accumulation and as a result have little aquatic plant and algae growth. The water is very clear and the lakes can support cold water fish. In mesotrophic lakes, there is a greater presence of nutrients, which results in lowered clarity and the presence of aquatic plants. Eutrophic lakes have large amounts of aquatic plants due to higher nutrient levels and the presence of suspended algae, which cause the water to be turbid. The aging eutrophication of a lake from a high quality (oligotrophic) lake to warm, weedy, poor quality (eutrophic) lake is a natural process. However, this process can be greatly influenced by human activity. Changes in the watershed can alter the quality and quantity of runoff that, in turn, can influence the rate of eutrophication.

All of the water based recreation areas in the county are receiving increased pressure from development. The orderly changes in this land use process will impact the land cover in Alpena County, but if done properly, will not greatly impact surface water quality or sediment and nutrient delivery rates into lake and streams.

Proper placement and maintenance of septic systems, the restricted use of fertilizers near shorelines, erosion control practices, lower density development near lakes and streams and the use of green belts and buffers are a few of the management techniques that can be implemented to help safeguard water quality. Maintaining high water quality in all of the county's lakes, ponds and rivers will be highly beneficial to the community and its people.

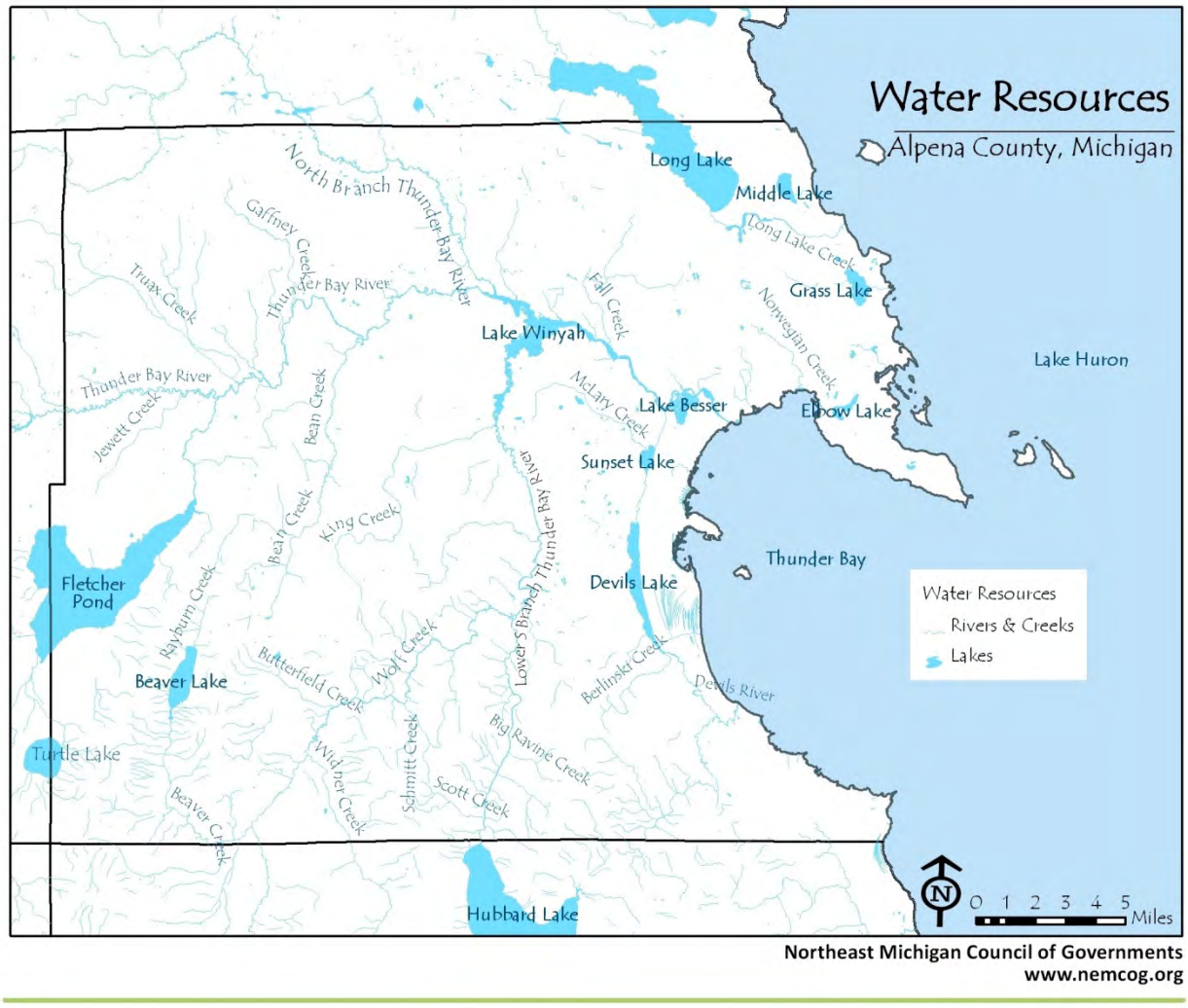

Water Resources
Alpena County, Michigan
Long Lake
Middle Lake
Long Lake Creek
Grass Lake
Norwegian Creek
Lake Huron
Elbow Lake
Lake Besser
McLary Creek
Fall Creek
Lake Winyah
North Branch Thunder Bay River
Gaffney Creek
Thunder Bay River
Truax Creek
Thunder Bay River
Jewett Creek
Bean Creek
Sunset Lake
Lower S Branch Thunder Bay River
King Creek
Bean Creek
Thunder Bay
Fletcher Pond
Devils Lake
Rayburn Creek
Butterfield Creek
Wolf Creek
Beaver Lake
Berlinski Creek
Devils River
Turtle Lake
Big Ravine Creek
Schmitt Creek
Wildner Creek
Scott Creek
Beaver Creek
Hubbard Lake
Water Resources
Rivers & Creeks
Lakes
N
0 1 2 3 4 5
Miles
Northeast Michigan Council of Governments
www.nemcog.org

TABLE 4-14

TABLE 4-15 ALPENA COUNTY LAKES INVENTORY					
Name	**Location**	**Section**	**Acres**	**Description**	**Public Access**
Beaver	29n5e, 30n5e	2,3, 35	665	Natural Lake w/ Dam	X
Combs	31n5e	24	4	Natural Lake	
Conway	31n9e	20	11	Natural Lake	
No Name (Crapo)	31n9e	9	24	Natural Lake	
Elbow (Crooked)	31n9e	20,21,29	170	Natural Lake	
No Name (Danokowski)	32n8e	6	6	Natural Lake	
Denton	32n7e	16	6	Natural Lake	
Devil's (#1)	30n8e	8,17,20,28,29,33	900	Fish & Wildlife Flooding	
Devil's(#2) (The Narrows)	32n8e	23,24	100	Natural Lake	
Fitzgerald	32n7e	1,6	34	Natural Lake	
Fletcher Pond (Floodwater)	30n5e	2,7,10,11, 15-22, 28-31	5310	Hydroelectric reservoir	X
Four Mile Pond	31n8e	7	98	Hydroelectric reservoir	X
Grass	31n9e,	33, 4	123	Natural Lake	
Jacob	32n7e	16	3	Natural Lake	
Long	32n8e	3,4,5,9,10,11,14,15	2750	Natural Lake with Dam	X
McKay Dam	29n8e	26	0	Artificial Pond	
Middle	32ne	7,12,13,18	264	Natural Lake	
Mindack	32n7e	2	32	Natural Lake	
Sunset Lake	31n8e	29,32	183	Natural Lake	
No Name (Mud)	31n9e	20,29	16	Natural Lake	
Muskrat Farm	31n7e	24	23	Natural Lake	
Zim (Nash)	31n7e	23	8	Natural Lake	
Ninth Street (Lake Besser)	31n8e	15,16,21,22	392	Hydroelectric reservoir	X
No Name	31n9e	35	7	Natural Lake	
No Name	30n5e	9	0	Natural Lake	
No Name	32n9e	18	20	Natural Lake	
No Name	30n8e	9,16	100	Natural Lake	
No Name	30n8e	27	14	Natural Lake	
No Name	30n8e	21,22	32	Natural Lake	
No Name	31n9e	35	15	Natural Lake	
No Name	31n9e	18	21	Natural Lake	
No Name	31n9e	34,35	5	Natural Lake	
No Name	31n9e	20	5	Natural Lake	
No Name	31n8e	15,22	26	Artificial	
No Name	31n9e	10	33	Natural Lake	
No Name	32n9e	28,29	28	Natural Lake	
Seven Mile (Lake Winyah)	31n7e	1,2,3,9,10	1530	Hydroelectric reservoir	X
Spratt Hunting	30n5e	12	10	Natural Lake	
Sylvester	31n5e	34	6	Natural Lake	
Turtle	29n5e	18,19	275	Natural Lake	

Source: Michigan State University, Department of Resource Development Michigan Lake Inventory Bulletin Number 4

Green Township

Green Township's three most significant bodies of water are Fletcher Pond, Beaver Lake, and the South Branch of the Thunder Bay River. Fletcher Pond, a reservoir created by the construction of a hydroelectric dam on the South Branch, is the largest body of water in the Township, and in the County as well. Shared with Montmorency County, the reservoir covers a total of 8,970 acres with 5,310 acres in Green Township.

Numerous water quality studies have been conducted on Fletcher Pond and the Thunder Bay River. Although pollutants such as sediment from eroding streambanks and road/stream crossings have been identified, the river exhibits a Good to Excellent water quality rating. With the ever-increasing demands development puts on water resources, however, great care will need to be taken to ensure continued high water quality for the future. Many factors can threaten or impair water quality. Threats and potential threats to the water resources of Green Township include:

- Sediments and contaminants introduced to the lake and river by stormwater runoff
- Increased development of shorelines
- Loss of wetlands and wildlife habitat due to development and other human impacts
- Inadequate or poorly maintained septic systems
- Agricultural runoff that contribute bacteria and nutrients to the water system
- Increased sedimentation from shoreline erosion
- Erosion at road/stream crossings
- Impairment of recreation and aquatic/wildlife habitat with the introduction and spread of invasive species.

In a 2003 inventory of nonpoint source pollution in the Thunder Bay River Watershed, sediments and nutrients were determined to be the pollutants most affecting the Thunder Bay River. Sources of sediment include road/stream crossings, streambank erosion, stormwater runoff, agricultural operations, land development practices and lake and river access sites.

Excess nutrients are introduced to the Thunder Bay River and Fletcher Pond from a variety of sources. Yard and pet waste, improperly functioning septic systems on riparian parcels, and livestock management practices (including unrestricted livestock access to water bodies and the storage/application of manure) are significant sources of nutrients. Another by-product of excess nutrients in a water body is the proliferation of aquatic nuisance species such as Eurasian watermilfoil (present in large portions of Fletcher Pond) and Hydrilla. Once introduced to a water body these species can spread rapidly, forming dense mats of vegetation that not only hamper navigation, but deprive native aquatic plants and animals access to sunlight. As the plant matter dies and sinks to the bottom of a lake it decomposes, and in the process depletes the oxygen supply, further degrading habitat for native species.

It is important to address all of these water quality threats. The economy of the Township in large part depends on the availability of high quality lakes and streams for recreational purposes. The tourism industry, in particular, thrives because of the boating, fishing, and hunting opportunities afforded by these pristine waters. Golf courses, canoe liveries, restaurants, entertainment enterprises, and many other businesses also benefit from the numbers of visitors attracted to the area by water related recreational opportunities. Any degradation of the water system will adversely affect Green Township's standing as one of northeast Michigan's preferred vacation destinations. A water quality monitoring program should be considered (perhaps in partnership with adjacent counties or townships) in order to safeguard the quality of the Township's water resources. The highly developed Beaver Lake, in particular

should be monitored closely, and information on how to protect the quality of the lake should be made available to its shoreline residents.

Ossineke Township

Surface water in Ossineke Township exists in mostly in rivers, streams, and two lakes. Beaver Lake, a 675-acre lake in the northwestern portion of the township lies mostly within Ossineke Township while the remainder lies in Green Township to the north. A portion of 841-acre Turtle Lake lies along the western boundary of the Township with the remainder lying in Rust Township in Montmorency County. While not located in the Township itself, Hubbard Lake is just south of the Township and is an important recreational resource for residents. The two major river systems in the Township are Wolf Creek and the Lower South Branch of the Thunder Bay River. Beaver Creek, Little Wolf Creek, Schmitt Creek, Widner Creek, and Butterfield Creek are all associated with the Wolf Creek system, while Big Ravine Creek, Scott Creek, Simmons Creek, and Doscoba Creek are associated with the Thunder Bay River system.

Wilson Township

The majority of Wilson Township exists within the Thunder Bay River Watershed. Surface water in the Township exists in creeks such as King Creek, Wolf Creek, and Butterfield Creek which flow into the Lower South Branch of the Thunder Bay River. The extreme western edge of the Township is drained by Bean Creek which flows directly into the Thunder Bay River. The eastern portion of the Township is located within the coastal watersheds of the Devil's River and Black River, which drains toward Lake Huron. Only two small lakes exist in Wilson Township. Zim Lake, found in section 23 (T31N R7E), is a natural, warm water lake. Zim Lake is 7.5 acres in size and is approximately 36 feet in depth. Muskrat Lake, found in section 24 (T31N R7E), is also a natural, warm water lake and is approximately 23 acres in size. The waters of Lake Winyah, an impoundment of the Thunder Bay River, extend south into Wilson Township. Another man-made lake was recently created by Lafarge in the abandoned Paxton shale quarry. Lakes in the Township contain warm water species such as pan fish, northern pike and bass.

GROUNDWATER

Contaminated groundwater is often a dangerous problem because it generally travels unobserved until detected in a water supply well. Some contamination may remain undetected because no odor, taste or color is evident. Once contaminated, groundwater is difficult and expensive to clean up. The contaminant disperses in the groundwater, is difficult to remove, and may persist for decades. It is always simpler, cheaper and easier to prevent groundwater contamination than it is to clean it up.

In many areas in the county the depth to groundwater within this matrix of sand, gravel and clay is less than 50 feet below the soil surface. Near lakes, streams and wetlands the depth to ground water is shallower and commonly can be found only a few feet below the soil surface. Because of the abundance of shallow groundwater in the county, many drinking water wells are also shallow, just deep enough to reach the uppermost region of the aquifer. This special combination of factors places the groundwater of Alpena County at risk of contamination. For groundwater protection planning it should be assumed that the entire county is vulnerable to contamination. A wide variety of contaminants have already been discovered in the ground water at sites throughout the county, and it is likely that there are a number of other sites that have not yet been discovered.

Sinkhole areas are often conduits to groundwater pollution. Historically, many sinkholes have been used as dump sites and some continue to be used in this manner. Agricultural drainage from pastures, feedlots, bean, potato, corn and small grain fields enters the aquifers through karst features such as swallow holes, sinkholes and fractures at the ground surface. Water contamination from agricultural byproducts, nitrates, infectious disease, septic systems and sediment has been documented to the result of the unique karst terrain. Action to protect and preserve sinkholes can be recommended both on account of their value as a scenic feature and as a groundwater quality measure. Abandoned wells can also pose a major threat to groundwater. If not capped, contamination can have a direct conduit into the groundwater through the well. Assistance in properly capping a well is available from the Alpena County Conservation District.

All groundwater in Michigan will eventually discharge to the surface. Most will discharge into the Great Lakes through entry into surface streams or from the subsurface directly into the lake bottom. Groundwater can emerge where surface topography cuts below the surface of the groundwater level. Where ground water is under confinement, it can develop pressure (a high hydrostatic head) and break through to the surface as an artesian spring. Groundwater can also be drawn off into areas of lowerground water pressure (low hydrostatic head). These areas can be layers of coarse materials or they can be open fissures and voids in bedrock that discharge the water efficiently elsewhere.

Basically groundwater will flow down gradient, quickly through caverns and fissures, slowly through coarse materials and very slowly through fine materials. Clays act as barriers to downward flow of water. Clay, however, is not present everywhere as it varies in thickness and horizontal extent.

The storage and use of pesticides and fossil fuels can also pose a threat to groundwater. If stored and used properly, these substances do not pose a serious threat to groundwater. Spills, leaking storage tanks, accidental discharge or misapplication are the greatest concerns. Because of its high solubility in water, road salt is another significant and common threat to groundwater. Tons of rock salt is applied to the roads each year. The primary sources of contamination are from unprotected salt storage facilities and road runoff that infiltrates through recharge zones into groundwater.

Wetlands

A wetland is land where water is found, either on the surface or near the surface, at any time during the year. Poorly drained soils and water loving vegetation also may be present. Wetlands are often referred to as marshes, swamps or bogs. Residents of Michigan are becoming increasingly aware of the value of wetlands. Beyond their aesthetic value, wetlands improve water quality of lakes and streams by filtering polluting nutrients, organic chemicals and toxic heavy metals. Wetlands are closely related to high groundwater tables and serve to discharge or recharge aquifers. By absorbing excess water when river

levels are high and releasing water when levels are low, wetlands help prevent floods and droughts. Wetlands are also dynamic ecosystems, which are home to a wide variety of plants and animals.

While wetland ecosystems are unique, they are not independent habitats. Wetlands are vital to the health of other ecosystems, wildlife and humans. Because of their cleansing benefits and by helping control water flow, wetlands have been called "nature's kidneys". Many of the plants and animals that live in a wetland have symbiotic relationships with the wetland and each other.

There are numerous wetland areas scattered throughout Alpena County totaling over 36 thousand acres (Table 4-16). In addition to the many inland wetland areas, Alpena County also has significant coastal wetlands scattered along its 61 miles of Lake Huron shoreline. These wetlands are important resting and feeding spots for migratory birds and help slow shoreline erosion by dissipating wave energy.

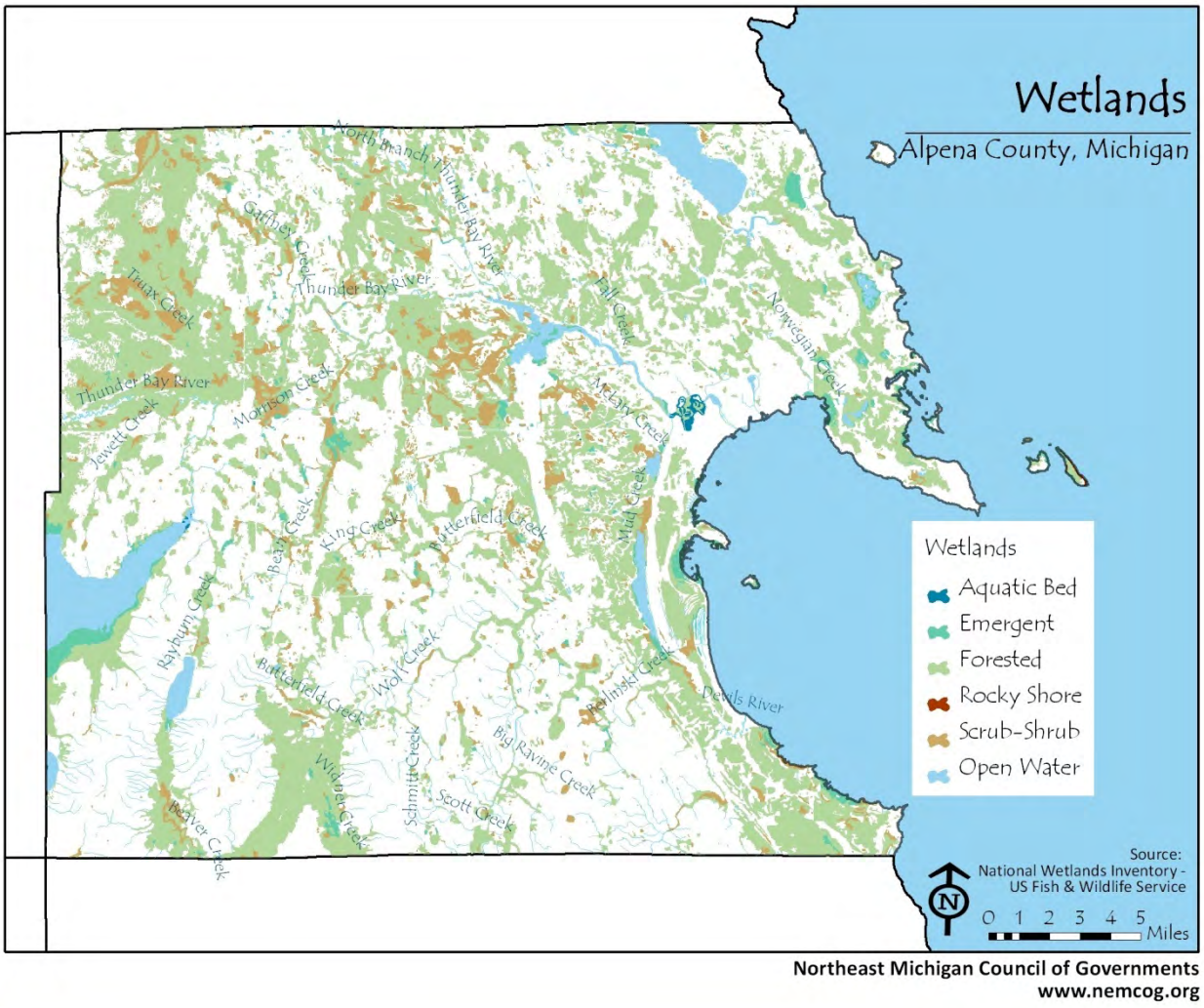


TABLE 4-16

FISH & WILDLIFE

Sheltered by evergreen and hardwood forest, Alpena County's wildlife includes raccoon, fox mink beaver, wildcat, deer, elk, black bear, ruffed grouse, and turkey. Hunting for white tailed deer and small game species such as cottontail rabbit, tree squirrels, wild turkey and ruffed grouse attracts many people to the county annually. Other game species of importance to trappers are beaver, otter, muskrat, raccoon, opossum, skunk and weasel. Alpena County also provides prime waterfowl habitat that is supplemented by private ponds, beaver dams, pothole wetlands and wooded flood plain areas. Alpena County is part of the Mississippi flyway for migrating birds.

FISHING

Alpena County offers the sport fisherman an abundance of fishing opportunities. The many lakes, rivers and streams, as well as the near shore waters of Lake Huron, offer a wide range of warm, cool and cold water species. Historically, the Thunder Bay River provided an important link between inland habitats and Lake Huron, with the fish using the corridor for spawning and nursery habitats. Although most of the riverine habitat is now inaccessible to Lake Huron fish, due to the presence of hydro-power projects, the watershed is still providing nutrient input to the near-shore waters of Thunder Bay and is important to the fishery resources from an energy standpoint.

Alpena County offers multiple opportunities for sport fishing on rivers, lakes and Great Lake. In addition to world class catches of brown trout, pan fish, crappies and salmon, waters of the county also support rainbow trout, lake trout, brook trout largemouth bass, smallmouth bass, perch, walleye and pike.

Lake Huron offers many fishing opportunities. Brown trout, lake trout, rainbow trout and salmon are all plentiful. Public launching ramps on Lake Huron are located at Rockport, off Fletcher Street in Alpena, at the Alpena Small Boat Harbor, and on the Devil's River in Ossineke. Charter boat services are available at the Alpena Small Boat Harbor. Undeveloped possible access sites from public land are at Ossineke, Squaw Bay and Partridge Point. Since 2000, according to the Michigan Department of Natural Resources fish stocking report, Lake Huron has been stocked with over 4.9 million fish including brown trout, lake trout, and a small number of walleye.

One of the most scenic and rustic waterways in the area is the 8,970 acres of Fletcher Pond. Located on the extreme western border of Alpena County, this impoundment was created by damming of the Thunder Bay River. It is Michigan's 12th largest inland body of water, but the maximum depth is only ten feet. Although the shallow, stump-laden waters hamper powerboats, Fletcher Pond offers some of the best largemouth and smallmouth bass fishing in the State. Pike, crappies, perch and other pan fish are also abundant in this water body. Year-long fishing activities include ice fishing.

Long Lake is located on the northern border of Alpena County. Covering 5,652 acres, its maximum depth is 25 feet. Long term fish stocking programs make walleye abundant in these waters. Largemouth and smallmouth bass, pike and pan fish are also commonly caught here.

Beaver Lake covers 665 acres and is located in the southwest part of the county. This lake contains largemouth and smallmouth bass, perch, pike, and other pan fish. Since 2000, the DNR has stocked the lake with 180,000 fish including northern pike and walleye.

The Thunder Bay River is a picturesque river that winds its way along the countryside, through the City of Alpena and into Lake Huron. Most of Michigan's game and pan fish are found along this river. The river and its various major branches cover most of the county. There are several impoundments along the river's path, varying in size from Fletcher Pond to smaller Lake Winyah. Formed when the Seven Mile dam was constructed, Lake Winyah is a favorite area for those seeking the challenge of landing northern

pike. Since 2000, The DNR has stocked the Thunder Bay River with over 430,000 fish including brown trout, rainbow trout, and walleye.

HUNTING

Hunting opportunities are available in Alpena County for most species of animals and game birds common to Michigan (Table 4-17). White tail deer are abundant for the big game hunter and black bear populations, though low overall, are high in areas of dense forest. Along with privately owned forest lands, more than 43,000 acres of State land provide ample habitat for wild turkey, ruffed grouse, woodcock and other upland birds. Small game such as the cottontail rabbit, snowshoe hare and squirrel are also common in these woodlands. State owned lands are open to the public for hunting, unless otherwise posted.

Although the State of Michigan attained Bovine TB accredited-free state status in 1979, it is now thought that during earlier periods of high TB reactor rates there was spillover of Bovine TB from infected cows into Michigan's white-tailed deer population, a result of shared pastures. In 1994, a TB infected deer was killed by a hunter in Alpena County. In 2001, Presque Isle County had one deer test positive for TB. Unfortunately, large deer populations, combined with indiscriminate feeding practices, were contributing factors to the spread of Bovine Tuberculosis (TB) in Alpena County and across northern Michigan. TB is a serious disease caused by bacteria attacking the respiratory system. In 2002, of the 1,236 deer that were tested, 9 tested positive for TB in Alpena County. In 2003, 9 deer tested “preliminary positive.” There are three main types of TB - human, avian, and bovine. Human TB is rarely transmitted to non-humans, and avian TB is typically restricted to birds. Bovine TB - also known as 'cattle TB' is the most infectious of the three, and is capable of infecting most mammals. Primarily found in hoofed animals, it is generally not considered a significant health risk to humans. However, humans can and have contracted Bovine TB. The disease has also been found in coyotes, raccoons, black bear, bobcat, red fox and opossum.

The effort to eradicate the disease has led to an aggressive TB testing campaign and the creation of a surveillance zone and Deer Management Unit (DMU) 452. Hunters in the surveillance area are asked to submit deer heads for testing. In DMU 452 testing is mandatory. Adjacent Presque Isle County (DMU 071) is in the infected area, but is not a part of DMU 452. Efforts to eradicate the disease led to changes in deer feeding rules, deer harvest increases, extension of the number of hunting days, and the banning of new deer or elk farms. In November of 2011, the Natural Resources Commission voted to remove the baiting ban in Presque Isle County effectively allowing hunters to use up to two gallons of bait. Baiting remains illegal in the counties of Alpena, Montmorency, Alcona, and Oscoda.

Although not found in Alpena County, chronic wasting disease (CWD) has been found in the State of Michigan in the lower peninsula and the state has adopted protocols and control measures. These include asking hunters to be aware and on the lookout for the disease. The Michigan DNR recommendations for hunters with regards to CWD are as follows: get deer checked, avoid long-distance movements with a deer carcass, handle and dispose of a deer carcass in a responsible manner, if hunting out-of-state, only bring back allowed animal parts, stay up-to-date with the latest regulations, especially if hunting in or near CWD areas.

CORMORANT

In Alpena County, and throughout the Great Lakes Basin, the Double Crested Cormorant, a deep-diving fish predator, has substantially increased in numbers. Since the abatement of some pesticides, over the past twenty years, these birds have made a remarkable comeback. The high densities of birds combined with their observed fish eating behaviors have led to their implication in declines of both commercial and

recreational fisheries throughout the Great Lakes. Scientists, however, have found it difficult, if not impossible to identify the actual mechanisms(s) or causes behind fish population declines.

Central Michigan University and the Michigan Department of Natural Resources (MDNR) Fisheries Division initiated an intense population sampling in May of 1999. Compared to similar data gathered by researchers at CMU nearly 20 years ago, it was found that not only was the smallmouth bass population down by an astounding 75-80 percent, but other fish species, including brown bullhead and rock bass have declined by as much as 98 percent. Cormorant diets often include species that are of little commercial value but may be important to community trophic dynamics. Therefore, cormorants may have a secondary effect on sport fisheries by competing with desired species for forage fish.

TABLE 4-17 ALPENA COUNTY INVENTORY OF GAME SPECIES

Species	Relative abundance	Management Potential
Deer	High	Good. Timber cuttings on private land could increase deer carrying capacity
Bear	Low overall High in places	Limited. Population holding at low level. High in less populated forestland held for hunting recreation. Gradual reduction is expected.
Bobcat	Medium overall	Good. Long range maintenance of swamplands is vital.
Raccoon	Moderate	Good. Moderate hunting and trapping pressure maintains population at a desired level
Squirrel	Moderate	Good. Population fluctuates with winters and crops.
Snowshoe Hare	Up and Down	Good. Fluctuate on 10 to 15 year cycle. Continued survival depends on large areas of swamp land
Ruffed Grouse	Moderate	Good. Population numbers are Increasing. Habitat improves with clear cutting coniferous cover
Waterfowl	Low to Medium	Canada Geese number increasing. Wood Duck numbers have Increased with local nest box placement. No change in mallard numbers.
Wild Turkey	Moderate	Good. Population is expanding numbers continue to increase
Fox, Beaver, Badger, Muskrat	Low to Moderate	Low level. Populations fluctuate.

Source: Tom Carlson, DNR Wildlife habitat biologist, Atlanta MI. 1989

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THREATENED AND ENDANGERED SPECIES

Alpena County is also home to a number of different plants and animals that are threatened endangered or are of special concern (Table 4-18). The following list presents the Endangered (E) or Threatened (T) plant and animal species of Alpena County which are protected under the Endangered Species Act of the State of Michigan (Public Act 203 of 1974 as amended). This list also includes plant and animal species of Special Concern (SC).

TABLE 4-18 ALPENA COUNTY ENDANGERED AND THREATENED SPECIES			
SCIENTIFIC NAME	**COMMON NAME**	**FEDERAL STATUS**	**STATE STATUS**
Acipenser fulvescens	Lake sturgeon		T
Adlumia fungosa	Climbing fumitory		SC
Alasmidonta viridis	Slippershell		T
Ammodramus henslowii	Henslow's sparrow		E
Ammodramus savannarum	Grasshopper sparrow		SC
Armoracia lacustris	Lake cress		T
Asplenium rhizophyllum	Walking fern		T
Botrychium hesperium	Western moonwort		T
Buteo lineatus	Red-shouldered hawk		T
Cacalia plantaginea	Prairie indian-plantain		SC
Calypso bulbosa	Calypso or fairy-slipper		T
Carex scirpoidea	Bulrush sedge		T
Charadrius melodus	Piping plover	LE	E
Chlidonias niger	Black tern		SC
Cirsium pitcheri	Pitcher's thistle	LT	T
Coregonus artedi	Lake herring or Cisco		T
Crataegus douglasii	Douglas's hawthorn		SC
Cypripedium arietinum	Ram's head lady's-slipper		SC
Dorydiella kansana	Leafhopper		SC
Dryopteris filix-mas	Male fern		SC
Emydoidea blandingii	Blanding's turtle		SC
Flexamia delongi	Leafhopper		SC
Gavia immer	Common loon		T
Glyptemys insculpta	Wood turtle		SC
Haliaeetus leucocephalus	Bald eagle		SC
Iris lacustris	Dwarf lake iris	LT	T
Lanius ludovicianus migrans	Migrant loggerhead shrike		E
Notropis anogenus	Pugnose shiner		E

Source: Michigan County Element Lists - March 15, 2012, Michigan Natural Feature Inventory
State Status: E = endangered; T = threatened; SC = special concern
Federal Status: LE = listed endangered; LT = listed threatened

TABLE 4-19 ENDANGERED SPECIES* IN ALPENA COUNTY	
NAME	**STATUS**
Mammals	
Northern Long-eared Bat (Myotis septentrionalis)	Threatened
Birds	
Kirtland's Warbler (Setophaga kirtlandii)	Endangered
Piping Plover (Charadrius melodus)	Endangered
Red Knot (Calidris canutus rufa)	Threatened
Reptiles	
Eastern Massasauga rattlesnake (Sistrurus catenatus)	Threatened
Insects	
Hine's Emerald Dragonfly (Somatochlora hineana)	Endangered
Hungerford's Crawling Water Beetle (Brychius hungerfordi)	Endangered
Flowering Plants	
Dwarf Lake Iris (Iris lacustris)	Threatened
Houghton's Goldenrod (Solidago houghtonii)	Threatened
Pitcher's Thistle (Cirsium pitcheri)	Threatened
Critical habitats	
Hine's Emerald Dragonfly (Somatochlora hineana)	Final

Source: US Fish and Wildlife Service, 2019

* List includes species and critical habitats that are solely or jointly managed by the US Fish and Wildlife Service's Ecological Services Program

While not afforded legal protection under the act, many of these species are of concern because of declining or unreliable populations in the state. If these species continue to decline, they would be recommended for Threatened or Endangered status. Protection of Special Concern species before they reach dangerously low population levels would prevent the need to list them in the future by maintaining adequate numbers of self-sustaining populations.

WOODLANDS

Forests cover approximately 60 percent of the land area in Alpena County, making it the largest single land use in the county. In addition to using the forest resources for timber and fiber, woodlands are also used for all types of outdoor recreation. Large expanses of different forest types offer habitat for a wide variety of species. Forest types include northern hardwood, aspen-birch, northern white cedar, and white, red and jack pine.

There are a number of different categories of forestland owners. According to the Resource Assessment of Alpena County, prepared by the Alpena Conservation District, the largest amount of forestland (71.1%) is owned by private non-industrial landowners. Corporations own 15.4 percent of the county's forestland, 12.4 percent is state or federally owned, while cities and townships own 1.1 percent. The forest industry on private lands contributes greatly to the overall economic well-being of Alpena County.

As can be seen by Table 4-20**,** predominant forest types in Alpena County are lowland hardwoods (ash, elm, soft maple and cottonwood) with 70,000 acres, lowland conifers (cedar, tamarack, black and white spruce and balsam) with 58,000 acres, and aspen/birch with 45,000 acres.

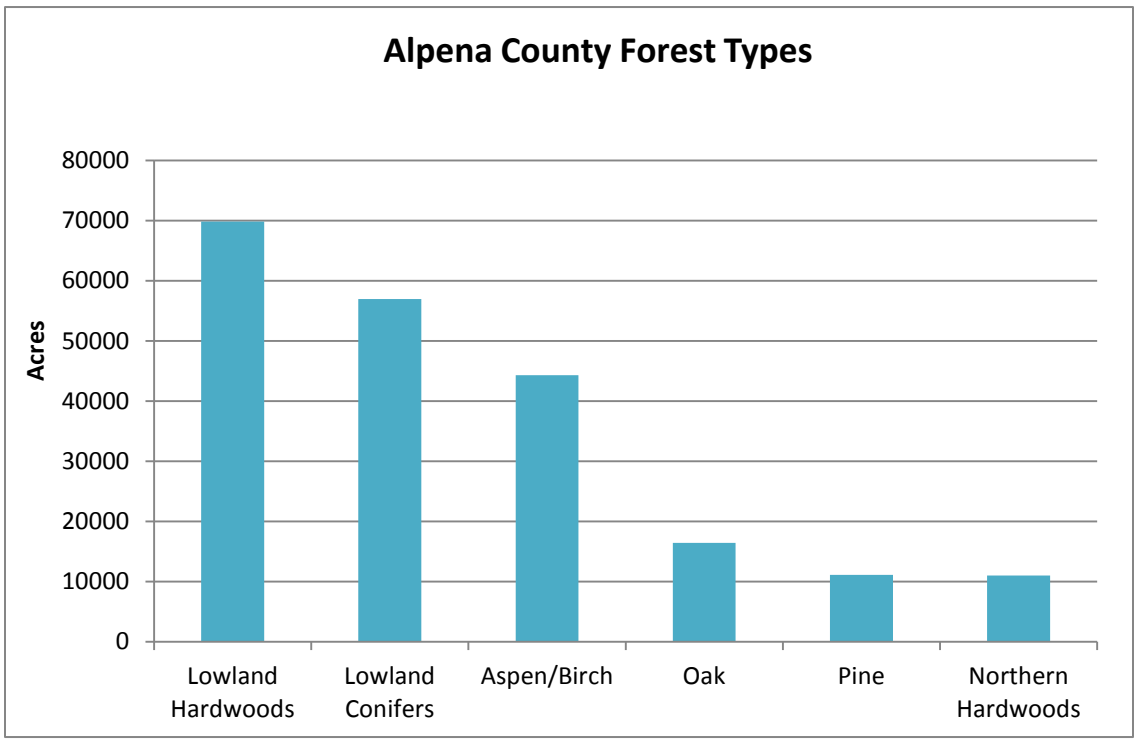

TABLE 4-20

MAJOR FOREST PESTS

Emerald ash borer (EAB), *Agrilus planipennis* Fairmaire, is an exotic beetle that was discovered in southeastern Michigan near Detroit in the summer of 2002 and is responsible for the death of approximately 20 million trees in the Lower Peninsula. The adult beetles nibble on ash foliage but cause little damage. The larvae (the immature stage) feed on the inner bark of ash trees, disrupting the tree's ability to transport water and nutrients, ultimately killing the trees in 3-4 years. The Michigan Department of Agriculture reports Alpena County as a Level I quarantined area. Level I represents that area of the state that is generally infested with EAB. The Michigan Department of Agriculture revised its quarantine in February 2011 which regulates the movement of EAB, ash trees, wood chips, and hardwood firewood.

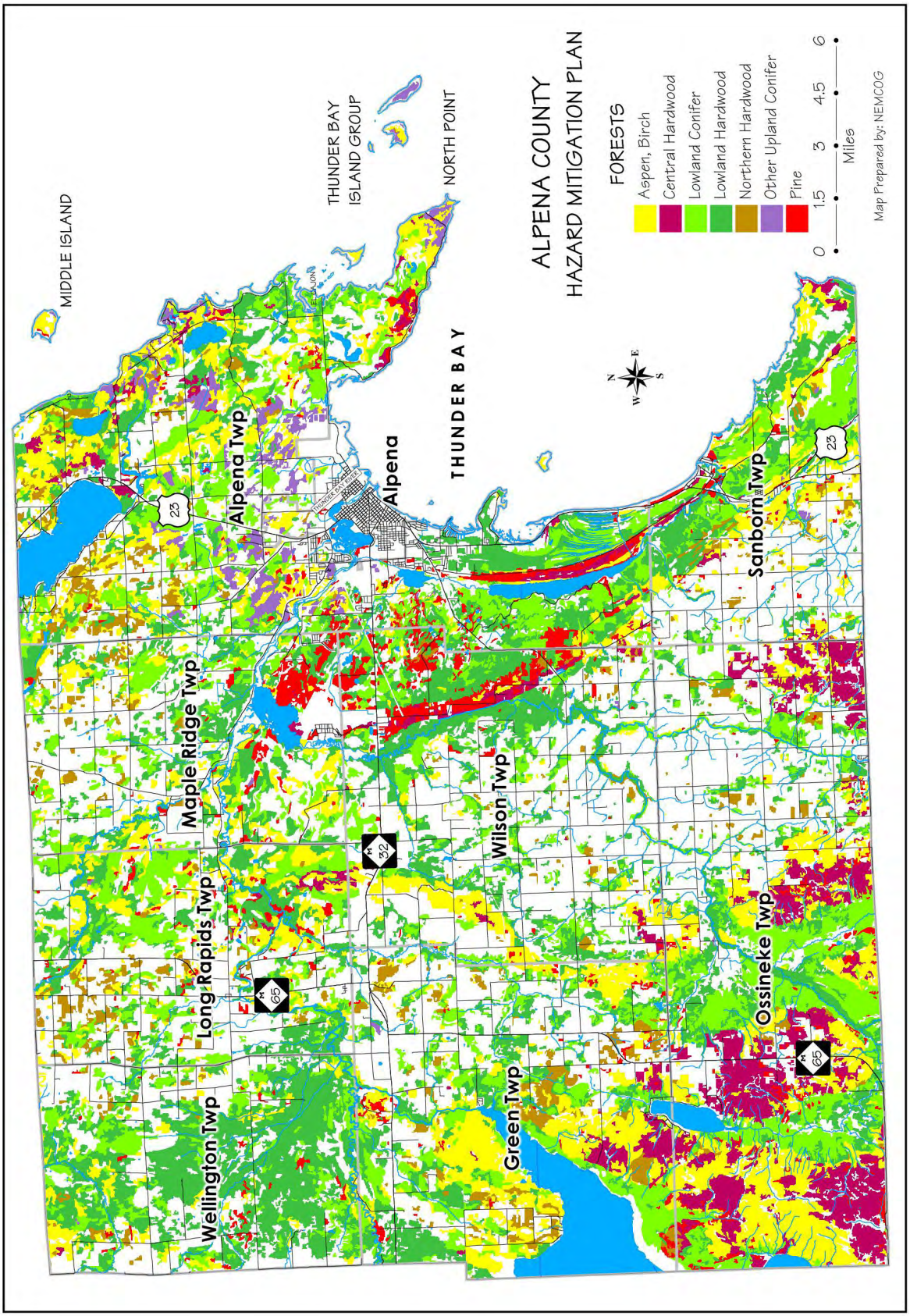
ALPENA COUNTY
HAZARD MITIGATION PLAN
FORESTS
Aspen, Birch
Central Hardwood
Lowland Conifer
Lowland Hardwood
Northern Hardwood
Other Upland Conifer
Pine
0 1.5 3 4.5 6
Miles
Map Prepared by: NEMCOG
MIDDLE ISLAND
THUNDER BAY ISLAND GROUP
NORTH POINT
THUNDER BAY
Alpena
Alpena Twp
Maple Ridge Twp
Long Rapids Twp
Wellington Twp
Green Twp
Wilson Twp
Ossineke Twp
Sanborn Twp
23
32
65

TABLE 4-21

AGRICULTURE

The United States Department of Agriculture maintains information on agricultural activities and prepares the U. S. Census of Agriculture. The 2007 and 2012 Census of Agriculture Reports were used to gain an understanding of the status and trends in agriculture. As can be seen in Table 4-22, the number of farms and acres farmed decreased from 2007 to 2012. However, the average farm size increased slightly. While the estimated market value of land and buildings (average per farm) decreased by $19,200 over the five year period, the estimated market value of machinery and equipment (average per farm) increased by $16,200. There was an increase in the number of small farms of 1-9 acres in size, but other size groups showed a loss in numbers.

Some positive trends include, even though there were fewer farms, the total market value of agricultural products sold actually increased between 2007 and 2012. As well, the market value of agricultural products (average per farm) and the net income (average per farm) increased. The number of farms with annual value of sales of $25,000 or greater increased between 2007 and 2012. Additionally, the number of farms, where the principal operator worked at farming full time, increased over the five year period. Table 4-22 compares the total market values of the important agricultural commodities in Alpena County. The market value of some commodities increased while others decreased.

In 1974, Public Act 116 (now known as Part 361, Farmland and Open Space Preservation, of the Natural Resources and Environmental Protection Act, P.A. 451 of 1994) was passed into state law to provide tax relief to farmers that agreed to keep their farms in substantially undeveloped condition. To qualify for the tax credit a farmer must enter into a "farmland development rights agreement" in which they agree to impose a restrictive covenant on the property that limits the development of the property for any uses other than the farming operation. The agreements stay with land and must last a minimum of ten years and may be renewed. Once an application is approved, the property owner would continue to pay property taxes as before, but any amount that exceeds 3.5 percent (reduced from seven percent in 2002) of the owners annual household income becomes a tax credit applied to the state income tax. If the credit is larger than the taxes owned, the balance is refunded to the owned by direct payment. Records from the Michigan Department of Agriculture and Rural Development show that Alpena County farms have 54 active agreements covering approximately 5,600 acres. There are also two pending agreements covering 154 acres at the time of this writing.

TABLE 4-22 AGRICULTURE IN ALPENA COUNTY		
Category	**2007**	**2012**
Farms (number)	573	458
Land in farms (acres)	85,947	69,274
Land in farms - Average size of farm (acres)	150	151
Land in farms - Median size of farm (acres)	79	80
Estimated market value of land and buildings (average per farm)	$387,180	$367,974
Estimated market value of land and buildings (average per acre)	$2,581	$2,433
Estimated market value of machinery and equipment (average per farm)	$66,222	$82,430
Farms by size - 1 to 9 acres	16	23
Farms by size - 10 to 49 acres	195	129
Farms by size - 50 to 179 acres	246	205
Farms by size - 180 to 499 acres	79	71
Farms by size - 500 to 999 acres	29	23
Farms by size - 1,000 acres or more	8	7
Total cropland (farms)	525	409
Total cropland (acres)	59,577	44,122
Total cropland - Harvested cropland (farms)	420	349
Total cropland - Harvested cropland (acres)	46,450	38,428
Market value of agricultural products sold	$21,458,000	$23,653,000
Market value of agricultural products sold (average per farm)	$37,449	$51,644
Total farm production expenses (average per farm)	$30,420	$45,944
Net farm income (average per farm)	$9,251	$9,258
Farms by value of sales - Less than $2,500	264	199
Farms by value of sales - $2,500 to $4,999	68	53
Farms by value of sales - $5,000 to $9,999	75	35
Farms by value of sales - $10,000 to $24,999	70	66
Farms by value of sales - $25,000 to $49,999	28	38
Farms by value of sales - $50,000 to $99,999	21	15
Farms by value of sales - $100,000 or more	47	52
Principal operator by primary occupation - Farming	217	227
Principal operator by primary occupation - Other	356	231
Crops, including nursery and greenhouse crops	$6,430,000	$9,507,000
Grains, oilseeds, dry beans, and dry peas	$3,835,000	$7,467,000
Corn	$1,166,000	$3,231,000
Wheat	$899,000	$1,078,000
Soybeans	$489,000	$2,415,000
Other grains, oilseeds, dry beans, and dry peas	$1,263,000	$697,000
Vegetables, melons, potatoes, and sweet potatoes	$182,000	$223,000
Fruits, tree nuts, and berries	$175,000	$162,000
Nursery, greenhouse, floriculture, and sod	$296,000	$216,000
Cut Christmas trees and short-rotation woody crops		$68,000
Other crops and hay	$1,912,000	$1,362,000
Poultry and eggs	$36,000	$27,000
Cattle and calves	$2,370,000	$2,091,000
Milk from cows		$11,784,000
Hogs and pigs	$43,000	
Sheep, goats, wool, mohair, and milk		$51,000
Horses, ponies, mules, burros, and donkeys	$129,000	$159,000
Source: The Census of Agriculture, United States Department of Agriculture, 2007 and 2012		

OIL & GAS WELLS

The Michigan Department of Environmental Quality reports that there are 1,595 oil and gas wells in Alpena County; most of those wells occur in Green, Wilson, and Ossineke Townships with a smaller portion occurring in Sanborn Township. The majority (872) are gas wells, which are producing. Table 4-23 is a summary of oil and gas wells in Alpena County. Table 4-24 is a map the shows oil and gas wells distributed around the county.

TABLE 4-23 ALPENA COUNTY OIL & GAS WELLS

Well Type	Number of Wells and Status
Brine Disposal Well	37-active, 2-plugged
Dry Hole	89-plugging approved, 1-unknown
Gas Condensate Well	2-plugging approved
Gas Well	872-producing , 16-plugging approved, 6-plugging completed, 13-temporarily abandoned
Brine Well	2-unknown
Lost Hole	5-plugging approved
Location only	416-terminated permit, 6-plugging approved, 5-permitted well
Test Hole	84-plugging completed, 39-unknown

Source: Michigan Department of Environmental Quality, 2018

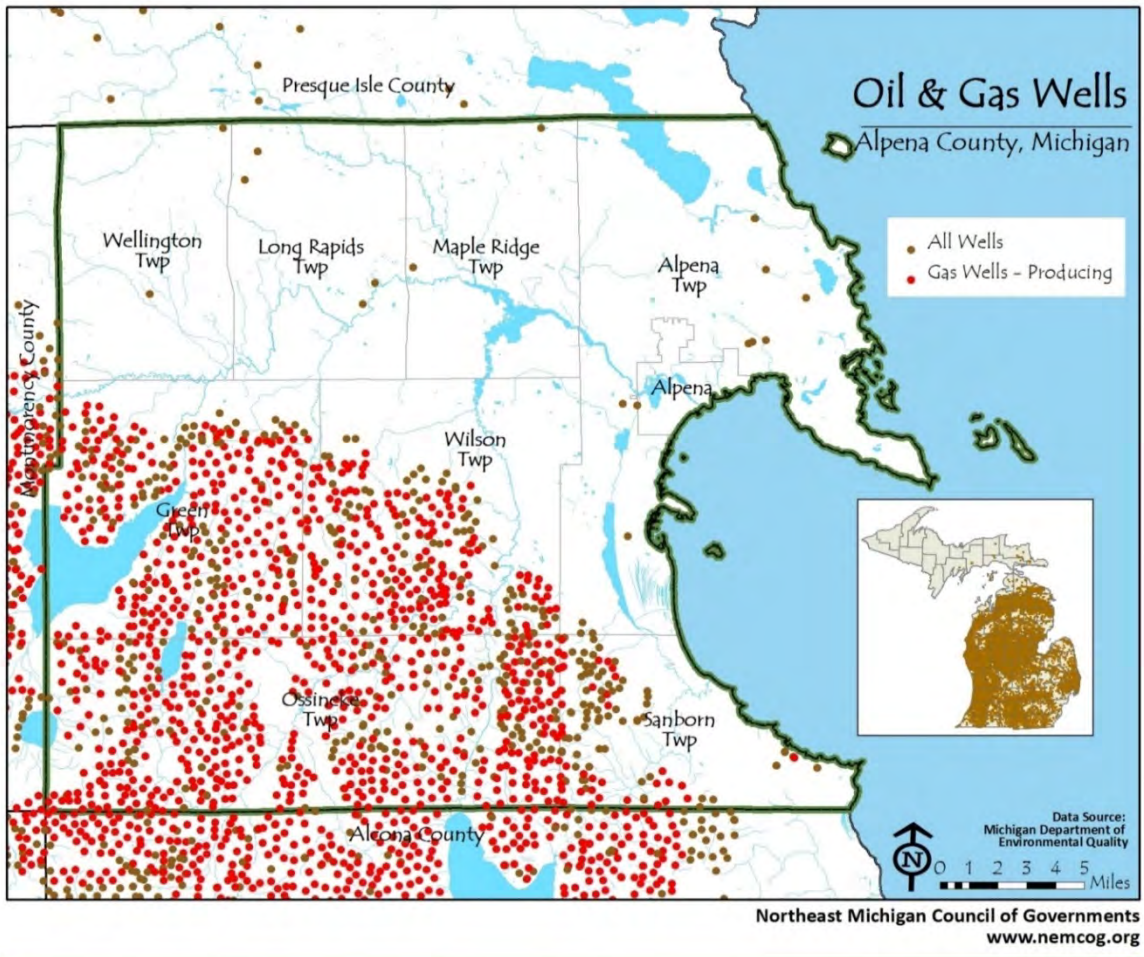

TABLE 4-24

SURFACE AND GROUNDWATER DISCHARGE PERMITS

All point source discharges into surface waters are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit which is issued by the Michigan Water Resources Commission upon recommendation by Michigan Department of Environmental Quality (MDEQ), Surface Water Quality Division. Permit requirements generally address discharge limitations, effluent characteristics, monitoring and reporting requirements, along with facility management requirements. Currently, there are 33 point-source discharge permit holders located in Alpena County (Table 4-9). Similar permitting requirements are enforced to control the discharge of pollutants into groundwater. There are two active groundwater discharge permits in Alpena County, see Table 4-9**.**

TABLE 4-25 GROUNDWATER DISCHARGE PERMITS

Site Name	Permit Number	Address	City	State	Zip Code
Lakeshore Estates MHP	GW1510284	8924 West Long Lake Road	Alpena	MI	49707
Team Elmers Alpena Quarry	GW1540048	3870 East Hamilton Road	Alpena	MI	49707

Source: Michigan Department of Environmental Quality

AIR QUALITY

Air Quality is monitored by the Air Quality Division of the MDEQ. Standards have been established as acceptable levels of discharge for any of the following air pollutants: particulate matter, sulfur dioxide, nitrogen dioxide, carbon monoxide, ozone, lead, and trace metals. These pollutants are monitored on a continuing basis at selected locations around the state. Monitoring in recent years has shown the level of pollutants in the region to be within the established acceptable standards.

Air discharge permits are required for businesses discharging more than the acceptable level of any of the regulated air pollutants. There are two Renewable Operating Permit (ROP) Air Discharge Permits issued in Alpena County. The ROP program is a national permitting system administered by each state. Each major source of pollution is subject to the program. A "major source" is a facility that is capable of emitting more than specific amounts of air contaminants.

- Decorative Panels International and American Process Incorporated, 412-416 Ford Avenue, City of Alpena, Permit # MI-ROP-B1476-2015a
- La Farge Midwest Inc. – Alpena Plant, 1435 Ford Avenue, City of Alpena, Permit # MI-ROP-B1477-2012c

TABLE 4-26 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS					
Site Name	**Permit Number**	**Address**	**City**	**State**	**Zip Code**
Alpena Biorefinery	MI0058997	PO BOX 337	ALPENA	MI	49707
Alpena Biorefinery	NEC186519	PO BOX 337	ALPENA	MI	49707
Alpena Co Regional Airport	MIS210266	1617 Airport Road	Alpena	MI	49707
Alpena CRC-Herron Rd HRRR	MIR115354	Herron Road	Lachine	MI	49753
Alpena CRC-Wolf Creek Rd	MIR115425	Wolf Creek Road	Hubbard Lk.	MI	49747
Alpena WWTP	NEC186477	210 Harbor Drive	Alpena	MI	49707
Alpena WWTP	MI0022195	210 Harbor Drive	Alpena	MI	49707
Ameri-Shred Ind Corp-Alpena	MIS210265	3490 US 23 North	Alpena	MI	49707
ATI Casting Service	NEC186337	615 McKinley Street	Alpena	MI	47070
ATI Casting Service LLC	NEC157933	615 McKinley Avenue	Alpena	MI	49707
Bay Mfg Corp-Alpena	MIS210264	3750 US 23 North	Alpena	MI	49707
Benjey North	NEC157645	108 East Herman Street	Alpena	MI	49707
Besser Co	MIS211043	801 Johnson Street	Alpena	MI	49707
Cheboygan Cement-Alpena BP	MIS210263	400 Commerce Drive	Alpena	MI	49707
Conveyor Systems Inc	MIS210710	167 North Industrial Hwy.	Alpena	MI	49707
Decorative Panels Intl-Alpena	MI0002500	416 Ford Avenue	Alpena	MI	49707
Federal Express Corp-APNA	NEC186537	2070 M-32 West	Alpena	MI	49707
Great Lakes Maritime Center	MIG250479	500 West Fletcher Street	Alpena	MI	49707
Lafarge-Alpena	MI0001988	1435 Ford Avenue	Alpena	MI	49707
Lees Auto Parts-Alpena	MIS220057	5221 US 23 North	Alpena	MI	49707
Nemroc Inc-Alpena	MIS210057	800 Bolton Street	Alpena	MI	49707
Nor-Tech Ind Corp-Alpena	MIS210385	3800 US 23 North	Alpena	MI	49707
Panel Processing Inc-Alpena	NEC157944	120 North Industrial Hwy.	Alpena	MI	49707
PCI	MIS210284	3810 US 23 North	Alpena	MI	49707
Quest Industrial Corp-Alpena	MIS210262	1995 Hamilton Road	Alpena	MI	49707
R E Glancy Inc-Alpena	MIG490152	3502 Wessel Road	Alpena	MI	49707
Ren-Tech Ind Corp-Alpena	MIS210277	3580 US 23 North	Alpena	MI	49707
Specification Stone Products	MIG490151	1009 Long Lake Avenue	Alpena	MI	49707
Specification Stone Products	MIS210998	1009 Long Lake Avenue	Alpena	MI	49707
Steel Craft Inc-Alpena	MIS210275	1086 East Hamilton Road	Alpena	MI	49707
Thunder Bay Tree Service LLC	MIG031060	1172 Halley	Alpena	MI	49707
UPS-Alpena	NEC157876	1847 M-32 W	Alpena	MI	49707
Via-Tech Corp-Lachine	MIS210468	11715 M-32 West	Lachine	MI	49753
Source: Michigan Department of Environmental Quality					

SITES OF ENVIRONMENTAL CONTAMINATION

The Michigan Environmental Response Act (Part 201 of PA 451 of 1994, as amended) provides for the identification, evaluation and risk assessment of sites of environmental contamination in the State. The Environmental Response Division (ERD) is charged with administering this law. A site of environmental contamination, as identified by ERD, as "a location at which contamination of soil, ground water, surface water, air or other environmental resource is confirmed, or where there is potential for contamination of resources due to site conditions, site use or management practices." The database has information for sites of environmental contamination (Part 201), Leaking Underground Storage Tanks (Part 213) and Baseline Environmental Assessments (BEAs). The BEA is completed when a property is purchased, leased or foreclosed on for the purposes of documenting contamination and protecting from liability for cleanup of existing contamination on the property. The Michigan DEQ online database was accessed to determine the number, types and location of site of environmental contamination. There are a total of 189 sites listed in the database. Table 4-27 is a summary of types in the County and Table 4-28 is a listing of all sites in the County.

TABLE 4-27 SUMMARY OF SITES OF ENVIRONMENTAL CONTAMINATION IN ALPENA COUNTY

Type	Number
Part 201	53
Part 213	41
Part 201 and 213	7
Part 201 with BEA	12
Part 213 with BEA	8
Part 201 and 213 with BEA	1
BEA	67

Source: Michigan Department of Environmental Quality

TABLE 4-28 ALPENA COUNTY CONTAMINATION SITES		
Facility Name	**Address**	**Data Source**
	311 Taylor Street	BEA
	2591 US-23 South	BEA
	1143 M-32 West	BEA
	2919 Garden Street	BEA
	815 West Miller Street	BEA
	819 & 821 W. Miller Street	BEA
1000 Highland Court	1000 Highland Court	Part 201
112 & 120 E. Herman St.	112 & 120 E. Herman St.	BEA
1135 West Chisholm St.	1135 West Chisholm Street	Part 201, BEA
120 W Washington Ave	120 W Washington Ave	BEA
1295 DeVere Dr.	1295 DeVere Dr.	Part 201, BEA
14771 Highway M-32	14771 Highway M-32	BEA
1499 M-32 West	1499 M-32 West	BEA
1615 M-32 West	1615 M-32 West	BEA
181 North Industrial Hwy.	181 North Industrial Highway	BEA
201 North Third Street	201 North Third Street	BEA
2229 US 23 South	2229 US 23 South	BEA
2585 US-23 South	2585 US-23 South	BEA
2591 US-23 South	2591 US-23 South	BEA
2707 Pearl Road	2707 Pearl Road	Part 201, BEA
310 N 2nd Ave and 123 Water St	310 N 2nd Ave and 123 Water St	BEA
324 North 11th Avenue	324 North 11th Avenue	Part 201
401 Oxbow Drive	401 Oxbow Drive Unit 5 - Oxbow Commercial Village	BEA
4170 US-23 South (Former Scrap Yard)	4170 U.S.-23 South	Part 201, BEA
4174 US-23 South (Former Fisher Recycling)	4174 US-23 South	Part 201
500 Palm Street	Huron Industrial Park 500 Palm Street	Part 201, BEA
610 S. Third Avenue Heating Oil Release	610 S. Third Avenue	Part 201
633 W. Campbell Street	Former Alpena Flour Mill	BEA
718 West Campbell Street	718 West Campbell Street	BEA
Abandoned Drum on Behning Road	north end of Behning Road	Part 201
Abitibi-Price Corp	416 Ford Avenue	Part 201
Action Auto Stores, Inc	US-23 South	Part 213
Admiral Petroleum #166	906 W Washington	Part 213
Admiral Petroleum #167	2520 US Hwy 23 South	Part 213
Alpena Airfield Area PFAS	M-32 West of Alpena	Part 201
Alpena Area Wide SAF	several sites - each scored separately	Part 201
Alpena City Highway Garage	615 W Campbell St	Part 213

Alpena County Regional Airport	AIRPORT ROAD RTE 6	Part 213
Alpena County Road Commission	1400 N Bagley St	Part 213
Alpena County Sheriffs Dept	320 Johnson St	Part 213
Alpena EZ Mart	1035 W Chisholm St	Part 213
Alpena Hide and Leather Company	817 and 819 West Miller Street	Part 201
Alpena Holiday Inn Express	225 River St	Part 213
Alpena LF City of	M-32 (3.3 miles west of Bagley St)	Part 201
Alpena Manufacturing	2919 Garden St.	Part 201
Alpena Oil Campbell Street	620 West Campbell	Part 201
Alpena Oil Co Inc	235 Water St	Part 213
Alpena Public Schools - Bus Garage (213)	1357 M-32 West	Part 201
Alpena Resource Recovery c/o NEMCOG	4344 M-32 west	Part 201
Alpena Riverfront Area	several sites - each scored seperate	Part 201
Alpena South E-Z Mart	2222 US-23 South	Part 213
Alpena Third & River	Third & River Streets 225 River Street (address was 201 N 3rd	Part 201
Amerilodge Group	225 River St	BEA
Beavers Automotive & Radiator Repair Inc	600 N Ripley Blvd	Part 213
Bob-A-Lu Market	10010 Werth Road	Part 213, BEA
Brown Jug Party Store	1256 Long Rapids Rd	Part 213
Cap & Bottle Store	525 S State Ave	
Cap and Bottle Party Store	525 South State Street	Part 213BEA
Carter Street Right of Way	Between Second & Third Ave	Part 213, BEA
Cathro Auto Parts	5436 Cathro Rd.	Part 201
Chippewa Drive Fuel Oil Release	10303 Chippewa Road	Part 201
Chroninger's Radiator & U-Haul	2389 US-23 South	Part 201, BEA
City of Alpena Marina	400 E Chisholm St	Part 213, Part 201
Cliff Anschuetz Chevy/old/nissan	1074 Us Highway 23 N	Part 213
Commercial Parcel	2313 US 23 South	BEA
Consumers Energy (Former MGP)	730 State Street	Part 201
Country Party Store	3074 M 32 W	Part 213
Cramer, Inc.	12990 West M-32	BEA
Deckside Marina	9027 West Long Lake Road	BEA
Diamonds Point Self Service	2404 US-23 South	Part 213
Downtown Union 76	201 E Chisholm St	Part 213
Dunkin Donuts	2591 US Highway 23 S	Part 213
Dunkin Donuts (HAC)	2585 US Hwy-23 South	Part 213, BEA
E-Z Way Store Inc	2060 M-32 W	Part 213
Eastside 65 Truck Stop	12990 M-32	Part 213
First of America Bank - Alpena	2329 US 23 South	Part 201
Fisher Recycling	4174 US-23 South	BEA

Former Action Auto	2229 US 23 South	BEA
Former Alpena City Garage	615 W. Campbell Street	BEA
Former Alpena Collision	305 North Ninth Avenue	Part 201, BEA
Former Alpena Flour Mill	633 West Campbell Street	Part 201
Former BBi Enterprises, LP	820 West Long Lake Avenue	BEA
Former Bob-A-Lu Market	10010 Werth Road	BEA
Former Cap and Bottle Party Store	525 South State Sreet	BEA
Former Chroninger Radiator & U-Haul	2389 US-23 South	BEA
Former D & M Railroad Property	122, 124, 130, 220 & 224 W. Fletcher St.	BEA
former ERB Lumber Company	2633 US-23 South	BEA
Former Fletcher Paper Company	318 W. Fletcher Street	Part 201, BEA
Former Floyd Minton Cedar Post Co.	2800 & 2806 Floyd Lane	BEA
Former Freese Hydraulics	324 North 11th and 325 North 11th Ave	Part 201
Former Kurvan's Party Store South	612 S Ripley Blvd	Part 213
former MDOT property	420 West Campbell Street	BEA
Former Summit Sports	224 East Chisholm Street	BEA
Former Thunder Bay Manufacturing	666 McKinley Avenue	BEA
Former Werth Dry Cleaners Property	901 W. Chisholm Street	Part 201, BEA
Former Yockey Construction Co. Property	1499 M-32 West	BEA
Francis Service Station	11923 US 23	BEA
Freese Hydraulics Property	324 North 11th Avenue & 325 North 10th Avenue	BEA
Fuel OIl Release Hiawatha Lane	10344 Hiawatha Lane	Part 201
Garants Office Supplies & Print	117 W Washington Ave	Part 213
Gorski Property	117 South Ripley Street (T31N, R8E, Section 23)	BEA
Great Lakes Maritime Heritage Center	500 W. Fletcher St.	BEA
H & N Kurvan's	1141 Highway US-23 North	BEA
Harborside Mall	100-190 North State Avenue	Part 201,BEA
Holiday Station #177	2270 US-23 South	Part 213, BEA
Homant Oil Property	1010 Long Lake Avenue	BEA
Hubbard Lake Garage	13833 Hubbard Lake Rd	Part 213
Hubbard Lake General Store	6914 Hurbert Rd	Part 213
Huggler Oil Co	930 W Washington Ave	Part 213, Part 201
Huron Oil Ideal BP Property	1035 West Chisholm Street	BEA
Jason's Posen Quick Stop	10706 Michigan Ave	BEA
Jerry Duby Excavating	9883 M-32	Part 201
Jim Taylor	5571 M-65 North	Part 213
JRs Country Store and Liquor	14471 M 32 W	Part 213
Kihns Superette	8042 Wolf Creek Road	Part 213, Part 201
Komatsu America Corp.	181 N. Industrial Highway	BEA
L & K Sunoco	9975 US-23 South	Part 201, Part 213

L & M Salvage	10628 Ossineke Rd	Part 201
Lafarge Corporation	1435 Ford Avenue	Part 201
Lake State Railway	1002 Long Lake Avenue	Part 201
Lancewicz Dump	4197 Long Lake Road	Part 201
Larry & Norma Schultz	12010 Wolf Creek Rd	Part 213
Lee Parcel	1143 M-32 West	BEA
Lee's Auto Parts	5221 US-32 North	Part 201
Long Lake Super Market	9538 W. Long Lake Road	Part 201, Part 213
Lynn Drive Alpena County	1055 Lynn Drive	Part 201
Maple Ridge Twp. Disposal	5558 Lacomb Rd.	Part 201
McAnsh Property	523 South State Street	BEA
MI Stop LLC	1141 US-23 North	Part 213
Midas Muffler & Brake Shop	901 West Washington Avenue	Part 213, BEA
Middle Island Light Station	Middle Island	Part 201
National Gypsum Company	T 31N R8E, Section 24 Tax ID# 04-091-024-000-256-00	Part 201, BEA
Ninth Street Warehouse	9th Street Warehouse	Part 213
NOAA (part of Former Fletcher Paper)	500 West Fletcher Street	Part 201
Northland Market	9010 M-65 South	Part 201, Part 213 BEA
Opechee Inc	9621 US Highway 23 N	Part 213
Ossineke Industries	10401 Piper Road	Part 201
Ossineke Sport & Party Inc	11923 US Hwy-23 South	Part 213
Oxbow Commercial Village	301 Oxbow Drive Units 2, 3, 4, prospective Unit 5	BEA
Oxbow Commercial Village Condominiums	Maas Development Property-Units 6, 7 & 8 Pinecrest Street	BEA
Oxbow Commercial Village Condos #6,7,8	300 Oxbow Drive (Turning Brook)	BEA
Oxbow Park	T31N-R8E, Section 16 NW 1/4 of the SW 1/4	BEA
Oxbow Park	off Pinecrest	Part 201
Partridge Point Marina	1105 Partridge Point Rd	Part 213
Perry Oil Co. Campbell	634 West Campbell Street	Part 201
Perry Oil Co/alpena Bulk Plant	634 W Campbell St	Part 213, BEA
Phelps Collins A N G Base	Airport Rd	Part 201
Pilarski Parcel	1275 M-32 West	BEA
Proposed 7-11 Store #36916 Garb-Ko 85	650 North Ripley Blvd	BEA
Quick & Convenient Store	7120 Hurbert Rd	Part 213
R.A. Townsend Co	1100 N Bagley St	Part 213
Reynolds Residence Fuel Spill	15027 Third Street	Part 201
Richardson Auto Repair	13775 Hubbard Lake Rd	Part 213
Scheuner Construction Dump	Wessel Road	Part 201
Schultz's Market and Gas - Part 213	12010 Wolf Creek Road	Part 201

Second Avenue Former Salvage Yard	Second Avenue NE of Herman Street	Part 201, BEA
Seymours Grocery	8943 US Highway 23 N	Part 213
Shallas Service Station	326 Long Lake Ave	Part 213
Sodium Borate Disposal	Dubey Gravel Pit Corner of Weiss and Wessel Roads	Part 201
Sparkle Mart North	906 and 912 W. Washington Avenue	BEA
Sparkle Mart North/Admiral Store	906 West Washington St	BEA
Sparkle Mart South	2520 US-23 South	BEA
Spruce Road Dump	Spruce Road	Part 201
Standard Oil Company (Former)	324 North 11th Ave & 325 North 10th Ave	Part 201
Stockade General Store	6153 Us Highway 23 N	Part 201, Part 213
Summit Sports	224 E Chisholm St	Part 213
Summit Sports - Part 213	224 East Chisholm Street	Part 201
SWATT, LLC	615 W. Campbell St.	BEA
Tandem Transport	5 Wood Street	Part 201
The Barn	11904 Us Highway 23 S	Part 201, Part 213
The Former Barn	11904 & 11924 US-23 South and adjoining vacant parcel to west	BEA
Third Avenue Soil Piles	Third Avenue	Part 201
Thunder Bay Island USCG	US Coast Guard Station	Part 201
Thunder Bay Manufacturing	666 McKinley Ave.	Part 201
Thunder Bay River Heating Oil Release	2050 Riverview Drive	Part 201
Total # 2587	2140 State Street, Lot 5	Part 213, BEA
Trans Auto Glass & Company, Inc.	421 West Miller Street	BEA
Transfer Station Parcel	1298 US 23 North	BEA
Transportation Garage	1357 M032 WEST	Part 213
True Van	620 Ripley	Part 213
Turning Brook	300 Oxbow Drive Units 6, 7 & 8	BEA
Turning Brook	300 Oxbow Drive	BEA
Tuttle Street	132 Tuttle	Part 201
Union Oil	235 West Chisholm	BEA
Unit 1 - Oxbow Commercial Village	101 Oxbow Drive	BEA
W Washington Avenue Heating Oil Release	538 W. Washington Avenue	Part 201
Wayne Kowalski	102 MASON	Part 213
Wessel Road Quarry	Wessel Road	Part 201
West Miller Street Property	817 W Miller St	BEA
What Not Shop Heating Oil Release	4307 US 23 S	Part 201
Source: Michigan Department of Environmental Quality		

Chapter 5 EXISTING LAND USE

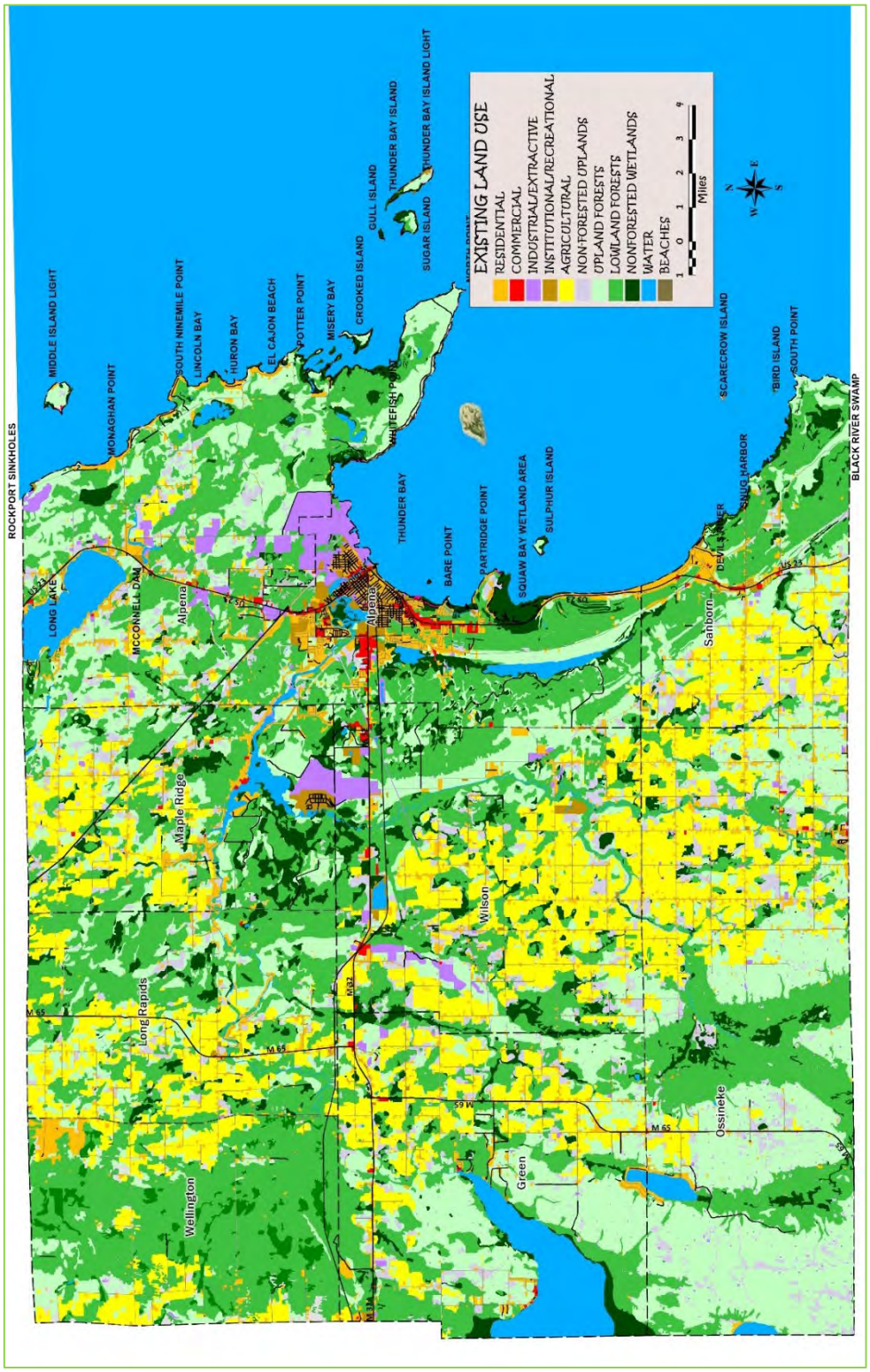

FIGURE 5-1 EXISTING LAND USE MAP

EXISTING LAND USE CHARACTERISTICS

Existing land uses are shown on the county map (Figure 5-1 Existing Land Use MapError! Reference source not found.), illustrating the distribution of land uses throughout the County. Michigan Resource Information Systems (MIRIS) land cover/use classification categories were used to map the existing land use. Land use map data was acquired from several community master plans developed over the past 10 years. Where not available from local sources, MIRIS data was acquired from the State of Michigan. Utilizing a computer mapping system or Geographic Information System (GIS) the MIRIS maps were updated with 2018 digital color infrared aerial photographs acquired from the USDA. Ancillary digital data including parcels, hydric soils, national wetlands inventory, and 2014 color aerial photographs were used to refine the maps. The updated digital information was utilized to produce the existing land use map (Figure 5-1 Existing Land Use Map) and statistics. Table 5-1 presents the area of the County according to the land uses, with number of acres and percent of the County in each of the land use categories. Each of the land use categories is discussed later in this chapter.

TABLE 5-1
Existing Land Use Characteristics

Land Use	Acres	Percent
Residential	22,718	5.8%
Commercial	1,709	0.4%
Industrial/Extractive	6,201	1.6%
Institutional/Recreational	2,285	0.6%
Agricultural	60,051	15.3%
Upland Open Areas	22,059	5.6%
Upland Forests	92,558	23.6%
Lowland Forests	143,367	36.6%
Non-Forested Wetlands	26,906	6.9%
Beaches	498	0.1%
Water	13,377	3.4%

Source: NEMCOG Update 2019

RESIDENTIAL

Residential land use includes residential dwelling structures such as: single family or duplexes, multi-family low-rise residential, multi-family medium & high rise residential, and mobile home parks. The total residential land use in Alpena County is approximately 22,718 acres or 5.8 percent of the County. By far the largest concentration of residential development is located in the City of Alpena and around its periphery in Alpena Township. Smaller concentrations of residential development are found around the community centers of Ossineke, Hubbard Lake and Lachine. Some waterfront areas have high concentrations of residential development, which are a combination of new development and the transition of seasonal cabins to year-round homes. Almost all of the shoreline of Long Lake in Alpena County has some residential development. Long Lake, Sunset Lake, Lake Winyah, Beaver Lake and portions of the Thunder Bay River have a concentration of residential development. Several portions on the Lake Huron shoreline have also been residentially developed. At the interior of the County, residential development is occurring along county roads as larger parcels are split into ten-acre and smaller parcels.

COMMERCIAL

The commercial land use category includes classifications related to the sale of products and services such as: central business districts, shopping centers/malls, strip commercial, and neighborhood compact groups of stores that are surrounded by noncommercial uses. This category includes parking areas related to the commercial businesses. According to the land use map, the total commercial land use in

Alpena County is approximately 1,709 acres or 0.4 percent of the County. Commercial uses are primarily found in the City of Alpena, along M-32 and U.S. 23 north and U.S. 23 south in Alpena Township and in Sanborn Township in the unincorporated community of Ossineke. Small nodes of commercial uses can be found scattered throughout the County, located at primary crossroads and in the unincorporated community of Hubbard Lake. These establishments are generally convenience commercial stores that cater to local residents and tourists.

INDUSTRIAL/EXTRACTIVE/TRANSPORTATION

Industrial land use includes extractive industries, manufacturing and industrial parks, light industries that fabricate or package products, oil & gas drilling and production facilities, lumber mills, chemical plants, brick-making plants, large power facilities, waste product disposal areas, areas of stockpiled raw materials, and transportation facilities. The total industrial/extractive/transportation land use in the County is approximately 6,201 acres or 1.6 percent of the County. Much of the industrial land use is comprised of the Lafarge Corporation quarry and cement processing facility. Other large areas of industrial uses include the Alpena Regional Airport and various gravel pits throughout the townships.

INSTITUTIONAL/RECREATIONAL

This category includes institutional uses such as churches, schools, museums, hospitals, cemeteries, public buildings, military facilities, and recreational facilities. Institutional and recreational uses are fairly well distributed throughout the County. However, large areas are found within the City of Alpena (various schools, multiple parks, and Alpena Community College) and in Maple Ridge Township (military).The total area in this land use is 2,285 acres or 0.6 percent.

AGRICULTURAL

The agricultural land use category generally includes land that is used for the production of food and fiber, but also includes land used for non-food livestock such as horses. These classes are: cropland, orchards, confined feeding operations for livestock of any kind, permanent pasture lands, farmsteads, greenhouse operations, and horse training areas. The total agricultural land use in Alpena County is approximately 60,051 acres or 15.3 percent. The majority of the agricultural uses are found, not surprisingly, in the prime agricultural soils that generally bisect the County from the northwest to the southeast. Wilson Township (13,843 acres), Ossineke Township (11,415 acres), Green Township (8,710 acres) and Long Rapids (8,171 acres) have the largest amount of land being used for agricultural purposes.

NON-FORESTED UPLAND

Non-forested upland includes “open land” and rangeland classifications such as barren land, herbaceous open land, and shrub land. Herbaceous open land is usually subjected to continuous disturbance such as mowing, grazing, or burning, and typically it can have a variety of grasses, sedges, and clovers. Shrub land is land in transition from being open to becoming an eventual forest. There are native shrubs and woody plants like blackberry, dogwood, willow, sumac, and tag alder. The non-forested uplands in the County total approximately 22,059 acres or 5.6 percent of the County. Much of the non-forest land is found in the active farming belt mentioned above and consists of abandoned farms. Other areas may be the result of turn of the century logging operations or reclaimed mining areas. Typical grass species found in these areas are quack grass, brome grass, upland and lowland sedges, red canary grass and clover. Typical shrub species found include blackberry and raspberry briars, dogwood, willow, and sumac and tag alder.

UPLAND FOREST

Forestland use areas are generally at least ten percent stocked by trees of any size. The upland forest category includes upland hardwoods like maple, beech, basswood, red oak, aspen and birch; upland

conifers such as red, white or jack pine, white spruce, blue spruce, eastern hemlock, and balsam fir. Upland forest in the County is approximately 92,558 acres or 23.6 percent of the land area. Large areas of upland forest can be found in the western portion of Ossineke and Green Townships.

LOWLAND FOREST

Lowland forest areas are dominated by species that grow in very wet soils. Lowland hardwoods include ash, elm, red maple and balsam poplar. Lowland conifers include cedar, tamarack, balsam fir, black and white spruce. Lowland forest is the largest land use in the County with approximately 143,367 acres or 36.6 percent of the land area. Large uninterrupted areas of lowland forest can be found in Wellington and Long Rapids Townships. In addition, the eastern portion of Sanborn Township and large areas of Alpena Township are dominated by lowland forest.

NON-FORESTED WETLANDS

Wetlands are those areas where the water table is at or near the land surface for a significant part of most years. Examples of wetlands are marshes, mudflats, wet meadows, shrub/scrub swamps, shallow areas along rivers or lakes or ponds. The wetland category in Alpena County is approximately 26,906 acres or 6.9 percent of the County. Wetlands are found throughout the County along river systems but are especially concentrated in the southern portion of Maple Ridge Township and coastal lake plain areas of Alpena and Sanborn Townships.

BEACHES

Beaches along the Lake Huron were delineated on the land cover use map. The width and therefore acreage of beaches can vary greatly, depending upon the rise and fall of Lake Huron. For example, in the first decade this century water levels were well below average and therefore beaches covered a much larger area. Lake levels have rebounded and in summer of 2019 water levels have reached record highs, which in turn equates to less beach area along the coastline. There are a range of beach types, which include sand, cobble stones and bedrock. Nearly 500 acres or 0.1 percent are identified as beaches. With fluctuating water levels of Lake Huron, the amount of beach area will vary depending upon water depths.

SURFACE WATER

The surface water category includes areas such as lakes, reservoirs, impoundment's, ponds, rivers, and streams. Surface water in the County is approximately 13,377 acres or 3.4 percent of the County. Fletcher Pond, Long Lake, Lake Winyah, Devils Lake, Beaver Lake, Turtle Lake, Grass Lake, Middle Lake, Sunset Lake and the three branches of the Thunder Bay River comprise the majority of the surface water in the County.

Chapter 6 COMMUNITY GOALS AND OBJECTIVES

Chapter 7 FUTURE LAND USE RECOMMENDATIONS

Chapter 8 IMPLEMENTATION AND ADOPTION