

CHAPTER 3 PHYSICAL CHARACTERISTICS

It is important to begin an assessment of the community with a description of its physical characteristics. This chapter presents a description of the climate, geologic features, topography, soils, water resources, fish and wildlife, wetlands and woodlands.

Climate

Climate is a factor which contributes to Alpena Township's appeal as a place to live and recreate. Alpena Township's climatic conditions are similar to those across Northern Lower Michigan, long cold winters and moderate warm summers. However, the proximity to Lake Huron serves to moderate temperature extremes in comparison to inland communities. Because of lake effect, the Township typically experiences the first frost four to six weeks later than inland in communities like Gaylord or Atlanta. The average date of the first killing frost for the Alpena area in the fall is October 4. The Great Lakes tend to cool the air in the spring and early summer, while fall and early winter tends to be warmed.

The Midwest Climate Data Center in Champaign, Illinois has collected weather data from 1971 to 2012 for locations across the central United States. The annual climate summary of the Alpena Township area is summarized in **Table 3-1**. The climate information was recorded from a weather station located at Alpena Wastewater Treatment Plant in the City of Alpena.

The mean annual temperature for Alpena is 43.8° F. The lowest one-day temperature on record is minus 37° F on February 18, 1979. The highest recorded summer temperature is 106° F on June 20, 1995, July 7, 1988, and August 25, 1948. The average annual precipitation, including melted snowfall, is 29.88 inches. The average annual snowfall is 56.0 inches.

Table 3-1 Average Annual Weather Statistics, Alpena, Michigan, 1971-2000	
January average minimum temperature	12.0° F
January average maximum temperature	26.7° F
July average minimum temperature	59.4° F
July average maximum temperature	76.7° F
Mean temperature for the year	43.8° F
Average annual precipitation	28.43 inches
Average annual snowfall	56.0 inches
Source: Midwestern Regional Climate Center, Weather Reporting Station at Alpena Wastewater Treatment Plan, MI.	

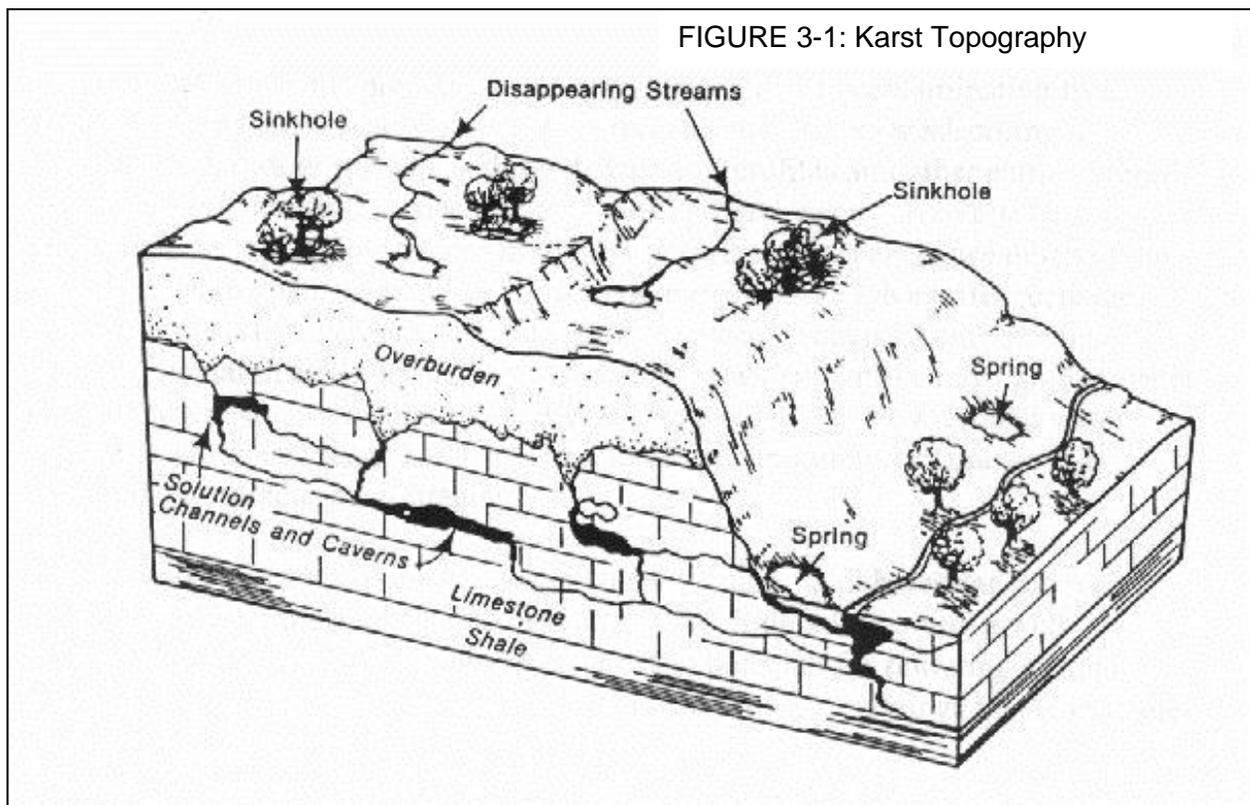
Bedrock Geology

The bedrock underlying the area was formed from ancient seas which covered the area approximately 400 million years ago (Middle and Upper Devonian Series of the Paleozoic Era). These shallow marine seas deposited layers of silt, clay, organic debris, and calcareous skeletal remains of marine life.

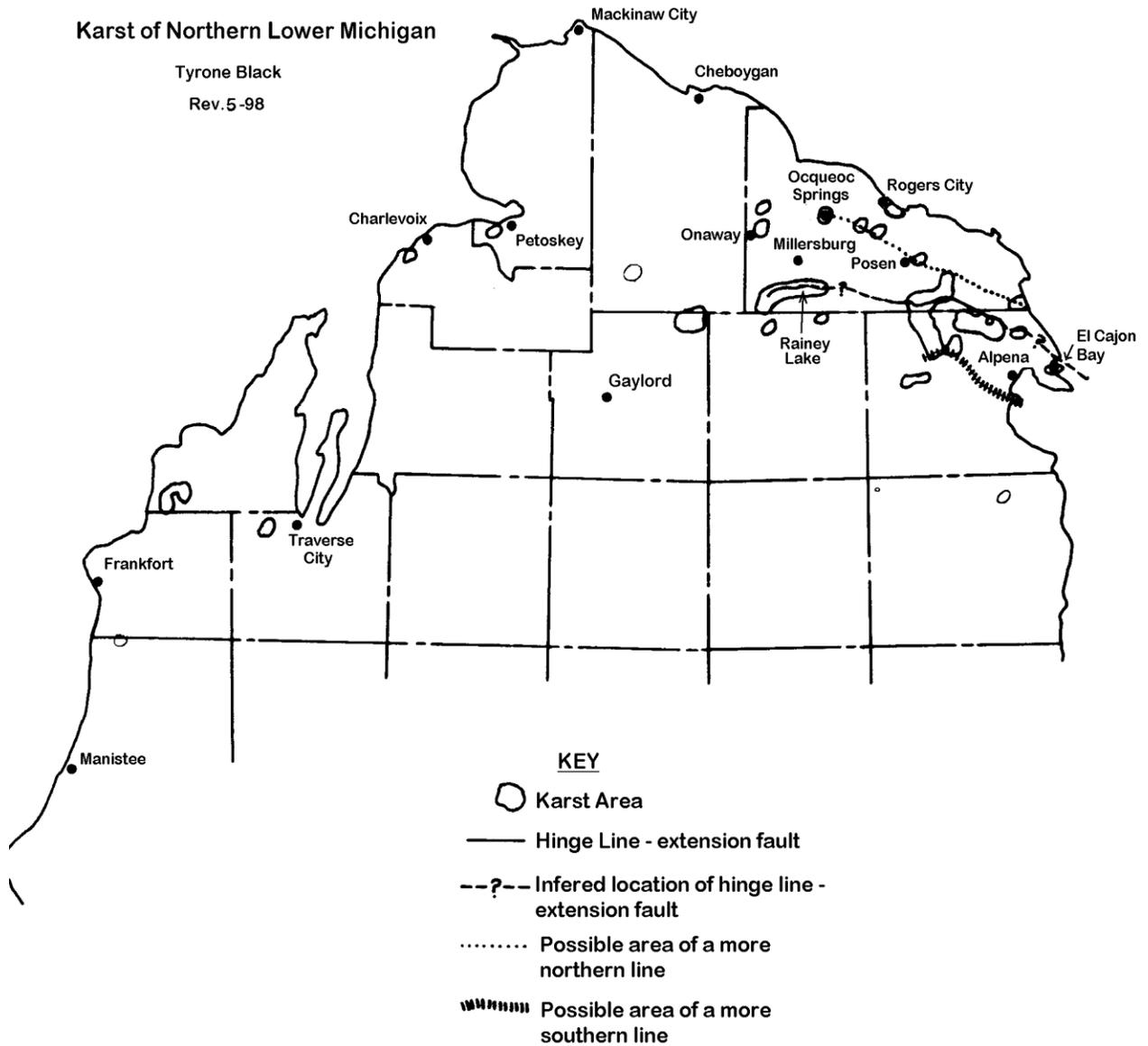
The geologic composition of Alpena Township is representative of conditions along the Wisconsin and Michigan Great Lakes shorelines in terms of bedrock and glacial deposits. Bedrock in the northern portions of the Township consists of limestone, which Lafarge Corporation actively mines along the Thunder Bay shoreline. Antrim shale makes up the bedrock in the southern section of the Township.

One important feature of the regional bedrock is the occurrence of sinkholes and underground streams. As groundwater flows through cracks and fissures in the bedrock, the limestone gradually dissolves, and the openings are widened. Over a long period of time underground caverns form and the ceilings become thinner. The ceiling collapses when it becomes too thin to support the weight above, thus forming a sinkhole. "Karst" is the scientific term used to describe a type of topography that is formed over dissolved limestone, dolomite, or gypsum and is characterized by sinkholes, cave, and underground drainage. Karst is also a term used to describe a very distinct terrain as well as the process by which it formed. **Figure 3-1** illustrates how a typical limestone sinkhole is formed.

Karst features are present in several northern Michigan counties, but are most prevalent and have the greatest number of exposed features in Presque Isle and Alpena Counties. As **Figure 3-2** shows, the northeastern portion of Alpena Township exhibits karst features. Several sinkholes, most of which are on private property, are located in the area south of Long Lake.



**Figure 3-2
Surface Karst and Hinge Line Location Map
Northern Michigan**



Divers have located a karst fed spring in Lake Huron's El Cajon Bay. The bay itself is formed by two sinkholes, and the spring outlet enters the bay at the northwest shore. Reports of sightings of unpigmented fish in the passage have been noted. As can be seen in **Figure 3-2**, geologists believe that a hinge-line fault, serving as a pathway for subterranean drainage, interconnects several sinkholes and sinkhole controlled lakes before emptying into Lake Huron at El Cajon Bay.

In addition to providing an interesting geographic feature, sinkholes also can host unusual plant communities. The relatively moist terrain with bedrock at or near the surface and the partially subterranean shaded location provide an environment, which sustains vegetation not found in the surrounding surface areas.

Sinkhole areas are often especially vulnerable to pollution. Over the years sinkholes have been used as dump areas. The accumulation of refuse is especially dangerous, because of the direct connection to the groundwater, which usually exists in a sinkhole. One particular sinkhole clean-out project netted eight automobiles, three snowmobiles, a 250-gallon fuel oil tank, and several tons of other metal materials, along with a large amount of household trash. Local action to protect and preserve sinkholes is recommended both on account of their scenic value and as a groundwater quality protection measure.

Surface Geology

The surface geology of Alpena Township is mainly composed of Lacustrine clay and silt laid down on the bottom of glacial Lake Huron, when the lake was much larger than at present. Spotted areas of dune sand occur along the shoreline and inland around Thunder Bay, relics of glacial age shorelines which were abandoned as the waters receded.

Devil's Lake in the southern portion of the Township was formed by the process of glacial lake recession. Sand dunes along the newly abandoned shorelines blocked inland surface drainage from reaching Lake Huron. The trapped water eventually formed Devil's Lake, whose elongated crescent shape is testimony to the region's glacial history.

Parallel to Devil's Lake lie a series of alternating sand dunes and wet swales, also left by glacial age lake recession. The corresponding alteration of dune vegetation with interspersed wetlands is a nature-lovers delight, highlighting significant geographic and ecological resources.

Topography

Alpena Township's topographic features show only minimal variation. The approximate mean lake elevation of Thunder Bay is 580 feet above sea level, with the elevation in the City of Alpena ranging from 590 feet to 600 feet. For reference, a topographic map can be seen as **Figure 3-3**.

The elevation of the Township increases slightly in the northwesterly direction, ranging from a low of 600 feet to a peak of 750 feet. The mean lake elevation of Long Lake in the northwest portion of the Township is 649 feet above sea level.

In the northeastern portion of the Township, the elevation varies from 600 feet to 680 feet with wetlands dispersed throughout the forested regions. Located in the northeast portion of the City of Alpena and just outside the city boundary is a large pit used in the limestone mining operations of Lafarge Corporation. In Alpena Township, the quarry comprises nearly all of

Section 13 of T31N-R8E. The pit has been excavated to an elevation of 520 feet or 60 feet below the mean lake elevation of Thunder Bay and 80 feet below the surrounding surface elevation.

The elevations in the southern part of the Township are generally lower than the northern section, with the lowest elevation noted along Lake Huron's Squaw Bay. The highest elevation of 750 feet can be noted in a very small area in the southwestern corner of the Township.

Soils

Soil characteristics help to define the land's capacity to support certain types of land uses. Soils most suitable for development purposes are well drained and are not subject to a high water table. Adequate drainage is important to minimizing stormwater impacts and the efficient operation of septic drainfields. Adequate depth to the water table is necessary to prevent groundwater contamination from septic systems or other non-point source runoff. 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.

Figure 3-4 illustrates specific soil conditions, which may pose constraints to building construction. The map shows hydric or wetland type soils scattered throughout the Township and in areas generally adjacent to the certain water bodies such as Mud/Sunset Lake, Devil's Lake, and Squaw Bay. Some of these areas may be considered unbuildable. Hydric soils cover more than 25,000 acres in Alpena Township. Although very limited, soils with slopes greater than six percent are noted on the map, because they may present development challenges.

While soil condition information discussed in this report can be used for general guides for the planning process, it should not be used for development of specific sites. More detailed soil and vegetation information for specific sites may be obtained from *Soil Survey of Alpena County, Michigan* by contacting the Natural Resources Conservation Service for Alpena County.

Woodlands and Wetlands

In addition to the scenic characteristics of woodlands, forested areas provide habitat for wildlife, protect the soil from erosion, and act as a buffer from noise on heavily traveled highways. State forestland in Alpena Township encompasses more than 10,000 acres. More than 60 percent of the state land in the Township is located in the southern portion in T30N-R8E, in the vicinity of Devils Lake. In addition, privately owned forested lands, some of which are used for hunting purposes, can be found throughout the Township.

Forested areas, including both upland forests and lowland forests, are mapped on the Environmental Resources Map shown as **Figure 3-5**. The dominant upland forest associations in Alpena Township are northern hardwoods (sugar maple, beech and basswood), aspen/white birch, pine (white and red), and oak (red and white). Upland forests cover more than 22,000 acres of land in Alpena Township. Lowland forest species include lowland conifers such as northern white cedar, black spruce, and eastern tamarack and lowland hardwood such as black ash, slippery elm and red maple. Lowland forests cover nearly 24,000 acres of land in the Township.

Hold page for Figure 3-3, Topographic Map

Hold page for Figure 3-4, Soils Map

Hold page for Figure 3-5, Environmental Resources Map

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 more 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 to recharge aquifers. Additionally, wetlands support wildlife, and wetland vegetation protects shorelines from erosion.

Wetland areas in Alpena Township are typically associated with old glacial drainageways, and can be noted near or adjacent to Devil's Lake/Devil's River, Mud Lake/Mud Creek (AKA Sunset Lake), Grass Lake, Elbow Lake, Norwegian Creek, McLary Creek, Fitzgerald Creek and Fall Creek. Because of the abundant emergent wetland vegetation, Middle Lake in the northern portion of the Township is depicted as "wetland" on the Environmental Resources Map (**Figure 3-5**). Wetland areas are also noted along the Lake Huron shoreline at Squaw Bay and near North Point Road just outside the Alpena city limits.

Water Resources, Water Quality Issues, and Fisheries

Surface water resources in Alpena Township are abundant. Lake Huron forms the Township's eastern boundary. Several islands within the Township's boundaries are set in Lake Huron's Thunder Bay. Major inland waters in the Township include Long Lake, Thunder Bay River, Devil's Lake and Mud Lake. Although there is no indication that the name of Mud Lake has ever officially been changed, local residents refer to the water body as Sunset Lake. Minor waterways include Fitzgerald Lake, Elbow Lake, Conway Lake, Grass Lake, Middle Lake (emergent wetland), Devil's River, Mud Creek, Long Lake Creek, Grass Creek, Norwegian Creek, Fall Creek and McLary Creek. Water resources are noted on the Environmental Resources Map (**Figure 3-5**). A brief description and information on water quality and fisheries data of the major water resources are discussed below.

Long Lake

The southern half of Long Lake is located in Alpena Township, while the northern half is in Presque Isle County's Presque Isle and Krakow Townships. Information regarding Long Lake is referenced from a water quality study prepared in 2001 by Dr. Wallace E. Fusilier of Water Quality Investigators. Long Lake has a surface area of 5,652 acres and has a shoreline length of nearly 29 miles. The maximum depth is 25 feet with a mean depth of 12.5 feet. Long Lake is 7.8 miles in length at its longest dimension, and the elevation of the lake is 649 feet above sea level. The size of the Long Lake drainage area, including the lake, is approximately 52 square miles. Water samples were collected during the spring and summer of 2001 at five different sampling stations. Tests performed included total phosphorus, total nitrate nitrogen, total alkalinity, pH, conductivity, chlorophyll, Secchi disk depth, temperature, and dissolved oxygen. Analysis of the factors tested was presented in graphic form showing the total Lake Water Quality Index (LWQI). On a scale of 0-100, Long Lake's LWQI scores ranged between 94 and 98, depending on the time of year and location where the test samples were collected. According to Dr. Fusilier's study, these scores indicate Long Lake has excellent water quality.

The Fisheries Division of Michigan Department of Natural Resources periodically conducts fish collections in order to determine the species population numbers and the size and health of fish in inland waters. The most recent fish collection and growth summary was conducted for Long Lake in May of 2000. The following table shows the results of that fish collection activity.

The fish collection analysis summarized that "Long Lake continues to produce fish populations exhibiting very good size distributions. Overall, the game fish populations remain healthy. Smallmouth bass make up more of the fisheries due to increased catch and release tendencies and the increase in the size limit since the previous survey. The only management action recommended at this time is to implement a creel survey to assess both the summer and winter fisheries." In a cover letter attached to the fish collection study, the fisheries biologist commented, "You've got very good populations of naturally reproducing walleye, perch and smallmouth bass, and stocking is definitely not necessary in Long Lake."

**Table 3-2
Fish Collection Survey and Fish Growth Analysis
Long Lake, May 2000**

Species	Number Collected			Average Length in Inches			Average Weight in Pounds		
	Catch 1	Catch 2	Catch 3	Catch 1	Catch 2	Catch 3	Catch 1	Catch 2	Catch 3
Brown Bullhead	71	--	4	13.0	--	13.0	1.04	--	1.02
Lake Whitefish	7	7	--	17.6	17.6	--	1.93	1.93	--
Northern Pike	7	2	--	22.9	24.0	--	2.70	3.05	--
Rock Bass	413	7	48	7.2	6.2	7.4	0.31	0.20	0.35
Smallmouth Bass	301	1	22	11.9	10.5	12.2	1.05	0.59	1.09
Walleye	32	10	2	16.8	14.4	18.5	1.79	1.00	2.08
White Sucker	119	33	10	17.2	14.6	18.9	2.12	1.28	2.72
Yellow Perch	62	58	--	8.1	8.1	--	0.26	0.25	--

Source: Michigan Department of Natural Resources, Fisheries Division

Thunder Bay

Lake Huron's Thunder Bay is the location of several islands and is the final resting place of numerous known and unknown shipwrecks. According to the *Thunder Bay National Marine Sanctuary* study, a total of 126 vessels were lost in the Thunder Bay vicinity. Because of the many species of fish, variety of aquatic vegetation, geologic formations and cultural resources, Thunder Bay is a popular recreation site for boaters, sport fishermen and divers.

In 1981, Thunder Bay was designated as the first State of Michigan Underwater Preserve. In 1991, Thunder Bay became an active candidate as a national marine sanctuary. In October of 2000, a 448-square mile area of Lake Huron received the designation of Thunder Bay National Marine Sanctuary and Underwater Preserve. The Sanctuary and Preserve is jointly administered by National Oceanic and Atmospheric Administration (NOAA) and the State of Michigan. The goals and objective of the Sanctuary and Preserve are to provide education, recreation, research, exploration, resource protection and community involvement.

The Michigan Department of Natural Resources (MDNR) is responsible for stocking and monitoring fish resources in Lake Huron and surrounding waters. **Table 3-3** below illustrates recent stocking activities in Lake Huron off Alpena County.

Table 3-3 Fish Stocking Program Lake Huron, Alpena County, 2005-2011					
Species	2005	2006	2007	2010	2011
Brown Trout	47,006	101,112	74,080	19,826	13,980
Lake Trout	443,670	0	287,572	596,983	0
Source: Michigan Department of Natural Resources, Fisheries Division					

Thunder Bay River

The Thunder Bay River Basin covers portions of five northeast Michigan counties: Alpena, Montmorency, Alcona, Oscoda and Presque Isle. Approximately four miles of the river's main branch pass through Alpena Township. The river basin is the location of a hydroelectric power project, consisting of six dams and four power plants. One dam and power plant are located in Alpena Township, about four miles west of the City of Alpena, thus the name, Four-Mile Dam. The site includes a 72' x 72' concrete and masonry powerhouse containing three turbines and generators and a 445' long spillway section. A canoe portage has been developed around one end of the dam. The site was originally used at the turn of the 20th century by Fletcher Paper Company as a pulp mill.

Sport fishing is popular along the Thunder Bay River. The Fisheries Division of the MDNR maintains a routine fish planting program for the river in addition to Lake Huron's Thunder Bay. **Table 3-4** below documents stocking activities over six years.

Table 3-4 Fish Stocking Program Thunder Bay River, Alpena County, 2001-2006					
Species	2001	2002	2003	2005	2006
Steelhead	22,000	24,000	24,000	20,300	19,800
Walleye	15,000	10,000	10,000	0	51,953
Source: Michigan Department of Natural Resources, Fisheries Division					

Devil's Lake

Long, narrow and crescent-shaped Devil's Lake is located in the southern portion of Alpena Township. The 900-acre lake was formed by the process of glacial lake recession. The lake is undeveloped, and the surrounding area within the Mackinaw State Forest is used as a wildlife flooding area and for snowmobile trails. The water level is regulated for environmental purposes.

A water quality survey conducted in 1979 by NEMCOG indicates the lake with a mean depth of about three feet is covered with emergent vegetation. Some confusion may persist about the location of Devil's Lake, since there is also a Devil's Lake in the northern portion of the Township. In Sections 23 and 24 of T32N-R8E, a wide Y-shaped section of Long Lake Creek is noted as Devil's Lake on all maps in this plan. The site is also referred to locally as "The Narrows."

Mud Lake/Sunset Lake

Sunset Lake is often referred to as Mud Lake, and local residents understand either name. The 190-acre lake is located in Sections 29 and 32 of T31N-R8E. The north and east sides of the lake are developed for residential use, while no development occurs on the swampy south and west sides. NEMCOG's 1979 water quality study rated the lake as moderately enriched. With a maximum depth of about five feet, abundant aquatic plants inhibit recreational use.

Wildlife

Deer, rabbit, grouse, and woodcock are abundant in the Township. Bear, coyote, bobcat, fox, and turkey have small to moderate populations that are growing. Wildlife is a resource that brings in hunters and tourists. October and November bring many hunters to the Township for small game hunting, bear hunting, and bow season (deer). Hunting peaks sharply in mid-November with the opening day of deer (rifle) season.

Unfortunately, large deer populations combined with indiscriminate feeding practices were contributing factors to the spread of Bovine Tuberculosis (TB) across Northern Michigan. TB is a serious disease caused by bacteria attacking the respiratory system. 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.

Although the State of Michigan attained accredited-free Bovine TB 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. In 1994, a TB infected deer was killed by a hunter in Alpena County. Since then, over 87,000 deer have been tested with 397 testing positive or being suspected of having the disease.¹ Although primarily found in hoofed animals and not considered a health risk to humans, humans can and have contracted Bovine TB. The disease has been found in coyotes, raccoons, black bear, bobcat, red fox, and opossum. The State now has a split-state Bovine TB status. The counties of Alpena, Alcona, Antrim, Charlevoix, Cheboygan, Crawford, Montmorency, Oscoda, Otsego, Presque Isle and portions of Iosco and Ogemaw now have "Modified Accreditation" status.

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. The southwest quarter of Alpena County is in DMU 452. The remainder of Alpena County including Alpena Township is in DMU 004 and is in the infected area, but it is not a part of DMU 452. Efforts to eradicate the disease have led to changes in deer feeding rules, quota increases, extension of the number of hunting days, and the banning of new deer or elk farms. As the eradication effort continues, more changes in hunting and feeding rules can be expected.

¹ Source: State of Michigan Tuberculosis Eradication Project Report

Land Use Patterns

As development occurs, larger tracts of land are generally broken down into smaller parcels. Therefore, studying the existing pattern of land divisions is one way to analyze the status of land use and development. Land division patterns for Alpena Township are discussed below.

Large undivided tracts of land can be found in the southern portion of the Township, mainly on the west side of Devils Lake. This land is state owned and part of the Mackinaw State Forest. Large privately owned tracts of land include Lafarge Corporation property northeast of the City along the northern shore of Thunder Bay. The state owned Rockport Property is located in the northeast part of the Township.

Privately held tracts of 40, 80 and 120 acres or greater occur mainly in the northern and western portions of the Township, but a few can also be seen between U.S. 23 South and the railroad right-of-way in the southern half of the Township. Parcels of between 10 and 40 acres are dispersed throughout the Township, but can be found primarily in the northern portion.

Subdivisions and small tracts occur near the City of Alpena on the south, west and northwest sides. They can also be found along the north shore of the Thunder Bay River, U.S. 23 South, U.S. 23 North, Long Lake, and the Lake Huron shoreline where development is possible.

Existing land use and land cover statistics for the Township are shown as **Table 3-5**. Michigan Resource Information System (MIRIS) statistics, which were compiled by MDNR using 1978 color infrared aerial photographs utilizing a detailed classification system, were used as a base in developing existing land use information. Urban and built-up land categories were updated by Northeast Michigan Council of Governments (NEMCOG) in 1995. As part of this Comprehensive Plan update, extensive field checking was conducted in 2003. The 2003 updated information was then computerized to produce the existing land use/land cover map, presented as **Figure 3-6** at the end of this chapter. Each of the land use categories is discussed in detail later in this chapter.

Land Use/Cover	Number of Acres	Percent of Township
Residential	3,401	4.6
Multiple-Family/Mobile Home Park	60	<0.1
Commercial	510	0.7
Industrial/Extractive	1,852	2.5
Institutional/Recreational	418	0.6
Agricultural	1,761	2.4
Upland Non-Forest	6,959	9.6
Upland Forest	14,549	20.0
Lowland Forest	29,944	41.1
Wetland	8,736	12.0
Water	4,634	6.4
Total	72,824	100.0
Source: Northeast Michigan Council of Governments, 1995 Transportation Study. Wade Trim, Inc. Field Check, 2003.		

Urban Land

The urban land category of the MIRIS mapping system can further be divided into the following subcategories: residential, commercial, industrial/extractive and institutional/recreational.

Residential

As can be seen in **Table 3-5**, 4.6 percent of the Township's total area is used for residential purposes. For reference purposes, residential land use is shown on the existing land use/land cover map as yellow in color. Residential development generally corresponds with the location of the numerous subdivisions and small tract land divisions are described above in the pattern of land division discussion. Residential development along the Lake Huron shoreline north of the City occurs at Monaghan Point, South Nine Mile Point, Lincoln Bay, Huron Bay, El Cajon Beach, Misery Bay and North Point Shores, and south of the City at Bare Point, Partridge Point, north shore of Squaw Bay and along U.S. 23 south of Squaw Bay.

In addition to the Lake Huron shoreline development, residential land use in the northern portion of the Township is noted in several subdivisions near the City, Long Lake shoreline, U.S. 23 North, Long Lake Road, French Road, Truckey Road, Hamilton Road, Haken Road, LaComb Road, Naylor Road, Bloom Road, Monaghan Point Road and Weiss Road. On the west side of the City of Alpena, residential development occurs in several subdivisions accessible from M-32 West and Bagley Street, and on Long Rapids Road along the northern shore of the Thunder Bay River. Residential development south of the City can be seen in several subdivisions on the west side of U.S. 23 South, extending to Sunset Lake (Mud Lake) and nearly to Mud Creek. These areas include the Werth Road, Paad Addition and Piper Road neighborhoods.

The majority of the residential development in Alpena Township is single-family homes. However, several multiple-family complexes and mobile home parks exist in the Township. They make up less than 0.1 percent of the township's area and are noted on the existing land use/land cover map in orange color.

Commercial

Table 3-5 shows 0.7 percent of the Township's total land area is categorized as commercial use. The Township's commercially used land tends to be concentrated near the City of Alpena along the major highway corridors, U.S. 23 North and South and M-32 West, and they are shown in red on **Figure 3-6**. These locations allow for easy access to public services and transportation.

Industrial/Extractive

For the purpose of this existing land use analysis, industrial land use and extractive land use were combined into one category, shown as light purple on the map. Together, they cover 1,852 acres and make up 2.5 percent of the Township's total area. Alpena Township's industrial properties are located just north of the City's industrial park, at the Werth/Piper Roads intersection, on the corner of French Road and Hamilton Road, on east side of U.S. 23 South behind commercial development, and at a few U.S. 23 North locations.

Extractive industry is very important to the region's economy. The geologic make up of the region makes the area a good source of quality limestone. Much of the Township's mined property is owned by the Lafarge Corporation, whose operation also includes property in the

City. An area in the northeast corner of the Township, locally referred to as Rockport, is no longer mined, and is now owned by the State of Michigan. Several small gravel pits are found in the northern half of the Township, as well as the west central sector.

Institutional/Recreational

Other urban land includes institutional land uses, such as schools, churches, governmental buildings, and fraternal/civic buildings. It also includes parks, golf courses, cemeteries and outdoor recreational areas. This land use category makes up 0.6 percent of the Township's total land area. These land uses are shown in dark blue on **Figure 3-6**.

Forests and Wetlands

For the purpose of this Comprehensive Plan update, forested lands were mapped into two categories, upland forest and lowland forest. The existing land use/land cover depicts upland forests in dark green and lowland forests in light green. Upland forests, which include upland hardwoods and conifers, account for 20 percent of the Township's land. Lowland forests are the most predominant land cover in the Township, covering more than 41 percent of the total. Much of the lowland forest areas have wetlands dispersed throughout.

Wetlands include land that has sufficient water at, or near, the surface to support wetland or aquatic vegetation. These areas are commonly referred to as swamps, marshes or bogs. It is important to note that the existing land use/land cover map used in this report is based on MIRIS maps. Wetland information was not verified by field inspection when these maps were compiled. Thus, the areas shown as wetlands by MIRIS may not actually meet State and Federal criteria for legally regulated wetlands.

Wetland areas in Alpena Township make up 12 percent of the land. Heavy wetland areas occur in the southern portion of the Township, on the west and north sides of Devils Lake, around Squaw Bay, and on the west side of Sunset Lake (Mud Lake). Wetlands occur in many locations throughout the Township, which have not been built up. These areas are generally mixed with lowland forested and non-forested land covers. The wetland category is shown as dark brown on **Figure 3-6**.

Non-forested Land

Non-forested land and open land makes up over nearly 10 percent of the community. These areas are scattered throughout the northern and western portions of the Township, and are mixed with forests and wetlands.

Agricultural

Farmland (shown as tan on the existing land use/land cover map) in the Township covers 1,761 acres or 2.4 percent of the total, with scattered areas occurring in the northwest and north central sectors. Two other farmland locations can be found in the southern sector; northwest of Devils Lake and southwest of Devils Lake.

Water

Over six percent of the Township is covered with surface water (light blue on **Figure 3-6**). Alpena Township lakes include: Long Lake, the Narrows, Devils Lake, Sunset (Mud) Lake, Fitzgerald Lake, Elbow Lake, Conway Lake, Grass Lake and Middle Lake. Rivers and streams in the Township are: Thunder Bay River, Devils River, Mud Creek, Long Lake Creek, Grass Creek, Norwegian Creek, Fall Creek, Cranberry Creek and McLary Creek.

Several islands, located just off the mainland, are also part of the Township. Many of the islands are situated in Lake Huron's Thunder Bay.

Zoning

Alpena Township has had zoning in effect since 1970. The zoning ordinance was completely updated and amended in 1993 and has had several minor amendments since that time. Existing zoning districts for Alpena Township are:

- Waterfront Residential (WR)
- One-Family Residential (R-1)
- Rural Residential (R-2)
- Mixed Residential (R-3)
- Office Service (OS)
- Restricted Business (B-1)
- General Business (B-2)
- Community Business (B-3)
- Community Facilities (C-F)
- Light Industrial (I-1)
- Mixed Industrial (I-2)
- Agricultural (A)
- Forest/Recreation (FR)
- Conservation (C)

The Township Hall/Huron Shores Fields and Old Piper School are located in the B-2 District. Rockport Picnic Area is in the FR District. Access site at "The Narrows" is in the R-3 District. VanWormer Field and the 40-acre parcel are in the R-2 District. The Alpena Township Nature Preserve is in the WR District. Thunder Bay Island area is in the Conservation Area.

Hold page for Figure 3-6, Existing Land Use/Land Cover Map

Transportation

Alpena Township's major highway system includes north-south U.S. 23 and east-west M-32. These two major highways provide access to Alpena Township and the City of Alpena. The Alpena County Road Commission maintains them through an agreement with the Michigan Department of Transportation (MDOT). Maintenance costs for the remainder of the local roads and streets are shared by the Township and the County Road Commission.

Passenger rail service to the Alpena area is not available. Railway freight service for the Alpena area is provided by Lake State Railway Company, formerly Detroit & Mackinac Railroad (D&M). Former D&M employees formed Lake State Railway Company (headquartered in East Tawas) in 1992, when D&M ceased operations for financial reasons. Much of the freight rail traffic is aggregate products such as gravel and stone, as well as potash for mixing into concrete produced by Lafarge at the Alpena plant. Former D&M tracks north of Alpena have been sold or leased to Michigan Department of Natural Resources (MDNR) and converted to recreational trails. For the past several years, snowmobilers have been able to travel the former grade from Hawks in Presque Isle County to Mackinaw City. The former grade from Alpena to Hawks through Posen to Cheboygan is open as a multi-use trail. The communities are trying to establish a trail head.

Regional air service is available at Alpena County Regional Airport. Commercial air service is provided by Delta Airlines to and from Detroit Metro Airport two times daily. More than 20,000 passengers pass through the airport in an average year. United Parcel Service, Airborne Express, and Federal Express provide air freight service. Avis, Hertz, and Superior Auto Rental provide car rentals. Aviation North and Freedom Transportation operate charter services from the airport, which also includes refueling, aircraft maintenance, flight instruction, aircraft rental, sightseeing tours, and car/van rentals. The Alpena Combat Readiness Training Center (formerly Phelps-Collins Air National Guard Base) is located adjacent to the airport and uses the airport's runways.