Chapter Five - Physical Profile & Natural Resources

Introduction

Two of the community assets most often praised by the Bear Lake Community's citizens throughout the comprehensive planning process were the local natural resources and rural character. From picturesque Bear Lake to beautiful wide open spaces, the landscape of the community plays an important role in the quality of life of area residents. However, recent development in the rural areas of the community have raised the concerns of many residents about potential damage to groundwater and surface water and the need to protect the area's natural resources and rural character.

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

To avoid duplicating research efforts on several items discussed in this section, portions of the 2002 Bear Lake Township and 1999 Pleasanton Township Land Use Plan were excerpted and incorporated into this chapter or are directly referenced. Where appropriate, these references have been updated to reflect 2007 statistics.

Climate

Climate data for the Bear Lake Community was considered from the Michigan State Climatologist's Office. However, due to the lack of specific climate data for the Bear Lake Community and a lack of current data from surrounding weather stations, the summary provided in this section was compiled from the 2002 Bear Lake Township Comprehensive Plan and 1999 Pleasanton Township Land Use Plan.

Prevailing westerly winds blowing across Lake Michigan assure that the area rarely experiences prolonged periods of hot, humid weather in the summer or extreme cold weather during the winter. In general, spring and summer temperatures range between 60 and 80 degrees while the fall and winter temperatures ranges between 0 and 30 degrees. Due to its proximity to Lake Michigan, the Bear Lake Community has a relatively long frost-free period, on average 153 days.

In general, the highest amounts of precipitation occur during September and October. On average, the total annual precipitation water equivalent (rain) is 30.1 inches a year. Due to the proximity of Lake Michigan, lake effect snow contributes to a higher annual snowfall for the Bear Lake Community. On average, the annual snowfall for Bear Lake Township is 66.4 inches, while Pleasanton Township to the north averages approximately 100 inches annually.

Geology

The 1982 Michigan Department Natural Resources (DNR) *Quarternary Geology Map* (Map 8) illustrates the surface geology of Manistee County and the Bear Lake Community. The map shows that the geological materials just beneath the soil are primarily composed of coarse-textures tills and outwash sand and gravel and postglacial alluvium left by glaciers. According to the 2002 Bear Lake Township Comprehensive Plan, *the network of hills in Bear Lake Township are marginal moraines. The hills are deposits created by water running off the edge of a stationary glacier. Bear Lake Township is also part of a glacial outwash plain. The outwash plain is where water moving away from the glacier deposits sands and silt creating flat areas.*

The DNR's 1987 *Michigan Bedrock Geology Map* (Map 8a) depicts the bedrock geology of the Bear Lake Community, which includes portions of the Antrim Group, Ellsworth and Antrim Shale.

Topography

The Bear Lake Community is dominated by a network of hills reaching heights of over above 900 feet above sea level in the north portion of the community (Pleasanton Township). Hills in the mid-section of the community (Bear Lake Township) have elevations of up to 900 feet above sea level. Areas around Bear Lake have some of the lowest elevations in the community ranging down to about 720 feet.

Soil Conditions

A firm understanding and knowledge of the soil types, soil suitability and soil permeability within the Bear Lake Community is useful when considering future land use development. For example, some soil types limit infiltration of fluids, presenting limitations to the use of on-site wastewater treatment systems (e.g. septic tanks and tile fields). These limitations can be very important to developers since the entire Bear Lake Community relies on on-site wastewater treatment systems.

Several maps were developed for the Bear Lake Community to indicate those areas subject to development and building constraints, based on soil information. While many of these constraints can be overcome, the engineering costs may be substantial. For example, soil characteristics of high slopes and poor drainage can limit or impede construction efforts. Map 9 illustrates the probable locations of hydric soils in the Bear Lake Community: areas with potentially high water tables and poorly drained soils. Map 10 illustrates areas where slopes may be greater than 12%, presenting construction concerns such as unstable soils and erosion. Map 11 illustrates areas with limitations for dwellings with basements. Map 11a illustrates areas with limitations for commercial buildings.

The Natural Resource Conservation Service (NRCS) has not yet published a *modern soil survey* for Manistee County. Therefore, the general soil characteristics discussed in this plan below were derived from the Major Land Resource Area (MLRA) descriptions published by the NRCS a number of years ago. According to the MLRA, the soils of the Bear Lake Community can be roughly lumped into either of two very general categories. Information about these general soil categories is presented below in general regional terms. Map 12 illustrates the soils of the Bear Lake Community.

94A - Northern Michigan and Wisconsin Sandy Drift

Land Use:

The forests are used mainly for lumbering and recreation. Forage and feed grains for dairy cattle and other livestock are the principal crops. In places fruits and vegetables are an important cash crop and other vegetables and fruit are also grown.

Soils:

Most of the soils are Orthods or Saprists. They have a frigid temperature regime, and the mineral soils have mixed mineralogy. Deep, coarse textured and moderately coarse textured Haplorthods (Kalaska, Vilas, Rubicon, Emmet and Montcalm series) formed in sandy or loamy glacial drift. The associated very poorly drained Borosaprists (Carbondale, Lupton, and Tawas series) formed in organic materials in depressions. Also important in the area are Udipsamments (Grayling and Omega series) on outwash plains, Psammaquents (Roscommon series) and Haplaquods (Au Gres and Kintoss series) in flat, wet areas and Eutroboralfs (Nester, Kawkawlin and Rudyard series) and Haplaquepts (Pickford and Sims series) on moraines, till plains, and lake plains.

Potential Natural Vegetation:

This area supports forest vegetation of broadleaf deciduous and needleleaf evergreen trees. Jack pine, red pine, and bigtooth aspen are the dominant tree species on the more sandy soils. Sugar maple, yellow birch, American beech, and hemlock are dominant on the moist sites. Tamarack, black spruce, and northern white-cedar are dominant on the wet soils.

MLRA 96 - Western Michigan and Northeastern Wisconsin Fruit Belt

Land Use:

Forage and feed grains for dairy cattle are the major crops, but fruits and specialty crops are also grown and are of great economic importance. This is one of the major areas of production of cherries in the United States. Recreation is an important land use, especially on sites bordering Lake Michigan and Green Bay. Controlling soil blowing and water erosion, conserving moisture, and improving drainage on wet soils are the principle concerns of management.

Soils:

Most of the soils are Orthods or Boralfs. They are moderately deep to deep and medium textured to coarse textured. These soils have a frigid temperature regime, an udic moisture regime and mixed mineralogy. Well drained Haplorthods (Montcalm, Kalkaska, Rubicon, Emmet, Onaway and Longrie series) in loamy or sandy textured glacial drift are dominant. Well drained Eutroboralfs (Kolberg series) in thin loamy glacial drift over lime rock are important in Wisconsin. In Michigan, well drained and moderately well drained Eutroboralfs (Nester series) and somewhat poorly drained Eutroboralfs (Kawkawlin series) formed in deep glacial drift. Udipsamments (Grayling series) formed in deep sands. Haplaquepts (Ensley and Ruse series), Haplaquods (Kinross and Au Gres series), and Psammaquents (Roscommon series) formed in sandy and loamy materials in low-lying areas. Borosaprists (Carbondale, Luton, Cathro and Seeleville series) formed from organic remains of plants in the deeper depressions.

Potential Natural Vegetation:

This area supports forest vegetation consisting of broadleaf deciduous and needleleaf evergreen trees. Sugar, maple, yellow birch and hemlock are the dominant tree species. Jack pine, red pine, and white pine are dominant on the more sandy soils. Lowland soils support mixed hardwood and conifer forests. Elm, soft maple, black ash, and white cedar are the major lowland species.

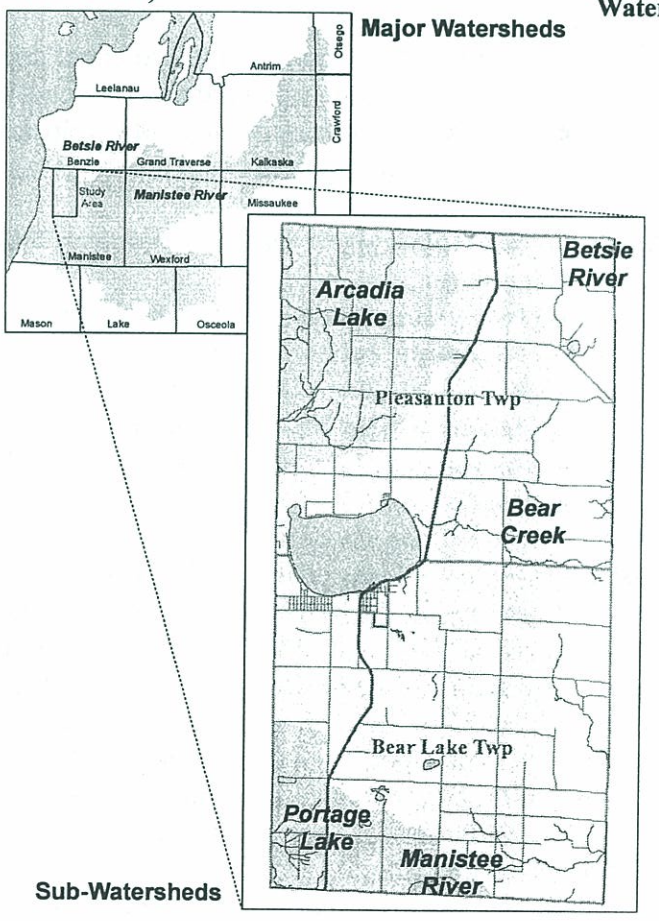
Woodlands and Wetlands

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

Based on LIAA's 2005 land use/land cover analysis, forests of all types cover over 17,900 acres or about 40% of the Bear Lake Community's total land area. These wooded acres occur in most parts of the community. However, the largest concentration of contiguous woodlands (Approx. 2,083 acres) is found in the Pere Marquette State Forest, in the mid-eastern portions of Pleasanton Township (sections 13-14, 23-24, 25-26 and a portion of 36).

The 2005 land use/land cover analysis shows that wetlands account for over 3,800 acres or 8.4% of the Bear Lake Community's land area. The wetlands are predominantly located in large areas around Little Bear Creek and in the southwest portions of Bear Lake Township near Little Beaver Creek. Wetlands are unique ecosystems that filter out nutrients and sediments and help to maintain and enhance the clarity of lakes and streams. The protection and conservation of wetlands has been a very important issue in the Bear Lake Community. In fact, Pleasanton Township has adopted a *wetland overlay district* placing special regulations for onsite sewage disposal and zoning permits.

Figure 5.1
Watersheds



Source: LIAA

Surface Water

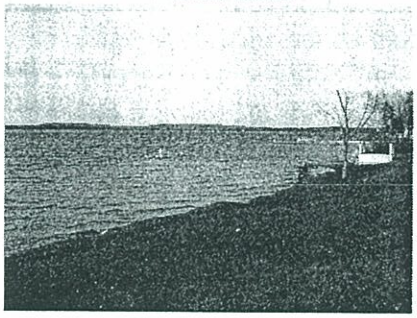
According to the Environmental Protection Agency (EPA) a watershed is the area of land where all the water that moves under and across the land surface drains to the same major water body. Most of the Bear Lake Community falls within the Bear Creek Watershed. The Bear Creek Watershed is part of the larger Manistee River Watershed - covering 1.4 million acres in northwest-lower Michigan, including parts of 11 counties.

The Bear Creek Watershed encompasses 118, 000 acres in both Manistee and Benzie Counties. The Bear Creek Watershed is drained by Bear Lake, which drains into Little Bear Creek. Little Bear Creek drains into Big Bear Creek (Brown Township), then into the Manistee River and on to Manistee Lake. Along the way, Little Bear Creek is fed by Greens Creek, Horseshoe Creek and Little Beaver Creek. At the southern edge of the community, Chief Lake drains into Chief Creek, which drains into the Manistee River.

The northwest portion of Pleasanton Township lies within the Betsie-Platte Watershed. The Betsie-Platte Watershed is drained by Bowens Creek and Lumley Creek which drains into Arcadia Lake and Lake Michigan.

The Bear Lake Community also has a number of small ponds and lakes. Bear Lake is the largest lake at approximately 1,800 acres. Other lakes include Chief Lake, Emma Lake, James Lake, Watson Lake, Adamson Lake, Cooper Lake, Glovers Lake and Mud Lake. According to the 2002 Bear Lake Township Comprehensive Plan, Watson Lake and Cooper Lake are thought to be kettle lakes - *Generally, a kettle lake doesn't seem to be connected to a surface water drainage basin and is not connected to any of the Township or County's rivers.* After reviewing several community-wide maps, Grovers Lake and Mud Lake also appear to be kettle lakes.

Picture 5.1
Bear Lake



Source: LIAA

Groundwater

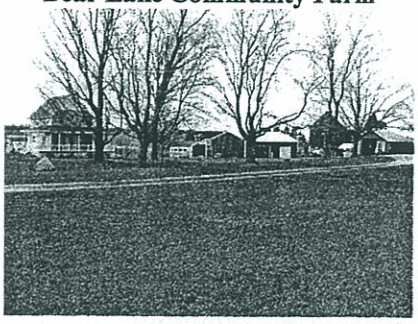
Groundwater is the exclusive source of drinking water for the Bear Lake Community. Therefore, the Bear Lake Community's groundwater quality is very important to the overall health of the community, future development options and to the quality of the area's water features. According to the 2002 *Wellhead Protection Delineation Report* for the Village of Bear Lake, *the Village's supply wells are completed in an unconfined sandy aquifer. Groundwater in the subject aquifer recharges south of Bear Lake (surface water body) and then flows to Bear Lake.*

Due to the nature of the unconfined aquifer and the relative high ground water elevation, a wellhead protection area (*Bear Lake Wellhead Protection Delineation Report*) has been delineated. This area represents a 10-year *groundwater capture zone* for the supply wells of the Village. In theory, a drop of groundwater (and any contaminants in it) at the far edge of the capture zone would take 10 years to reach the public water supply well. Therefore, contaminants released into the groundwater within the capture zone could threaten the public water supply within 10 years. Map 12a illustrates the soil permeability of the Bear Lake Community. Map 6 illustrates the wellhead protection area for the Bear Lake Community. Methods for controlling the release of contaminants within the *groundwater capture zone*, along with an analysis of the soil permeability of the community were considered and discussed in the development of the goals and objectives of this plan.

Farmland

One of the Bear Lake Community's most valued resources is farmland. In 2005, just over 8,300 acres of the land or about 18% of the community was in agricultural use. According to the USDA soil survey, only a few small areas of the community are considered prime farmland. Map 9a illustrates the Prime Farmland within the Bear Lake Community.

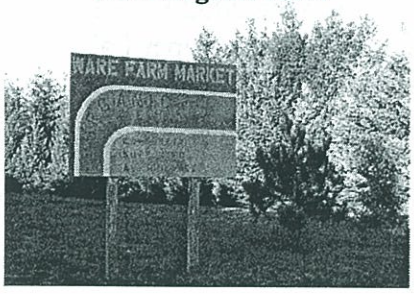
Picture 5.2
Bear Lake Community Farm



Source: LIAA

According to the *2002 Bear Lake Comprehensive Plan*, there are numerous sites ideal for growing cherries, peaches and apples due to their close proximity to Lake Michigan. In addition, there are a number of families involved in cow-calf operations. Farmers in cow-calf operations are growing their own cattle feed including: hay, corn, oats and rye for cover crop. In more recent years, a number of organic farming operations have begun in the Bear Lake Community.

Picture 5.3
Ware Organic Farm



Source: LIAA

The historical significance of farming in the Bear Lake Community is emphasized by the number of Centennial Farms still in operation. According to the Michigan Department of Agriculture Centennial Farm Program, a centennial farm is a working farm of 10 or more acres that has been continuously owned by the same family for at least 100 years. According to the 2002 Bear Lake Township Comprehensive and information received from the Michigan State Historic Preservation Office, there are 13 centennial farms (listed below) in the Bear Lake Community.

Location	**First Owner**	**Date of Purchase**
John & Lillian Porter 7332 Chippewa Highway Kaleva, MI 49645	John Baptiste Porter (PaQuin)	7/1/1863
Mabel Schimke Route 1 Bear Lake, MI 49614	Gotleib Schimke	10/18/1866
Hazel Briske Route 1 Bear Lake, MI 49614	James Griswold	11/23/1868
Winston S. Churchill 11058 11-Mile Road Bear Lake, MI 49614	Andres Arner	6/5/1869

Location	First Owner	Date of Purchase
Donovan and Bernice Anderson Route #2 Bear Lake, MI 49614	David Anderson	5/11/1872
Harold and Joyce Johnson 7174 Thorpe Road Bear Lake, MI 49614	Andrew Johnson	7/1/1880
Earl F. and Dorothy Osborn Route #1 Bear Lake, MI 49614	Andrew & Calhevine Arner	4/27/1867
Joel D. and Carol Meister 7901 Anderson Road Kaleva, MI 49645	Daniel and Tillie Meister	4/6/1895
Felix S. and Catherine Gauthier 7616 Adamson Lake Road Kaleva, MI 49645	Frank L. Gauthier Sr.	4/21/1898
Douglas E. and Linda Alkire 8390 11-Mile Road Bear Lake, MI 49614	Micheal Fauble	7/7/1899
	Ludwig Worch	
	Renaldo Norconk	
	Renaldo/Sarah McKinstry Norconk	

Currently, there are no acres of farmland operating under the Farmland and Open Space Preservation Program (PA 116). The Farmland and Open Space Preservation Program allows land owners to enter into an agreement with the state promising to keep the land in agricultural use for a minimum of ten years. In return, the land owners are entitled to certain income tax credits and limits on special assessments.

Other Public Lands

The Grand Traverse Regional Land Conservancy owns and manages several large parcels within northern Pleasanton Township. According to the Conservancy, several parcels will be sold to willing farmers with conservation easements that may allow for agricultural buildings. Additionally, some of the parcels will be preserved to establish a grassland preserve and some parcels will be incorporated into lands already designated in the Arcadia Dunes Preserve. Map 13 illustrates the public lands in the Bear Lake Community

Large Lots

In considering the preservation of natural resources and farmland, it can be helpful to discuss the preservation of large tracts of land (40 or more acres). There are a number of tracts within the Bear lake Community that are 40 or more acres. Map 13a illustrates large lots within the Bear Lake Community. This map was examined and discussed in the development of the goals and objectives of this plan.

Environmental Contamination Sites

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

The agency publishes an annual list of environmental contamination sites under Part 201 by county, showing the sites by name, address, city, source, pollutant(s) and site assessment score. *A Part 201 listed site is a location that has been evaluated and scored by the MDEQ using the Part 201 scoring model. The location is or includes a facility as defined by Part 201, where there has been a release of hazardous substance(s) in excess of Part 201 residential criteria, and or where corrective actions have not been completed under part 201 to meet the applicable cleanup criteria for unrestricted residential use.* This list is available from the MDEQ website and is regularly updated with new information regarding site reclassifications, site additions and site deletions. Table 5.1 provides the 2007 site identification number, site name, location, source, type of pollutant, and SAM Score. Site severity is partially determined by the site assessment model (SAM) score. The score is based upon a 48-point scale with a 48 rating indicating the most hazardous conditions. It should be noted that not every site of contamination that is subject to regulation under Part 201 is listed because owners are not required to inform the MDEQ about sites and can pursue cleanup independently.

Table 5.1 Part 201 Site List

Site ID Number	Site Name	Location	Source	Type of Pollutant	SAM Score
51000002	Chief Road GW Contam	9909 Chief Rd.	Agricultural Production-Crops	1,2 DCP	17 out of 48
51000061	Res. Well 8 Mile Road	8758 8 Mile Rd.	Unknown	1,2 DCP	20 out of 48
51000062	Res. Well Co Rd. Bear Lake Twp.	10395 Linderman Road	Refuse Systems	Benzene; Zn	21 out of 48
51000069	Res. Well Pleasanton Hwy.	13479 Pleasanton Hwy.	Unknown	1,2 DCP; Cl: EDB	21 out of 48
51000086	Res. Well Maidens Road	9237/9276 Maidens Rd.	Unknown	1,2 DCA; 1,2 DCP; EDB	22 out of 48
51000125	Vorbau Estate	13489 Lakeside Avenue	Private Households	Benzene; Ethylbenzene; Toluene; Xylenes; PNAs	15 out of 48

Source: Remediation and Redevelopment Division (RRD) of the Michigan Department of Environmental Quality (DEQ) 2007

Another category of Michigan Sites of Environmental Contamination includes leaking underground storage tank or LUST sites. According to the MDEQ, open LUST sites are locations where a release has occurred from an underground storage tank system and where corrective actions have not been completed to meet the appropriate land use criteria. According to Michigan State University's Institute for Water Research, "a leakage of two drops per second can result in the loss of up to 500 gallons of fuel per year and can contaminate up to 500 million gallons of water to the level where odor and taste make it unacceptable for drinking." Table 5.2 provides the open LUST sites for the Bear Lake Community. Closed LUST sites and Active & Closed UST facilities are not noted in this plan.

This list is updated regularly and can be downloaded from the MDEQ website: http://www.deq.state.mi.us/sid-web/

Table 5.2 Open Leaking Underground Storage Tanks (LUST) sites

Facility ID	Site Name	Site Address
00011182	Blarney Castle #2	123-48 U.S. 31
00011170	Cooks 66 Service	U.S. 31
Source: Remediation and Redevelopment Division (RRD) of the Michigan Department of Environmental Quality (MDEQ) 2007		

Wildlife

The Bear Lake Community is home to a wide range of fauna, birds, fish and mammals, typical of Northern Michigan. Some of the unusual mammal species seen in the Bear Lake Community are Black Bear, Bobcat, Coyote, and Northern Flying Squirrel. In addition, the Bear Lake Community and Manistee County are home to numerous plants, birds, fish and mammals that are classified under federal and state status. The Nature Conservancy and the Michigan Department of Natural Resources jointly produce and maintain a Michigan Natural Features Inventory (MNFI). The MNFI's mission is to *actively contribute to decisions that impact the conservation of biological and ecological diversity by collecting, analyzing, and communicating information about rare and declining plants and animals, and the array of natural communities and ecosystems native to Michigan.*

As part of this mission, the MNFI publishes an *elements list* for Manistee County that *should be used as a reference of which natural features currently or historically were recorded in the county and should be considered when developing land use plans. Included in the list is scientific name, common name, element type, federal status, and state status for each element.* The following species are just a few of the threatened, endangered or special concern plants and animal species found in Manistee County. A full list can be found in Appendix H.

Common Name

- Cooper's Hawk, *Special Concern*
- Grasshopper Sparrow, *Threatened*
- Migrant Loggerhead Shrike, *Endangered*
- Common Loon, *Threatened*

Picture 5.4
Cooper's Hawk

Source: Patrick Williams
Utah Wings Website

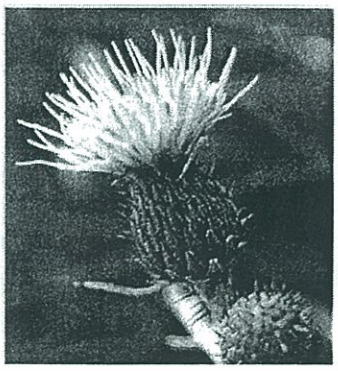
Picture 5.5
Grasshopper Sparrow

Source: Gerhard Williams
Smithsonian, National Zoological Park
Website

Common Plant Name

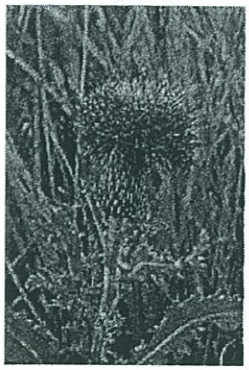
- Hill's Thistle, *Special Concern*
- Pitchers Thistle, *Threatened*
- Wild-rice, *Threatened*

Picture 5.6
Pitchers Thistle



Source: U.S. Fish & Wildlife Service
Website

Picture 5.7
Hill's Thistle



Source: A.B. Sheldon
Chicago Wilderness Magazine
Website

Chapter Six - Land Use Characteristics & Trends

The characteristics of the land in the Bear Lake Community, and the way people use the land, change over time. Trees grow and mature in areas that were once open fields. Lands that were once cultivated as farmlands become shrub-covered fields. Houses are built in areas that once were forests.

This chapter will describe recent patterns of land use in the Bear Lake Community and how those patterns changed between 1978 and 2005. To make this comparison, we have used a geographic information system (GIS) to evaluate and compare two different land use maps derived from aerial photographs and other data. The first map was created for the Michigan Resource Information System (MIRIS) in 1978 under the direction of the Michigan Department of Natural Resources. The second map was derived by the Land Information Access Association (LIAA) using the MIRIS standards and procedures and based on aerial photographs taken in 2005.

Both maps were created by trained technicians following procedures for interpreting aerial photographs and categorizing the land uses identified. In general, land use areas were mapped if they were 2.5 acres or greater in size. For example, a half-acre residential lot in the middle of a forest would be ignored. As a result, these maps provide relatively accurate summaries of land characteristics on a township-wide basis, but not detailed point-by-point analysis.

The land use maps in this section should be interpreted in conjunction with text and tables to gain a better understanding of the variation and distribution of land uses throughout the township. The data represents the actual use of land as seen from the air and recorded in the land use classification system. The Michigan land use land cover classification system was developed by the Michigan Land Use Classification and Referencing Committee under the *Michigan Department of Natural Resources* and later revised and adopted by the *Improving Michigan's Access to Geographic Information Networks* (IMAGIN) organization as the state-wide standard. This system uses seven major categories referred to as "Level 1" Categories, as follows:

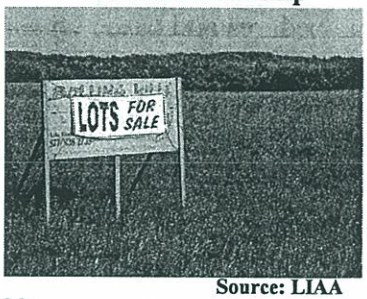
1. Urban/Built (residential, commercial, services, institutional, industrial, transportation, communications, utilities, extractive and open land)
2. Agricultural (cropland, orchards, vineyards, ornamental horticulture, permanent pasture and other agricultural land)
3. Non-Forested (shrub lands, grasses)
4. Forested (broadleaf, coniferous)
5. Water (streams, lakes, reservoirs)
6. Wetlands (forested, non-forested)
7. Barren (beach, dune, rock)

The seven major categories can be further subdivided into the "Level 2" subcategories listed in parentheses above. For example, an area of land used for residential housing would be mapped and categorized as 11 - urban residential use. In some cases, aerial photography and detailed interpretation would allow further categorization to Level 3. However, in performing this analysis, we focused on larger areas of land use, using Level 1 and Level 2 categorizations. A full list of each Level 1 and Level 2 category can be found in *Appendix I.*

Map 14 depicts the distribution of land uses identified for the Bear Lake Community in 1978. There are 45,733 acres in the Bear Lake Community. In 1978, approximately 24% of this area (11,017 acres) was being used for agriculture; about 35% of the area (16,230 acres) was covered with forests and about 24% of the area (11,196 acres) had non-forest cover. Almost 3% of the area (1,256 acres) was classified as urban.

The 2005 land use map (Map 14a) shows that land use and land cover have changed significantly from that of 1978. In 2005, roughly 18% of this area (8,359 acres) was being used for agriculture; about 39% of the area (17,995 acres) was covered with forests and about 22% of the area (10,093 acres) was non-forest cover. Just over 7% of the area (3,292 acres) was classified as urban.

Picture 6.1
Lots for Sale
Pleasanton Township



Source: LIAA

Table 6.1 below provides the acreages and percentages of land areas classified for each category in Level 1 and Level 2 for 1978 to 2005. Again, these calculations are based on mapping with limited level of accuracy (e.g. no mapped areas less than 2 ½ acres). Regardless, comparisons of the two maps and related tables present a useful summary of land use patterns in the Bear Lake Community and indicate trends in land use over the past 27 to 28 years.

Table 6.1 shows the actual net change in Level 1 land use over the nearly three decades from 1978 to 2005 in the Bear Lake Community. In terms of total acreage, the largest change was the 2,658 acres decrease in agricultural land use, a 24% decline. The second most substantial change was the 2,036 acre increase in urban land uses, a 162% increase. As indicated in table 6.1, under Level 2, the vast majority of urban land use change can be attributed to the increase in residential development. There was also a substantial increase in the acreage classified as forested, an estimated increase of 1,765 acres or 11%.

Although the changes described above are substantial, they do not present the whole picture. Over time, changes of land use in one area may offset changes in land use in another. As a result, there may be a much greater amount of change than that depicted in the net totals listed above. For example, a farmer may abandon one field and allow it to change slowly to herbaceous plants and shrubs and then to forest. While that same farmer may clear a new parcel of shrubs and turn that into cropland. To fully analyze the type and amount of land use change, we need to consider the acres of land shifting into and out of various categories.

The land use cross-tabulations (see *appendix J*) give a much clearer picture of the dynamic nature of land use change. For example, it is estimated that there was a loss of 3,696 acres of cropland (Land Use Code 21). However, during the same period, 1,877 acres of cropland were added. Similarly, the Bear Lake Community added 1,901 acres of grasses in various locations while losing 6,195 acres of grasses in other areas. If all these land use changes are taken into account, we can see that land use changes occurred on about 15,059 acres of land - over 32% of the Bear Lake Community. Given the relatively modest increase in the total population, this is a substantial amount of land use change.

Table 6.1 Land Use/Cover: 1978 - 2005

		1978 Land Use		2005 Land Use		Change in Acres 1978 - 2005	
Level 1	Land Use Code	Acres	Percent	Acres	Percent	Acres	Percent
Urban	1	1,256	2.7%	3,292	7.2%	Gained: 2,036	Gained: 162%
Agriculture	2	11,017	24.1%	8,359	18.3%	Lost: 2,658	Lost: 24%
Non-Forested	3	11,196	24.5%	10,093	22.1%	Lost: 1,103	Lost: 10%
Forest	4	16,230	35.5%	17,995	39.3%	Gained: 1,765	Gained: 11%
Water	5	2,122	4.6%	2,119	4.6%	Lost: 3	0%
Wetlands	6	3,913	8.6%	3,875	8.5%	Lost: 38	Lost: 1%
Barren	7	0		0		0	
Total Acres		**45,733**		**45,733**			
Level 2							
Residential	11	750	1.6%	2,110	4.6%	Gained: 1,360	Gained: 181%
Commercial, Services and Institutional	12	71	0.2%	140	0.3%	Gained: 69	Gained: 97%
Industrial	13	47	0.1%	53	0.1%	Gained: 6	Gained: 13%
Transportation, Communications, Utilities	14	29	0.1%	164	0.4%	Gained: 135	Gained: 466%
Extractive	17	153	0.3%	427	0.9%	Gained: 273	Gained: 179%
Open Land and Other	19	206	0.5%	398	0.9%	Gained: 192	Gained: 93%
Cropland	21	8,424	18.4%	6,605	14.4%	Lost: 1,819	Lost: 22%
Orchards, Vineyards, Ornamental Horticulture	22	2,013	4.4%	1,410	3.1%	Lost: 603	Lost: 30%
Permanent Pasture	24	550	1.2%	13	0.0%	Lost: 538	Lost: 98%
Other Agricultural Land	29	30	0.1%	331	0.7%	Gained: 301	Gained: 1,003%
Grasses	31	8,255	18.1%	3,961	8.7%	Lost: 4,294	Lost: 52%
Shrubs	32	2,941	6.4%	6,132	13.4%	Gained: 3,192	Gained: 109%
Broadleaved Forest	41	11,600	25.4%	12,781	27.9%	Gained: 1,181	Gained: 10%
Coniferous Forest	42	4,630	10.1%	5,214	11.4%	Gained: 584	Gained: 13%
Lakes	52	2,122	4.6%	2,119	4.6%	Lost: 3	0%
Forested (Wooded) Wetlands	61	3,649	8.0%	3,571	7.8%	Lost: 78	Lost: 2%
Non-Forested (Non-Wooded) Wetlands	62	264	0.6%	304	0.7%	Gained: 40	Gained: 15%
Total Acres		**45,733**		**45,733**			

As documented in the comparison of land use maps, there have been substantial changes in characteristics of the Bear Lake Community from 1978 to 2005. In most cases, these changes would be visible to the observer over time, For example, most of the residential development throughout the Bear Lake Community is located along road corridors. Similarly, there has been a substantial amount of agricultural land converted to other uses - much of this area would have been visible from the roadways. These land use changes are consistent with well documented statewide trends of low-density, large-lot residential development and the conversion of farmlands to other uses. Maps 15, 15a, 16 and 16a show the pattern of land use changes from 1978 to 2005 for farmlands, urban lands, forest lands and wetlands.

Chapter Seven - Planning and Development Issues

As described in Chapter Two, planning and development issues for the Bear Lake Community were identified through an analysis of the social-economic and land use trends. The following listings provide a brief summary of the key findings and trends identified by the Bear Lake Community Planning Commission.

People

- The Bear Lake Community has experienced modest growth over the past 15 years.
- Population growth in the Bear Lake Community is expected to continue at a modest rate.
- A comparison of the 1990 U.S. Census data to 2000 data indicates that the number of people 5-years or younger living in the Bear Lake Community has increased from 1990 to 2000 though the number of young families has decreased.
- Around 20% of the people living in the Bear Lake Community are 65-years or older and Census figures suggest that the percentage of residents in this category is increasing.
- The level of educational attainment has increased from 1990 to 2000.

Housing

- A comparison of 1990 and 2000 U.S. Census data sets indicate that the number of housing units in the two Townships increased over the ten year period; while, at the same time, the number of housing units decreased in the Village.
- During the same period, the median home value (half the home values are higher and half are lower) in the Bear Lake Community increased over 50%.
- Also during the same period, the cost to rent housing in Bear Lake increased by over 10%.

Economy

- The median household income in the Bear Lake Community increased around 62% to $34,421 during the ten years between 1990 and 2000. However, the unemployment rate also increased.
- The number of people commuting to work outside the Bear Lake Community has increased from 1990 to 2000.

Land Use

- The amount of land used for residential purposes increased by about 1,360 acres from 1978 to 2005. However, the amount of land used for commercial and industrial uses (taken together) increased by less than 80 acres during that same period.
- The percentage of land used for agriculture decreased by about 24% (2,648 acres) from 1978 to 2005. This was the largest change noted.
- Other significant changes in land use include a 1,103 acre decrease in non-forested lands and an increase of about 1,765 acres in forested land.

Community Infrastructure

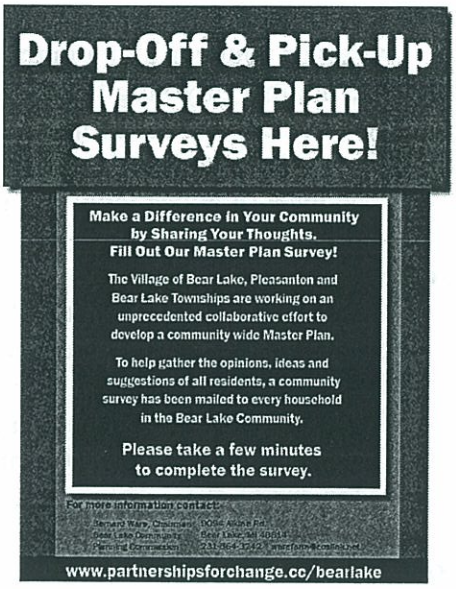
- Downtown Bear Lake has a number of empty and dilapidated buildings.
- The Bear Lake Community has no sewer system and a limited public water supply.
- The Bear Lake Community has a limited number of public recreation facilities.

With these characteristics and trends in mind, the Bear Lake Community Planning Commission solicited public opinion to help identify the planning and development issues of greatest concern for the Bear Lake Community. Public opinion was collected through a number of activities and exercises including, a thorough community-wide survey, three large public meetings, a joint meeting of elected and appointed officials and an interactive project website. Additionally, interested citizens were encouraged to attend regularly scheduled Planning Commission meetings.

Community Survey

In an effort to better assess community attitudes toward important development and land use issues, the planning commission developed and mailed a community-wide survey to every address in the Bear Lake postal delivery system. Survey questions were organized under six topic headings, touching on issues identified at the first public meeting and at the monthly planning commission meetings. In total, 1,853 surveys were mailed. A total of 394 surveys were returned, yielding a response rate of about 21%. The surveys offer a broad-based and useful sampling of public opinion in the Bear Lake Community. A brief summary of the survey is discussed below. A copy and a full summary of the survey can be found in *Appendix K.*

Figure 7.1
Community Survey Poster



Source: LIAA

Topic: General Land Use and Development

In response to the question, "How important was each of the following to your decision to live in the Bear Lake Community?" - 83% of the respondents noted **air quality** as "somewhat" to "very important", 77% of the respondents noted **rural/small town character** as "somewhat" to "very important", 73% noted **wildlife habitat** as "somewhat" to "very important" and 74% noted **desirable neighborhoods** as "somewhat" to "very important".

In response to the question, "What are the most important qualities of the Bear Lake Community's rural character?" - 85% of the respondents noted **quiet** as "somewhat" to "very important", 83% of the respondents noted **scenic views** as "somewhat" to "very important", 81% of the respondents noted **large areas of forests** as "somewhat" to "very important", 77% of the respondents noted **low amount of traffic** as "somewhat" to "very important", 77% of the respondents noted **seeing lots of wildlife** as "somewhat" to "very important" and 72% of the respondents noted **access to small streams and small lakes** as "somewhat" to "very important".

Topic: Downtown and Economic Development

In response to the question, "what types of business and economic development would you favor in or very near the Village?" - 78% of the respondents said they would be "somewhat" or "completely in favor" of a **farmers market,** 77% of the respondents said they would be "somewhat" or "completely in favor" of **more restaurants**, 75 % of the respondents said they would be "somewhat" or "completely in favor" of **additional medical services** and 69% of the respondents said they would be "somewhat" or

"completely in favor" of **more retail shops**. In response to the question, "Do you favor business and economic development in Pleasanton and Bear Lake Townships outside the Village of Bear Lake?" - approximately 71% of the respondents said **yes** and approximately 39% said **no**. ADDS UP TO 110%

Topic: Housing and Neighborhoods

In response to the question, "Where would you like to see most of the new housing developed?" - In most cases, the negative response was relatively high, with "no new housing" or "very few housing" receiving 38 to 43% of all responses for **In the Village of Bear Lake**, **In Bear Lake Township, In Pleasanton Township** and in **Groups or Clusters outside the Village**. Out of the six options, 38% of the respondents noted they would like to see "some new housing units" or "many new housing units" **next to the Village in the Townships** and 35% of the respondents noted they would like to "see some new housing units" or "many new housing units" **near existing country side roads**.

In response to the question, "What types of future residential housing would you favor in the Bear Lake Community?" - Over 50% of the respondents said they were "totally opposed" to the **conversion of homes to multi-family dwellings** and 63% were "totally opposed" to **mobile home parks**.
Out of the eight options, 51% of the respondents said they would be "somewhat in favor" or "completely in favor" of **single family dwellings on large lots**, 47% of the respondents said they would be "somewhat in favor" or "completely in favor" of **single family dwellings on very large lots** and Nearly 57% of the respondents said they would be "somewhat in favor" or "completely in favor" of **senior housing**.

Topic: Recreation and Tourism

In response to the question, "Are you satisfied with the quality and quantity of recreation facilities in the Bear Lake Community?" - 56% of the respondents said **yes** while 44% said **no**. In response to the question, "How important are the following features to recreation & tourism for the community?" - 53% of the respondents revealed it was "somewhat important" to "very important" to **expand non-motorized trails** and 58% said it was "somewhat important" to "very important" to **provide additional public access to Bear Lake**.

Topic: Public Facilities

In response to the question, "To support business and economic development, would you favor the expansion of the public water supply system in and around the Village if you did not have to pay any fees or taxes? - approximately 80% of the respondents said **yes** and 18% said **no**. In response to the question, "To support business and economic development, would you favor the construction of a public sewer and wastewater treatment system in and around the Village if you did not have to pay any fees or taxes?" - approximately 82% of the respondents said **yes** and 18% said **no**. In response to the question, "Which of the following municipal facilities/services would you like to see constructed or improved?" - 88% of the respondents noted **maintenance of roads** as "somewhat important" to "very important".

Topic: Natural Resources

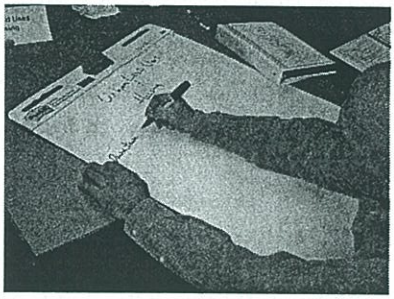
In response to the question, "Do you believe it is important to protect the water quality of the lakes, streams and groundwater of the Bear Lake Community?" - 98.4 of the respondents said **yes** and 1.6% said **no**. In response to the question, "Which things would you favor local government doing to protect

water quality?" - at least 74% of the respondents responded as "somewhat in favor" to "completely in favor" of all four choices, **Reduce Runoff from Streets & Parking; Maintain Shoreline Vegetation; Require Maintenance of Septics; and Protect from Invasive Species.** In response to the question, "How important do you think it is for the community to preserve the following natural features?" - 77% of the respondents said **open space (field & wetlands)** were "somewhat important" to "very important", 83% of the respondents said **farms & orchards** were "somewhat important" to "very important" and 89% said **wildlife habitat** were "somewhat important" to "very important".

Public Meetings

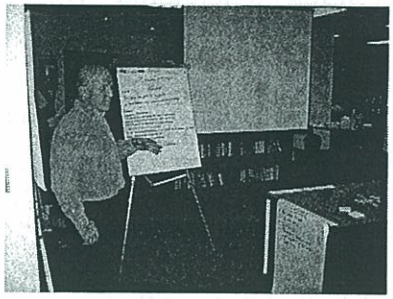
To solicit public opinion, the Planning Commission convened three large public meetings. Notice for each meeting was well publicized through articles in the newspaper and postings at municipal offices. In addition, flyers were distributed at grocery stores, and posters were placed in store fronts and public buildings. Notice for each public meeting was also personally advertised (word of mouth) by members of the Planning Commission.

Picture 7.1
December 18, 2006



Source: LIAA

Picture 7.2
December 18, 2006



Source: LIAA

Meeting One: December 18, 2006
At the project kick-off meeting, LIAA staff members walked interested citizens through a description of the planning process. In addition, citizens were presented with a brief social and physical profile of the community. Citizens then engaged in several exercises to help identify a *Vision* for the Community. In the first exercise, participants were asked to describe what they loved about the community and what they are most concerned about. Next, participants were asked to develop several "statements" describing their vision of what the Bear Lake Community could look like in 25 years. Finally, participants were organized in groups and asked to describe the ***S***trengths, ***W***eaknesses, ***O***pportunities, and ***T***hreats (SWOT) of the community organized under six topic headings: Economy and Employment; Arts, Culture and Humanities; Government Services and Infrastructure/Agriculture, Natural Resources and Recreation; Youth and Education; and Urban Land Uses and Housing. The ideas expressed during each exercise were collected on flip-charts and discussed. In general, when asked what do you love about the Bear Lake Community? - participants noted natural resources, self-reliance and small town atmosphere. When asked, what are you most concerned about in the Bear Lake Community? - participants noted the lack of jobs and economic opportunities, water quality, Milfoil and inappropriate behavior on Bear Lake. When asked to list statements describing the vision of the Bear Lake Community in 2030, participants said, charming village, vibrant downtown, rural character maintained, greenery, and diverse agriculture. A complete list of the responses from these questions and results from the SWOT exercise can be found in *Appendix L.*

Meeting Two: April 18, 2007

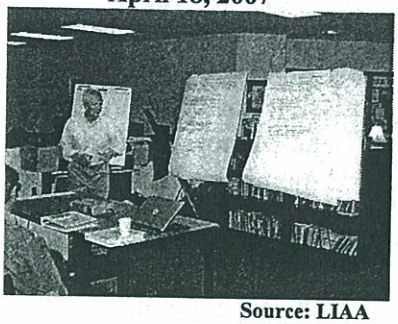
The second public meeting began with a presentation of a draft Bear Lake Community Vision Statement (stated below). This vision was derived from the comments and suggestions provided by participants of the first public meeting and discussions among the planning commission at their regularly scheduled meetings. The vision statement is intended to establish the foundation upon which the plan's goals and objectives are based.

> *In 2030, the **Bear Lake Community** is a healthy mix of active farms, beautiful natural areas and rural residences surrounding a vibrant village with small town charm and modern amenities. The people of the **Bear Lake Community** are friendly, cooperative, and work together to support community events, preserve and rehabilitate downtown buildings, develop new businesses, and manage the area's agricultural and natural resources. From the pristine natural areas of the surrounding landscape to the lively streets of downtown, the **Bear Lake Community** offers residents and visitors of all ages, access to modern schools, a broad spectrum of services, healthy waterways, park and recreation facilities, a vibrant downtown, engaging community events, and employment opportunities.*

After a brief discussion on how the vision statement was established, participants provided the following comments and suggestions. Each idea, comment and suggestion was collected on flip-charts and discussed, including:

- Please mention Bear Lake specifically
- Please consider how important ground water is to the community
- Consider "acting" to protect the greater watershed
- Define "beautiful natural areas"

Picture 7.3
April 18, 2007



Source: LIAA

Picture 7.4
April 18, 2007

Source: LIAA

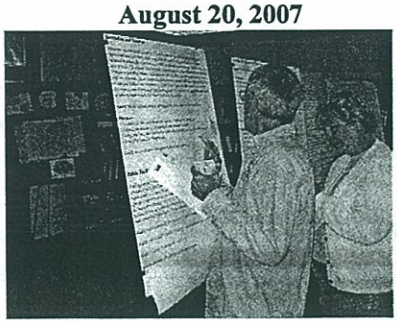
After further discussion concerning the comments suggestions about the draft vision statement, participants were asked to convene into small groups, under six topics of interest: General Land Use and Development; Downtown and Economic Development; Housing and Neighborhoods; Recreation and Tourism; Public Facilities; and Natural Resources and the Environment. Each group was presented with a preliminary set of goals and objectives pertaining to the topic they selected. The preliminary goals and objectives were derived from the answers provided at the first meeting (including the responses of the SWOT analysis) and discussions among the planning commission at their regularly scheduled meetings. Group members were asked to discuss and suggest comments and revisions to each goal and objective statement. Group members were then asked to prioritize each goal and objective as high, medium, or low. After about twenty minutes of discussion, participants were asked to convene under a different topic and the exercise was repeated. After the exercise, the ideas, comments, suggestions and revisions from each group was collected and discussed. In general, most of the

preliminary goals and objectives discussed received a high or medium priority. In addition, a few language revisions were suggested for some of the goals and objectives. A complete list of the responses (in CAP/~~STRIKE~~ form) from these exercises can be found in *Appendix M.*

Meeting Three: August 20, 2007

The third public meeting began with a review of the planning process and a presentation of the results from the community-wide survey. After a brief discussion, members of the Bear Lake Community Planning Commission presented a revised set of goals and objectives. The revised goals and objectives were derived from responses collected at the two previous public meetings (including the preliminary goals and objectives discussed at the second public meeting), discussions among the planning commission at their regularly scheduled meetings and community survey results. LIAA staff members then presented the draft Future Land Use Map and Definitions. After another brief discussion, participants were asked to place comments (using yellow sticky notes) directly on large print-outs of each goal and objective and the future land use map and definitions. In addition participants were asked to submit comments directly on large print-outs of the draft *strategies* of the plan. Throughout the exercise, Planning Commission members convened around the large print-outs to help answer and/or clarify questions. At the end of the exercise, all the comments and suggestions submitted on yellow sticky notes were collected. Each comment was then discussed at the next scheduled meeting of the planning commission. A complete list of the responses from this meeting can be found in *Appendix N.*

Picture 7.5
August 20, 2007



Source: LIAA

Picture 7.6
August 20, 2007

Source: LIAA

Public Official Informational Meeting: May 14, 2007

In an effort to inform public officials from the three jurisdictions about the progress and results from the first phases of the planning process, the planning commission hosted an informal "informational" meeting at the Bear Lake Manor. Planning commission members, township board members, village council members and other public officials from the three jurisdictions were invited. Interested citizens of the Bear Lake Community were also welcome to attend. With about 30 people in attendance, LIAA staff members provided a presentation outlining the progress and results of the two public meetings, results from the community-wide survey and the next steps toward adoption of the new comprehensive plan.

Picture 7.7
Bear Lake Manor

Source: LIAA

Project Website

For the purpose of providing an open and citizen driven planning process, a project website was established - (http://www.partnershipsforchange.cc/bearlake). Among other things, the website provided interactive mapping, direct access to information on meeting dates, important documents, draft chapters of the plan and meeting handouts. In addition, the website provided a "forum" in which citizens could voice their opinion or post comments on all of the questions posed at each of the public meetings and the draft comprehensive plan.

Figure 7.2
Project Website