

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.

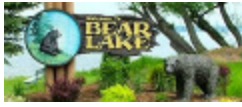
This chapter will describe recent patterns of land use in the Bear Lake Community and how those patterns changed between 1978 and 2005. To make this comparison, we have used a geographic information system (GIS) to evaluate and compare two different land use maps derived from aerial photographs and other 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.

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.

Picture 6.1
Lots for Sale
Pleasanton Township



Source: LIAA

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.

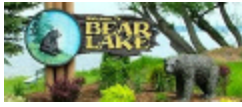


Table 6.1 Land Use/Cover: 1978 - 2005

Level 1	Land Use Code	1978 Land Use		2005 Land Use		Change in Acres 1978 - 2005	
		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.