

## Chapter B4: Land Use

### Land Use/Cover Change

USE of land changes over time. In Wexford County 62 square miles of land has changed use or cover over a 20 year period. This chapter examines the changes in land use and land cover for the county. It will focus on existing land use/cover along with a comparison of 1978 and 1998/99 land use/cover in the county. Much of the base research for this analysis was initially presented in *Wexford County Land Cover/Land Use Change Project*<sup>93</sup> and *Wexford County Land Cover/Land Use Update Phase I Data Presentation*.<sup>94</sup> This chapter is heavily based on these two reports. The following general maps pertain to this discussion, and visually shows existing and changing land use/cover:

- Land Use/Cover for 1978, page 100.
- Land Use/Cover for 1998/99, page 101.
- Land Use/Cover changes 1978-1998/99, showing what the land use/cover was in 1978, page 102.
- Land Use/Cover changes 1978-1998/99, showing what the land use/cover is in 1998/99, page 103.

Examination of these maps at length is better than a prose explanation.

Wexford County contracted with Michigan State University's Center for Remote Sensing and Geographical Information Science to update the county's land use/cover inventory. This update was based on aerial photography flown in spring of 1998 and 1999. In the late 1970s/early 1980s Wexford County participated in the Michigan Resource Information System (MiRIS) program under the Michigan Resource Information Act.<sup>95</sup> Under this program Wexford County conducted the first inventory of land use and cover based on summer 1978 aerial photography. This work was not field checked, but is a result of air photo interpretation. As a result, there is an anticipated rate of error.

<sup>93</sup>Machemer, Patricia L. Ph.D. and Jessica J. Moy, Sarah J. AcMoody, Richard E. Groop Ph.D., Robert Goodwin and others; *Wexford County Land Cover/Land Use Change Project*, Michigan State University Center for Remote Sensing and Geographical Information Science; December 2000.

<sup>94</sup>Moy, Jessica J. and Patricia L. Machemer Ph.D., Sarah J. AcMoody, Richard E. Groop Ph.D., Robert Goodwin; *Wexford County Land Cover/Land Use Update Phase I Data Presentation* (at the July 12, 2000 Wexford County Planning Commission meeting); Michigan State University Center for Remote Sensing and Geographical Information Science; June, 2000.

<sup>95</sup>Part 609 of P.A. 451 of 1994, as amended, being the Resource Inventory part of the Michigan Natural Resources and Environmental Protection Act (M.C.L. 324.60901 *et. seq.*; formerly P.A. 204 of 1979, as amended; the Michigan Resource Inventory Act, M.C.L. 321.201 *et. seq.*).

The 1978 MiRIS data claimed to be 95% accurate. Based on MSU's quality control work, it is estimated the 1998/99 work is at least that accurate, and probably more. The methodology used follows:

- MSU fixed the gross errors in 1978 Land Use/Cover data, so we should have the most accurate 1978 data.
- The 1998/99 photos were registered, rectified, and mosaicked to meet National Map Accuracy Standard of  $\pm 12$  meters.
- Each Land Use/Cover township update interpretation was completed by two separate interpreters – in this process, all of our aerial interpretation was 97 - 100% accurate.
- Five percent of polygons/township were field checked, as were any "questionable" polygons. For example one individual had a very large yard filled with "stuff," - from the aerial photo, it appeared commercial (a 10 acre junkyard), however, from the field check, it was realized it was actually residential. Very few polygons were changed as a result of field checking (i.e. interpretation was accurate).

In this project the 1998/99 error rate is estimated to be 3% to 5% – or 95 to 97% accurate.

A land use/cover inventory uses air photography to classify use of the land, or land cover, into various categories. The mapping into categories done in 1978 was done down to about a 2 or 2½ acre unit size. Land use/cover which occupies a smaller area would not be included in the mapping. In order to be consistent, and have the ability to do change analysis, the 1998/99 interpretation was also done with a minimum 2 or 2½ acre parcel size.

The classification system used to do this is different from classes used for assessing taxes which is different than the zoning district. The three different systems should not be confused with one another and are not interchangeable. The classification of use of land and land cover categories places areas of land into one of the following categories:

- Land Cover Category 1: Urban/Built-up
- Land Cover Category 2: Agriculture
- Land Cover Category 3: Grass/Shrub
- Land Cover Category 4: Forest
- Land Cover Category 5: Water
- Land Cover Category 6: Wetland

From these initial categories it is further classified into more detailed subcategories. Data can then be reported out at any of the available levels:

- 1 Urban
  - 11 Residential
    - 111 Multi-Family: Medium to High Rise
    - 112 Multi-Family: Low Rise (less than three floors)

- 113 Single Family/Duplex
  - 1131 Single Family
  - 1132 Duplex
  - 1135 Manufactured Home
- 115 Manufactured Home Park
- 12 Commercial, Services, & Institutional
  - 121 Primary/Central Business District
  - 122 Shopping Centers/Malls/Retail Centers
  - 124 Secondary/Neighborhood Business District
  - 126 Institutional
- 13 Industrial
  - 138 Industrial Park
- 14 Transportation
  - 141 Air Transportation
  - 142 Rail Transportation
  - 143 Water Transportation
  - 144 Road Transportation
  - 145 Communications
  - 146 Utilities
- 17 Extractive
  - 171 Open Pit
    - 1714 Sand & Gravel
  - 173 Wells
- 19 Open Land & Other
  - 192 Outdoor Public Assembly
  - 193 Outdoor Recreation
    - 1931 Parks
    - 1932 Play, Games, & Athletics
    - 1933 Other Land-Activities
  - 194 Cemeteries
  - 196 Under Construction
- 2 Agriculture
  - 21 Cropland
  - 24 Permanent Pasture
  - Other Agriculture Land
  - Farmsteads
- 3 Range Land
  - 31 Grasses
  - 32 Shrub

- 4 Forest
  - 41 Broadleaved (Deciduous)
    - 411 Northern Hardwoods
    - 421 Central Hardwoods/Oak
    - 413 Aspen/Birch
    - 414 Lowland Hardwoods
  - 42 Conifer
    - 421 Pines
    - 422 Other Upland Conifer
    - 423 Lowland Conifers
    - 429 Managed Christmas Tree Plantation
  - 43 Mixed Conifer-Broadleaved Forest
- 5 Water
  - 51 Streams & Waterways
  - 52 Lakes
- 6 Wetland
  - 61 Forested wetland
    - 611 Wooded Wetland
    - 612 Shrub/Scrub Wetland
  - 62 Non-forested wetland
    - 621 Aquatic Bed Wetland
      - 6211 Floating Bed Wetland
    - 622 Emergent Wetland
    - 629 Other Non-Forested Wetland

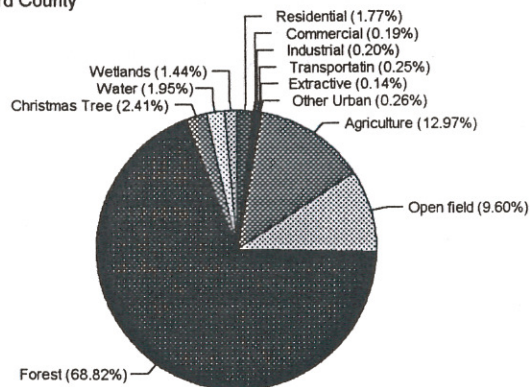
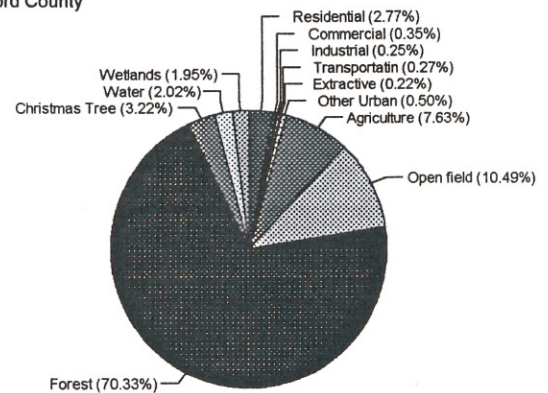
The classification of land into the categories is done with the use of computers, running Geographic Information System (GIS) software. This software has the ability to look at the categories and their spacial extent and location, and compare the 1978 and 1998/99 data. The result is the ability to show and examine change over the 20 year period. From this analysis important trends and data about Wexford County can be presented in tabular, chart, and map form.

The following table summarizes data resulting from the land use/cover analysis of the county.



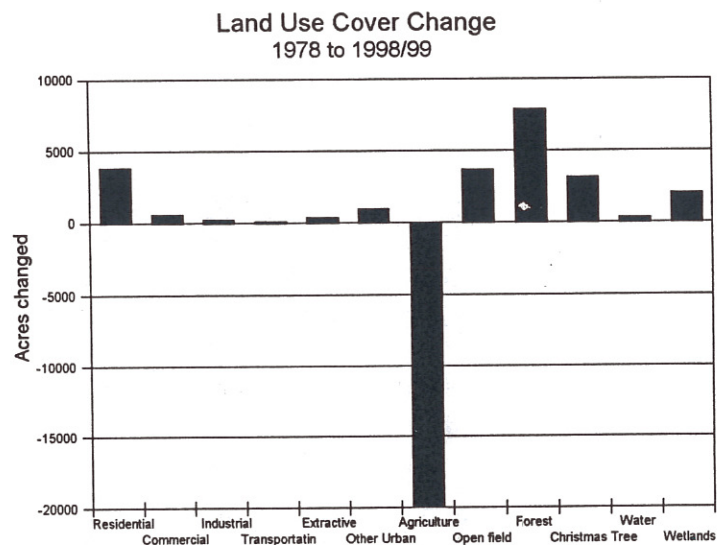
Land Use/Cover Table<sup>96</sup>

	Description	1978 Acres	1978 Percent Total Land Area	Total 1998/99 Acres	Total 1998/99 sq. miles	1998/99 Percent Total Land Area	Gross Gain 1978-1998/9 Acres	Gross Loss 1978-1998/9 Acres	Net 1978-1998/9 Acres	Net 1978-1998/9 sq. miles	Change 1978-1998/9 Percent
1	Urban	10,593.731	2.879%	16,605.980	25.947	4.513%	7,289.916	1,277.667	6,012.249	9.394	56.753%
11	Residential	6,684.593	1.817%	10,537.763	16.465	2.864%	4,475.225	622.055	3,853.170	6.021	57.643%
112	Multi-Family Residential	164.642	0.045%	382.230	0.597	0.104%	238.960	21.372	217.588	0.340	132.158%
113	Single Family Residential	6,454.441	1.754%	10,045.101	15.695	2.730%	4,191.343	600.683	3,590.660	5.610	55.631%
115	Mobile Home Park	65.510	0.018%	110.432	0.173	0.030%	44.922	0.000	44.922	0.070	68.573%
12	Commercial/Services/ Institutional	719.144	0.195%	1,320.969	2.064	0.359%	645.659	43.834	601.825	0.940	83.686%
121	Primary Business (CBD)	146.338	0.040%	202.769	0.317	0.055%	56.431	0.000	56.431	0.088	38.562%
124	Secondary Business	348.074	0.095%	728.697	1.139	0.198%	415.065	34.442	380.623	0.595	109.351%
126	Institutional	224.732	0.061%	389.503	0.609	0.106%	174.163	9.392	164.771	0.257	73.319%
13	Industrial	745.600	0.203%	961.610	1.503	0.261%	305.108	89.098	216.010	0.338	28.971%
14	Transportation/Utilities	951.784	0.259%	1,032.647	1.614	0.281%	81.186	0.323	80.863	0.126	8.496%
17	Extractive	512.328	0.139%	844.087	1.319	0.229%	428.146	96.387	331.759	0.518	64.755%
171	Quarries	480.547	0.131%	825.496	1.290	0.224%	426.311	81.362	344.949	0.539	71.783%
173	Wells	31.781	0.009%	18.591	0.029	0.005%	1.835	15.025	-13.190	-0.021	-41.503%
19	Other Urban	980.282	0.266%	1,908.904	2.983	0.519%	1,354.592	425.970	928.622	1.451	94.730%
2	Agriculture	48,903.663	13.291%	29,023.838	45.350	7.888%	2,614.986	22,494.811	-19,879.825	-31.062	-40.651%
3	Grassland/Shrubland	36,178.541	9.832%	39,863.847	62.287	10.834%	21,792.641	18,107.335	3,685.306	5.758	10.186%
4	Forest	259,490.867	70.522%	267,367.324	417.761	72.663%	32,707.776	24,831.319	7,876.457	12.307	3.035%
41	Deciduous Forest	176,448.044	47.954%	170,300.290	266.094	46.283%	6,353.005	12,500.759	-6,147.754	-9.606	-3.484%
42	Coniferous Forest	73,950.481	20.098%	84,840.018	132.563	23.057%	17,481.638	6,592.101	10,889.537	17.015	14.725%
429	Christmas Tree Plantations	9,092.342	2.471%	12,227.016	19.105	3.323%	8,873.133	5,738.459	3,134.674	4.898	34.476%
5	Water	7,369.760	2.003%	7,671.500	11.987	2.085%	309.796	8.056	301.740	0.471	4.094%
6	Wetlands	5,418.606	1.473%	7,422.678	11.598	2.017%	2,726.447	722.375	2,004.072	3.131	36.985%
7	Barren Land	0.000	0.000%	0.000	0.000	0.000%	0.000	0.000	0.000	0.000	0.000%
	<b>TOTAL</b>	<b>367,955.168</b>	<b>100.000%</b>	<b>367,955.167</b>	<b>574.930</b>	<b>100.000%</b>	<b>67,441.562</b>	<b>67,441.563</b>	<b>-0.001</b>	<b>-0.000</b>	<b>-0.000%</b>

1978 Land Use/Cover  
Wexford County1998/9 Land Use/Cover  
Wexford County

These charts compare the above table to illustrate the proportionate amount of land use/cover in Wexford County. The table, below, shows change from 1978 to 1998/99.

<sup>96</sup>Based on Michigan Resource Information System (MiRIS) land use/cover classification.



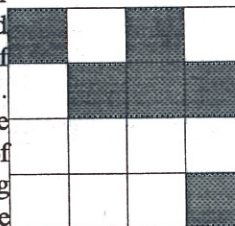
The 1973 *Wexford County Plan*<sup>97</sup> lists urbanized land as 1% of the county's area at 3,545 acres; agricultural land 15.6% (56,989 acres); forest land 60.4% (220,400 acres); public recreation land 0.2% (631 acres); transportation lands 3.2% (11,833 acres); water surface area 1.9% (6,912 acres); and other (wetlands, mining, private recreation lands) at 17.7% (64,490 acres).

### Agricultural

Nearly 31 square miles (19,880 acres) of agricultural lands were lost in Wexford County from 1978 to 1998/99. That is an average of a 2¾ acre farmland loss per day.

This loss of farmland has occurred mainly in Clam Lake Township, and a corridor along M-42 (Wexford, Antioch, Greenwood, Colfax, and Cedar Creek Townships).

In most areas of Wexford County, farmland loss is not a result of urbanization or sprawl. Sprawl appears to only be happening around the City of Cadillac area, and impacting farmland loss in Clam Lake Township. Most of the county is seeing a loss of farmland for other reasons. Land that was agriculture in 1978 became, in 1998/99, the following land uses:



<sup>97</sup>Wexford County Planning Commission; *Wexford County Comprehensive Plan Existing Conditions, Trends, Potentials*; Cadillac; 1973, p. 6-2 and 6-3.



## Loss in Agricultural Lands

Change: What it was in 1978			What it became in 1998/9		
Land Use/Cover	Acres	Percent	Land Use/Cover	Acres	Percent
Agriculture	21,350 (net 19,879)	100%	grass/shrub	11,288	52.9%
			forest	8,458	39.6%
			urban	1,503	7%

Of the farmland acreage shifting into forest uses, a certain amount became managed Christmas tree plantation—arguably not a “loss” in agriculture lands. How much of the 8,873 acres of Christmas tree plantation gross gain is from agriculture uses was not calculated. It is clear from examining the land use change maps in this chapter, it accounts for somewhat less than half the Christmas Tree gain.

The question becomes, if farmland is not lost to urbanization, then is it being lost to a proliferation of “farmetts” on 10 acre parcels (or parcels ranging in size from 5 to 35 acres)—parcelization? A series of maps on pages 112, 113, 114 attempts to illustrate the answer to this. The answer appears to be different in different parts of the county.

In the western and southern Wexford County,<sup>98</sup> the amount of former farmland which became smaller parcels does not appear to be as frequent an occurrence (in proportion to total farmland lost) as it is in other parts of the county. Thus “rural sprawl,” or proliferation of 10 acre parcels on lands that were farmed in 1978 does not appear to be a major issue. (This is not to say that parcelization and “rural sprawl” is not occurring. It is, but not on land that was farmed in 1978.)

In northern Wexford County (mainly along M-42)<sup>99</sup> the amount of former farmland which became smaller parcels appears to be a more frequent occurrence (in proportion to total farmland lost) as it is in other parts of the county. This area also coincides with the areas of the county where the greatest farmland loss has occurred.

Despite the farmland loss, these traditional farm areas are still the main areas of farmland in Wexford County. The areas of the county with prime farmland (mainly Wexford and Clam Lake Townships) also have seen very little parcelization of former farmland. In addition to these areas, a north-south corridor in east Boon Township is also a center

of agricultural land use activity in the county. The map on page 101 shows the areas of the county where land is currently used for agriculture. A comparison of this map to the Agricultural Lands map shows that farming is not confined to just those areas which are prime farmlands. (Prime farmlands occur mainly in Wexford and Clam Lake Townships.) Active farming also occurs in areas where physical attributes do not present conditions which are as favorable for farming.

For the most part, zoning for the three areas of the county have been the same (Wexford County Zoning: one acre minimum parcel size, dwelling and agriculture as permitted uses). The exception is Cedar Creek Township where zoning was requiring a 10 acre minimum parcel size (and dwelling and agriculture are permitted uses). Research and advocates in the planning profession have indicated that minimum parcel sizes between 5 and 35 acres may actually do more harm for purposes of protecting farmland. Ten acre parcels which are allowed have a width to depth ratio of 1:4 (thus being 333 feet wide at a road) is not even effective as an open space preservation tool. Using parcel size for farmland enhancement should be at least 40 acres in size (and maybe an ability to divide a limited number of ½ acre minimum, and a **maximum** of a one acre, parcel size). The 10 acre parcel size zoning in Cedar Creek Township, and the existence of former parcelized farmland in that townships tend to support the research on this topic.

In the western and southern Wexford County if loss of farmland is not “urbanization” and is not “parcelization” the next possible candidate reason for farmland loss is the individual farmer’s choice to get out of farming because it is not profitable, or the farmer stops farming because of his age and heirs or others do not choose to acquire the farm due to poor economics of farming.

It is presumed that farming can be pursued anywhere in the county with appropriate investment and management practices. However, the better areas (better soil areas such as prime farmland and locally essential) will present more favorable conditions which give those farms a competitive edge. Also farms which are contiguous to large blocks of farmland (such as Wexford Township next to a large farm

<sup>98</sup>Western and southern Wexford County means Wexford, Hanover, Springville, Slagel, Boon, South Branch, and Henderson Townships.

<sup>99</sup>Northern Wexford County means Cedar Creek, Liberty, Greenwood, Colfax, and Antioch Townships.

area in south Grand Traverse County and Clam Lake Township next to a large farm area in Missaukee and Osceola Counties) will do better. Farms which are a part of a larger farm community enjoy have the "critical mass" necessary to support services (farm suppliers, equipment servicing, marketing).

Land use/cover change is shown with maps on pages 100, 101, 102, and 103. Further analysis is provided on the map on page 105, 106. Much row crop farm activity has shifted back and forth between range land and farmed areas. The land use/cover may simply have caught a field on the year(s) it was held as fallow between crop planting, and was categorized as "open field."

The map on page 111 shows those areas of Wexford County which have been enrolled in the state's farmland and open space preservation program.<sup>100</sup> These lands in the county are restricted as to possible future development. The landowner and the State of Michigan have entered into an agreement where the owner has agreed not to develop his

land in return for tax credits, or reductions to effectively reduce property tax costs. While it is possible to back out of such agreements, the landowner must reimburse the state for a certain amount of the rebated or credited taxes.

## Forestry

Deciduous forest in Wexford received the second largest loss with 9.6 fewer square miles (6,147.75 fewer acres) of broadleaf forest. The area of the county which is classified as forested (70.33%) is a much greater area, so the percentage of loss is only 3.4%. Deciduous forest is also part of the broader land use category "Forest" and includes upland and lowland deciduous and conifer (pine) forests as well as managed Christmas tree plantations.

Overall "forest" land use/cover represents the largest gain in Wexford County, with 12.33 additional square miles (7,876 acres) – a 3% increase.

Forest land use/cover growth came mainly from open fields on which trees were planted or natural regeneration resulted in shrubs which matured to trees. Former agricultural areas are the second major source for new forest land use/cover areas.

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<sup>100</sup> Part 361 of P.A. 451 of 1994, as amended, being the Farmland and Open Space Preservation part of the Michigan Natural Resources and Environmental Protection Act, M.C.L. 324.36101 *et. seq.* (formerly P.A. 116 of 1971, as amended, being the Farmland and Open Space Preservation Act M.C.L. 554.701 *et. seq.*)



## Gain in Forest Lands

Change: What it was in 1978			What it became in 1998/9		
Land Use/Cover	Acres	Percent	Land Use/Cover	Acres	Percent
grass/shrub	11,120	56.5%	Forest		100%
Agriculture	8,457	42.9%			
other		0.5%			

Forest gain appears to center in an east-west area to the south of the M-42 highway (Springville, Antioch, Colfax, Cedar Creek, Slagle and Boon Townships).

Overall, forest land use/cover in Wexford County is, by far, the most dominant use/cover category. The map on page 101 shows the areas of the county where land is currently forested. Land use/cover change over time is shown with maps on pages 100, 101, 102, and 103. For more detail see forest change analysis maps on pages 107 and 108. As with agricultural land use, forest lands are not limited to those areas which have been given productivity ratings of national, regionally or locally prime timberlands.

While much of the county is still forest land, these maps do **not** show the size of the parcel. For forestry, this is a major issue. Research and advocates in the planning profession have indicated that minimum parcel sizes between 5 and 35 acres may actually do more harm for purposes of good forest management. Ten acre parcels which are allowed have a width to depth ratio of 1:4 (thus being 333 feet wide at a road) is not even effective as an open space preservation tool. Using parcel size for forestry purposes should be at least 40 acres in size (and maybe an ability to divide a limited number of 0.5 acre minimum, and a **maximum** of a one acre, parcel size). Parcelization is often a major cause of forest land fractionalization. See detailed discussion of this starting on page 320.

The following is from "Influence of Inclusion of Public Lands" in *Wexford County Land Cover/Land Use Change Project*<sup>101</sup> and is quoted here:

<sup>101</sup>Machemer, Patricia L. Ph.D. and Jessica J. Moy, Sarah J. AcMoody, Richard E. Groop Ph.D., Robert Goodwin and others; *Wexford County Land Cover/Land Use Change Project*, Michigan State University Center for Remote Sensing and Geographical Information Science; (continued...)

It should be noted that Wexford County has significant public land holdings due to the presence of state and federal forests. There is greater stability in land cover in public lands, i.e. the potential for public lands to change land cover type is not as high as the potential for non-public lands to change cover type.

The existence of significant public land holdings could influence perceptions of land use change. Because of this a township with significant public land holdings may appear to be more stable, have less overall percentage change. However, the same township may have a great deal of change occurring in non-public lands. Additionally, for land use planning purposes it may be more insightful to examine the degree of change in non-public lands, that is the lands that have a higher potential for change.

Slagle Township serves as a case for understanding how public lands may influence overall acreage change, percent change, and perceptions of land cover change. If public lands are included in the analysis, the total township acreage is 22,885.094 acres, and the total acreage that changed from 1978 to 1998/99 is 3,588.139 acres, representing a 15% change. Using an approximation of public land extent, derived through heads up digitizing of a Wexford County Map, the township [private] acreage is 9,907.668 acres, and the total acreage changed is 2,712.241 acres, representing a 27% change. In effect, the elimination of public lands decreased the total township acreage by 12,977.426 acres. However, the total acreage changed for this ten-year time period was only reduced by 875.898 acres. More significant than acreage differences, is the percent change difference, where the percentage change when public lands are not included is 11% higher. This supports the assumption that public lands are more stable.

<sup>101</sup>(...continued)  
December 2000; pages 4-6.



Comparing Change Tables for Slagle Township, including and excluding public lands, gives further insight into the influence of public

lands on acreage change, percentage change, and perceptions of land use change.

Slagle Township Change Table (public lands included in calculations)

	Total 78	Total 98/99	Gain	Loss	Net
Urban/Built-up	320.118	745.969	437.422	11.571	425.851
Agriculture	1926.923	733.740	10.350	1203.533	-1193.183
Grass/Shrub	1746.745	1304.401	651.515	1093.859	-442.344
Forest	18862.492	20061.313	1717.496	518.675	1198.821

Slagle Township Change Table (excluding public lands in calculations)

	Total 78	Total 98/99	Gain	Loss	Net
Urban/Built-up	289.866	603.335	315.805	2.336	313.469
Agriculture	1860.379	718.878	10.350	1151.851	-1141.501
Grass/Shrub	1441.281	1189.584	569.215	820.912	-251.697
Forest	6292.156	7368.488	1439.166	362.834	1076.332

The density of forest cover also corresponds with the areas where public land ownership is concentrated.

## Minor Change

Certain areas of Wexford County reflected notably less land use/cover change than the remainder of the county. These areas tended to be in areas of public land ownership, but with notable exceptions. Less than normal change occurred in Hanover, South Branch and Henderson Townships. Each of these three townships have a large amount of public land ownership. Moderately low change occurred in Slagle, Boon, Springville, Colfax and Greenwood Townships. Of these Springville and Colfax Townships do not have as much public lands as others, nearly an equal amount of public land as Antioch, and certainly has less public land than Liberty Township which is not listed among the notably less or moderately low change-townships.

## Urban

The second largest gain in the county was in urbanization (residential, commercial/services/institutional, industrial, transportation/utilities, extractive (sand or gravel pits), and other (cemeteries, parks, recreation areas) land use/cover categories). An additional 9.4 square miles

(6,012.25 acres) have become urbanized in the 20 years from 1978 to 1998/99. This represents a 56.75% increase over the urban areas in 1978. Today there is 4.5% of the county in urban land use categories, about 26 square miles (16,606 acres).

Within urban, 16 square miles (10,537.6 acres, or 2.8% of the county) is residential.

Within urban, 2.9 square miles (1,909 acres, or 0.5% of the county) is "other" (cemeteries, parks, recreation areas).

Within urban, 2 square miles (1,321 acres, or 0.3% of the county) is commercial/service/institutional.

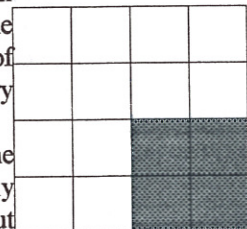
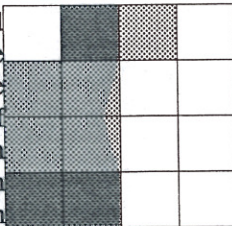
Within urban, 1.6 square miles (1,032.6 acres, or 0.3% of the county) is transportation/utilities.

Within urban, 1.5 square miles (961.5 acres, or 0.25% of the county) is industrial.

Within urban, 1.3 square miles (844 acres, or 0.25% of the county) is extractive.

Urbanization has been predominantly occurring in the four townships around the City of Cadillac (Selma, Haring, Cherry Grove, and Clam Lake).

Lands that have become urbanized were, in 1978, mainly forest and grass/shrub. About 24% was agricultural land uses.





## Urban Gains

Change: What it was in 1978			What it became in 1998/9		
Land Use/Cover	Acres	Percent	Land Use/Cover	Acres	Percent
Forest	2,658.6	42.3%	Urban		100%
grass/shrub	2,112.3	33.6%			
agriculture	1,503.3	23.9%			
other		0.2%			

## Sprawl

Sprawl has become a buzz word for a type of development which has bad connotations. However not all sprawl is "bad." Sprawl is a necessary part of what happens when a community grows. In one view sprawl becomes "bad" when it happens without the corresponding growth. In that case one has urban development spreading out on the land (more roads, sewer, water pipes) with additional public costs without the increased number of people to pay taxes to pay for those services. This has been what has been happening in Michigan. (See the discussion on Michigan's Trend Future, page 71, and a brief history of how sprawl came about on pages 59, 71.) In Wexford residential land use increased by 57.5% during 1978-1998/99. Wexford's population grew 21.5% during 1980-2000.

The following essay presents another view, or definition of what sprawl is.<sup>102</sup>

If sprawl truly is destructive, why is it allowed to continue? The beginning of an answer lies in sprawl's seductive simplicity, the fact that it consists of very few homogeneous components – five in all – which can be arranged in almost any way. It is appropriate to review these parts individually, since they always occur independently. While one component may be adjacent to another, the dominant characteristic of sprawl is that each component is strictly segregated from the others.

*Housing subdivisions*, also called *clusters* and *Pods*. These places consist only of residences. They are sometimes called *villages*, *towns*, and *neighborhoods* by developers, which is misleading, since those terms denote places which are not exclusively residential and which provide an experiential richness not available in a housing tract. Subdivisions can be identified as such by their contrived names, which tend toward the romantic

– Pheasant Mill Crossing – and often pay tribute to the natural or historic resource they have displaced.<sup>103</sup>

*Shopping centers*, also called *strip centers*, *shopping malls*, and *big-box retail*. These are places exclusively for shopping. They come in every size, from the Quick Mart on the corner to the Mall of America, but they are all places to which one is unlikely to walk. The conventional shopping center can be easily distinguished from its traditional main-street counterpart by its lack of housing, or offices, its single-story height, and its parking lot between the building and the roadway.

*Office parks* and *business parks*. These are places only for work. Derived from the modernist architectural vision of the building standing free in the park, the contemporary office park is usually made of boxes in parking lots. Still imagined as a pastoral workplace isolated in nature, it has kept its idealistic name and also its quality of isolation, but in practice it is more likely to be surrounded by highways than by countryside.

*Civic institutions*. The fourth components of suburbia is public buildings: the town halls, churches, schools, and other places where people gather for communication and culture. In traditional neighborhoods, these buildings often serve as neighborhood focal points, but in suburbia they take an altered form: large and infrequent, generally unadorned owing to limited funding, surrounded by parking, and located nowhere in particular. The school . . . shows what a dramatic evolution this building type has undergone in the past thirty years. A comparison between the size of the parking lot and the size of the building is revealing: this is a school to which no child will ever walk. Because pedestrian access is usually nonexistent, and because the dispersion

<sup>102</sup>Duany, Andres and Elizabeth Plater-Zyberk, and Jeff Speck; "The Five Components of Sprawl"; "What is Sprawl, and Why?" *Suburban Nation, The Rise of Sprawl and the Decline of the American Dream*; North Point Press; New York; 2000; ISBN 0-86547-557-1; pages 5-7.

<sup>103</sup>Housing subdivisions are not the only components of sprawl with ridiculous names. Our favorite is a new section of Atlanta called Perimeter Center, a moniker that aptly sums up the confusion inherent in the suburban landscape.



of surrounding homes often makes school buses impractical, schools in the new suburbs are designed based on the assumption of massive automotive transportation.

*Roadways.* The fifth component of sprawl consists of the miles of pavement that are necessary to connect the other four disassociated components. Since each piece of suburbia serves only one type of activity, and since daily life involves a wide variety of activities, the residents of suburbia spend an unprecedented amount of time and money moving from one place to the next. Since most of this motion takes place in singly occupied automobiles, even a sparsely populated area can generate the traffic of a much larger traditional town.

The traffic load caused by the many disassociated pieces of suburbia is most clearly visible from above. . . . the amount of pavement (public infrastructure) per building (private structure) is extremely high, especially when compared to the efficiency of a section of an older city like Washington, D.C. The same economic relationship is at work underground, where low-density land-use patterns require greater lengths of pipe and conduit to distribute municipal services. This high ratio of public to private expenditure helps explain why suburban municipalities are finding that new growth fails to pay for itself at acceptable levels of taxation.

One of the methods of trying to address sprawl is use of an urban growth area. Discussion on this topic can be found on page 90.

## Residential

Within the urban classification, 16 square miles (10,537.75 acres, or 2.8% of the county) is residential. Residential increased by about 6 square miles (3,853 acres) from 1978 to 1998/99, a 57.5% increase over 1978. Residential growth, by itself, can be considered the third largest land use/cover growth change in Wexford County, even though some may consider it a subset of "urban."

Residential areas occur within established cities and villages (Cadillac, Manton, Buckley, Mesick, and Harrietta).

There are also nodes of residential at Sherman, Gitchegume, North Hodenpyl Road, along Slagle Creek near M-37, Jack's Corner (corner of W 30 Road (Coates Highway) and M-37), Boon, Caberfae, Hoxeyville, Hobbs Bridge (S 5½ Road crossing Pine River), corner of W 48½ Road (Hoxeyville Road) and M-37, and by Forest View School.

Residential sprawl – in terms of disconnected concentrated residential development (subdivisions, around lakes, etc.) – appears most prevalent in the south two thirds of Haring Township and the north half of Clam Lake Township.

Residential sprawl – in terms of appearance of unplanned rural lineal development along roads – is most prevalent in the Haring, Clam Lake, Cherry Grove and Selma Townships. Also, but less prevalent, it is also seen around Manton (Cedar Creek Township), and around Mesick. This feature of the landscape was almost non-existent in 1978. The map shows areas of the county where strip residential development has been occurring, and concentrations at the traditional market centers. Change in residential land use/cover is seen on page 104.

The resort character of the county can be seen with residential development concentrating around inland lakes (notably Lakes Mitchell, Stone Ledge, Berry, Woodward, Pleasant, Meauwataka, Gitchegume, and at spotted locations along the Big Manistee and Pine Rivers.

These observations can be seen on the 1998/99 land use/cover map.

Residential areas of the county are important and basic to the formation of neighborhoods and a sense of community, and in providing shelter for consumers of goods and services in the county. Housing, in areas protected from undesirable industrial and commercial encroachment, is important for the establishment of desirable living conditions and to create areas attractive for resort residential development.

For 1990 property tax purposes, the County Equalization Department lists the true cash value of all property and of residential property in the county as follows:<sup>104</sup>

<sup>104</sup>Moore, Wendy; Wexford County Treasurer; Interview May 7, 2001.



Change in Property Tax Values Table

Year	True Cash Value of all real property		True Cash Value of Residential Property	
	Dollars	Percent change over previous decade	Dollars	Percent change over previous decade
1980	\$217,553,086	n/a	n/a	n/a
1990	\$317,639,262	146%	\$190,619,691	n/a
2000	\$743,486,040	234%	\$502,360,775	263%

The map on page 200 is housing density based on the 2000 T.I.G.E.R. census files converted for use by the county's GIS.

Zoning, as practiced in northern Michigan and Wexford County, is a formula for urban sprawl: See further discussion on this topic on page 346.

### Open Lands/Parks

Within the urban category, 2.9 square miles (1,909 acres, or 0.5% of the county) is "other" (cemeteries, parks, recreation areas). "Other urban" grew by almost 1.4 square miles (928.6 acres) from 1978-1998/99 – a 95% increase over 1978 land uses. Much of this growth can be attributed to new golf courses, Caberfae resort, and the Buckley Engine Show grounds.

Wexford County does not operate a park system. Parks, campgrounds, etc., are provided by municipal government, the DNR, the U.S. Forest Service, and private enterprise.

Wexford County owns the Northern District Fair grounds with the county fair overseen by the Northern District Fair Board. Also on this site is a county-owned ice arena and civic center, THE WEX.

The map on page 104 shows the areas of the county where land is currently used for open lands/parks, cemeteries, and recreation facilities. Land use/cover change over time is shown with maps on pages 100, 101, 102 and 103. For more detail, one should refer to the *Wexford County Recreation Plan*.

### Commercial

Within the urban category, 2 square miles (1,321 acres, or 0.33% of the county) is commercial/service/institutional. Commercial land use grew 0.94 square miles (602 acres) for a 83% growth over 1978 land used for commercial land uses.

Commercial land use/cover is shown on the map on page 102, 103, with land use/cover change over time shown with maps on pages 101, 100, 102 and 103.

Commercial lands have existed in the central business district of established cities, villages, and towns. Commercial growth has been pronounced in south Haring and north Clam Lake Townships. Also growth has occurred in the Mesick area and at the freeway interchange where

U.S.-131 and M-115 cross.

### Transportation Land Use

Within the urban category, 1.66 square miles (1,032.66 acres, or 0.3% of the county) is transportation/utilities. About an additional 0.1 of a square mile (80.9 acres) occurred from 1978 to 1998/99, for a 8.5% growth over 1978. (The study period pre-dates the expansion of the U.S.-131 freeway.)

See discussion on this topic under infrastructure on page 265.

### Industrial Land Use

Within the urban category, 1.5 square miles (961.5 acres, or 0.25% of the county) is industrial. This land use category increased 0.33 of a square mile (216 acres) in the 20-year study period. That represents a 29% growth rate over the 1978 area of industrial land use.

The dominant location for industrial activity is in Cadillac (industrial park). However industrial presence, and land use growth is also found in Manton (industrial park), in and around Buckley, and to a minor extent in Mesick and growth at E 34 Road (Boon Road) and M-115. New industrial uses have also been taking place in spotted rural locations (possibly saw mills?) and in Wexford Township where oil-related facilities are found along the geologic reef which has received successful oil exploration in the county. This can be seen on the land use/cover map on page 101, with land use/cover change over time shown with maps on pages 101, 100, 102 and 103.

See also discussion on Brownfield Redevelopment on page 242.

### Extractive

Within the urban category, 1.3 square miles (844 acres, or 0.25% of the county) is extractive. Extractive land uses has increased about 0.5 square mile (332 acres) from 1978 to 1998/99, for a 65% increase over 1978 area.

The increase in extractive land use activities has been, for the most part, expansion of existing quarries (sand and gravel pits) rather than opening new facilities. New quarries (sand and gravel extraction) has increased 0.539 square miles (344.949 acres) in the 20 year study period. Wells



(mainly oil and gas) decreased by 0.021 square miles (13.19 acres) in the same time period.

Extractive land use/cover is shown on the map on pages 101, with land use/cover change over time shown with maps on pages 100, 101, 102 and 103.

## Rangelands/Fields/Grassland

THE map on page 109, 110 shows the areas of the county where land is currently open fields, rangeland. Land use/cover change over time is shown with maps on pages 100, 101, 102, and 103. Change in this land use/cover category tends to be most dominant in the north half of Wexford County (except Liberty Township), and in South Branch Township. This is the third largest gain with an additional 5.75 square miles (3,685.3 acres, or 11% of the county) in this land use/cover category. The rate of change is 10% over the 1978 land area.

Most of the gain in rangelands/fields/grassland came from agriculture loss. About 17.66 square miles (11,288 acres, or 51.797% of the total grassland gain) was from agriculture land uses. Examination of air photos allows one to see evidence of past farm efforts (furrows, fence rows, etc. still visible). The poor quality soil has not had the ability to heal itself from previous agricultural practices. The open areas do not represent all abandoned farms, as some have been planted to trees or otherwise used.

## Water and Wetlands

Statistics from the change analysis in the land use/cover categories on water and wetlands are suspect. Data showing a 3.1 square mile (2,004 acre) increase in wetlands does not appear realistic or plausible. One explanation could be that when Wexford County participated in the land use/cover mapping in the late 1970s/early 1980s there was a political disapproval of the state's relatively new wetland protection act<sup>105</sup> and distrust that the land use/cover mapping would be used by the Michigan Department of Natural Resources as a wetland inventory. (This fear has since proved unfounded.) As a result the 1978 air photo interpretation was done in such a way to under-report wetlands found in Wexford County.

The 0.4 square mile (301.7 acre) increase in surface water occurs mainly around the perimeter of inland lakes who's water level is directly related to the groundwater levels. This represents higher water levels, which in turn, make the surface area of inland lakes larger when the higher

water covers more of the land area (beach) around the lake. This explanation is supported by the 1978 air photos which were flown in mid to late summer, when water levels are typically lower. The 1998/99 air photos were flown in spring (April-May) when water levels are typically high as a result of winter snow melt and spring rains. Thus relatively low groundwater levels reported in 1978 and high groundwater tables found in 1998/99. Also air photo interpretation done in 1978 had an obstructed view of many lake shores, due to vegetation being on the trees. The 1998/99 air photos were taken before leaves budded out on trees – allowing a clear view of shorelines.

## Urban Growth Area

CADILLAC Area Chamber of Commerce and the City of Cadillac have attempted to introduce the concept of an urban growth area as an alternative to city-township annexation disputes and disputes over the provision of water/sewer services. To promote the idea, the Chamber invited public officials from the city and surrounding townships around Midland, Michigan to share that community's success with the use of urban growth boundaries. An urban growth area is an agreed upon line drawn around a developing urban area. The purpose of the boundary is to establish limits of urban growth so that growth can be planned for and provided for. The boundary is not permanent. Its purpose is to direct growth to within the boundary before development sprawls outside the boundary. When development within the boundary reaches a certain density, the boundary is then expanded.

Two communities in Michigan, Frankenmuth and Midland, have been recognized statewide by the Michigan Society of Planning<sup>106</sup> for their progressive efforts on this front. The purpose of an urban growth area is much more than just an alternative to annexation and sewer service disputes. Urban growth area is important for coordinated planning and community development, natural feature protection, ability to be able to accurately engineer the design for public services, define public service zones, and may be the most effective method to avoid sprawl.

The possible use of an urban growth area should be considered not just for Cadillac. Its use around Manton, Mesick and Buckley should also be considered.

There are many methods to develop an urban growth area. Many of the methods are highly political. If the process becomes too political there is a danger the result will bear little relationship to the facts, or science, that should have a bearing on the process. Obviously it is not possible –

<sup>105</sup>Part 303 of P.A. 451 of 1994, as amended, being the Wetland part of the Michigan Natural Resources and Environmental Protection Act, M.C.L. 344.30301 *et. seq.* (formerly P.A. 203 of 1979, as amended, being the Gomare-Anderson Wetland Protection Act, M.C.L. 281.701 *et. seq.*).

<sup>106</sup>Michigan Society of Planning (formerly the Michigan Society of Planning Officials, MSPO) is a professional and lay planning education and advocacy organization in Michigan which has been responsible for development of a wide array of planning education programs and tools. The Society also issues annual awards for outstanding planning and community development.



or desirable – to completely remove the political process from establishing an urban growth area. However the initial process should be based upon a resource analysis and the limitations of the land.

In order to provide an example of this process, Wexford County participated with Professor S. Foster's Landscape Architecture 444 class, taught by Dr. Trish Mochamer, on Geographic Information System (GIS) analysis class at Michigan State University. The county provided GIS data on soils, land use/cover, location of utilities, base map information, and so on. From these data sets students were able to produce data on septic suitability; wetlands; forest habitat; slopes; drainage; proximity to existing water lines, sewer lines, roads; and much more. Using these factors students were given the assignment to conduct a GIS analysis of the area around Cadillac to produce a proposed urban growth area.

Four students were successful in producing results which impressed local planners upon a quick initial review. Those students are Steven DeVries, Zhaoyan "Joy" Zheng, Wayne O'Barker, and Lucas Bonney. Because each student chose which factors they used, and weighed the different factors they did use differently, the resulting proposed urban growth area for each was different. The results of the urban growth area around Cadillac can be seen on the map on page 115. This is presented here to show how local policy, or priorities can reflect which factors are used and weighted to provide a fact-based boundary.

A summary of the methods used by each student for their proposed urban growth area is provided here:

**Steven DeVries:** The purpose of making an urban growth area is to prevent irresponsible use of land and urban sprawl. This means that not everywhere that is designated as potential future development area should have development allowed. Thus there are some trade-offs. Areas outside of the urban growth area that are designated as 'developable' should not have development allowed and some areas inside of the urban growth area that are designated as 'ecological protection zones' will have development allowed. Some protected areas inside the urban growth area will remain protected with the recommendation that they be designated as parks or nature areas.

Potential Development sites were identified by performing an inventory of current land use existing roads, existing soils; analyses including queries for suitable land cover and soils, and proximity analysis on streets and highways. This information was synthesized into a Potential Development Site Map. Areas Designated for Preservation were identified by performing an inventory of current land use and existing streams; analyzing where woodland, wetland, and stream protection zones existed, yielding an "Areas Designated for Preservation Map." In order to designate an urban growth area, the maps containing areas that are designated as potential development and the area designated for preservation were combined. This resulted in

some overlap. In areas where the preservation zone and the development areas overlap the preservation zones took preference. The Potential Development Map and the Areas Designated for Preservation Map were then synthesized into the Urban Growth Boundary Map with a resulting urban growth area around Cadillac.

**Zhaoyan "Joy" Zheng:** In this project the Urban Growth Boundary is preliminarily defined by buildability and preservation of natural resources. Buildability is examined by accessibility to roads, water and sewer systems, and main utility supplies; and suitability of soil types and topography for construction. For preservation of natural resources, lakes, streams, wetlands, and forested areas are considered not suitable for further urban expansion.

Variables considered in defining the Urban Growth Boundary included roads, soil, land cover/use, utility, water, sewer, and topography.

Five major suitability maps (Access to Roads, Access to Infrastructure, Soil Suitability, Land Cover Suitability, and Slope Suitability) were overlaid to determine the most suitable area for future urban development. To enable the tracking of information on the categories of suitability of all the land parcels, each suitability map was reclassified based on a unique exponential value of 10. For each map, the larger the number, the greater the suitability for development. In the final map, the values are 0-10, where values of 7-10 were assigned a growth value of 2, values 4-6 have a growth value of 1, and values 0-3 have a growth value of 0 indicating least suitable for development. The Urban Growth Boundary is the edge of the value 2 area.

**Wayne O'Barker:** A number of maps were produced showing the various types of land cover, soil, water and other features that are present in Wexford County. From that information it was decided that the criteria for determining the urban growth area would take into consideration the existing soils, and their ability to support buildings; the land cover, a subjective judgement of what was the best areas for development, and the proximity of certain areas to highways and streets. Then various areas were identified to preserve. These included land within 250 meters of water and forest areas. This data was summarized into two maps: a Development Areas Map and a Preservation Areas Map. The urban growth area for Cadillac was then synthesized from the Development Areas Map and the Preservation Areas Map.

**Lucas Bonney:** The urban growth area was created mainly towards the idea of preservation. If one gathers all of the preserved land still existing, development will fall in its place.

The process started by taking inventory of the greater Cadillac Area, in terms of soils, land use, lakes, streams, wetlands, forests, and highways. The analysis continued towards separating these elements and then analyzed the possibilities of preserving lands of exiting agriculture, forests, wetlands, soils good for agriculture, buffering lakes



and streams, and highway corridors.

Finally, the conclusion was an urban growth area which defines an area where developable lands are most prevalent and concentrated. Within this boundary lies areas that are in the category of "no development". Even though they are within the boundary, these areas can still be preserved by creating greenway corridors and parks within the urbanized area.

After an urban growth area is established, additional details should be developed. Details such as at what density should residential development be (usually medium to high), and what type of commercial development (neighborhood service areas, area-wide commercial, and/or regional commercial) and where the commercial development should be placed. A main value of an urban growth area is to geographically define where high density – and thus higher level of urban services like water and sewer – can be expected to be cost effective.

## Future Land Use

**L**IKE the urban growth area a similar procedure can be used to determine the county's future land use map.

There are many methods to develop a future land use map. The process can become highly political. If the process becomes too political there is a danger the result will

bear little relationship to the facts, or science, that should have a bearing on the process. Obviously it is not possible – or desirable – to completely remove the political process from establishing a future land use map. However, the initial process should be based upon a resource analysis and the limitations of the land.

Using GIS, a different set of assumptions and rules can be made to produce different future land use map outcomes. Regardless of the assumptions or rules of application, all the analysis should be based on the same set of factual information provided for in this book. The example given below is just one example. The order the tasks are done and rules of precedence, reflect different priorities or policies a community might wish to have. If the order the tasks are done and rules of precedence are changed, it will result in a different future land use map.

The example here, favors both protection of environment and favors commercial and industrial development, but in different areas. It might be seen as one way to balance the need for commercial/industrial parts of the economy while at the same time recognizing the environmental aspect of quality of life is important for residents, to attract commercial/industrial enterprise owners to the area and for tourism. The example follows here:

Sample Land Use Map Procedure

Step	Task	Rules of precedence	Map Color
1	<p>Show on a map the designated <b>Special and Unique Areas</b>. This is a starting point, in an attempt to recognize those areas of the county which may require particular land use management attention. All Special and Unique Environments might not be treated equally. A priority is given to those special and unique areas which are so designated because of natural, environment or timber harvesting reasons. (For example, on the map, historic districts would not appear as special and unique. Rather, it is shown as a commercial Plan Map Area. This is because the commercial district treatment of that area (such as with zoning, or a downtown development effort) is not unique, while zoning treatment for a fragile wetland has a more likely chance of requiring particular zoning regulation or treatment.)</p> <p>Also, some special and unique areas are "written off" as having been already developed to the point of having lost the character which caused the area to be so designated.</p>	High precedence	Dark green
2	<p>Overlay on the map information from the agricultural and prime forest mapped information. These areas are then added to the Plan Map as "<b>resource development</b>" Plan Map Areas. This is intended to show areas of the county where the land resources presents more suited conditions for agriculture and forestry practices.</p>	If areas mapped here overlap areas already shown on the map, the areas already on the map (#1) have precedence and is left as special and unique.	Light green



Step	Task	Rules of precedence	Map Color
3	Overlay on the map areas which have land resource characteristics which limit development (e.g. wetland or areas where on-site sewage disposal systems are suspected not to work). These areas are on the Plan Map as " <b>resource limitation</b> ."	If areas mapped here overlap areas already shown on the map, the areas already on the map (#1, 2) have precedence.	Light blue
4	Overlay on the map information on residential use (mainly areas so designated in the 1998/99 Land Use/Cover which reflects existing land uses, areas which are developed residential (high density housing, subdivisions), and areas currently zoned residential). From this one develops an area labeled as " <b>residential</b> ."	If areas mapped here overlap areas already shown on the map, the areas already on the map (#1, 2, 3) have precedence and remain as shown.	Yellow
5	<p>Overlay on the map information on commercial activities (mainly areas so designated in the 1998/99 Land Use/Cover which reflects existing land uses, areas which are developed commercial (high density commercial, commercial subdivisions), and areas currently zoned commercial). From this one develops an area labeled as "<b>commercial</b>."</p> <p>Remove from the map commercial sites which are small (single or very few property owners) and isolated.</p> <p>The county hinterland boundaries were used, mainly to identify trade centers and to check to make sure to place a commercial area in each trade center.</p>	If areas mapped here overlap areas already shown on the map, the areas already on the map (#1, 2, 3) have precedence and remain as shown; other areas (#4) do not have precedence and the area is shown as commercial.	Orange
6	<p>Overlay on the map information on industrial activities (mainly areas so designated in the 1998/99 Land Use/Cover which reflects existing land uses, areas which are developed industrial parks, and areas currently zoned industrial). From this one develops an area labeled as "<b>industrial</b>."</p> <p>Remove from the map industrial sites which are small (single or very few property owners) and isolated (i.e. saw mills, oil wells).</p>	If areas mapped here overlap areas already shown on the map, the areas already on the map (#1, 2, 3) have precedence and remain as shown; other areas (#4, 5) do not have precedence and the area is shown as industrial.	Red
7	There may be areas which are likely to be in transition (usually toward commercial or industrial uses. These areas should be defined and shown on the map. From this one develops an area labeled as " <b>transition</b> ."	If areas mapped here overlap areas already shown on the map, the areas already on the map (#1, 2, 3) have precedence and remain as shown; areas (#4, 5, 6) do not have precedence and the area is shown as transition.	Brown
8	All the area now left over is an area labeled " <b>rural residential</b> ."	Lowest precedence	White



Step	Task	Rules of precedence	Map Color
9	Compare the boundaries on the map with the following to modify/straighten them to follow, in order of priority: (1) survey lines created from the public land survey system (e.g. tier and range lines, section lines, $\frac{1}{4}$ lines, $\frac{1}{16}$ lines, etc.), (2) natural features (rivers, lakes, contours), (3) transportation right-of-ways (roads, railroads, alleys, utility easements), and (4) parcel boundaries (property lines). Adjust the boundaries shown on the map to follow the above.	n/a	Black (with roads in a grey and water as dark blue).
10	Final editing done by public review and action by the planing commission and committee(s)	n/a	n/a

In some communities a county future land use map does not include areas within a village or city because these areas are incorporated municipalities. As such, they do not fall under the jurisdiction of county land use planning, and their zoning is not reviewed by the county planning commission. In other communities a county future land use map does include areas within a village or city because economic development coordination with hinterlands is seen as very important and is part of the coordinated planning

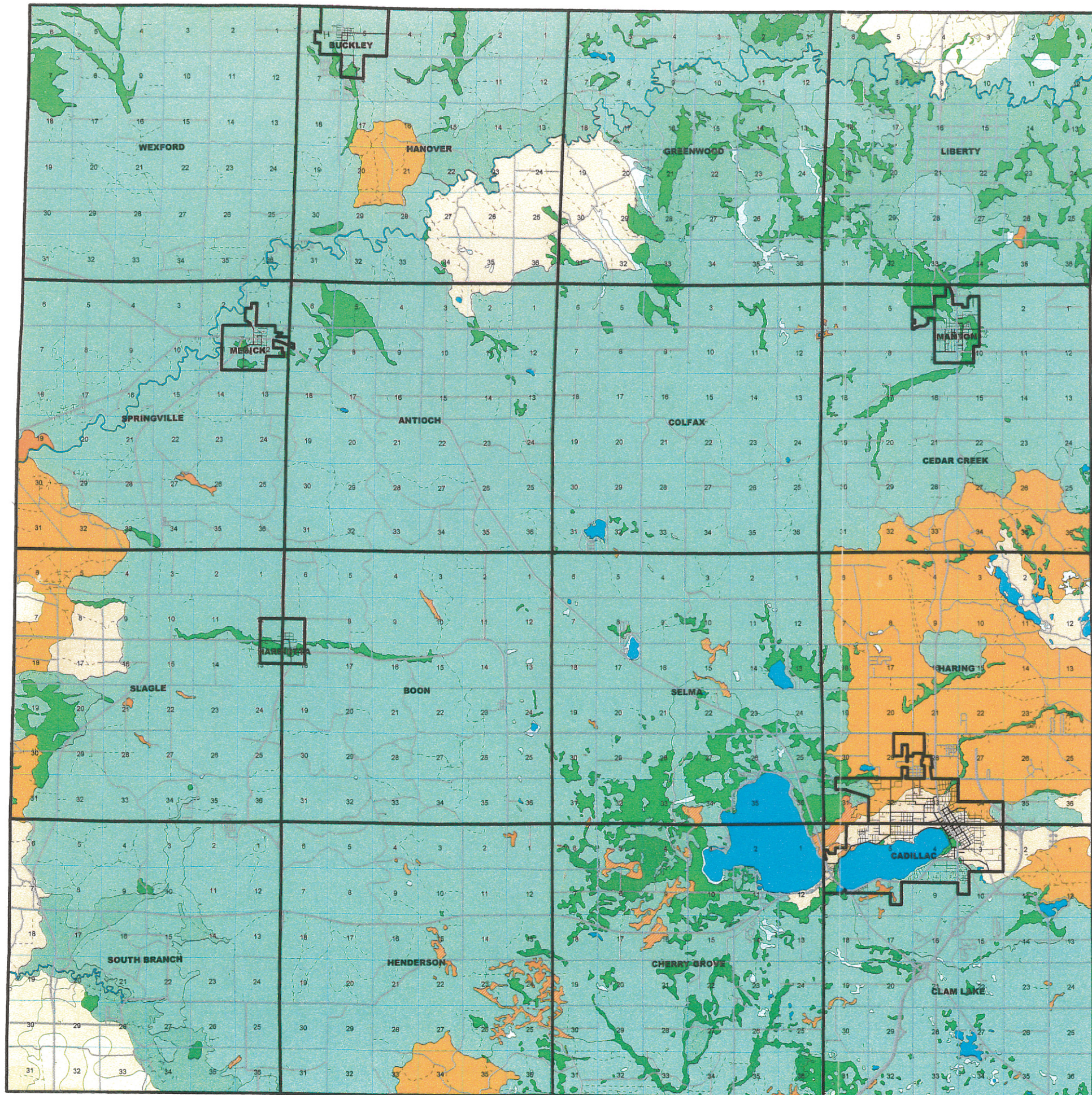
effort. In those communities county planning review of city and village zoning and planning is done on a cooperative and collaborative basis.

This report does not present a future land use map. That map is a product of the policy discussions which led to a table similar to the one above which is then used to develop the map for Wexford County.





## Land Cover Circa 1800

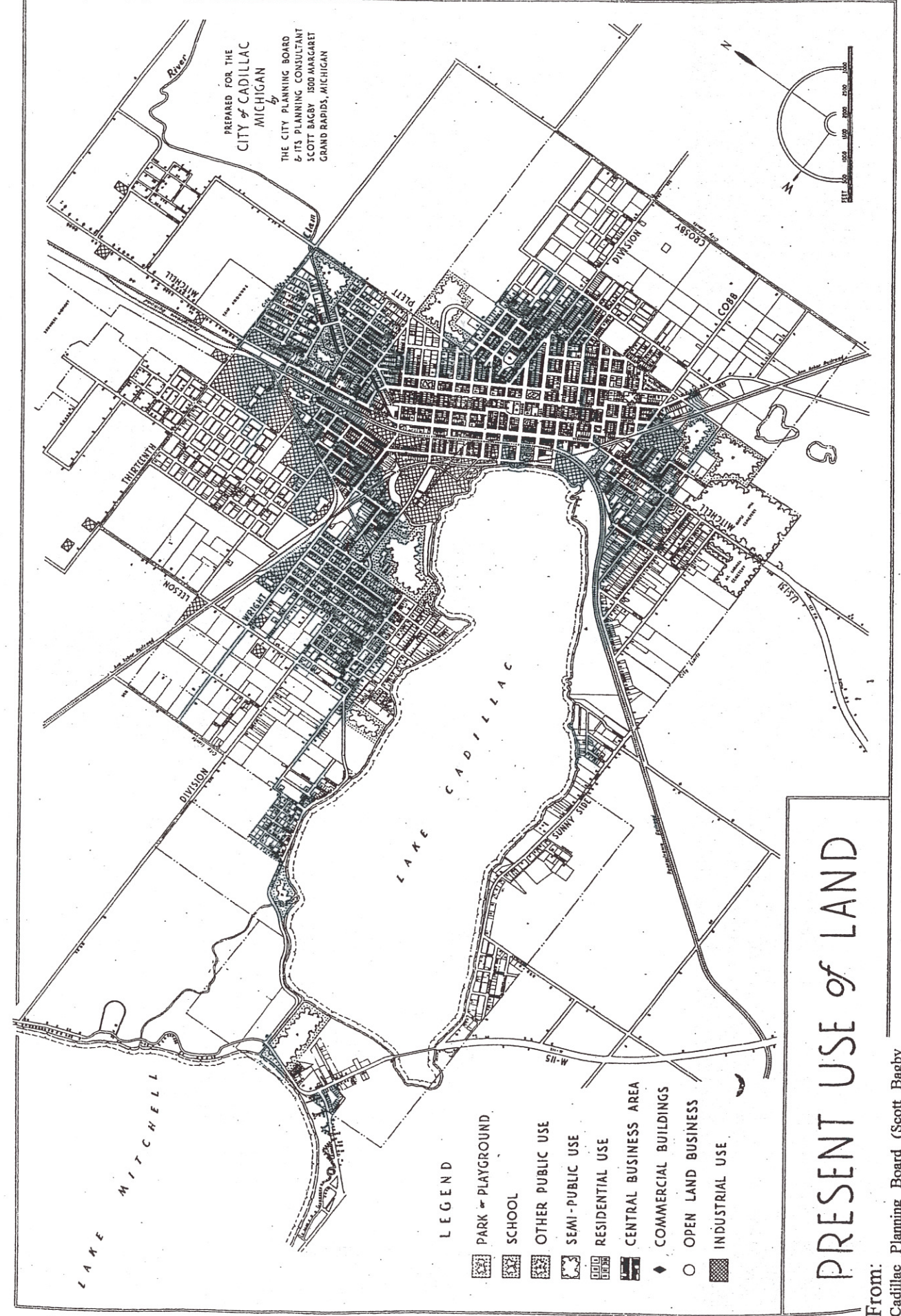


- Land\_cover\_feet.shp
- BEECH-SUGAR MAPLE-HEMLOCK FOREST
  - BLACK ASH SWAMP
  - CEDAR SWAMP
  - HEMLOCK-WHITE PINE FOREST
  - HEMLOCK-YELLOW BIRCH FOREST
  - JACK PINE-RED PINE FOREST
  - LAKE/RIVER
  - MIXED CONIFER SWAMP
  - MIXED HARDWOOD SWAMP
  - MUSKEG/BOG
  - PINE BARRENS
  - RED PINE-WHITE PINE FOREST
  - SHRUB SWAMP/EMERGENT MARSH
  - WHITE PINE-MIXED HARDWOOD FOREST

SOURCE: Michigan Natural Features Inventory; *Natural Heritage Biological and Conservation Datasystem* (pre-European settlement vegetation); Geographic Information System (GIS) database derived from United States Government Land Office (GLO) public land survey notes and witness trees.





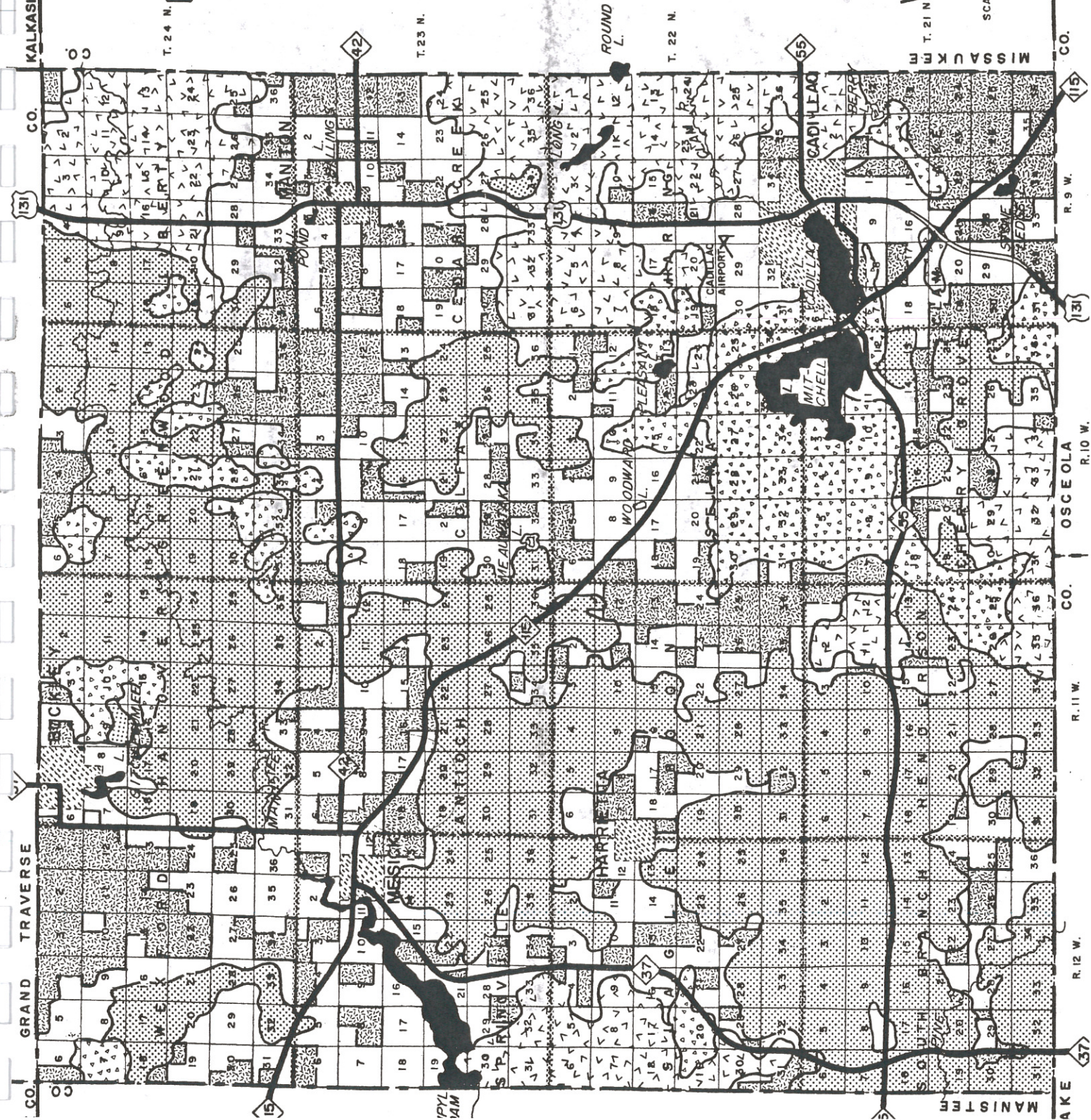




FROM:  
Wexford County Planning  
Commission; Wexford County  
Comprehensive Plan Existing  
Conditions, Trends, Potentials;  
Cadillac, 1973, page 6-3.

# LAND COVER

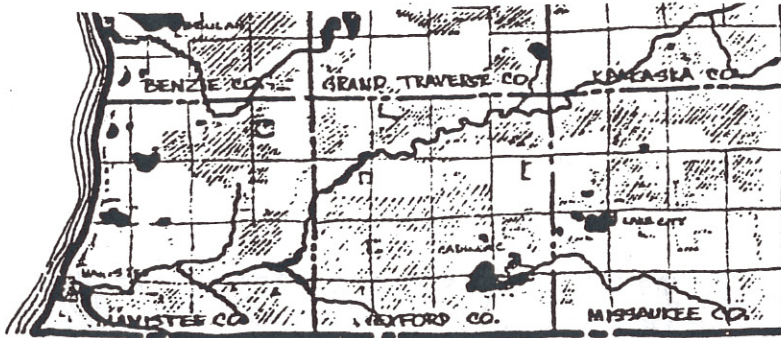
- URBAN
- CROP LAND
- GRASS LAND
- 10-40% FOREST CANOPY
- 40-100% FOREST CANOPY
- TIMBERED SWAMP LAND
- WATER



WEXFORD COUNTY  
MICHIGAN

SCALE 0 1 2 3 4 MILES  
POLYCONIC PROJECTION








REGIONAL  
SKETCH  
PLAN  
1972





MAP NO.

## LAND USE



-  LAKES AND RIVERS
-  URBAN DEVELOPMENT
-  STATE & NATIONAL FOREST AREAS



-  DEVELOPED LAND
-  SPECIALTY AGRICULTURE
-  GENERAL AGRICULTURE
-  FOREST LAND
- RECREATION, OPEN SPACE, AND OTHER

WEST MICHIGAN REGIONAL PLANING & DEVELOPMENT COMMISSION  
COMPREHENSIVE PLAN: LAND USE June 1978