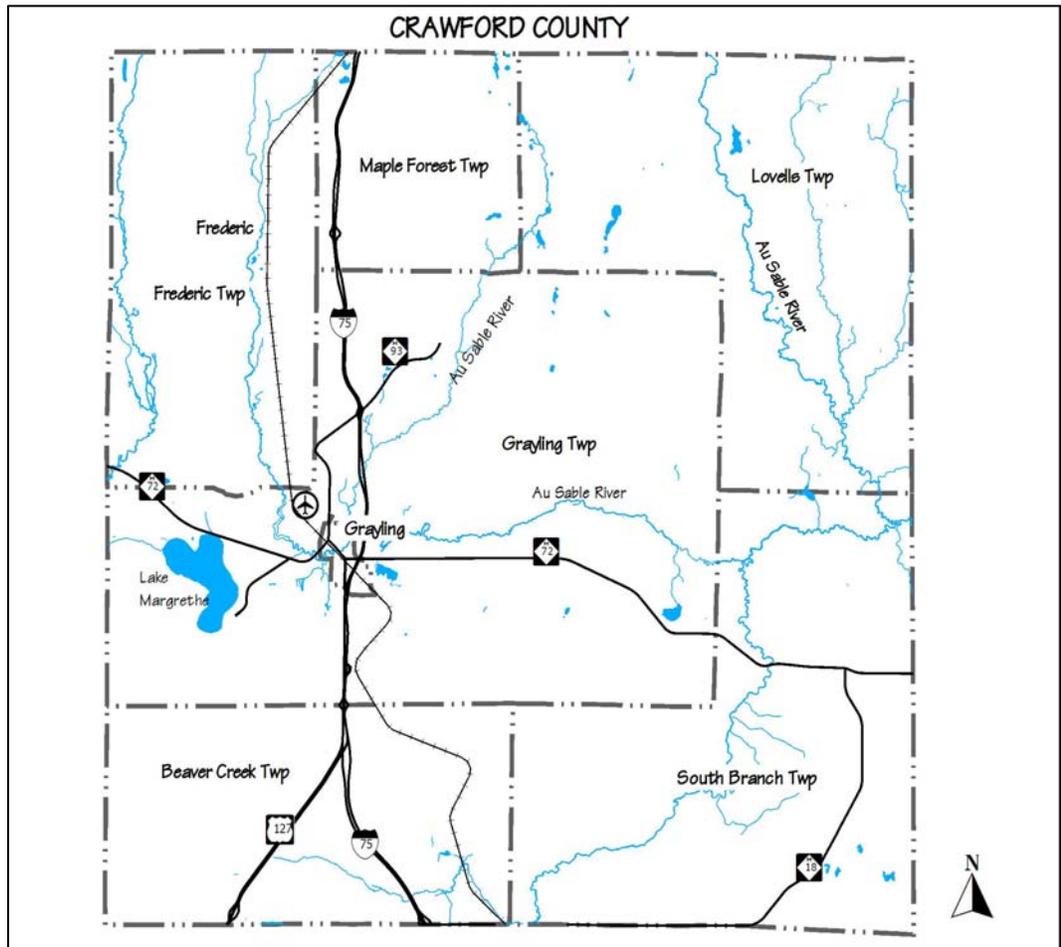


Crawford County Master Plan



DRAFT PLAN

2008

Prepared with the assistance of:
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CRAWFORD COUNTY MASTER PLAN

Crawford County, Michigan

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CRAWFORD COUNTY
MASTER PLAN

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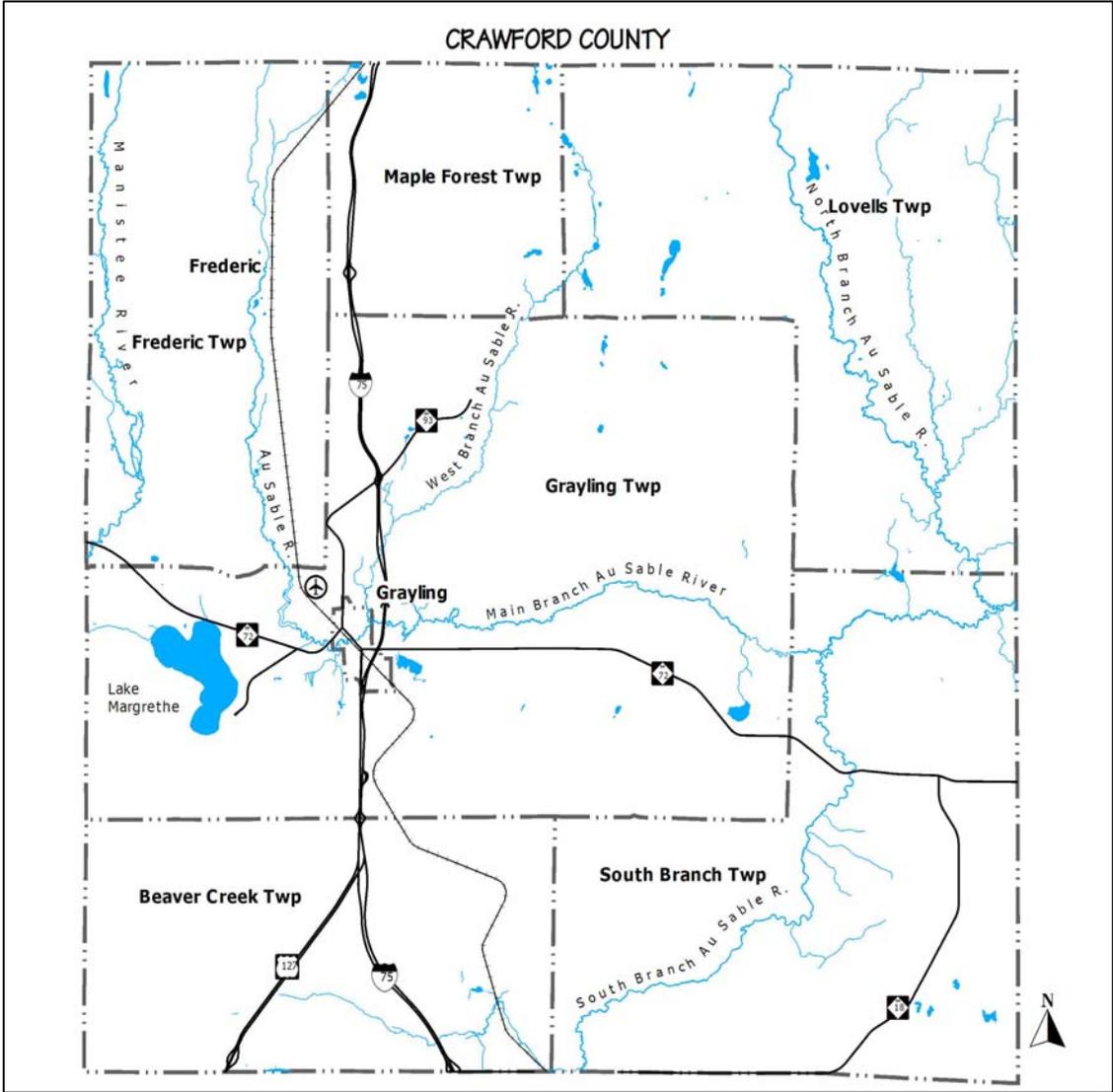
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Chapter 1 - Introduction



Crawford County is located in the north central Lower Peninsula of Michigan. The county is composed of six townships: Grayling Township, Frederic Township, Maple Forest Township, Lovells Township, South Branch Township, and Beaver Creek Township. Also located in Crawford County is the City of Grayling, which is the county seat (**Figure 1.1**).

Crawford County is approximately 30 miles from Lake Michigan and approximately 55 miles from Lake Huron. It is bordered on the east by Oscoda County, on the south by Roscommon County, on the west by Kalkaska County, and on the north by Otsego County. Crawford County has a land area of 558 square miles and a population of 14,273. Its population density is 25.6 people per square mile.



Purpose and Planning Process

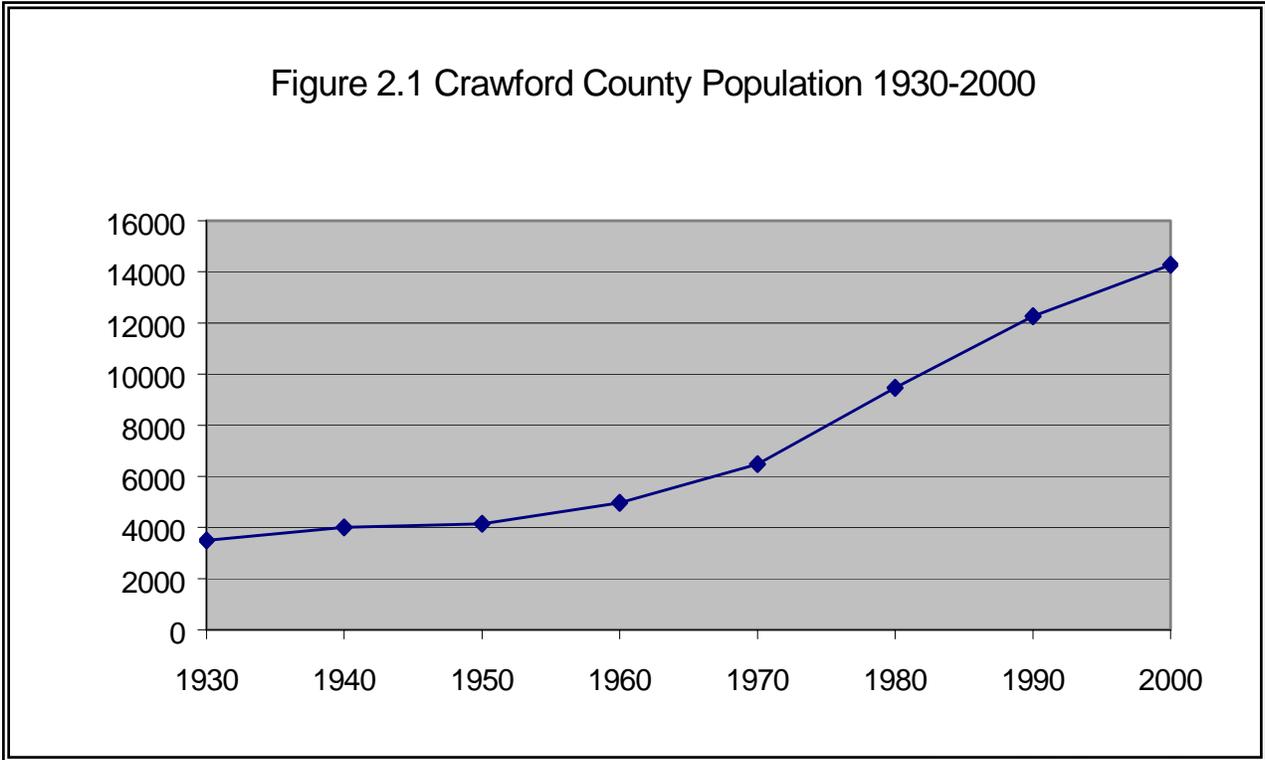
The County Planning Act 282 of 1945 authorizes counties to develop comprehensive or master plans. As stated in the enabling legislation: *It shall be a function of the county planning commission to make a plan for the development of the county, which plan may include planning in cooperation with the constituted authorities for incorporated areas in whole or to the extent to which, in the commission's judgment, they are related to the planning of the unincorporated territory or of the county as a whole. The plan with accompanying maps, plats, charts, and all pertinent and descriptive explanatory matter shall show the planning commission's recommendations for the development of the county. In the preparation of a county development plan, the planning commission shall make careful and comprehensive studies of the existing conditions and probable growth of the territory within its jurisdiction. Such plan shall be made with the purpose of guiding and accomplishing a coordinated, adjusted and harmonious development of the county which will be in accordance with present and future needs for best promoting the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants, as well as for efficiency and economy in the process of development. It shall be the duty of the county planning commission to: (1) make studies, investigations, and surveys relative to the economic, social and physical development of the county; (2) formulate plans and make recommendations for the most effective economic, social and physical development of the county; (3) cooperate with all departments of the state and federal governments and other public agencies concerned with programs directed towards the economic, social and physical development of the county, and seek the maximum coordination of the county programs of these agencies; (4) consult with representatives of adjacent counties in respect to their planning so that conflicts in over-all county plans may be avoided. The county planning commission may serve as a coordinating agency for all planning committees and commissions within the county.*

NEMCOG assisted the Crawford County Planning Commission in developing the Master Plan. This plan presents background information on social and economic data, natural resources, existing community services and facilities, and existing land cover. The background information is used to identify important characteristics, changes and trends in County. Community zoning maps and future land use maps were stitched together to form composite maps that were reviewed and analyzed for consistency and boundary conflicts. The County planning commission sponsored two roundtable discussions, one with community organizations/county officials meeting and one with local community officials. Other community workshops and surveys were reviewed to gain an understanding of the issues and concerns of county residents, landowners and local officials. In addition, results of workshops conducted by several townships during their own master plan development and subsequent township goals and objectives were reviewed. Based on this multitude of information, the County Planning Commission developed goals and recommendations. The final component involved an analysis of public lands that may be appropriate for transfer into private ownership, and would benefit the county and local communities.

Chapter 2 - Social and Economic Conditions

Population

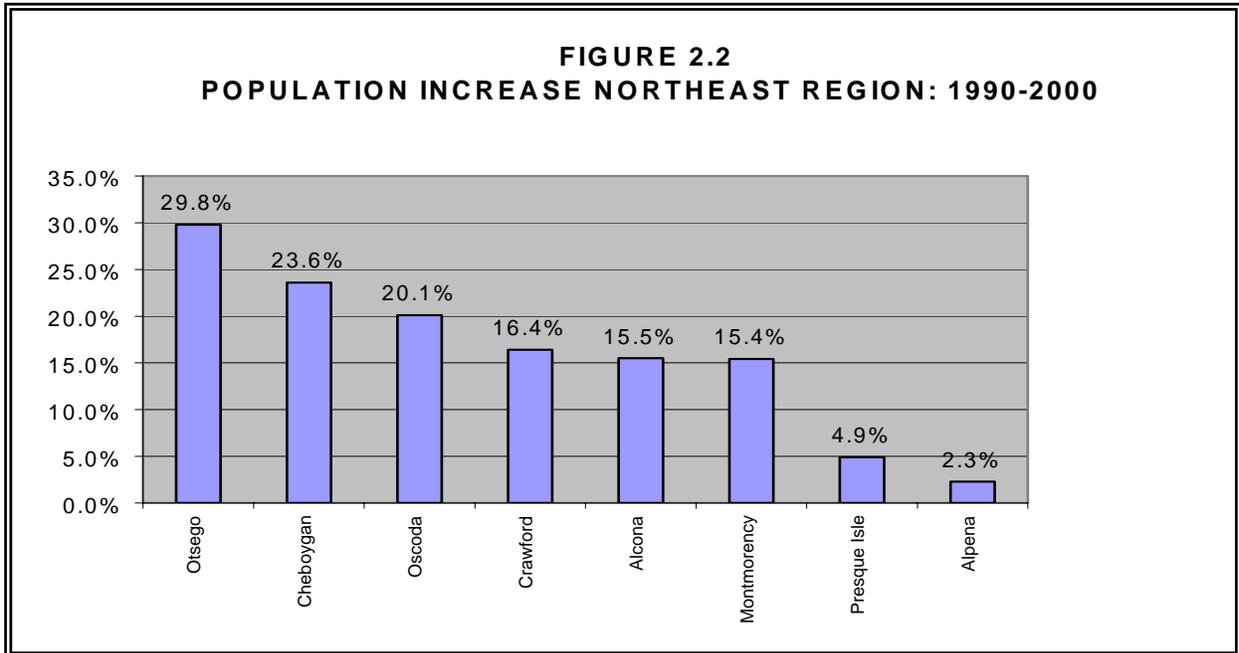
Crawford County’s population is slowly growing and is predicted to continue to over the next several decades. Although its growth rate has not been as high as some neighboring counties, it is higher than the State’s rate. Plans to accommodate this projected growth need to be undertaken in advance in order to provide adequate services and infrastructure to the area’s future residents. A further exam of the county’s statistics shows that, similar to most of the nation, Crawford County’s population is aging. Over the past three decades, the county’s age distribution continued to increase in percentage of those over 25 years of age, while shrinking in those under 25 years. Shifting population bases create new demands on community services. Communities with a larger elderly population need to concentrate more on plans for expanded health care and emergency services. Nationally, according to the Administration on Aging report “A Profile of Older Americans: 2001”, one in four persons over the age of 65 rates their health as poor and the average hospital stay for an older person is four times longer than someone under the age of 65. More than half of the older Americans reported having a least one disability and over a third reported at least one severe disability.



Source: U.S. Census Bureau

The 2000 Census showed that Crawford County had population of 14,273, an increase of 16.4 percent since 1990 (Figure 2.1). The additional 2,013 persons continued the 30-year trend of significant population gains. The population density for the County averages 25.4 persons per square mile, although 60 percent of the County population is located in Grayling Township or the City of Grayling.

Similar to the majority of the eight counties that make up the Northeast Region, Crawford experienced considerable population growth during the last decade. With the exception of Alpena and Presque Isle Counties, all the counties in the region experienced growth rates that ranged from 15 to 30 percent (Figure 2.2).



Source: U.S. Census Bureau

Population By Municipality

All of the townships in the County increased in population over the past decade. The majority of the new residents (56.4% or 1,136 persons) moved to the outlying townships of Lovells, Beaver Creek, South Branch, Frederic and Maple Forest. The Township of Lovells had the highest growth rate at 37.6 percent (158 persons) followed by South Branch at 33.5 percent (462 persons) and Beaver Creek at 26.5 percent (311 persons). Grayling Township had the largest numeric increase with an additional 869 new residents (15.4%). The population of the City of Grayling changed very little over the past decade adding only 8 new residents, an increase of 0.4 percent.

**Table 2.1
Population For Crawford County & Municipalities, 1990-2000**

| Municipality | 1990 Population | 2000 Population | % Change '90-'00 |
|-----------------------|-----------------|-----------------|------------------|
| Crawford County | 12,260 | 14,273 | 16.4% |
| City of Grayling | 1,944 | 1,952 | 0.4% |
| Beaver Creek Township | 1,175 | 1,486 | 26.5% |
| Frederic Township | 1,287 | 1,401 | 8.9% |
| Grayling Township | 5,647 | 6,516 | 15.4% |
| Lovells Township | 420 | 578 | 37.6% |
| Maple Forest Township | 407 | 498 | 22.4% |
| South Branch Township | 1,380 | 1,842 | 33.5% |

Source: U.S. Bureau of the Census

Seasonal Population

Obtaining accurate numbers of seasonal residents and tourists is difficult. Because the U.S. Census is conducted each decade in April, the numbers only reflect those persons who live in the county on a year-round basis. Tourism and annual events can provide large increases in population on any one weekend. The Weyerhaeuser AuSable River Canoe Marathon in July can attract as many as 50,000 people to area.

A rough estimate of the number of county seasonal residents can be calculated by multiplying the number of county seasonal housing units by the county's average number of persons per household. The 2000 Census showed that there were 4,112 seasonal housing units in the county and the average number of persons per household was 2.5. Therefore, it can be estimated that as many as 10,280 seasonal residents are added to the county population. This figure does not include those seasonal visitors or tourists staying in area motels, campgrounds, or family homes.

Population Projections

Population projections from three different sources are available for comparison. Northeast Michigan Council of Government (NEMCOG), the University of Michigan (U of M) and the Department of Management and Budget (DMB) all predict that the County's population will continue to grow between 2000 and 2020.

| Source | 2000 | 2010 | 2020 |
|--------|--------|--------|--------|
| NEMCOG | 14,273 | 18,700 | 23,511 |
| U of M | 14,237 | 17,630 | 18,697 |
| DMB | 14,237 | 17,700 | 20,900 |

Source: U.S. Bureau of the Census 2000, Northeast Michigan Council of Governments, Regional Economic Models, Inc by the University of Michigan, and Michigan Department of Management and Budget

Age Distribution

The 2000 census data shows that 46.6 percent of Crawford County's total population was 45 years old or older, up from 36.0 percent in 1990 (**Table 2.3**). Age groups that had declined as a percentage of the total population from 1990 to 2000 were the 25 to 44 age group (-3.0%), the 18-24 age group (-1.9%) and the under 5 age group (-1.9%).

| Age | 1990 | % of Total Population | 2000 | % of Total Population |
|------------|-------|-----------------------|-------|-----------------------|
| Under 5 | 901 | 7.3 | 777 | 5.4 |
| 5-17 | 2,300 | 18.8 | 2,720 | 19.1 |
| 18-24 | 1,007 | 8.2 | 900 | 6.3 |
| 25-44 | 3,633 | 29.6 | 3,798 | 26.6 |
| 45-64 | 2,592 | 21.1 | 3,706 | 30.0 |
| 65+ | 1,827 | 14.9 | 2,372 | 16.6 |
| Median Age | 34.7 | | 40.6 | |

Source: U.S. Bureau of the Census

From 1990 to 2000, the number of individuals in all age groups increased with the exception of the under 5 age group which had 124 fewer persons (-13.8%) and the 18 to 24 age group which had 107 fewer persons (-10.6%). The 45 to 64 age group increased by 1,114 persons (43%), the over 65 group increased by 545 persons (30%), the 5-17 age group increased by 420 persons (8.3%), and the 25-44 age group increased by 165 persons (4.5%).

The median age of residents in Crawford County increased 5.9 years to 40.6 during the period 1990-2000 (**Table 2.3**). This is a larger increase and is 5.1 years older than the median age for the State, which increased from 32.5 to 35.5 years. As the population continues to age and the population of persons in the childbearing years continues to decrease, it can be expected that the median age will continue to increase as less children are born into the community.

Race and Ethnic Composition

Information found below on (**Table 2.4**) shows that Crawford County has a very small minority population and that statistic has changed relatively little over the last several decades. A small increase in the minority population from 1990 to 2000 is mostly attributed to different reporting criteria in the 2000 Census. For the first time, respondents were given the opportunity to choose more than one race category.

| | Number of Persons | % of Total Population |
|---|-------------------|-----------------------|
| White | 13,757 | 96.4% |
| African American | 214 | 1.5% |
| American Indian | 85 | 0.6% |
| Asian | 36 | 0.3% |
| Pacific Islander | 3 | >0.1% |
| Other Race | 28 | 0.2% |
| Two or More Races* | 150 | 1.1% |
| Hispanic or Latino Origin** | 142 | 1.0% |
| Total | 14,273 | 100.0% |
| * Census 2000 gave respondents the opportunity to choose more than one race category. | | |
| ** Persons of Hispanic or Latino Origin may be of any race. | | |
| Source: U.S. Bureau of the Census | | |

Disability Status

Data shown on (**Table 2.5**) gives an indication of how many disabled people reside in Crawford County. A person was classified as having a disability if they had a sensory disability, physical disability, mental disability, self-care disability, going outside the home disability or an employment disability. The Census showed that in 2000 there were 6,632 (21%) disabled persons in Crawford

County. The largest number of disabled persons in the county was between the ages of 20 - 64 (3,511) and, of those, 45.3 percent were employed. This compares with employment of 77.7 percent of people with no disability. The 65 and over age group had the highest percentage of persons with disability with almost one out of every two having a disability (45.5%).

| Unit of Government | 5-20 years | | 21-64 years | | | 65 years & over | |
|-----------------------|-----------------|------------------|-----------------|------------------|----------------------------|-----------------|------------------|
| | Number Disabled | Percent Disabled | Number Disabled | Percent Disabled | Percent disabled, employed | Number Disabled | Percent Disabled |
| Crawford County | 261 | 8.4 | 1,742 | 22.7 | 46.7 | 1,038 | 45.3 |
| City of Grayling | 51 | 10.1 | 25 | 27.7 | 49.0 | 213 | 65.5 |
| Beaver Creek Township | 46 | 15.9 | 216 | 24.1 | 53.7 | 116 | 50.9 |
| Frederic Township | 50 | 15.3 | 182 | 24.4 | 46.7 | 106 | 46.7 |
| Grayling Township | 74 | 5.1 | 693 | 20.1 | 47.9 | 371 | 38.8 |
| Lovells Township | 7 | 9.0 | 50 | 17.4 | 42.0 | 64 | 39.8 |
| Maple Forest Township | 9 | 8.6 | 82 | 25.4 | 35.4 | 34 | 43.0 |
| South Branch Township | 24 | 6.6 | 264 | 25.3 | 40.2 | 134 | 42.4 |

Source: U.S. Bureau of the Census
*Disability of civilian non-institutionalized persons.

Education

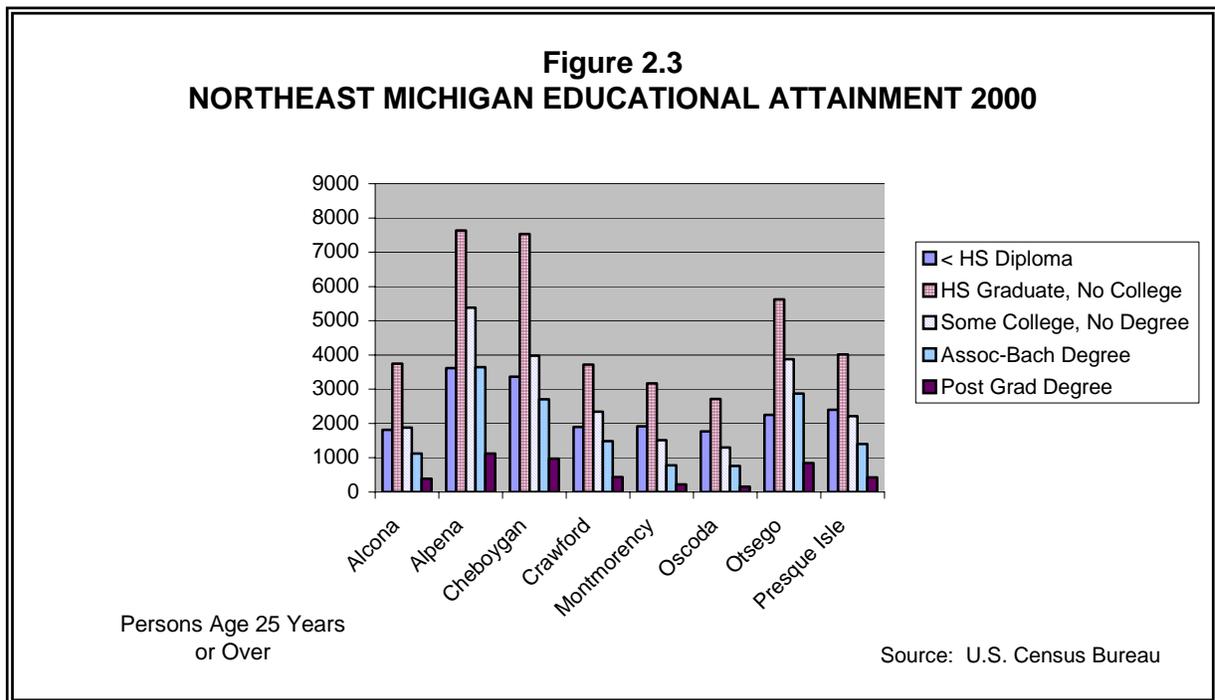
Since 1990, Crawford County has made increases in educational attainment as shown by **Table 2.6**. The number of people 25 and older who had a high school diploma or higher increased from 73.6 percent to 83.1 percent. Most of the gain can be attributed to people taking some college classes but not obtaining a degree as this group had a 39.5 percent increase. There were also significant increases in the number and percent of persons with associates, bachelors, graduate or professional degrees.

| Degree | 1990 | | 2000 | |
|--|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Less than 9 th grade | 674 | 8.4 | 436 | 4.4 |
| 9 th to 12 th no Diploma | 1,485 | 18.4 | 1,457 | 14.8 |
| High School Diploma | 2,871 | 35.6 | 3,715 | 37.6 |
| Some college no degree | 1,514 | 18.8 | 2,342 | 23.7 |
| Associates | 501 | 6.2 | 643 | 6.5 |
| Bachelors | 610 | 7.6 | 845 | 8.6 |
| Graduate or Professional | 402 | 5.0 | 433 | 4.4 |

Source: U.S. Bureau of the Census

Other encouraging news shown by the 2000 census was the marked decrease in the numbers of persons who only completed 9th to 12th grade and had no diploma and those who had less than a 9th grade.

On a regional scale, post-secondary educational attainment is more likely to be found in the counties of Alpena, Cheboygan, Crawford and Otsego than in the other Northeast Michigan counties (**Figure 2.3**). This is not surprising, given the fact that community colleges are located in or very near these four counties. Access to four-year colleges and advanced training opportunities are also more readily available in these counties, as are jobs in the manufacturing sector. Some of these jobs require post-secondary education or training.



Both **Figure 2.4** and **Table 2.7** show the educational attainment of Crawford County and its individual municipalities as compared to the state and national level. Both Michigan and the U.S. have a higher percentage of people with a Bachelor’s Degree or higher. There are comparable levels of people with some college experience in the county, state, and nation. On average, the percentage of people with only 9th – 12th grades or a high school education is greater in Crawford County and its municipalities than Michigan and the U.S. Of all the municipalities, Grayling Township appears to have the highest level of education attained. However, the overall education level is lower in the county than in the Michigan or the U.S.

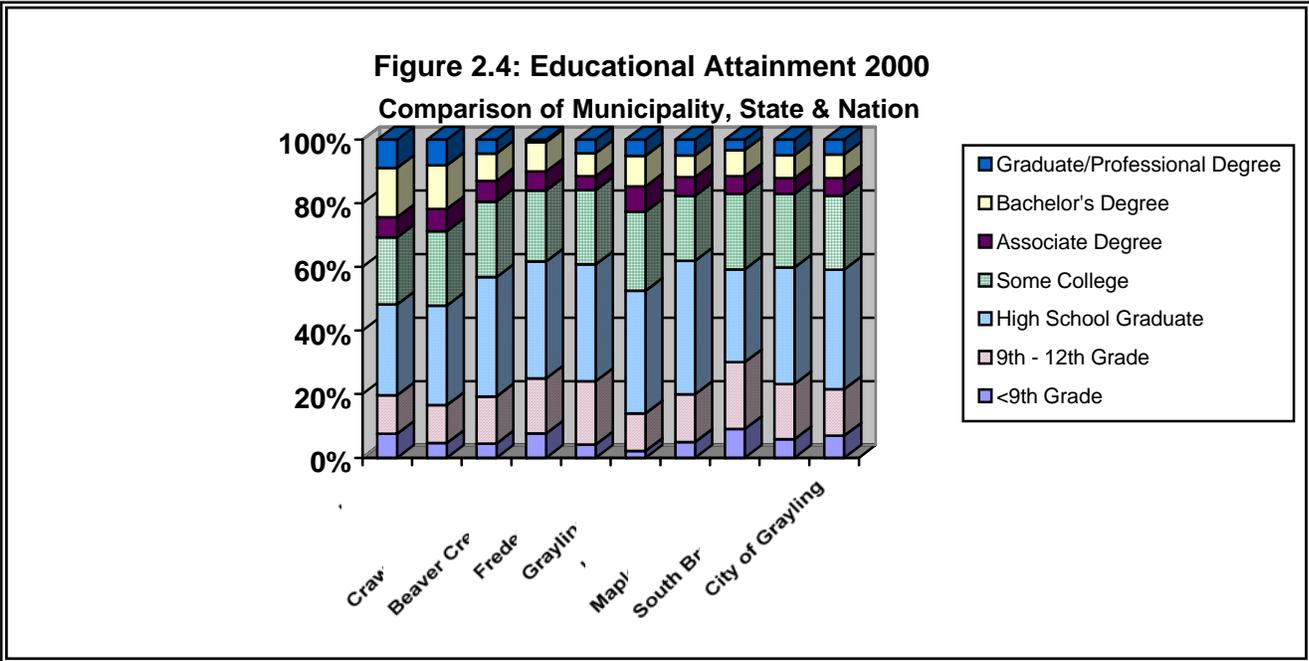


Table 2.7
Education Attainment – U.S., Michigan, Crawford County, and Municipalities

| Governmental Unit | Less than 9th Grade | 9th - 12th Grade | High School Graduate | Some College | Associate Degree | Bachelor's Degree | Graduate/ Professional Degree |
|-----------------------|---------------------|------------------|----------------------|--------------|------------------|-------------------|-------------------------------|
| United States | 7.5% | 12.1% | 28.6% | 21.1% | 6.3% | 15.5% | 8.9% |
| Michigan | 4.6% | 11.9% | 31.3% | 23.3% | 7.0% | 13.7% | 8.1% |
| Crawford County | 4.5% | 14.8% | 37.6% | 23.8% | 6.5% | 8.6% | 4.4% |
| Beaver Creek Township | 7.6% | 17.3% | 36.8% | 22.3% | 6.0% | 9.2% | 0.8% |
| Frederic Township | 4.2% | 19.9% | 36.8% | 23.4% | 4.4% | 7.2% | 4.3% |
| Grayling Township | 2.1% | 11.8% | 38.6% | 24.8% | 8.0% | 9.6% | 5.1% |
| Lovells Township | 5.0% | 15.0% | 42.0% | 20.4% | 5.9% | 6.8% | 5.0% |
| Maple Forest Township | 9.0% | 21.0% | 29.2% | 23.6% | 5.6% | 8.2% | 3.3% |
| South Branch Township | 5.8% | 17.3% | 36.7% | 23.1% | 5.0% | 7.2% | 4.9% |
| City of Grayling | 6.9% | 14.6% | 37.6% | 23.2% | 5.5% | 7.4% | 4.7% |

Source: Bureau of the Census 2000

Economic Overview

As with much of northern Michigan, Crawford County has long been an area of high poverty, low incomes, and unemployment. This problem is due largely to the lack of high paying, year-round employment for local residents. Although less obvious in Crawford County, Michigan's economic boom during the 1990s did bring positive economic results. The last decade has produced gains in real wages, reductions in unemployment and diversification in economic base. The retail and service sectors have grown, particularly in health care and tourism related fields. Crawford County has become better known in the State as a recreation and retirement destination. Favorable land prices have helped draw new residents and seasonal visitors to the area. The County's high quality of life, including an abundant natural resource base, has helped sustain the local economy.

Income and Poverty

Income and poverty statistics for Crawford County show that, although median income in the county has increased by 50 percent, it is still considerably lower than the State. The gap has narrowed somewhat from 33 percent less in 1990 to 30 percent less in 2000 (**Table 2.8**). From 1990 to 2000, the poverty rate in Crawford County had modest declines in all categories (**Table 2.9**). The poverty rate for families with children had only a small reduction of 0.8 percent, while the rate for families with a female householder with no husband present dropped by 4.5 percent. The poverty rate of all individuals dropped by 1.9 percent.

| Year | Crawford County | Michigan |
|------|-----------------|----------|
| 1990 | \$24,688 | \$36,652 |
| 2000 | \$37,056 | \$53,457 |

Source: U.S. Bureau of the Census

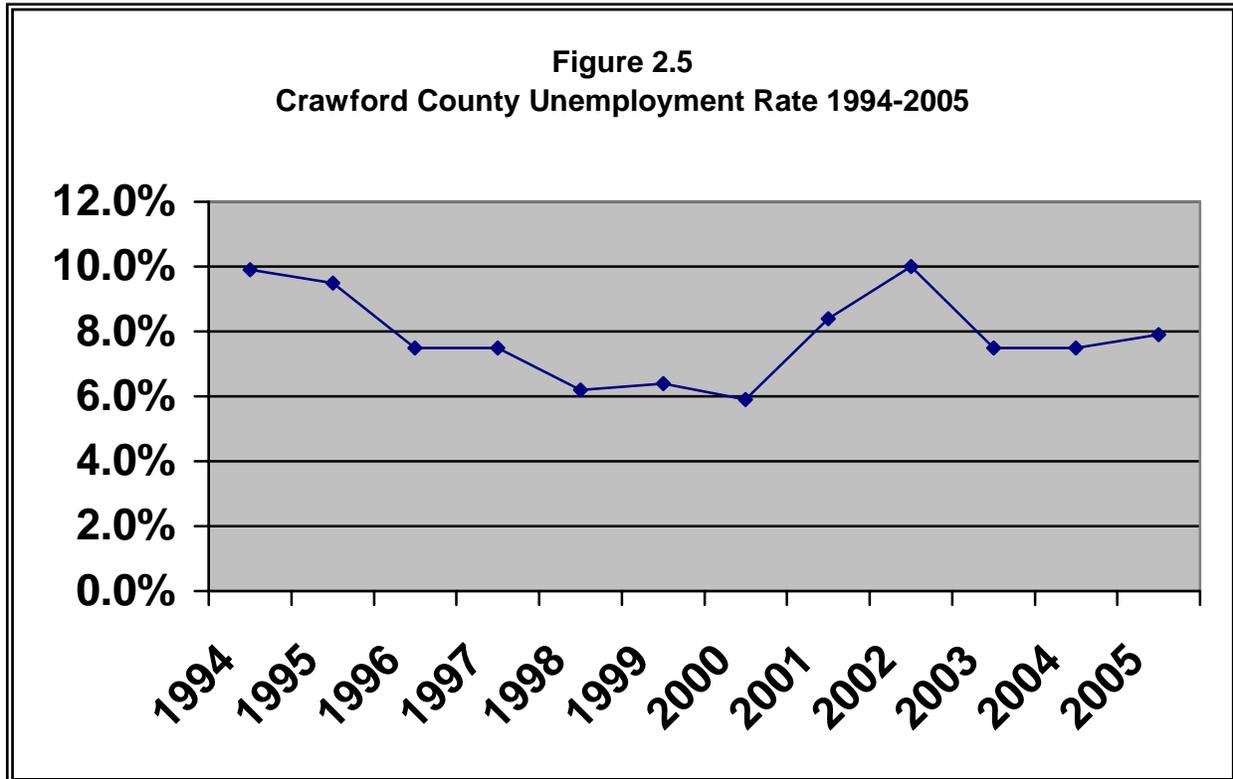
| Category | 1990 | | 2000 | |
|------------------------------|--------|---------|--------|---------|
| | Number | Percent | Number | Percent |
| Individuals | 1,688 | 14.6% | 1,756 | 12.7% |
| Families | 358 | 10.8% | 407 | 10.0% |
| Families, no husband present | 120 | 35.8% | 173 | 31.3% |
| Individuals 65+ | 199 | 11.8% | 174 | 7.6% |

Source: U.S. Bureau of the Census

Employment and Unemployment

Crawford County's economy has improved significantly in the last decade. **Figure 2.5** shows that the county's unemployment rate is again increasing after a period of decline from 1994 to 2000. The unemployment rate peaked in 1994 at 9.9 percent and declined steadily until 1998. The rate remained more or less steady at about 6 percent until 2000. Between 2000 and 2002 the rate rose 2 percent, peaking at 8 percent unemployment rate. As was the case with the State and most of the Country, a slowing national economy exacerbated by the terrorist attack of September 11 were the primary

causes for Crawford County's 1.1 and 1.2 percent rise in the unemployment rate for this time period. These increases were the largest in nine years, and unemployment rose to its highest level since 1995. Following this period, the unemployment rate gradually fell to 6.7 percent by the year 2005. Current data indicates that the jobless rate increased to nearly 8% by April 2006. Crawford County's unemployment rate has historically been 3 to 4 points higher than the State and has mirrored the State's trend over the past 10 years.



Wage and Salary Employment

Employment in Crawford County is most likely to be found in the retail sector, government or services (**Table 2.10**). The top job producers in Crawford County are much the same as found in other Northeast Michigan counties: service sector (28.1 % of the 2001 wage and salary employment), with government sector and retail employment very close to one another at 23.8 percent and 21.1 percent respectively. The county's percentage of jobs in the government sector is the highest percentage in that sector of any in Northeast Michigan (Alpena County, however, has a higher number of government jobs). The county's manufacturing sector now makes up 16.2 percent of the county's wage and salary employment and "other" employment makes up 68.5 percent. The smallest sector of the county's economy is employment in mining and construction (3.8% of the wage and salary employment).

Over the past decade, Crawford County's total wage and salary employment grew by only 6.8 percent (300 jobs). This was the smallest percentage gain in total wage and salary employment of any county in the region during that period. The largest percentage increase in the county's wage and salary employment was found in the manufacturing sector (23.1% or 150 jobs). Much of the added manufacturing employment was in forest products.

Table 2.10
Crawford County Wage And Salary Employment 1991-2000

| | Mining & Construction | Manufacturing | Retail | Service | Government. | Other | Total |
|----------|-----------------------|---------------|--------|---------|-------------|-------|-------|
| 1991 | 225 | 650 | 1175 | 1125 | 975 | 275 | 4425 |
| % Change | 50.0% | 4.0% | -7.8% | 9.8% | 2.6% | 0.0% | 2.3% |
| 1992 | 175 | 625 | 1100 | 1150 | 1000 | 350 | 4400 |
| % Change | -22.2% | -3.8% | -6.4% | 2.2% | 2.6% | 27.3% | -0.6% |
| 1993 | 125 | 625 | 1150 | 1200 | 1025 | 350 | 4475 |
| % Change | -28.6% | 0.0% | 4.5% | 4.3% | 2.5% | 0.0% | 1.7% |
| 1994 | 100 | 700 | 1000 | 1175 | 1025 | 375 | 4375 |
| % Change | -20.0% | 12.0% | -13.0% | -2.1% | 0.0% | 7.1% | -2.2% |
| 1995 | 125 | 675 | 1025 | 1225 | 1025 | 375 | 4425 |
| % Change | 25.0% | -3.6% | 2.5% | 4.3% | 0.0% | 0.0% | 1.1% |
| 1996 | 125 | 675 | 1000 | 1250 | 1050 | 350 | 4425 |
| % Change | 0.0% | 0.0% | -2.4% | 2.0% | 2.4% | -6.7% | 0.0% |
| 1997 | 125 | 725 | 1000 | 1275 | 1025 | 375 | 4525 |
| % Change | 0.0% | 7.4% | 0.0% | 2.0% | -2.4% | 7.1% | 2.3% |
| 1998 | 125 | 750 | 975 | 1225 | 1050 | 375 | 4525 |
| % Change | 0.0% | 3.4% | -2.5% | -3.9% | 2.4% | 0.0% | 0.0% |
| 1999 | 150 | 775 | 1025 | 1225 | 1050 | 425 | 4625 |
| % Change | 20.0% | 3.3% | 5.1% | 0.0% | 0.0% | 13.3% | 2.2% |
| 2000 | 150 | 800 | 1000 | 1250 | 1000 | 400 | 4725 |
| % Change | 0.0% | 3.2% | -2.4% | 2.0% | 4.8% | -5.9% | 2.2% |

Source: Michigan Department of Career Development, Employment Services Agency

During the same decade, service sector employment increased by 11.1 percent (125 jobs) while government sector employment increased by 7.7 percent (75 jobs). Employment in the retail sector and mining & construction sector declined when comparing 1991 to 2000. The number of jobs in the county's retail sector fell by 175 (10.6%) making it the only county in the region to lose retail employment during the period. The county's mining & construction sector lost 75 jobs (33.3%). Employment in the county's mining and construction sectors was the same when comparing 1991 to 2000.

Crawford County did not experience great job losses between 2000 and 2001. The county's "other" sectors lost 75 jobs and the manufacturing sector declined by 50. The mining and construction sectors actually gained 25 jobs each, while the retail and government sectors remained the same.

Housing Stock

Over past decade, the number of residential housing units in the county increased by 15.1 percent (1,315 units) and the population increased by 16.4 percent (2,013 persons). The ratio of 1 new home per 1.5 new residents reflects the trend toward fewer persons per household. **(Table 2.6)** shows that between 1990 and 2000, Crawford County's total number of persons per household decreased from 2.62 to 2.42 persons.

The percentage of owner-occupied housing units in Crawford County increased in 2000 from 80.3 percent to 82.8 percent. In all of the county's local units, except the City of Grayling, at least 80 percent

of the occupied housing units were owner occupied. Vacancy data is one measure of the availability of housing in a community. Sufficient housing stock, for both owner-occupied and renter-occupied, must be provided to accommodate an expanding population base. According to the Census, Crawford County's housing market vacancy rate was remarkably low in 1990 at 2.6 percent and even lower in 2000 at 1.7 percent (**Table 2.11**). Throughout the county, owner and renter vacancy rates are fairly low with the exception of Maple Forest Township which had a high renter vacancy rate of 20.8 percent. The next highest vacancy rate was Lovells Township with a renter vacancy rate of 8.0 percent. Typical normal vacancy rates of owner-occupied housing are nationally about 5 percent. Crawford County's low percentage indicates a tight housing market and an inadequate supply of available units for new residents. This situation indicates that the demand for housing is not being met through the existing housing stock.

| Housing Characteristics | 1990 | 2000 | % Change |
|--|-------|--------|----------|
| Total Housing Units | 8,727 | 10,042 | 15.1% |
| Total Occupied Units | 4,441 | 5,625 | 26.7% |
| Owner-Occupied (#) | 3,566 | 4,655 | 30.5% |
| Owner-Occupied (%) | 80.3% | 82.8% | 2.8% |
| Renter-Occupied (#) | 875 | 970 | 10.9% |
| Renter-Occupied (%) | 19.7% | 17.2% | -2.5% |
| Total Vacant Units | 4,286 | 4,417 | 3.1% |
| Seasonal Units | 3,912 | 4,112 | 5.1% |
| Vacancy Rate:* | | | |
| Owner (%) | 2.6% | 1.7% | |
| Renter(%) | 18.8% | 6.3% | |
| Persons Per Household | 2.62 | 2.45 | -6.5% |
| *Includes units that are vacant, for sale or rent; does not include seasonal units | | | |
| Source: U.S. Bureau of the Census | | | |

Housing characteristics by municipality are found in **Table 2.12**. As in many areas of northern Michigan, townships in Crawford County have a large percentage of seasonal housing units, particularly in Lovell Township where 68.5% (638 dwellings) are seasonal units. Other areas with high percentages of seasonal housing units are South Branch (52%), Maple Forest (49%) and Beaver Creek (43%). The City of Grayling has a very low percentage of seasonal housing units (1.2%). Seasonal units are often located on rivers and lakes and can vary from excellent to substandard. Many lots platted in the 1920's or 1930's are substandard in size, have private wells and use poor wastewater practices.

When analyzing the county's housing stock, it is important to look at the age of the housing units. Typically, after 30 years, homes are in need of upgrade, repair and/or replacement of major systems such as roofs, heating, plumbing and electrical. As illustrated in (**Table 2.13**), 41.9 percent of all housing units in Crawford County were at least 30 years old and almost 20 percent of the housing units in the county that were built between 1970 and 1979 will be reaching 30 years old over the course of this decade. Nearly a quarter of the housing units in the county were constructed before 1959.

| Municipality | Total* Units | Total Occupied | % Owner Occupied | % Renter Occupied | Total Vacant | % Seasonal* | Vacant % Owner | Vacant % Renter |
|--------------------------|-----------------|-------------------|---------------------|----------------------|-----------------|----------------|-------------------|--------------------|
| Crawford County | 10,042 | 5,625 | 82.8 | 17.2 | 4,417 | 40.9 | 1.7 | 6.3 |
| City of Grayling | 895 | 828 | 53.1 | 46.9 | 67 | 1.2 | 3.3 | 6.1 |
| Beaver Creek Township | 1,125 | 603 | 90.0 | 10.0 | 522 | 43.9 | 1.3 | 1.6 |
| Frederic Township | 1,092 | 555 | 86.3 | 13.7 | 537 | 46.1 | 1.2 | 7.3 |
| Grayling Township | 3,945 | 2,420 | 85.7 | 14.3 | 1,525 | 35.5 | 1.4 | 7.0 |
| Lovells Township | 932 | 283 | 91.9 | 8.1 | 649 | 68.5 | 1.1 | 8.0 |
| Maple Forest Township | 438 | 201 | 90.5 | 9.5 | 237 | 49.3 | 3.7 | 20.8 |
| South Branch Township | 1,615 | 735 | 92.1 | 7.9 | 880 | 52.7 | 2.0 | 0.0 |

*Total number of housing units for each municipality
**Percent of total housing units used as seasonal housing
Source: U.S. Bureau of the Census

Census data from 2000 shows that the large majority of homes in Crawford County (77.2%) are single family detached stick built structures. Mobile homes are a popular housing option in the county and make up 14.8 percent of the housing units in the County. Multi-family dwellings make up 4.0 percent of the housing units and the remainder of the housing units (3.6%) are other housing options such as a boat, RV, or van.

| Year Structure Built | Number | Percent |
|----------------------|---------------|-------------|
| 1990 to 2000 | 2,088 | 16.0% |
| 1980 to March 1990 | 1,248 | 9.6% |
| 1970 to 1979 | 2,581 | 19.8% |
| 1960 to 1969 | 1,149 | 8.8% |
| 1940 to 1959 | 1,817 | 13.9% |
| 1939 or earlier | 1,159 | 8.9% |
| Total | 13,042 | 100% |

Source: U.S. Bureau of the Census

Chapter 3 - Community Services and Facilities

Public Water Supply

The Department of Environmental Quality (DEQ) has primary enforcement authority in Michigan for the Federal Safe Drinking Water Act under the Michigan Safe Drinking Water Act. The DEQ has regulatory oversight for all public water supplies including approximately 1,500 community and 11,000 non-community water supplies. The program also regulates drinking water well drilling for approximately 25,000 new domestic wells drilled each year. Michigan has over 1.12 million households served by private wells, more than any other state. Like most of northern Michigan, Crawford County's only source of drinking water is groundwater. Public water supply for the County is summarized below:

Private Wells: Most of Crawford County's land area is served by private wells, and nearly 1,000 of these wells supply water to County residents. If drinking water comes from a private well, the owner is responsible for the water's safety. EPA rules do not apply to private wells, but the agency recommends that well owners have their water tested annually.

Community Water Systems: Community water systems serve the population year-round, such as in private residences or businesses. There are five active community water systems active in Crawford County, serving a total of 2,523 persons. This figure includes the City of Grayling community system, which supplies drinking water to 1,952 City residents and is maintained by the City of Grayling Department of Public Works.

Non-Transient Non-Community Water Systems: Non-transient water systems serve the same population, but not year-round (for example, schools that have their own water system). There are fifteen such water systems active in Crawford County, serving a total of 1,986 persons.

Transient Non-Community Water Systems: Transient non-community water systems are systems that do not consistently serve the same population. Rest stops, campgrounds, gas stations, motels and convenience type stores not hooked into a community water supply would be included in this category. Most of the wells in the County that are not considered private wells fall into this group. Eighty such wells are found in the County, serving approximately 20,000 persons.

Sewage Disposal

The City of Grayling Department of Public Works provides sewer services to the City of Grayling. Residents and business owners in the remainder of the County must rely on private onsite septic systems for wastewater disposal. Currently there are 7,641 households and businesses using these private systems throughout the County. There is one septage hauler located in Crawford County, operating two tanker trucks. Combined tank capacity of the trucks is 2,800 gallons (2,500 gallons in one, 300 in the other). The method of disposal used by the hauler is land application, with disposal sites in Grayling Township (117 acres) and Maple Forest Township (40 acres). District Health Department #10 regulates and maintains a permitting system for private wells and septic systems, and is responsible for inspection of the septage-hauling operation.

Solid Waste

Collection of residential and commercial solid waste in Crawford County is accomplished by commercial haulers and by individuals transporting their own waste to transfer stations or to the landfill. Private hauling companies provide residential and commercial service pick-up throughout the county, through private agreements with customers. The county is served by several commercial waste hauling companies. City Environmental Services Inc. operates the primary solid waste disposal facility for the County. The facility, formerly the Crawford-Otsego Landfill, is located in Maple Forest Township.

Residents can recycle certain materials through the use of recycling trailers stationed at transfer stations located in the Village of Frederic, Lovell Township and Grayling Township. Materials are then transferred to the recycling center in the City of Grayling.

Utility Services

Due to the large amount of public land and internal parcels (parcels in the center of a section that does not abut a public road), utility services are lacking in some areas of the County. Costs of providing telephone service to these isolated residences can be prohibitively high. Since these landowners must pay the cost of running the lines, some have chosen not to bear the expense, instead relying on cellular telephones.

Gas and Electricity Providers—MichCon provides natural gas service for the County; several sections in the northeast portion do not have natural gas service. Consumer Energy and Great Lakes Energy provide electricity to developed areas within the County. Large portions of South Branch, Lovells and Beaver Creek Townships have no electric service. With the exceptions of Frederic Township and the military base in Grayling Township, there is little three-phase service in the County. Three-phase power is needed to support some types of commercial and industrial activities, particularly in businesses that operate heavy machinery or equipment.

Telephone and Internet Service—Verizon and AT&T provide telephone service to the largest geographic area of the County. Businesses within three miles of the City of Grayling or of Frederic also have access to DSL Internet service through EPCS, an Otsego County Internet Service Provider. (This service is only available through Verizon telephone lines)

Schools

Crawford County is within the Crawford AuSable School District located on 1135 North Old 27, Grayling, MI 49738, Phone: (989) 344-3500. Schools within this School District include:

| | | |
|--|---|--|
| Grayling Elementary School 1000 Michigan Ave. Grayling, MI 49738 | Adult Learning Center 6470 Manistee Street Frederic, MI 49733 | Grayling High School 1135 N. Old-27 Grayling, MI 49738 |
| AuSable Primary School 306 Plum Street Grayling, MI 49738 | Grayling Middle School 500 Spruce Street Grayling, MI 49738 | |

The Devereau Memorial Crawford County Library system has four branches to serve the cities, villages and townships of Crawford County. The main branch of the library is located on Plum Street in the City of Grayling, and offers a wide variety of services and programs including internet service, inter-library loans, children's activities, specialized book sections. The three satellite branches include the Frederic Library, located on North Old 27 Highway in the Village of Frederic, the Beaver Creek Library located in Beaver Creek Township on South Grayling Road, and the Lovell Library located in Lovell Township on Twin Bridge Rd.

Public Safety

Law Enforcement

Crawford County has two local law enforcement agencies, the Sheriff Department, located at 200 W. Michigan Avenue in Grayling and the City of Grayling Police Department located at 1020 City Blvd. in Grayling. The County 911 system is co-located in the Sheriff Department as well as the Crawford County Jail. The County receives Michigan State Police support from the Gaylord Post Headquarters and its Satellite Post in Mio, located just east of the Sheriff Department. Camp Grayling will provide some law enforcement to Crawford County if needed.

Emergency Medical Services

Crawford County maintains Emergency Medical Services (EMS), located in Frederic and South Branch Townships. In addition, Mobile Medical Response (MMR) units are located in Beaver Creek Township and the City of Grayling.

Fire Services

Crawford County has six fire departments providing fire protection to all areas of the County. In addition, Camp Grayling has three fire departments, providing fire protection service for the residents of Camp Grayling, but will assist fire departments in Crawford County if needed.

| Name of FD | Type | Area covered (Sq. miles) | Persons covered | Location |
|--|----------------|--------------------------|-----------------|---------------------------------|
| Frederic VFD | Volunteer | 108 | 1,287 | 654 Frederic St., Frederic |
| Grayling City-Township | Partially-paid | 180 | 8,468 | 1041 City Blvd., Grayling |
| Lovells Township | Partially-paid | 108 | 500 | Twin Bridge Rd., Lovell Twp. |
| South Branch Township | Partially-paid | 125 | 2,000 | M-18 Hwy., Roscommon |
| Beaver Creek | Partially-paid | 72 | 2,000 | Grayling Rd., Beaver Creek Twp. |
| Camp Grayling | Partially-paid | 1 | 7,000 | Building 36, Camp Grayling |
| Grayling 1440 Engine Detachment | Partially-paid | 1 | 7,000 | Building 3, Camp Grayling |
| Camp Grayling ADSW | Paid | 129 | 7,000 | Building 39, Camp Grayling |
| DNR Field Office | N/A | | | 1955 N. I-75 BL, Grayling |
| Source: Crawford County Hazard Mitigation Plan | | | | |

Medical Facilities

Crawford County has 35 health service establishments that employ between 473 and 975 people. **Table 3.2** shows a breakdown of the types of facilities that are available. Most of the facilities are located in or near the City of Grayling. The largest medical facility in Crawford County is Mercy Hospital Grayling, a 130 bed facility (90 acute care, 40 long term care) located on 110 Michigan Avenue in Grayling. Troop Medical Clinic located within Camp Grayling addresses troop related medical issues. The Clinic has minimal staff much of the year and is only fully staffed during troop training. Northern Lakes Community Mental Health of Traverse City provides support services to developmentally disabled persons as well as persons needing mental health services. District Health Department #10 is often able to fill health care needs of the community. The Crawford County Branch is located on 220 Meadows Drive in Grayling. Programs offered by the Health Department fall into three categories: home health care services, environmental health services and personal health services.

| Table 3.2 Healthcare in Crawford County | |
|--|----------------------|
| Type of Facility | Number of Facilities |
| Adult Care Facilities | 3 |
| Chiropractors | 4 |
| Dentists | 3 |
| Health Services | 1 |
| Home Health Service | 1 |
| Hospitals | 1 |
| Mental Health Services | 1 |
| Nurses – Practitioners | 1 |
| Nursing & Convalescent Homes | 2 |
| Optometrists | 2 |
| Physical Therapists | 3 |
| Physicians & Surgeons | 10 |
| Podiatrists | 1 |
| Psychologists | 2 |
| Source: U.S. Department of Labor – Occupational Health & Safety Administration | |

Recreation

The lakes, streams and woodlands of the area provide a venue for a variety of recreational activities. Recreation is an important economic factor for the region. An updated countywide recreation plan developed by Northeast Michigan Council of Governments for the Crawford County Planning Commission was approved by the MDNR in February of 1997. The plan provides a means by which the county and local governments may apply for recreation funding to implement projects listed in the plan. Recreational facilities in Crawford County include the 9,672-acre Hartwick Pines State Park, the largest State Park in the Lower Peninsula. A portion of the Higgins Lake State Park lies at the southernmost edge of Crawford County. In addition to its 210 campsites, the Park is noted for its Civilian Conservation Corps (CCC) Museum. Recreational facilities found throughout the County are described in **Table 3.3** below.

**Table 3.3
Recreational Facilities in Crawford County**

| Facility | Amenities | Location |
|-------------------------------------|---|--|
| Shupac Lake Campground | 30 campsites, boating, boat ramp, swimming, fishing | Section 18, Lovells Township |
| Jones Lake State Forest Campground | 42 campsites, boating, swimming, fishing, small-boat ramp | Section 31, Lovells Township |
| Lake Margrethe Forest Campground | 37 campsites, boating, swimming, fishing, boat ramp | Section 17, Grayling Township |
| Upper Manistee River Campground | 30 campsites, 10 walk-in sites, canoeing, fishing, group camp for canoeists | Section 7, Frederic Township |
| Manistee River Bridge Campground | 23 campsites, canoeing, fishing, canoe access | Section 31, Frederic Township |
| AuSable River Canoe Camp | 13 campsites (5 are canoe access only) hiking, picnicking, fishing, wildlife viewing | Grayling Township, 5.5 miles east of Grayling |
| Burton's Landing Canoe Launch | 12 campsites, canoeing, fishing | Section 10, Grayling Township |
| Keystone Landing Campground | 18 campsites, canoeing, fishing, canoe launch | Section 11, Grayling Township |
| White Pine State Forest Canoe Camp | Open area campsite, canoe access only, fishing, wildlife viewing | Section 7, South Branch Township |
| Rainbow Bend Forest Campground | 6 campsites, canoeing, fishing, canoe access, canoe group camping sites | Section 3, South Branch Township |
| Canoe Harbor Campground | 44 campsites, canoeing, fishing, 10 canoe group campsites | Section 32, South Branch Township |
| Hartwick Pines | 100 campsites, hiking, mountain bike trails, fishing, logging museum & camp, Interpretive Center | 6 miles northeast of Grayling, Grayling Township |
| Goose Creek State Forest Trail Camp | 9 campsites, canoeing, hiking, horseback riding, wildlife viewing, fishing | 5.5 miles west of Frederic, Frederic Township |
| Kneff Lake Campground | 26 campsites, boating, fishing, swimming, picnicking | 7 miles southeast of Grayling, Grayling Township |
| 4 Mile State Forest Trail Camp | 50 campsites, horse camp, horseback riding, boat launch, fishing, canoeing, hiking, wildlife viewing | 9 miles southeast of Grayling, Grayling Township |
| Connor's Flat Campground | 4 campsites, canoeing, boat access, fishing | Section 10, northern tip of South Branch Township |
| Sheep Pasture Campground | 3 campsites, canoeing, fishing | Section 16, southern portion of Lovells Township |
| Wakeley Lake Area Federal Forest | 4 walk-in campsites, limited fishing, trails | Section 23, 10 miles southeast of Grayling |
| North Higgins Lake State Park | 210 campsites, trailer station, cabins, boat access, fishing, trails, museum, pavilions, conference center | Section 36, southern edge of Beaver Creek Township |
| Hanson Hills Recreation Area | Clubhouse, ball diamond, playground, picnic area, ski lodge & 6 downhill slopes, fishing, hiking & cross-country ski trails | Approximately 2 miles southwest of Grayling, Grayling Township |
| Grayling Fish Hatchery | Public trout fishing, feeding | City of Grayling |
| Crawford County Fairgrounds | Horse arena, concession stand, barn, ball fields, exhibition building, pavilion, group camping area | Section 31, north of Grayling, Grayling Township |
| Chamber of Commerce Visitors Park | Chamber office, parking, pavilion/picnic area, river access | City of Grayling |
| Grayling Library | Library building, children's playground, river access | City of Grayling |

Chapter 4 - Natural Resources

The woodlands, open spaces, wildlife, water, and rolling hills are several key resource values that draw people to both recreate and live in the County. Abundant public lands offer access to thousands of acres of recreational lands for hunting, hiking, wildlife viewing and snowmobiling. Lakes, creeks and streams, especially the Manistee and Au Sable River provide opportunities for fishing, boating and water sports. Special recreation areas such as the Mason Tract are additional draws to the County.

A rural landscape, abounding with views of forestlands and wetlands, typifies the community character of Crawford County. Forestlands are important to the local economy; recreational use and production of forest goods bring dollars into the Community. Many long time visitors decide to move to the area upon retirement. These renewable yet priceless resources warrant special considerations when planning for future growth.

The protection and wise use of these natural resources are central to maintaining a sustainable community. Along with planning for the built-up infrastructure like roads and utilities, a community needs to plan for the green infrastructure; the forests, wetlands, farmland and water. Development, without consideration of carrying capacity of the land, can have long term negative impacts on the resources. When planning for future growth, the community must identify environmental constraints, such as wetlands, steeply sloped areas, ecological corridors and ground water recharge zones. This chapter will analyze the physical environment to assist local officials in developing a desired future of the County. Natural resources addressed include climate, geology, topography, soils, water, vegetation and wildlife.

Climate

The climate is yet another reason why people are drawn to the area. Typical of northern Michigan, the distinct four seasons offer an ever-changing landscape. Long snowy, cold winters; and moderately warm summers are separated by a cool, green spring and a cool colorful fall. Located in the north central part of the northern lower peninsula, the County is approximately 30 miles inland from Lake Michigan and 55 miles inland from Lake Huron. Given this geographic location, with the exception of lake effect snowfall, the weather is not significantly influenced by the lake moderating effect of both Great Lakes.

Table 4.1 shows the average temperature and precipitation by month calculated over a 30-year period. Moderately warm temperatures dominate summers. The warmest days occur in the month of July and between the years of 1971-2000, there was an average of seven days per year that exceeded the 90-degree mark. Temperatures over 100 degrees have been recorded in the months of June, July, August and September and temperatures in the high 80's have occurred as early as March and as late as October. Normal temperatures for the area range from the high 70's to the low to mid 40's in the summer and from the low 30's to single digits in the winter. The following temperature extremes for the station in Crawford County are: maximum, 104 F, recorded July 11, 1936; minimum, -45 F, recorded February 3, 1898; warmest monthly mean, 75.5 F recorded in July of 1921; and coldest monthly mean, 4.4 F was recorded February 1904.

| Temperature Averages (Degrees Fahrenheit) | | | Precipitation Averages (Inches) | | |
|--|---------|------|--|---------------|-------|
| Period | Maximum | Min | Mean | Precipitation | Snow |
| January | 25.5 | 6.6 | 16.1 | 1.76 | 29.9 |
| February | 28.4 | 6.4 | 17.4 | 1.28 | 19.5 |
| March | 38.5 | 15.2 | 26.8 | 1.96 | 14.5 |
| April | 52.4 | 28.1 | 40.3 | 2.64 | 4.1 |
| May | 67.1 | 39.0 | 53.1 | 3.10 | 0.3 |
| June | 76.0 | 48.5 | 62.2 | 3.47 | 0.0 |
| July | 80.1 | 53.2 | 66.7 | 3.76 | 0.0 |
| August | 77.4 | 51.1 | 64.3 | 3.79 | 0.0 |
| September | 68.5 | 43.2 | 55.9 | 4.01 | 0.0 |
| October | 56.2 | 33.6 | 44.9 | 3.42 | 1.1 |
| November | 41.9 | 24.9 | 33.4 | 2.45 | 13.2 |
| December | 30.3 | 14.3 | 22.3 | 1.82 | 24.7 |
| Annually | 53.5 | 30.3 | 41.9 | 33.40 | 107.3 |

Source: Midwestern Regional Climate Center, Champaign IL, Station 203391 Grayling MI

Based on the 1971-2000 period, the average date of the last freezing temperature in the spring was May 30, while the average date of the first freezing temperature in the fall was September 17. The freeze-free period, or growing season, averaged 110 days annually.

In the summer, precipitation comes mainly in the form of afternoon showers and thundershowers. Most precipitation occurs in the months of April-September, which received an average of 20.76 inches or 62 percent of the average annual total for the 1971-2000 period. During this same period the average wettest month was September that averaged 4.01 inches, while the average driest month was February which averaged 1.27 inches. The average seasonal snowfall was 104.7 inches. During the 1971 –2000 period, 123 days per season averaged one inch or more of snow on the ground, but varied greatly from season to season. The greatest one-day precipitation total was 5.02 inches, recorded August 8-9, 1965; greatest monthly total, 12.51 inches, recorded September 1986. The least monthly total, 0.00 inches, was recorded April 1889. Soil moisture replenishment during the fall and winter months plays an important role in the success of agriculture for this area. While drought occurs periodically, the Palmer Drought Index indicated drought conditions reached extreme severity only two percent of the time.

Geology

The rolling hills, river valleys, swamps and lakes were created by glacial activity as the last continental glacier left the landscape some 12,000 years ago. Beneath a thick mantle of the glacial deposits lays a foundation of layered sedimentary bedrock. This section will describe the glacial landforms or quaternary geology and the underlying bedrock geology.

Starting some 2 million years ago, during the Pleistocene era, continental glaciers formed in the Hudson Bay area. Several times, over this two million year period, the massive sheets of ice built up and inched their way south across what is today Michigan.

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

Each advance and retreat of the continental glaciers took tens of thousands of years. This reoccurring process shaped and reshaped the land; obliterating and then creating hills, valleys, rivers and lakes, swamps and marshes. The last glacial period, called the Wisconsin era, created the landscape we know today. The glacier left behind boulders, rocks, cobble, sand, gravel, silt, clay and loam. In some areas the material was deposited in unsorted masses called till plains, ground moraines and end moraines. Water flowing from the melting glaciers also sorted materials, creating outwash channels, sand deltas, kames and eskers. Fine materials, captured in the fast moving glacial meltwater, settled to the bottom of expansive glacial lakes creating lacustrine clay and silt plains. **Figure 4.1** from "The Glacial Lakes around Michigan," by William R. Farrand, shows how glacial landforms were created.

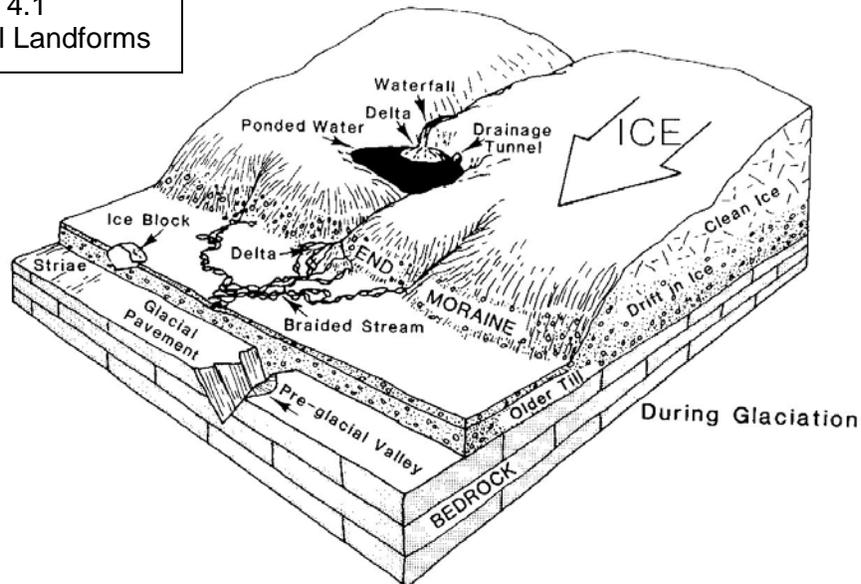
According to the USDA Crawford County Soil Survey, the county has three main physiographic regions. The northwestern and north-central parts of the County are characterized by a series of four high plateau-like remnant moraines that were dissected by glacial meltwater. The remnant moraine landforms have a north-south linear orientation and are referred to as the Grayling fingers. The second landform region is located in the central and northeastern parts of the county. These areas are characterized by nearly level to gently sloping outwash plains. The mainstream and north branch of the Au Sable River are located in this region. The streams have cut shallow valleys in the outwash materials. The third landform region, located in the south part of the County, consists of a nearly level to gently sloping plain that is interrupted by a series of high kame moraines. Much of the gently sloping plain is over washed with sand. The kame moraines have a general east-west orientation. Some of the highest elevations in the county are found on these kames. There are several small postglacial lake plains, dominated by loam and clay, in the County.

At the front of the massive retreating glaciers, large streams originated from the melting ice. The debris laden water carved through moraines creating wide drainageways and outwash channels. The Au Sable River and Manistee River further to the west are located in the glacial drainageways. These areas are dominated by sands and organic muck soils. As the continental glaciers melted, huge blocks of ice became separated from the retreating ice front. The ice blocks became embedded in the glacial debris deposited by the retreating glacier. The embedded ice blocks eventually melted and left depressions (kettle holes) which are today's inland lakes, associated wetlands and bogs.

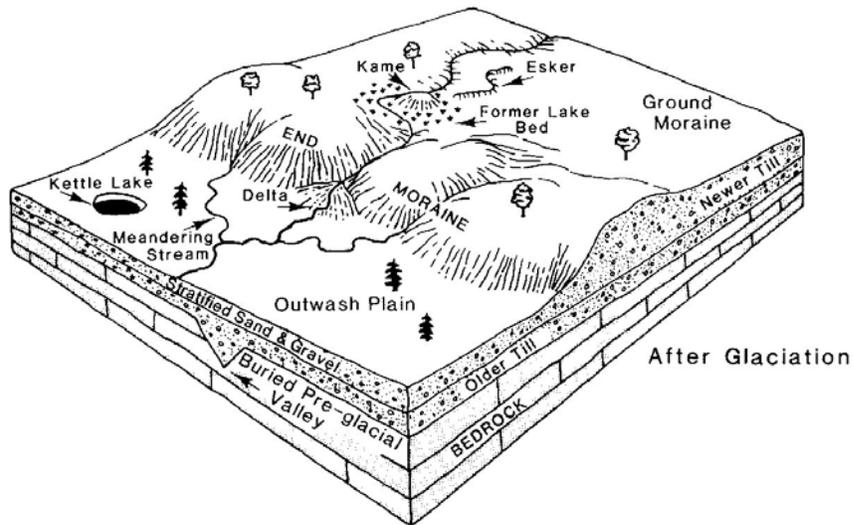
Beneath the glacial deposits, some 200 to 300 feet below the surface, is sedimentary bedrock that was created during the Late Mississippian ages of the Paleozoic Era. The bedrock was formed in ancient seas, which covered the area some 310- 345 million years ago. The shallow marine seas deposited layers of silt, clay, sediments, marine animals, plants, coral, and other calcareous materials. These deposits formed shale, sandstone and limestone bedrock. According to the 1987 Bedrock Geology of Northern Michigan map, prepared by the Geological Survey Division of the Michigan Department of Environmental Quality, the upper layer of bedrock is Coldwater shale. Other bedrock formations beneath the glacial overburden include the Michigan Formation and Marshall Formation. Natural gas deposits have been discovered in the Michigan and Marshall

formation. Recent proposals to explore for gas adjacent to the Mason Tract have caused concerns with many groups. Concerns are the proposed drilling and associated road widening, flow line/pipeline burying, and constructed facilities (if needed) would reduce the quality of the outdoor recreation experience of visitors to the Mason Tract. The US Forest Service completed an Environmental Assessment in the fall of 2004 and authorized drilling adjacent to the Tract. The authorization is being appealed.

Figure 4.1
Glacial Landforms



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



Landforms of continental glaciation are unmistakable.

Topography

Most of the county is nearly level or gently rolling. Local differences in elevation are slight, in a few places exceeding 100 feet, although the hills and plateau-like ridges appear to rise above adjacent sand plains when viewed from a distance. Slopes of hilly land are both long and expansive or, where the relief is choppy, smooth and rounded. There are no steep slopes except along watercourses.

The northern part of the county consists of three broad highland plateaus, having a general north-south direction, three complementary broad sand valleys, and a wide sandy plain on the east. The central part, from eastern to western boundaries, is a wide level sand plain through which the AuSable River and its tributaries have cut valleys. Several detached swells or ridges, irregular in outline but having general east to west trends, characterize the southern part of the county. Here the general relief is gently rolling or moderately hilly. Level sand plain and swamps intervene between masses of higher land. The highest elevation, ranging from 1,300 to 1,480 feet above sea level, can be found on kame moraines in the southeastern parts of the county. The lowest elevation of 1,010 feet above sea level, noted on USGS quadrangle maps, is located in the eastern edge of the County where the main branch of the Au Sable River flows into Oscoda County.

Soils

The soils of Crawford County are generally sandy with low fertility and low moisture-holding capacity. Few loamy soils are found in the northwest portion of the county. Portions of the county have building limitations due to poor filtration of septic effluents. The two predominant soil associations in Crawford County are: *Grayling-Rubicon* (nearly level to undulating, well drained sandy soils on outwash plains); and *Grayling-Grayalm-Montcalm* (rolling to hilly, well-drained sandy soils, on uplands). Found in the northwest portion of the county are significant beds of a third association, *Kalkaska-Blue Lake* (sloping to steep, well-drained sandy soils, on the side of ridges and escarpment-like features enclosing upland valleys).

When planning for types and intensity of land uses, soil types and slopes are two important factors that determine the carrying capacity of land. The construction of roads, buildings and septic systems on steeply sloped areas or areas with organic and hydric soils require special design considerations. In addition, costs for developing these sensitive areas are greater than in less constrained parts of the landscape. If developed improperly, the impacts to natural resources can be far reaching.

The Natural Resource Conservation Service completed a detailed soil survey of Crawford County. A digital or computerized version of the soil survey maps was acquired from the Michigan Department of Natural Resources, MIRIS program. Using information contained within the published soil survey book, a series of maps are presented that depict hydric soils, steep slopes, soils with building limitations and soils with septic system limitations.

Hydric Soils and Steeply Sloped Areas

Figure 4.2 is a color thematic map that classifies hydric soils and soils on steep slopes. Lower density and less intensive development should be directed to these areas with

severe building constraints. Hydric soils are saturated, flooded or ponded during part of the growing season and are classified as poorly drained and very poorly drained. Hydric soils have poor potential for building site development and sanitary facilities. Wetness and frequent ponding are severe problems that are difficult and costly to overcome. Sites with high water tables may be classified as wetlands and a wetlands permit would be required to develop these areas.

Less than ten percent of the County is mapped as hydric soils with a high potential for wetlands. The hydric soils are mainly located adjacent to streams and lakes. The largest concentrations are found in the central portions and northern portions of the community. Note the green areas or hydric soils are typically drained by creeks and streams that in turn empty in the major rivers. This connectivity of riparian wetlands and surface water features can be seen throughout the landscape.

Hills and steeply rolling terrain may provide opportunities for spectacular views of the landscape. However, steeply sloped sites have severe building constraints, are more difficult and costly to develop. Maintenance costs tend to be higher on steeply sloped terrain. Special design standards such as erosion control measures, limiting size of disturbed areas, retaining natural vegetation, revegetation, slope stabilization and on-site retention of water run-off from impervious surfaces would all serve to minimize resource impacts. According to information presented in the Crawford County Soil Survey areas with slopes 18 percent and greater are minimal. Of greatest concern are steeply sloping hillsides adjacent waterways. Steeply slopes areas are depicted in red on **Figure 4.2**. Note the large area mapped as steep slopes in the northern part of the county. This anomaly is related to the bombing range of Camp Grayling.

Building Site Development

The USDA soil survey of Crawford County rates soils for various uses such as building site development and identifies the limiting factors such as steep slopes or high water table. The rating system is slight, moderate and severe limitations. Using the rating system developed by USDA, soil limitations for buildings without basements have been mapped and are displayed in **Figure 4.3**. Areas with well drained soils and slopes less than 10 percent tend to have slight limitations for building development. Areas with steep slopes, high water tables and organic soils have severe limitations. Lands with severe constraints are scattered throughout the County, but tend to be more prevalent near streams and in the northeast and southeast parts of the county. Due to the prevalence of sandy soils in Crawford County large areas have slight to moderate limitations for buildings.

Septic Systems

Using a computer mapping system soils maps have been color coded to show areas with slight to severe septic system limitations as defined by the USDA Natural Resource Conservation Service. Criteria include depth to water table, wetness, filtering capacity and ability to perc water. **Figure 4.4** is a septic system limitations map. Much of the County is classified as having severe limitations. Clearly the greatest limiting factor is the prevalence of sandy soils with severe limitations due to poor filtration of septic effluents. This is a critical issue when the water table is close to the surface or when high density development occurs. Limiting types and density of development or making public water and sewer available for high density development are likely the best options for protecting the groundwater resources.

Forestry

A large amount of land in Crawford County is in public ownership in the form of the Huron National Forest and the Au Sable State Forest. According to 2001 statistics from the U.S. Forest Service, Crawford County has a total land area of 364,347 acres. Forestland totals 324,274 acres (approximately 90 percent of the county's total land area). 36,183 acres are classified as nonforest, while 5,186 acres are classified as water (**Figure 4.5**).

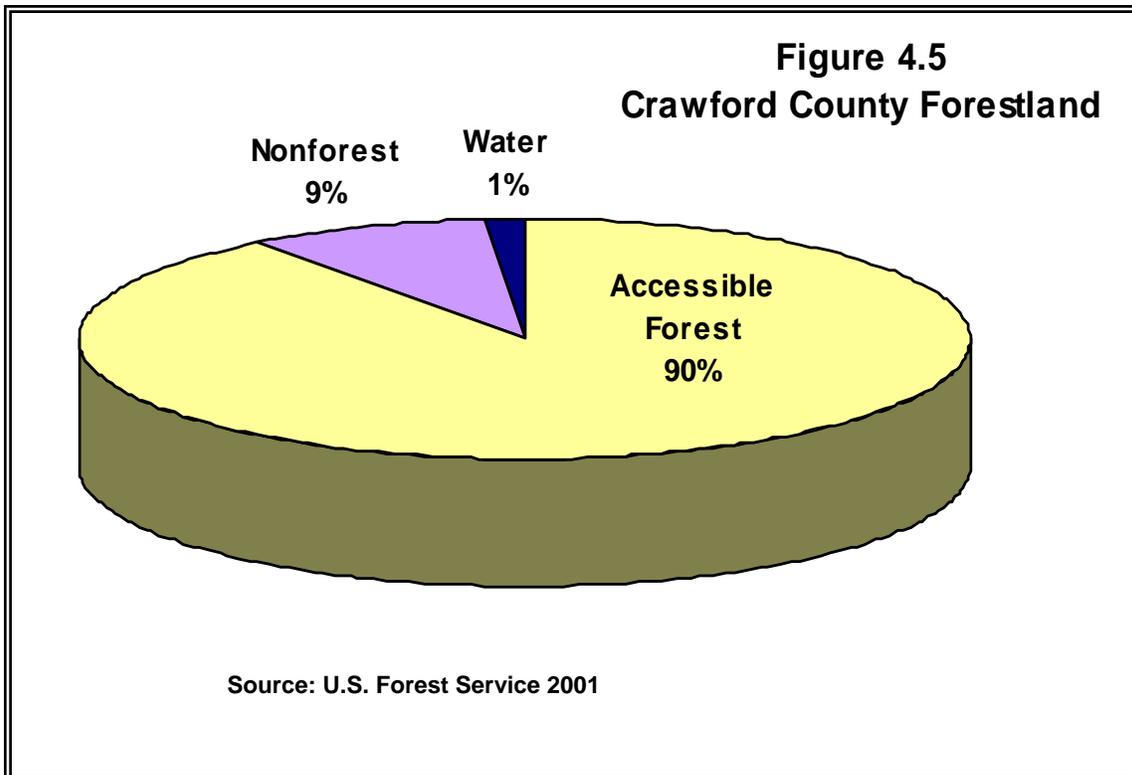


Table 4.2 shows that the major forest species found in the county are Jack Pine (27%), Oak/Hickory Group (23%) and Aspen (21%). The Maple/Beech/Birch Group totals 12 percent. A small amount of forestland is comprised of Black Spruce (6%), Balsam Fir (4%), and Red Pine (4%). Smaller acreage of Eastern White Pine, White Spruce, Northern White Cedar, White Pine/Red Oak/White Ash, and Paper Birch are also present. The abundance of Jack Pine and Oak forests dramatically increase the wildfire hazard for Crawford County. **Figure 4.6** shows forest types in the County. Note the predominance of pine and oak depicted on the 1978 MIRIS forest cover map. In addition, note the prevalence of northern hardwoods in Maple Forest Township and northern Frederic Township.

The majority of forestland in the county is in public ownership - 52 percent state owned and 16 percent federally owned (**Figure 4.7**). Most of these lands are managed under a multi-use concept, which is directed toward recreation. The use of military forestland is not geared toward commercial forest production. Some areas have been determined as

refuge areas for the endangered Kirtland's Warbler. The next largest ownership class is in individual ownership 32 percent.

Figure 4.8 and **Table 4.3** show the breakdown of tree species by ownership group. The acreage of Jack Pine is fairly evenly split among federal, state, and private ownership. Species in the Oak/Hickory Group are predominantly in state and private ownership. Aspen and Maple/Beech/Birch are found mostly on state owned property.

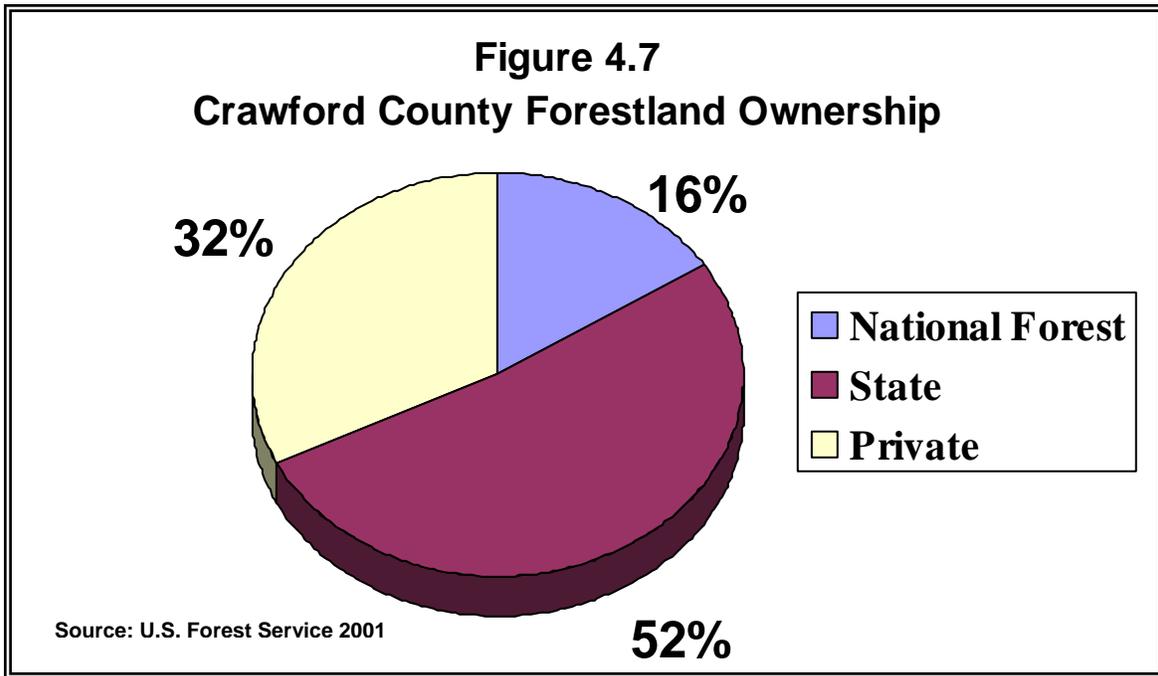
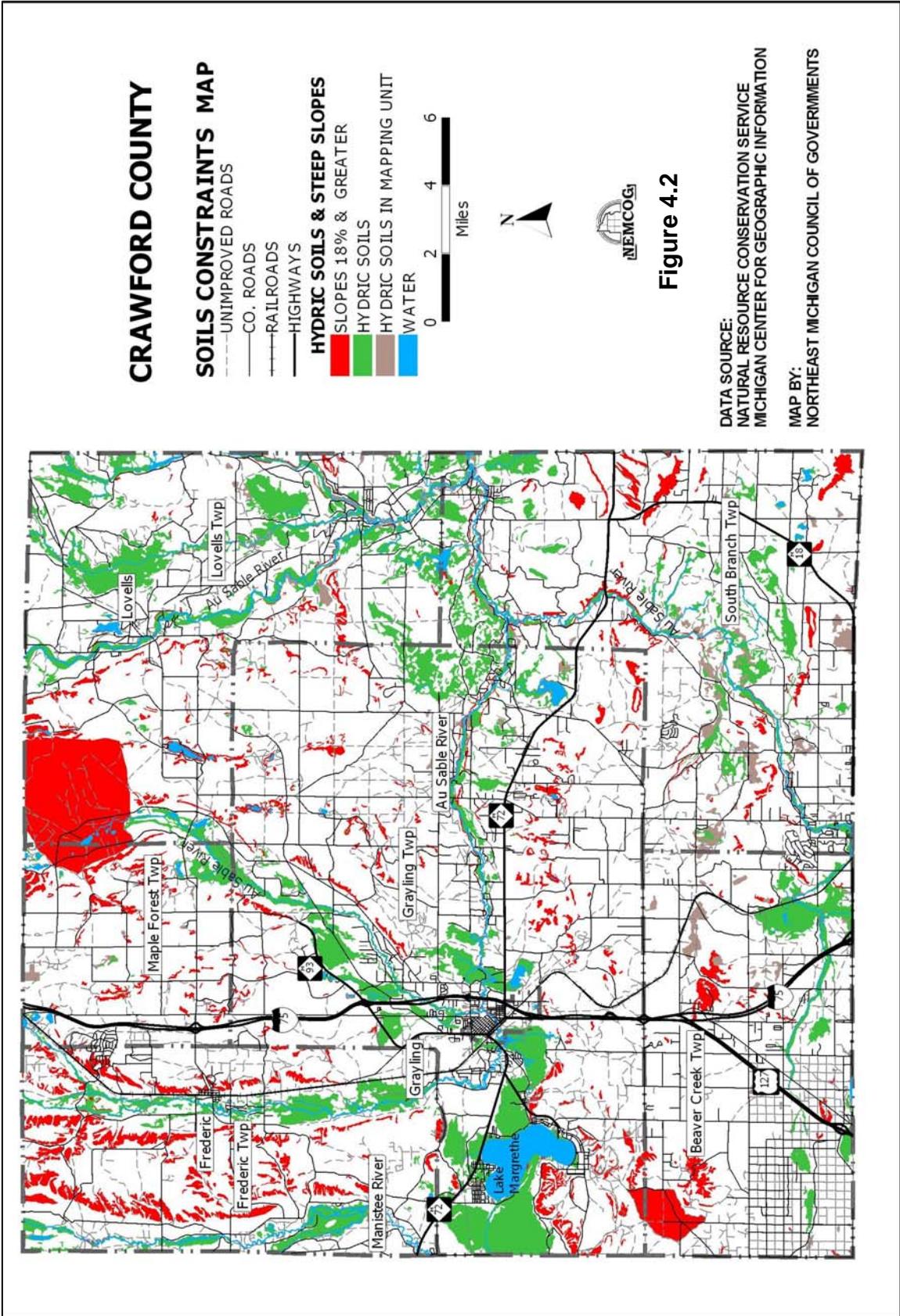
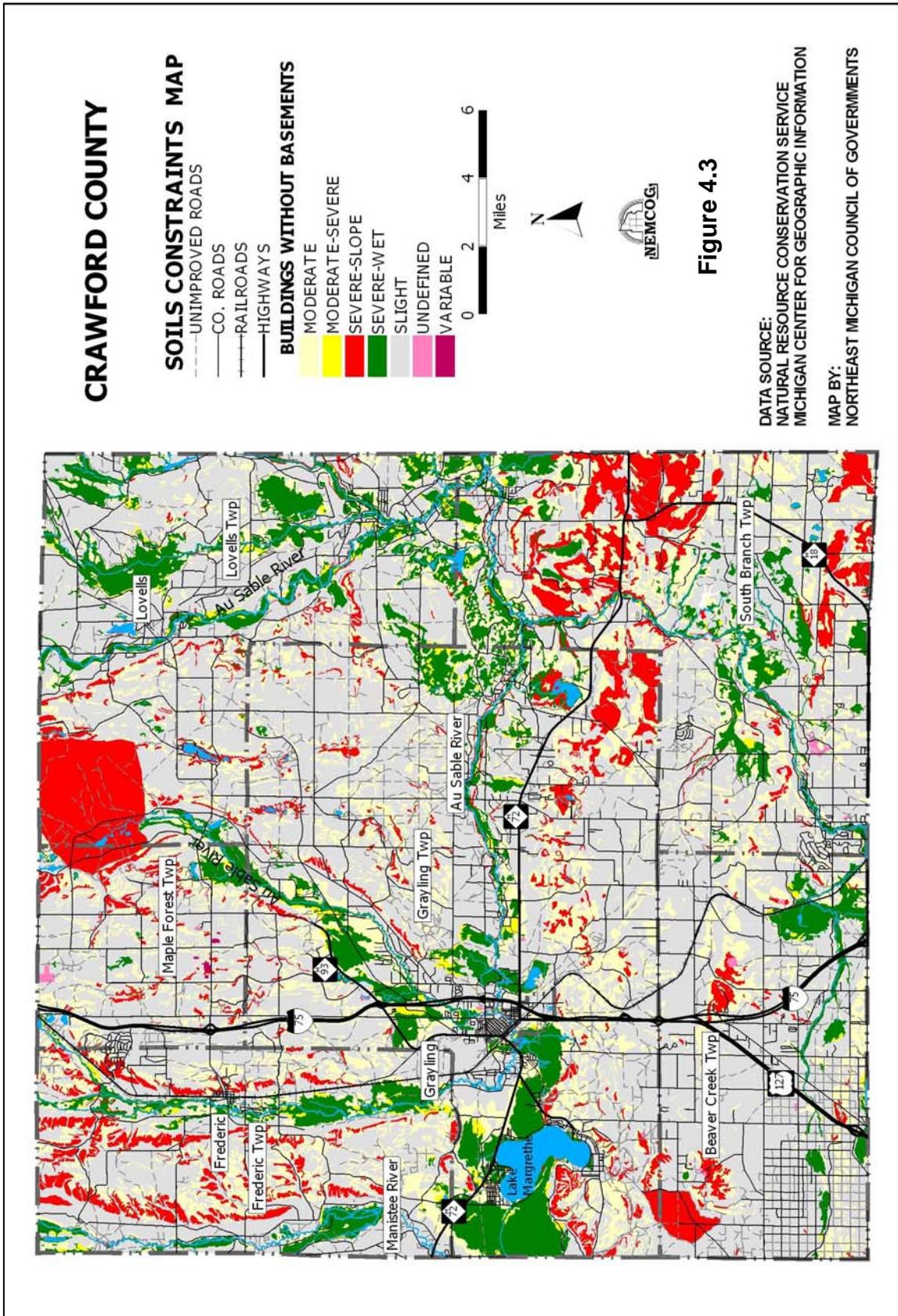


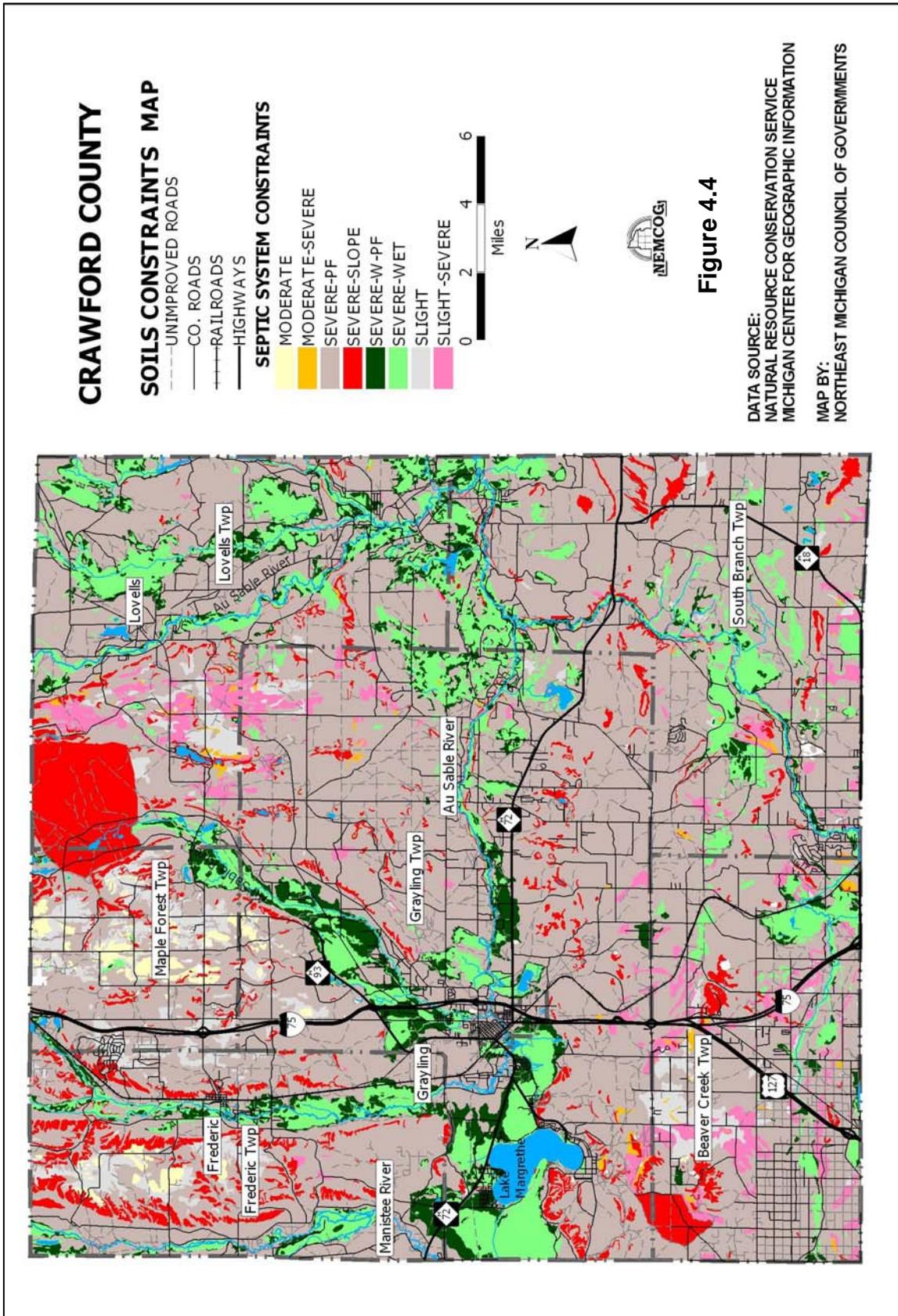
Table 4.2
Crawford County – Acres of Timberland by Forest & Ownership Type

| | National Forest | State | Private | Total | Percent |
|----------------------------------|-----------------|------------------|------------------|-----------------|---------|
| Jack Pine | 25936.6 | 39744.8 | 22953.5 | 88634.9 | 27.3% |
| Red Pine | | 11318.4 | | 11318.4 | 3.5% |
| Eastern White Pine | 1459.8 | | | 1459.8 | 0.5% |
| Balsam Fir | 5839.0 | 1296.5 | 4382.2 | 11517.7 | 3.6% |
| White Spruce | 1459.8 | | | 1459.8 | 0.5% |
| Black Spruce | | 10372.0 | 9169.0 | 19541.0 | 6.0% |
| Northern White Cedar | | | 2593.0 | 2593.0 | 0.8% |
| Oak/Pine Group | | 1491.4 | | 1491.4 | 0.5% |
| White Pine / Red Oak / White Ash | | | 739.0 | 739.0 | 0.2% |
| Oak / Hickory Group | 5839.0 | 32433.9 | 37194.1 | 75467.0 | 23.3% |
| Maple / Beech / Birch Group | 4379.3 | 24908.3 | 10188.0 | 39475.6 | 12.2% |
| Aspen | 6331.7 | 46127.0 | 15558.0 | 68016.7 | 21.0% |
| Paper Birch | | | 1263.1 | 1263.1 | 0.4% |
| Nonstocked | | 1296.5 | | 1296.5 | 0.4% |
| Total | 51,245.2 | 168,988.8 | 104,039.9 | 324273.9 | |

Source: U.S. Forest Service 2001







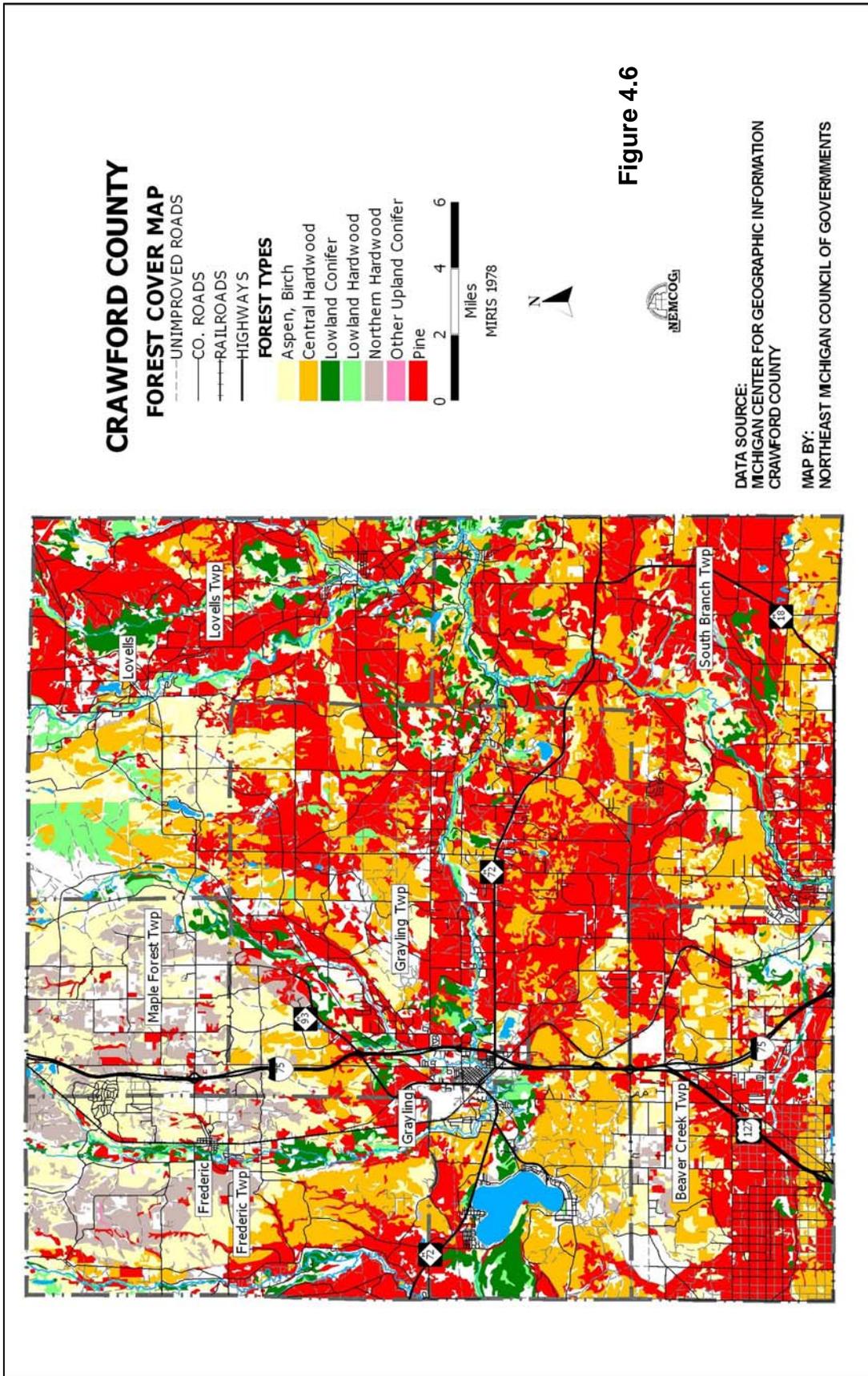


Figure 4.6

Figure 4.8: Crawford County Timberland by Forest Type & Ownership

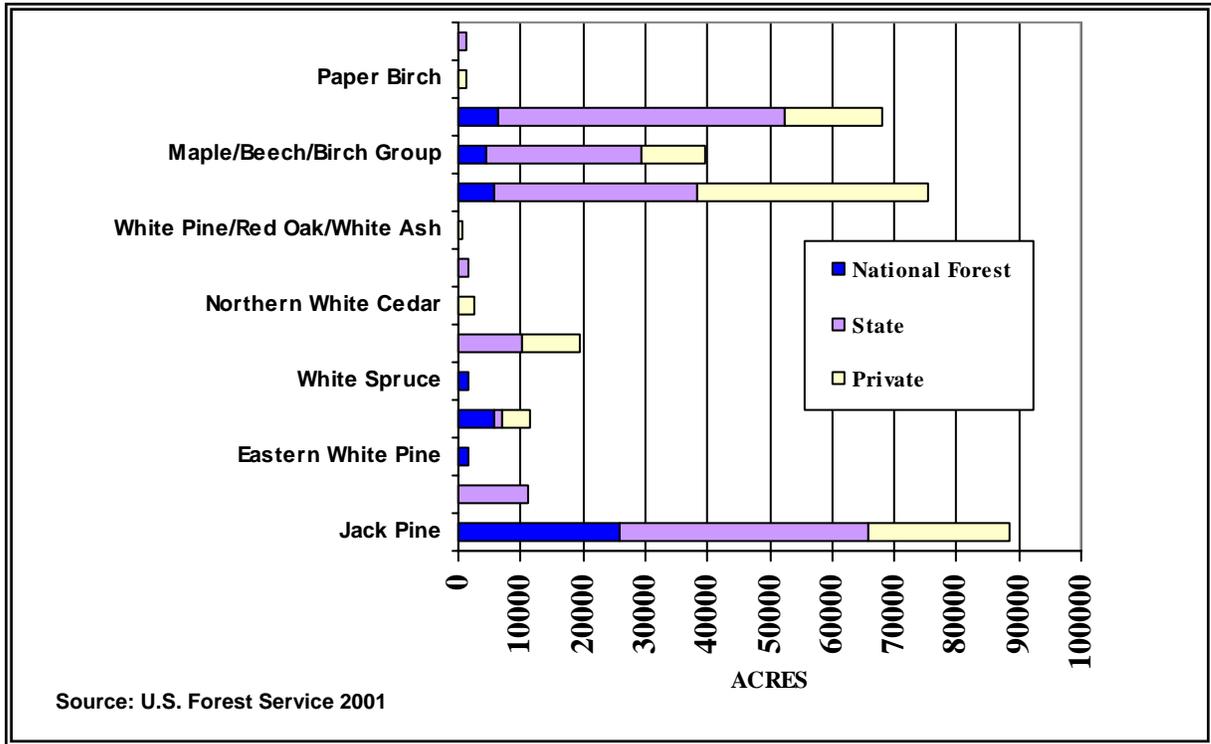


Table 4.3 shows the net volume of growing stock on timberland and the net volume of live trees on timberland by softwood/hardwood group. The Forest Service defines a growing stock tree as a live tree of a commercial species that meets specified standards of size, quality, and merchantability (excludes rough, rotten, and dead trees). Approximately 157.5 million cubic feet of softwoods (coniferous trees, usually evergreen, having needles or scale-like leaves) and 143.2 million cubic feet of hardwoods (broad-leaved and deciduous) make up the growing stock of Crawford County. There are

| | Softwoods | Hardwoods | Total Volume |
|--|---------------|---------------|---------------|
| Cubic feet of growing stock by hardwood/softwood group | 157,474,832.8 | 143,196,231.4 | 300,671,064.2 |
| Cubic feet of live trees by hardwood/softwood group | 163,515,556.7 | 154,123,700.2 | 317,639,256.8 |

Source: U.S Forest Service 2001

approximately 163.5 million cubic feet of softwood live trees and 154.1 million cubic feet of hardwood live trees in the county. **Table 4.4** shows the acreage of size classes and stocking class of total growing stock (the degree of occupancy of land by live trees) found in Crawford County. Thirty-eight percent of the forest acreage in the county is small diameter trees, while 28 percent are medium diameter and 32 percent are large diameter. Approximately 66 percent are medium to fully stocked. **Table 4.5** depicts annual growth and annual removals by major species group from 1980 to 1993. Average net annual growth exceeds removal for this period.

| Table 4.4 | | | | |
|--|-----------------|----------------|----------------|------------|
| Crawford County Timber Stock | | | | |
| Area of Timberland By Stand Size Class (acres) | | | | |
| Large Diameter | Medium Diameter | Small Diameter | Nonstocked | |
| 104,904 | 93,866 | 124,207 | 1297 | |
| 32.4% | 28.9% | 38.3% | 0.4% | |
| Stocking Class of Growing Stock Trees (acres)* | | | | |
| Overstocked | Fully Stocked | Medium Stocked | Poorly Stocked | Nonstocked |
| 64,504 | 109,548 | 103,970 | 45,577 | 674 |
| 19.9% | 33.8% | 32.1% | 14.1% | 0.2% |

*An overstocked stand is defined as one in which stocking of live trees is 133% or more. Fully stocked stands are those in which stocking of live trees is 100 – 132.9%. Medium stocked stands are 60 - 99.9% stocked, poorly stocked stands have only 16.7 – 59.9% live trees stock, and a stand is considered nonstocked if live tree stock is less than 16.7%.
Source: U.S. Forest Service 2001

| Table 4.5 | | | | | |
|-------------------------------------|------------------------------|----------------------------|--------------------------------------|------------------------------|----------------------------|
| Annual Growth & Removal | | | | | |
| Average Net Annual Growth 1980-1993 | Growing Stock (1000 Cu. ft.) | Sawtimber (1000 Board ft.) | Average Net Annual Removal 1980-1993 | Growing Stock (1000 cu. ft.) | Sawtimber (1000 Board ft.) |
| Pine | 2,936 | 13,963 | Pine | 545 | 1,697 |
| Other Softwoods | 365 | 1,495 | Other Softwoods | 0 | 0 |
| Soft Hardwoods | 2,252 | 5,628 | Soft Hardwoods | 1,342 | 1,903 |
| Hard Hardwoods | 3,155 | 11,300 | Hard Hardwoods | 1,614 | 1,313 |
| TOTAL | 8,708 | 32,386 | TOTAL | 3,501 | 4,319 |

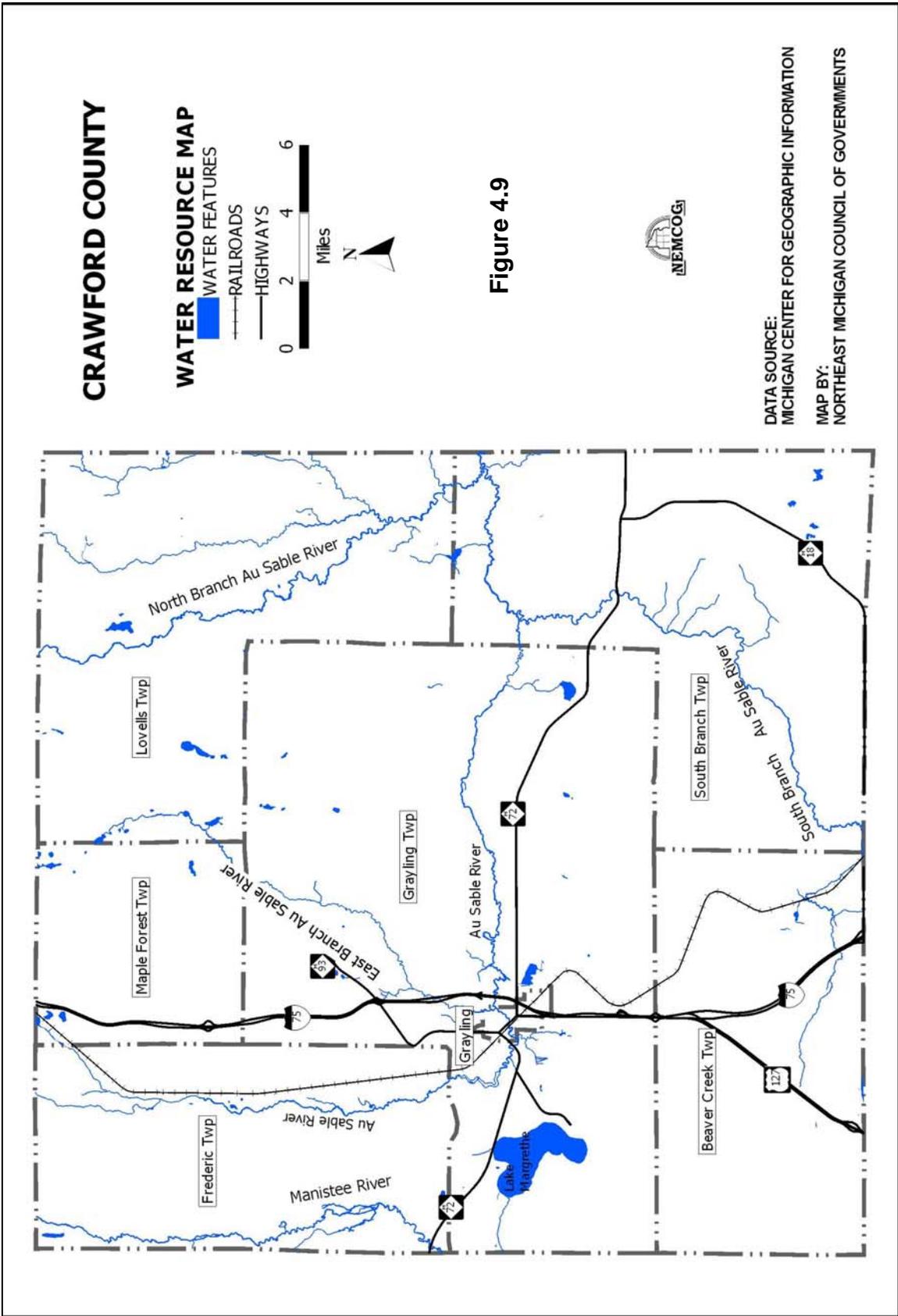
Source: U.S. Forest Service 1993

Groundwater Resources

Groundwater can be found in the deep glacial deposits of sand and gravel throughout the county. The availability of groundwater appears consistently good, ranging from 400 to 500 gallons per minute from wells ten inches in diameter. Ground water provides the only source of potable water for the county. Because of the deep sand and gravel underlying the county, the aquifer is quite vulnerable to contamination from surface and subsurface discharges.

Surface Water Resources

Crawford County has an abundance of lakes and streams (**Figure 4.9**). The county has a total of 53 lakes that are one acre or larger. The largest body of water in the county is Lake Margrethe, with a surface area of 1,928 acres, an average depth of 16 feet and a maximum depth of 65 feet. Seven lakes are over 100 acres. The large majority of the lakes are less than 50 acres in size. The county is predominantly within the Au Sable watershed. The Manistee River drains the western portion of the county. There are 45 miles of inland shoreline in Crawford County with approximately 25 miles open to the public. Almost all of the lakes and streams provide good fishing and many tourists come



to the county to fish. The lake is at the headwaters of the Manistee River watershed and is a popular recreational and tourist area in the county. Other significant lakes in the county include Shupac Lake, Shellengarger Lake and Jones Lakes. Smaller lakes are quite numerous.

The Au Sable River is the largest river in the county at nearly 200 miles in length. It drains approximately 1,800 square miles. It is a river system of high quality because of the geology and topography of the basin. The gentle slope of the terrain and the porous glacial outwash plains, consisting mostly of the sandy porous soils type that encourages infiltration of the precipitation delivered to the basin, assures the river system a steady contribution of cold groundwater throughout the year. This is a key characteristic of the river. The generous flow of cold, clear water offers some of the most productive and fishable trout waters in the world. The Au Sable is rated as a "Blue-Ribbon" trout stream and is designated as a Michigan Natural River. The lakes and streams in the county are popular tourist attractions and are heavily used in the summer and winter months. Canoeing and fishing are very popular on the Au Sable River, with swimming and boating being popular on the larger lakes.

Fish and Wildlife

The predominance of forested land and surface water makes Crawford County the home to many species of fish and wildlife. The recreational opportunities linked with these resources are many. With over 3,000 acres of lakes and streams, the County has an abundance and variety of fish habitat. Many of the streams in Crawford County are suitable for trout fishing. Three branches of the AuSable River are designated Blue Ribbon Trout Streams. Brook, rainbow, and brown are established singly or in combination in these streams. Many of the deeper lakes in the County also contain trout, including Glory, Bright, Sandhill, and Kneff Lake. Other lakes in the County support populations of rock bass, yellow perch, blue gills, small mouth bass, large mouth bass, tiger muskie, northern pike, and walleye. Lake Margarethe, the largest lake in the County, has a wide variety of pan fish and sports fish. In 2006, the Department of Natural Resources established guidelines to develop a process to create quality fishing lakes by designation. Based on the newly developed criteria, Jones Lake has been placed into the 'Quality Lakes' designation.

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

Unfortunately, large deer populations, combined with indiscriminate feeding practices, were contributing factors to the spread of Bovine Tuberculosis (TB) across northern Michigan. TB is a serious disease caused by bacteria attacking the respiratory system. There are three main types of TB - human, avian, and bovine. Human TB is rarely transmitted to non-humans, and avian TB is typically restricted to birds. Bovine TB - also known as 'cattle TB' is the most infectious of the three, and is capable of infecting most mammals.

In addition to the 509 infected deer reported throughout the State, Michigan has found several other species to be infected with the disease, including four elk, and several coyotes, raccoons, black bear, bobcats, red fox and opossums. The disease has been

confirmed in 33 cattle herds to date, but none during the last testing season. Two humans and one domestic house cat have also been diagnosed with the same unique strain of TB found in deer and cattle.

While 96% of the Bovine TB infected deer came from five counties in northern Michigan (Alpena, Alcona, Montmorency, Oscoda and Presque Isle), the impact of this disease has been nonetheless felt in Crawford County. As of the 2005 testing season, four deer and one coyote have tested positive for TB in the County.

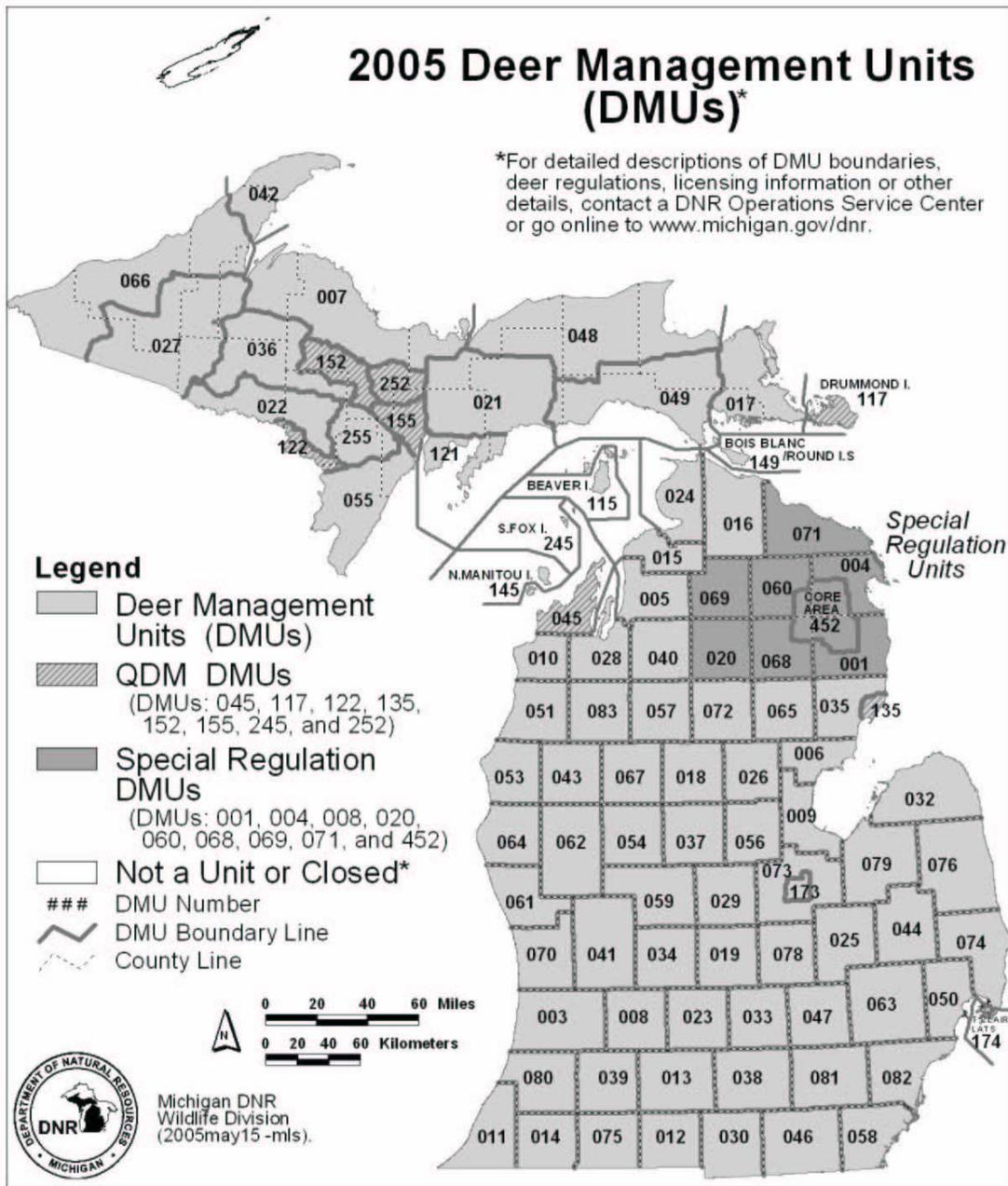
The effort to eradicate the disease has led to an aggressive TB testing campaign and the creation of a 42 county surveillance area and a seven county Deer Management Unit (DMU) that is subject to special regulations. Hunters in the surveillance area are asked to submit deer heads for testing, in DMU 452 (the core area covering portions of the four counties directly east and northeast of Crawford County) testing was mandatory until 2002, but testing is now on a voluntary basis. Crawford County is included in the seven County DMU area (**see Figure 4.10**). Efforts to eradicate the disease has led to changes in deer feeding rules, quota increases, extension of the number of hunting days and the banning of new deer or elk farms. As the eradication effort continues, more changes in hunting and feeding rules can be expected.

Endangered Species

Crawford County is also home to a number of different plants and animals that are threatened, endangered or are of special concern. **Table 4.6** presents the Endangered (E) or Threatened (T) plant and animal species of Crawford County, which are protected under the Endangered Species Act of the State of Michigan (Public Act 203 of 1974 as amended). This list also includes plant and animal species of Special Concern (SC). While not afforded legal protection under the act, many of these species are of concern because of declining or relict populations in the state. Should these species continue to decline, they would be recommended for Threatened or Endangered status. Protection of Special Concern species before they reach dangerously low population levels would prevent the need to list them in the future by maintaining adequate numbers of self-sustaining populations.

The only summer nesting area of the very rare songbird, Kirtland's Warbler, is found in the immediate vicinity of Crawford and Roscommon counties. This Warbler winters in the Bahamas and migrates to northern Michigan nesting areas in young jack pine forests. Bird watches from all over the world come to the area to view and study this scarce bird. Kirtland's Warbler habitat is young jack pine forests that are 5 to 20 years old. The habitat is managed by cutting older jack pine stands and replanting with millions of new seedlings each year. Protection of this habitat is critical to insure future preservation of the Kirtland's Warbler.

Figure 4.10



**Table 4.6
Crawford County Threatened and Endangered Species**

| SCIENTIFIC NAME | COMMON NAME | FEDERAL STATUS* | STATE STATUS** |
|--|--------------------------|-----------------|----------------|
| <i>Accipiter Gentilis</i> | Northern Goshawk | | SC |
| <i>Agoseris Glauca</i> | Prairie or pale Agoseris | | T |
| <i>Appalachia arcana</i> | Secretive Locust | | SC |
| <i>Aster Longifolius</i> | Long-leafed aster | | SC |
| <i>Atrytonopsis Hianna</i> | Dusted skipper | | T |
| <i>Brachionycha Borealis</i> | Boreal Brachionyncha | | SC |
| <i>Calypso Bulbosa</i> | Calypso or fairy slipper | | T |
| <i>Cirsium Hillii</i> | Hill's thistle | | SC |
| <i>Clemmy insculpta</i> | Wood Turtle | | SC |
| <i>Dalibarda repens</i> | False violet | | T |
| <i>Dencroica kirtlandii</i> | Kirtland's Warbler | LE | E |
| <i>Festuca Scabrell</i> | Rough Fescue | | T |
| <i>Gavia immer</i> | Common loon | | T |
| <i>Haliaeetus leucocephalus</i> | Bald eagle | LTNL | T |
| <i>Incisalia henrici</i> | Henry's elfin | | SC |
| <i>Jancua vaseye</i> | Vasey's rush | | T |
| <i>Martes Americana</i> | American martin | | T |
| <i>Microtus Pinetorum</i> | Woodland vole | | SC |
| <i>Mimulus glabratus var jamesii</i> | James monkey flower | | SC |
| <i>Pandion Haliaeetus</i> | Osprey | | T |
| <i>Prosapia ignipectus</i> | Red-legged spittlebug | | SC |
| <i>Prunus alleghaniensis var davisii</i> | Alleghany or sloe plum | | SC |
| <i>Pygus wyandot</i> | Grizzed skipper | | SC |
| <i>Scirpus clintonii</i> | Clinton's bulrush | | T |
| <i>Sistrurus catenatus</i> | Eastern massasauga | | SC |
| <i>Solidago houghtoni</i> | Houghton's goldenrod | LT | T |

*LE= Listed endangered, LTNL = Listed endangered in part of its range

** E = Endangered, T = Threatened, SC = Special concern

Source: Michigan Natural Feature Inventory, Department of Natural Resources, Wildlife Division

National Wetlands Inventory

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

Poorly drained, lowland areas support northern white cedar, tamarack, balsam fir, black spruce, eastern hemlock, white pine, balsam poplar, trembling aspen, paper birch, black ash, speckled alder and shrub willows. Northern white cedar dominates the wetland areas where there is good lateral water movement and the soils are high in organic content. Lowland forests are typically located adjacent to water features and function as riparian forests and water quality buffers. The network of lowland forests, associated

with rivers and creeks, also function as wildlife corridors and are the backbone of large regional ecological corridors. Lowland forests adjacent to rivers and streams may be prone to flooding during the spring snowmelt, particularly when combined with heavy spring rains. Forested and non-forested wetlands are a finite resource in the County. Land use planning activities should focus on protecting and preserving these limited and critical resources.

The U.S. Fish and Wildlife Service developed national wetlands inventory program in the 1980's. Through this effort a national wetlands inventory map was compiled for Crawford County. The digital data was acquired from the Center for Geographic Information, State of Michigan, and used to compile **Figure 4.11**. The map depicts forested and non-forested wetlands.

Pre-Settlement Vegetation

The Michigan Department of Natural Resources has compiled pre-settlement vegetation maps of counties in Michigan. The maps were generated from information contained in the first government land survey notes in the 1800's along with information such as current vegetation, land forms and soils, **Figure 4.12**. A review of the pre-settlement vegetation map of Crawford County shows extensive areas were covered with jack pine-red pine forest, pine barrens, and pine-oak barrens. This clearly shows a long history of wildfires in the area. The map delineates jack pine-red pine forest, white pine-red pine forest, pine barrens, pine-oak barrens, pine-oak forests, and northern hardwood forests. In the late 1800's extensive logging and subsequent wildfires altered the forest make-up, yet still today as noted on the 1978 forest vegetation map, jack pine covers large parts of the county. **Figure 4.13** shows historical vegetation and interpolated fire observations from General Land Office Survey Notes. This map again supports that jack pine and wildfires have long been a part of life in this part of the state. Today, the concern lies in residential development within these historic fire prone areas.

Sites of Environmental Contamination

The Part 201 (Environmental Response) of Natural Resources and Environmental Protection Act (P.A. 451 of 1994), as amended, provides for the identification, evaluation and risk assessment of sites of environmental contamination in the State. The Environmental Response Division (ERD) is charged with administering this law. A site of environmental contamination, as identified by ERD, is "a location at which contamination of soil, ground water, surface water, air or other environmental resource is confirmed, or where there is potential for contamination of resources due to site conditions, site use or management practices". The agency publishes a list of environmentally contaminated sites by county showing the sites by name, pollutant(s) and site status (**Table 4.7**).

A Site Assessment Model (SAM) score is computed to assess the relative risk a site may pose and to help determine the aggressiveness of clean up efforts. SAM scores range from 0 to 48 with 0 being the least contaminated and 48 the most contaminated. In some instances where the score is high and further contamination is possible, immediate response may be required. Conversely, a location where the score is low and the conditions of the site are not likely to change; no action may be the preferred course.

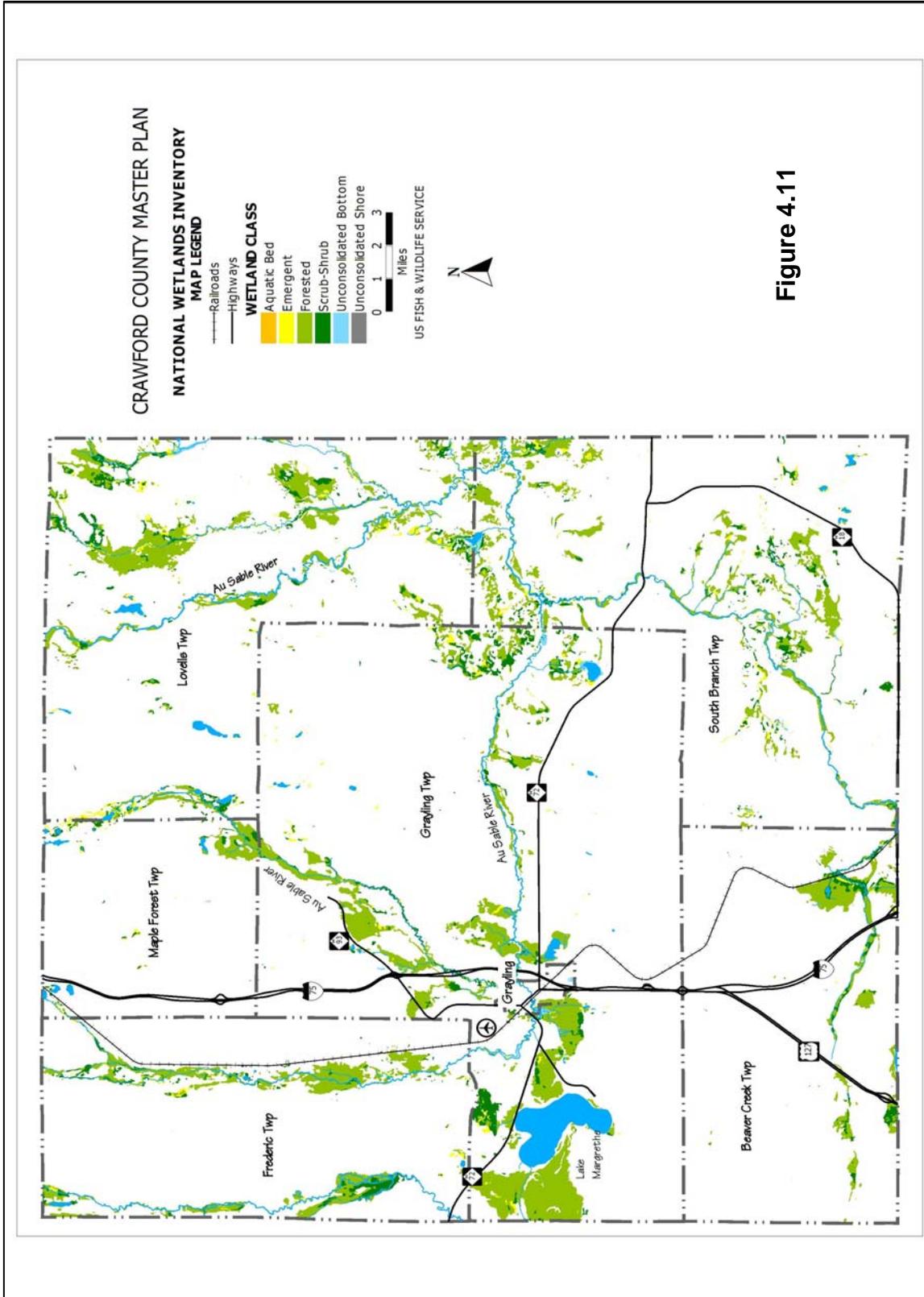


Figure 4.11

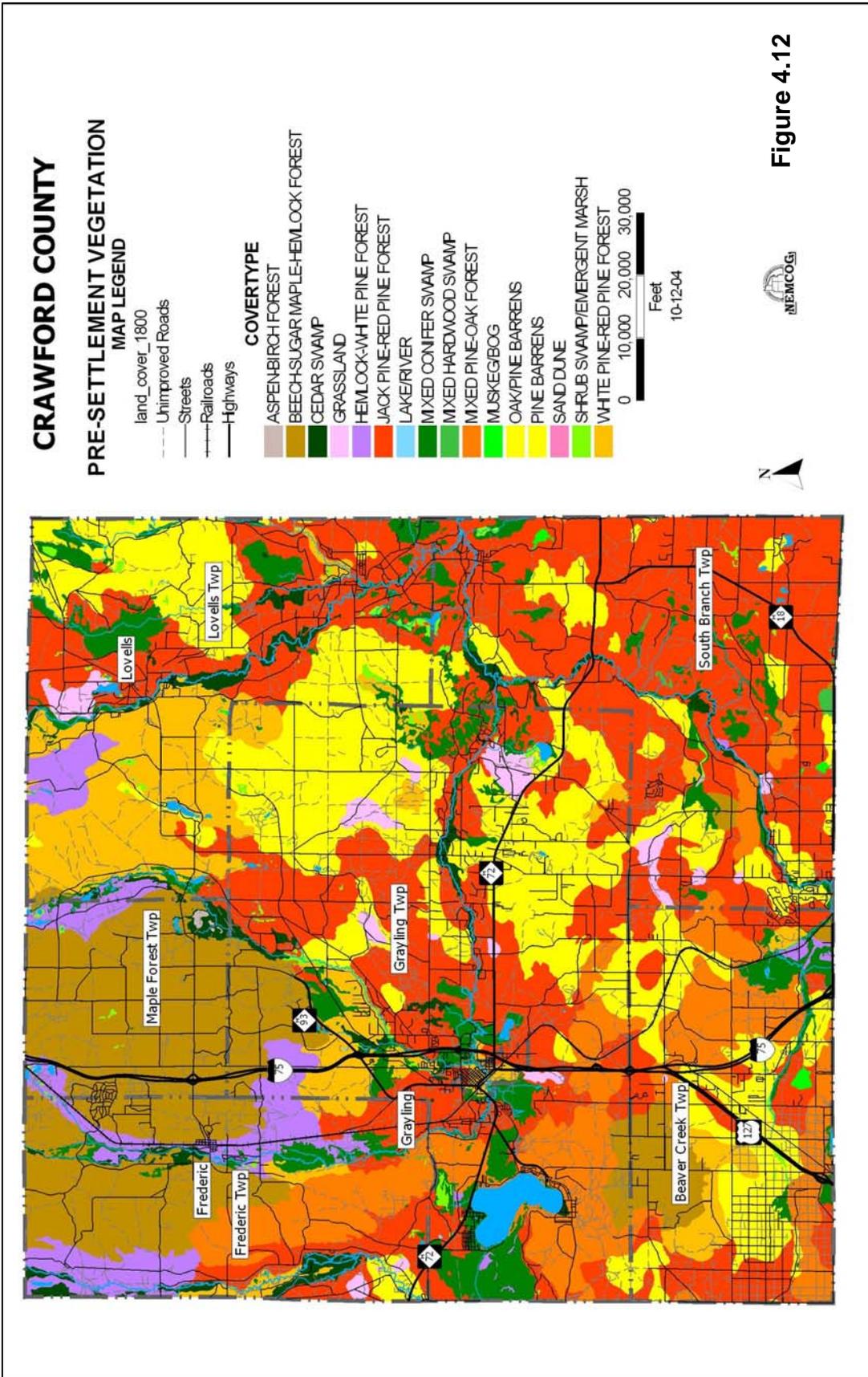
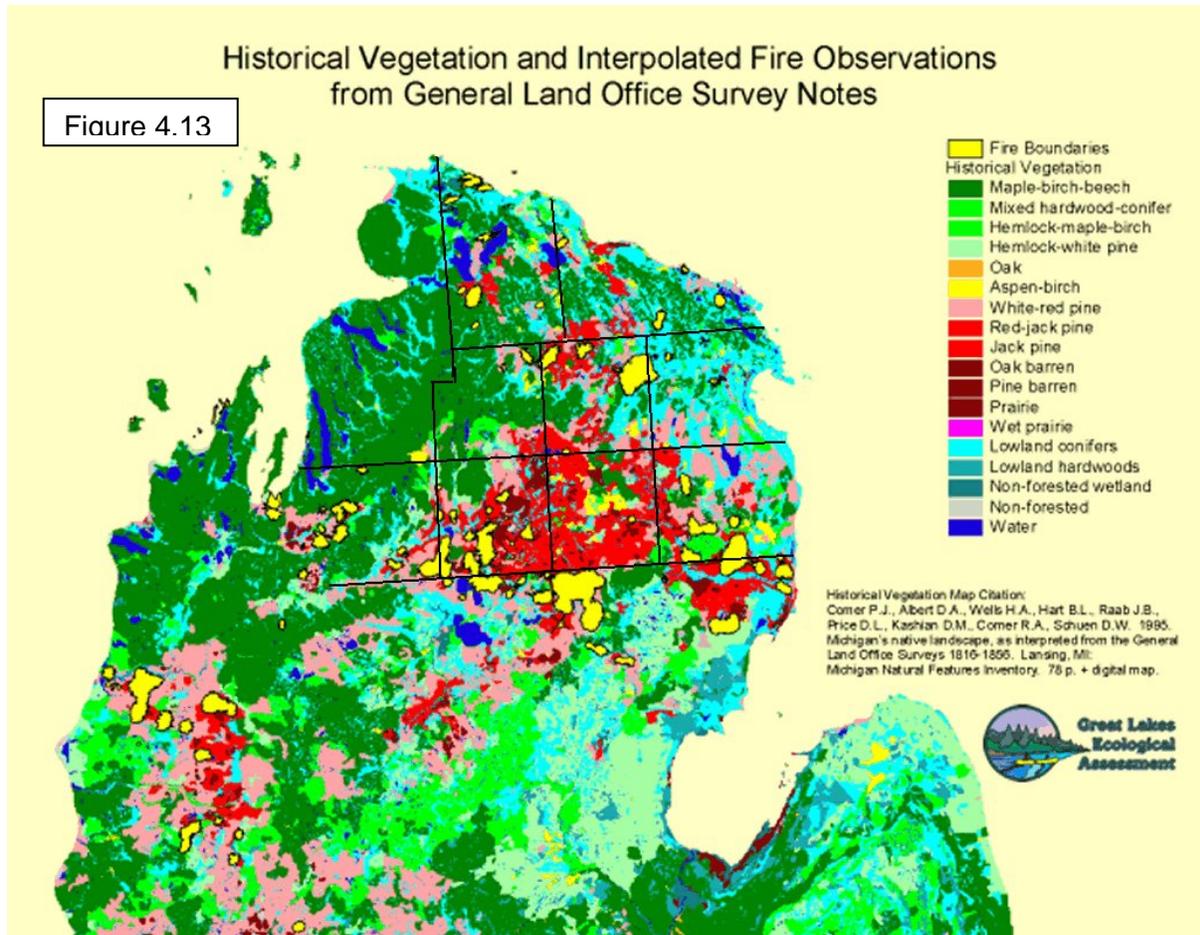


Figure 4.12



Surface Water and Air Discharge Permits

NPDES Permits

Anyone discharging, or proposing to discharge, waste or wastewater into the surface waters of the State is required to obtain a National Pollutant Discharge Elimination System (NPDES) permit. The NPDES program is intended to control direct discharge

into the surface waters of the State by imposing effluent limits and other conditions necessary to meet State and federal requirements. The NPDES program regulates pollutants discharged directly into waterways from wastewater sources. According to the EPA Consolidated Database, as of May 21, 2006 no NPDES permits have been issued for Crawford County.

Air Discharge Permits

There are four categories of review or permits in the state of Michigan for air discharges: Maximum Achievable Control Technology (MACT) determinations; New Source Review (NSR); Renewable Operating Permit (ROP); and Acid Rain Permits.

MACT determinations are required under the Clean Air Act. The U.S. EPA is required to develop standards for industrial categories of "major" sources of hazardous air pollutants that require the application of MACT. This is done on a case-by-case basis by the Air Quality Division. NSR requires a person to obtain a permit prior to the installation of any potential source of air pollution unless the source is exempt from the permitting process. The ROP program is a national permitting system, administered by each state. Each major source of pollution is subject to the program. A "major source" is a facility that is capable of emitting more than certain amounts of air contaminants. Acid Rain Permits may be required for electric generating units which sell electricity to the grid and burn fossil fuel. **Table 4.8** lists the Air Discharge permits issued for Crawford County.

Summary

Review of the natural resources in Crawford County indicates the environment is currently in very good condition, however these resources are extremely sensitive to change. The environmental features of the county are an important asset to the area and need continued protection.

Table 4.7
Crawford County Contamination Sites

| SITE ID & STATUS | LOCATION | SOURCE | POLLUTANT | SAM SCORE |
|---|--------------------------------|--------------------------------|--|-----------|
| 20000002 Active | M-93 | National security | PCE , TCE | 28 |
| 20000003 Active | Sherman Rd | Landfill | Benzene Iron, Vinyl Chloride , 4-methylphenol | 24 |
| 20000004 Active | 6636 AuSable Street (Old 27) | Gasoline Service Station | BTEX 1,1 DCA Lead , 1,1,1 TCA PERC | 30 |
| 20000007 Active | Rt #1, 7 Mile Rd. | Pumps & Pumping Equipment | BTEX | 31 |
| 20000008 No Action Taken | W. Colky Creek | Oil drilling | Brine | 20 |
| 20000009 Inactive | 5453 M-18 Hwy | Gasoline Service Station | BTEX , 1,2 DCA | 27 |
| 20000010 No Action Taken | 123 Barbara St | Nonclassifiable Establishments | BTEX | 22 |
| 20000028 Monitoring Only | 427 South Grayling Rd | Auto Dealer & Service Stations | Tetrachloroethylene, 1,2 Dichloroethylene, Trichloroethylene | 17 |
| 20000049 Active | Industrial Dr | Sewerage Systems | Nitrate | 24 |
| 20000058 Active | 106 Jonassen | Private Households | Heating Oil , Ethylbenzene | 14 |
| 20000060 Active | 2459 Industrial Drive | Wood Preserving | Cr+6 | 20 |
| 20000064 Active | 200 West Michigan Ave. | Railroad Transportation | PNAs Dibenzofuran, 2-Methylnaphthalene | 29 |
| 20000065 No Action Taken | Beech Terrace Drive | Private Households | Fuel Oil | 20 |
| 20000066 State Project Terminated | 308 Huron Street (M-72) | Lumber & Wood Products | benzo(a)pyrene, fluoranthene, phenanthrene | 21 |
| 20000067 De-listed | 1985 Dansk Lane | Private Household | Heating Oil, Phenanthrene | 21 |
| 20000068 De-listed | 1320 S. McMasters Bridge Rd. | Hotels & Other Lodging Places | Heating oil | 15 |
| 20000071 Active | Camp Grayling | National Security | Lead , Zinc , Phenanthrene | 33 |
| 20000073 Active | N. Down River Rd. | Sporting & Athletic Goods | TMB; Benzene; Ethylbenzene; PCE; Toluene; Xylenes; n-Propylbenzene | 31 |
| 20000074 Active | 10360 W. Deward Rd.. | Pipelines | Ethylbenzene | 22 |
| 20000075 Active | 4364 N. Down River Rd | Fabricated Metal Products | PCE; TCE; cis-1,2 DCE | 34 |
| 20000077 | 9439 East North Down River Rd. | Gasoline Service Station | TMB; Benzene; Ethylbenzene; Naphthalene; Toluene; Xylenes | 31 |
| 20000090 Inactive | 4622 Young Street | Lumber & Wood Products | TMB; Pb | 27 |
| Source: Department of Environmental Quality | | | | |

| Table 4.8 Air Discharge Permits Issued Crawford County 1990-2006 | | | | | |
|---|-------------------|----------|----------|----------|--|
| Company | Location | Permit # | Received | Approved | Activity |
| Central Paving Co. | Beaver Ck. Twp. | 169-69k | 9/12/94 | 12/15/94 | Asphalt plant |
| City Envl. Services of Waters | Frederic | 18-94 | 1/14/94 | 5/31/94 | Air stripper |
| City Management Corp. | Maple Forest Twp. | 707-93 | 9/9/93 | 11/15/93 | Landfill leachate aeration |
| Dominion Exploration | Maple Forest Twp. | 26-06 | 1/27/06 | 4/13/06 | Compressor Engine |
| Georgia Pacific Resins, Inc. | Grayling | 363-89c | 7/9/03 | 8/18/03 | Revise stack configuration |
| Georgia Pacific Resins, Inc. | Grayling | 488-95 | 9/28/95 | 11/16/95 | Storage tanks |
| Mercury Exploration Co. | Frederic Township | 694-96 | 10/1/96 | 12/20/96 | Oil & gas facility |
| Merit Energy Co. | Frederic | 54-04 | 2/18/04 | 3/30/04 | Opt out |
| Merit Energy Co. | Frederic Township | 65-01 | 2/2/01 | 6/18/01 | Tri-ethylene Glycol dehydrator |
| Michigan Wood Finishing LLC | Grayling | 223-01a | 1/28/03 | 3/13/03 | Modify coating line |
| Payne & Dolan Inc | Grayling | 151-00 | 5/16/00 | 5/4/00 | Non-metallic mineral crusher |
| Quicksilver Resources Inc. | Beaver Creek Twp. | 120-01c | 3/31/05 | 8/19/05 | Revise Beaver ck DRZ CPF permit |
| Quicksilver Resources Inc. | Frederic | 652-96 | 9/30/96 | 2/26/97 | Oil & gas facility |
| Springs Window Fashions LP | Grayling | 140-04a | 7/25/05 | 9/2/05 | Saw & wood drying kilns |
| Stephan Wood Products, Inc. | Lewiston | 251-95 | 5/8/95 | 3/25/97 | Assembly/coating of wood/metal composite |
| Total Petroleum, Inc. | Grayling | 807-93 | 10/19/93 | 12/28/93 | SVE System |
| Weyerhaeuser Co. | Grayling | 546-92 | 5/29/92 | 7/13/92 | Combustion catalyst |
| Weyerhaeuser Co. | Grayling | 535-94d | 3/11/04 | 3/17/04 | Replace burners to dryers, mod. Exhaust system |
| Source: MDEQ Air Quality Division | | | | | |

Chapter 5 – Land Use Characteristics

This chapter presents information on both the types and location of land uses on a countywide basis. The process identifies both urban built-up land uses such as residential and commercial, along with natural land cover types like forests and wetlands. As a result the final map presented in this chapter is a hybrid that combines land cover and land use.

Land Division Patterns

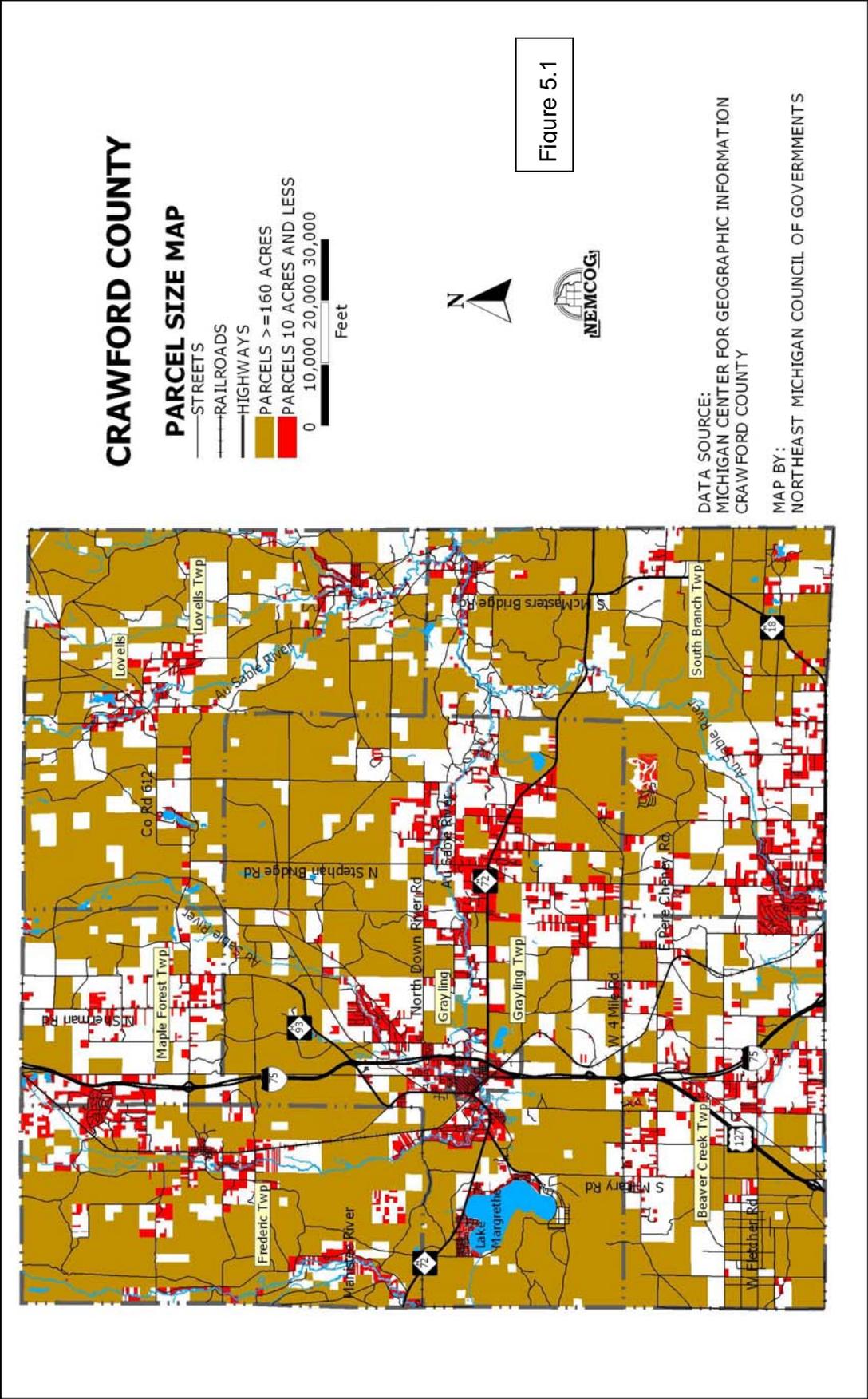
As development occurs, larger tracts of land are generally broken down into smaller parcels. Therefore, studying the existing pattern of land divisions is one way to analyze the status of land use and development. Most of the private ownership is in tracts that are 10 acres and smaller. Large tracts of private ownership, typically hunt/fish clubs, are scattered throughout the County. Subdivisions and small tracts are located near rivers, around lakes along major highways, within recreational developments and clustered around the community of Grayling. **Figure 5.1** shows the distribution of parcels 160 acres or larger, and parcels 10 acres or less.

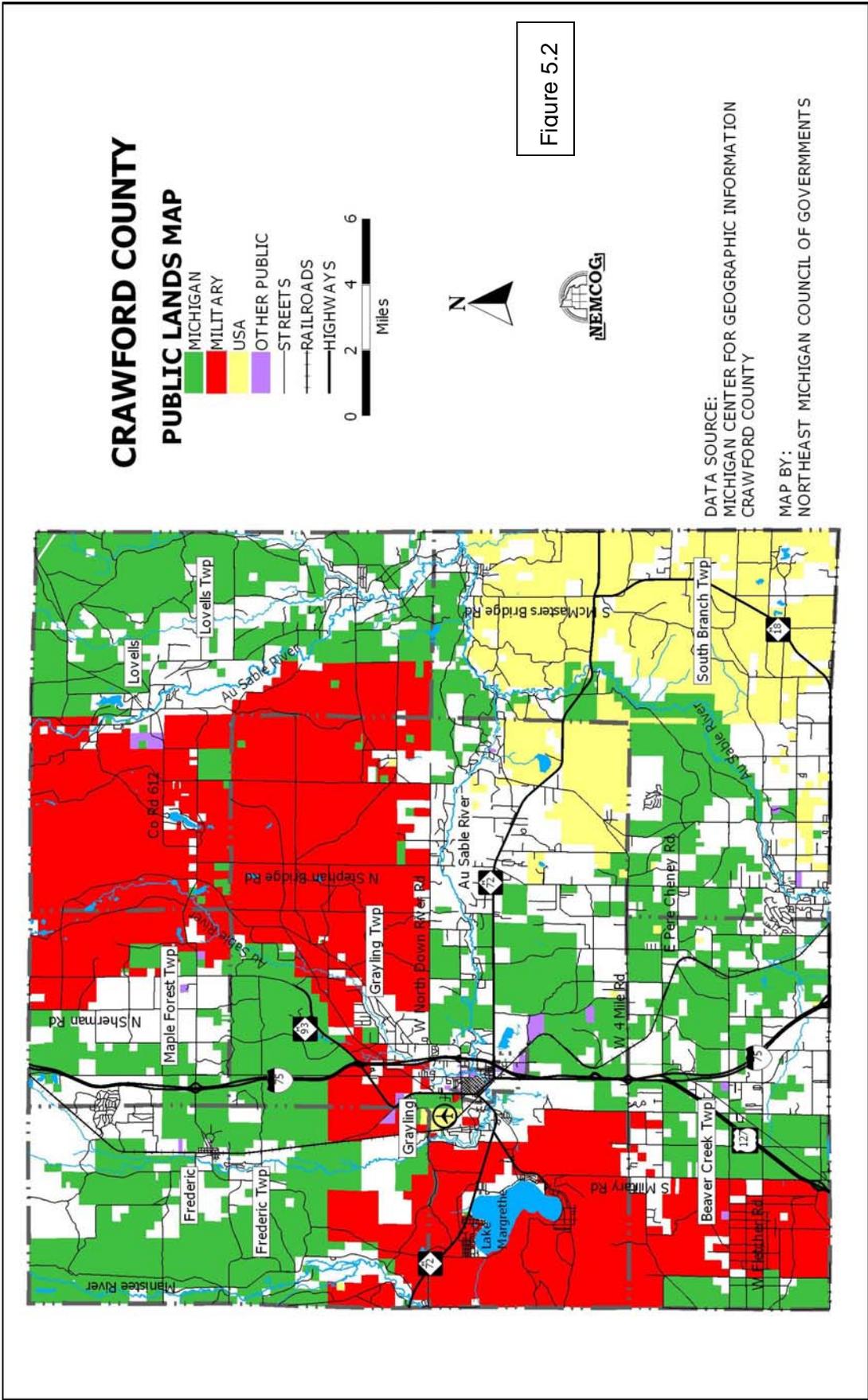
A key factor that determines community character and the location of potential future development areas is the amount of land public ownership. **Table 5.1** and **Figure 5.2** show the breakdown of public land ownership in Crawford County. Excluding water, all public lands (including that owned by cities, townships, the county, as well as federal and state properties) make up over 70 percent of the county's total land area.

| Table 5.1 Crawford County Land Ownership | | |
|---|---------|---------|
| Public Lands | Acres | Percent |
| State of Michigan | 116,734 | 32 |
| Military | 97,294 | 27 |
| USA | 41,433 | 12 |
| Other Public | 1,246 | >1 |
| Water | 3,031 | >1 |
| Source: NEMCOG | | |

Land Use

One of the features that attract people to Crawford County is the rural character of the area. Data from 1992 satellite imagery shows that 86.3 percent of the County's 360,294 total acreage is forested, with another 7.1 percent non-forest. Agriculture, wetlands and surface water each claim an additional 1.1 percent (Table 5.1 and Figure 5.1). Just a little over three percent of the County's land is used for urban-type purposes, including commercial, industrial, recreational and residential (see **Table 5.2** and **Figure 5.3**)





Data for the land/cover use inventory was taken from the Michigan Land Cover Dataset (MLCD), which was produced as part of the National Land Cover Dataset (NLCD). The NLCD was compiled from Landsat satellite imagery in 1992 as a cooperative effort between the U.S Geological Survey (USGS) and the U. S. Environmental Protection Agency (US EPA) to produce consistent land cover data for the US. Land use for Crawford County consists of the following ten classes:

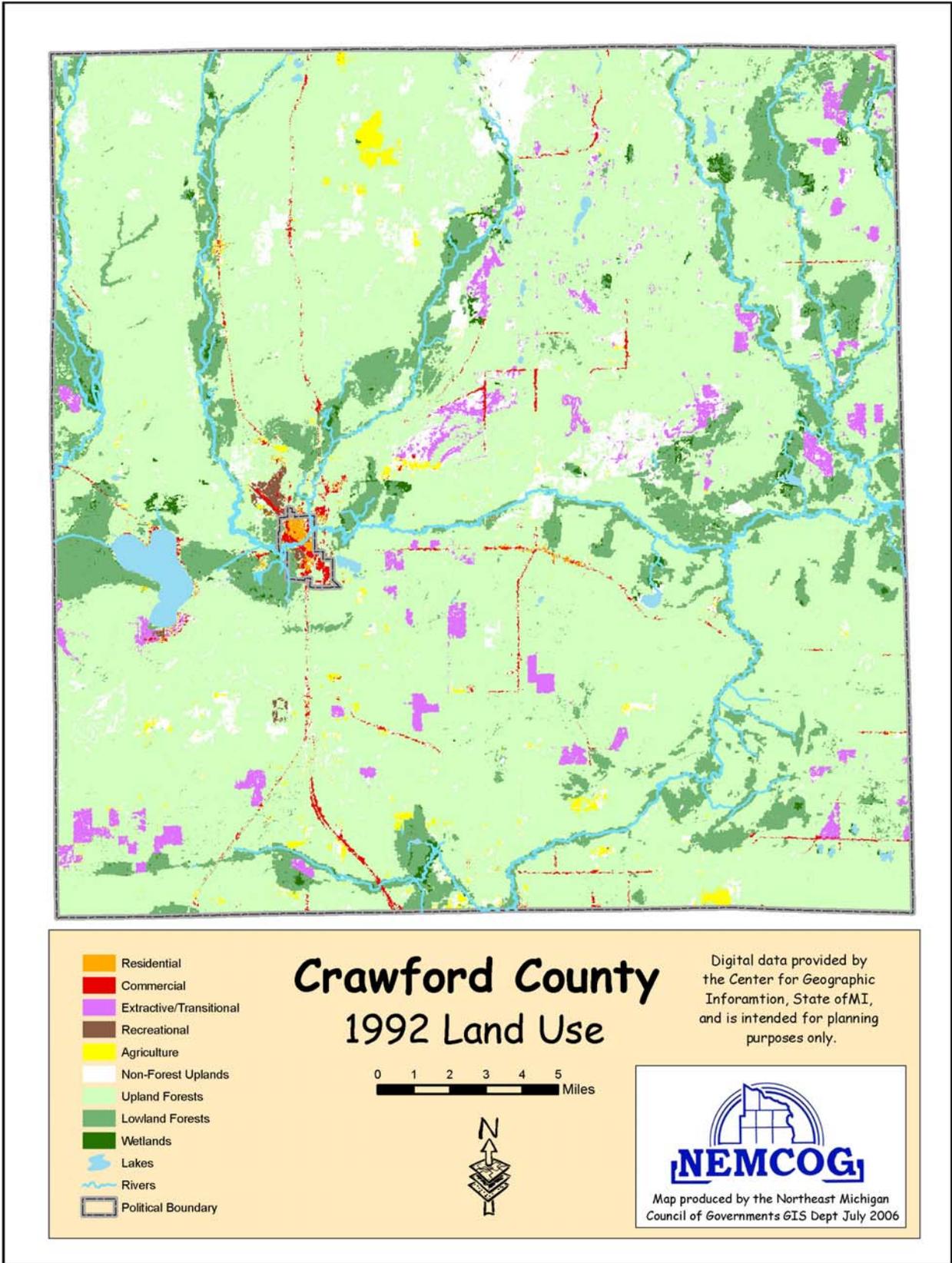
| Land Use Type | Acres | Square Miles | % of Total Area |
|--------------------------------------|----------------|---------------|-----------------|
| Agricultural | 3,957 | 6.18 | 1.1% |
| Commercial/Industrial/Transportation | 2,679 | 4.18 | 0.7% |
| Extractive/Transitional | 8,278 | 12.93 | 2.3% |
| Lowland Forest | 43,959 | 68.68 | 12.2% |
| Non-Forest Upland | 25,719 | 40.18 | 7.1% |
| Recreational | 460 | 0.71 | 0.13% |
| Residential | 472 | 0.73 | 0.13% |
| Upland Forest | 266,861 | 416.97 | 74.1% |
| Surface Water | 4,005 | 6.25 | 1.1% |
| Wetlands | 3,904 | 6.10 | 1.1% |
| Total | 360,294 | 562.95 | 100% |

Residential

According to the MLCD, 0.14 percent (472 acres) of the County's total land area was used for residential purposes in the early 1990s. As noted in Chapter 2, the number of housing units in the County increased over 15 percent between 1990 and 2000. This increase in housing units indicates a likely increased percentage of land in residential use. The most popular areas for residential development tend to be along the banks of the County's water resources. Residential usage is concentrated in and around the City of Grayling, the Village of Frederick, around the north and east shore of Lake Margerethe, along the Manistee River in Forest Township, along the Au Sable River in Grayling Township and along the South Branch of the Au Sable River in South Branch Township. For the most part, residential development in the County consists of single-family dwellings. However, single family duplexes, multi-family units, condominiums, mobile homes and mobile home parks are also listed in this category.

Commercial/Industrial/Transportation

Commercial land uses include primary/central business districts, shopping center/malls, secondary/neighborhood business districts, including commercial strip development, as well as industrial development, transportation, oil and gas, communication and utility facilities, and all highways. The MLCD identified 2,679 acres, or 0.7 percent of Crawford County's in this land use category. Commercial/Industrial facilities are found primarily in the City of Grayling and in the Village of Frederic, with expansion noted in areas along M-72, along I-75 and in Beaver Creek Township around the junction I-75 and US 27.



Commercial/Industrial/Transportation

Commercial land uses include primary/central business districts, shopping center/malls, secondary/neighborhood business districts, including commercial strip development, as well as industrial development, transportation, oil and gas, communication and utility facilities, and all highways. The MLCD identified 2,679 acres, or 0.7 percent of Crawford County's in this land use category. Commercial/Industrial facilities are found primarily in the City of Grayling and in the Village of Frederic, with expansion noted in areas along M-72, along I-75 and in Beaver Creek Township around the junction I-75 and US 27.

Extractive/Barren

This category includes quarries, strip mines and gravel pits as well as land in transition (forest clear cuts, transition between agriculture and forest lands, and changes due to natural causes such as fire or flooding). Areas of bare rock, sand or clay with little green vegetation are also included in this class, which makes up 2.3 percent (8278 acres) of Crawford's land area.

Recreational

Land devoted specifically for recreational purposes amounted to approximately 0.13 percent, or about 460 acres in Crawford County. Land uses included in this category are public parks and campgrounds, golf courses, schools, churches and public buildings.

Agricultural

With only 3,957 acres classified as farmland, agriculture operations make up a relatively small portion (1.1%) of the County's land use. The largest concentration and majority of the agricultural land use is located in Maple Forest Township with smaller areas located in Beaver Creek Township and South Branch Township. Agriculture land is used predominately as pastureland hay and growing crops such as beans, oats, and barley. A small amount of land is used for livestock such as cattle, milk cows and hogs.

Non-Forested Uplands

Non-forested land is defined as areas supporting early stage of plant succession consisting of plant communities characterized by grasses or shrubs. Non-forest land makes up 7.1 percent or 25,719 acres of the County's land area. Typical grass species are quackgrass, Kentucky bluegrass, upland and lowland sedges, reed canary grass and clovers. Typical shrub species include blackberry and raspberry briars, dogwood, willow, sumac and tag alder. Also included in this category are the lands used by the National Guard at camp Grayling for artillery and bombing ranges.

Upland Forest

Upland forests make up 266,861 acres or 74.1 percent of the County's surface area. While some of this land may have been converted to other uses since 1990, it is still by far the largest single land cover/use in the County. The predominant species on much of these lands is jack pine but other species such as white, red, scotch pines, sugar and red maple, elm, beech, yellow birch, cherry, basswood, white ash, and aspen can also be found.

Lowland Forest

The County's land use inventory shows that 43,959 acres or 12.2 percent of the County's surface area consists of lowland forests. Lowland forests are defined as those containing ash, elm and soft maple, along with cottonwood and balm-of-Gilead. Lowland conifers, such as

cedar, tamarack, black and white spruce and balsam fir stands are also included. Lowland forests are mostly found close to the rivers and lakes in the county.

Wetlands

As can be noted from **Table 5.1**, 3,904 acres or 1.1 percent of the County's land area was identified as wetlands. Wetlands are those areas between terrestrial and aquatic systems where the water table is at, near, or above the land surface for a significant part of most years. The hydrologic regime is such that it permits the formation of hydric soils or it supports the growth of hydrophytic vegetation. Examples of wetlands include marshes, mudflats, wooded swamps and floating vegetation situated on the shallow margins of bays, lakes, rivers, ponds, streams. These wetland categories include shrub wetlands, fresh-water marshes, wet meadows, open bogs, emergent wetlands and aquatic bed wetlands.

Surface Water

Crawford County is home to many small lakes and several major rivers. Surface water makes up 1.1 percent (4,005 acres) of the County's land use types. The combination of wetlands types, lowland forests and surface water makes up a significant portion (14.6 percent) of the County's surface area. Therefore, protecting the county's water and wetland resources should be a major priority in land use planning.

Chapter 6 – Status of Planning and Zoning

Introduction

Planning and Zoning are the principal tools that local communities have to manage growth, preserve community character, protect property values and enhance the economic viability of the area. Planning helps establish and focus the desired future of the community and zoning ordinances are used as one of the primary ways to implement the community master plan and achieve the goals of the community.

The purpose of this chapter is to present the status of planning and zoning in Crawford County. Furthermore, the presence of key zoning regulations such as signs and access management in each community will be documented. It is not the intention to compare the strengths and weaknesses of zoning regulations among the various zoning ordinances, but to give a general perspective on planning and zoning in the county.

Table 6.1 presents the status of planning in Crawford County. In the county, the City of Grayling and all the townships have adopted master plans. With the exception of South Branch Township, all of the communities administer their own zoning ordinance. South Branch Township is presently under County zoning but is in the process of developing its own zoning ordinance.

| Table 6.1 Crawford County Planning and Zoning Status | | |
|---|-------------------------------|--|
| Municipality | Master Plan (year adopted) | Zoning Ordinance (year of last amendment) |
| Beaver Creek Township | 2006 | 2004 |
| Frederic Township | 2001 | 2006 |
| Grayling Township* | 1997 | 2003 |
| Lovells Township | 2002 | 2003 |
| Maple Forest Township | 2002 | 2006 |
| South Branch Township | 2006 | 2007 |
| City of Grayling* | Update in process | 2006 |
| Crawford County | - | - |
| *City of Grayling and Grayling Township developed a joint master plan in 1997. Both in process of updating their master plans | | |

Community Future Land Use Plans

A key element of the community master plan is the future land use plan. This is the culmination of the planning process that entails an analysis of existing conditions, public input and goal setting, and finally establishing the community's desired future. The community-wide future land use plan includes a map that depicts where the community envisions types and densities of development. As well, the plan may address important resource areas to protect. Accompanying text describes future land use categories, compatible uses, incompatible uses and development densities. Special issue areas may include utility service areas, roads, open space development and waterfront development. The future land use plan is a policy document designed to guide land use decisions over a given planning horizon, usually 20 years. By comparison, the zoning ordinance and zoning map is a local law that regulates how property can be developed today.

Generally communities place public lands into low intensity development categories such as forest recreation, resource conservation or public lands. Most townships have identified select areas of public land for private development such as residential, commercial or industrial. Grayling Township and Beaver Creek Township have identified the largest areas of public lands for private development mostly around the 4 Mile Road interchange and between 4 mile and M-72. A large resort development has been proposed north of 4 Mile and east of I-75. If this project is built, communities will have to accommodate associated growth such as residential and commercial/retail.

Community Zoning

With South Branch Township adopting its own ordinance in the summer of 2007, zoning is administered at the local level. Tables on the following pages summarize each communities zoning districts by showing minimum lot sizes, and general uses such as residential and commercial. In natural resource and agricultural districts most communities allow for minimum two acre lot sizes for residential. Maple Forest allows minimum 10 acre lot sizes in their Resource Conservation, South Branch Township allows a minimum 20 lot size in its resource conservation district, while Frederic Township allows for 20 acre minimum lots sizes in its Deferred Development. All of the communities recognize the natural rivers act for the Au Sable River and in the case of Frederic Township the Upper Manistee River.

Figure 6.1 is a composite zoning map for Crawford County. Areas colored yellow and orange are zoned for residential, areas colored red are commercial and purple areas are zoned for industrial. Zoning maps displayed at the Town-Range level can be found in Appendix B-Zoning Maps.

CRAWFORD COUNTY COMPOSITE COMMUNITY ZONING MAP

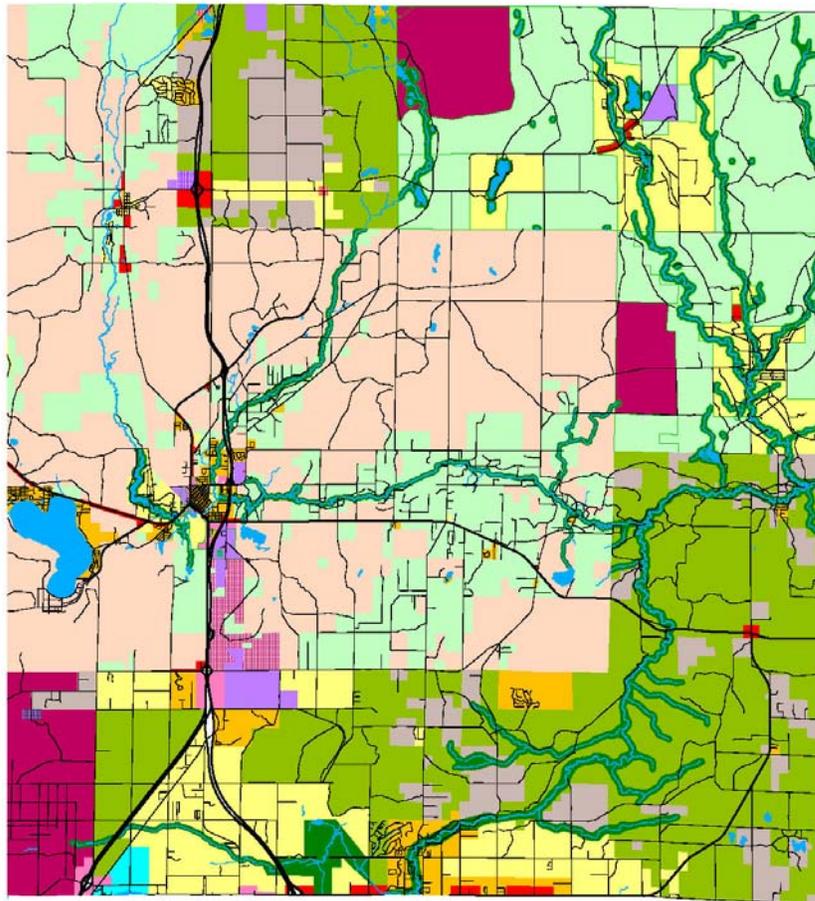


Table 6.2: Beaver Creek Township Zoning Information

| District Name | District | Minimum Lot | Residential | Multi-Family | Commercial | Industrial | Agricultural |
|---|----------|------------------------------------|-------------|--------------|---------------|------------|--------------|
| Resource Development | RD | 20 acres Residential 2 acres | Yes | NA | NA | NA | Yes |
| Agricultural Residential | AR | 20 acres Residential 2 acres | Yes | NA | Agri-Business | NA | Yes |
| Low Density Res. | LDR | 20,000 sf 43,560 sf | Yes | NA | NA | NA | Yes |
| Medium Density Residential | MDR | 10,000 sf 20,000 sf | Yes | Special Use | NA | NA | Yes |
| Community Services Comm. | CSC | 10,000 sf 43,560 sf | NA | NA | Yes | NA | NA |
| Highway Service Commercial | HSC | 10,000 sf 43,560 sf | NA | NA | Yes | NA | NA |
| Industrial | I | 40,000 sf 2 acres | NA | NA | NA | Yes | NA |
| Planned Unit Development | PUD | LDR/MDR 20 ac. CSC/HSC/I 10 ac. | Yes | Yes | Yes | Yes | Yes |
| Access Management Driveways Open Space in PUD Sign and billboard regulations Telecommunication towers | | | | | | | |
| Ordinance adoption date: Amended on February 2, 2004 | | | | | | | |

Table 6.3: Frederic Township Zoning Information

| District Name | District | Minimum Lot | Residential | Multi-Family | Commercial | Industrial | Agricultural |
|--|----------|-------------|-------------|--------------|---------------------|------------|--------------|
| General Residential | R | 20,000 sf | Yes | Special Use | NA | NA | NA |
| Mixed Use | MU | 20,000 sf | Yes | Special Use | Yes | NA | NA |
| Commercial | C | 26,000 sf | NA | NA | Yes | NA | NA |
| Industrial | I | 5 acres | NA | NA | NA | Yes | NA |
| Recreational-Forest | R-F | 40,000 sf | Yes | Special Use | Limited Special Use | NA | Yes |
| Deferred Development | DD | 20 acres | | NA | NA | NA | Yes |
| AuSable River | ARD | 50,000 sf | Yes | NA | NA | NA | NA |
| Manistee River | MR | 80,000 sf | Yes | NA | NA | NA | NA |
| | | | | | | | |
| Landscaping PUD may be established in all districts except ARD and MRD Sign and billboard regulations Telecommunication towers Wind Turbine Generators | | | | | | | |
| Ordinance adoption date: September 11, 2006 | | | | | | | |

Table 6.4: Grayling Township Zoning Information

| District Name | District | Minimum Lot | Residential | Multi-Family | Commercial | Industrial | Agricultural |
|--|----------|-------------|-------------|--------------|------------------------|------------|--------------|
| Single-Family Res. | R-1 | 15,500 sf | Yes | NA | NA | NA | NA |
| General Residential | R- 2 | 12,000 sf | Yes | Special Use | NA | NA | NA |
| General Residential (Association) | R-3 | 40,000 sf | | | | | |
| General Commercial | C-1 | 12,000 sf | NA | NA | Yes | NA | NA |
| Heavy Commercial | C-2 | 30,000 sf | NA | NA | Yes | NA | NA |
| Industrial | I | 30,000 sf | NA | NA | NA | Yes | NA |
| Recreational-Forest | R-F | 2.5 acres | Yes | Special Use | Limited Special Use | NA | Yes |
| Deferred Development | DD | NA | NA | NA | NA | NA | Yes |
| Planned Unit Development | | 2.5 acres | Yes | yes | Yes | NA | Yes |
| Planned Industrial | PI | NA | NA | NA | NA | Yes | NA |
| Planned Commercial | PC | NA | NA | NA | Yes | NA | NA |
| Natural River District | NRD | 80,000 sf | Yes | NA | NA | NA | NA |
| Access Management Airport Overlay Zone Landscaping Open Space requirements in PUD (40%) Planned Commercial – for property released from the State to serve the general and light commercial needs of the community. Planned Industrial – for property released from the State to serve the general industrial needs of the community. Sign and billboard regulations Telecommunication towers | | | | | | | |
| Ordinance adoption date: 2003 | | | | | | | |

| Table 6.5: Lovells Township Zoning Information | | | | | | | |
|---|----------|-------------|-----------------------|--------------|---------------------|------------|--------------|
| District Name | District | Minimum Lot | Residential | Multi-Family | Commercial | Industrial | Agricultural |
| Greenbelt | GB | 60,000 sf | Yes | NA | No new | No new | NA |
| Recreation & Residential | R-R | 101,640 sf | Yes | Special Use | Limited Special Use | NA | Yes |
| Residential | R | 14,000 sf | Yes | NA | NA | NA | NA |
| Commercial & Business | C-B | NA | Accessory Special Use | NA | Yes | NA | NA |
| Industrial | I | NA | NA | NA | NA | Yes | NA |
| Groundwater Protection in Industrial District PUD may be established in all districts except G-B Sign and billboard regulations Telecommunication towers | | | | | | | |
| Ordinance adoption date: October 14, 2003 | | | | | | | |

Table 6.6: Maple Forest Township Zoning Information

| District Name | District | Minimum Lot | Residential | Multi-Family | Commercial | Industrial | Agricultural |
|---|----------|------------------------|-------------|--------------|------------|------------|--------------|
| Resource Conservation | RC | 10 acres | Yes | NA | NA | NA | Yes |
| Farm Forest | FF | 2 acres | Yes | NA | NA | NA | Yes |
| Low Density Residential | LDR | 20,000 sf 1 acres | Yes | NA | NA | NA | Yes |
| Medium Density Residential | MDR | 10,000 sf 20,000 sf | Yes | Special Use | NA | NA | NA |
| Neighborhood Business | NB | 40,000 sf | Yes | NA | Yes | NA | NA |
| Commercial Business | CB | 10,000 sf 1 acres | NA | NA | Yes | NA | NA |
| Light Industrial | I-1 | 40,000 sf 2 acres | NA | NA | NA | Yes | NA |
| Industrial | I-2 | 40,000 sf 2 acres | NA | NA | NA | Yes | NA |
| Stream Corridor Overlay | SCO | 50,000 sf | Yes | NA | NA | NA | NA |
| Driveways and Private Roads Stormwater retention Groundwater Protection Landscaping Open Space requirements in PUD (25%) Sign and billboard regulations Telecommunication towers Wind Turbine Generators | | | | | | | |
| Ordinance adoption date: June 13, 2006 | | | | | | | |

Table 6.7: South Branch Township Zoning Information

| District Name | District | Minimum Lot | Residential | Multi-Family | Commercial | Industrial | Agricultural |
|---|----------|-------------|-------------|--------------|------------------------|------------|--------------|
| Low Density Residential | LDR | 2 acres | Yes | NA | NA | NA | Yes |
| Mixed Residential | MR | 20,000 sf | Yes | Special Use | | NA | NA |
| Commercial Business | CB | 1 acre | NA | NA | Yes | NA | NA |
| Industrial | I | 2 acres | NA | NA | NA | Yes | NA |
| Farm Forest | FF | 5 acres | Yes | NA | Limited Resource Based | NA | Yes |
| Resource Conservation | RC | 20 acres | Yes | NA | NA | NA | Yes |
| Stream Corridor Overlay | SCO | 50,000 sf | Yes | NA | Only existing | NA | NA |
| Landscaping Stormwater Retention and Groundwater Protection Sign and billboard regulations Telecommunication towers Wind Turbine Generators Driveways and Private Roads PUD in LDR, MR, CB, I and FF, open space requirements (25%) | | | | | | | |
| Ordinance adoption date: Draft | | | | | | | |

Table 6.8: City of Grayling Zoning Information

| District Name | District | Minimum Lot | Residential | Multi-Family | Commercial | Industrial | Agricultural |
|--|----------|-------------------------------|---------------|--------------|------------|------------|--------------|
| Single Family Residential | R-1 | 7,200 sf | Yes | NA | NA | NA | NA |
| Multiple Family | R-2 | 10,000 sf for first two units | Yes | Special Use | NA | NA | NA |
| Downtown Commercial | C-1 | 5,000 sf | Accessory Use | NA | Yes | NA | NA |
| Professional Office | C-2 | 7,200 sf | Yes | NA | Yes | NA | NA |
| Highway Commercial | C-3 | 20,000 sf | NA | NA | Yes | NA | NA |
| Industrial | I | 30,000 sf | NA | NA | Limited | Yes | NA |
| Access Management Airport Overlay Zone Landscaping Sign Ordinance Telecommunication towers | | | | | | | |
| Ordinance adoption date: May 20, 2001 | | | | | | | |

Chapter 7 – Goals and Recommendations

Introduction

This chapter of the County’s Master Plan will set forth goals and recommendations. These are written to have a countywide perspective, though they do address common local issues. It is not the intention of the Crawford County Planning Commission for these goals to replace goals and objectives found in township or city master plans; but to bring forth a multi-jurisdictional approach to addressing common community needs and issues. It is hopeful these goals and recommendations will not only provide guidance to Crawford County government, but also encourage a coordinated approach to planning and zoning at a local level.

Surveys and Workshops

There have been a number of “Visioning” efforts completed in recent years. These include goal-setting workshops conducted by many communities as a part of their master planning process; a series of Focus Groups Sessions held by the Grayling Regional Chamber of Commerce in 2002; and two roundtable discussions held by the County Planning Commission (see Appendix A). All of these efforts were reviewed and used to develop goals and recommendations for the master plan.

There are a number of common themes that surface in all of the surveys and workshops.

- 1) People live in and visit Crawford County because of the abundant natural resources, which include forests, lakes, streams, clean air, wetlands, wildlife and fish.
- 2) People like the County because of its rural character and friendly atmosphere.
- 3) Development pressures are increasing. Growth needs to be managed to preserve the very reasons people live here. However, this should be done without over regulating landowners.
- 4) There is a need for ongoing education on land use planning geared at both the general public and local decision makers.
- 5) There is a lack of good paying jobs within the County. A coordinated effort, by communities and organizations, must continue and expand to improve the economic health of Crawford County.
- 6) Communities need to invest in the infrastructure such schools, roads, water and sewer, public facilities and parks, downtown business districts, public transit, industrial parks, and recreational trails.
- 7) There needs to be more commercial and retail opportunities for residents of the County.
- 8) There is a general consensus that, where appropriate, the transfer of public lands into private ownership would benefit the county and local communities.

Goals

Natural Environment Goal:

Preserve the natural environment by protecting groundwater, surface water, forests, wetlands, clean air, fisheries and wildlife.

Recommendations:

- The County Planning Commission should work cooperatively with communities, agencies and organizations to develop studies and institute programs that address watershed, woodlands, wildlife and ecosystem management.
- The County Planning Commission encourages County departments to effectively administer and enforce county ordinances such soil erosion and sedimentation control.
- The County Planning Commission may work with communities to implement conservation-based open space or cluster development options in local zoning ordinance. The County could assist by supporting studies that identify critical resources, critical wildlife habitat, ecological corridors, scenic areas and vistas, and existing protected areas.
- The County Planning Commission may assist local communities by developing model zoning ordinance language to protect greenbelts, farmlands, forestlands, groundwater, and surface water.
- The County should support natural resource education and technical assistance programs that target landowners, businesses and communities.

Land Use Planning and Zoning Goal:

Encourage a coordinated, locally administered approach to regulating land uses in order to protect the natural, social, and economic resources in each jurisdiction.

Recommendations:

- The County Planning Commission may assist local communities by developing model zoning ordinance language to address access management, billboards and signs, cellular and transmission towers, site plan review and stormwater management.
- When reviewing community master plans and zoning ordinances, the County Planning Commission should focus on cross-jurisdictional issues.
- The County should support land use education programs for landowners and local communities.
- The County Planning Commission, in conjunction with townships and the Village, should participate in an annual joint meeting/awards luncheon to promote communication between planning commissions and recognize communities for outstanding planning and zoning efforts.
- Increase public awareness and the effectiveness of the County Planning Commission.
- Explore the feasibility of the purchase of development rights or conservation easements as a land use tool. Disseminate this information to local planning and zoning entities.
- Continue to fund and support the Crawford County Planning Commission.

Infrastructure and Community Facilities Goal:

Continue to maintain and expand, as needed, the transportation systems and community facilities to accommodate the needs of residents and businesses in the County.

Recommendations:

- The County Road Commission should continue to work closely with communities and property owners to program for road improvements across the county. Implementation of the Asset Management System will enhance program planning for maintenance of the local road network.
- Support the improvement of existing schools in all communities.
- As communities become densely populated, they will likely need public water and sewer services. In order to protect ground water and surface water supplies, this plan encourages communities to pursue such public facilities, when studies document the need.
- A countywide trails plan should be developed to establish a network of connected non-motorized and motorized trails across the County. The plan would first identify existing trails and propose connectors that would link existing systems.
- Participate in and support the Grayling Area Transportation Study.

Residential Goal:

Encourage a variety of housing types that meet the needs of all income levels and age groups.

Recommendations:

- Support the availability of an adequate supply of low to moderate income family and senior citizens housing (rental and owner-occupied) that is located near community facilities and shopping areas.
- Continue to support the Crawford County Housing Commission and Michigan State Housing Development Authority (MSHDA) programs to rehabilitate substandard housing and to provide needed moderately priced rental units in the County.
- Encourage all communities to preserve the integrity of existing residential neighborhoods by protecting them from intrusion of incompatible uses.

Commercial Development Goal:

Promote a varied business environment, and encourage retention, expansion and enhancement of businesses to meet the needs of residents and tourists, while preserving the natural environment and rural character of the community.

Recommendations:

- This plan encourages communities to support existing commercial areas. New commercial development should be directed into designated hubs and corridors, through community master plans and zoning ordinances; while discouraging single tier linear strip development along state highways and primary county roads.

- The County Planning Commission recommends communities utilize planning and zoning techniques, such as clustering, shared parking, access management, and landscaping to regulate commercial development along state highways and primary county roads.

Industrial Development Goal:

Encourage manufacturing industries that provide a positive contribution to the local tax base and provide local jobs without compromising the County's rural and scenic character.

Recommendations:

- Industrial uses should be developed in an environmentally sensitive manner, harmonious with the existing community and located in areas identified in communities' future land use plans.
- This plan encourages industrial re-development of vacant industrial properties and ~~sighting~~ of industries in existing industrial parks with adequate space and infrastructure.
- The County Planning Commission recommends communities encourage light industries and high tech industries that do not pollute the air, soil, or water nor offend because of noise, odor, or visual impact to locate in appropriately zoned areas.
- Industrial sites should be located along state highways or all season primary roads to provide direct access to markets.

Hazard Mitigation Goal:

Work cooperatively with townships, City of Grayling and agencies to create disaster resistance communities by developing and implementing a hazard mitigation plan.

Recommendations:

- The County Local Emergency Planning Committee will lead the implementation of the Hazard Mitigation Plan. Given the number one hazard is wildfire, communities are encouraged to adopt and promote a community-wide "Firewise" program.
- Local communities should use local, state and federal resources to implement the hazard mitigation. It will be important to increase public awareness about hazard mitigation.

Historic Preservation Goal:

Understand the importance of preserving historic resources and scenic landscapes to maintaining a sense of community, supporting tourism, and maintaining the unique character of a community.

Recommendation:

- Communities should make historic preservation a part of regional and local planning efforts in order to create viable, livable communities with individual character.

Recreation and Public Lands Goal:

Preserve and improve access to public lands and water, recreational trails and public parks for the enjoyment of residents, visitors and future generations.

Recommendations:

- The County Planning Commission should update the Crawford County Recreation Plan that identifies and prioritizes needed community recreational facilities.
- The County should pursue outside funding sources, such as grants for land acquisition and recreational development.
- All communities should retain and improve public water access sites for residents, seasonal residents and visitors.
- In a cooperative effort, communities should facilitate the designation of snowmobile routes that connect communities to regional snowmobile networks by working with the County Road Commission, County Sheriff Department and the Michigan Department of Natural Resources.
- The County encourages the expansion and creation of non-motorized recreation trails such as x-country ski trails, bike trails and horseback riding trails on both public and private lands.

Economic Prosperity Goal:

Improve the competitiveness of the county's economy while enhancing the employment opportunities for residents and the profitability of businesses and industries.

Recommendations:

- The natural resources and associated recreational opportunities are major draws to the county. The county should work with the Crawford County EDC, local communities and Chambers of Commerce to develop additional strategies for marketing the area as a tourism destination. Adding cultural and historic aspects to the tourism package will reach a broader market.
- Many people leave the county to shop. Communities should initiate programs to support businesses in the area.
- Like most rural areas in northern Michigan, the telecommunication infrastructure is lacking in Crawford County. The County should participate in planning efforts being conducted by the Michigan EDC that are investigating methods to bring high band width communication networks to rural areas.
- Work with local, regional and state organizations to bring in "value-added" industries.

- Encourage the Crawford County Economic Development Corporation to develop a strategic plan to improve the economic prosperity of the County.
- Support the Crawford County Economic Development Commission's business and industry attraction program.
- Encourage municipalities and community organizations to continue strategies that build on Crawford's status as a regional market place for Northeast Michigan.
- Support the attraction of health related businesses and services to the Grayling area, which will build on the location of a regional hospital and other medical services already available in the area.
- Strengthen the partnership between the county and Camp Grayling in seeking ways in which to expand the center's training activities.
- Encourage partnerships between community organizations, Kirtland Community College and the M-Tech Center in order to insure that education and training programs continue to meet the needs of the area's present employers and possible new businesses.
- Continue to investigate and implement methods to develop high-speed telecommunication service in rural areas, while maintaining a rural character.
- Investigate the establishment of a Land Bank to efficiently hold, manage and develop tax-foreclosed property.

Health, Human and Public Services Goal:

Improve access to needed medical and human services and provide needed public safety.

Recommendations:

- The County should continue to operate the 911 emergency services.
- Local communities operate fire and ambulance services. Several are multi-jurisdictional efforts. This plan encourages communities to continue to cooperate in providing these services and to seek grant funding, where possible, to help cover capital and operating expenses.
- The Crawford County Sheriff Department provides countywide police and safety coverage. This plan encourages the County to continue to support countywide coverage and seek out appropriate funding sources.
- The Planning Commission recommends continued support of the District Health Department No. 10.

Chapter 8 – Public Lands Analysis

A key factor that determines community character and the location of potential future development areas is the amount of land public ownership. **Table 8.1** and **Figure 8.1** show the breakdown of public land ownership in Crawford County. Excluding water, all public lands (including that owned by cities, townships, the county, as well as federal and state properties) make up over 70 percent of the county's total land area. Communities have been successful in working with the State of Michigan to transfer public lands into private ownership for economic development.

The Michigan Department of Natural Resources is in the process of completing a review of state-owned, the DNR administered lands. According to the DNR Web site, "The DNR is completing this land review to evaluate state-owned parcels located outside DNR project boundaries to determine if their natural resource and outdoor recreation values contribute significantly to the DNR's mission. Completing this review will assist the DNR in consolidating state land ownership. This will also increase efficiency of management by reducing the cost of managing small, isolated parcels, especially those that do not have significant natural resource or recreation potential. The proceeds from the sale or exchange of such parcels will be used to acquire replacement land to consolidate state lands and increase recreation opportunities." This section will identify state owned lands that communities would potentially be interested in having transferred into private ownership. Community master plans, zoning ordinances, long range community development proposals, in addition to local officials' input, help guide this process.

| Table 8.1 Crawford County Land Ownership | | |
|---|--------------|----------------|
| Public Lands | Acres | Percent |
| State of Michigan | 116,734 | 32 |
| Military | 97,294 | 27 |
| USA | 41,433 | 12 |
| Other Public | 1,246 | >1 |
| Water | 3,031 | >1 |
| Source: NEMCOG | | |

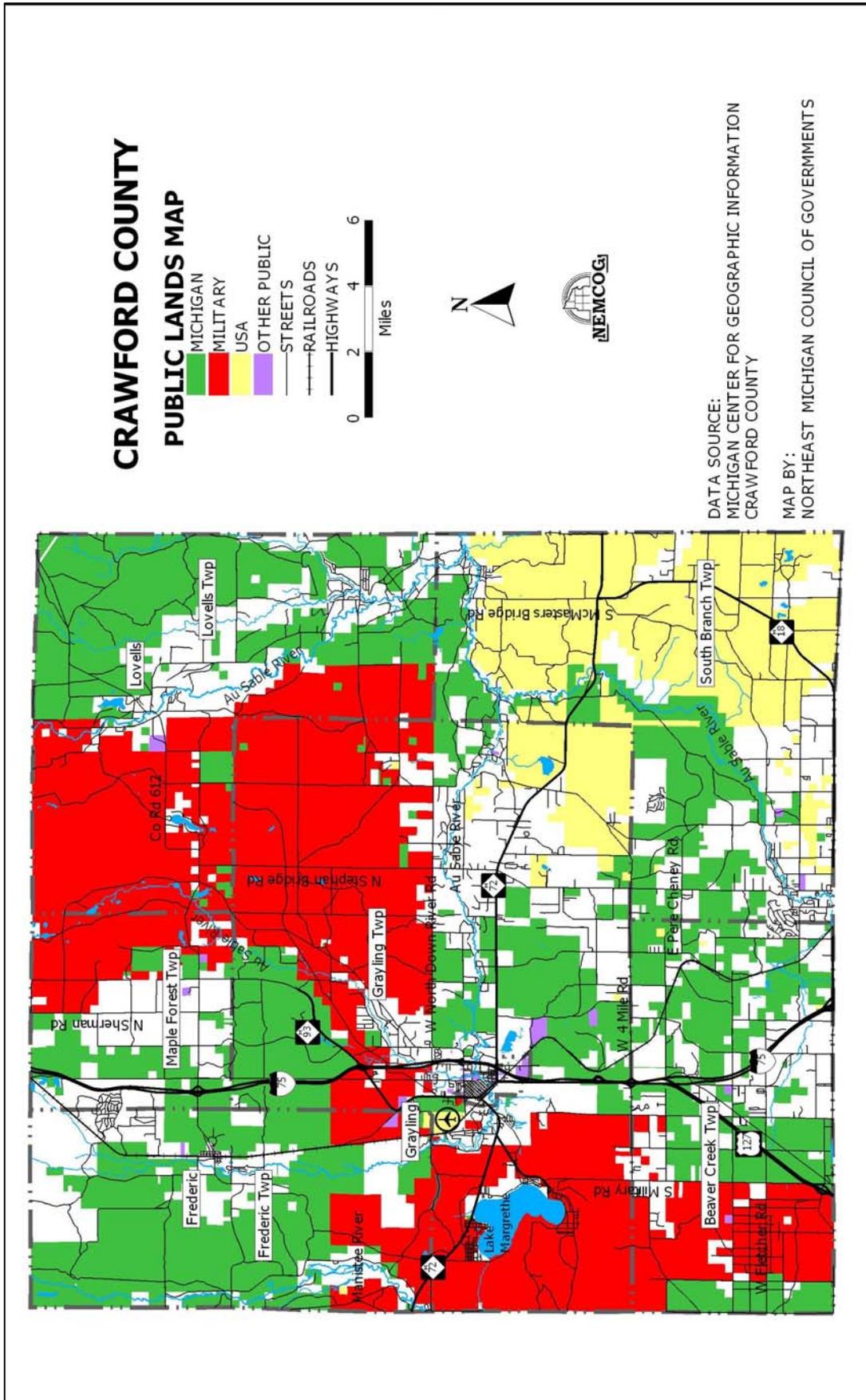
Figure 8.2 shows publicly owned lands that communities have identified for private economic development. The areas are mapped according to type of proposed development such as commercial or industrial. Areas were identified in master plans, zoning ordinances or other community planning activities.

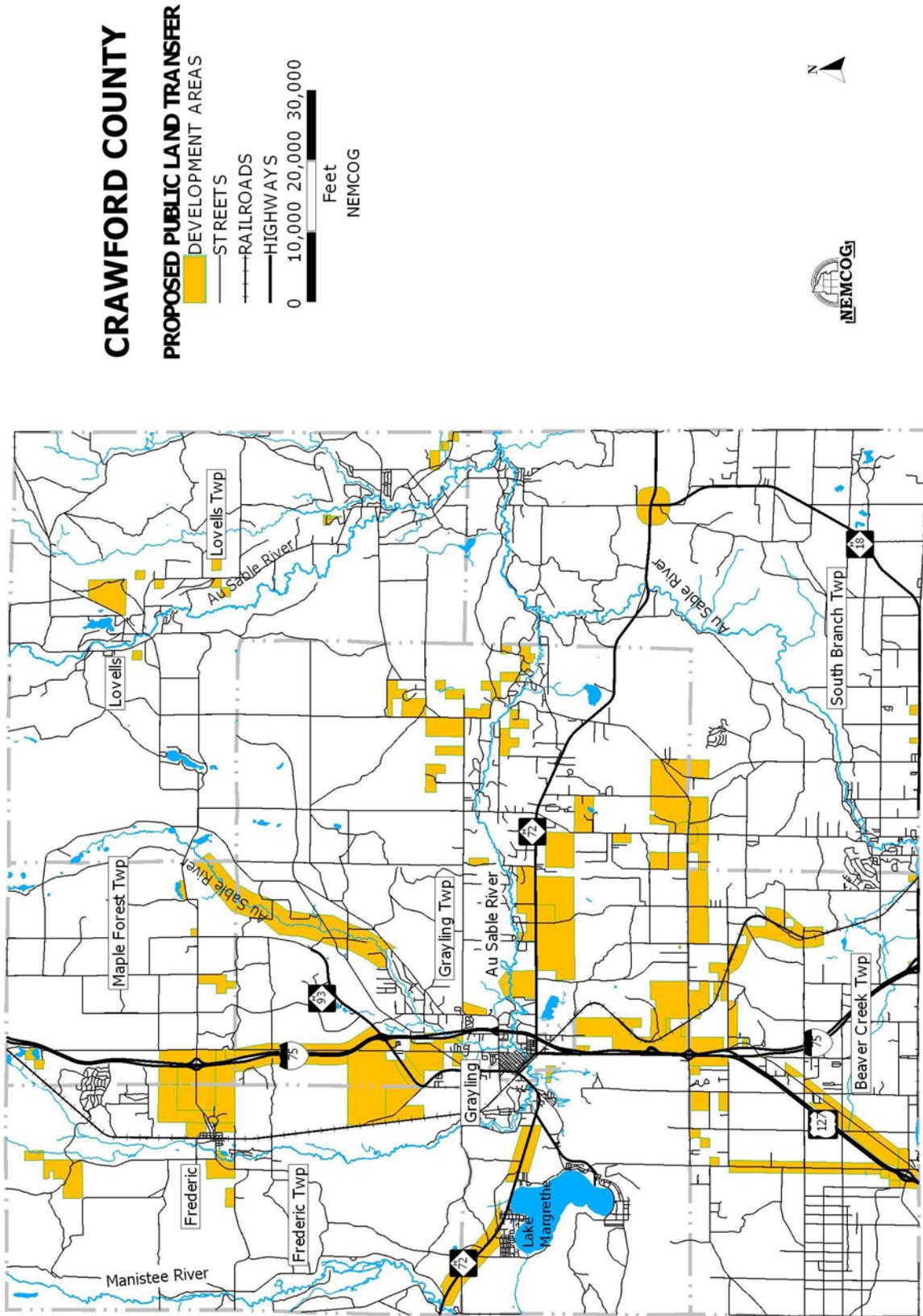
Maple Forest Township has identified lands around the Frederic I-75 Interchange for future commercial and light industrial development. State owned lands in Section 6 adjacent to several small lakes have been identified for future residential development. In addition, state lands at the intersection of Co Rd. 612 and Hartwick Pines Road are identified for neighborhood business and lands bordering Bear Lake are identified for transfer to Township ownership for development of a park. Frederic Township identified lands in Sections 25 and 36 in T.28N.-R.4W. for industrial development.

Lovells Township has identified a large are in Section 17 (T.28N.-R.1W.) along Co. Rd. for industrial development and an area in Section 15 (T.27N.-R.1W.) for commercial development. Isolated state parcels 40 and 80 acres in size were also identified for residential development. South Branch Township has identified two areas along M-18 for commercial development.

Beaver Creek has completed its own public lands analysis and has identified extensive areas for transfer to private ownership for residential, commercial and industrial development. Grayling Township, in its zoning ordinance, identified extensive areas for future industrial development. A proposed large scale four-season theme park is located adjacent to the 4-mile Road and I-75 interchange on lands previously identified as future industrial development (Section 32).

The County Master Plan supports the transfer of State lands to private ownership to support development of residential, commercial and industrial uses in locations identified by the local communities. **Figure 8.2** depicts areas identified by communities as part of an outreach effort by the County Planning Commission. The intent is to depict land identified to date, but should not construed as the only areas to be considered for future transfer to private ownership.





Chapter 9 – Plan Adoption

Public Notice

Pursuant to Public Act 282 of 1945, as amended, the Crawford County Planning Commission sent a written notice explaining that they intended to prepare a county master plan update. This notice requested the recipients' cooperation and comment on the plan. The notice was sent to the planning commissions (or if no planning commission to the legislative body) of each city, village or township located within or contiguous to Crawford County. It was sent to the Northeast Michigan Council of Governments. It was also sent to all county planning commissions (or if no planning commission to the county board of commissioners) for each county located contiguous to Crawford county. It was sent to each public utility company and railroad company owning or operating a public utility or railroad within the county and to any government entity that registered its name and mailing address for this purpose with the county planning commission.

The Crawford County Planning Commission approved the draft "Crawford County Master Plan Update" for distribution at their _____ meeting. They forwarded the draft plan to the Crawford County Board of Commissioners. The Crawford County Board of Commissioners approved the draft plan for distribution at their _____ meeting. Copies of the draft plan were mailed to the required recipients on _____. A copy of the draft plan was also posted on the Crawford County web site. Articles concerning the draft were printed in the local press. Comments were taken on the draft plan up until the date of the formal public hearing.

A notice of the public hearing was printed in the _____ on _____ (see **Attachment 1**). The formal public hearing took place on _____. Minutes from that meeting are found in **Attachment 2**.

Plan Adoption

After considering comments made by the public through the public comment period and those made at the public hearing, the Crawford County Planning Commission approved the "Crawford County Master Plan Update" at their _____ meeting. The secretary of the Crawford County Planning Commission then forwarded the final plan to the Crawford County Board of Commissioners (see **Attachment 2**).

Legal Transmittals

Once the final plan was presented to the Crawford County Board of Commissioners at their _____ meeting, copies of the approved plan were mailed to all of the recipients as required by law.

Appendix A

Crawford County Master Plan Update

Community Roundtable Questions

The roundtable discussion session was held on February 28, 2007 at 2:00 a.m. at the Devereaux Memorial County Library located at 201 Plum St. in Grayling. All townships and the City of Grayling were invited to participate with four of the six communities sending representatives.

1. Please give a five to ten minute informal presentation about your community's status of planning and zoning.

Maple Forest Township

- Township developed a master plan several years ago.
- Adopted its own zoning ordinance.
- Created a Zoning Board of Appeals, but it hasn't met yet.
- Updating Master Plan this year
- Making small adjustments to the Zoning Ordinance

City of Grayling

- Completing a review of the Zoning Ordinance
- Will make adjustments to districts and dimensional requirements
- Starting an update of the 1996 Master Plan

Grayling Township

- Has recently worked on amendments to commercial and industrial zoning districts.
- Hired a code enforcement officer

South Branch Township

- Nearing completion of developing their own zoning ordinance, attorney review of draft ordinance has been completed
- Hired a zoning administrator
- Created a Zoning Board of Appeals
- Posting zoning forms, documents and informational documents on Township web page

Beaver Creek Township

- Working under its own master plan and zoning ordinance
- Initially adopted the county ordinance with minor changes
- Updated its master plan in 2006
- In process of updating its zoning ordinance to conform to the master plan, correct districts and regulations and make it more user-friendly.
- Detailed sectional zoning maps with parcels and base map information

2. What do you see as the major issues related to planning and zoning in your community and in the greater Crawford County area? What is working and what isn't working so well?

All communities is dealing with blight and code enforcement

There are concerns about the proposed theme park and additions to Camp Grayling, and whether communities are ready to handle associated growth pressures

Beaver Creek Township

- Adopted blight and dangerous building ordinances, they have torn down three buildings.
- Code enforcement officer and enforcement bureau

South Branch Township

- Camping and storage of campers are problems
- Blight is a problem
- Lack of enforcement over the past years has been an issue

Grayling Township

- Hired a code enforcement officer
- Developed a partnership with Au Sable Woods Association to address zoning violations
- The township is concerned about "the Big Project" they have no information and therefore cannot plan for the potential impacts

City of Grayling

- Enforcement and blight
- Disconnect of land use and zoning
- Reclassifying districts, will create a central business district
- Amending dimensional requirements

3. With the adoption of South Branch Township's own zoning, the role of the County Planning commission will be changing. What do you see as their role in the future? What can they do to help your community?

- Coordination of all communities' planning and zoning
- Sponsor joint planning commission meetings once or twice a year
- Provide a big picture view of the county
- Provide countywide transportation plan
- Should participate on the Grayling Transportation Study
- Can mediate planning issues
- Bring people and communities together
- Provide information to communities to help with planning and land use
- Provide model ordinance language to bring uniformity across the county
- Point out inconsistencies between community zoning and planning
- Plan for infrastructure, transportation and recreation investments
- Maybe the planning commission structure could change to have a representative from each community's planning commission
- Housing to accommodate potential new growth

4. Are there areas in your community that are publicly owned and have been identified or even zoned for private development?

The communities identified general areas on maps where it would be appropriate to transfer state land into private development. Beaver Creek Township conducted a study to identify areas for development of state owned lands.

Crawford County Master Plan Update

County Departments and Organizations Questions

The roundtable discussion session was held on February 28, 2007 at 10:00 a.m. at the Devereaux Memorial County Library located at 201 Plum St. in Grayling. Eighteen invitations were sent to county departments and county organizations, with nine people participating.

1. What do you see as the key assets in Crawford County?

(Community, services, organizations, resources, etc.)

- Au Sable River
- Relatively progressive for a small northern Michigan community
- Hospital is in growth mode
- Great opportunities for hunting and fishing
- Snowmobiling
- Service clubs
- Brownfield development
- DDA
- County Board is forward looking
- Abundant natural resources
- Recreational opportunities
- Schools with variety of programs
- Camp Grayling
- Public Transit
- People work together
- Military brings dollars into the community
- Natives and new arrivals work well together
- Community is a workable size
- Everyone knows each other
- Environmental monitor
- Library
- MSU Extension

2. What do you see as the major issues facing the County both today and over the next 10 to 20 years?

- Jobs for young people/families
- Land use to enhance recreation
- There is a lack of opportunities for ORV's and snowmobiles
- Residential development is increasing and there will be an increasing demand for services.
- Educating public on importance of economic development
- New people want growth and change while generally long time residents don't want change.
- Families with intergenerational poverty.
- Shortage of living wage jobs
- Lack of access to higher education
- Feeling the impacts of Michigan's poor economy

- Lack of jobs for middle aged population
- More foreclosures than in the past
- Need to be able to deal with impacts of potential theme park development
- Lack of competitive shopping so residents shop outside of the community
- Lack of advanced educational opportunities within the community
- Lack of medical specialists
- Need to reconstruct freeway interchange to have easy on-off ramps in Grayling
- Need a good mix of land use for development and recreation
- Roads are nearing capacity and can't handle more traffic
- Schools are losing students
- Military is fencing more land and restricting public use of lands
- Recycling program needs to be improved
- Demand for services is ahead of ability to pay
- With so much public land, either needs to release more land for development or the state should pay higher taxes
- Need to formulate our identity, what is our brand
- Should identify lands along I-75 for commercial development and lands along state highways for residential development
- Rapid growth of senior population in county
- Growth of seniors in poverty and at risk

3. What actions should be taken to address those issues?

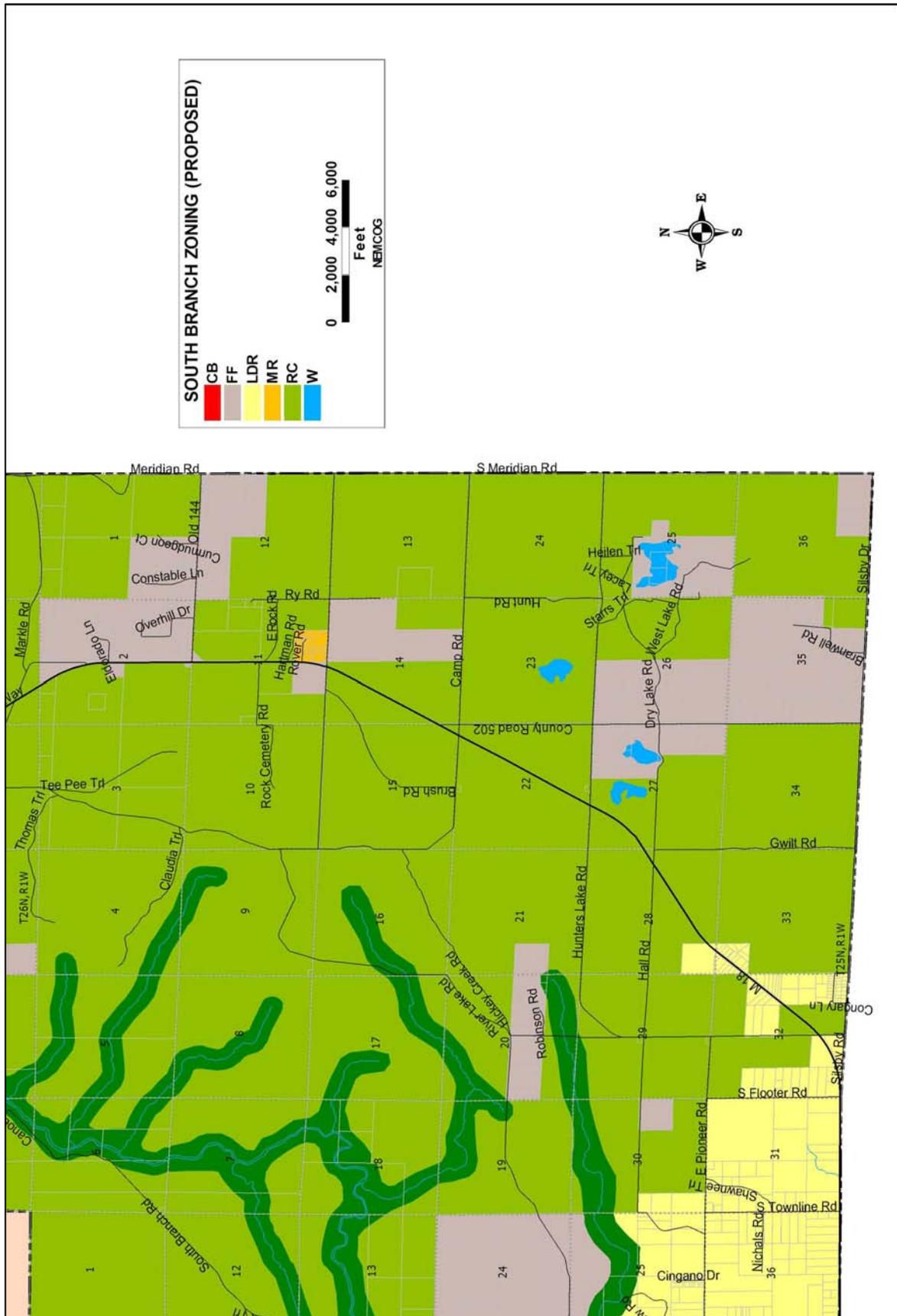
- Develop planning to address growth
- Communities need to coordinate planning and development
- Need to find ways to finance demand of new services
- Need to improve emergency communications
- Need to educate people on value of increased services and supporting funding
- Provide financial incentives for organization and businesses
- Develop a comprehensive planning process to proposed new large scale developments
- Increase access to higher education
- Increase involvement elders and retirees
- Conduct an assessment process for the elderly
- Build partnerships
- Support family caregivers
- Educate community on steps needed to improve quality of life
- Quarterly meetings with all groups to brainstorm and work together
- Need to develop a plan for private use of state lands
- Training program to inform seniors on services
- Elderly people can be a resource to the community, need to engage them and tap into their skills
- Need for better communication
- Plan for transition of public lands to private ownership
- Build recreational opportunities
- Work with existing businesses to expand
- Restructure state government
- Cooperation between local governments, not competition
- Master plan update should plan for healthy development and healthy growth

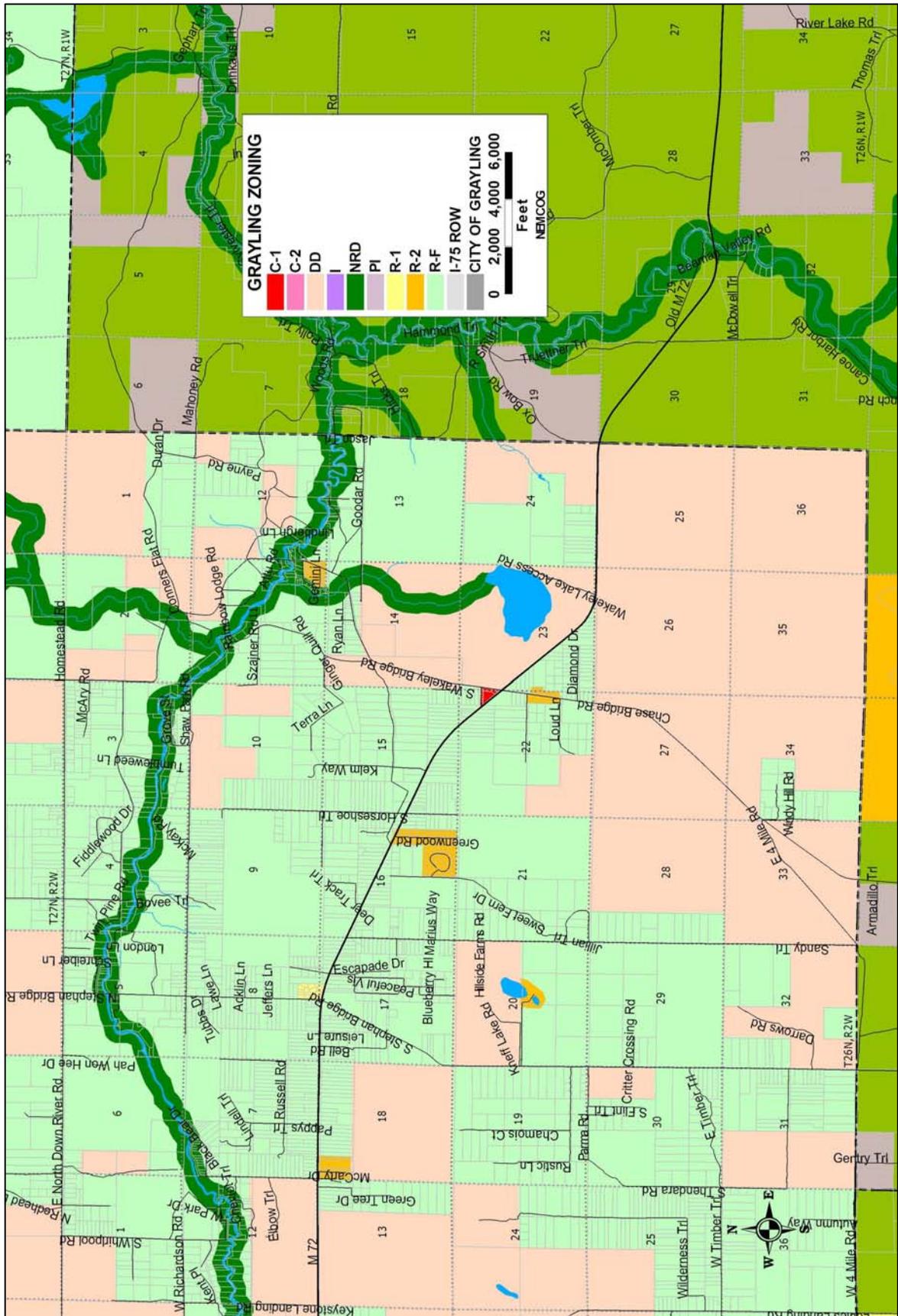
4. What do you see as the role of the County Planning Commission in addressing those major issues? What can they do to help your department or organization?

- I don't understand their role
- Educate organizations on what the Planning Commission can do to help them
- They need to learn what organization like the library does
- Help facilitate organizations to work together
- Provide a big picture view of growth management
- Coordinate with county departments
- Provide model ordinance language such as private road ordinances
- Spearhead educational efforts to mitigate hazards, for example, Fire Wise
- Get people involved in the planning process
- Solid waste planning, in particular recycling, such as where to locate drop-off centers
- Review master plan periodically, get people and groups involved
- Blight ordinance – gain a perspective for county issue and share with each community
- Support linkages with all communities within the county and bordering the county
- Key role is a coordinating body and clearinghouse for community and organizations
- Need to incorporate aging in place into the master plan
- Planning for higher education
- Planning for alternative education

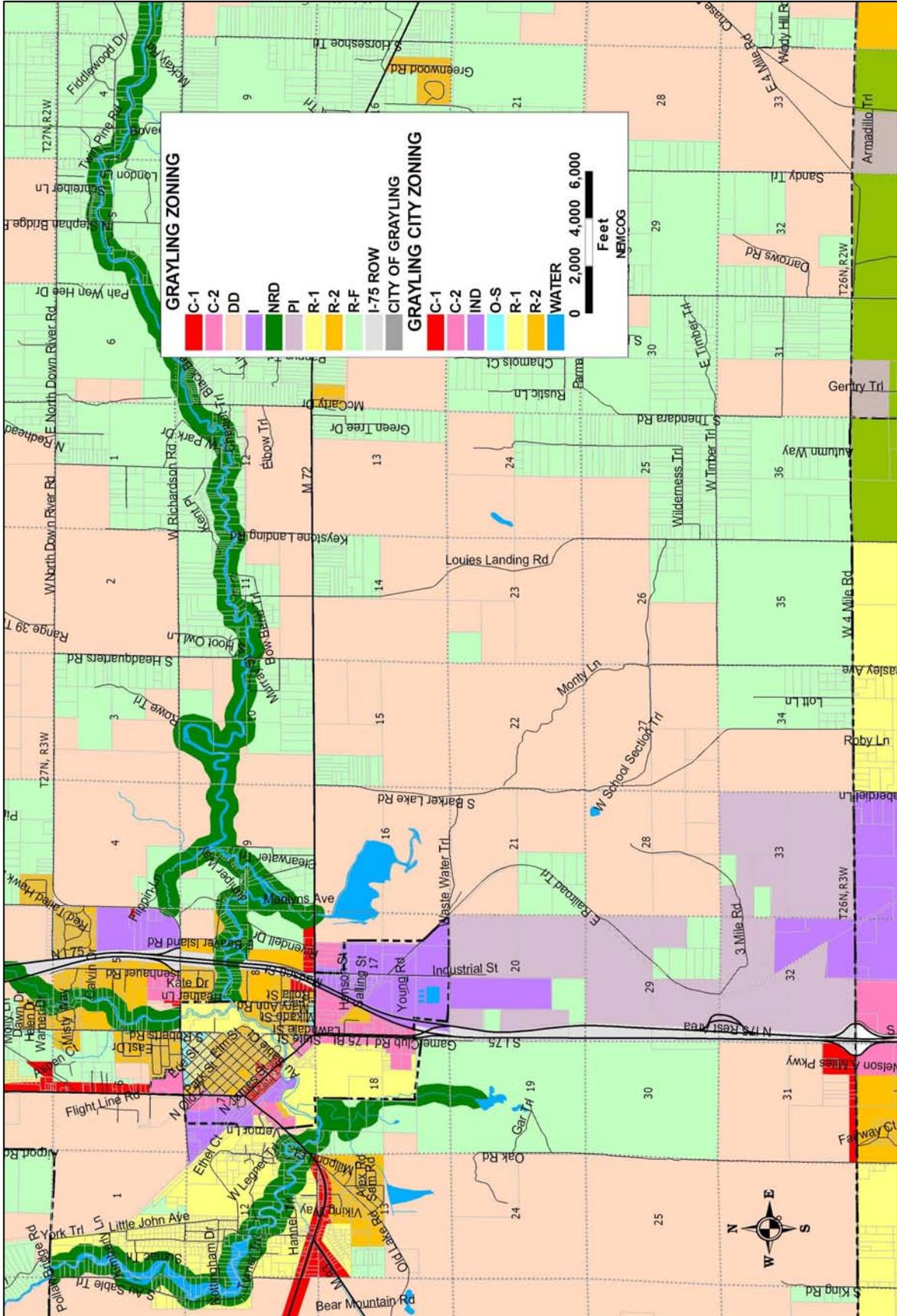
Appendix B Zoning Maps

Zoning maps were acquired from communities and digitized into NEMCOG's computer mapping system. The intent of this approach was to compare zoning at community borders. The maps should be used for general planning purposes. It is important to note these maps should not be used to determine zoning of specific properties for land use and development purposes. The maps are a snapshot in time. Communities amend their zoning from time to time and therefore these maps could be out of date after publication of the County Master Plan. Landowners should acquire the zoning ordinance and zoning map from the community where their property is located. Zoning map for South Branch is the proposed zoning ordinance under development by the Township at the time of the publication of the draft document.

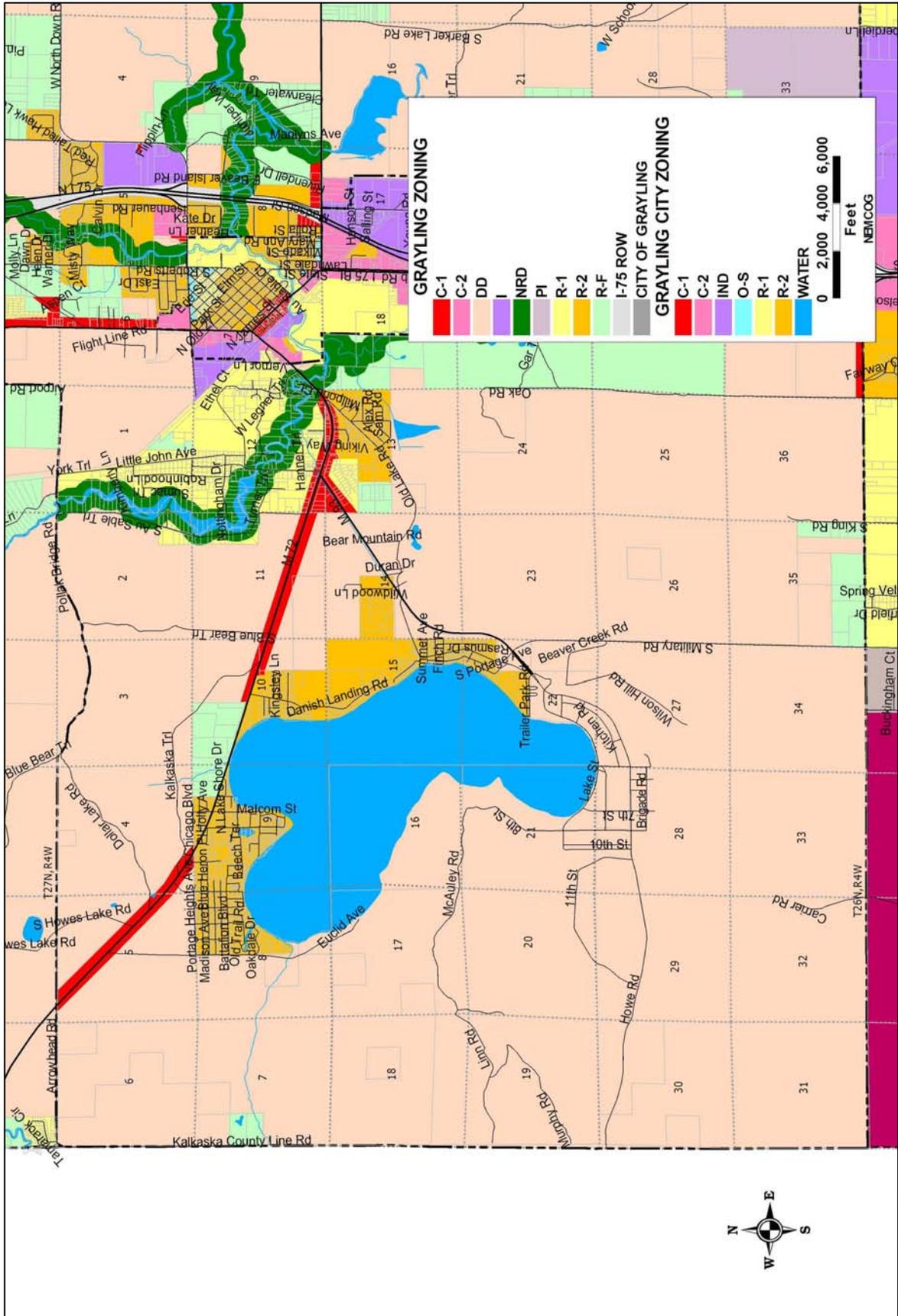




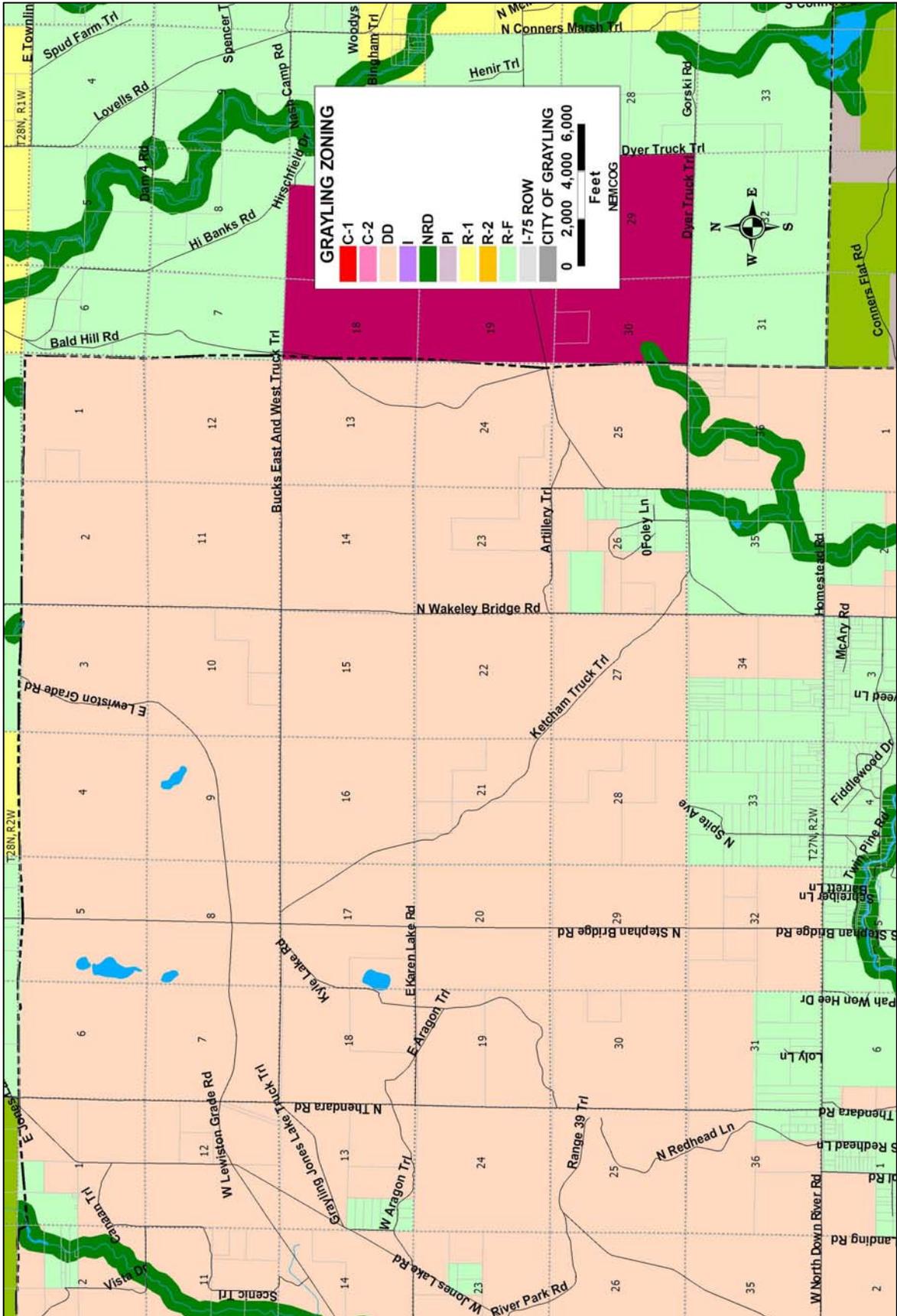
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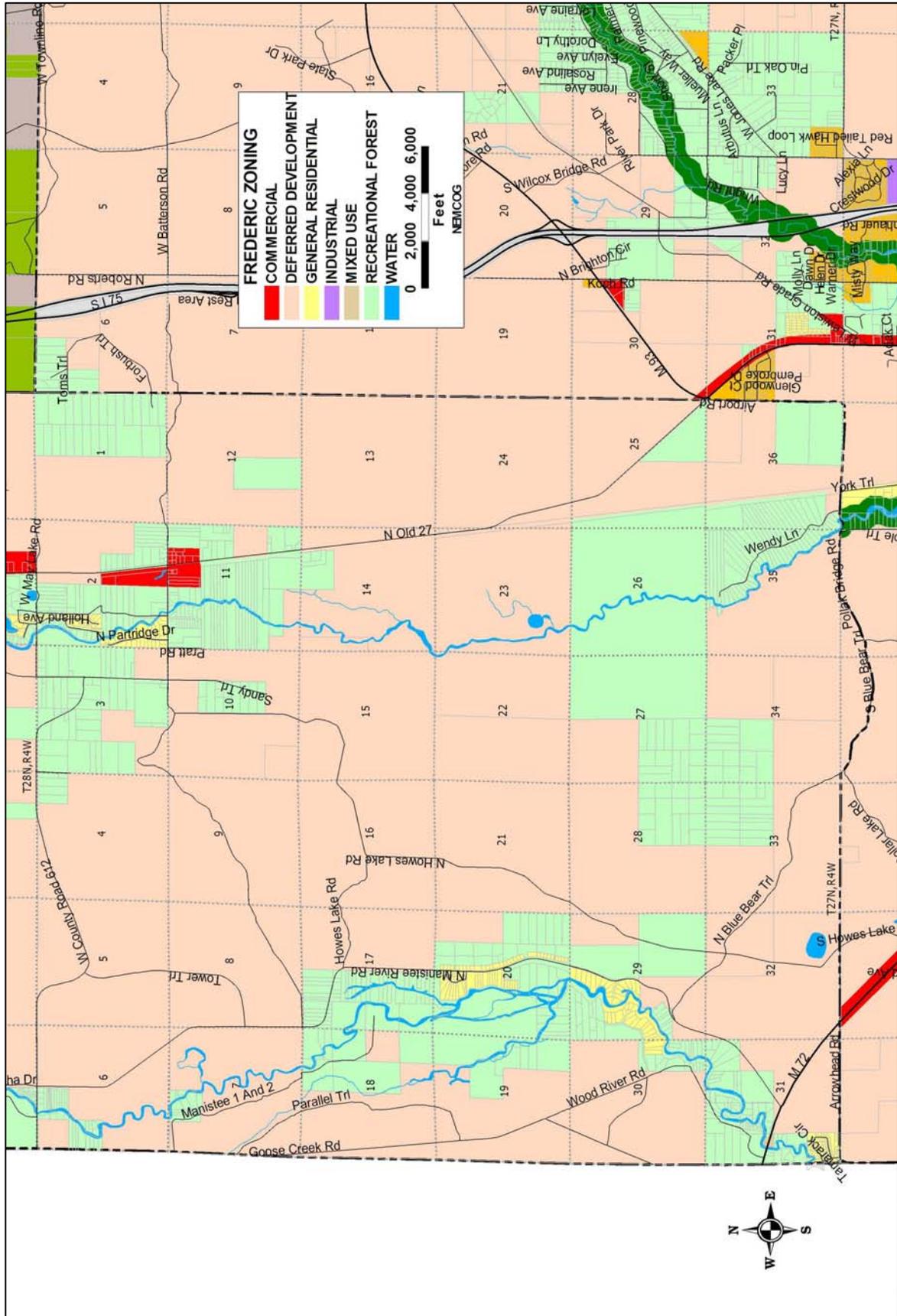
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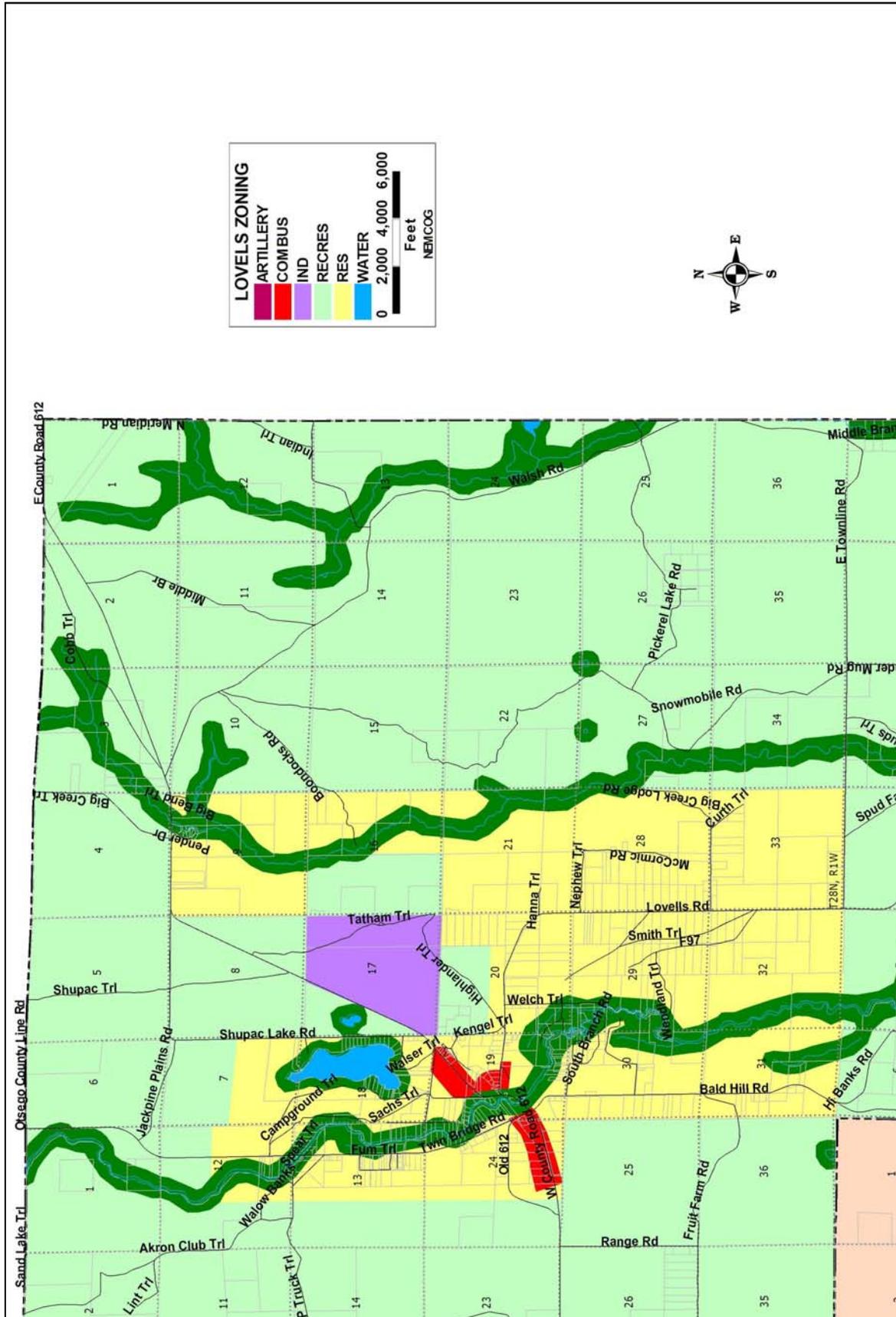


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T.27N.-R.4W.





T.28N.-R.2W.

