

# DMU 010

## Benzie County

### Deer Management Unit

#### Area Description

The Benzie County Deer Management Unit (DMU 010) is in the Northern Lower Peninsula Region (NLP) (Figure 1). It has roughly 62,000 acres of State Forest Land which is about 31% of the total acreage in the county. Topography is mostly relatively flat (lake-border plains and sandy outwash plains) with small inclusions of hills. State Forest is concentrated in a north/south strip near the middle of the county.

Soils in the area vary from well drained sand mixes to poorly drained peat and muck soils. The drier soils support mixes of pine, oak, aspen, and red maple on the outwash plains to the south and northern hardwoods on the moraines in the north. The poorly drained soils support various wetland communities. Row crop agriculture can be found predominately on private lands along the lakeshore. Orchards become prevalent closer to the lakeshore.

The Grass Lake Swamp in the southeast and the Deadstream Swamp in the northwest are the area's most significant winter yarding complexes. Other traditional winter yarding areas occur along various riparian corridors including the Platte and Little Betsie Rivers and creeks such as Dair Creek and others. Riparian corridors also provide important travel routes for deer and other species. Herring Swamp is another yarding area but is situated entirely on private lands. Numerous pine stands provide thermal cover in upland areas as well.

Sleeping Bear Dunes National Lakeshore extends into Benzie County with about 9 miles of Lake Michigan shoreline and dunes. The Betsie River State Game Area (SGA) is located immediately upstream of the towns of Frankfort/Elberta on the Betsie River. The SGA is predominately lowland forests and does provide some good winter cover and excellent hunting if one is not opposed to swampy conditions. A large portion of the Grass Lake Swamp is situated on WLD's Grass Lake Wildlife Management Area which includes the Grass Lake Wildlife Dam on the Betsie River.

## Management Guidance

Two main goals guide the deer management in this DMU: 1) impact management; and 2) hunting opportunities. Impact management refers to reduction of undesirable effects associated with deer over-abundance. Crop damage, deer-vehicle collisions, and poor forest regeneration due to over-browsing are examples. To find a middle-ground in which deer numbers provide ample hunting and wildlife viewing opportunities and mitigate unwanted impacts, we review data from several sources to adjust the harvest strategy as needed. These data include deer harvest data from check stations and an annual hunter survey, the winter severity index, deer-vehicle collision data from the Michigan State Police, and deer-related information collected by regional wildlife biologists (e.g., hunter observations, number of crop damage Permits, spotlight surveys, habitat assessments, etc.).

## Population Assessment Factors

### Winter Severity Index (WSI)

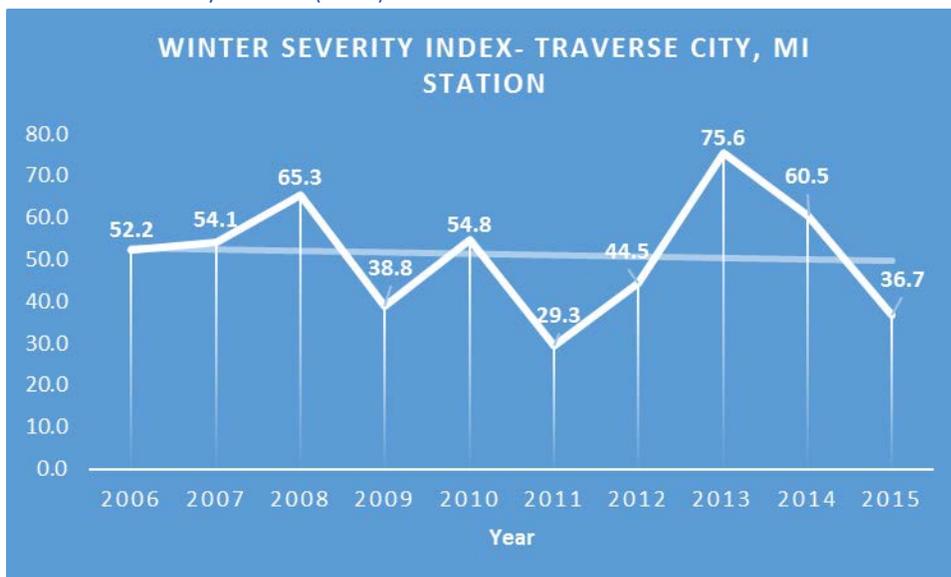


Figure 1: Graph of Traverse City Areas Winter Severity Index from 2000 to 2012

The current WSI system takes advantage of standard weather data available from the National Climatic Data Center. The DNR uses weekly data on air temperature, wind speed, and precipitation from weather stations throughout Michigan and the surrounding area to calculate a weekly index value from November through April. Normally, the WSI values from individual stations are averaged across a specific area (i.e. Upper Peninsula, Northern Lower Peninsula, Southern Lower Peninsula) to give a regional scale perspective on winter severity. To monitor deer related trends specific to the Grand Traverse area, only the Traverse City Area WSI station data were used. The DNR plots these values over time to provide insight into the pattern of winter severity over the course of the winter and to identify severe weather events. Extended periods of severe weather and very early or very late peaks in severity tend to have the greatest effect on deer. The above graph (Figure 2) shows the cumulative WSI, or the overall severity of each complete winter season. Despite several harsher winters over the past 10+ years, the trend has been for milder winters. Relatively mild winters allow for increased deer survival,

particularly for fawns which are typically the most vulnerable. Furthermore, pregnant does experiencing a mild winter tend to be healthier which positively affects newborn survival. Whereas mild winters allow for better survival of deer, severe winters can cause high deer mortality. Does may abort fetuses to survive a severe winter, which creates a lag effect into the following year. Winter severity has been low over the last two years compared to the average trend for the area. The mild winters observed over the last several years would allow for a steady increase in the deer population

### Deer Harvest Analysis

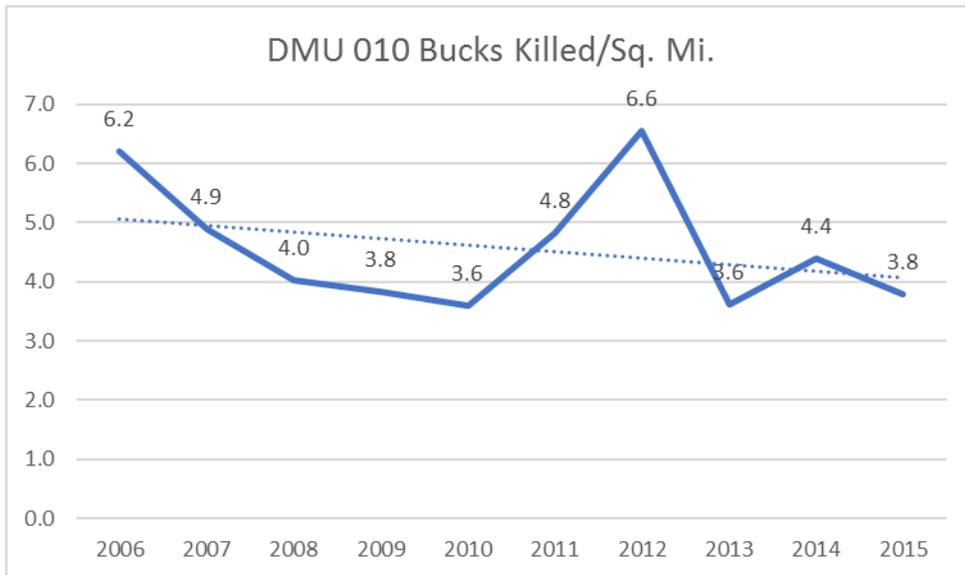


Figure 2. Bucks Killed per Square Mile

In DMU 010, buck harvest per square mile has declined over the last decade (Figure 3). There was a spike in buck harvest in 2013. Despite the spike in harvest the numbers show a slightly negative trend, which by itself would suggest that the population is decreasing slightly. One variable to consider while interpreting this indicator is social choices made by hunters, either regulatory or voluntary restrictions on antlered deer harvest. Starting in 2013, DMU 010 became part of a 12-county mandatory Antler Point Restriction (APR) zone. The minimum legal buck must have at least three antler points on one side. This suppressed buck harvest for several seasons until bucks graduated into older age classes and produced antlers meeting the point restrictions. Another factor influencing bucks killed per square mile is hunting pressure. While it can be difficult to pinpoint exactly what is causing a population to increase or decrease we can make predictions based on past trends and looking at several factors that can indicate changes in populations.

In northern Michigan, winter severity has a direct impact on deer condition at the population level. Mild winters allow for better survival of deer, severe winters can cause high deer mortality. In addition, does may abort fetuses to survive which creates a lag effect into the following year.

## Deer Vehicle collisions

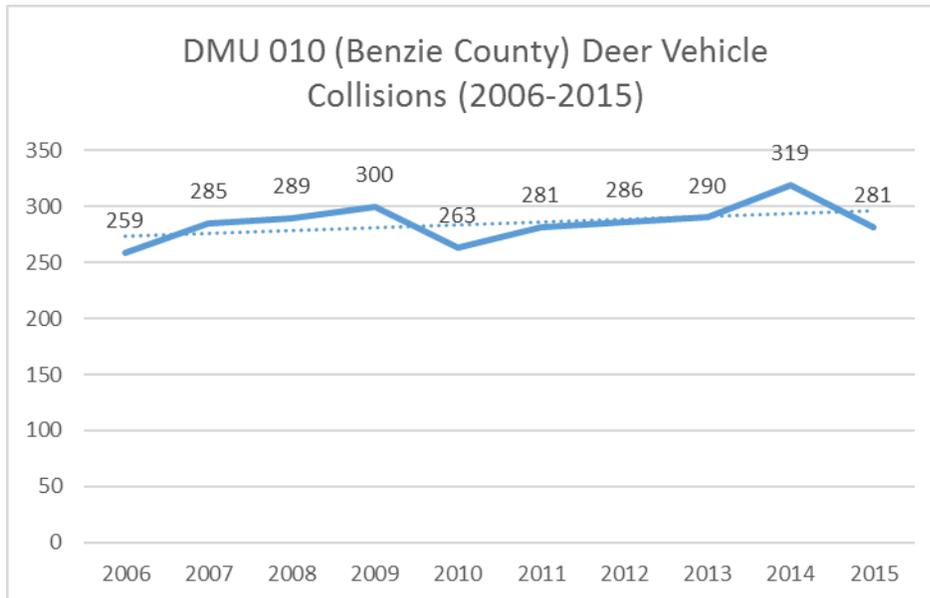


Figure 3. DMU 010 Deer Vehicle Collisions

Deer-vehicle collisions (DVC) are commonly used as an index to the deer population trend, the idea being that high rates of DVCs are correlated with high deer populations, and vice versa (Figure 4). Research has shown that there are other factors that influence the rate of DVCs. Habitat proximate to the roadway and highway characteristics can blur the relationship between deer population and DVCs. However, DVC data can provide useful information if considered as one part of a deer population assessment. The trend over the past decade is for a slight increase in DMU 010 for deer-vehicle collisions.

These data are provided by the Michigan State Police. Although changes may have occurred in law enforcement response and recording of DVCs over time, we assume they have remained consistent enough to provide a reliable estimate of DVC rates relative to vehicle miles driven.

The various fluctuations from year to year give supportive evidence to the primary driving factor of the deer population which is winter. Significant drops in DVC occurred one to two years after a particularly severe winter.

## Deer Hunter Numbers and Behavior

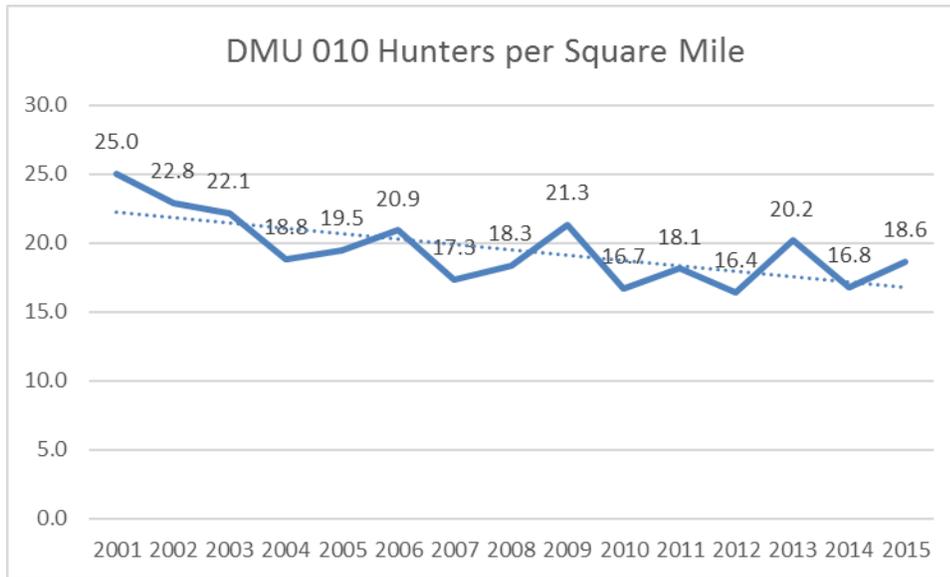


Figure 4. Hunters per Square Mile of Deer Range

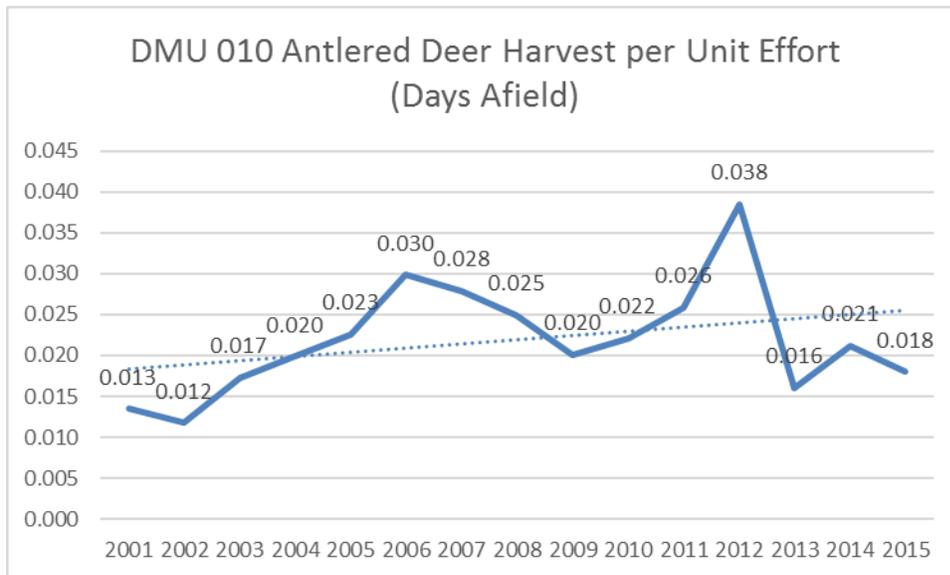


Figure 5. DMU 010 Antlered Deer Harvest per Unit Effort

Hunter trends can be an important indicator to assess, if the number of hunters are driving populations up or down. In DMU 010 hunter numbers have steadily decreased over the last decade (Figure 5). However, the number of antlered deer harvested per unit of effort has increased (Figure 6). This would indicate that as hunter numbers decline, the buck population has remained stable or even increased. The years of low harvest have followed years of high winter severity in DMU 010 and the same goes for years of high harvest have followed patterns of lower winter severity indicating that harvest is more likely driven by the severity of the previous winters.

Hunter perceptions and goals can also impact harvest numbers. Large scale shifts in hunters' decisions to target older deer and pass on younger bucks results in reduced harvest numbers and increased hunter effort, as there are fewer deer in older age classes. Success and harvest rates are thereby suppressed not by population decline, but by human decision-making processes. Similarly, hunters may self-regulate harvest of antlerless deer for a variety of factors, such as a perception of too few deer.

DMU 010 is one the 12 counties included in an Antler Point Restriction (APR) zone. Starting in 2013 hunters were restricted to harvesting a buck with at least 3 or more points on one side. Therefore, the reduction in the 2013 buck harvest was anticipated because this was the first year of APRs and the number of legal bucks would be reduced. Starting in 2014 the hunter success rate did begin to rebound as hoped.

### Deer Management Assistance Permits (DMAP)

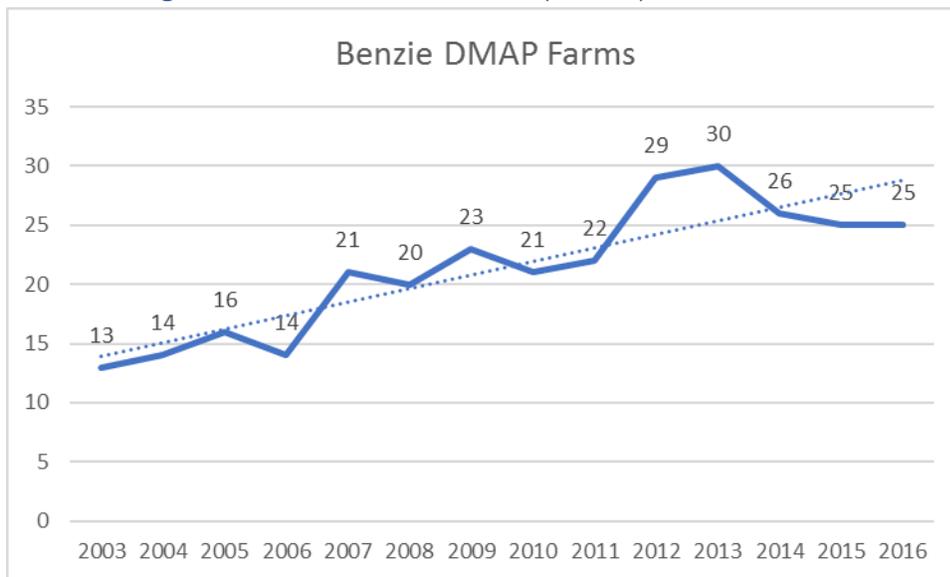


Figure 6. Benzie DMAP Farms per year

The number of farms per year requesting Deer Management Assistance Permits (DMAPs) has shown a positive trend, or overall increasing yearly in DMU 010 (Benzie County) since the early 2000s (Figure 7). Despite the overall positive trend, the last three years the number has stabilized. The number of farms was chosen to track the trend of this particular index rather than the number of permits issued, permits purchased, or permits filled. The numbers of permits issued, purchased, and filled could be influenced by such things as change in farm management, crop harvest dates (corn), crop success, weather during hunting seasons, actual and perceived damage during growing season, deer visibility leading up to hunting season, availability of over-the-counter antlerless tags, and even the general economy. However, the practice of a particular farm requesting at least a minimal amount of permits is believed to remain steady from year to year despite the severity of damage and/or other factors. The increasing trend can also be affected by arable land either coming into production as farming techniques change or out of productions as land is left fallow or converted to other uses

## Deer Damage Shooting Permits (DDSP)

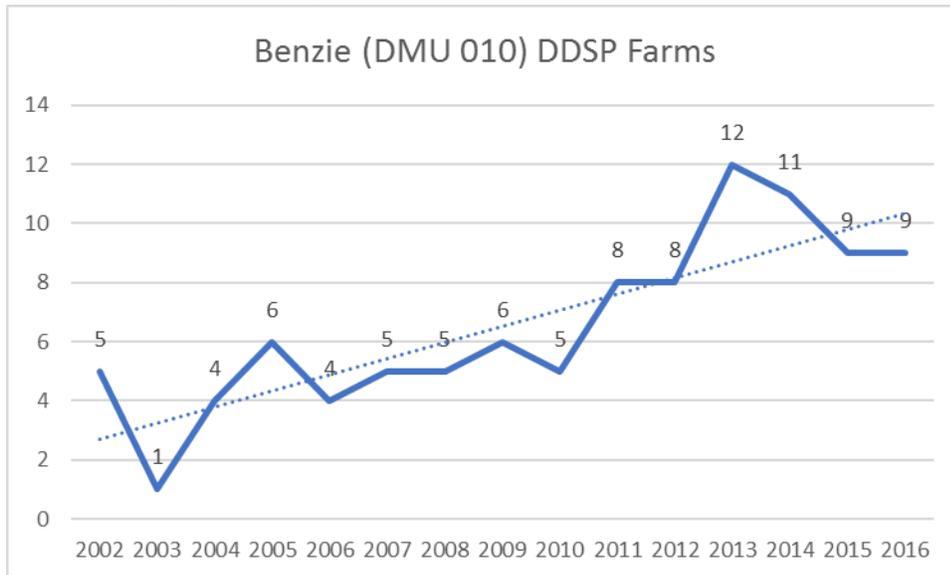


Figure 7. Benzie (DMU 010) DDSP Farms per year

The trend for number of farms per year requesting Deer Damage Shooting Permits (DDSPs) has been on an increase in Benzie County since the early 2000s (Figure 8). The number of farms was used to track the trend of this particular index rather than the number of permits issued or permits filled. The numbers of permits issued and filled can be influenced by such things as change in farm practices, number of shooters on the permit, crop harvest dates (corn), crop success, actual and perceived damage during growing season, change in DNR staff responding, and changes in DNR general policies for making permits available. However, the practice of a particular farm reporting current crop damage generally remains steady from year to year despite the severity of damage and/or other factors. The increasing trend can also be affected by arable land either coming into production as farming techniques change or out of productions as land is left fallow or converted to other uses.

## Deer Management Recommendations

While each indicator previously described is by itself not a stand alone gauge of the actual population change, they do, with one exception (Bucks killed per square mile), as a group point towards a growing deer population in DMU 010 (Benzie County). Therefore based on current trends for these indicators, we are recommending to increase antlerless permits. This antlerless quota recommendation is also consistent with the APR management philosophy of striving for a balanced buck to doe ratio and maintaining deer numbers at or below the biological carrying capacity.

A larger proportion of the antlerless quota should be private land antlerless. This is based on the fact that deer are not spread evenly across the landscape. Deer tend to congregate where the best food (and cover) is found. Because private lands tend to have better soils and are relatively productive, they can, and do support higher deer densities. State Forest Land is typically less productive than private farmland but is more than adequate for growing forests and other natural communities, which can support deer, but at lower densities than farmland. This creates a density gradient with the highest deer populations on the farmland and the lower deer densities on public forest lands. Therefore,

population increases are going to be seen first and at a higher growth rate on private farmland than on public land. The foods the deer are targeting on private lands are agricultural crops including various fruit orchards, row crops, pastures, and specialty crops. This can create economic hardships for individuals and communities. This is the reason that as a population grows, harvest pressure on does is first needed on private lands (a source of deer), and then possibly on public lands. As the population grows there will continue to be a larger need on the private lands for doe harvest than on the secondary habitat, public land. However, consideration should be made to keep deer populations on associated public lands at or below biological carrying capacity to minimize pressure on the public land habitat and therefore prevent too many deer migrating to private land. Another factor in distributing the total quota of antlerless licenses is the ratio of private to public land. Not only will private land have higher deer densities, but in most counties there is typically more private than there is public land, thus tilting the license distribution toward private land.

We also recommend an early private land antlerless firearm season for DMU 010 based on the increasing occurrence of deer damage to agricultural crops. An early season will allow farms with antlerless tags to target deer on their properties where damage has occurred. The early hunt will help target deer that are more likely to have been causing damage, and still in/near their summer range. Also, in some cases during the fall hunting seasons and after crops are harvested deer may move off of these now harvested ag lands and open fields to better cover where they may not be vulnerable during regular hunting seasons.

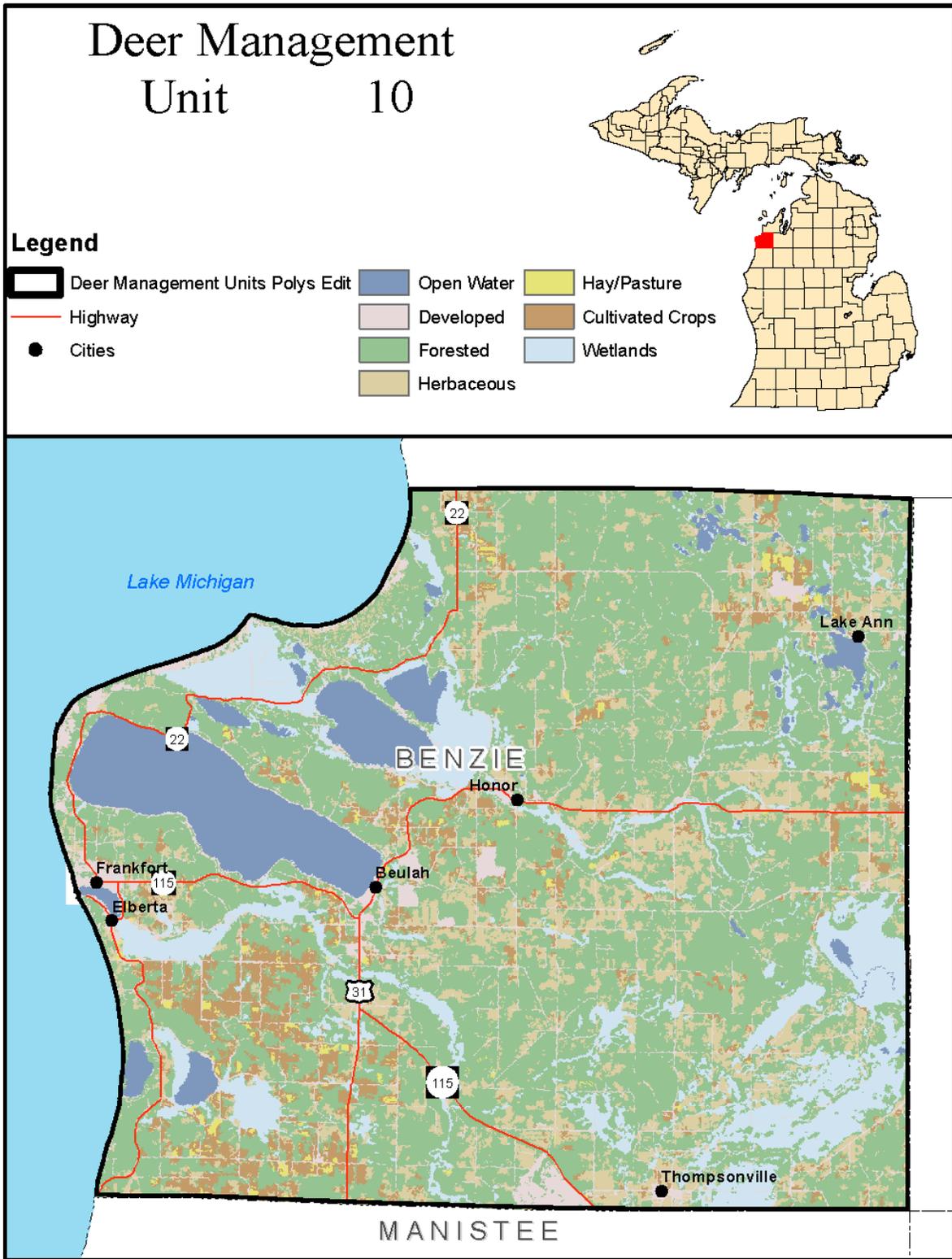


Figure 1. Deer Management Unit 010 Map