

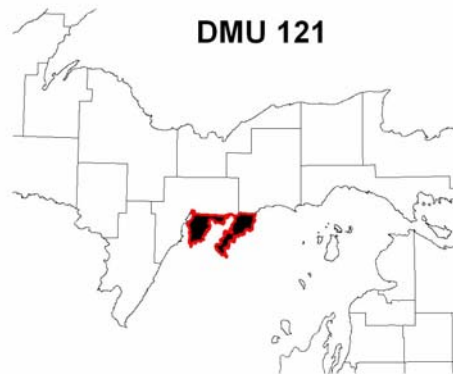
WORKSHEET FOR ESTABLISHING DEER POPULATION GOALS – DMU 121, 2006- 2010

Adjacent DMU(s) used in calculating goal N/A

2006 - 2010 goal: **7,700 to 9,400** deer (27 deer/mi² to 33 deer/mi²)
Estimated 2005 population **9,400** deer

1996 - 2004 goal: **8,500** deer (30/sq mi):

DMU 121 Description



At 284 square miles, Deer Management Unit (DMU) 021 is one of the smallest units in the Eastern Upper Peninsula (EUP). Approximately 36% of the land is publicly owned (MDNR and Hiawatha National Forest) while 64% is privately owned. This unit consists of the three peninsulas (Garden, Stonington, and Nahma) that jut out into Lake Michigan. The entire unit lies within the within the Escanaba/Door Peninsula sub-subsection of the Niagaran Escarpment and the Lake Plain ecological subsection.

Climatic conditions in DMU 121 are the mildest found in the EUP. Growing seasons are generally 130 to 140 days long. Annual snowfall averages 60 to 80 inches, and minimum winter temperatures generally reach lows of -30⁰ F. On average, winter migrations in this unit are substantially shorter than in other regions of the EUP.

Land use/Land cover classification from IFMAP imagery shows that mixed lowland conifers (24%), pines (10%), lowland deciduous (9%), northern hardwoods (8%), and aspen (7%) collectively cover more than half of the landscape. Agricultural activity (8%) and herbaceous openings (6%) are also important components of the landscape.

Ecological

Many studies have been conducted that show a relationship between deer browsing activities and forest plant growth and regeneration. However, most studies that investigate white-tailed deer interactions and impacts on other resource values have been

conducted in such a manner as to make comparisons on a presence/absence basis. This does not necessarily reflect reality as deer are an integral component of the forest community.

Surprisingly, only a few investigations have been conducted that relate deer densities to forest regeneration, herbaceous composition, and interspecies relationships within various habitat types. Two such studies were conducted in the Allegheny hardwood association of Northwestern Pennsylvania. The first study was conducted by Tilghman (1989) using enclosures to describe the deer impacts on forest regeneration at 10, 20, 40, and 80 deer/mi². In the second study deCalesta (1994) used smaller enclosures to simulate deer densities similar to Tilghman's to study the browsing impacts on song bird species richness and abundance.

Tree species composition in the Allegheny hardwood association, as described by Tilghman (1989) is similar to the northern hardwood association found in DMU 121. Major components include black cherry, red maple, sugar maple, and American beech. Tilghman found that the maximum year-round deer density that would allow for desirable tree regeneration was approximately 30 deer/mi² in managed forests. deCalesta (1994), again in the Allegheny hardwoods of northwestern Pennsylvania, found that deer density had no effect on ground nesting and upper canopy nesting song birds. However, the threshold for reducing species richness within the intermediate canopy nesting birds lied somewhere between 20 and 38 deer/mi² in managed forests

In Pennsylvania, deer are distributed across the landscape year round. However, this is not the case in Upper Michigan. Winter migration to established deer yarding complexes is a highly developed trait within DMU 121. Deer yard maps, constructed for this unit show nearly all the deer concentrate into 27% of the landscape during the winter months. The movement into the winter yarding complexes typically occurs in mid to late December. Deer generally move out of those yarding complexes between March 1st and April 1st. As such there are approximately 3.5 months during which no deer are present on 73% of the landscape.

The addition of agriculture onto the landscape substantially increases the biological carrying capacity of the land. Even though deer densities may increase in landscapes containing agricultural activity, negative impacts associated with browsing on summer range do not necessarily increase proportional to herd density. When deer densities are kept in check, the presence of nutritious grasses and legumes associated with farming activity in a forested regime and can actually reduce browse pressure. Biologists in Wisconsin have estimated that the carrying capacity for their Eastern farmland region, which contains portions of the same ecological sub-subsection as DMU 121, at 68 deer/mi². In that region, Wisconsin aspires to maintain deer densities ranging of 35 - 40 deer/mi².

Rudolf (1950) as cited in *Deer Population goals and Harvest Management Environmental Assessment for the Wisconsin Department of Natural Resources* found little impact in Upper Michigan pine plantations when deer densities were in the vicinity

of 16 deer/mi². Also cited in the Wisconsin document was a study by Anderson & Katz (1993) which noted the presence of hemlock regeneration across size classes associated with deer densities ranging between 13 and 32 deer/mi².

Predator – Prey Relationships

In establishing Deer Management Goals, it is important to consider the impacts that predatory species may have on deer. DMU 121 contains resident populations of three principal carnivores (black bears, coyotes, and bobcats) that prey upon deer during at least a portion of the annual cycle. Additionally, although no wolves were recorded in this DMU during the 2004-05 winter track survey, they have been found in the unit during past surveys and undoubtedly do make treks through the unit

Black bears generally take neonatal fawns, but have minimal impact on older fawns and adults. Bobcats and coyotes can take neonatal fawns in the spring and have also been known to kill deer in the winter yards. Wolves will feed on deer year round.

Deer Management Indicators

DMU 121 was established in 2003 by subdividing the Garden, Stonington, and Nahma peninsulas out of DMU 021. This DMU contains the former DMUs 319, 321 and a small portion of 388. The 2003 Deer Hunter Survey contained mapping errors that resulted in unusable data. As a result of these factors, there is very little historical data available for tracking trends in this DMU.

Agricultural Crop Damage: There are approximately 23 square miles of agricultural related cover types in DMU 121. In 2003 a total of 122 antlerless deer (~ 5/ mi² of agricultural lands) were killed on 8 Deer Management Assistance Permits (DMAP's) and 11 Deer Damage Control Permits. In 2004, 110 deer were killed on 4 DMAP's and 12 on Control Permits. Crop damage is a moderately important issue and warrants monitoring. Increasing trends in crop damage permits will indicate a need for liberalizing antlerless harvest. Decreases in crop damage permits will indicate a potential need to become more conservative in antlerless harvest.

Deer Vehicle Accidents: This DMU comprises small portions of rural Delta and Schoolcraft Counties. There are no major highways within this unit and the density of roads that permit high speed travel is low. Given these factors, deer/vehicle accidents are not a usable metric in DMU 121.

Forest Regeneration Impacts: The Michigan Department of Natural Resources manages approximately 10,000 acres of State Forest Lands within this DMU. A large portion of that management process includes cutting and regenerating timber. Each timber stand is reviewed by foresters and biologists at least once every ten years. In their reviews, state foresters monitor timber regeneration. Deer yarding areas in the southern portion of the Garden Peninsula are showing signs of deer browse pressure. However, this level of browse impact is deemed acceptable due to the migratory dynamics of the local deer

herd. Currently, 27% of the DMU 121 landscape is classified as deer yard. This means that for approximately 3 to 4 months of each year, 100% of the deer in this unit congregate into 27% of the landscape. Reducing the deer population to a level that would eliminate browse pressure in the yarding areas would produce summer densities of approximately 8 deer/mi². Deer densities at such a low level would violate the social and economic sides of the ecosystem management triangle.

State lands outside of the winter deer yards do not currently exhibit browse damage. The Hiawatha National Forest manages substantial acreage in the Nahma and Stonington Peninsulas. We will continue to work with MDNR foresters and Hiawatha personnel to ensure adequate forest regeneration outside of core deer yarding complexes.

Additionally, we will look for innovative forest management practices within deer yards that will allow for timber regeneration without lowering the DMU deer density below acceptable levels. Wide spread reduction of forest regeneration due to browse pressure on summer range will signal that deer are above goal and liberal harvest management is needed.

Forest Herbaceous Impacts: With a few exceptions, there is little documented research that shows the impacts of various densities of deer on forest herbaceous species. However, some of the work that has been done shows an inverse relationship between high deer densities and the amount of flowering trillium and jack-in-a-pulpit in northern hardwood stands. The large, easily visible, flower on trillium makes it a fairly simple indicator to casually monitor. While the reduction of trillium in and of itself may not mean there are too many deer, combining the loss of trillium with obvious signs of extensive deer browse damage to woody species will provide further evidence that a liberal harvest is necessary.

Deer Hunter Success Based on Camp Survey: Since 1998, an average of 66 hunters has participated in this survey annually. Pertinent data collected include, buck hunter success rate, hunter days per buck killed, and daily deer sighting rates during firearm season. A buck hunter success rate of 22%, approximately 34 days of effort per kill, and an average of 2 deer sighted per day reflect the lowest herd size documented for this unit during the past 8 years. However, hunter satisfaction, as reflected in the camp survey, was reasonably good. Our experience with other DMU's with similar habitat suggest hunter satisfaction would decline precipitously if deer sightings and hunter success go much lower. Thus, the statistics shown above seem to us to be reasonable goals for deer hunting indicators. Increases in hunter success and deer sighting rates with a corresponding decrease in hunter effort per kill rate from the above levels will indicate the need for more liberal antlerless harvest. Conversely, decreases in hunter success rates and deer sighting rates with a corresponding increase in effort per kill will suggest a need for more conservative antlerless harvest.

The following table shows data from the deer camp survey that appear to reflect deer population levels and trends. Values for 2001 and 2002 are omitted because DMU 121 was incorporated into DMU 021 with no distinction in the data collected.

DMU 121 DEER CAMP SURVEY RESULTS

	1998	1999	2000	2001	2002	2003	2004
Number of Camps	13	11	15			20	19
Number of Hunters	59	51	62			83	77
Pre-hunt deer per sq. mi. (DMIS)					30	38	32
Percent killing a buck	22%	35%	42%			36%	22%
Days hunted per buck killed	29	16	13			22	34
Deer seen per hunter day	1.3	1.7	2.9			3.5	1.8

Deer Hunter Success Rates Based Upon Wildlife Division Surveys: DMU 121 has been in existence for only two hunting seasons. The 2003 data were unusable due to a mapping error in the survey. Nevertheless, the Wildlife Division survey appears to track fairly well with the results from the camp survey. In 2003 this survey showed a buck hunter success rate (all seasons combined) of 38% vs. 36% firearm season success from the camp survey. In 2004, the Division survey indicated an 18% success rate compared to 22% from the camp survey. We will continue to monitor this index. Substantial increase in buck harvest rate will indicate a potential opportunity to increase antlerless harvest. Substantial decrease will indicate a potential need to become more conservative with antlerless harvest.

Deer Population Estimates using Sex-Age-Kill (SAK): Population index values can be calculated for DMU 121 using sex-age-kill population reconstruction and several additional calculations involving legal harvest, over-winter mortality, and estimates of fawn production. Population reconstruction in DMU 121 can be difficult because bio-data is limited. SAK-based index values are available only for 3 past years (2002-04), so it is very difficult to select which value is most appropriate for a goal. Ideally, population index values would be available for a much longer time period encompassing both low and high deer herd levels. This would facilitate an informed decision on which index level would best meet the ecological, social, and economic aspects of deer management. Given the above discussions on ecological impacts and social factors (i.e. hunter success and deer sighting rates), we believe that an index value of 27 to 33 deer per square mile is an appropriate goal. This equates an index range of 7,700 to 9,400 deer within the DMU and represents the herd size that has been common during the past several years.

Winter Severity: Winter weather conditions, although generally milder than in other portions of the EUP, pose the biggest survival challenge to deer in DMU 121. Snow accumulation is the most limiting factor impacting deer populations in this unit. Correlation test between buck harvest and annual snow accumulation show that approximately 55 to 60% of the annual variation in buck harvest in the East U.P. is related to winter snow accumulation. The data suggest that an average of 26 feet of accumulated snow readings will result in a decreased buck harvest the following year. In DMU 121, we measure snow depths at Fayette. A seasonal accumulated total of 26 feet or more will indicate the potential need to become more conservative with antlerless

harvest. Lighter snow regimes will indicate the potential to maintain or liberalize the levels of antlerless harvest.

Proposed Management Strategy for Maintaining the Deer Population at Goal

The presence of agriculture and the relatively mild (by EUP standards) winter conditions, give the DMU 121 deer herd the potential to expand to numbers above ecologically and socially acceptable levels. Severe winter weather can and does result in density independent deer mortality. However, the level of winter mortality in DMU 121 is generally lower than is seen in other portions of the EUP. As such, antlerless harvest will play a larger role in our attempts to maintain deer populations at or near goal than in other EUP DMUs.

Continued habitat management and population regulation through antlerless harvest manipulation are the primary tools for moving deer populations toward goal.

Habitat Management: Winter food and habitat are the primary factors limiting deer herd density and physical condition in DMU 121. Deer utilize only about 27% of the landscape during the winter in this unit. It is highly important, wherever possible, to maintain closed-canopied conifer forests within deer yarding complexes. It is also important to conduct timber sale activities in these systems in such a manner to provide long-term high quality winter browse for deer.

In DMU 121, DNR land managers have a moratorium against cutting cedar and hemlock on State lands in winter yarding complexes. Timber sales on deciduous species are conducted within these complexes during the winter to provide maximum browsing opportunity. Those timber sales are designed to provide more available stems than the deer can consume, thereby ensuring adequate forest regeneration, while at the same time, providing a long-term food source. Oak, a relatively rare commodity in the EUP, is found on the northern portion of the Garden Peninsula. Management techniques will be employed to maintain and enhance this valuable source of hard mast.

Antlerless Deer Harvest

Deer Damage Control Permits: In DMU 121, these permits are primarily issued to owners of agricultural operations. These permits are issued on an as-needed basis and provide a good means for allowing individual land-owners to protect their investments. These tools are particularly valuable when the unit wide deer density is low, but locally there are enough animals to create crop damage issues.

Deer Management Assistance Permits (DMAPS): DMAP's are issued to landowners for use during regular hunting seasons. They are issued generally to farmers or to other private landowners who wish to undertake population control measures on their properties. DMAP's are issued primarily to address crop damage and safety concerns. However, DMAP's can be used to accomplish

landowner objectives when those objectives are consistent with stated deer management goals for the DMU.

Private Land Antlerless Licenses: Sixty-four percent of this DMU is privately owned. Generally speaking the privately owned lands within the unit contain more productive soils, especially in the farming areas, than the publicly owned lands. Deer densities are higher on the farm lands than on forested areas. Private land antlerless licenses are used when the population is close to or above goal. This tool allows landowners to thin the herd in areas where the local densities are higher than desired even though the over DMU may be slightly below or at goal.

Public Land Antlerless Licenses: Approximately 75% of this DMU is in forest or otherwise relatively unaltered vegetative state. Thirty-six percent of this unit is publicly owned forest land. Public land antlerless licenses can be used on public lands as well as those lands enrolled in the commercial forest act. These licenses are issued when deer densities are deemed to be at or above goal.

Antlerless Harvest Decision Making Process

We propose to utilize an adaptive management scheme in our antlerless harvest decision making process. This process will provide a transparent system with build in accountability for DMU 121 deer management. The tables below provide the metrics to be utilized in this decision making process.

DMU 121 ANTLERLESS HARVEST DECISION MATRIX

		Previous Year					
	Forest Regeneration Concerns	Camp Survey Hunter Days per Buck Killed	Camp Survey Buck Kill Success	Camp Survey Deer Sighting Rate/Hunter Day	Mail Survey Buck Kill Success	Deer Killed on D.C. and DMAPs	Predicted Pre-hunt Deer per sq. mi.
INDICATES LOW DEER NUMBERS	Low	> 35	< 20%	< 1.5	< 20%	< 50	< 27
INDICATES MEDIUM DEER NUMBERS	Medium	16 to 35	20 to 40%	1.5 to 3.5	20 to 40%	51 to 150	27 to 33
INDICATES HIGH DEER NUMBERS	High	< 15	> 40%	> 3.5	> 40%	> 150	> 33

Low Deer Numbers	Accumulated Snow Depth =	< 20 Feet 20 to 26 Feet > 26 Feet	Then Institute	Normal Framework Restrictive Framework Restrictive Framework
Medium Deer Numbers	Accumulated Snow Depth =	< 20 Feet 20 to 26 Feet > 26 Feet	Then Institute	Liberal Framework Normal Framework Restrictive Framework
High Deer Numbers	Accumulated Snow Depth =	< 20 Feet 20 to 26 Feet > 26 Feet	Then Institute	Liberal Framework Liberal Framework Normal to Restrictive Framework

A liberal framework would employ public and private antlerless licenses with a goal of harvesting 5 to 7 antlerless deer per square mile.

A normal framework would employ public and/or private antlerless licenses with a goal of harvesting 2 to 5 antlerless deer per square mile.

A restrictive framework would employ only private antlerless licenses, with a goal of 1 to 2 antlerless deer per square mile.

	Draft	Final Draft
Biologist	Terry R.Minzey	Terry R.Minzey
Management Unit Supervisor	Douglas C. Wagner	Douglas C. Wagner
Field Operations Supervisor		_____
Wildlife Division Chief		_____