



Department of Natural Resources: Deer Population Management

While DNR has upgraded its deer population model, more work is needed to enhance deer statistics, improve the goal-setting process, and develop a statewide deer management plan.

Key Facts and Findings:

- The Department of Natural Resources (DNR) carries out a range of activities across Minnesota to manage and conserve the state's white-tailed deer populations. With an estimated one million white-tailed deer statewide in 2013, deer are found in every county.
- In recent years, DNR has used more sophisticated methods to estimate deer populations, and implemented processes to update deer population goals.
- Staff from several DNR divisions are either directly or indirectly engaged in deer management; however, DNR does not have a formal deer management plan that defines DNR's responsibilities and prioritizes resources, goals, and objectives for managing deer.
- DNR's current model is sound and aspects of DNR's methods to estimate deer populations are commendable and align with best deer management practices; however, we identified weaknesses in DNR's statistical methods, data resources, records management, and validation of its deer estimates.
- In recent years, DNR has used more conservative deer permit area designations intended to limit how many deer hunters may kill, and to increase deer numbers in many areas. As of 2015, DNR estimates of deer populations and deer goals varied significantly around the state.

- DNR adopted a majority of local deer goals proposed by Deer Advisory Teams in recent years. However, team members had mixed opinions about representation of local interests; some members wanted fewer deer and some wanted greater increases in deer populations.

Key Recommendations:

- DNR should develop a deer management plan that defines and prioritizes DNR resources, goals, and objectives, and includes strategies to improve and maintain adequate deer hunting and wildlife viewing opportunities.
- DNR should improve its resources for estimating deer populations; specifically, DNR should conduct field research to collect and utilize more information about Minnesota's deer, and to validate DNR deer population estimates.
- DNR should improve its statistical methodologies, deer model data, and records management system to better simulate changes in deer populations and reduce the risk of staff mistakes.
- DNR should expand the data and information it uses and provides to Deer Advisory Team members when setting deer population goals. Such data would provide better insight on local deer environments, deer survival rates, deer impact on local environments, and individuals' perspectives about deer.
- DNR should continue with its process to update deer population goals across the state, as defined within a formal deer management plan.

Report Summary

In accordance with federal and state law, DNR must manage, preserve, and protect white-tailed deer for the benefit of all people of the state. For these purposes, DNR must acquire and improve land for public hunting, and for food and cover for deer. DNR also must enforce wildlife protection laws; prevent and control wildlife disease; and prevent and reduce damage or injury by wildlife to people, property, agricultural crops, and state forests and parks.

White-tailed deer roam across Minnesota's landscape and their travel patterns change over time. Further, deer can thrive in a range of environments, including urban and suburban settings and private landowners' backyards. Active deer management by DNR is needed because environmental and other factors do not necessarily result in deer numbers that align with public interests and wildlife conservation principles. DNR must consider societal desires and tolerance regarding deer in local environments, as well as limitations in the quantity and quality of food, cover, and water to support deer populations.

Deer management in Minnesota relies on hunting to adjust deer numbers toward preferred levels in local areas.

Minnesota's Constitution and statutes support the rights of Minnesotans to engage in recreational hunting. DNR uses two main administrative processes to guide its deer management decisions: (1) an annual process to determine hunting season regulations, dates, and other factors; and (2) a less-frequent process to gather public input when DNR sets longer-term deer population goals around the state.

DNR does not have a formal deer management plan that defines and prioritizes deer management resources, goals, and objectives.

DNR staff from several DNR divisions carry out activities that either directly or indirectly impact deer; however, DNR has not synthesized this work into a formal plan that defines DNR's purpose and objectives for managing deer. A written plan would help describe how DNR prioritizes deer goals relative to goals for other species—such as moose or elk—or for other purposes, such as the immediate need to mitigate deer impact in forests or long-term reforestation plans that might improve deer habitat.

Minnesota is a relatively large state, with a range of climates and ecological environments, a mix of public and private land, and varied public interests regarding deer. DNR directly administers just 10 percent of Minnesota's land area that might be considered natural deer habitat. A deer management plan would help lay out the range of actions needed to manage deer and help document and prioritize local issues, including areas of conflict about deer among private landowners and hunters. A plan also could lay out strategies to improve deer hunting and recreational opportunities in targeted public areas around the state.

For DNR staff, a written deer management plan also would more clearly identify DNR's priorities and long-term actions among DNR's divisions and wildlife regions. From the public perspective, a deer management plan would define expectations and help assess DNR's progress toward goals.

In recent years, DNR enhanced its administrative processes and resources to update deer population goals and manage deer.

In 2012, DNR re-implemented a standardized process to update deer

population goals for geographically defined local deer permit areas (DPAs). DNR enlists citizens to serve on its Deer Advisory Teams and propose desired goals and changes to the size of local deer populations. DNR uses the deer population goals when setting annual hunting season regulations.

Between 2012 and 2015, the majority of deer population goals set by DNR were to increase deer populations. DNR adopted deer population goals proposed by Deer Advisory Teams for 88 percent of deer permit areas reviewed in 2015; however, many members disagreed with the goals proposed by their team. A consensus among team members was reached for 33 of 40 DPAs. Some members wanted fewer deer, and some members wanted deer numbers to increase more than 50 percent over the next three to five years.

DNR in 2015 expanded the range of interests represented on Deer Advisory Teams to include area residents, hunters, farmers, foresters, and others. Members reported mixed opinions about the composition of their team. Many were satisfied, but some suggested that DNR needed an even broader representation of interests.

Aspects of DNR's methods to estimate deer populations were commendable and aligned with best management practices.

To help assess the size of and changes to deer populations around Minnesota, DNR in recent years improved its statistical model for estimating and forecasting deer populations. Specifically, DNR upgraded its technical capacity and methods for this purpose, and DNR's approach is more sophisticated than methods used in many other states.

Many factors affect the number of deer in the environment, including hunting, disease, winter severity, availability of food, and predation by other animals, such as wolves. In 2015, DNR used state-of-the-

art statistical resources and data that were sufficient for basic modeling purposes and appropriate for estimating deer in northern U.S. climates. DNR's methods in 2015 reflected other positive features, given the complex nature of this work.

DNR should improve its statistical methods and data to better simulate dynamics of deer population growth and to fully utilize its new model.

DNR's deer modeling compared favorably with certain best management practices, but several aspects fell short of expected methods. DNR has missed an important data source by not collecting and utilizing age data from hunter-killed deer. DNR's model has relied primarily on deer data reported by hunters, but not all deer that are killed are reported, or may be reported to the incorrect area. DNR did not have adequate documentation to support its estimates of non-registered and illegal killing of deer; in particular, why these estimates would not vary over time or around the state.

In recent years, DNR has addressed deficiencies in its deer model data; however, more work is needed to improve deer statistics and the goal-setting process. DNR also should modify its statistical methods to improve workflow, reduce the risk of staff mistakes, and better simulate a potential range of deer densities. From our findings, we could not determine whether actual deer numbers differed from DNR's published estimates.

DNR's recent aerial surveys of deer were scientifically sound and met or exceeded industry standards, but DNR's infrequent use of these and other surveys limited their value.

DNR recently improved some of its modeling data; however, the department did not sufficiently carry out some other activities that are considered to be best practices when implementing a new model. For example, DNR did not take steps to fully validate model results against independent

observations, such as those obtained from surveys of deer populations from helicopters. DNR surveys hunters and landowners as another resource for understanding deer populations around the state. However, DNR could improve its surveys by obtaining a broader range of public opinions.

For setting deer goals, DNR's information does not sufficiently address the availability of deer habitat and the impact of deer in local environments.

Since 2012, the information provided by DNR to Deer Advisory Team members has increased and evolved to include general educational materials, statistical data on deer and hunter success, and references to national and local research. DNR could compile and provide more information that provides context about available local deer habitat, such as trends in human population density and changes in land use. Other information would help assess the impact of deer on local environments, such as the number of deer-vehicle crashes or data on the impact of deer on forests, agricultural land, and state parks. Such information may help discussions about whether deer may be managed for higher or lower numbers in local areas.

Beginning in 2011, DNR generally used more conservative deer permit area designations that were intended to increase deer populations.

When compared with hunting seasons prior to 2011, DNR has reduced its use of deer permit area designations that allow hunters to shoot more than one deer. This approach was intended to allow deer populations to gradually increase in many areas, and generally aligned with recent deer goals.

Still, hunting and wildlife viewing opportunities vary significantly across Minnesota's varied environments. According to DNR, deer estimates ranged from 1 to 2 deer per square mile in some areas of the state, to 24 to 38 deer per square mile in one other area. The number of deer killed as reported by hunters during the 2014 hunting season also varied statewide, from 6,737 deer in one northwestern deer area, to 29 deer in one northern deer area. DNR season limits on hunting may impact reported hunter success; however, hunters reported harvesting 139,442 deer in 2014, the lowest in several decades. More work is needed by DNR to assess and manage deer populations in targeted areas across Minnesota.

Summary of Agency Response

In a letter dated May 19, 2016, Department of Natural Resources Commissioner Tom Landwehr concurred with the report's key recommendations. He agreed that "a formal deer management plan would help to define, clarify, and prioritize deer management goals, objectives, and resources." He wrote that DNR is currently "developing a process to complete a comprehensive deer management plan," and "will work to involve hunters and other stakeholders." He noted that DNR has already implemented some recommendations to improve the DNR's deer population model; however, "any additional research and model validation efforts should be limited to what is necessary...to effectively model and manage deer populations." He also wrote that stakeholders' desire for more local information about deer will likely outweigh DNR's ability to collect meaningful data at "the scale at which most people hunt or observe deer."

The full evaluation report, *Department of Natural Resources: Deer Population Management*, is available at 651-296-4708 or: www.auditor.leg.state.mn.us/ped/2016/deermanagement.htm