Council on Forestry
Issue Brief

Issue: Deer Population Management and Impacts on Forest Management and Ecology
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Issue Statement: Deer are a highly valued natural resource that utilize forests for shelter and food. However, high deer populations can negatively impact forestry, agriculture, and human safety. The WDNR practices and advocates sustainable forest resource management to provide a full range of benefits for present and future generations. Sustained high deer populations (overabundance) can impair the sustainability of other social, economic, and ecological benefits produced by the management of healthy forest ecosystems. Overabundant deer populations are interfering with the success of sustainable forestry practices in many parts of the state. Ideally, deer populations should be maintained at levels that do not compromise other benefits. However, deer population management is a complex social process with many competing interests.

Impact of Issue: The Wisconsin DNR Biodiversity Report (1995) and the Statewide Forest Plan (2004) have identified negative impacts of high deer populations on forest ecosystems. Overabundant deer populations can cause widespread damage to vegetation, local extirpation of plant species, alteration of habitat for other wildlife species, and ecological simplification. Regeneration of desired tree species can become untenable without the implementation of costly protection measures. In many studies, a common recommendation to minimize the negative impacts of deer overabundance is to maintain populations below 20 deer per square mile.

Forestry concerns – economic, social, ecological:

- Unsustainable forest management through regeneration failure.
  - In a 2005 reforestation survey of practicing DNR foresters, deer browse was identified as the most significant barrier to successful artificial regeneration; 81% of respondents identified deer browse as a problem.
  - Forest certification specifies regeneration standards. Deer browsing can result in regeneration failures that require corrective actions to maintain certification.
- Increased regeneration costs through regeneration failure, repeated silvicultural treatments, and expensive protection of regeneration
- Reduced tree growth rates and productivity through regeneration failure, unacceptable stocking of desired species, delayed establishment, and slower growth from repeated browsing.
- Altered forest tree composition through impacts on regeneration. Some species are killed by browsing while others are placed at a competitive disadvantage.
  Examples:
  - Hemlock and white cedar: these historically predominant species are very susceptible to browsing, and regeneration is often extirpated, resulting in a significant shift in ecosystem composition
  - Maples, birches, and oaks: regeneration often severely impacted, and can be eliminated under severe browsing pressure.
  - White pine: regeneration often impacted; reduced growth and extended establishment period
  - Red Pine: avoided at low deer populations with abundant food, but deer can cause significant damage when other food sources are lacking
- Altered composition of understory plant communities through browsing. At high deer densities, seedling and herbaceous plants can be extirpated, leaving only barren ground, grasses, or ferns. Lilies and orchids are particularly vulnerable.
- Altered composition of animal communities through alteration of plant community composition and structure

Other socioeconomic concerns:

- Deer-vehicle collisions
- Agricultural crop damage
- Browsing of ornamental plants
- Disease: lyme disease, chronic wasting disease, foot-and-mouth disease, bovine tuberculosis
- Exclusion of recovering moose populations

Background:

Benefits of deer

Deer are a highly valued natural resource, with near iconic status for many wildlife enthusiasts. For wildlife viewing, deer are the most popular species; for many people, deer bring life to the landscape. The deer hunting industry contributes about one billion dollars to the Wisconsin economy. Hunting also contributes over twenty million dollars to Wildlife Management, most of which benefits a wide range of species and habitats.

Historic populations

In Wisconsin, it has been estimated that white-tailed deer populations ranged from 5-15 deer per square mile prior to EuroAmerican settlement in the mid-1800s. Early deer populations were highest in southern Wisconsin, where vegetation (intermixed prairies, savannas, woodlands, and forests) and climate were more favorable. Deer populations were lowest in northern Wisconsin, where forests were dominant and climate was less favorable. In the 1920s, deer populations began to increase in response to legislative regulations that limited hunting and the habitat created by the young forest vegetation that developed following the cutover. Deer populations may have peaked in the north during the 1940s with an estimated 40-50 deer per square mile. Deer populations have remained relatively high in the north and have increased in the south, with yearly fluctuations due to weather, management, and habitat conditions. Populations reached a record posthunt level in 1995.

2004 populations

In 2004, posthunt management unit deer populations ranged from 9-67 deer per square mile of deer range, however population management goals ranged from 10-30 deer per square mile. Fourteen management units maintained populations below goals, whereas 107 units were above goals (57 units >50% above goals). In the fragmented farm-forest landscape characteristic of most of Wisconsin, deer populations were 56-137% above management goals. Statewide, the 2004 posthunt population was 51% above the statewide goal; this population was the fifth highest on record.

Deer management

Currently, statewide posthunt management unit deer population goals range from 10-30 deer per square mile. Deer population goals are recommended by the public based on consideration of social, economic, and ecological impacts, and these goals are then implemented by the Department. Forest impacts are considered in goal setting. Forestry interests have been invited and are welcome to participate in the goal setting process. The key to setting reasonable goals is to have a balance of stakeholders at the table during deer unit goal reviews.

Hunters play a significant role in determining deer population goals. Hunters like to see and shoot deer. If deer numbers are low, then hunters have limited success and are unhappy. If deer numbers are high, then hunters are successful, but their impacts on the deer herd may not reduce populations to desired levels. The Department has repeatedly proposed expanded gun hunting opportunities to help with herd control, but these proposals have generally been opposed by hunters. Examples of Department efforts to encourage increased deer harvest to reduce overabundant herds have included the October gun season and the earn-a-buck rule, which are unpopular with many hunters. Efforts to manage herds at goals often pits wildlife staff against the very people who pay their wages.

All Department Wildlife Management funds are from hunters; none comes from GPR or other stakeholders. Deer management and payment for deer damage to agricultural crops are funded entirely by hunters. If forest damages are also compensated, current funding allocations would be insufficient.

There is a statutory mandate for managing deer at levels that result in tolerable levels of agricultural damage and there is administrative code that sets performance measures for this impact. There is no such mandate or standards for forest damage. Further, there are no standardized measures or data for forest damage or silvicultural impacts by deer that can be considered in making deer management decisions.

Deer baiting for hunting and deer feeding for viewing are popular social activities. However, these activities likely cause increased deer survival and reproduction. In addition, baited or fed deer may become increasingly nocturnal, unevenly distributed, and inaccessible to hunters

Current deer habitat and carrying capacity can support deer populations much higher than management goals. Deer carrying capacities typically are 50-100% higher than management unit population goals. Currently, many management units are sustaining populations well above goals. The primary mechanism to reduce populations is hunting; this is the most feasible and effective management strategy in the short-term. The key to getting overabundant deer populations down to goals is to work with hunters and landowners (e.g. access).

<u>Landscape management trends as barriers to deer population management</u>
Fragmented landscapes, with a mixture of forests and farms, typical of Wisconsin, may be most susceptible to browsing impacts. High deer populations are sustained by agricultural crops. Deer seek shelter in the forest and continue to browse. High deer populations can decimate understory tree and herb populations.

Several trends in forest ownership and management are making deer population management increasingly difficult:

- Increased landscape representation of young forests and early-successional forests contributes to preferred deer habitat and increased carrying capacity
- Parcelization of large industrial forest land ownerships into many smaller nonindustrial private ownerships
- Forest development for residential use
- Leasing of forest land for hunting (limits hunting numbers)
- MFL exemptions for public hunting

Current Status: Deer impact forest composition and structure statewide. However, the significance of these impacts on forest management and ecology are highly variable at both large geographic scales and local scales. In some areas, forest regeneration of all but a few species (e.g. spruce) has become highly unlikely barring expensive protection measures. Some hardwood forests managed under uneven-aged silvicultural systems do not contain any successful regeneration of desirable species less than 10-15 years old.
Where impacts are significant, current management strategies include:

- Do nothing; hope for regeneration now or later.
- Intensive and costly techniques to protect regeneration, including fencing, tree shelters, bud caps, and repellants.
- Manage for species that either are more resistant (less palatable) to deer impacts (e.g. spruce, red pine) or that regenerate in large numbers (overwhelm) under even-aged systems (e.g. aspen).
- Alter silvicultural systems in areas with extensive forests. Even-aged management strategies may enable reproduction to temporarily overwhelm deer herds; however the success of this technique is not well established.

Alternatives:

1. Do nothing. Learn to live with large deer herds and simplified ecosystems.
2. Gather further data to document the problem (significant negative economic, social, and ecological impacts of maintaining large deer herds)
3. Advocate for reduced deer herds with the public (especially landowners and hunters), policy makers, and natural resources organizations and agencies
    a. Reduce population management goals to ≤20 in most management units
    b. Mange deer herd to achieve management goals
4. Encourage and participate in sustainable landscape management that integrates deer and forestry concerns into the development of socioeconomic and ecological goals and adaptive management strategies

Recommendations: 2, 3, and 4

Presentations: Research on deer management and socioeconomic and ecological impacts.
Impacts of deer overabundance on forest regeneration and ecology.
Deer management and environmental assessment.