



Department of Natural Resources
Section of Wildlife
500 Lafayette Road
St. Paul, MN 55155-4040

MANAGING YOUR WOODLAND FOR

White-tailed Deer



Managing Your Woodland for White-tailed Deer



White-tailed deer are Minnesota's most abundant and popular big game animal with a population of approximately one million. Through the early to mid-2000's, deer populations were at historic high levels and have only recently been reduced through liberal hunting regulations. They are found throughout Minnesota and thrive in many diverse landscapes across the state's more than 79,000 square miles. Deer are very adaptable and can be found in agricultural areas near river bottoms and in farm woodlots, in open grass and brushland landscapes, and in northern forests. An important aspect of maintaining desirable deer populations is employing a hunting season harvest strategy that targets antlerless deer, and by providing the proper habitat, or food, cover, water, and space. By learning about the basic habitat needs of deer, and through active habitat and hunting management, you can enhance your woodland for deer.

Deer populations are highest in diverse forested and in mixed farmland and forest landscapes. Specifically, this diversity is provided by the appropriate mixture or proportion of natural vegetation (herbs, shrubs, trees) and forest age or growth phases and structure. Periodic disturbance provides rejuvenation of young growth stages of vegetation, and habitat edge, which favors species such as white-tailed deer. In such habitats, aggressive antlerless deer harvest will likely be needed.

The early succession forests and open grassland and brushland favored by white-tailed deer were historically maintained by natural disturbance such as fire, forest diseases and insects, and windstorms. Today commercial timber harvests have replaced natural disturbance as the dominant method for creating early succession forest. Disturbance in grassland and brushland areas comes from farming activity, use of mechanical equipment for cutting, "shearing," and mowing of decadent and rank brushland areas, and prescribed or controlled fire.

Behavior and Home Range

White-tailed deer make seasonal changes in the use and size of their home range in response to changing weather, food availability and cover needs. In Minnesota's northern forests an adult doe's seasonal home range is between 120-900 acres. Yearling does establish home ranges near their mother, while yearling bucks are more likely to establish home ranges some distance from their mother's home range. In late summer, adult does, fawns, and yearlings gather in social groups, staying together through the winter and spring.

Adult bucks occupy 300-1,300 acre home ranges and expand their home ranges during the fall rutting season. Bucks generally live separately except during the fall mating season when they may travel extensively.



Seasonal Behavior and Habitat Relationships



Spring

As the snow melts, deer move out of winter cover into edges and open areas to feed on green growth. To recover from winter stress, deer need protein-rich, easily digestible green food. Deer commonly appear on roadsides, forest openings, and in fields during the spring, where the first green vegetation is available.

Summer

During the summer months, good nutrition is important as young deer grow, adult does produce milk, and bucks grow antlers. Summer is the season of plenty as deer feed on grasses, buds, blossoms, and leaves of a variety of green herbs, shrubs and trees. Plants selected include asters, clovers, alfalfa, sumac, goldenrod, bush honeysuckle, jewelweed and various shrub and tree leaves. Preferred food plants are found along forest edges and in open growing deciduous and coniferous forests. In late August, deer begin to store energy and fat, and velvet is shed from buck's antlers.

Fall

Deer continue to feed heavily as they build up fat reserves and store energy in preparation for the breeding season and stressful winter period that follows. The availability of nutritious foods in fall determines how much fat the deer can store for the coming winter. By late October, bucks are in the rut, sparring with small trees and other bucks. They also paw "scrapes" on the ground to declare dominant buck territory and advertise their presence to does for breeding in November. As vegetation goes dormant and "browns out," deer seek out green vegetation in open areas. They are often observed in fields and roadsides during this period feeding on herbs and grasses.



For more information

Through the Division of Forestry's or the Division of Fish & Wildlife's Private Lands Programs, the Department of Natural Resources can help you take an inventory of your property and develop a plan for multiple use management, including wildlife habitat, timber stand improvement, timber harvesting and recreation. DNR specialists can provide technical advice for landowner participants. Contact a DNR Private Lands Wildlife Specialist for technical assistance, a DNR Forester, or a private consulting forester to have a Woodland Stewardship Plan prepared for your forestland.

Contact your DNR Private Lands Wildlife Specialist today for technical assistance:

www.mndnr.gov/privatelandsprogram

Contact a DNR Private Forest Management Forester to have a Woodland Stewardship Plan prepared for you forestland:

www.mndnr.gov/grants/forestmgmt/stewardship

For information and materials on natural resources, or DNR facilities, services, and regulations, contact:

DNR Information Center

500 Lafayette Road
St. Paul, MN 55155-4040
651-296-6157

info@dnr.state.mn.us

Toll free in Minnesota, 1-888-MINNDNR (646-6367)
TTY/Telecommunication Device for the Deaf, 651-296-5484 or toll free: TTY: 1-800-657-3929.

mndnr.gov

Additional DNR Publications:

- Helping Landowners Help Wildlife
- Lakescaping for Wildlife and Water Quality
- Landscaping for Wildlife
- Managing Your Land for Brushland
- Managing Your Land for Woodcock
- Managing Your Woodland for Ruffed Grouse
- Managing Your Woodland for Wild Turkey
- The Benefits of Prescribed Burning on Private Land
- Woodlands and Nongame Wildlife

S. Caron, editor



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deciduous-coniferous forest harvest areas, do not harvest smaller balsam fir (<6 inches DBH and <35 feet in height). Consult a professional forester for technical assistance.

- **Jack pine.** Jack pine forests with significant canopy closure and associated shrubs (deer browse) provides winter cover for deer. Maintain 50 percent of area being managed for as long as feasible. Use harvest methods to promote natural regeneration of jack pine. Consult a professional forester for technical assistance.
- **Wintering areas.** Manage the edges of winter cover strictly for browse production (50 foot wide area with trees and brush less than 15 feet tall) so deer don't have to travel far to obtain their daily winter feeding requirements.

General Forest

- **Biomass Harvest.** Considerations are site dependent. Utilize tops and slash that accumulate at log landings. Do not utilize downed large coarse

woody slash, debris, logs, or snags and reserve trees in harvest areas for biomass.

- **Old fields and forest openings.** Maintain old fields and forest openings in herbaceous cover by mowing, hand cutting, or controlled burning.
- **Conifer planting in old fields.** Red, white and jack pine and white spruce establishment on your woodland can be compatible with deer habitat management. Do not plant trees in small fields and openings. Plant conifers in blocks in larger fields, leaving some area in herbaceous cover.
- **Conifer under-planting.** Planting seedlings at standard densities to eventually convert a tract of aspen forest to long-lived coniferous forest (e.g. white pine) may be compatible with white-tailed deer management, but is not recommended in forests being managed for ruffed grouse.
- Consult and follow Minnesota's "Voluntary Site-Level Forest Management Guidelines."

Winter

Deep snow winters of 100 or more days can cause hardship for deer. Gradual reduction in daylight hours triggers changes in the deer's metabolism and coincides with lower availability of green and growing food sources. They enter a period of semi-fasting that results in lower food needs. Whitetails are adapted to using dormant vegetation and buds of a variety of shrubs and young trees during the winter period. White-tailed deer behavior and winter habitat use is variable from year to year depending on the date that significant snowfalls begin, accumulated snow depth, and the length of the deep snow period.

In years when snowfall comes late and remains relatively shallow, deer may not shift their home ranges and will remain spread out on the landscape. In winters when significant snowfalls of approximately 12 inches or more accumulates, deer begin a "migration" to winter habitat complexes. These wintering area complexes have heavier mixed deciduous and coniferous forest and swamp conifer areas where deer begin to concentrate or "yard." These migrations by individual deer may be from 1 or 2 miles to 12-15 miles. During severe winter weather deer seek out thermal shelter and prefer to remain in conifer cover instead of expending energy looking for food.

Preferred winter foods include acorns, dogwood, mountain maple, white cedar, ash, willow, and hazel. Woody browse is nutritionally inadequate to maintain a deer's body weight over-winter.

Although deer need good fat reserves to survive most winters, browse within wintering areas gives deer the best chance for survival because it slows weight loss. Plots of un-harvested corn provide good winter food in agricultural areas, and they will also continue to paw through snow to access waste corn and stubble, and alfalfa.

A combination of deep snow and cold temperatures over a long period drains a deer's energy. A severe winter often causes malnutrition, and combined with a late spring green-up, may cause starvation and lower fawn production. Periodic severe winters have contributed to fluctuating deer populations in northern Minnesota. Supplemental feeding of deer is not recommended and should not be viewed as a replacement for good habitat.



Mixed aspen-balsam fir. Good winter habitat for deer.



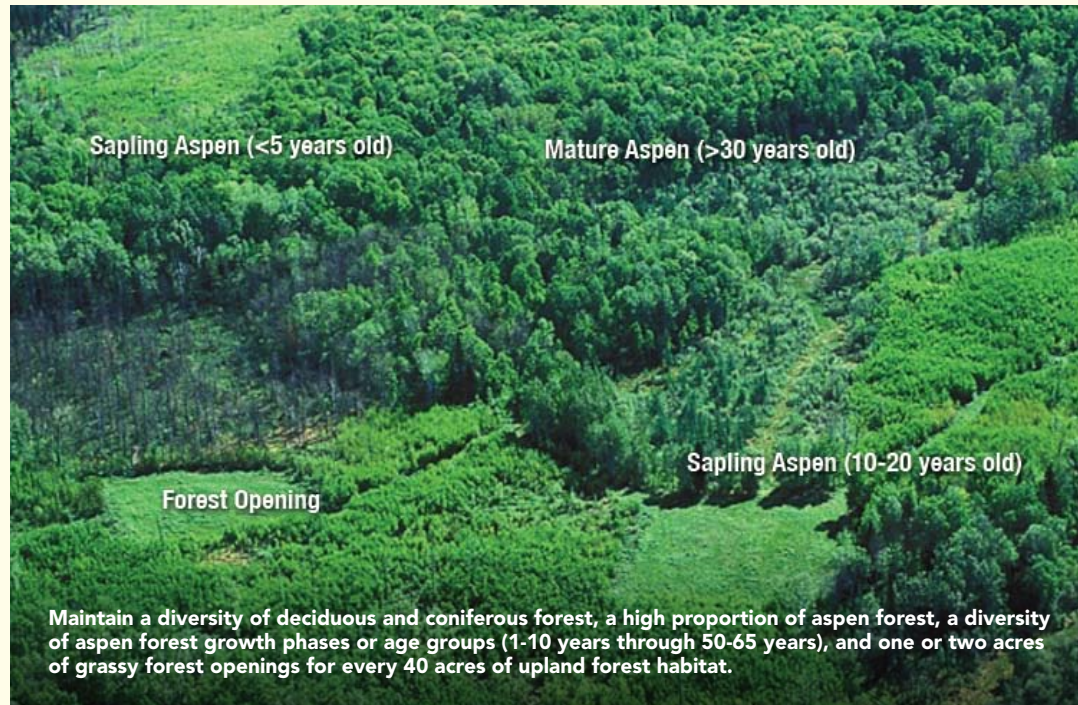
Recommendations set forth in this brochure are intended to assist landowners in forested areas in meeting goals to provide optimum habitat for white-tailed deer. However, every forestland owner should consider the larger context of the landscape where their land is located. There are trade-offs to every management action (including no management) in forest eco-systems. Deer are a very adaptable species and high populations can have negative consequences on your property and adjacent landowners. Before managing your woodlands for deer, consideration should be given to impacts on adjacent lands. Also, a hunting harvest plan should be established where deer are subjected to annual harvest so they do not increase beyond the capacity of the land.

Deer are wide-ranging animals, and you may not be able to provide for all their needs on your property. Your efforts will be best rewarded if you assess the habitat on your land and nearby properties. The surrounding forest habitat, within about a two-three mile radius of your property, will influence the management of your property for deer.

Decide which habitat components are in the shortest supply, such as young regenerating forest, grassy openings, acorn production, or winter cover, then provide that habitat on your land.

Habitat management for deer will also benefit ruffed grouse, woodcock, sharp-tailed grouse, and many nongame wildlife species associated with the early developmental or succession growth stages of open brushland and mixed deciduous forest habitat.

Invasion of *European buckthorn* into oak and other hardwood woodlands is common throughout Minnesota. It out-competes and eliminates native under-story plants and degrades woodlands. Efforts should be undertaken to monitor your woodland for this invasive and exotic species. If found, implement aggressive control measures. If European buckthorn is present and unmanaged, it has the potential to dominate a woodland over time, which will reduce its value for white-tailed deer and other wildlife.



Aspen Forest

- Maintain 3-4 age classes of aspen with 20-25% in young (<10 years old) growth stage.
- Harvest trees in smaller blocks (< 10 acres) if ruffed grouse are a priority wildlife management goal.
- If your aspen is over 65 years old, harvest the tract now. Aspen loses the ability to sprout as it gets past this age. If aspen dies on the stump it will be replaced by another forest type. Reserve small patches or strips in harvest areas >40 acres.
- Reserve 2-6 scattered individual snag trees (standing, dead or dying hardwoods) or patches of trees for dens, cavities, perches, and feeding sites for use by other wildlife.
- If the area around your property has been recently cut (within 1-5 years), delay harvest on your property until the adjacent cuts are 10 years old. If the surrounding forest is mature, you should begin harvesting your aspen as soon as possible.
- In aspen forest tracts that are uniformly in the sapling stage (10-20 years old) consider providing age class diversity by cutting strips or patches in one third of the area.
- **Aspen Forest Thinning:** Not recommended in tracts less than 25 years old being managed for ruffed grouse. Commercial thinning performed in tracts older than 25 years should include aspen reserve areas that are not thinned.

Aspen-Hardwoods-Brushland

- **Openland Habitat.** In portions of northern, northwestern, and east-central Minnesota, openland habitat management is a priority for species such as sharp-tailed grouse and sandhill crane. Aspen woodlands and brushland areas are managed to promote young growth stage of trees and shrubs intermixed with grasslands. This management is compatible with and enhances deer habitat in these

areas. Consult the local DNR area wildlife manager to discuss how your land fits into larger landscape management.

- **Brushland (Shrubs).** Shrubs, especially dogwood and willow, are preferred winter food for deer in northwestern Minnesota. Tall dense shrubs can be rejuvenated by timber harvest activity, shearing, mowing or rotary-axe.

Oak -Hardwood Forest

- If oak seedlings are not present perform “shelterwood” harvest.
- If oak seedlings are present perform small patch clear-cuts in mature forest.
- Implement timber harvest in oak following good acorn production.
- In mixed oak-aspen tracts reserve mature aspen clumps in oak clear-cuts.
- In mixed aspen-oak tracts perform small patch clear-cuts and reserve oaks.
- Improve acorn production by performing selective tree removal around good acorn producing oaks.
- Plant acorns or oak seedlings in open growing hardwoods or old field.
- Consult with a professional forester or wildlife manager concerning the need and procedures for conducting prescribed burning on your oak forest or woodland.

Conifer Forest

- **White cedar.** Don't harvest white cedar. It is an important winter cover forest type for deer. It is difficult to regenerate after it is harvested.
- **Balsam fir.** Mixed aspen-balsam fir that contains at least 8 cords per acre of balsam fir should be managed to maintain and perpetuate winter cover values for deer. Maintain 50 percent of an area being managed as cover for deer, for as long as feasible. Within mixed

Open Areas in the Forest Landscape



Open areas are an important component of good deer habitat. Grasslands, brushlands, clear-cuts, natural canopy gaps, young pine stands, agricultural lands, wetland edges, frost pockets, forest roads and trails, and rock outcrops within the forest landscape can all provide important herbaceous food sources that are used by deer, especially in early spring and late fall.

The DNR no longer recommends creating new permanent forest openings in the northern forest. If your land currently

includes any permanent old fields, managing these fields can benefit deer and other wildlife such as woodcock. Mowing or burning these fields will keep them open and attract deer. While disking and planting to agricultural crops will certainly attract deer and provide good harvest opportunities, this practice should be used cautiously. Soil disturbance may make these areas vulnerable to invasive species that could affect the long-term health and productivity of your forest.

Improving Deer Habitat

In the northeastern third of Minnesota, mixed aspen forest is the most important forest type for deer. Other important types are oak, balsam fir, jack pine, birch, upland brush, white cedar, and balsam poplar. Deer use jack pine forests as both summer habitat and in some cases as winter habitat in northern Minnesota. White cedar and balsam fir are very important for winter deer habitat as well. Mixed aspen-northern hardwood forests and woodlands in the transitional deciduous forests in extreme northwestern and central portions of the state are the most important forest types for deer. In the far southeastern portion of the state oak and mixed deciduous forest are the most important forest types. During most of the year, deer prefer edges, young forests, and open areas for feeding. Although deer are adaptable, they require periodic disturbance in their environment. Timber harvesting is the best and the most economical method of creating this habitat.

Timber Harvesting



Aspen Forest

To improve aspen and mixed aspen forests as deer habitat, a portion should be clear-cut periodically to set growth back to the aspen sprout stage. Clear-cutting removes the tree canopy so that sunlight, heat, and rain penetrate to the forest floor stimulating plant growth. Clear-cutting can be accomplished with a commercial timber sale which benefits wildlife and provides you with income. The boundaries of a timber sale do not have to be straight lines; the shape can follow topography or other natural features. Leave tight clumps of balsam fir or jack pine un-harvested for use as winter cover. Areas of new forest growth scattered within a deer's home range provide good deer habitat for 10-15 years.

Whitetails respond best to timber management that maintains a proportion of young, intermediate, and mature growth stages or age classes. Forest "stand" harvest in aspen-birch forest is an appropriate option for deer. To improve habitat for deer and ruffed grouse, harvest timber in patches or units 10 acres or smaller in aspen-birch and northern hardwood-oak forests.

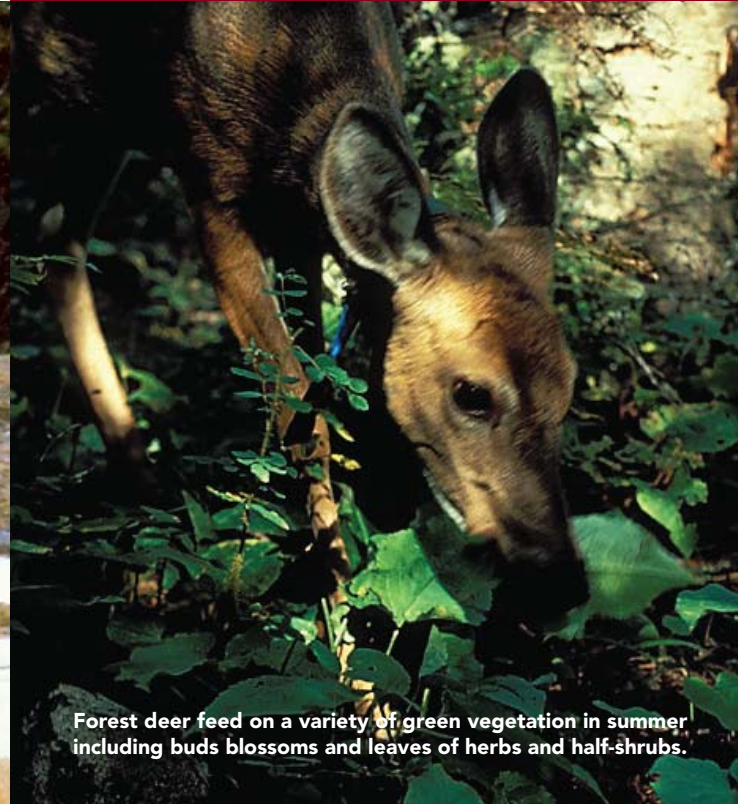
Oak-Hardwood Forest

Oaks and other hardwood species are more predominant than aspen in the hardwood forests of southeastern Minnesota. The goal is to maintain or perpetuate the oak or mixed oak woodlands by active management. These forest types can be difficult to manage. Challenges include disease outbreaks, excessive deer browsing of seedlings, and hardwood regeneration failure. Consult a resource professional to manage oak and other hardwoods in your woodland.

Oak management is influenced by the quality, condition and age of the trees present. The proportion of oak



Open grassy areas are important food sources for deer in Spring.



Forest deer feed on a variety of green vegetation in summer including buds blossoms and leaves of herbs and half-shrubs.

reproduction (saplings) will be determined by other trees or shrubs that are present, soil type and woodland size, and current oak distribution of your oak woodland and (oaks scattered throughout the stand or growing in clumps). A mosaic of small (about 10 acre) regenerating cuts dominated by 5-15 foot tall oaks will allow perpetuation of oaks in your woodland.

Oak harvest strategies need to focus on reserving three to six large mast producing trees per acre to supply the important acorn crops as deer food sources and a seed source for oak regeneration. Some middle-aged oak and (if present) hickory trees should be reserved from harvest to provide future mast crops. Combined with a proper regeneration strategy, this will provide a perpetual supply of mast.

Smaller cuts or harvest areas also stimulate under-story vegetation such as fruit and berry producing shrubs, and forbs (herbaceous plants) which provide additional wildlife foods. Dense stands of younger trees can sometimes be thinned to promote acorn production and tree growth. Thinning the canopy near forest edges can promote under-story growth.

There are two methods that will produce young saplings to provide the mix of food and cover used by deer. The option you use depends on whether there already is oak regeneration (small oak trees) in the area, and the age and condition of the trees. Do not harvest oaks without professional advice. To do so invites regeneration failure.

Shelterwood Cuts – oak seedlings absent

Where oak seedlings are absent, a series of partial cuttings or thinning are applied to the woodland to open the canopy and allow acorn germination. Remove up to 40 percent of the canopy to encourage seedling growth. When saplings are established, in about 5 years, remove the remaining canopy to expose emerging seedlings to the sunlight they need.

Clear cuts – oak saplings are present

If oak saplings are present, clear cut 10-15 percent of the mature trees every 5-10 years, in small scattered cutting blocks. Reserve 3-6 oak trees per acre in a cutting block for acorn production. Clumps of oak or aspen saplings more than 3 feet tall should be left standing in clear-cuts.

Competition with other trees may cause oak regeneration failure. This makes regenerating oak difficult. If unmanaged, oak stands may succeed to another forest type of less value to white-tailed deer and other wildlife. Always consult a professional forester when planning a timber harvest in oak.

Oak is mature at about 90 years of age. After they reach this age, oaks will not sprout or regenerate as vigorously. This makes regenerating over-mature forest more difficult. If unmanaged oak stands will succeed to another forest type and likely be of less value to white-tailed deer and other wildlife.

Since most oak forests are dependent on fire, you should consider conducting prescribed or controlled burns as part of your long-term oak management plans. Correct application of fire will improve long-term sustainability and regeneration of your oak woodland. Contact a natural resources professional for advice.

Deer densities in your area may also influence your ability to regenerate oak (and other preferred browse species) in your woodland. Oak regeneration may be very difficult in areas with densities at or exceeding 15 deer per square mile, especially where disturbance from fire cannot be re-introduced into the stand.



Winter Cover



In northwestern, central and southeastern Minnesota, deer seek out and use closed canopy mature aspen and mixed deciduous forest and woodlots for winter cover. Food plots in these areas located near south and southwest facing slopes will receive the most activity by white-tailed deer.

In northern forests, deer need conifer or “evergreen” forest types as winter cover. Because deer are capable of moving several miles or more to reach suitable winter cover, each parcel of land does not need to provide winter cover and evergreens should not dominate forests being managed for deer. In the northern forest region of Minnesota, quarter township size areas (5,000-6,000 acres) should consist of ten to twenty percent or 500 to 1,200 acres of coniferous winter cover.

In this mixed deciduous-coniferous forest region, deer select winter cover that includes evergreen stands with closed canopies for protection from the deep snow, cold, and wind. This snow shelter and thermal protection is preferred over areas that contain abundant browse but little cover.

White cedar forest provides the best winter cover in northern regions and should not be harvested because it’s difficult to regenerate. Cedar is a slow growing long-lived tree and cedar can provide good cover for deer for up to 200 years. Many cedar “deer yards” in northern Minnesota have documented use by deer for decades.

If cedar is not available, balsam fir, mixed aspen-balsam fir, and jack pine stands provide important cover and should be harvested in blocks at intervals to avoid removing all winter cover from an area. Where aspen or birch stands contain good understory of cedar or balsam fir, consider harvesting these areas at an advanced age to allow the evergreens to reach merchantable size and provide an additional 15-20 years of winter cover. In areas lacking winter cover, mixed stands should be managed for understory evergreen species to provide needed cover.

Conifer Management

White cedar should be rarely or ever harvested because of its high deer habitat value and lack of regeneration. Balsam fir should be managed for deer winter cover as a co-dominant and under-story in mixed deciduous/coniferous forest types. Small clumps of mature balsam and intermediate aged balsam can be reserved from harvest. Jack pine management should include timber harvest strategies to preserve deer winter cover needs and to promote natural jack pine regeneration from seed. Long-term perpetuation of the jack pine forest type is important to whitetails and other wildlife species in northern Minnesota. Reserve 2-6 standing dead and live snag and den trees per acre during the timber harvest to provide habitat for other wildlife species that use mature trees as perching, nesting, denning, and feeding sites.

