

MICHIGAN DEPARTMENT OF NATURAL RESOURCES

INTEROFFICE c oMMUNICATION

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TO: Ned Caveney, Field Operations Supervisor
District Forest Managers
Area Forest Managers
District Wildlife Supervisors
Wildlife Habitat Biologists

FROM: Gerald J. Thiede, Chief, Forest Management Division
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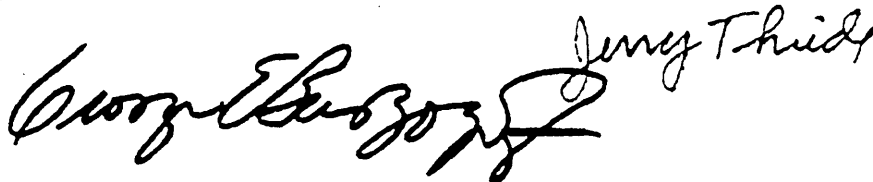
SUBJECT: Guidelines for Managing Dead Wood to Enhance Biological Diversity on
State Forest Lands

Attached are "Guidelines for managing dead wood to enhance biological diversity on state forest lands." These guidelines were developed by Robert Hess and William Mahalak and reviewed by selected individuals within both Wildlife and Forest Management Divisions. It has also been reviewed and approved by the Chief of Safety Standard, Department of Labor.

The goal of these guidelines is to improve forest resource management, by promoting diversity and improving habitat for certain wildlife species. Much can be achieved using these guidelines to reduce the impact of utilization in the state forest. They contain a variety of valuable management recommendations and suggestions. The diverse Michigan landscape may require adapting these guidelines further to address specific situations for managing dead wood. Many of these guidelines are already being implemented by Forest and Wildlife Managers.

Should you have any questions regarding these guidelines, please feel free to call Bob Hess or Bill Mahalak.

GJT/GB:bjc
Attachment



George Burgoyne
Gerald J. Thiede

Guidelines for Managing Dead Wood to Enhance Biological Diversity on State Forest Lands

Dead standing snags, downed woody debris, and dying trees are valuable components of all forest communities. They add important structural diversity which in turn adds significantly to the biological diversity of Michigan and its forest lands.

Over 40 species of Michigan birds and mammals use tree cavities commonly occurring in standing snags and den trees. Dead and downed woody debris provides escape cover, feeding areas, roosting sites, and breeding and brood rearing areas for a striking variety of wildlife: from shrews and bats to chipmunks, rabbits and bears, salamanders and tree frogs, woodpeckers and chickadees, fishers and pine martens, ruffed grouse and barred owls. Larger dying trees offer similar benefits. They often have cavities, dead tops, or other characteristics common to snags and typically have greater longevity than standing dead trees.

Hundreds of smaller life forms including insects, centipedes, snails, mushrooms, lichens, mosses, higher plants, and microorganisms utilize the organic matter and nutrients provided by dead or dying trees and coarse woody debris. These species add to local diversity and are key players in decomposition and nutrient recycling processes.

In addition to their value as nest and roosting sites, snags and downed wood are heavily used by many birds as forage sites. Ants, spiders, moths, beetles, and many insect larvae use the complex habitat provided by bark and crevices.

Because most cavity nesters are insectivores, they are helpful in reducing populations of insect pests which damage or kill trees. Leaving snags or providing mature forest habitat for cavity nesters, thus, has economic advantages.

Forest treatment proposals and timber sale specifications should be designed to conserve and enhance these important habitat components. Standing snags, den trees, dying trees, and downed woody debris should be protected whenever practical and desirable.

Partial Cuts

Conserving snags and woody debris can be most readily accomplished in stands where selection or partial cuts (uneven-aged management) are being prescribed. In this treatment, dying, dead, or den trees can be conserved simply by leaving them unmarked. The amount of downed, woody debris can be reserved and augmented by cutting specifications which preserve existing dead and downed wood and require that tops of harvested trees be left in the woods, or, in some cases, by killing poor quality trees and leaving them either on the forest floor or standing to fall on their own.

Reserving a combination of at least four snags and den trees per acre from the selection cut is generally regarded as a minimum. Four to ten per acre is more optimal for wildlife. Leaving a range of diameter classes is preferable. Generally, the larger the tree, the better the snag. Leaving a variety of tree species (softwoods and hardwoods) also is desirable. A simple approach would be to let the species composition of reserve snags reflect the species composition of live trees in the stand.

It should be recognized that the process of some trees dying is a normal continuous part of stand dynamics even in managed stands. Many snags develop naturally on each acre between 10- or 20-Year cutting periods.

Reserving uncut patches of mature trees within managed stands of northern hardwoods has been promoted as an economical way to maintain clumps of conifers and mast producers and to develop den trees, snags, and down woody debris. The patches can be as small as a few trees or as large as an acre or more. The patches would remain uncut for many cutting cycles. These could also be chosen to protect steep slopes, wet areas, or vernal ponds.

Residual chipping of tops from harvested trees is becoming more common. This tends to remove valuable organic material and habitat; leaving tops should be encouraged. Especially near vernal ponds, streams, and other aquatic habitats.

In young pole stands where few dead trees exist, retention of some short-lived tree species such as aspen, black cherry, and white birch will provide for future snags and den trees. This will help maintain stand diversity and, thereby, biological diversity. This would be important in young hardwood stands, oak stands, pine plantations with hardwood present, or perhaps older stands that have been intensively managed in the past.

Selecting leave trees that are "defective" will minimize economic loss. For example, trees can be selected that are poorly formed, show decay by the presence of fungal conks, or have broken branches or other injuries prone to fungal infection.

In stands where heavy mortality has occurred, salvage cuts should be designed to leave some dead standing trees and dead and downed wood. This would be most important in large acreage salvage cuts. The option of leaving some potential salvage sales unharvested should also be considered.

Clearcuts

Leaving snags in clearcuts, or managed even-aged stands, complicates sales and may be more costly if leave trees need to be individually marked. Cutting specifications can be written requiring that all standing dead trees, or those greater than 6 inches in diameter, be left standing, and that dead and downed trees, and snags or hazard dead trees cut for safety reasons, be left onsite.

Whole tree chipping is becoming more common. On some area forests it is the norm. Aspen, jack pine, and oak clearcut areas are often devoid of dead wood and snags following whole tree harvest. Many species including bluebirds and kestrels will use cavities in snags left in open habitat created by clearcuts. They may not use these areas if snags are not available. Many songbirds will use leave trees or snags as territorial singing posts or as feeding perches for hunting insects.

In clearcuts, snags and dying trees may be provided for by excluding a fringe of trees along the stand edge when marking sale boundaries, or marking clumps and patches of short-lived tree species. Leaving variable width buffer zones along wetlands, small streams, and vernal ponds will add structural diversity as leave trees die and fail. Fallen leaves and organic material from the buffer zone add valuable carbon and other nutrients to these aquatic systems. Coarse, woody material also provides habitat structure necessary for many types of aquatic and wetland species. In some locations, cutting to the water's edge may benefit certain wildlife and plant species.

Safety Considerations

Human safety is an important consideration when making decisions on managing snags and woody debris. Contractors should be allowed to fell certain snags that they judge to be a hazard. In keeping with MIOSHA guidelines, hazard trees should be felled by machine, with the operator enclosed in a safety cab or operator's compartment. Such felled snags should be left as woody debris. Dangerous snags are generally those that are tall, have large limbs, and have been dead for a long time, leaving them unstable.

MIOSHA does not require that all snags be removed from a sale area. MIOSHA inspectors indicate that it is up to the employers (timber contractors) to use good judgment regarding which snags employees may work near or which snags they must either fall or work a safe distance from. Timber markers need to evaluate each situation, but **it is the timber producer or contractor who, under MIOSHA, is legally responsible for making decisions on whether a tree is safe to cut.**

Safety conditions may sometimes be a reason to not leave snags or downed tops along recreational trails, public roads, and other sensitive human use areas. Snags and large downed tops left in these more accessible areas may stimulate requests for fuelwood permits or create a visual concern. However, snags are sometimes visually appealing or provide an opportunity to educate the public on the values of deadwood.

Safety concerns from standing dead trees left on the sale may be greater in partial or thinning cuts, especially those with high quality logs, since these are typically cut manually by chainsaw operators. Clearcut operations are more likely to be mechanical and operators more likely to be enclosed in a safety cab. For the same reason, snags left on clearcut areas that will later be planted to pine by mechanical planters pose less concern for safety than those left on clearcut areas that will be planted manually.

If a particularly valuable snag, den tree, or clump of trees is selected; it may be desirable to not mark any trees in the vicinity of the leave tree and defer treatment in the immediate vicinity to the next 10- or 20-year cutting cycle.

Leaving relatively sound, poor quality trees that are nearly dead, or can be girdled, may also be a safer alternative.

Additional Considerations

Diversity is important. Snags and downed woody debris are valuable and will be used by wildlife in virtually every habitat type. However, all snags are not created equal. Size, height, location, tree species and degree of decay are all important considerations when writing cutting specifications.

Leaving a diversity of different diameter classes of snags and den trees is important because it meets the needs of a wider variety of wildlife. Red breasted nuthatches or chickadees will excavate or use a cavity in a snag that is less than 6 inches in diameter. Larger animals such as squirrels, wood ducks, raccoons, pileated woodpeckers, and fishers need larger snags which will have larger cavities; **often** in the 20-inch and above diameter class. Small wildlife species also use large cavities.

Bigger is better. Because more species can use larger cavities, a large snag is generally considered more valuable than a small snag. Also, when large snags fall, they leave more woody debris, last for more years, and are used by a greater variety of species than small snags.

Consider height. Studies have shown that tall snags are used more readily than short snags of the same diameter, presumably because higher cavities are less accessible to ground predators and taller trees offer more lineal habitat. This must be balanced by safety considerations since taller snags may pose greater hazard to timber operator employees.

Leftovers from cutting operations. Woody debris resulting from cutting operations, such as chip piles and slash left at a landing site, provides good habitat for small mammals, amphibians and reptiles, and many smaller life forms mentioned earlier. Decomposition increases internal temperatures of chip piles attracting invertebrates, salamanders, and many snake species such as ring-necked snakes. In some instances, and where visual management is not of prime consideration, leaving leftover chips in deep piles, 3 feet or more, will increase their longevity and short term benefits to wildlife. Woody debris may also act to protect soil from wind and water erosion.

Protection for plants and tree reproduction. Leaving tops and down woody debris will protect many small plants and tree seedlings from overbrowsing by herbivores such as deer and elk. Lopping of tops tends to eliminate this value and shorten the longevity of the woody debris.

Look beyond the stand level. When assessing the relative importance of leaving snags and woody debris, it is important to study the surrounding landscape and adjacent cover types. This will help determine appropriate numbers, sizes, and species mixes of snags to leave and where to leave them.

A compartment and adjacent land or compartments which have been intensively managed for short rotation species by clearcutting may have fewer snags, less woody debris, and a greater need than a landscape that has older mature stands, uncut riparian zones, or other stands that act as snag reservoirs.

A large clearcut will reduce snags and woody debris over a larger area than a small checkerboard cut. Leaving snags, clumps of snags, or small longer-rotation patches, would be particularly important. Leaving clumps or patches of mast or seed producing trees such as beech, oak, and even maple within clearcuts will increase diversity and value for wildlife. Leaving clumps of hemlock, pine, or other conifers may be desirable to add diversity and wildlife cover, especially in compartments or stands where conifer cover is limited.

Think treatment, not harvest. When designing cutting specifications, it is important to think of them in terms of a "treatment" rather than a "harvest". This is especially true when designing specifications aimed at conserving species diversity and the many values provided by properly managing dead and dying wood.

Not the last word. It is essential to keep practicality, efficiency, and safety in mind when designing forest treatments. With much discussion, innovation, trial and error, and combined commitment, Department personnel will continue to improve and refine these initial guidelines for managing dead wood and continue to co-manage the diverse human demands while attempting to preserve biological diversity and ecological processes on state forestlands.