ONR-DLF-2 / Retention on State Forests

New York State Department of Environmental Conservation

DEC Program Policy

Issuing Authority: Christopher Amato, Asst. Commissioner for Natural Resources	Title: Retention on State Forests
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I. Summary: This Policy provides the procedures for establishing and maintaining forest retention on State Forests (Reforestation, Multiple Use, and Unique Areas) during forest management activities.

II. Policy: It is the policy of the DEC Division of Lands and Forests (Division) to include forest retention during the planning and implementation of all silvicultural treatments on State Forests applied at the stand level.

III. Purpose: The purpose of this policy is to specify the quantity and distribution of live and dead trees to be retained during stand treatments and through at least the next rotation. This policy supports the Division's goal to sustainably manage New York's State Forests and to maintain green certification under the most current and applicable standards set forth by the Sustainable Forestry Initiative® (SFI®) and Forest Stewardship Council® (FSC®). Forest retention is a strategy for conserving biodiversity in stands managed for timber production. Retention and recruitment of snags, cavity trees, coarse woody debris (CWD), fine woody material (FWM) and other features preserve the structural and compositional complexity necessary for conserving biodiversity and maintaining long term ecosystem productivity.

IV. Background: Foresters have long recognized the importance of "wildlife trees" (snags, cavity trees, retained live trees and CWD) as necessary components of a healthy, diverse forest. Retention of live and dead trees to enhance or provide wildlife habitat has been the subject of much research going back decades (Evans and Conner 1979, DeGraff and Shigo 1985, and Tubbs, et.al. 1987).

DeGraff et al. (1992) documented over 50 wildlife species dependent upon cavity trees for feeding, roosting, or nesting/denning sites. In addition to vertebrate wildlife species, numerous invertebrate species such as wasps, spiders and honeybees depend upon cavities for habitat. Providing an abundance of trees suitable to maintain cavity nesting bird populations maintains avian species diversity while also directly benefitting the forest. Most cavity nesting birds are insectivorous. Researchers have demonstrated the increased growth of forests when insectivorous birds are present to control populations of leaf eating insects (Marquis and Whelan 1994).

DeGraff et. al. (1992) also documented 39 wildlife species (esp. small mammals and amphibians) that use dead and down woody material for foraging or shelter and 65 species that use overstory inclusions (pockets of hardwood trees within conifer stands or groups of conifers within hardwood areas) for feeding, nesting or winter shelter. The retention of dead and down trees also provides habitat for many invertebrates, vascular plants, lichens, fungi, mosses and microorganisms. CWD and FWM are also essential for nutrient cycling and provide a seedbed for the establishment of some tree species (Harmon, et. al. 1986). Much of New York's State Forests are gradually recovering from the complete loss of dead wood material as a result of agricultural clearing. On many of these areas, there is still a lack of any CWD even up to 70 years after reforestation.

In the 1990's, scientists incorporated the retention of "wildlife trees" into the larger concept of biological legacies. Biological legacies are defined as: "the organisms, or a biologically derived structure or pattern inherited from a previous ecosystem – note biological legacies often include large trees, snags, and down logs left after harvesting…"(Helms, 1998). Biological legacies also include other ecological features that are vulnerable to timber harvesting such as vernal pools, small forest wetlands and patches of rare or unusual plant species. In addition to the obvious function of providing habitat for wildlife species as described above, biological legacies are valued for their "lifeboating" function after a period of heavy disturbance. Examples of such function include:

- Perpetuating plant species that would otherwise be lost as a result of the disturbance.
- Perpetuating living organisms by providing nutrients, habitat and modifying microclimatic conditions.
- Providing habitat for recolonizing species by structurally enriching the new stand and providing protective cover in the disturbed area (Franklin, et. al. 2007).

The function of "lifeboating" is most pertinent after a large disturbance such as an even-aged regeneration harvest. Lifeboating is believed to be most effective at protecting those species with limited dispersal capabilities such as herbaceous plants, lichens, mosses, invertebrates and terrestrial amphibians. Bellemare et.al. (2002) documents the difficulty many forest herbs have at recolonizing secondary forests, many decades after the sites have been reforested, and that such herbs are often present on sites that escaped the extermination effects of forest clearing and plowing such as bedrock outcrops, rocky slopes and along hedgerows. Sites such as these would be examples of desirable locations for retention.

If biological legacies are to be deliberately left, they must first be recognized and incorporated into harvest prescriptions. This practice is known as the variable retention harvest system and is defined as: "an approach to harvesting based on the retention of structural elements or biological legacies (trees, snags, logs, etc.) from the harvested stand into the new stand to achieve various ecological objectives. Major variables are types, densities and spatial arrangements of retained structures" (Helms 1998; Franklin et.al. 2007). Variable retention harvests can be incorporated into traditional regeneration harvest systems (clearcut, seed tree, shelterwood or selection) to enable managers to protect a wider array of site characteristics for conservation of biodiversity while still

establishing conditions for desirable tree regeneration. This practice has also been known as [regeneration method] with reserves.

There is also recognition that traditional silviculture has the potential to reduce or largely eliminate cavity and snag trees, as well as CWD. Kenefic and Nyland (2007) reported that managers need to deliberately incorporate cavity tree retention as part of their marking strategy to maintain cavity trees in stands where the focus of management is on growing high-value trees.

In the development of this policy, existing research results and similar standards or guidelines of other states were reviewed including those of Wisconsin, Michigan, Pennsylvania, Minnesota, New Hampshire and Maine. While the requirements inevitably vary somewhat among the states, there is broad consensus on the need for such a policy to assist managers in maintaining diverse, healthy and productive forests.

V. Responsibility:

The responsibility for interpretation and update of this document and the overall management of State Forests shall reside with the Office of Natural Resources Division of Lands and Forests - Bureau of State Land Management, or its successor.

VI. Definitions:

Cavity Tree – Live or dead tree with excavations sufficient for wildlife nesting, denning and shelter.
Coarse Woody Debris (CWD) - Any piece of dead wood >6" in diameter including logs, limbs, and large root masses on the ground or in streams (Helms, 1998).
Fine Woody Material (FWM) - Any piece of dead wood ≤ 6" in diameter including stems, tree tops, slash and branches on the ground.
Hardwood/Conifer Inclusion - Groups or individual stems of hardwoods or conifers within conifer or hardwood stands respectively. The area and/or distribution of the inclusions are such that it is not practical to type them out as individual stands.
Recruitment (Legacy) Tree - Live tree that is permanently retained to eventually develop into a cavity tree, snag, or downed woody material (CWD and FWM) within the stand or to retain a unique feature on the landscape.
Reserve Tree - Overstory tree left uncut through at least the next harvest rotation.
Retention – A forest management tool designed to retain trees as key structural elements of a harvested stand for at least one harvest rotation (Franklin et al. 1997)
Rotation – In even-aged systems, the period between regeneration establishment and final cutting (Helms, 1988)
Snag – A standing dead tree that is at least 20' tall (DeGraff and Shigo, 1985).

VII. Procedure:

1. Retention is to be incorporated into all silvicultural treatments undertaken on State Forests and applied at the stand level. Each practice should be considered during the planning, layout and design of each silvicultural treatment. Refer to **Table 2 Stand Treatments and Applicable Retention Practices** in section **VIII. Related**

References to determine which of the seven retention practices listed below are required to be incorporated into a given silvicultural treatment. If a practice is not required, as specified in Table 2, it may still be incorporated at the discretion of the forester implementing the silvicultural treatment.

1.1. Snags: For all silvicultural treatments retain existing snags within a stand with the exception of those removed for safety and to protect forest health. Retain an average of at least four snags per acre with a goal of two between 11"-17" dbh and two 18" dbh or larger.

1.1.1. In stands with a deficiency of snags, live trees will be selected as additional recruitment trees to become future snags.

1.1.1.1. The contractor, at their sole discretion, has the option to fell any tree they consider a hazard.

1.2. Cavity Trees: For all silvicultural treatments retain an average of at least four cavity trees per acre with a goal of three between 11"-17" dbh and one ≥18" dbh or larger.

1.2.1. In stands lacking cavity trees, retain live trees as additional recruitment trees to become future cavity trees.

1.2.2. Dead trees with cavities may satisfy both the snag retention requirement in addition to the cavity tree retention goal.

1.3. Recruitment (Legacy) Trees: Retain an average of at least one live tree per acre in the largest pre-harvest diameter class.

1.3.1. In even aged stands recruitment trees are identified at the time of regeneration harvest.

1.3.2. In uneven aged stands recruitment trees are identified during intermediate treatments.

1.4. Reserve Trees: In even-age stands 5 acres or larger in size and at the time of regeneration harvest retain ≥5% of the stand area in reserve patches that are 0.1-2 acres in size or ≥5% of the pre-harvest basal area in dispersed individual trees.

1.5. Hardwood/Conifer Inclusions: Promote mixed stand conditions having both conifers and hardwoods where possible.

1.5.1. During intermediate treatments in conifer plantations, where possible, retain at least 10% of the overall pre-harvest basal area in hardwoods.

1.5.2. In natural stands, where possible retain conifers in hardwood stands and retain hardwoods in conifer stands so that they compose at least 5% of the overall pre-harvest basal area.

1.5.3. Hardwood/Conifer Inclusions may contribute toward retention standards for Reserve Trees, Recruitment (legacy) Trees, and Cavity Trees.

1.6. Coarse Woody Debris (CWD): Retain at least three logs ≥10" in diameter at the small end and 16' in length or an equivalent volume in longer or shorter lengths per acre.

1.7. <u>Fine Woody Material (FWM)</u>: Retain at least 20% of fine woody material of harvested trees when conducting the regeneration harvest on even-age managed stands.

2. The Stand Prescription will indicate whether or not the minimum standard for each Retention Practice that is required for the silvicultural treatment applied will be met, and how any deficiencies will be addressed (example: recruitment trees are needed to satisfy a deficiency in snags).

3. The retention features should be evident after the silvicultural treatment is completed. At the completion of the silvicultural treatment and at a time when individual stands are inspected, the forester should make an ocular estimate as to whether or not each retention practice was achieved within each treated stand. The forester should document on page two of the Bureau's *State Land Timber Sale Completion and Inspection Report* (v. 3/10 or later) the level of each retention practice achieved including, if applicable, justification for why the conditions do not meet the minimum standards stated above.

VIII. Related References:

Table 1. Summary of Retention Practices

Retention Practice	Standard
Snags	Two 11"-17"dbh/ac. and two ≥18"dbh/ac.
Cavity Trees	Three 11"-17"dbh/ac. and one ≥18"dbh/ac
Recruitment Trees	One ≥18"dbh/ac. Plus any additional trees needed to satisfy deficiencies in snag or cavity trees.
Reserve Trees	EA regeneration harvest ≥5ac.: ≥5% of stand area or ≥5% of pre-harvest stocking.
Hardwood/Conifer Inclusions	Conifer plantations: During intermediate treatments retain ≥10% of pre-harvest basal area in hardwoods where possible. Natural hardwood stands: retain ≥5% of pre-harvest basal area in conifers where possible. Natural conifers stands: retain ≥5% of pre-harvest basal area in hardwoods where possible.
Coarse Woody Debris (CWD)	Retain ≥ three logs ≥ 10" diameter at small end and ≥16'/ac. or equivalent volume in other lengths.
Fine Woody Material (FWM)	Retain 20% of FWM ≤6" in diameter

Table 2. Stand Treatments and Applicable Retention Practices

Key: **1** = required if present, **2** = may be needed to satisfy a deficiency in another required practice, **3** = optional

Treatment	Snag	Cavity	Recruitment	Reserve	Inclusions	CWD	FWM
Pre-Commercial Thinning	**1**	**1**	**1, 2**	**3**	**1**	**3**	**3**
Even-Age Commercial Thinning	**1**	**1**	**1, 2**	**3**	**1**	**1**	**3**
Even-Age Regeneration Harvest ≤5 acres	**1**	**1**	**2**	**3**	**3**	**1**	**1**
Even-Age Regeneration Harvest >5 acres	**1**	**1**	**1, 2**	**1, 2**	**3**	**1**	**1**
Uneven-Age Treatment	**1**	**1**	**1, 2**	**3**	**1**	**1**	**3**
Conversion to shrubland	**1**	**3**	**3**	**3**	**3**	**1**	**3**
Salvage harvest*	**1**	**1**	**1**	**1**	**1**	**1**	**1**
Sanitation harvest**	**1**	**1**	**1**	**1**	**1**	**1**	**1**

* Satisfy retention standards to greatest extent possible.

**Satisfy retention standards to greatest extent possible while achieving forest health goal.

1. State Forest Retention Policy Guidance Document (*in development*).
2. Strategic Plan for State Forest Management
3. Management Rules for Establishment of Special Management Zones on State Forests
4. Program Policy # ONR-DLF-1/ Plantation Management on State Forests
5. Program Policy # ONR-DLF-3/Clearcutting on State Forests
6. Timber Sale Completion and Inspection Report (v. 3/10 or later)

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