

## Restoration and Management of Rare or Declining Habitats - 643

### Massachusetts Old Growth Forest Characteristics Job Sheet

<b>Client:</b>	<b>Farm #:</b>	<b>Tract #:</b>
<b>Planned By:</b>	<b>Date:</b>	
<b>Acres to be Managed (Patch Size):</b>	<b>Target Species:</b> Late succession forest species	

#### DEFINITION

Restore and manage rare and declining habitats and their associated wildlife species to conserve biological diversity.

#### BACKGROUND/PURPOSE

It is estimated that old-growth forests covered 70-90% of Massachusetts prior to European settlement; however, it is now one of the rarest habitat types in the state, constituting less than one tenth of 1 percent (< 0.1%) of our forests. The loss of older forest age classes is a major threat to forest biodiversity. The purpose of this practice is to restore or create old growth characteristics in forest stands for the purpose of improving wildlife habitat and maintaining Massachusetts' biodiversity.



Old growth forest characteristics include a diversity of tree sizes and ages, pit and mound topography, large standing dead trees (snags), and large accumulations of dead wood on the forest floor. Many of the species associated with old growth forests are dependent on large living trees, large dead trees or fallen logs; features that are common to late successional forest but not younger forest or financially mature forest. Once old forest elements such as large trees or logs are lost from a stand (e.g., as a result of harvesting practices), it can take centuries for the species to return to that location. Species that move or disperse slowly through the landscape and prefer large old trees or logs are most at risk to the loss of late successional forests.

In the northeast, certain species of fungi, lichens and invertebrates are dependent on old-growth or old growth structure. As these species' habitats shift northward in response to climate change, patches of old growth forest or forest with old growth characteristics will be required as movement corridors. Additionally, many bird species such as woodpeckers and warblers have been shown to reach greater abundance in forests with old growth characteristics and these areas can serve as important source populations in the face of large scale disturbance. Lastly, only 10% of species on earth are documented therefore restoring these once common habitats is of central importance to conserving the region's biological diversity.

True old growth forests exhibit the following characteristics:

- Multiple age classes. Natural canopy gaps less than one tree length are common and they typically occur during a timeline of between 75 and 200 years as a result of tree death or windthrow. As these gaps are colonized by seedlings, a multi-aged forest is created.

- Preponderance of shade tolerant, late successional species. Old growth forests are dominated by long-lived and shade tolerant species in the canopy such as sugar maple, beech, yellow birch and hemlock. Disturbance related tree species such as aspen and paper birch are rare.
- Large old trees. The absence of frequent stand disturbances allows trees to remain on the landscape longer, often reaching large diameters. The density of large trees correlates with other attributes of old growth such as large snags and logs.
- Large standing snags and coarse woody debris. Large living trees in a mature forest ultimately become large standing snags and coarse woody debris. Older forests characteristically have a higher density and volume of dead wood.

Although true old-growth forests cannot be created, the opportunity exists to restore old-growth characteristics in our current forests. Forests develop along a continuum and along complex pathways; old growth characteristics do not develop instantaneously at some specific age, but rather they accrue over time. Thus even stands with a harvest history can have old-growth characteristics. Old growth forest structure can be restored either through *passive* or *active* management.

*Passive management* involves letting nature take its course and waiting for forest development and natural disturbance to create the structure without any direct human intervention. Developing old-growth structure using this approach will often take over a century based on tree growth rates and the types of natural disturbances in southern New England.

*Active management* can accelerate the development of old growth structure. Many of the practices used for meeting traditional timber management objectives can also be used for restoring old-growth characteristics.

## **SITE SELECTION**

Locations to target for restoration of old growth characteristics include:

1. Sites that currently exhibit some old growth characteristics. This could include an area with an abundance of downed logs due to a recent blow down, an area that contains abundant large snags, or areas that have large trees.
2. Previously harvested stands that are dominated by shade tolerant species.
3. Sites located on productive soils as these sites will grow big trees faster. However, these areas also present the best sites for timber management.
4. Management patch at least 5 acres in size and located in close proximity to interior forest or within a large forested block. Patches smaller than 5 acres are not considered self-sustaining.
5. Areas that are somewhat inaccessible for timber harvesting, and riparian ecosystems.

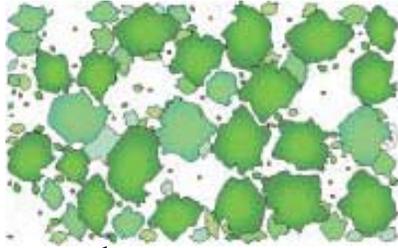
## **SPECIFICATIONS**

1. Restore Large Old Trees: Identify and retain *legacy* trees. Individual legacy trees can be dispersed throughout the patch or retained in groups to serve as small-patch reserves. Leave between 25 to 50 percent of the canopy trees as legacies to ensure that old-growth structure will develop over time. Leaving fewer trees will take longer for the structure to develop.

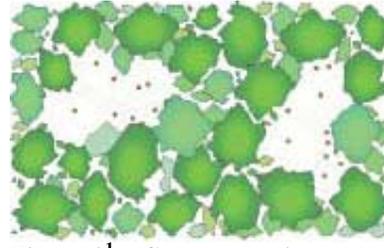
*Legacy Trees* are in the main canopy and are left to serve as future sources of old-growth structure. Legacy trees are never harvested; they are left to grow larger and die, providing standing dead trees for habitat and a source for downed wood once they eventually fall over. Select legacy trees using the following guidelines:

- Select long lived species (i.e., sugar maple, beech, white pine)
- Select canopy trees with large crowns
- Select trees that provide important habitat features such as cavity or den trees

2. Restore Multiple Age Classes and Tree Species Composition: Utilize uneven-aged silvicultural systems, such as single-tree (Figure 1) and small group selection cuts (Figure 2), to create gaps similar to what would occur through natural disturbances. These gaps will allow for regeneration of trees creating a new age class. Do not create gaps larger than ¼ acre in order to favor regeneration of shade intolerant species (beech and sugar maple) and mid-tolerant species (black cherry, yellow birch, and red oak).



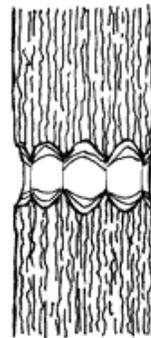
**Figure 1<sup>1</sup> – Single-tree selection cut**



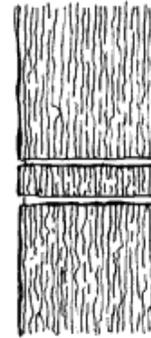
**Figure 2<sup>1</sup> – Group selection cut**

3. Restore Coarse Woody Debris: Strive to maintain 100% of the coarse woody debris present on the site prior to any active management by directing equipment around large downed logs, stumps, etc. The goal is to have downed logs in all stages of decay well distributed across the site. Fell and leave on the ground selected medium- to large-sized trees, including cull trees, which can improve growth of residual trees. Select for logs greater than 12 inches diameter and greater than six feet in length.
4. Restore Large Standing Snags: Tree species have varying rotting characteristics which effects how quickly they provide habitat as snags; however, fast rotting characteristics also mean the snag will remain standing for a shorter period of time. Red maple and aspen rot faster than other hardwood species. Coniferous species generally last longer than deciduous species with Eastern hemlock being the most rot resistant. Girdle selected medium- to large-sized trees, including cull trees.

To girdle a tree, remove a band of wood and bark all the way around the trunk. Do not leave any uncut portion or the tree may survive. If using an axe to girdle a tree, cut a band approximately 4 inches high and ¾" deep (see Figure 3). Girdling can also be done with a chain saw: two encircling cuts will be required, to a depth of one to two inches, and about 6 inches apart (see Figure 4).



**Figure 3**



**Figure 4**

## **MAINTENANCE**

The old growth forest characteristics will develop over time. Any additional forest management that occurs in the patch (such as single tree or group selection cuts planned in later years to create additional age classes) should be done in a manner that ensures equipment avoids disturbing coarse woody debris. Legacy trees will not be harvested. Exotic invasive species should be controlled.

**Massachusetts Shrubland / Young Forest Job Sheet**

Provide a map (may be attached) showing the location of the proposed practice and practice components.  
 Scale 1"=\_\_\_\_\_ft. (NA indicates sketch not to scale; grid size=1/2" by 1/2")


**METHOD** (check all that apply)

<input type="checkbox"/> <i>Restoring multiple age classes</i>	<input type="checkbox"/> <i>Restoring tree species composition</i>	<input type="checkbox"/> <i>Retaining snags</i>
<input type="checkbox"/> <i>Retaining legacy trees</i>	<input type="checkbox"/> <i>Restoring coarse woody debris</i>	
<input type="checkbox"/> <i>Other (describe)</i>		

**EXISTING STAND CONDITIONS: SUMMARY INVENTORY INFORMATION** (refer to forest mgmt plan)

Field/Stand	Ac.	Forest Type	Basal Area/Ac	Mean Stand Diameter	% Stocking

**DESIRED FUTURE STAND CONDITIONS**

Field/Stand	Landowner Objective	Basal Area/Ac	Mean Stand Diameter	% Stocking

**LEGACY TREES, SNAGS, AND COARSE WOODY DEBRIS**

Field/Stand	Legacy trees/Ac to be retained (no.)	Existing snags/Ac (no.)	Snags/Ac to be created (no.)	Existing CWD 12" x 6' (no.)	CWD >12" x 6' to be created (no.)

Notes:

**OTHER SPECIFICATIONS**

Comply with all applicable federal, state, and local laws and regulations during the installation, operation and maintenance of this practice. Forest management activities must be in compliance with any current Forest Cutting Plan (MA Forest Cutting Practices Act, M.G.L. Ch. 132, s. 40-46) for the property.

**RESOURCES FOR MORE INFORMATION**

<sup>1</sup> Forest Regeneration Handbook, The Connecticut Agricultural Experiment Station  
[http://www.wildlife.state.nh.us/Wildlife/Northeast\\_Hab\\_Mgt\\_Guide.htm](http://www.wildlife.state.nh.us/Wildlife/Northeast_Hab_Mgt_Guide.htm)

A Forest Manager’s Guide to Restoring Late Successional Forest Structure, UMass Extension  
 Restoring Old Growth Characteristics, UMass Extension. 2007

Managing for old-growth structure in northern hardwoods, W. S. Keeton <http://masswoods.net/index.php/oldgrowth>  
 Old Growth Policy, Massachusetts Department of Conservation and Recreation, Division of Forests and Parks, Bureau of Forestry.1998

**RECORD OF COMPLETION AND CHECK OUT CERTIFICATION:**

<i>Treated Acres:</i>	<i>Date Completed by Client:</i>	<i>Date Inspected:</i>	<i>Inspector:</i>

Notes:

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