**My Maine Woods – Western Maine**

**Forest Management Plan Standards**

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**Table of Contents**

[I. Applicability 3](#_Toc488746948)

[Overview 3](#_Toc488746949)

[Required and Optional Plan Elements 3](#_Toc488746950)

[II. My Maine Woods Management Plan Standards 5](#_Toc488746951)

[Property History 5](#_Toc488746952)

[Forest Management Goals and Objectives 5](#_Toc488746953)

[Summary of Planned Management Activities 6](#_Toc488746954)

[Property Map(s) 6](#_Toc488746955)

[Forest Natural Resources Enhancement and Protection 6](#_Toc488746956)

[Special Sites and Social Considerations 6](#_Toc488746957)

[Air, Water, and Soil Protection 7](#_Toc488746958)

[Soils 7](#_Toc488746959)

[Roads, Trails, and Landings 7](#_Toc488746960)

[Stream Crossings 8](#_Toc488746961)

[Riparian Habitats, Streams, Wetlands, Ponds, and Lakes 9](#_Toc488746962)

[Fish, Wildlife and Biodiversity 10](#_Toc488746963)

[Rare, Threatened, and Endangered Species and Natural Communities, 10](#_Toc488746964)

[Late Successional and Old Growth Forests 12](#_Toc488746965)

[Vernal Pools 12](#_Toc488746966)

[Other Important Wildlife Habitats 14](#_Toc488746967)

[Property-Wide and Landscape Habitat Diversity 14](#_Toc488746968)

[Within-Stand Habitat Diversity 17](#_Toc488746969)

[Invasive Plants and Earthworms 18](#_Toc488746970)

[Planning for Climate Change 19](#_Toc488746971)

[Management of Other Forest Resources 19](#_Toc488746972)

[Silviculture and Timber Management 20](#_Toc488746973)

[Stand-Level Information 20](#_Toc488746974)

[Stand Descriptions 20](#_Toc488746975)

[Forest Management Activities 20](#_Toc488746976)

[Management Activity Schedule and Tracking 20](#_Toc488746977)

[III. Forest Management PLAN APPENDICES and/or Attachments 22](#_Toc488746978)

[Forest Inventory Report 22](#_Toc488746979)

[Soils Report 22](#_Toc488746980)

[Maine Natural Areas Program / Maine Department of Inland Fisheries and Wildlife Report 22](#_Toc488746981)

[NRCS Required Attachments 22](#_Toc488746982)

[Other Appendices 22](#_Toc488746983)

[IV. References and Information resources 23](#_Toc488746984)

[Literature Cited 23](#_Toc488746985)

[Other Useful Resources 24](#_Toc488746986)

[V. Habitat Assessment Methods 26](#_Toc488746987)

[Stand and Property Forest Habitat Assessment 26](#_Toc488746988)

[Forest Classification 26](#_Toc488746989)

[Property-Wide Habitat Assessment Summary Example 31](#_Toc488746990)

[Landscape Habitat Assessment 32](#_Toc488746991)

[Habitat Patch and Block Assessment and Management 33](#_Toc488746992)

[Habitat Preferences of Maine Audubon Priority Forest Birds 34](#_Toc488746993)

[My Maine Woods Stream Smart Rapid Assessment Checklist 38](#_Toc488746994)

[VI. Other Recommended Practices 40](#_Toc488746996)

[Recreational Trail Planning Guidelines 40](#_Toc488746997)

# I. Applicability

## Overview

This document is intended to be used by foresters who are preparing forest management plans for landowners who are participating in the My Maine Woods –Western Maine project. These landowners have committed to a high-level focus on fish and wildlife habitat management, described here as Improved Forest Habitat Management (IFHM). Participating landowners are required to have a forest management plan that meets the requirements for a Natural Resources Conservation Service (NRCS) forest management plan plus additional fish and wildlife information specific to the My Maine Woods project.

Three key NRCS documents apply to CAP-106 FMP criteria in Maine. These include:

CAP 106: [Forest Management Plan Criteria.](https://efotg.sc.egov.usda.gov/references/public/ME/CAP_106_Forest_Management_Plan_November2016.pdf) November 2016

CAP 106: [Managing Your Woodlands: A template for your plans for the future](https://efotg.sc.egov.usda.gov/references/public/ME/CAP_106_Managing_Your_Woodlands_Natl_Joint_Mgt_Plan_Template_Nov2016.doc). National joint management plan template. November 2016

CAP 106: [A Guide for Foresters and other Natural Resource Professionals on using: Managing Your Woodlands: A template for your plans for the future](https://efotg.sc.egov.usda.gov/references/public/ME/CAP_106_Guide_for_Foresters_for_the_Joint_Mgmt_Plan_Template_Nov2016.pdf). November 2016.

The most comprehensive description of the required plan contents is in the Cap 106 “A Guide for Foresters…” A review of that document shows that the plan requirements for fish and wildlife habitat management are quite general as the document is national in scope and is designed to accommodate a wide range of interests in fish and wildlife habitat management. To meet the needs of My Maine Woods participating landowners who have a high level of interest in fish and wildlife management and to address the habitat management goals of the project, this document identifies the specific requirements for including IFHM as a component of NRCS CAP-106 Forest Management Plans (FMPs).

The sections that follow use the headings and subheadings and applicable guidance from the NRCS template management plan, but only those sections where IFHM is applicable have been included.

## Required and Optional Plan Elements

Unless indicated as “recommended” or “consider,” the information listed under the Assessment and Management subheadings below is required for My Maine Woods plans. My Maine Woods prefers that “recommended” information or practices to “consider” be included as applicable, but these are not required.

The following sections include subsections titled *Identification and Ecological Significance*. This text is designed to inform foresters and landowners and may be copied and used in management plans. My Maine Woods recommends the use of this or similar language in management plans.

**Note:**

1. The CAP-106 plan requirements included below only apply to plans developed for landowners participating in the My Maine Woods project.
2. All other NRCS CAP-106 management plan requirements are still applicable.
3. Additional information may be required for plans developed for Maine’s Woods WISE or Tree Growth programs.

# II. My Maine Woods Management Plan Standards

## Property History

In addition to a general narrative history, My Maine Woods recommends a chronological table of management history, including ownership, management activities, and management plan revisions.

Other information per NRCS/USFS/ATFS CAP-*106* [*Managing Your Woodlands: A template for your plans for the future*](https://efotg.sc.egov.usda.gov/references/public/ME/CAP_106_Managing_Your_Woodlands_Natl_Joint_Mgt_Plan_Template_Nov2016.doc)and NRCS/USFS/ATFS *A Guide for Foresters and other Natural Resource Professionals on using: Managing Your Woodlands: A template for your plans for the future*

## Forest Management Goals and Objectives

* 1. *Recommended*: The management plan should include separate long-term goals from shorter-term objectives as follows:

1. Goals: The landowner(s) long-term vision for the land and major values of importance to the landowner and address the My Maine Woods ecological and timber management goals, and
2. Objectives: Specific short-term or mid-term (e.g. 10-25 years) targets for management that support the goals. Objectives should be specific enough for tracking progress and to know when they have been reached.

**My Maine Woods Goals**

The overarching theme of My Maine Woods is improving fish and wildlife habitat for an array of species. This includes:

1. Protecting habitat for rare, threatened, or endangered species, including Atlantic salmon, Canada lynx, northern long-eared bat, Bicknell’s thrush and other species that may occur.
2. Adopting management practices benefiting the habitats used by a great majority of common wildlife species in the Northern Forest for all or a portion of their life cycle, including:
   1. Maine Audubon's Forestry for Maine Birds (FFMB) species and habitats, including both old-forest and ,where consistent with landowner values, landscape context, young-forest habitats, and
   2. Other umbrella and/or other focal species whose habitats overlap with those of a great many other species, as feasible based on ownership size (for example, wood thrush, American marten)
3. Protecting and enhancing water quality, aquatic habitat, and restoring or maintaining aquatic connectivity for aquatic organisms.

Include other information per NRCS/USFS/ATFS CAP-106 *Joint Management Plan Template* and *A Guide for Foresters.*

## Summary of Planned Management Activities

*Recommended*: The *Managing Your Woodlands* template requires a summary of management activities near the end of the management plan. Foresters are encouraged to include a summary list or table of recommended management near the beginning of the management plan to provide landowners with an easily located summary section to help them keep on schedule with activities.

## Property Map(s)

For My Maine Woods management plans include:

1. Landscape Map. Show property on an aerial image including a total area of at least 2,500 acres (about 2 miles by 2 miles), with a larger area as properties increase in size.
2. Special ecological features. Any important plant and wildlife habitats not shown on the MNAP/MIDIFW map (see Attachments), plus old growth and late successional forest if present.
3. Stand Map. *Recommended:* Include FFMP stand structure class or approximate equivalent stand size class coding (see system described in ***Forestry for Maine Birds* (*FFMB*)** and as summarized in Section V of this document).
4. Planned Management Activities. Show specific locations of all management activities not associated with stand-wide harvests or other treatments, including locations of NRCS practices; landings; any new roads or significant trails to serve proposed management activities; and other activities as applicable.

Optional maps could include Maine’s [Beginning with Habitat](http://webapps2.cgis-solutions.com/beginningwithhabitat/) maps, The [Nature Conservancy’s Northeast Habitat Maps](http://maps.tnc.org/nehabitatmap/), historical imagery, or others of potential interest to the landowner.

Include other maps and information required for CAP-106 management plans.

## Forest Natural Resources Enhancement and Protection

### Special Sites and Social Considerations

Ecological issues pertaining to multi-stand, property wide, and landscape context are addressed in the Fish, Wildlife, and Biodiversity sections of this guide. Otherwise follow NRCS recommendations for this section.

## Air, Water, and Soil Protection

### Soils

**Ecological Significance**

The types of soils found within a forest are critical to determining the type of forests that will grow there, their productivity, associated wildlife, and limitations to management. Minimizing disturbance to soils is essential to maintaining long-term forest heath and productivity.

**Assessment**

1. Follow CAP-FMP requirements.
2. *Recommended:* Include technical soils information as an appendix or separate document and summarize applicability to forest management in this section.

**Management**

1. Describe any management limitations caused by soils.
2. The guidelines in the most recent (2017) edition of **Best Management Practices for Forestry: Protecting Maine’s Water Quality** (“BMPs”; see *References and Information Resources* section)should be used to protect soil and water quality.
3. See **Recreational Trail Planning Guidelines** in Section VI and the *References and Information Resources* section for other guidelines and technical resources, to plan and build trails.

### Roads, Trails, and Landings

**Ecological Significance**

Roads, trails and/or landings are essential to managing a forest. However, a poorly planned, built or maintained transportation network can result in unnecessary loss of productive forest, loss and fragmentation of wildlife habitat, and damage to soils and water quality. Poorly located, constructed, or maintained recreation trails can have similar impacts. Improperly located recreation trails also can result in disturbance to sensitive wildlife.

**Resource Assessment**

1. Describe general conditions of the transportation network and recreation trail network and any areas that threaten water quality or sensitive wildlife or their habitats.
2. Include roads and recreation trails on maps.

**Management:**

1. Describe roads, main trails, and landings to be used in management and any new work needed.
2. Generally locate roads and landings to minimize forest habitat fragmentation, but also consider landings as an opportunity to create and manage small patches of open or early successional habitat.
3. Use Maine’s 2017 water quality BMPs as a baseline for all work.
4. Remove unneeded culverts whenever possible.
5. Consider increasing culvert size above minimum BMP sizes and taking other appropriate measures to handle the increased frequency of extreme precipitation events associated with climate change. For example, permanent drainage culverts in skid trail and road network should be sized larger than has historically been the custom; culvert size will vary by site, but for many landowners 15” is now becoming the norm for truck road cross drains. See Horton et al. 2015 and other sources in the *References and Information Resources* section for additional guidance.

Include other information as required for CAP-106 management plans.

### Stream Crossings

**Identification and Ecological Significance**

Designing, installing, and managing stream crossings is critical to protecting water quality and ensuring that fish and other aquatic organisms have free upstream and downstream passage. Without free passage, access to breeding habitat or other important seasonal habitats will be blocked and populations may become isolated and likely will decline. Workshops and guidelines to restore aquatic organism passage have been an important focus of government agencies and non-government conservation groups in Maine in recent years.

**Resource Assessment**

1. Identify all stream crossings that do not currently meet the Maine’s Stream Smart fish passage guidelines, which are included on pages 41-43 of the Maine’s forestry BMPs (Third Edition, 2017), or for greater detail see the Maine DOT Stream Smart Pocket Guide, or indicate if NRCS Aquatic Organism Passage (AOP) technical assistance for AOP assessment has been requested and include date of request.
2. *Recommended:* The *My Maine Woods Stream Smart Rapid Assessment Checklist* (Appendix X) may be used in the field to record basic information on current stream crossings or for planned permanent crossings.

**Management**

1. Develop a plan to upgrade existing crossings as needed and for new crossings to ensure that all crossings meet the Stream Smart guidelines. Contact NRCS for AOP technical assistance if the landowner intends to apply for NRCS Aquatic Organism Passage practice funding.
2. Remove unneeded culverts or substandard crossings whenever possible and avoid or minimize new steam crossings.
3. Use temporary crossings such skidder bridges whenever possible. Use Maine’s 2017 forestry BMPs and state and local regulatory standards as the baseline for all work. Protect stream channel and bank integrity during installation and removal of temporary stream crossing structures and ensure aquatic organism passage while temporary crossings are in place.
4. Include other information as required for CAP-106 management plans.
5. Consider increasing culvert size above minimum BMP sizes to handle the increased frequency of intense rainfall events associated with climate change. Culvert size will vary by drainage area, but for many landowners 15” is now becoming the norm for truck road cross drains. See the *References and Information Resources* section for sources of additional guidance.

### Riparian Habitats, Streams, Wetlands, Ponds, and Lakes

**Identification and Ecological Significance**

Riparian areas are located adjacent to streams, wetlands, ponds, and other aquatic areas. Over 60 wildlife species in Maine are dependent on riparian habitats for part of their life cycle, and many other species are frequently found in riparian habitats. Riparian areas include areas covered by Maine’s Statewide Standards for Timber Harvesting in Shoreland Areas and the Land Use Planning Commission (LUPC) rules for the unorganized townships, as well as those subject to local Shoreland Zoning regulations. However, riparian habitats often extend well beyond the area subject to these state and/or local regulations to include adjacent unregulated areas.

A Riparian Management Zone (RMZ) should be managed to conserve riparian habitat functions and to protect aquatic habitat. An RMZ may also be managed for timber, but timber management is secondary to the RMZs conservation goals.

**Assessment**

1. Maps: include streams and wetlands from published sources as well as previously unmapped features identified during management plan preparation.
2. For areas that have not been thoroughly field-checked during management plan preparation a field survey should take place during appropriate field conditions as part of developing an operations plan.

**Management**

1. Specify riparian zone widths that will be used.

*Recommended:*

* 1. Riparian zones with prescribed widths varying by stream size are recommended to ensure consistency of management within the My Maine Woods. In many cases RMZ widths will exceed the minimum BMP widths for water quality. The RMZ widths and management guidelines in ***Focus Species Forestry***, p. 31 (Bryan 2007) or similar are recommended.
  2. For seeps and intermittent streams a 75-foot RMZ is recommended; narrower widths may be applicable for stream channels that only carry water for brief periods. For streams higher in the watershed these recommendations may exceed Maine’s Statewide Standards for Timber Harvesting in Shoreland Areas.
  3. Wider RMZs may be appropriate in floodplains or where plant community and topography characteristic of riparian areas exceed the widths recommended in ***Focus Species Forestry***.

1. Prior to restoration work or other site-disturbing activities:
   1. Check areas of planned site disturbance for unmapped streams and wetlands.
   2. Check with the US Army Corps of Engineers, Maine DEP and the town in which management is planned regarding permits or notification requirements for any work in wetlands or streams.
2. During operations always apply Maine’s Best Management Practices for water quality protection.
3. Include other information as required for CAP-106 management plans.

## Fish, Wildlife and Biodiversity

### Rare, Threatened, and Endangered Species and Natural Communities,

**Identification and Ecological Significance**

Rare, threatened, and endangered (RTE) species include species listed as Threatened or Endangered by the federal and/or Maine Endangered Species Act as well as “candidate” species for threatened or endangered species listing. RTE natural communities include Imperiled, Critically Imperiled, or Vulnerable natural communities as classified by the Maine Natural Areas Program (MNAP). In most cases individual woodlots have not been surveyed on the ground by MDIFW, MNAP or US Fish and Wildlife Service. Forest landowners have an important responsibility to help maintain these rare species and natural plant communities.

**Assessment**

1. Request information on RTE species and other important plant and wildlife habitats from the Maine Natural Areas Program (MNAP) and include the report as an attachment to the management plan.
2. During the NRCS review of management plans NRCS will check to see if there are any known locations of federally listed species.
3. Summarize RTE species and natural community findings from MNAP/MDIFW report.
4. Northern Long-eared Bat (NLEB) is federally listed as Threatened. Because NLEB is a wide ranging species with little site-specific information available, use the following for assessment purposes:
   1. As of February 2017 there were no known maternal roost trees in Maine that would affect forest management.
   2. When requesting RTE species information, MNAP and/or NRCS will notify the landowner if there is a known hibernaculum or maternal roost tree in the vicinity that must be considered.

**Management**

1. If any RTE species or natural communities have been identified, describe conservation measures consistent with applicable agency guidelines and implement management accordingly.
2. Check with the Maine Natural Areas program and US Fish and Wildlife Service for any updates when the plan is updated in ten years.
3. Northern Long-eared Bat (NLEB). As of April, 2017:
   1. For funded conservation activities NRCS does not allow any harvest of trees during the pup rearing season (June 1-July 31).
   2. As of February 2017 there were no known maternal roost trees that would affect forest management.
   3. When requesting RTE species information, MNAP and/or NRCS will notify the landowner if there is a known hibernaculum in the vicinity that must be considered.
4. Canada Lynx. Canada lynx is listed as Threatened in Maine by the US Fish and Wildlife Service. NRCS will review the management plan to determine and consult with USFWS when needed.

My Maine Woods Canada lynx recommendations:

1. All Ownerships. Manage to maintain spruce-fir where present and where sites are suitable. In young stands maintain a high density of conifers. See ***Focus Species Forestry*** management recommendations for spruce-fir habitat (p. 26) and for snowshoe hare (the primary prey of lynx, p.37). Outside of the primary lynx range, species such as bobcat, coyote, magnolia warbler, and, at higher elevations, Bicknell’s thrush will benefit from similar management.
2. Large Ownerships**.** Within the mapped Canada lynx Critical Habitat designated by US Fish and Wildlife Service, consider lynx habitat management consistent with the US Fish and Wildlife Service draft Canada Lynx Habitat Management Guidelines for Maine (McCullough 2007). The area of soils where softwood-dominated stands are the characteristic forest type is the primary determinant of whether or not there is sufficient area to manage for lynx[[1]](#footnote-1). Because management for lynx requires a young-forest focus, adjacent landscape units would need to emphasize older-forest management to meet the My Maine Woods / **FFMB** goals for that habitat age class. Collaborative management with adjacent landowners could be considered.

### Late Successional and Old Growth Forests

**Identification and Ecological Significance**

Late successional forests are older, complex forests with little recent management activity and in Maine are generally considered to be over 120 years of age. Old growth forests have little or no evidence of past management and are generally considered to be 150 to 200 years or more in age. See the Glossary for a more complete definition. These forests have been little studied due to their rarity, but they are known to harbor rare lichens and are generally considered to be an important part of Maine’s forest biodiversity.

**Assessment**

1. Identify any late successional or old growth forests as part of cover type mapping and field inventory. The Manomet *Revised Late Successional Forest Index* (Whitman and Hagan 2009) may be useful on some stands and sites, but experienced foresters may also find that professional judgement provides similar or better results in less time.
2. Summarize assessment findings in the management plan.

**Management**

1. Describe protection measures in the management plan.
2. Protect and buffer existing old growth stands.
3. Manage any identified late successional stands to maintain, or if degraded by past management, to enhance their character.
4. If missing or minimal in extent, consider identifying some areas to manage for late successional forest characteristics, either as a set-aside area with no harvesting or where some harvesting may occur but with a goal of managing for very large and old trees. (The general approach used by Keeton et al. for Structural Complexity Enhancement (SCE) in [The Vermont Forest Ecosystem Management Demonstration Project](http://nsrcforest.org/sites/default/files/uploads/keetonfull04.pdf) could be used as a guideline. In addition to managing for large old trees, this project used timber harvesting equipment to create downed logs and tip-up mounds as per Keeton et al.)

### Vernal Pools

**Identification and Ecological Significance**

Vernal pools are small, fishless water bodies that provide breeding habitat for a unique group of amphibians and invertebrates, including spotted salamander, blue-spotted salamander, four-toed salamander, wood frog, and fairy shrimp. During most of the year, adult spotted salamanders and wood frogs are found in the nearby forest; salamanders may be found up to several hundred feet from the pools and wood frogs are found up to a quarter mile or more from pools.

Vernal pools are best identified in spring when breeding adults and/or eggs are present. By mid or late summer they are frequently dry. Typically vernal pool species breed in small isolated pools and ponds, but other areas such as forested wetlands and stream floodplain channels are also often used. See ***Forestry Habitat Management Guidelines for Vernal Pool Wildlife in Maine***(Calhoun and DeMaynadier 2004) or the***Focus Species Forestry*** guidebook (Bryan 2007) for more information. A productive vernal pool is typically at least 12” deep during the early spring and likely to hold water for more than 2 ½ months.

**Assessment**

1. Identify and map possible vernal pools during the forest inventory process and/or during harvest operations layout. Possible pools can be identified any time there is no snow cover by looking for evidence of standing water that has been present for an extended period of time. For winter operations planning, assess possible sites prior to snowfall. If management plan field work occurs during the winter, check for vernal pools prior to harvest when there is no snow cover.
2. At minimum, for each possible or verified pool, record:
   1. Date of observation
   2. Estimated length, width, and depth of pools that you would expect to observe at the time of high water
   3. Current pool dimensions
   4. Number of adults and/or egg masses of the four indicator species (fairy shrimp, wood frog, blue-spotted salamander, and (yellow) spotted salamander), if surveyed during the breeding season.
3. If timing allows, return in the spring to check the “possible” vernal pools for evidence of vernal pool indicator species (adults and/or egg masses) during the amphibian breeding season. Use this [map on the MDEP website](http://www.maine.gov/dep/land/nrpa/vernalpools/timing.pdf) to identify the best breeding season survey dates.
4. Classify pools as “significant” using the Maine DEP criteria; if no breeding season survey is available make an informed judgment based on available information.
5. Summarize the assessment results and include a location map in the management plan and operations plans.
6. Consider encouraging forest landowners to survey their forest for vernal pools during the spring breeding season and to monitor the pools annually.

**Management**

1. Describe vernal pool protection measures in the management plan.
2. Use the Maine ***Vernal Pool Habitat Management Guidelines*** (HMGs) to plan harvest operations near “significant” vernal pools as defined by Maine DEP. For vernal pool complexes, use HMGs around all pools as if one large pool.
3. For vernal pools that are not “significant” use the riparian zone management recommendations guidelines described above.
4. Refer to the *Literature Cited* section of this report for more information.

### Other Important Wildlife Habitats

**Identification and Ecological Significance**

Other important wildlife habitats include deer wintering areas and other Significant Wildlife Habitats as mapped by MDIFW, LUPC Fish & Wildlife, Wetlands, Mountain Areas, and other important habitats identified by conservation agencies or identified during the forester’s field inventory. For organized towns, known important wildlife habitats are shown on Maine’s Beginning with Habitat (BWH) maps.

**Assessment**

1. Request information on RTE species and other important plant and wildlife habitats from the Maine Natural Areas Program (MNAP) and include the report as an attachment to the management plan.
2. Map sections copied from the BWH website can be used to illustrate the management plan.
3. Other important habitats not included on the BWH or MNAP maps such as beaver ponds, old flowages, or other important habitats identified during field work by examination of aerial imagery should be mapped and described in the plan.

**Management:**

1. Reference all agency reports and maps that are included in appendices and attachments (e.g. MNAP report map).
2. Describe all special management areas and associated management recommendations and, as applicable, include quantifiable management targets in the management plan and operations plans.
3. Maine’s regulatory framework should address most important habitats associated with wetlands and water bodies.
4. For Deer Wintering Habitats (DWA) and similar extensive habitats (e.g., as shown on Beginning with Habitat Maps):
   1. In organized towns where DWA are not regulated follow the recommendations in the Maine Inland Fisheries and Wildlife recommendations in the MNAP report and consult with regional biologists as needed.
   2. In unorganized towns, work with the regional biologist to develop a DWA plan that includes LUPC P-FW zones and surrounding forest areas as needed to develop and maintain a viable DWA.

### Property-Wide and Landscape Habitat Diversity

**Identification and Ecological Significance**

Many wildlife species are closely linked to specific forest types and forest stand-age classes (e.g., young vs. mature). The type and amount of these habitat types (e.g. young spruce-fir stands or older northern hardwood stands) across a property and within the surrounding landscape is the most important factor in determining the wildlife species likely to be present.

**Assessment**

1. Stand Classification. Classify each stand by forest type and structure or size class based on the forest inventory and cover type mapping as described in ***Forestry for Maine Birds* (*FFMB)*** and as summarized in the *Habitat Assessment Methods* section of this report. Forest managers may find that a simple approach is to develop a crosswalk table that relates the forester’s current classification system to the **FFMB** classification system. Note that a more detailed forest type classification system than hardwood/ softwood/ mixedwood is required.
2. Property-wide Habitat Assessment. Summarize the amount of forest in the different forest type and size classes across the entire property (see property-wide summary example in the *Habitat Assessment Methods* section of this document).
3. Landscape Habitat Assessment. Estimate the total percentage of forest in the landscape (including the property) and describe the major land uses and forest habitat/size classes in the surrounding landscape and in the management plan.
   1. Small ownerships. Qualitative visual estimates and a narrative summary based on a review of aerial imagery are adequate. See *Habitat Assessment Methods* section of this document or **FFMB**,Section IV for guidance.
   2. Large ownerships. Begin with property-wide assessment data and evaluate the surrounding landscape of 5,000 or more acres as described in *Habitat Assessment Methods* section of this document and**FFMB**,Section IV.
4. Habitat Block Assessment. Identify any unfragmented intermediate and older forest blocks >250 acres in size. *Recommended:* Estimate the area in forest habitat patches by age and size classes as described in the *Habitat Assessment Methods* section of these standards.
5. Habitat Connectivity. Identify any current or potential areas where habitat connectivity may be a concern, for example where wildlife movement corridors are fragmented by agriculture, development, or clearcuts. This would include habitat connectivity both within the property as well as connectivity with adjacent properties.

**Management**

1. All Ownerships
   1. The size of forest bocks needed to provide high-value bird habitat decreases as the amount of forest in the landscape increases. For My Maine Woods the forest thrush habitat guidelines developed by the Cornell Lab of Ornithology (Rosenburg et al. 2003) will be used to develop targets for suitable patches of intermediate and older-forest habitat. When feasible manage for high-value habitat suitability forest patches for wood thrush (which may include surrounding ownerships if necessary), as shown in the *Habitat Assessment Methods* section.
   2. If the landowner has species-specific management objectives, include management recommendations and timeline in the plan consistent with the recommendations in the applicable habitat guides for those species. Examples may include species and habitats identified in**FFMB**, ***Focus Species Forestry***, or other management guides for species of interest to the landowner.
   3. Consider how management can complement landscape habitat conditions, for example by promoting habitats that are uncommon in the landscape and encourage landowner’s to incorporate this focus (see **FFMB**, Section V, Landscape Context or ***Focus Species Forestry***, p. 65-69).
   4. Plan even-aged regeneration harvests to maintain habitat connectivity, particularly near riparian areas or other points that concentrate restrict wildlife movement through the landscape, and manage to improve habitat connectivity where it is fragmented (for example, see Elliott et al., ***Biodiversity in the Forests of Maine***).
2. Small Ownerships (<2,500 acres).
   1. Develop long-term, quantitative habitat structure class goals for the property (i.e., total acres by forest type and size class) based on the landowner’s goals for wildlife habitat diversity that incorporate landowner’s goals, landscape context, and feasibility of management. Encourage landowners to retain these goals in future planning periods.
   2. Describe rationale for selected habitat structure class goals and develop a 10-year activity plan to move the forest toward those goals, and include those in the management plan. If feasible, develop a long-term goal to manage for and maintain over 40% of the ownership in **FFMB** older forest habitat age class stands (Class 4 and 5).
   3. When consistent with landowner goals, forest conditions, and the surrounding landscape context, consider balancing the older-forest habitat goals with 5-10% of the parcel in young forest habitat management; this will provide habitat for priority species that breed in young forests (see **FFMB** and ***Focus Species Forestry***) as well as post-fledgling habitat for species that nest in older forests such as scarlet tanagers and wood thrush (see Lambert et al. 2017).
3. Large Ownerships (>2,500 acres).
   1. Describe how management will meet the **FFMB** habitat goals of 5-10% in Young Forest (Class 1&2, seedling sapling), 40-50% in maturing (Class 4, small sawtimber) and >10% in older complex (Class 5, large sawtimber) stands within a 50-year period.
   2. Develop a plan to manage at least 10% of the ownership in patches of intermediate and older forest >250 acres in size when feasible over the next 30 years (see **FFMB**).
   3. Based on the percentage of forest in the surrounding 2,500 acres, develop a plan to manage for at least 25% of the ownership in “moderate suitability” or better habitat patches based on Rosenberg et al. (2003, Table 3 in *Habitat Assessment Methods* section).
   4. Consider developing a plan to manage for large patches of intermediate and older forest suitable for American marten. See ***Focus Species Forestry***, p. 39 or consult with MDIFW for current recommendations. See also recommendations for Canada lynx in the *Rare, Threatened, and Endangered Species* section above.

### Within-Stand Habitat Diversity

**Identification and Ecological Significance**

Important components of within-stand habitat that affect the species present include a) native species composition, b) canopy layers (overstory, midstory, understory) and within-stand gaps, and c) wildlife trees including dead standing trees (“snags”), cavity trees, and down and dead wood.

**Assessment**

1. Native plant communities. Include a brief overview of components of the forest stands not described by forest inventory data or cover-type description, notably the understory/midstory plant community, as part of the stand descriptions.
2. Vegetation layers and habitat gaps. Include an assessment of vegetation layers and within-stand gaps as described in **FFMB** so that targeted habitat enhancement practices (e.g., thinning to promote understory development) may be identified. Refer to the ***FFMB*** guidebook for more information on vegetation layer assessment and stand-data forms.
3. Wildlife trees and downed wood. A quantitative assessment is possible but very time consuming. *Recommended:* During the forest inventory note any raptor nest trees and any exceptionally large or old legacy trees and include snags (and if possible, decay level) in inventory.
4. The ***FFMB Assessment Data Form*** is a rapid qualitative assessment tool that is recommended to collect all stand-scale **FFMB** habitat assessment data. The information collected on this form can be used to supplement the quantitative tree inventory data and to develop management recommendations based on the **FFMB** guidelines and other habitat management guides.

**Management**

1. Native plant communities. Describe how silviculture will promote native plant species appropriate to the site. If planting is required, the total area in planted stands should be minimal in area or managed in such way that over the long term they will transition to include a diversity of native species similar to natural stands. On ownerships with intensive, high-yield plantations or plantation-like native stands, an approach balancing this intensive management with ecological reserves and managed natural forests (i.e., the Triad approach, Seymour and Hunter 1992) may be appropriate. *Note*: for lands in or being considered for Forest Stewardship Council (FSC) certification, conversion of natural forests to plantations as defined by FSC (including very intensively managed planted stands or naturally regenerated stands that managed so that there are few characteristics of natural stands) is not allowed, unless for restoration purposes.
2. Vegetation layers and habitat gaps. Include as applicable any recommendations for enhancement of vegetation layers or for creating habitat gaps in the stand prescriptions as described in **FFMB** or other applicable guidelines.
3. Wildlife trees and downed wood.
   1. Reference and follow applicable guidelines in ***FFMB***, ***Focus Species Forestry***, p. 63, or ***Good Forestry in the Granite State***.
   2. For biomass harvesting operations or whole tree harvesting where tops are not distributed throughout the forest, use the ***Forest Biomass Harvesting and Retention Guidelines for the Northeast*** (Forest Guild 2010).
   3. Consider proactively marking wildlife trees that will be retained during harvests to help ensure that wildlife tree goals are integrated into stand improvement harvest.

### Invasive Plants and Earthworms

**Identification and Ecological Significance**

Invasive plants are exotic invasive species listed by the Maine Natural Areas Program that have been recognized as a serious threat to many forest ecosystems in the Northeast. Several species of exotic shrubs found in Maine’s forests can displace native understory plant species and prevent or severely limit the regeneration of trees, thereby affecting the long-term composition and integrity of the forest.

Almost all common earthworms are non-native species and recent research has shown that they can eliminate most of the soil surface organic layer and severely impact forest regeneration and forest floor plant communities. Unfortunately there are no feasible control methods for invasive earthworms, but foresters and landowners should be aware of their potential presence and impacts.

**Assessment**

1. Map and/or describe the extent of invasive plant patches and describe the percent cover of invasive plants and the species within each patch.
2. Map and/or describe areas of invasive earthworms.

**Management**

1. Describe measures to minimize the risk of introducing invasive plants and invasive earthworms (e.g., equipment washing) and other measures to minimize spread within the forest.
2. *Recommended:*
   1. Use Maine and/or regional guidelines to recommend a strategy, timeline, and methods for control of invasive plants, including an assessment of control feasibility, thresholds for when control methods should be implemented, and need for follow-up treatments and future monitoring.
   2. Use the “early detection and rapid response strategy” to control invasive plants before they become a problem (see Maine Natural Areas Program website for more information).
   3. Consider engaging landowners in long-term invasive plant monitoring and ongoing management.

For additional invasive plant information and management recommendations see ***Good Forestry in the Granite State***, Section 5.2

## Planning for Climate Change

**Ecological Significance**

Climate change models predict that the optimum climate for spruce and fir is predicted to shift north of the Canadian border, the optimum climate for northern hardwoods such as sugar maple and yellow birch is predicted to retreat to the western mountains and northwestern highlands of Maine, and the northern limit of optimum climate for oak, which is now best adapted to southwestern Maine, is predicted to shift north to the Canadian border. Trees that are outside of their optimum climate are likely to become stressed, with potential for increased rates of health decline and mortality due to insects and diseases. In addition, research and recent empirical evidence suggest that rain events will become more intense, leading to overflow of culverts and subsequent damage to roads, trails, and water quality.

**Management**

Consider the following options to help maintain a forest that is more resilient to changing climate:

1. Increase resilience by managing for multiple age classes.
2. Manage for the forest types and species best suited to the site and avoid practices that would speed conversion to other types (e.g. spruce-fir dominated to hardwood-dominated). Use natural regeneration to retain and increase species diversity characteristic of the site and forest type, including the proportion of species predicted to be better adapted to future conditions, such as white pine and red oak.
3. Plan for high-volume runoff by using the recommendations for roads and steam crossings earlier in this document.

For more information and management strategies, see Horton et al. Vermont Department of Forests, Parks and Recreation 2015 and Wilkerson et al. 2011.

## Management of Other Forest Resources

This section includes general management recommendations not addressed elsewhere in this report.

* Management recommendations for soil and water protection and fish, wildlife and biodiversity are included in the previous sections.
* Stand -specific management activities are included in the *Stand Level Information*section.

### Silviculture and Timber Management

1. Describe how management will maintain or promote forest productivity, and, as applicable to the landowners goals and the flow of forest products.

## 

## Stand-Level Information

### Stand Descriptions

Include in the stand descriptions:

1. **FFMB** or equivalent habitat classification including forest habitat association or forest type and stand-structure or stand-size class.
2. Long-term desired future conditions and short-term management objectives integrating habitat and timber (as applicable) and how these relate to property wide and landscape habitat goals, described in earlier sections of the plan including habitat age class diversity, habitat connectivity, and management for specific habitat patch goals as applicable.
3. Stand-level information as described in the NRCS *CAP-106 Guide for Foresters.*

### Forest Management Activities

1. Describe applicable management information for each stand as described in the NRCS *CAP-106 Guide for Foresters.*
2. Include integrated timber and habitat management recommendations designed to move stands toward desired future conditions and the property-wide and landscape-context goals.

**Note:** For funded conservation activities NRCS does not allow any harvest of trees from June 1 to July 31 during the NLEB pup rearing season. Even if there are no NRCS funded conservation activities, My Maine Woods recommends no harvesting between May 15 to July 31 when possible to minimize destruction of both bat roosts and forest songbird nests during peak  breeding seasons.

## 

## Management Activity Schedule and Tracking

Include:

1. A summary schedule of planned management activities in chronological order, in list or table format.
   1. Classify management activities as “NRCS practices” (i.e. those practices included in the NRCS Record of Decisions) or as “Other management activities” not part of the ROD).
   2. The table format from Maine Forest Service *Woods WISE Forest Management Plan Standards* may be used.
   3. For properties in the Maine Tree Growth program, consider identifying which activities would be required for continued Tree Growth certification and which are recommended in the management plan but would not be not required for Tree Growth.
   4. *Recommended:* include the schedule at the beginning of the management plan to provide landowners with a quick reference and for keeping on schedule with activities.
2. Other information per NRCS/USFS/ATFS CAP-106 Joint Management Plan Template and forester’s guide.

# III. Forest Management PLAN APPENDICES and/or Attachments

Include the following information as appendices to the management plan or as stand-alone attachments that are part of the management plan.

## Forest Inventory Report

Include stand and stock tables based on field inventory meeting NRCS requirements.

## Soils Report

Include NRCS Web Soil Survey report and map or other format meeting NRCS requirements.

## Maine Natural Areas Program / Maine Department of Inland Fisheries and Wildlife Report

Include a report prepared by MNAP and MDIFW for the property per request of the forester preparing the plan.

## NRCS Required Attachments

Include all other required CAP-106 attachments and forms.

## Other Appendices

Include other information that may be of interest to the landowner or that would help them understand the management plan or be of use when implementing management recommendations.

Any of the information in the *Habitat Assessment Methods* or *Other Recommended Practices* sections of these standards may be included as a management plan appendix or attachment. Request a Word-format copy of this document so that the information may be copied and pasted into management plans. Bird species informational pages identified as management priorities may be added as an appendix using pdfs from the FFMB website page.

# IV. References and Information resources

### Literature Cited

Bennet, K.P. editor. 2010. Good Forestry in the Granite State: Recommended Voluntary Management Practices for New Hampshire. University of New Hampshire Cooperative Extension, Durham, NH.

Bryan, R.R. 2007. [Focus Species Forestry: A Guide to Integrating Timber and Biodiversity Management in Maine](http://maineaudubon.org/wp-content/uploads/2012/08/MEAud-FocusSpeciesForestry.pdf). Maine Audubon, Falmouth, ME. *Comment:* A practical “how-to” guide that can be used on small private, large commercial or public forests. Addresses management for including stand and landscape scale wildlife and biodiversity management in a forest management plan.

Calhoun and deMaynadier.2004. [Forestry Habitat Management Guidelines for Vernal Pool Wildlife.](http://www.vernalpools.me/wp-content/uploads/2015/06/Forestry-Habitat-Management-Guidelines-for-Vernal-Pool-Wildl.pdf)

Elliot, C.A., Editor. 1999, 2nd edition 2008. *Biodiversity in the Forests of Maine: Guidelines for Land Management.* University of Maine Cooperative Extension. UMCE Bulletin #7147. [First edition can be downloaded free here](file:///C:\Users\Robert\Documents\AB%20-%20Projects%20Other%20A-M\MAS\MAS%2017%20RCPP\Reports\.%20http:\www.upperstjohnriver.com\BFM.pdf.%20Second%20edition%20hardcopy%20from%20UM%20Extension).

Forest Guild Biomass Working Group. 2010. [Forest Biomass Retention and Harvesting Guidelines for the Northeast](https://www.forestguild.org/publications/research/2010/FG_Biomass_Guidelines_NE.pdf)*.*  Forest Guild, Santa Fe, MN.

Horton et al. 2015*.* [Creating and Maintaining Resilient Forests in Vermont: Adapting Forests to Climate Change.](http://fpr.vermont.gov/sites/fpr/files/Forest_and_Forestry/The_Forest_Ecosystem/Library/Climate%20change%20report_final_v6-18-15a.pdf) Vermont Department of Forests, Parks and Recreation.

Keeton, W.S. et al. 2008. [The Vermont Forest Ecosystem Management Demonstration Project](http://nsrcforest.org/sites/default/files/uploads/keetonfull04.pdf). Comment: Study evaluating methods to manage for late-successional forest structure.

Lambert, J. D., B. Leonardi, G. Winant, C. Harding, and L. Reitsma. 2017. [Guidelines for Managing Wood Thrush and Scarlet Tanager Habitat in the Northeast and Mid-Atlantic Regions](http://highbranchconservation.com/wp-content/uploads/2017/02/Guidelines-for-Managing-Wood-Thrush-and-Scarlet-Tanager-Habitat-in-the-Northeast-and-Mid-Atlantic-Regions-2017.pdf)**.** High Branch Conservation Services, Hartland, VT.

Maine Audubon. 2017. Publication pending. Forestry for Maine Birds: A Forester’s Guide**.**

Maine Department of Transportation. 2017. [Steam Smart Pocket Guide](http://maineaudubon.org/streamsmart/handouts/).

Maine Forest Service, 2017[. Best Management Practices for Forestry: Protecting Maine’s Water Quality.](http://www.maine.gov/dacf/mfs/publications/handbooks_guides/bmp_manual.html) Third edition. *Comment:* The Third Edition includes Stream Smart guidelines for aquatic organism passage not included in earlier versions.

McCullough, Mark.2007. [Canada Lynx Habitat Management Guidelines for Maine](https://www.fws.gov/mainefieldoffice/PDFs/Canada%20lynx%20habitat%20management%20guidelines%20for%20Maine%209.13.07.pdf). US Fish and Wildlife Service, Old Town, ME.

Rosenberg, K.V., R.S. Hames, R.W. Rohrbaugh, Jr., S.B. Swarthout, J.D. Lower, and A.A. Dhondt. 2003. [A Land Managers Guide for Improving Habitat for Forest Thrushes.](http://www.birds.cornell.edu/bbimages/clo/pdf/thrushguide.pdf) Cornell Lab of Ornithology, Ithaca, NY.

Seymour, R.S. and M.L. Hunter. [New Forestry in Eastern Spruce-Fir Forests: Principles and Applications to Maine.](http://digitalcommons.library.umaine.edu/cgi/viewcontent.cgi?article=1027&context=aes_miscpubs) Publication 4-1992. Maine Agricultural and Forest Experiment Station, University of Maine, Orono.

Whitman A., and J. Hagan. 2009. [A Revised Rapid-Assessment Late-Successional Index for common northeastern forest types](https://www.manomet.org/sites/default/files/publications_and_tools/Whitman%20and%20Hagan.%20%202009.%20A%20Revised%20Rapid-Assessment%20Late-Successional%20Index%20for%20Northern%20Hardwoods%20and%20Spruce-Fir%20Forest.%20Report.pdf). Forest Mosaic Notes, FMSN-2009-1. Manomet Center for Conservation Sciences.

Beginning with Habitat.BWH maintains maps of Maine riparian habitats, high value plant and wildlife habitats, and undeveloped habitat blocks. Program home page and links: <http://www.beginningwithhabitat.org/>. BWH maps: [PDF Maps by town or region](http://www.beginningwithhabitat.org/the_maps/map_availability.html) and [Web Map Viewer](http://webapps2.cgis-solutions.com/beginningwithhabitat/).

Wilkerson, E. et al. 2011. [Allen-Whitney Memorial Forest: Climate Change Adaption Plan](http://newenglandforestry.org/wp-content/uploads/2016/04/NEFF-Climate-Change-Adaption-Plan.pdf). Manomet Center for Conservation Sciences.

### Other Useful Resources

**Culverts and Stream Crossings**

Maine Forest Service 2017 BMP guide (see Literature cited, above)

Stream Smart Crossing Program.[**http://maineaudubon.org/streamsmart/**](http://maineaudubon.org/streamsmart/)

Maine Department of Transportation. 2017. [Steam Smart Pocket Guide](http://maineaudubon.org/streamsmart/handouts/).

[*Maine Stream Crossings: new designs to restore stream continuity*](http://maineaudubon.org/streamsmart/files/2014/11/Maine-Stream-Crossings-New-Designs-to-Restore-Stream-Continuity1.pdf)*.*

**Climate-Smart BMPs**

See <http://climatesmartnetwork.org/2014/09/stream-crossings-and-climate-change-part-2/>

**Invasive Plants and Earthworms**

[Maine Natural Areas Program/Invasive Plants](http://www.maine.gov/dacf/mnap/features/invasive_plants/invasives.htm)

Gorres, Joseph. 2014. [Invasive Earthworms in the Northeast and the Horticulture Industry](https://www.uvm.edu/~entlab/Greenhouse%20IPM/Workshops/2014/InvasiveEarthworms.pdf). University of Vermont, Burlington, VT.

[Invasive Earthworms in Northern Hardwood Forests](http://www.wildlifegardeners.org/forum/feature-articles/5284-invasive-earthworms-northern-hardwoods-forests.html). Wildlife Gardeners. Comment: Useful overview with web links to other materials.

**Vernal Pools.**

[Forestry Habitat Management Guidelines for Vernal Pool Wildlife](http://www.vernalpools.me/wp-content/uploads/2015/06/Forestry-Habitat-Management-Guidelines-for-Vernal-Pool-Wildl.pdf) (Vernal pool HMGs).

Focus Species Forestry. *Comment:* includes summary of the Vernal pool HMGs.

[Maine DEP Vernal Pool web site](http://www.maine.gov/dep/land/nrpa/vernalpools/). Note: definitions, assessment procedures, and regulations are for vernal pools regulated as “Significant Wildlife Habitat” under Maine’s Natural Resources Protection Act. The NRPA regulations do not apply to forestry operations, but the definitions of “Significance” and the recommended periods for identifying vernal pool egg mass surveys in different regions of the state are very useful for forestry surveys.

[Maine Audubon Vernal Pool web site](http://maineaudubon.org/wildlife-habitat/vernal-pools/).

**NRCS Forest Management Plan Requirements**

CAP 106: [Forest Management Plan Criteria.](https://efotg.sc.egov.usda.gov/references/public/ME/CAP_106_Forest_Management_Plan_November2016.pdf) November 2016.

CAP 106: [Managing Your Woodlands: A template for your plans for the future](https://efotg.sc.egov.usda.gov/references/public/ME/CAP_106_Managing_Your_Woodlands_Natl_Joint_Mgt_Plan_Template_Nov2016.doc). National joint management plan template. November 2016.

CAP 106: [A Guide for Foresters and other Natural Resource Professionals on using: Managing Your Woodlands: A template for your plans for the future](https://efotg.sc.egov.usda.gov/references/public/ME/CAP_106_Guide_for_Foresters_for_the_Joint_Mgmt_Plan_Template_Nov2016.pdf). November 2016.

# V. Habitat Assessment Methods

## Stand and Property Forest Habitat Assessment

An assessment of wildlife habitats based on the ***Forestry for Maine Birds*** guidelines is a core component of the My Maine Woods project. At minimum the assessment is based on cover type maps and forest inventory data that classifies stands based on forest type and stand-size class information. After each stand is classified a summary of the cover types for the entire property is compiled and compared with the surrounding landscape. This information is then used to guide wildlife habitat management decisions.

Information in this section may be copied and included in My Maine Woods management plans to provide background information for landowners.

### Forest Classification

The management plan may include a forester’s person/company forest classification system that meets the minimum requirements of the ***Forestry for Maine Birds* (*FFMB*)** habitat classification system.

Each stand must be classified at minimum as follows:

1. **Forest Type**
2. Forest type must be based on the major species present, not simply Hardwood / Softwood / Mixedwood. Broad but commonly recognized types such as “Northern Hardwoods,”, “Spruce-Fir,” etc. or the **FFMB** Forest Habitat Associations (see below) are acceptable. An addition of more descriptive forest typing descriptions is encouraged.
3. **Stand Structure Class:** At minimum use five structure classes as follows:
4. Regeneration (seedling)
5. Sapling
6. Intermediate (poletimber)
7. Maturing (small sawtimber)
8. Old/complex (large sawtimber)
   * See the **FFMB** stand structure class system for further information.
   * When company classification systems are used include a crosswalk table to the **FFMB** system so that landowners or field foresters can refer to the appropriate **FFMB** guidebook sections and recommendations as needed.

**.**

**FFMB Forest Habitat Classification**

For habitat assessment purposes, common forest types found on a property are grouped into Forest Habitat Associations, which generally share a common suite of wildlife species in any given region. The **FFMB** habitat associations are described in the following table.

|  |  |  |
| --- | --- | --- |
| **Map Symbol** | **FFMB Forest Habitat Association**  *(comments in italics)* | **Common Forest Types** |
| **NHW** | **Northern Hardwoods1**  *May include up to 25% softwoods* | Northern Hardwoods (beech-birch-maple and variants)  Aspen-Birch (early successional) |
| **NMW** | **Northern Mixedwoods2**  *Neither hardwoods nor softwoods exceed 75% of stocking* | Northern Hardwood/Hemlock  Northern Hardwood/Spruce-Fir  Hemlock (in patches)  Aspen-Birch (early successional) |
| **NSW** | **Northern Softwoods3**  *May include up to 25% hardwoods* | Spruce-Fir  Spruce-Hemlock  Northern White Pine-Mixed Conifer  Northern White Cedar  Aspen-Birch (early successional) |
| **OP** | **Oak-Pine4**  *May range from pure oak-dominated hardwoods to*  *mixed hardwood and softwood stands* | Northern Red Oak  Red Oak-Mixed Hardwoods  Red Oak-White Pine-Red Maple  White Pine  Hemlock and Hemlock-Oak-Pine |
| **--** | Add other forest types that do not fit these habitat association types if needed. |  |

**FFMB Habitat Age Class, Stand Structure Class, and Canopy Cover**

Many wildlife species are closely linked to specific forest ages and structures, including tree size, canopy density, and vertical structure (i.e., canopy layering). Stands are classified in terms of general size and combinations of stand structure class (which is related to maturity) and canopy cover as described in the following tables. **Stand Structure Class** is an indication of ecological development, wildlife habitat condition, and commercial forestry potential. **Habitat Age Class** is used to summarize the stand structure classes into broad habitat conditions for assessment and planning.

|  |  |  |  |
| --- | --- | --- | --- |
| **FFMB Forest Habitat Age and Structure Classes** | | | |
| **Habitat Age Class** | **Stand Structure Class1** | | **Description2** |
| Young | 1 | Regeneration | 1-10 years old, <1”DBH4 |
| 2 | Sapling | 2-5” DBH, 10-30’, <30% overstory3 cover |
| Intermediate | 3a | Intermediate - Single-aged (Poletimber) | Overstory 5-10” DBH, total canopy cover > 60-70% with midstory component <30% |
| 3b | Intermediate - Two-aged (Poletimber) | Overstory 5-10” DBH and <60% cover, development of midstory and understory variable depending on time since last harvest or other canopy disturbance |
| Older | 4 | Maturing (Small Sawtimber) | Overstory trees 10-16” DBH dominant, total canopy cover typically >60-70% |
| 5 | Older Complex (Large Sawtimber) | Overstory trees >16” DBH dominant. Multiple canopy layers common with total canopy cover typically >60-70% |

**1**Equivalent forest product class in parentheses.

**2**These are general descriptions; diameter and canopy cover may vary by species and site. Percent cover of any layer may be less than indicated if there has been recent harvesting (typically within 10-15 years).

3See Vegetation Layer table

4DBH: diameter at breast height (4.5 ft.)

**Vegetation Layers**

Bird species often specialize by canopy layer. A canopy layer classification is not required for the My Maine Woods project. However, a canopy layer assessment taken during the forest inventory process is strongly recommended so that targeted habitat enhancement practices (e.g., thinning to promote understory development) may be identified. Refer to the **FFMB** guidebook for more information on vegetation layer assessment. The ***FFMB Assessment Data Form*** is designed to efficiently record these data.

The following table provides an overview of canopy layer values and could be included in forest management plans to inform landowners.

|  |  |  |  |
| --- | --- | --- | --- |
| **Vegetation Layer** | | **Height (ft.)** | **Bird Habitat Notes** |
| Canopy | Overstory | >30 | Canopy heights of >50-60’ are important for many mature forest species, including Black-throated Green Warbler and Scarlet Tanager. |
| Midstory | 6-30 | Important nesting and foraging stratum for species like Canada Warbler that prefer dense midstory. Other species, such as Eastern Wood-Pewee, prefer a more open midstory. |
| Understory | | 1-6 | Dense understory provides important feeding and nesting cover for mature forest species such as Black-throated Blue Warbler and Veery. |

Canopy cover classes are used to categorize the amount of the aerial coverage of each vegetation layer, which will affect habitat values differently for different species. See **FFMB** guidebook for more details.

**Canopy Cover Classes**

|  |  |
| --- | --- |
| **Cover Class** | **% Canopy Cover** |
| A | >80 |
| B | 60-80 |
| C | 30-60 |
| D | 5-30 |
| E | <5 |

**Species Benefitting by Habitat Type**

Forest habitat types are based on a combination of a cover type and development stage, for example, sapling softwoods or late successional hardwoods. Following is a list of characteristic species categorized by forest development stage and other key habitat variables. This is not a complete list and there are many more examples that could be included.

**Examples of Species Potentially Benefitting from Different Habitat Types**

|  |  |  |
| --- | --- | --- |
| **Habitat Age Class and Other Habitat Types** | **Hardwood Dominated** | **Softwood Dominated** |
| **Young Forest (Stages 1 and 2)** | Ruffed grouse (P)  American woodcock (P, ME)  Chestnut-sided warbler (P, ME) | Magnolia warbler  Snowshoe hare  Canada lynx (ME) |
| **Intermediate Forest**  **(Stages 3a and 3b)** | Transitional from young-forest species to older forest species, depending on stage of development | |
| **Older Forest (Stages 4-5)** | Eastern wood pewee (P, ME)  Wood thrush (P, ME)  Blackburnian warbler (P)  Brown creeper (P) | Black-throated green warbler (P, ME)  Hermit thrush  Bay-breasted warbler (P)  Cape May warbler (P)  Blackburnian warbler (P) |
| **Large forest blocks and interconnected forest mosaics** | Broad-winged hawk (ME), Wood Thrush (ME)  Scarlet tanager (ME)  Fisher  Bobcat | |
| **Forest understory** | Black-throated blue warbler (P, ME)  Veery (P) | Canada warbler (P, ME) |
| **Riparian Forest** | Wood Turtle (ME)  Brook Trout (ME) | |
| **Forest Generalists** | Moose (ME)  Black bear | Moose (ME)  Black bear |
| **Vernal Pool** | Spotted salamander  Blue-spotted salamander (ME)  Wood frog | |

P: Priority Species identified by the North American Bird Conservation Initiative

ME: Species of Greatest Conservation Need identified in the Maine Wildlife Action Plan (2015)

## 

## Pro**perty-Wide Habitat Assessment Summary Example**

All My Maine Woods management plans must include a table summarizing stand structure classes for the property (i.e. total acres by

forest type and stand structure class) and/or a chart displaying the same data. The example below is applicable to any sized ownership.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Stand Structure Class | Stand Size Class | Forest Type  (acres) | | | | | Non-Forest  (acres) | | TOTAL  (acres) | % of Forest Area |
| ASP-BIR | | NHW | NMW | NWC\* | OW\*\* | Road |
| 0 | Open |  | |  |  |  | 225 | 86 | 311 |  |
| 1 | Seedling |  | |  |  |  |  |  |  |  |
| 2 | Sapling | 23 | | 99 | 48 | 142 |  |  | 311 | 16% |
| 3a | Intermediate -even aged | |  | 612 | 427 | 20 |  |  | 1,060 | 54% |
| 3b | Intermediate-two aged | |  | 152 | 268 | 33 |  |  | 452 | 23% |
| 4 | Maturing |  | |  | 126 |  |  |  | 126 | 6% |
| 5 | Old/Complex |  | |  | 11 |  |  |  | 11 | 1% |
| TOTAL | Grand Total | 23 | | 863 | 880 | 194 | 225 | 86 | 2,271 | 100% |
| Percent of Ownership | | 1% | | 38% | 39% | 9% | 10% | 4% | 100% |  |

\*Northern White Cedar; see ***Focus Species Forestry*** for habitat and management information

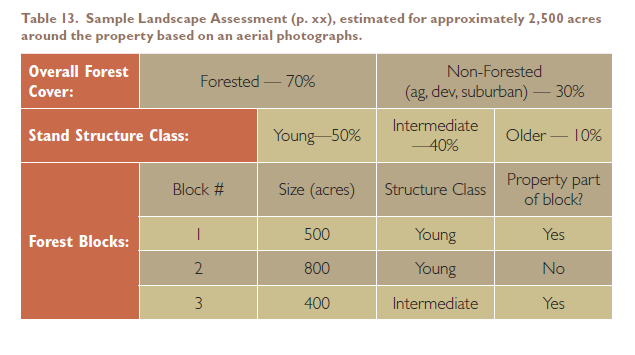
\*\* Open wetland

## 

## Landscape Habitat Assessment

Source: ***Forestry for Maine Birds*** (pre-publication draft). Refer to the **FFMB** guidebook for additional information.





## Habitat Patch and Block Assessment and Management

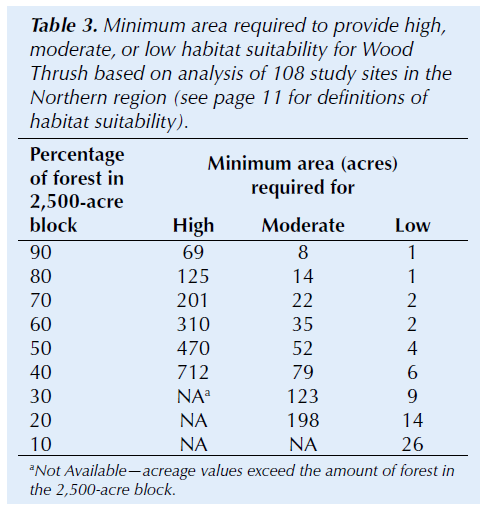
**Patch definition:** A habitat patch is an area of suitable habitat separated from other patches by >30 m (Betts et. al., 2007). A patch may consist of a single stand or multiple stands with similar habitat characteristics. Patches for different species may overlap. For example, wood thrushes prefer patches of older intermediate and mature deciduous and mixedwood forests, while black-throated green warblers may be found in softwood and mixedwood stands. May include patches that span ownership boundaries.

**Forest Block** **definition**: All habitat patches within a single block not separated from other patches by >30 m. May include patches that span ownership boundaries.

* **Intermediate & Older-forest patch**: At least 75% of an area dominated by stands >50 ft. tall or > 4.5” DBH, and >60% canopy closure.
* **Young-forest patch:** At least 75% of an area dominated by trees <4.5” dbh or <25 ft. tall
* **Patch Size Classes:** <25 acres, 26-100 acres, 100-250 acres, 250-500 acres, >500 acres

**Management**

For the purposes of general forest management, identifying patches by combining all cover types into two broad classes (intermediate/older, or young) is the most practicable approach unless targeted management for a species with narrow habitat requirements is the goal (e.g. management of deer wintering areas). On small ownerships a qualitative assessment of habitat patch conditions based on cover type maps and data of the property and a review of aerial imagery of the surrounding properties is sufficient. Large landowners with advanced GIS may be able to more accurately quantify habitat patch sizes and management opportunities.

Research has shown that in forested landscapes some species are sensitive to habitat patch size while others are not. The general goal should be to manage for larger patches of intermediate to older-forest high-value habitat. The following table from Rosenberg et al. (2003) can be used as guide.

## Habitat Preferences of Maine Audubon Priority Forest Birds

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NORTHERN HARDWOOD** | **YOUNG** | **INTERMEDIATE** | **OLDER** | **MANAGEMENT NOTES** | **GAPS** | **AREA SENSITIVE** | **FOREST INTERIOR** | **MOIST SOIL OR RIPARIAN** | **SNAGS OR CAVITY TREES** | **CANOPY COVER** | **OVERSTORY (>30**'**)** | **MIDSTORY (6–30**'**)** | **UNDERSTORY (<6**'**)** | **GROUND COVER** | **LEAF LITTER** |
| **Scarlet Tanager** |  |  |  | Maintain or create well-stocked uneven-aged sawtimber stands with >80% cover, especially those with a signficant oak component and those embedded within larger blocks of mature forest (>250 acres) |  | X | X |  |  | >80% | HIGH | MED- HIGH |  |  |  |
| **Ovenbird** | Maintain mature forest with med to high canopy cover, within larger block of contigu- ous forest (>250 acre) Habitat affected 300' or more from edge of forest management activities Prefers less ground cover, deeper leaf litter for domed ground nest |  | X | X |  |  | 60–  90% | HIGH | MED- HIGH |  | LOW | X |
| **Wood Thrush** |  |  | Maintain or create well-stocked uneven aged sawtimber stands with tall trees, >80% canopy cover, diverse species and moist leaf litter Generally more productive in larger forest blocks of contiguous forest habitat (>250 acres) |  | X | X | X |  | >50% | MED- HIGH | MED | MED | LOW |  |
| **Yellow-bellied Sapsucker** |  |  | Retain larger snags and potential snags or live trees with decay, especially aspen and birch Will use intermediate forest if snags are present |  | X |  |  | X |  |  |  |  |  |  |
| **Black-throated Blue Warbler** |  |  | Maintain or create NH or NM stands with 50-80% canopy cover and dense understory Responds well to low-intensity cutting where canopy is closed and openings allow for patches of regeneration Prefers larger forest blocks (>250 acres) | X | X | X |  |  | 50–  80% | MED- HIGH | MED- HIGH | HIGH |  |  |

**NORTHERN HARDWOOD SUMMARY TABLE**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Black-throated Green Warbler |  |  |  | Maintain or create well-stocked uneven-aged sawtimber NM and NS stands of with >80% canopy cover, especially softwood inclusions and hemlock |  | X | X |  |  | >80% |  |  | HIGH |  |  |
| **Veery** |  |  |  | Maintain or create stands with low to medium canopy cover (30-80%) and dense understory, ideally near wetlands |  | X | X | X |  | 30–  80% |  |  | HIGH |  |  |
| **Chestnut-sided Warbler** |  |  |  | Maintain or create seedling/sapling stands >1 acre in size with <30% canopy cover Needs larger saplings for singing perches Will use older forests where gaps are present | X |  |  |  |  | <30% | LOW | LOW | HIGH | MED- HIGH |  |
| **Mourning Warbler** | Maintain or create early successional stands Increase sapling density, understory cover, and canopy openings Will use newly cut areas  2-10 years old Will use older forests where gaps are present | X |  |  |  |  | 40–  70% | MED |  | HIGH | HIGH |  |
| American Woodcock |  |  | Maintain or create forest matrix with mix of openings and young forest in early stages of regeneration (<20 years old) preferably near shrubby wetland (FMI, timberdoodle org) | X |  |  | X |  | VARI- ABLE | LOW- HI | LOW- HI | LOW- HI |  | X |
| **Northern Flicker** |  |  |  | Retain current and future large snags More open park-like woods preferred, especially if habitat for ants, which are a preferred  food soruce Will use younger forest if snags present |  |  |  | X | >12" DBH | LOW | LOW- OPEN |  |  | LOW |  |
| Eastern Wood-pewee | Maintain or create NH pole/sawtimber stands with >80% cover, gaps, and open midstory | X | X |  |  |  | 50–  70% | MED | MED- LOW |  |  |  |

**BOLD**=Species that prefer Northern Hardwood (others will use Northern Hardwood); Orange=Preferred Stand Structure Class; Tan=Used Stand Structure Class; White=Rarely Used Stand Structure Class

**NORTHERN MIXEDWOOD SUMMARY TABLE**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NORTHERN MIXEDWOOD** | **YOUNG** | **INTERMEDIATE** | **OLDER** | **MANAGEMENT NOTES** | **GAPS** | **AREA SENSITIVE** | **FOREST INTERIOR** | **MOIST SOIL OR RIPARIAN** | **SNAGS OR CAVITY TREES** | **CANOPY COVER** | **OVERSTORY (>30**'**)** | **MIDSTORY (6–30**'**)** | **UNDERSTORY (<6**'**)** | **GROUND COVER** | **LEAF LITTER** |
| **Black-throated Blue Warbler** |  |  |  | Maintain or create NH or NM stands with 50-80% canopy cover and dense understory Responds well to low-intensity cutting where canopy is closed and openings allow for patches of regeneration Prefers larger forest blocks (>250 acres) |  | X | X |  |  | 50–  80% | MED- HIGH | MED- HIGH | HIGH |  |  |
| Black-throated Green Warbler |  |  | Maintain or create well-stocked uneven-aged sawtimber NM and NS stands with >80% canopy cover, especially softwood inclusions and hemlock |  | X | X |  |  | >80% |  |  | HIGH |  |  |
| **Blackburnian Warbler** | Maintain large conifers and larger forest blocks (>250 acres) Uses beared lichen |  |  | X |  |  | >80% |  | HIGH |  |  |  |
| Bay-breasted Warbler |  |  | Maintain mature softwood stands with tall trees, high canopy cover and dense midstory Spruce budworm specialist, will use younger forests if spruce budworm present |  | X |  |  |  |  | HIGH | HIGH |  |  |  |
| Northern Parula |  |  | Maintain larger (>250 acres) blocks of tall, mature coniferous forest Presence of beard- ed lichen essential |  |  | X | X |  | >80% | HIGH | MED- HIGH | MED- HIGH |  |  |
| Scarlet Tanager |  | Maintain or create well-stocked uneven-aged sawtimber stands with >80% cover, especially those with a signficant oak component and those embedded within larger blocks of mature forest (>250 acres) |  | X | X |  |  | >80% | HIGH | MED- HIGH |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Canada Warbler** |  |  |  | Maintain or create NM stands with 50-70% canopy cover and a dense under- and midsto- ry Uneven forest floor with woody debris (stumps, logs, upturned tree roots) preferred | X | X |  | X |  | 50–  70% |  | HIGH | HIGH | MED- HIGH |  |
| **Magnolia Warbler** |  |  | Create stands of young conifers Selective cutting within more mature stand that creates openings of shrubby conifer growth create ideal haibtat Will use older forest if gaps with dense softwood regen | X |  |  |  |  | 30–  60% | MED- LOW |  | HIGH |  |  |
| Chestnut-sided Warbler |  |  |  | Maintain or create seedling/sapling stands >1 acre in size with <30% canopy cover Needs larger saplings for singing perches Will use intermediate /older forest if gaps present | X |  |  |  |  | <30% | LOW | LOW | HIGH | MED- HIGH |  |
| Mourning Warbler | Maintain or create early successional stands Increase sapling density, understory cover, and canopy openings Will use newly cut areas 2–10 years old Will use intermediate /older forest if gaps present | X |  |  |  |  | <30% | LOW | MED | HIGH | HIGH |  |
| American Woodcock |  |  | Maintain or create forest matrix with mix of openings and young forest in early stages of regeneration (<20 years old) preferably near shrubby wetland (FMI, timberdoodle org) | X |  |  | X |  | VARI- ABLE | HI- LOW | HI- LOW | HI- LOW |  | X |
| Northern Flicker |  |  |  | Retain current and future large snags More open park-like woods preferred, especially if habitat for ants, which are a preferred  food soruce Will use younger forest if snags present |  |  |  | X | >12" DBH | LOW | LOW- OPEN |  |  | LOW |  |

**BOLD**=Species that prefer Northern Hardwood (others will use Northern Hardwood); Orange=Preferred Stand Structure Class; Tan=Used Stand Structure Class; White=Rarely Used Stand Structure Class

**NORTHERN SOFTWOOD SUMMARY TABLE**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **NORTHERN SOFTWOOD** | **YOUNG** | **INTERMEDIATE** | **OLDER** | **MANAGEMENT NOTES** | **GAPS** | **AREA SENSITIVE** | **FOREST INTERIOR** | **MOIST SOIL OR RIPARIAN** | **SNAGS OR CAVITY TREES** | **CANOPY COVER** | **OVERSTORY (>30**'**)** | **MIDSTORY (6–30**'**)** | **UNDERSTORY (<6**'**)** | **GROUND COVER** | **LEAF LITTER** |
| **Bay-breasted Warbler** |  |  |  | Maintain mature softwood stands with tall trees, high canopy cover and dense midstory Spruce budworm specialist, will use younger forests if spruce budworm present |  | X |  |  |  |  | HIGH | HIGH |  |  |  |
| **Northern Parula** |  |  | Maintain larger (>250 acres) blocks of tall, mature coniferous forest Presence of Usnea lichen essential |  |  | X | X |  | >80% | HIGH | MED- HIGH | MED- HIGH |  |  |
| **Black-throated Green Warbler** |  |  | Maintain or create well-stocked uneven-aged sawtimber NM and NS stands of with >80% canopy cover, especially softwood inclusions and hemlock |  | X | X |  |  | >80% |  |  | HIGH |  |  |
| **Blackburnian Warbler** |  |  | Maintain large conifers and larger forest blocks (>250 acres) Uses beared lichen |  |  | X |  |  | >80% |  | HIGH |  |  |  |
| **Black-backed Woodpecker** | Retain larger snags and potential snags or live trees with decay Presence of wood-boaring beetles essential In younger stands if snags present |  |  |  |  | >12" DBH | >50% | MED- HIGH |  |  |  |  |
| **Boreal Chickadee** |  |  | Maintain stands with abundant snags >12” DBH for cavity excavation Retain spruce and balsam fir as preferred tree species In younger stands if cavity trees present |  |  |  |  | X | >80% | HIGH |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Canada Warbler |  |  |  | Maintain or create NM stands with 50-70% canopy cover and a dense under- and midsto- ry Uneven forest floor with woody debris (stumps, logs, upturned tree roots) preferred | X | X |  | X |  | 50–  70% |  | HIGH | HIGH | MED- HIGH |  |
| Veery |  | Maintain or create stands with low to medium canopy cover (30-80%) and dense understory, ideally near wetlands |  | X | X | X |  | 30–  80% |  |  | HIGH |  |  |
| **Magnolia Warbler** |  |  | Create stands of young conifers Selective cutting within more mature stand that creates openings of shrubby conifer growth create ideal haibtat In older stands if gaps present | X |  |  |  |  | 30–  60% | MED- LOW |  | HIGH |  |  |
| Mourning Warbler |  |  |  | Maintain or create early successional stands Increase sapling density, understory cover, and canopy openings Will use newly cut areas  2-10 years old Will use intermediate /older forest if gaps present | X |  |  |  |  | 40–  70% | MED |  | HIGH | HIGH |  |
| **Olive-sided Flycatcher** |  |  |  | Create forest openings or forest edges near natural openings, with snags or other perches for foraging and singing In any age forest where gaps are present | X |  |  |  |  |  | MED |  |  |  |  |

**BOLD**=Species that prefer Northern Hardwood (others will use Northern Hardwood); Orange=Preferred Stand Structure Class; Tan=Used Stand Structure Class; White=Rarely Used Stand Structure Class

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **OAK PINE** | **YOUNG** | **INTERMEDIATE** | **OLDER** | **MANAGEMENT NOTES** | **GAPS** | **AREA SENSITIVE** | **FOREST INTERIOR** | **MOIST SOIL OR RIPARIAN** | **SNAGS OR CAVITY TREES** | **CANOPY COVER** | **OVERSTORY (>30**'**)** | **MIDSTORY (6–30**'**)** | **UNDERSTORY (<6**'**)** | **GROUND COVER** | **LEAF LITTER**  **OAK PINE SUMMARY TABLE** |
| **Scarlet Tanager** |  |  |  | Maintain or create well-stocked uneven-aged sawtimber stands with >80% cover, especially those with a signficant oak component and those embedded within larger blocks of mature forest (>250 acres) |  | X | X |  |  | >80% | HIGH | MED- HIGH |  |  |  |
| **Ovenbird** | Maintain mature forest with med to high canopy cover, within larger block of contigu- ous forest (>250 acre) Habitat affected 300' or more from edge of forest management activities Prefers less ground cover, deeper leaf litter for domed ground nest |  | X | X |  |  | 60–  90% | HIGH | MED- HIGH |  | LOW | X |
| **Wood Thrush** |  |  | Maintain or create well-stocked uneven aged sawtimber stands with tall trees, >80% canopy cover, diverse species and moist leaf litter Generally more productive in larger forest blocks of contiguous forest habitat (>250 acres) |  | X | X | X |  | >80% | MED- HIGH | MED | MED | LOW |  |
| Black-throated Blue Warbler |  |  | Maintain or create NH or NM stands with 50-80% canopy cover and dense understory Responds well to low-intensity cutting where canopy is closed and openings allow for patches of regeneration Prefers larger forest blocks (>250 acres) |  | X | X |  |  | 50–  80% | MED- HIGH | MED- HIGH | HIGH |  |  |
| Blackburnian Warbler | Maintain large conifers and larger forest blocks (>250 acres) Uses beared lichen |  |  | X |  |  | >80% |  | HIGH |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Yellow-bellied Sapsucker |  |  |  | Retain larger snags and potential snags or live trees with decay, especially aspen and birch Will use intermediate forest if snags are present |  | X |  |  | X |  |  |  |  |  |  |
| Veery |  |  |  | Maintain or create stands with low to medium canopy cover (30-80%) and dense understory, ideally near wetlands |  | X | X | X |  | 30–  80% |  |  | HIGH |  |  |
| Mourning Warbler |  |  |  | Maintain or create early successional stands Increase sapling density, understory cover, and canopy openings Will use newly cut areas  2-10 years old Will use older forest if gaps present | X |  |  |  |  | <30% | LOW | MED | HIGH | HIGH |  |
| **Northern Flicker** |  |  |  | Retain current and future large snags More open park-like woods preferred, especially if habitat for ants, which are a preferred food soruce Only in younger forest if snags present |  |  |  | X | >12" DBH | LOW | LOW- OPEN |  |  | LOW |  |
| American Woodcock |  |  |  | Maintain or create forest matrix with mix of openings and young forest in early stages of regeneration (<20 years old) preferably near shrubby wetland (FMI, timberdoodle org) | X |  |  | X |  | VARI- ABLE | HI- LOW | HI- LOW | HI- LOW |  | X |
| Eastern Wood-pewee |  |  |  | Maintain or create NH pole/sawtimber stands with >80% cover, gaps, and open midstory | X | X |  |  |  | 50–  70% | MED | MED- LOW |  |  |  |

**BOLD**=Species that prefer Northern Hardwood (others will use Northern Hardwood); Orange=Preferred Stand Structure Class; Tan=Used Stand Structure Class; White=Rarely Used Stand Structure Class

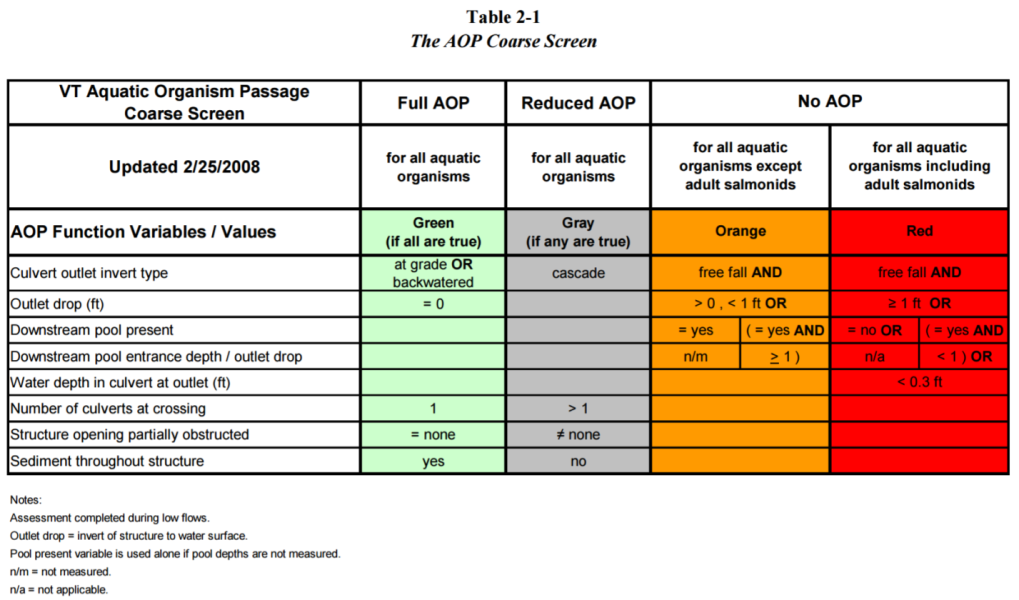
Source: **Forestry for Maine Birds: A Forester’s Guide.** Maine Audubon, Falmouth, ME. Publication pending 2017

## My Maine Woods Stream Smart Rapid Assessment Checklist

For field use by foresters preparing My Maine Woods management plans. Request an evaluation by and NRCS aquatic biologist if existing stream crossings do not meet any of the four Stream Smart Principles or there is a downstream drop. Consider applying for NRCS Aquatic Organism Passage practice funding to restore passage at existing crossings or when installing new crossings. See reverse side of this form for additional information.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Crossing # | Crossing Type (bridge/culvert; shape; material, span/diameter) | Please answer with Yes, No, or Unknown | | | | | | | | Comments | Photos Taken?[[2]](#footnote-2) |
| Is the stream a perennial stream? | Is there a pool at the inlet? | Is there a pool at the outlet? | Is the crossing structure perched at the outlet? | Is there water in stream but not in the crossing structure? | Is inlet clogged with debris? | Does stream appear wider than crossing structure? | Do you think crossing structure blocks fish/wildlife movement? (see next page) |
|  |  |  |  |  |  |  |  |  |  |  |  |
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**Vermont Aquatic Organism Passage Coarse Screen**

**This tool may be used to estimate if the crossing restricts fish or aquatic wildlife movement. NRCS will make final determinations based on field assessments.

*Source:* Vermont Fish and Wildlife 2009. For more information on using this table, see [The Vermont Culvert Aquatic Organism Passage Screening Tool](http://www.vtfishandwildlife.com/common/pages/DisplayFile.aspx?itemId=111512).

**Supplemental AOP Quick Data Form (Optional)**

Foresters and landowners may use this form to record additional information about the crossing. This form is not intended to replace a full AOP assessment conducted by NRCS for NRCS practices.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Crossing #** | **Estimated Dimensions** (NRCS will conduct full assessment if AOP practices are planned) | | | | **Conformance of Existing Crossing with**  **The “4S” Stream Smart Principles (Y/N)** | | | | **Comments** |
| Bank-full Stream Width  (not at crossing pool) | Bank-full Stream Depth  Width (not at crossing pool) | Current span opening | Down-stream drop at low water | 1 | 2 | 3 | 4 |
| Span the ban- full width? | Structure below elevation of original channel? | Slope matches stream? | Substrate in crossing? |
|  |  |  |  |  |  |  |  |  |  |
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# VI. Other Recommended Practices

## Recreational Trail Planning Guidelines

**Introduction**

Recreation trails have the potential to disturb some wildlife species. Disturbance will vary with species, usage level and type, and season. Following are some general considerations for ecologically friendly trails that may be used by a wide range of public and private ownerships. Not all the uses discussed below are applicable to all landowners or appropriate in all situations.

**Trail Design and Layout- All Trails**

* Minimize disturbance to wildlife by creating wildlife security areas consisting of large patches of habitat without trails, rather than crossing all sections of a woodlot with trails.
* To minimize disturbance to aquatic wildlife, trails should not run parallel with the shore of water bodies and open wetlands for any distance. Rather, approach water bodies with spur trails to a screened viewpoint or have loop trails only approach the shoreline for short distances. See Maine Audubon’s [Conserving Wildlife in Maine’s Shoreland Habitats.](http://www.beginningwithhabitat.org/pdf/MA.ShorelandHabitats-5405-FINALcolor_000.pdf)
* Poorly designed and built trails for hiking or other uses can cause soil compaction, erosion, and degradation of water quality. American Trails has a number of excellent on-line resources on trial building and design (download: <http://www.americantrails.org/resources/trailbuilding/index.html>). The US Forest Service Trail Construction and Maintenance Handbook is also a helpful resource (download: <http://www.fhwa.dot.gov/environment/fspubs/07232806/index.htm>).
* Trails should avoid sensitive breeding and winter habitats such as goshawk nest sites, heron rookeries, deer wintering areas, and moose wintering habitat, or be closed seasonally as needed and depending on use level.

**Mechanized Use**

* Mountain bikes increase the potential for permanent soil damage, off-trail use, and conflicts with other users. However, studies have generally shown that mountain bikes have no more impact on wildlife than pedestrians.
* ATV use can cause severe soil damage, impact water quality, and affect forest values for other users of the area. Where ATV use is an objective, trails should follow the general design and layout principles above and use appropriate techniques to minimize damage to soils and water quality. Stream crossings and associated approaches, wet sites, and erosion on steep trails should be primary considerations. Public-use ATV trails should be built to applicable published standards.
* Trails should avoid sensitive winter habitats such as deer wintering areas and be planned to minimize conflicts with non-mechanized users.
* Consult trail design guidelines applicable to the type and amount of use anticipated

**Pets**

* Dogs should be leashed during the nesting season of ground-nesting birds (April to end of July). Examples of ground nesting birds that might be disturbed by dogs include woodcock, hermit thrush, and ovenbird. Dogs should also be leashed during winter when snow restricts animal movement and cold temperatures require energy conservation for survival.

1. McCullough recommends one 35,000-acre lynx management unit per 200,000 acres; within the unit 20% or 7,000 acres should be large patches (>100 acres) of 10-30/35 year-old softwood-dominated stands at any one time. For a 60-year even-aged rotation, this would require 21,000 acres (60%) of the 35,000 acres in large patches of softwood-dominated stands managed with even-aged methods. This would increase to 80% for an 80-year softwood rotation. Few landscape units in Maine have the type soils appropriate for this percentage of conifer management. [↑](#footnote-ref-1)
2. **Photos:** *Please take 4*: inlet, outlet, looking upstream from crossing, and looking downstream from crossing [↑](#footnote-ref-2)