

Appendix 5

Wildlife Habitat and Biodiversity

This section contains a series of broad-based management ideas, principles and philosophies regarding the management of woodlands for the conservation or enhancement of biodiversity. Species biodiversity pertains to the broad array of organisms found throughout our forests from the smallest single celled types to the largest mammals. In managing a diverse forest structure, we inherently manage for a diverse wildlife population creating a healthy ecosystem that offers a wide array of habitats. These concepts will be directly described and applied in a separate section covering Focus Species Forestry. This section is based on the guide, Focus Species Forestry, A Guide to Integrating Timber and Biodiversity Management in Maine by Robert Bryan et al.

These principles are not site specific instructions on how to manage the forest, but concepts that, if applied appropriately and with proper planning, will enhance the long-term diversity, health and richness of the forests we manage. The application of these principles will also vary greatly with landowner objectives. These ideas are adapted from Biodiversity in the Forests of Maine: Guidelines for Land Management (Flatebo, Foss & Pelletier, 1999), and a more thorough explanation of these practices and their rationale may be found there.

Vertical Structure and Crown Closure_____

Diversity in vertical structure provides an integrated habitat from the forest floor to the canopy for a wide variety of species. Additionally, openings in the canopy regulate light, heat, and other variables throughout the forest further adding to the range of microclimates key to maintaining and enhancing species biodiversity in a stand. Bearing these principles in mind, the following guidelines will help create and/or maintain a vertical structure during forest management activities that will, in turn, help promote a diverse forest.

- When harvesting, attempt to thin trees from all layers of the strata. Maintain a healthy herb, shrub, understory and overstory structure for maximum richness whenever possible.
- Retain tress of differing species, size and age, balancing each group appropriately throughout the stand.
- Promote softwood areas in hardwood stands and vice versa.
- Encourage varying vertical structure at the landscape level as well as the stand level to ensure a diverse structure beyond the immediate area.

Native Tree Species Composition

Recognizing that differing habitats exist within and around different tree species, it is important to maintain healthy tree diversity throughout a stand. Furthermore, recognizing the native species composition and its influence on the characteristics of the whole forest is essential to maintaining and promoting rich, healthy forest stands. To help promote these ideas:

- Rare or uncommon species should be identified and retained in stands where they are found. Additionally, make conditions more suitable for their regeneration where appropriate.
- Avoid converting stands from their natural composition and age structure or eliminating any species from a stand where it is found.
- Naturally uniform stands occurring because of soil or site conditions may be valuable to maintain over the landscape.

Downed Woody Material, Snags and Cavity Trees

Standing and downed woody material provides essential habitat for many of our smaller plants and animals including insects, mosses, lichens and liverworts to name a few. Additionally, downed woody debris, snags and cavity trees provide a special area for hundreds of species to rest, nest, den, forage, perch, display and bask. The breakdown of woody material provides nutrients to the soil and aquatic component of the forest as well as serving as important function in the structure of streams and brooks. The following guidelines can help to promote downed woody debris, snags and cavity trees during management activities.

- Allow downed woody material to remain on site following harvesting. Also avoid damaging existing downed woody debris.
- Logs greater than 12in diameter and 6ft in length are especially rare and should be left or possibly created wherever practical.
- Snags should be left where possible, especially those currently being used as nesting or den sites. Also leave trees that will become snags and consider leaving a retention area around snags and potential snags.

Mast

Mast, defined as nuts, seeds, berries or fruit produced by trees, plants or shrubs, is a critical food source for many wildlife species. Of particular value is what is known as hard mast; highly nutritional nuts produced by about 16 of Maine's trees. In order to promote species diversity it is critical to maintain plants that produce the wide range of food source these creatures depend on. To promote the production of mast in forest stands:

- Promote a variety of mast producing trees and shrubs in stands as they are managed to create an equal variety of actual mast.
- Oak and Beech are the most common mast producers and mature trees should be retained during thinnings to continue mast production. Select healthy trees to leave as they will likely produce healthy, mast producing offspring in the future.
- Black cherry and apple trees are rare and should be managed carefully to encourage the production of fruit and potentially offspring.
- Small openings to encourage pin cherry, raspberry and a productive herb layer are a good idea.

Forest Soil, Forest Floor and Site Productivity

Soil health is the keystone to ensuring a healthy and productive forest. Recognizing soil types, drainage characteristics and subsurface biological activities will help to understand site productivity as well as guide management to enhance or preserve soil health. We must recognize that more fertile soils will generally lend to a more diverse forest (at all vertical levels) while more infertile soils may harbor rarer species. Some guidelines to help protect soil quality, quantity and productivity are listed below. Additionally please refer to the "Soil Characteristics" section of this management plan for a more detailed analysis of soils and soil types found on these lots. Additionally, note the connection between soils management and Best Management Practices.

- Understand soil types and conditions on site through inspections and soil maps.
- Promote the appropriate harvesting equipment for soil conditions and time of year for all harvests. For instance, more poorly drained soils should be harvested during frozen conditions to avoid rutting, compaction and general disturbance.
- Use current harvesting technology to protect the organic layer and reduce mineral soil exposure whenever practical.
- Consider leaving brush and slash on-site, especially on less productive soils.
- Avoid conditions that lead to erosion or potential erosion (like rutting or skidding long distances parallel with grades) over the entire site.

The following considerations refer to site-specific conditions where "Special Habitats and Ecosystems make unique contributions to biodiversity."

Riparian and Stream Ecosystems

Riparian areas are some of the most productive and species rich areas in the landscape. They serve to buffer aquatic plants and animals from disturbance and well as offer protection to wetlands and water quality. To ensure the function and integrity of riparian areas is protected:

- Establish buffer areas around streams, ponds, lakes and wetlands where limited harvesting maintains more continuous forest cover. This helps promote shade for forest streams as well as ensuring a supply of organic matter into water bodies essential to aquatic food chains. Additionally, these buffer areas will serve as filter strips protecting water quality and wetland health.
- Buffer strips should vary in size and take into account the size and structure of the riparian area.
- Stream and wetland crossings should be limited to as few as possible. Use careful harvest layout to establish this and use Best Management Practices before, during and following harvesting activities to ensure the least possible impact.
- Avoid disturbing the mineral soils wherever possible in these areas.

Vernal Pools

Vernal pools qualify as a significant habitat as they are essential to the reproduction of several types of amphibians, reptiles and invertebrates. These pools further add to biodiversity by providing foraging habitat for a number of animal species. Recommendations to support vernal pool habitats and the pools themselves include:

- ✓ Identify and document vernal pools in the spring when they contain water and wildlife. The presence of indicator species (tree frogs, yellow spotted

salamander etc.) helps to identify and differentiate vernal pools from other aquatic ecosystems.

- ✓ Maintain a buffer around the pool with a deep litter layer, plenty of downed woody material and shade in and around the pool itself.
- ✓ Avoid depositing slash and other logging debris in the pool, disturbing the organic layer and water flow systems of the pool and disturbing the pool floor or depression.

Beaver Influenced Ecosystems _____

Flowages created by beavers are home to a great variety of plant and animal diversity. The natural cycle or progression of these systems is in itself a diverse ecosystem as it changes from newly formed ponds, to meadow to forested wetland and beyond. To help protect, maintain or even encourage beaver habitat and ecosystems:

- ✓ Determine the limits of acceptable flooding within a watershed based on historical activity and outline potential sites that may be more acceptable for both Beaver and the landowner.
- ✓ Use water control devices to control flooding where excessive tree mortality or road damage may become a concern.
- ✓ Design and construct new roads and plan other management activities away from potential flood areas.

Maine's Department of Inland Fisheries and Wildlife is an excellent source of information for Beaver control and mitigation.

Woodland Seeps and Springs _____

Seeps and springs can provide a unique feature and are valuable to many species of wildlife in several ways. Areas that remain unfrozen in the winter provide a water source for many animals and may serve as a hibernation area for small amphibians. Additionally, these areas may allow for green vegetation earlier in the spring as well as support insect and invertebrate populations important to mammals and migrating birds.

- Identify seeps and springs in the spring or early summer when they are more apparent and easier to differentiate.
- Maintain a 50-ft buffer to limit equipment around the edge of seeps and springs wherever possible.
- Avoid depositing brush and slash in seeps and springs
- Consider using seeps and springs as the focal point of retention areas and further limiting disturbance to the subsurface flow to the extent .

Nesting Areas for Colonial Wading Birds

Maine is host to some eight species of tree-nesting colonial wading birds, seven of which are near or at their northern limit for breeding. These birds form an important link between terrestrial and aquatic ecosystems and represent a unique component of bird diversity. To help protect these populations:

- Map known locations of wading-bird colonies on stand maps and consult abutters and MDIFW biologists when working within 1500-ft of nests.
- Avoid human activity within 330-ft of active heron colonies during the breeding season.

**** Identified as proximate to the Rines Forest**

Deer Wintering Areas

Deer Wintering Areas (DWAs) are essential to the survival of white-tailed deer during the winter months of deep snow. These areas additionally provide important habitat to other species including fisher and over 40 bird species, five of which are rare or uncommon in Maine and 12 that require softwood forests.

- LURC maps and zoning maps are excellent sources for identifying current DWAs and should be used to identify these areas on the ground.
- Identify additional DWAs through scouting and cruising and designate them on stand maps.
- MDIFW biologists should be consulted when planning harvests in DWAs to help develop a collaborative plan that takes all needs and objectives into account.
- There are many considerations when harvesting in DWAs, including protecting softwood regeneration, protecting riparian travel corridors and leaving an intact softwood overstory through at least one-half the area of deer habitat.
- Schedule harvests in DWAs in the winter months whenever possible.

**** Depending on the source, DWA's are identified as proximate to the Rines Forest, or existing on the Rines Forest.**

Nest Sites for Woodland Raptors

There are several species of raptors that nest and breed in Maine, including hawks, owls, eagles, falcons and vultures. These birds are important members of the ecosystem and may have particular nesting needs within a forest for successful breeding. In order to help maintain suitable nesting sites across the forest and protect nesting pairs:

- Consult MDIFW for recent maps of bald eagle nest sites and further consult biologists with the department if planning forest management activities near bald eagle nests.
- Retain trees with large stick nests and inspect suitable trees (large white pine and some hardwoods) for additional nesting sites when cruising or scouting.
- Avoid forest management activities within a quarter-mile of known nesting raptors during the breeding season (February to July).
- Leave an uncut buffer of about 66-ft around known raptor nest trees and additionally, maintain about 75% crown closure within 200-ft of nests in closed canopy forests.
- Leave large “supercanopy” trees in clearcuts and along rivers and ponds as recruitment trees for future nest building.

Old Growth and Primary Forest

Old growth, primary and late successional forests offer a unique habitat that is not only uncommon, but important to many species of flora and fauna. A great deal of research has been done and continues to be done to understand the complex relationships that may occur in these areas and how they may differ from conditions in more managed stands. While defining an old growth stand may remain up for debate, some ideas to help identify and protect old growth, primary and late successional forests include:

- Use scouting and any old land records that may be available to help identify old growth areas on your ownership and consider a no-management option in areas that are identified on your land.
- Smaller stands with old growth conditions should be buffered with larger stands of mature forest wherever possible.
- Identify areas that may be good candidates for restoring old growth conditions. Areas near existing old growth stands are more likely to experience successful transition as species migrate.

Rare Plants or Animal Sites

Plants and animals that occur rarely in Maine are intrinsically valuable to biological diversity. Areas where rare plants and animals occur should be considered for protection as they may be especially vulnerable to changes in the landscape. Helping to protect rare plant and animal communities starts with the ability to recognize and identify them.

- The MDIFW and MNAP are excellent sources of information to help identify sites where known rare plants and animals exist, and can further assist in developing management plans that may protect or enhance these areas.
- Become familiar with rare plants and animals to the extent possible and keep an eye out for them when scouting and cruising.

NOTE: This management plan includes a MDIFW and MNAP review for existence of rare plants and animal.

Rare Natural Communities

Maine has several natural community types that occur throughout the state. These communities are areas that represent defined criteria which make them unique in their own way. The Maine Natural Areas Program (MNAP) lists 10 closed-canopy (of 25) and 7 (of 9) partial-canopy community types as rare or very rare. Conservation at the community level helps preserve and protect all biological functions and interaction in that particular ecosystem, thus helping to preserve the natural biodiversity of the site.

- The MNAP is an excellent source of information in helping to identify these rare or uncommon natural communities as well as a source of maps depicting known communities on the ground.
- Become familiar with these rare community types and contact MNAP for management ideas and identification tips

NOTE: This management plan includes an MNAP review for existence of rare natural community types.