

**Management of State Woodlands: Other Biodiversity**  
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I have been asked to comment on two questions related to the management of woodlands on state parks and forests under the jurisdiction of the Massachusetts Department of Conservation and Recreation (DCR) especially as it relates to biodiversity not including species characteristic of early successional habitats. I paraphrase the two questions as follows: 1) what are the appropriate management strategies for DCR to conduct on state parks and forest to ensure persistence of the native biodiversity of the Commonwealth (i.e., this particular ecosystem service); and 2) how should these strategies be balanced with other, potentially competing demands as covered by other panelists.

PREMISES

- 1) DCR parks and forests provide habitat for more state-listed species than any other landowner in the Commonwealth; some of the species are found only on DCR lands. State parks and forests also contain a diverse array of natural community types unrivaled in the Commonwealth.
- 2) These important features of biodiversity are not uniformly distributed across DCR properties.
- 3) State law mandates management of habitat of state-listed species for the benefit of those species (321 CMR 10.05(2)(c) 3).
- 4) State law also mandates management plans for DCR lands (MGL Ch. 21 S.2F).
- 5) The principle goal of ecological management is the maintenance of existing native biodiversity on state lands. We work with what we have and not get caught up in judgments about past abundance of particular species, or whether or not they are features of cultural landscapes. As a corollary to this premise, we would not manage necessarily to restore species native to Massachusetts that were extirpated as a result of human activity, e.g., large predators.

This last premise may be the most controversial for multiple reasons including 1) most of the Massachusetts landscape has been heavily modified following centuries of activity dating since settlement (1620) and current distribution of many species is a legacy of this past activity; 2) a rapidly changing climate and concomitant change in species' distribution and abundance provides a longer-term challenge for land managers, especially for the management of state-listed species whose southern range margin includes Massachusetts. Given regulatory requirements alluded to above however, there are important legal drivers for managing for existing biodiversity.

An additional and important premise of this discussion is that a collection of large forest reserves has been or will be established. It is not clear what management will be allowed in reserves, but I assume it will be "management-lite" in most of the reserves (with some exceptions noted below).

It is generally accepted by ecologists that a well-designed system of ecosystem reserves is the best method for protecting all biodiversity at all levels.<sup>1</sup> To accomplish this purpose in Massachusetts we

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<sup>1</sup> Aber, J. et al. 2000. Applying ecological principles to management of the U. S. National Forests. *Issues in Ecology* 6, 20 pages

would have to set aside sufficient reserves of sufficient size and redundancy including physiographic features known to be strongly correlated with biodiversity<sup>2</sup>. In addition there should be established a comprehensive monitoring program in the reserve system that features representative taxa as surrogates for monitoring trends in biodiversity<sup>3</sup>

Early successional species (I define here as primarily grassland and shrubland species) are discussed by another panelist, and the need for habitat for those species would likely not be met in reserves, but would require focused efforts in actively managed woodlands.<sup>4</sup> In some cases, management in reserves will also need to be more intensive, especially in those forests requiring chronic disturbance. For example it might be necessary to maintain a system of controlled fires (either stand creating e.g., pitch pine or low-intensity ground fires, e.g., oak woodland) to maintain populations of those species adapted to those types of disturbance.

I've been asked specifically to discuss active management as it applies to non-reserved forests for the protection of biodiversity other than that characteristic of early successional communities. Some general thoughts:

- 1) First, as mentioned in an earlier premise, not all of the state-listed species found on DCR lands will be captured in reserves, and management plans for these state-listed species and exemplary communities, e.g., freshwater fens, may mandate active management driven primarily by ecological considerations.
- 2) DCR could designate actively managed woodlands that are managed primarily for ecological purposes consistent with biodiversity, carbon sequestration, watershed protection goals, and where timber production is secondary, i.e., trees that are removed selectively to create habitat or enhance habitat structure could be sold commercially. Tree removal would have to be conducted to minimize soil disturbance and road construction to avoid providing opportunities for invasion by non-native species.
- 3) There is no potential conflict between managing for biodiversity and providing for the other ecosystem services considered by this panel depending on the specifics of the management for those services. As alluded to earlier the ancillary activities of logging (road construction) can degrade species habitat and motorized recreation that might follow those roads potentially would further exacerbate those impacts. Where biodiversity is a priority management objective, these activities should be discouraged.
- 4) Active management to protect biodiversity, e.g., invasive species control will also positively affect aesthetics and public recreation. In turn, many special places were protected for their biodiversity value and will require active management to sustain those special places
- 5) DCR should investigate emerging techniques for accelerating the development of mature and or "old-growth" structure by selective tree removal as an alternative to passive development of old-growth taking several decades. However, this research-based management would need to be done carefully and would necessitate a long-term commitment to monitoring. Regardless, many areas should also be allowed to develop naturally.

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<sup>2</sup> Mark Anderson, TNC presentation to Mass Audubon, June 10, 2009

<sup>3</sup> There are plans for a Long-Term Ecological Monitoring system for the reserves and Mass Audubon has been working with the relevant committees and agencies to expand this system, focused primarily on forest inventory, to birds.

<sup>4</sup> Aber, et al. 2000.

I'm not sure we know enough to be able to state quantitatively, how much early successional habitat is necessary versus other woodland habitats. For example, populations of grassland birds appear to have stabilized or slightly increased in our most recent surveys with the exception of Vesper Sparrow (2005 results) on approximately 11,000 acres of 60 grasslands sites ranging in size from ~10 acres to ~1,300 acres. These changes provide support for how well species characteristic of early successional stages respond to active management and protection of appropriately sized grasslands (>100 acres is the best size suited to most grassland species, with the possible exception of Upland Sandpiper).

Shrubland birds (and associated species) pose an important management challenge, but both grasslands and shrublands are distinctively different in their managing regimen such that focus should be on those areas that are already at an early seral stage rather than logging mature forest to create new areas. Natural disturbance processes in reserves may provide the conditions for sufficient abundance of early successional forest tree species (paper birch, grey birch, pin cherry) without the need for active management.