Massachusetts Department of Conservation and Recreation

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Deval L. Patrick, Governor
Timothy P. Murray, Lt. Governor
Richard K. Sullivan, Jr., Secretary
Edward M. Lambert, Jr., Commissioner
Jack Murray, Deputy Commissioner for Park Operations

Dear Friends,

On behalf of Governor Deval Patrick, Secretary of Energy and Environmental Affairs Rick Sullivan, and the Department of Conservation and Recreation, it brings me great pleasure to present the final *Landscape Designation for DCR Parks and Forests: Selection Criteria and Management Guidelines*. This document reflects the fruits of a comprehensive and inclusive initiative that began in April 2009 with the commencement of the Forest Futures Visioning Process. That year-long process involved an extensive public process and culminated in a report developed by a Technical Steering Committee (TSC), which proposed a long-term framework for: adaptive management of DCR's properties; consideration of the full range of public benefits and ecosystem values that DCR's forests and parks can sustainably provide; and versatility to guarantee that monitoring affords opportunities for refinement to ensure that those values and objectives are realized.

Building upon the findings and recommendations of the TSC, DCR appointed a Director of Forest Stewardship, a new senior-level position within the agency, and initiated the Landscape Designation Process, which featured fourteen public workshops between Fall 2010 and Spring 2011, providing several opportunities for public comment during the development of selection criteria and management guidelines for the three landscape designations proposed by the TSC and sought input on the agency's initial designations for DCR's parks and forests.

The agency's Internal Working Group, composed of representatives from nearly all of DCR's divisions and bureaus as well as EEA, worked together over the course of countless hours to review and evaluate thousands of pages of public input, and incorporate feedback appropriately. The task was considerable and the effort poured into it was equally great. Knowing that this group spent a significant amount of time debating and reviewing the pertinent issues raised by the public and our partners, I am proud and appreciative of the diligence and thoroughness with which they have approached this assignment and the dedication that they exhibited to its completion.

I want to take a moment to thank our partners in the DCR Stewardship Council as well as those at The Nature Conservancy, Mass Audubon, The Sierra Club, the Appalachian Mountain Club, the Trustees of Reservations, and the Environmental League of Massachusetts for their support throughout this process. Upon implementation, the product of these efforts will result in a considerable increase in the number of acres set aside from commercial timber harvesting, will focus forest management activities in areas targeted as most suitable, and will provide a framework for guiding the management of our parks and forests as we continue to work toward the development of Resource Management Plans.

Stakeholders, partners, and DCR staff alike have devoted many hours to this effort. What we advance here is a new and exciting paradigm of land management for DCR as well as a stronger and more robust standard for inter-disciplinary and integrated planning within the agency. I am excited by the opportunity to lead DCR into this new chapter of stewardship of our amazing natural, cultural, and recreational resources. After the considerable amount of deliberation, thoughtful review of key issues and concerns, and resources devoted to the development of this vision, I look forward to working with our staff and our partners to begin implementing and observing the impact of the course we have charted.

To all those whose fingerprints have made a lasting impression on this extraordinary achievement, I extend my sincerest thanks and gratitude to the service you have provided to DCR and to the Commonwealth.

Sincerely,

Edward M. Lambert, Jr.
Commissioner

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The Massachusetts Department of Conservation and Recreation (DCR), an agency of the Executive Office of Energy and Environmental Affairs, oversees 450,000 acres of parks and forests, beaches, bike trails, watersheds, dams, and parkways. Led by Commissioner Edward M. Lambert, Jr.., the agency's mission is to protect, promote, and enhance our common wealth of natural, cultural, and recreational resources. To learn more about DCR, our properties, and our programs, please visit us at www.mass.gov/dcr. Contact us at mass.parks@state.ma.us.

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# Section 1. Introduction

## *1.1 Background*

In 2009 and 2010, the Massachusetts Department of Conservation and Recreation (DCR), together with its partners and stakeholders, undertook a year-long initiative to develop a renewed vision and long-term strategy for managing the 311,000 acres of forested lands in the State and Urban Parks system. This effort, the Forest Futures Visioning Process (FFVP), explored the wide range of ecosystem services or natural benefits provided by these lands and their place in the overall context of the Commonwealth's three million acres of public and private forests. The process sought to balance forest management practices with other uses and activities so that these lands may continue to provide a range of public benefits to future generations. The FFVP, which involved forest resource experts, stakeholders, and the general public, resulted in a set of ten recommendations to DCR for the improvement of forest stewardship practices.[1]

DCR has committed to adoption of the core set of recommendations of the FFVP – specifically, elevating the role of forest stewardship through the creation of a Director of Forest Stewardship position, improving public process relative to management decisions impacting DCR lands, adoption of an ecosystem services model to guide management decisions, and creating a new land use management structure as a means to identify and delineate compatible activities within DCR parks and forests. These efforts are more than just changes in how DCR approaches forestry – rather, they represent a new direction for strategic land stewardship for DCR.

The implementation of the FFVP recommendations has provided DCR with the opportunity to complete an analysis for all DCR State and Urban Parks and Forests and group them by key natural and ecological characteristics (topography, geology and elevation) – an effort that supports not only the new land use management structure, but is also beneficial to other resource planning efforts. This also marks the first time the agency has reached out to stakeholders and the public to solicit input on land use management decisions at a statewide scale.

## *1.2 Forest Futures Visioning Process*

DCR, with facilitation by the Massachusetts Office of Public Collaboration (MOPC), launched the FFVP in April 2009. The agency undertook this process at the suggestion of the DCR Stewardship Council, in response to public criticisms of some of DCR's forestry practices and in recognition of the need to engage the public in an active dialogue about land management within the DCR State and Urban Parks system. Led by a Technical Steering Committee (TSC) composed of individuals with a high level of expertise on issues, trends, and best practices in climate change, forest conservation and ecology,

[1] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010. Available at: http://www.mass.gov/dcr/news/publicmeetings/tsc_final_recommendations.htm

invasive species, landscape ecology, natural resource economics and law, recreation, silviculture, social policy, visual/aesthetics, watersheds, and wildlife habitat, and guided by an Advisory Group of Stakeholders, the FFVP involved five public forums that were attended by over 500 individuals and received over 1,000 comments during the course of the process.

In its final recommendations report, the TSC encouraged DCR to embrace a "land management paradigm shift … moving the Department's forest management towards a vision based on a more comprehensive suite of ecosystem services."[2] The concept of ecosystem services, as developed through the 2005 Millennium Ecosystem Assessment[3], relates to the benefits provided to humans and the environment by ecosystem resources and processes. These services can be broken into four broad categories: provisioning, regulating, supporting, and cultural. The TSC focused on the premise that DCR lands should be managed for the provision of ecosystem services to the public that are not consistently delivered by private lands. These services include: carbon sequestration, soil, air and water quality, biological and ecosystem diversity, nutrient cycling, culture, history, spiritual values, public recreation, and renewable wood products.

To achieve this vision, the TSC provided DCR with a set of ten recommendations, primary among these recommendations is that DCR adopt a new land use management structure that incorporates a system of designating the 311,000[4] acres of DCR parks and forests at a statewide scale into three different zones—Reserves, Parklands and Woodlands—so that incompatibilities among the various ecosystem services can be prioritized and managed system-wide as well as prioritized within the individual zones in an effort to maximize outdoor recreational experiences on DCR lands. Taken together, these recommendations would impact every forest, park, and reservation in DCR's State and Urban Parks system.[5]

It is important to recognize that while DCR has adopted and is implementing many of the TSC's recommendations, some recommendations (or specific aspects of them) were not fully adopted, or cannot be at the present time, due to budgetary or other constraints. For example, some portions of Recommendations #9 (re: better stewardship of private forestland) and #10 (re: improved funding) require legislative action or budgetary resources that are not likely to materialize in the near future. In

[2] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 6.

[3] The 2005 Millennium Ecosystem Assessment was an international scientific effort that identified a connection between ecosystem services and human well-being, and divides these services into provisioning services, regulating services, and cultural services. Launched by the United Nations in 2001, the assessment involved over 1,300 natural and social scientists from around the world. For more information and access to reports, see: http://millenniumassessment.org/en/index.aspx

[4] Note: The TSC report referred to the "308,000 acres" of DCR State and Urban Park system properties. However, today that total is closer to 311,000 acres. The acreage figures in this document have been updated to reflect the more current total.

[5] DCR Water Supply Protection lands are not included in this process. The Quabbin, Wachusett and Ware River watersheds are managed by DCR's Division of Water Supply Protection (DWSP), in partnership with the Massachusetts Water Resources Authority. Although part of DCR, the DWSP is funded and overseen by a separate governing body – the Water Supply Protection Trust Board – and not the DCR Stewardship Council. The DWSP is undergoing a review of its forestland management by an independent panel of scientists and its legislatively-mandated Watershed Advisory Committees which will include opportunity for public input.

other cases, DCR foresaw a need for more flexibility than some TSC recommendations (e.g., regarding silvicultural methodology), in order to allow staff to apply certain forestry practices where necessary in order to effectively manage DCR lands consistent with the goals established by the TSC. Overall, DCR was in agreement with the vast majority of the TSC recommendations, and has made a number of significant changes and adjustments in its management planning and operations as a result.

It is also important to note that despite the controversies that led the agency, in consultation with the DCR Stewardship Council to initiate the FFVP, the TSC report and recommendations largely affirmed the value and importance of an active forest management program on DCR lands. Indeed, the report identified a number of ecosystem services and benefits associated with active forest management, and even proposed that the agency put in place silvicultural guidelines that demonstrate to private landowners and the general public how excellent silvicultural management can be implemented across the range of forest types and stands that exist in the Commonwealth.

### *1.3 Landscape Designation Overview*

DCR is adopting a new land use designation system for the State and Urban Parks system structured around the designation of DCR lands as Reserves, Parklands or Woodlands, based on primary land use characteristics and suitability. In order to balance the provision of ecosystem services and activities on these lands, the FFVP recommended target acreage allocation ranges for each designation. These targets are:

- Reserves: 90,000 – 120,000 acres
- Parklands: 70,000 – 90,000 acres
- Woodlands: 100,000 – 150,000 acres.[6]

Further, the Patrick-Murray Administration has made a commitment that at least 60% of the land within the State and Urban Parks system (at least 186,566 acres), will be designated as Parklands and Reserves.[7]

Each designation has its own set of ecosystem services and management priorities:

> **Reserves** will conserve large contiguous blocks of high-value ecosystems. These are areas where the dominant ecosystem service objectives will be biodiversity maintenance, nutrient cycling and soil formation, and long-term carbon sequestration. Reserves are areas that users often value for spiritual reasons and that may provide elements of a wilderness recreational experience. There will be no commercial

[6] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 35.

[7] *Patrick-Murray Administration Announces Commonwealth Forest Heritage Plan.* Press Release, April 21, 2010. Available at: http://www.mass.gov/dcr/news/2010/pr10-4-21.pdf. Also, see Footnote #4. Despite the change in leadership at the Secretariat that has occurred since the FFVP was completed, the Patrick-Murray Administration still supports this allocation.

harvesting of timber in Reserves. Forest management will generally consist of letting natural processes take their course, although under specific circumstances, more active management might be permitted. For example, wildfire fuels management may be necessary for Reserves in Southeastern Massachusetts. Recreational activities will generally be passive, but existing authorized motorized uses will be maintained until they can be evaluated according to DCR's Motorized Trail Recreation Facility Assessment Policy.[8] This evaluation will guide continuation of pre-existing Off Highway Vehicle (OHV) use in Reserves.

**Parklands** conserve unique natural and cultural resources while focusing on the provision of recreation.[9] Parkland management approaches are expected to range from areas where natural processes dominate to highly modified environments where use is intensively managed. While wood production will not be a management objective in Parklands, some vegetation management to support recreational use, or to ensure public safety or ecological integrity may take place (e.g., removal of hazardous trees, clean up of storm or insect disease damage around facilities, maintenance of unique habitats upon advice of the Division of Fisheries & Wildlife, etc.).

**Woodlands** conserve a range of forest ecosystems, where recreation activities and sustainable forest management will continue. (Timber harvest sites will be closed to the public *only during active harvesting operations* for public safety.) These areas will provide a range of ecosystem services, including: production of high-quality, local, renewable wood products, protection of water quality,[10] carbon sequestration, and both late forest successional structures, and in focused areas, early forest successional stages to promote habitat diversity. Commercial timber harvesting that demonstrates a range of "excellent forestry" through the application of best management practices will be the applied management standard, and there will be demonstration forest opportunities to educate landowners and the general public. While the emphasis will be on uneven aged management, openings of up to five acres may occur under exceptional circumstances, after intensive review and approval by the DCR Commissioner. Forest management will also play a role in the ecological restoration of areas that have been significantly altered by past management practices, such as plantations of non-native species and high-grade harvests.

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[8] This policy is available on the DCR website at: http://www.mass.gov/dcr/recreate/ohv_policy.pdf

[9] Note that the TSC directed DCR to consider all State and Urban properties in their analysis, stating that Parklands ". . . should include all DCR lands in heavily populated areas and other forested areas with high recreational values while retaining other important ecosystem services." *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 39.

[10] It is well established that watershed forest cover provides the best long-term protection for drinking water supplies. A watershed forest functions 24/7 and provides filtration that rivals that provided by the most carefully engineered filtration plant. Forest cover is, however, periodically subjected to significant natural disturbances (e.g., wind, ice, insects) that can temporarily set back its filtration function. In order to maintain vigorous forest filtration, watershed forest management works to deliberately and carefully diversify age structure and species composition in order to increase resistance to disturbance and speed post-disturbance recovery. For more details on these principles, see: http://www.mass.gov/dcr/watersupply/watershed/documents/2007QuabbinLMPCh3.pdf

The DCR mission is "To protect, promote and enhance our common wealth of natural, cultural and recreational resources." It is important to note that the application of Landscape Designations significantly advances that mission. Habitat protection and cultural resource retention is important in all three designations – as stewards of these important resources, we work hard to ensure their protection no matter where they exist. With the exception of continued OHV use in newly designated Reserves, which will be undergoing further analysis and evaluation, Landscape Designation has no other impacts to existing recreational uses. ***Public access will continue within all three designations***. These three different designations allow DCR to provide users with a variety of experiences.

### *1.4 Implementation Process*

In Spring 2010, after the TSC released the FFVP Final Report, DCR formed an Internal Working Group composed of staff with expertise in planning, natural and cultural resource protection, forestry, recreation, environmental education and interpretation, and park operations (see Appendix 11) to develop a framework for designating lands within the DCR State and Urban Parks system as Reserves, Parklands and Woodlands. With the FFVP Final Report and the Patrick-Murray Administration's endorsement and policy direction as its guide, the Internal Working Group produced a draft set of selection criteria and management guidelines to share with the public.

In November and early December of 2010, DCR hosted a series of seven public workshops across the Commonwealth to solicit public input on the selection criteria to be used in the Landscape Designation process, as well as on the draft management guidelines. Over 300 individuals participated in these meetings, and DCR received approximately 350 written comments expressing multiple viewpoints.[11] The selection criteria and the management guidelines were fine tuned based upon the public feedback received. Using available digital data, the selection criteria and Geographic Information Systems (GIS) software were used to develop three models (one each for Reserves, Parklands and Woodlands) and applied to develop a draft map of the three designations. [12]

The **Reserves Model** evaluated DCR State and Urban Parks properties using the Department of Fish and Game's (DFG) Natural Heritage and Endangered Species Program's (NHESP) BioMap2 data and output from a collaborative effort between The Nature Conservancy (TNC) and DCR to identify eleven Ecological Land Units. Ecological Land Units, or ELUs, are areas of land and water having similar characteristic combinations of physical environment – elevation, geology and land form (a measure of topography) – and as a result, similar vegetation and habitats. The purpose of designating ELUs was to identify and distribute potential Reserves across the state's forested ecosystems (i.e., areas with similar topography, geology and elevation) and to identify lands with the highest forest core values and best landscape level characteristics within each ecosystem. Designating ELUs ensured that Reserves would protect a range of ecosystem types, and be located across the Commonwealth so that all residents could have a Reserve experience.

[11] Notes from these public meetings and the subsequent written public comment submitted to DCR can be seen at: http://www.mass.gov/dcr/ld/landscapedesignations.htm

[12] The final selection criteria for each designation are described in the three sections of the report that follow. The three GIS models, and the datasets utilized to meet the selection criteria identified, are explained in Appendix 9.

The **Parklands Model** rated DCR State and Urban Parks properties based on high trail density, high population density and known intensive use areas developed for recreational activity.

The **Woodlands Model** ranked DCR State Parks properties for their suitability as productive Woodlands based upon soils, forest type, and lands that could benefit from silviculture. Urban Parks properties were not evaluated by the Woodlands Model because the necessary datasets were not available. Efforts were not made to develop the necessary data for a Woodland evaluation of these properties as there was neither the time nor the available funding to do so, and their typical characteristics of highly developed recreation, smaller acreage and surrounding population density suggested these properties would not be appropriately designated as Woodlands.

After the GIS models and selection criteria were applied, an internal agency review followed, to ground truth the draft mapping of the three designations. DCR Operations staff, who are most knowledgeable about the conditions and characteristics of properties on the ground, provided valuable feedback which was factored into the draft application of designations.

DCR sponsored a second round of seven public meetings around the state in May and June of 2011, at which the agency presented the draft application of the selection criteria and the resulting Landscape Designation proposals for DCR State and Urban Park properties. DCR also presented a draft set of management guidelines that articulated how Reserves, Parklands and Woodlands would be managed. The goal of the spring 2011 process was to solicit public review and input before finalizing the new system of land use management. Approximately 250 people participated, and over 400 written comments were submitted.[13] Again, multiple viewpoints were expressed, and all feedback was reviewed and considered during the Fall and early Winter of 2011. DCR reached out to some critically impacted municipalities to obtain broader involvement, as well as to major environmental organizations for input on particular issues of interest. As a result, some clarifications and adjustments were made and incorporated into the final designations and into these final guidelines. The final Landscape Designations can be seen in the series of maps provided in Appendix 10, and on the DCR website. The final breakdown of acreage among the three designations is as follows: 111,227 acres of Reserves, 76,904 acres of Parklands and 122,534 acres of Woodlands.

Thus, the final Landscape Designations were shaped by guidance and direction from the TSC and the Secretary of Energy and Environmental Affairs, and informed by both scientific (via GIS modeling) and public input processes.

DCR manages a number of properties that are co-owned and/or co-managed with DFG's Division of Fisheries & Wildlife (DFW), whose mission is more narrowly focused on the conservation of fish and wildlife resources.[14] Designations for these properties were made in consultation with staff at DFW – their comments on the Landscape Designations and Management Guidelines can be seen in Appendix 6.

[13] Notes from these public meetings and the subsequent written public comment submitted to DCR can be seen at: http://www.mass.gov/dcr/ld/landscapedesignations.htm

[14] This includes portions or all of the following properties: Bay Circuit Trail, Hawksnest State Park, Jug End State Reservation and Wildlife Management Area, Mount Watatic State Reservation, Quashnet Woods State Reservation, and the Southeast Massachusetts Bioreserve.

A small number of properties were not given a designation due to unusual administrative issues that did not merit designation at this time. These include:

- Hop Brook Flood Control Site: a flood control site that did not rank well for any of the three models
- MCI Plymouth: a minimum security prison that is located within Myles Standish State Forest
- Mt Watatic: a facility that is owned in partnership with five other public and private entities

### 1.4.1 Designation of Future Acquisitions

A major component of DCR's mission is land acquisition for resource protection and provision of public access. The Patrick-Murray Administration has displayed a strong commitment to land protection efforts, protecting over 88,000 acres across multiple Executive Office of Energy & Environmental Affairs (EEA) agencies – approximately 18,000 of those acres are held by DCR. As the TSC has recommended, the agency will seek opportunities to expand the Reserve system, so that the sizes of individual Reserves may be increased over time to encompass 10,000 to 15,000 acres.

In most cases, land acquired by DCR after the Landscape Designation process concludes will receive the same designation as the DCR facility that the new acquisition is expanding. For those acquisitions that result in the creation of a new DCR facility, or have different characteristics than surrounding facilities, or create new resource management or recreational opportunities, an internal assessment and analysis process will ensue and an interim designation made, to be finalized when a Resource Management Plan is completed.

## *1.5 Integration of Landscape Designation with Other Planning*

In recommending Landscape Designations throughout the DCR parks system, the TSC both recognized the broad, statewide scale at which Reserves, Parklands and Woodlands would be identified, and understood that DCR would incorporate new, more specific knowledge over time to inform management at the district and property levels. The TSC also emphasized the need for DCR to better integrate and coordinate all of the planning functions within the agency. As a part of its work, DCR's Internal Working Group undertook this task with the support of environmental partners, resulting in the integration of key statewide level and property-level planning systems that are fundamental to the agency's management of its properties going forward.

### 1.5.1 Statewide Level

Landscape Designations, described in detail in this document, are applied at a statewide scale, and will guide land use management activities based on a balance between conservation and recreation for properties throughout the DCR parks system. Land at this scale is designated as Reserves, Parklands, or Woodlands. Much of the rest of this document provides details on the criteria used to designate DCR State and Urban Park properties, and on the guidelines that will inform management activities in each of those three designations.

### 1.5.2 District and Property Level

DCR develops Resource Management Plans (RMPs) for State and Urban parks, forests and reservations that include a comprehensive inventory and assessment of environmental and recreational resources, identification of the unique characteristics of a property or management unit, development of clear management goals and objectives, and an implementation plan to guide the short and long-term management. Land Stewardship Zoning (LSZ) is a finer level assessment applied at the property scale through the RMP process.[15] LSZ incorporates site specific information to guide the management and the protection of resources and areas within a property. The LSZ process defines three types of zones to address the legislative requirement to provide for the protection and stewardship of natural and cultural resources and to ensure consistency between recreation, resource protection, and sustainable forest management. [16]

During the preparation of an RMP, at the property scale, resource inventory and assessment leads to the zoning of specific areas within the property based on resource significance, sensitivity to recreation and management activities that are typical for that facility. A wide variety of existing data sources are drawn upon to apply this zoning (including BioMap 2) as well as data collected in the field as a part of developing the RMP.[17] Three Land Stewardship Zones provide a general continuum to categorize resources, relative to their sensitivity to human activities:

- **Zone 1**, the most protective zone, encompasses areas with highly sensitive natural and cultural resources that require special management approaches and practices to protect and preserve their special features and values.

- **Zone 2** encompasses stable yet important natural and cultural resources that are typical to the site. Zone 2 is the keystone to DCR's management responsibilities, because the protected landscape provides a buffer for sensitive resources, recharge for surface and groundwater, and large areas where typical public recreation activities can be managed at sustainable levels.

- **Zone 3** encompasses already developed landscapes or areas that may be suitable for future development as intensive use areas.

Significant Feature Overlays are used to identify resource features formally recognized or designated through research and assessment by professional resource specialists, who have developed specific management guidelines for the resource feature. The Significant Feature Overlay can be applied across all three zones. Examples of potential Significant Feature Overlays include historic resources listed on the National Register, priority habitat areas not included in a Zone 1, or Public Water Supply Districts.

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[15] See MGL Chapter 21, Section 2F. Information on the Resource Management Planning program and process can be found at: http://www.mass.gov/dcr/stewardship/rmp/

[16] For a complete discussion of these three zones and the additional special overlay zones, including expanded definitions of each and how they are applied, please see the DCR Land Stewardship Zoning Guidelines in Appendix 4 or on the DCR website at: http://www.mass.gov/dcr/stewardship/rmp/lszguidelines.htm

[17] DCR does not rely solely upon existing resource inventories for this task, recognizing the importance of the site specific data development that is a part of the RMP process

Landscape Designations will be used to inform the RMP process and the application of LSZ zones. Specific management guidelines associated with each zone are intended to provide additional protection and stewardship for site-specific natural and cultural resources and to ensure consistency among the activities that are allowed in each property under the broad management guidelines described for each Landscape Designation.[18]

DCR anticipates that the Landscape Designation and the RMP systems will work in coordination with each other to set high-level land management priorities based on ecosystem services, and to supplement those priorities with site specific resource protection and management guidelines. RMP site specific analysis may reveal resources and conditions not available to us at this time however the vertical and horizontal integration of these two systems, as exhibited in Table 1, allows for consistency between the two processes.

[18] Please see the DCR Land Stewardship Zoning Guidelines in Appendix 4 or on the DCR website at: http://www.mass.gov/dcr/stewardship/rmp/lszguidelines.htm

**Table 1. Landscape Designation & Land Stewardship Zoning – A Land Management Framework**

| Landscape Designation Management Guidelines → <br><br> Land Stewardship Zones ↓ | **Reserve** – *The least fragmented forested areas where ecological processes will predominate and inform management, and where commercial timber harvesting is not allowed.* | **Woodland** – *Forested areas actively managed for forest health, resource protection, sustainable production of timber, and recreation.* | **Parkland** – *Areas providing public recreation opportunities, connections to nature, and protection and appreciation of natural and cultural resources.* |
|---|---|---|---|
| **Zone 1** – *Highly sensitive resources requiring special management approaches.* | Rare species habitat, natural communities, archaeological sites, or fragile cultural sites identified as being sensitive to / easily degraded by human activities. | | |
| **Zone 2** – *Resources that support recreational and management activities appropriate to the site.* | Large areas of natural vegetation and associated natural and cultural features, including rare species habitat, that is compatible with dispersed recreation. | Forest stands and associated natural and cultural features, compatible with dispersed recreation **and active forest management** intended to enhance species and age class diversity. | Stable / hardy natural and cultural landscapes, where a variety of outdoor recreation activities can be provided in a sustainable manner. |
| **Zone 3** – *Intensive use areas such as recreational sites or maintenance areas.* | **New zone 3s will not be established in Reserves**.<br><br>*Exception* – an RMP may identify existing intensive use areas missed during designation and not already captured in a Parklands designation area, in which case the application of a zone 3 may be considered. | Intensive recreation and park administration areas currently embedded within the forested landscape. | Areas that require regular maintenance by DCR staff, including altered landscapes in active use, intensive recreation areas, and park administration areas. Sites that may accommodate administrative or intensive recreation areas to meet future demands. |

*Significant Feature Overlays can occur in all three designations, and in all three zones.*

*For complete management guidelines for Reserves see Section 2; for Parklands see Section 3; and for Woodlands see Section 4.*

### 1.5.3 Forest Resource Management Plans

Prior to the FFVP, four comprehensive Forest Resource Management Plans (FRMPs) were prepared at the forestry district level, covering the Northern Berkshire district, the Central Berkshire district, the Southern Berkshire district, and the Western Connecticut Valley district.[19] These FRMPs include significant data analysis and public input, a review of current conditions and a vision for future forest conditions, along with short and long term strategies to reach those desired future conditions. DCR's Stewardship Council approved these four plans in November 2008 with the condition that they be revisited and revised as appropriate based on the FFVP.

Therefore, the existing FRMPs will be evaluated and edited to reflect Landscape Designations and incorporate the guidelines presented in this document and the updated Public Outreach and Consultation for Forest Cutting Plans Policy (see Appendix 3). In addition, Landscape Designations will supersede the Active Forest Resource Management Areas, Intensive Use Areas, and Forest Reserves that were established in the FRMPs. Amended FRMPs will incorporate the approaches to silvicultural treatments presented in the Woodlands guidelines to guide sustainable forest management in Woodland properties. Until the existing FRMPs are updated, the Woodlands guidelines will supersede the guidelines in the existing FRMPs. Decision criteria, resource protection, silvicultural approaches and guidelines are further detailed in the Woodlands section of this document.

Upon finalizing the Woodlands designations, DCR will undertake projects to demonstrate excellent forestry according to the Woodlands guidelines included in this document. Information from FRMPs will be incorporated into RMPs. Moving forward, forest management planning will occur as a part of the RMP process.

### 1.5.4 Public Process, Resource Assessment and Other Planning Tools

DCR is strongly committed to incorporating public processes into its planning and stewardship activities. In 2011 alone, the agency held over 50 public meetings. Proposed facility development and management activities that go beyond routine maintenance will continue to incorporate a public process.[20]

In addition to Landscape Designation, Resource Management Plans and Forest Resource Management Plans, DCR may employ a number of different planning tools as appropriate for the various complex challenges, resources, and issues that arise regularly. Examples of such planning tools include Master Plans that may be developed for a complex capital investment project (e.g., the Blue Hills Trailside Museum Master Plan[21]) and Comprehensive Interpretive Plans that may be developed to guide education and interpretation at a facility (such as the Mount Greylock Reservation Comprehensive

[19] These plans can be found on the DCR website at: http://www.mass.gov/dcr/stewardship/forestry/manage/planning.htm

[20] The DCR does not generally engage in a public process for new trails, changes in trail designation or trail closure decisions. However, in certain cases, where high levels of conflict exist, such as at the Middlesex Fells, or where changes could impact a significant portion of a trail system, the DCR may seek public input on such changes. See the *DCR Trail Guidelines and Best Management Practices Manual* for further guidance. Available at: http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf

[21] This is available on the DCR website at: http://www.mass.gov/dcr/pe/trailside.htm

Interpretive Plan[22]). Each of these tools is developed with public input, tailored to specific issues and provides for resource protection. These plans will be informed by the Landscape Designation of a given property. These planning tools may also be used and completed in conjunction with, prior to, or following an RMP, and may help inform or be informed by an RMP.

DCR consulted with DFW on the Landscape Designation process and guidelines,[23] and will continue to coordinate with DFW to assess what elements of the Massachusetts State Wildlife Action Plan can be implemented on DCR properties, consistent with DCR land management objectives and Landscape Designations.

Prior to completion of an RMP for a property or complex of properties, DCR's objectives are to provide stewardship for natural and cultural resources through compliance with applicable state and federal regulations, drawing upon professional site assessments of resources and a variety of professionally derived resource management guidelines; to maintain facilities; to protect public safety; and to meet state health and building codes. For properties where RMPs have not yet been developed, managers will follow the practices articulated in these management guidelines, along with relevant regulations, to ensure resource protection. The following is a partial list of regulations, agency policies, and resource management guidelines that are used to review and guide proposed management activities, facility development, and planning processes for DCR's forests, parks and reservations:

- DCR Best Practices for the Protection of Historic Buildings
- DCR Historic Parkways Preservation Treatment Guidelines
- DCR Old Growth Policy
- DCR Trails Guidelines and Best Practices Manual
- Federal and Massachusetts Endangered Species Act (16 U.S.C. 1531-1544 and 321 CMR 10.05)
- DCR Guidelines for agency activities in Areas of Critical Environmental Concern (301 CMR 12.00)
- DCR Guidelines for protection of archaeologically sensitive areas (DCR Archaeologist and Massachusetts Historical Commission)
- Massachusetts Environmental Policy Act review for projects that trigger specific thresholds (301 CMR 11.00)
- Massachusetts Forest Cutting Practices Act (MGL Chapter 132)
- Massachusetts Historical Commission Guidelines for protection of properties included in the State Register of Historic Places (MGL Chapter 254)
- Massachusetts Wetlands Protection Act, including project review by local Conservation Commissions (MGL Chapter 131)

[22] This is available on the DCR website at: http://www.mass.gov/dcr/news/publicmeetings/materials/parklands/greylockIMP2011.pdf

[23] See Appendix 6

- NHESP Forestry Conservation Management Practices for Rare Species
- Massachusetts Office of Coastal Zone Management Guidelines for Barrier Beach Management
- State and federal regulations and guidelines associated with ground and surface water quality, public water supplies, and waterways
- Massachusetts Watershed Protection Act MGL Chapter 92a and 350 CMR 11.05

In addition to the regulations and resource management guidelines listed above, DCR will carefully consider these factors when planning forest management projects:

- Old Growth Forests
- Rare Plant Communities
- Rare Species Habitat
- Riparian Areas
- Sensitive Historical Sites
- Steep Slopes
- Trail Buffers
- Wetlands and Vernal Pools

DCR is committed to the monitoring and protection of rare species, and will be utilizing BioMap 2 and working in coordination with NHESP to obtain and update resource information as staff resources permit.

All of these factors are evaluated on the ground when planning forest management projects and will contribute to the decision of whether a harvest will be excluded or deferred in order to protect the sensitive resources, including areas likely to be designated Zone 1 through the RMP process (see Section 4, Woodlands for more details).

### *1.6 Implementation Review and Improvement*

The TSC urged DCR to adopt a process of adaptive management, so that insights gained from implementation of TSC recommendations can be used to improve future management decisions.[24] DCR agrees that there will be a need to analyze the effectiveness of both the Landscape Designations and the management guidelines in terms of their success in meeting the goals of each zone. The agency also recognizes that new site-specific information will come to light through the development of RMPs and

[24] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 25; p. 43. A model for such is provided by the *Open Standards for the Practice of Conservation* (Conservation Measures Partnership, Version 2.0, October 2007), available at: http://www.conservationmeasures.org/initiatives/standards-for-project-management

other research and planning efforts, and there will be a continual need to consider and incorporate new information as part of adaptive management.

DCR will review both the Landscape Designations and the management guidelines every ten years to assess their effectiveness in reaching the agency's goals of providing for the broad range of ecosystem services and make any necessary adjustments as a result in order to increase effectiveness.

Within the TSC report and this document are many recommendations and commitments that will require extensive staff time and funding. In the current challenging budget times, DCR will focus on implementing the highest priority items in these guidelines. One way to make incremental progress is to undertake pilot projects. DCR will explore the possibility of working with one community to pilot a "community demonstration forest" on a small DCR property. Developing demonstration forests in cooperation with local towns is an important tenet of the TSC report. Such a pilot could demonstrate how motivated towns with expertise and public support for excellent forestry and local wood products can work cooperatively with DCR. Selection of a property for this type of pilot would consider attributes that make a good demonstration forest, such as forest conditions that can benefit from uneven aged, late successional restoration projects and good access for forestry and public education to develop interpretive programs around the work done. If successful, the pilot could be extended and possibly expanded to other small DCR properties with suitable forest conditions.

### *1.7 Landscape Designations and Management Guidelines*

Details on the three Landscape Designations – Reserves, Parklands, and Woodlands – are presented in the following pages. The description of each Landscape Designation begins with a statement of purpose, the TSC recommendation for the management approach for the designation, and a short list of primary ecosystem service objectives. This is followed by a discussion of each designation and any special considerations, and the selection criteria that were used to identify the appropriate properties for this land use. The discussion concludes with a description of the management guidelines for each Landscape Designation.

# Section 2. Reserves

## *2.1 Reserves – Purpose*

The primary purpose of setting aside large areas of forest as Reserves is to allow forests to develop relatively unimpeded by human disturbance and to create late successional habitat. Given a sufficient amount of time without major disturbances, the forest will develop characteristics associated with true old growth forest. These late successional and old growth conditions include a wide diversity of tree sizes and ages, tip-up mound topography, and micro-site conditions from fallen trees and large amounts of downed woody debris.

Another reason for the establishment of Reserves is to provide areas where forest conditions can be influenced solely by natural (versus human-caused) disturbances, where natural disturbance regimes can play out indefinitely, and where visitors will be able to experience these unique conditions first hand. Users of Reserves often value them for spiritual reasons since they may provide elements of a wilderness recreational experience.

DCR anticipates that Reserves will also provide an aspect of biodiversity less prevalent in the rest of the forests so it is important that the system of Reserves includes representatives from the main forest types across the Commonwealth.[25]

## *2.2 Patch Reserves*

The TSC recommended that DCR designate "patch reserves" within the Parkland and Woodland Landscape Designations to identify areas where standard best management practices may not be adequate to fully protect highly significant and sensitive ecological or cultural resources from certain human uses or management and to recognize areas of special significance to park users and the public.

However, DCR believes the term "patch reserve" has different meanings for different people, and as the TSC pointed out, these areas should be selected by another set of criteria and have goals that are altogether distinct from the land designated as landscape-level Reserves.[26] Further, all of the site-specific information that is needed to properly identify candidate areas for "patch reserves" was simply not available during the Landscape Designation process. Therefore, DCR will identify sensitive resources and apply specific management guidelines to protect them (thereby meeting – and in some cases exceeding – the intent of "patch reserve designation" as described in the TSC report) by categorizing them as Zone 1 under the LSZ system during the RMP process.

[25] Major forest types found in Massachusetts include: White/Red Pine, Hemlock, Spruce-Fir, Pitch Pine – Scrub Oak, Northern Hardwoods, Birch-Red Maple, Oak, Swamp softwoods, and Swamp hardwoods.

[26] See the discussions about patch reserves in *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, pp. 39, 50 and 54.

In suggesting the designation of smaller "patch reserves," the TSC report points to the need for protection of ecological and cultural sites of sensitivity and/or significance, old growth, and forest dependent rare species habitat. DCR believes that the Zone 1 designation within its LSZ system is designed and intended to encompass such areas and provide an appropriate level of management and protection. In the Land Stewardship Zoning Guidelines (available in Appendix 4), Zone 1 is described as encompassing "areas that contain highly sensitive ecological and cultural resources that require additional and more restrictive management approaches and practices to protect and preserve the special features and values identified in the Resource Management Plan. These can also include areas with resources that are threatened by a high level of use." In addition, Zone 1 areas are described as "not suitable for future intensive development." In providing examples, Zone 1 areas are identified as being "highly sensitive to human activity include rare species habitat or natural communities, archaeological sites or fragile cultural sites, where stewardship of these resources must be the primary consideration when assessing management and recreational activities in these areas." Actual examples of Zone 1 areas in completed RMPs include most of the Blue Hills Reservation to the east of Route 28, an area that provides habitat for five state-listed species, four of which are state-endangered and sensitive to disturbance, and the Spot Pond Brook Archaeological District in the Middlesex Fells Reservation.

### *2.3 Management Approach for Reserves*

Reserves are meant to contain natural features across a landscape, ideally located across the state representing different ecological settings. Reserves are also intended to be several thousand acres in size to provide adequate protection of resources, with the potential to be increased over time (either via state or local land conservation efforts or by co-management of non-state protected forest) to reach sizes of 10,000 to 15,000 acres. TNC recommends large Reserves in the Eastern United States be a minimum of 15,000 acres; EEA recommends a minimum of 5,000 acres; and BioMap2[27] selects "forest cores" (the least fragmented remaining forests) at a minimum of 500 acres in eastern Massachusetts, 1,500–2,000 acres in Worcester County and the Berkshire Plateau, and 3,000+ acres for the Taconics.

While large contiguous blocks of land are important to Reserve creation, DCR recognizes that Massachusetts is a relatively small, highly developed state, and that Reserves need to be scaled appropriately for Massachusetts. DCR believes that Reserves can also be effective at smaller scales, and has identified Reserves that vary by size in each region of the state due to several factors, including the level of development within properties as well as the size of DCR properties throughout the state. DCR was guided by BioMap2 in selecting "forest cores" to adjust the minimum sizes for "Large Reserves" across the state so that this designation would not be limited to large properties in the Berkshires. In addition, the new and more detailed ELUs developed by DCR, in collaboration with TNC, contain representation among Reserves as well as Parklands and Woodlands.

Management approach recommended by the TSC:

[27] See: http://www.mass.gov/dfwele/dfw/nhesp/land_protection/biomap/biomap_home.htm

*Management of large forest Reserves should allow ecological processes to determine the long-term structure, composition, function, and dynamics of the forest to the maximum extent possible. However, the areas that have been considered for large Reserves range widely in their natural and historical disturbance regimes. In this context, flexible yet thoroughly vetted reserve management will support ecological functions in the varied forest ecosystems of the Commonwealth and under the ecological and climatic uncertainties of the future.*[28]

The dominant ecosystem service objectives in Reserves will be:

- biodiversity expansion, including complex forest systems
- carbon sequestration
- provision of wilderness recreation opportunities

Management of Reserves should allow natural processes to determine the long-term structure, composition, function and dynamics of the forest to the maximum extent possible. Equally important is monitoring and studying these conditions, then applying this knowledge to low impact forest management techniques within Parklands and Woodlands, and on privately-managed forests.

The TSC also recommended the formation of a Forest Reserves Science Advisory Committee (FRSAC), consisting of conservation biologists and forest ecology experts to assist and review management and major restoration activities within Reserves.[29] The Patrick-Murray Administration supports this recommendation, and DCR is in the process of forming such a committee in the Spring of 2012 to provide guidance on vegetation management and assist with long term scientific monitoring and research opportunities within Reserves.

## *2.4 Selection Criteria for Reserves*

*FFVP Recommended Allocation:* 90,000 to 120,000 acres

Approximately 40,000 acres of State Park and Forest lands were previously designated as "Large Reserves" in 2006 through a process involving DCR – Divisions of State Parks and Water Supply Protection – and DFW, which was coordinated by EEA.[30] GIS models based upon a continuum using the best available data were utilized to guide the selection of additional Reserves. The most favorable units of land for designation as additional Reserves are those:

- with least fragmented tracts of land

[28] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p.44.
[29] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p.37.
[30] The existing Large Reserves are at Chalet, East Branch, Otis, Mohawk/Monroe/Savoy, Middlefield/Peru, Mt Greylock, Mt. Washington and Myles Standish. Reports documenting the baseline characteristics of many of these Reserves are found at: http://www.mass.gov/dcr/stewardship/forestry/index.htm

- with the highest amount of forest interior
- that are well buffered from development
- that are contiguous with other protected land
- that represent a major ecological setting in the Commonwealth
- that conserve ecological and evolutionary processes
- that are large enough at a regional scale to capture a range of ecological processes
- that provide redundancy within each ecological land unit
- that contain special attributes, such as old growth or continuously forested sites
- with limited recreational infrastructure
- with a low density of officially designated trails

For these criteria, several existing data sets were drawn upon from a variety of sources, including the forest cores identified in BioMap2, DCR's new ELUs, and DFW's forest interior data.

TNC previously developed ELUs for a significantly larger region stretching from Virginia to New Hampshire. These regional ELUs were used to select candidate areas for the nine Large Reserves designated by EEA in 2006. These ELUs utilized geology, elevation and landform to map where different ecosystems occur, mapping very large landscape units across half of the eastern seaboard.

For the current Landscape Designation process, DCR felt it was important to update TNC's regional process so that more refined ELUs could be scaled to Massachusetts and mapped at a DCR property level. For example, if a 5,000 acre DCR property was part of a 100,000 acre ELU, the attributes of that property may or may not reflect the designation of the overall ELU. DCR collaborated with TNC to develop 11 new ELUs for Massachusetts that have been more useful in the categorization and designation of all DCR properties, allowing DCR to balance Reserves, Parklands and Woodlands within each of the new ELUs across the state.[31]

### *2.5 Wilderness Areas*

The TSC also suggested that DCR consider establishing one or two wilderness areas within Reserves that would have further restrictions placed on them in order to maintain a wilderness character.[32] Wilderness means different things to different people, so in an effort to minimize conflicting interpretation of the term, DCR looked to the National Wilderness Preservation System, the largest systematic wilderness management program in the nation, for guidance on designating and managing suitable lands. The Wilderness Act of 1964, the prevailing document which guides management of wilderness areas on federal land, defines wilderness this way:

[31] For more information on the development of ELUs, see the GIS Model Descriptions in Appendix 9.
[32] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 38.

*A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammeled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped . . . land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.*[33]

There are few, if any, areas in Massachusetts that are "untrammeled by man," and have "at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition."

The TSC suggested looking into adapting DCR's existing Wildlands Program to apply to potential wilderness areas. Under that program, Wildlands are broken into two categories: Representative Natural Areas (RNAs) and Backcountry Areas. RNAs identify natural areas distinct from their surroundings that are so special as to require additional protection (e.g., the 5-acre Atlantic White Cedar Swamp in Douglas State Forest). All of these areas are significantly smaller than the necessary acreage to offer an outstanding opportunity for solitude. Backcountry areas in the program are larger, but are designed to be accessible and are therefore neither remote enough to meet the "untrammeled by man" criteria nor the solitude criteria (e.g., the old growth forest in Savoy State Forest, which abuts Route 2). While not wilderness, there are backcountry areas within existing Reserves. In this way DCR's Wildlands program is effectively absorbed and expanded by the expansion of the Reserve system, but this program is not the appropriate source for wilderness areas.

However, in time, some areas within the Reserve system may approach the high standards set by the Wilderness Act of 1964. Therefore, DCR is not designating any Wilderness Areas at this time, but will review Reserves every five years for areas that are suitable for designation as Wilderness Areas in the future. When the issue is revisited, DCR may develop criteria for selection and management of Wilderness that are appropriate to Massachusetts, based upon the scale of the Wildlands model and incorporating the intent of the federal definition.

## *2.6 Management Guidelines for Reserves*

Once land is designated as a Reserve, there are some significant threats that may impede natural processes in Reserves. These include:

[33] Public Law 88-577 (16 U.S. C. 1131-1136), Wilderness Act of 1964.

- fragmentation and destruction of adjacent forests due to residential or commercial development
- disruption of ecological processes from invasive species and climate change
- inconsistent enforcement of management policies
- unregulated recreational use such as off highway vehicle trespass
- human-caused wildfires
- development of dense trail systems or heavy use of trails and potential habitat fragmentation, soil compaction, and wildlife disturbance

Most DCR properties are less than the 15,000 acres recommended through the FFVP as the minimum size of Reserves (based on TNC's work). Therefore, it will be critical to work toward the protection of forested lands adjacent to Reserves to help retain the large forest blocks envisioned for Reserves. DCR will seek partnerships with statewide and regional conservation organizations to help accomplish this.

The lack of resources for monitoring and study present a challenge to attaining the desired value of Reserves. Since it will likely take decades for Reserves to look and function differently than other forests, it is important to routinely document changes so that the public can learn of their values and allow this knowledge to be applied to the management of other forests in the Commonwealth. DCR plans to elicit partnerships with private and academic conservation organizations and alternative funding sources to assist with monitoring Reserves and assess the efficacy with which Reserves are meeting this designation's goals.

In general, removal of trees and other vegetation (including commercial or salvage harvests) will not be allowed in Reserves. However, some situations may call for ecological restoration and vegetation management. Situations where some management may be appropriate include the removal of invasive species or for the protection of existing rare species. Fire adapted Reserves in Southeastern Massachusetts may require active restoration and management to maintain habitat for rare species and reduce the risk of catastrophic wildfire that can threaten human health and safety. Insect infestations, such as the recent discovery of the Asian Longhorned Beetle in the Worcester area, may also necessitate more active control and management activities than would normally be considered appropriate in Reserves. Finally, some management flexibility will be needed for Reserves that are part of municipal water supply watersheds, so that unanticipated future threats to those water supplies can be dealt with in effective and appropriate ways in accordance with the Landscape Designation management guidelines and in consultation with FRSAC, the municipal water supplier and/or the Department of Environmental Protection (DEP). Some management flexibility, with the safeguards discussed below, is crucial to maintain Reserve functions given the diversity of forest types, and the tremendous range of land use histories and disturbance regimes across the Commonwealth.

In order to consistently guide DCR in these decisions, the FRSAC, consisting of conservation biologists and forest ecology experts, will provide guidance on vegetation management and assist with long term scientific monitoring and research opportunities within Reserves.

**Recreation and Public Access Guidelines:**

A. Recreational activities that are compatible with Reserves include dispersed, non-motorized activities, including hiking, hunting, fishing, cross-country skiing, snowshoeing, mountain biking and horseback riding. Management needed to maintain those activities (e.g., trail maintenance) will be permitted, subject to agency guidelines and policies and existing property specific regulations.

B. Off Highway Vehicles, other than snowmobiles, are prohibited. However, where currently designated as an approved use prior to Reserve designation, OHV use may be continued if consistent with DCR's *Motorized Trail Recreation Facility Assessment Policy* and managed to minimize natural resource impacts and use conflicts.[34]

C. Snowmobile use shall be limited to designated trails and forest roads that are not maintained for vehicle use. Existing use regulations and policies apply.

D. Development of new intensive-use recreation sites (such as campgrounds, picnic areas, visitor centers, administrative offices, parking lots, etc.) is not permitted.

E. New trail construction is permitted only after the trail has been reviewed by DCR staff using the guidance and procedures established by the *DCR Trails Guidelines and Best Practices Manual*. Trail density and use levels will be evaluated to see how they may affect the values of the Reserve.

F. Trail relocations to reduce adverse impacts to critical resources will be prioritized. DCR will strive to maintain a low density of trails that are not highly developed (class 1–3[35]) within Reserves to protect their ecological and recreational intent. DCR may close trails to achieve the values of Reserves.

G. DCR will work with local fire and safety officials where Reserves are located to balance the need for fire and rescue access with the above goals for trail access in Reserves.

H. DCR will examine vehicle use on public roads that cross Reserves to determine whether fire and public safety access could be maintained and Reserve qualities enhanced by gating these roads. Any closing of public roads to vehicles would not negatively impact access to camping areas or

[34] In these cases, DCR is committed to applying the fine filter criteria developed in 2007 to determine whether the location may be able to provide safe and sustainable OHV recreation. If it passes the fine filter DCR will continue that use, but may also seek alternative locations for OHV recreation where management of this intensive recreational activity better matches the desired goals and conditions of the surrounding landscape. For more information on the fine filter criteria, see the *DCR Motorized Trail Recreation Facility Assessment Policy* available at: http://www.mass.gov/dcr/recreate/ohv_policy.pdf

[35] Trails are classified into 5 classes by tread, obstacles, constructed elements, signs, and typical recreational experience, the first 3 classes being the lower end of trail development. Class 1 trails are Minimal/Undeveloped Trails, Class 2 trails are Simple/Minor Development Trails, and Class 3 trails are Developed/Improved trails. For more info on these classifications, please see the *DCR Trails Guidelines and Best Practices Manual*, updated January 2010, pp 37 – 38. Available at: http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf

other facilities and would require close communication with the local towns and public safety officials.

**Silviculture and Vegetation Management Guidelines:**

A. Habitat manipulation, silvicultural treatments and commercial harvesting operations are not permitted in Reserves. However, if deemed appropriate by DCR and reviewed by the FRSAC, the following exceptions may be allowed:

   a) Implementation of NHESP recommendations to restore, maintain or enhance habitat for rare and endangered species and exemplary natural or rare communities.

   b) Removing plantations would not be permitted except to restore important wildlife habitat such as pitch pine barrens or other habitats and after consultation with DFW and FRSAC.

   c) Removing non-native invasive species may occur after consultation with FRSAC.

   d) Managing vegetation to control erosion, or to stabilize soils.

   e) Cutting of vegetation to maintain established public vistas and trails is permitted (e.g., the small Spruce Mountain vista located in Monroe State Forest).

   f) Removal of hazardous trees directly adjacent to official DCR trails and abutting properties that pose significant risk to public safety.

   g) Vegetation management is permitted by parties who have secured pre-existing rights (e.g., easement holders, utility easements) to perform such activity, subject, however, to standard regulatory and permitting requirements.

   h) Cutting vegetation to maintain existing agricultural fields or existing wildlife habitat openings is permitted.

B. Creation of new fields, vistas and wildlife openings is prohibited.

**Water and Soil Resource Guidelines:**

A. Management may be permitted to control erosion or stabilize soils, by closing roads and unauthorized trails, or other means such as stabilizing slopes with water bars or other erosion control structures. DCR will consult with local emergency management officials on road closures, and request FRSAC review for significant work of this type.

B. Where DCR Reserves are designated on local or regional public water supply watersheds, appropriate management activities may be undertaken in accordance with the Landscape Designation management guidelines, after consultation with the public water supplier, FRSAC and/or DEP, to confirm the need for, and the type and extent of, management actions to

address water quality protection issues (e.g., due to wildfires, insect or disease outbreaks, or other unanticipated threats to water quality). See Appendix 5 for a list of DCR properties on public water supply watersheds.

**Habitat Protection Guidelines:**

A. Identification, documentation and protection of rare species occurrences and important habitats will be addressed using the following tools:

   a) Review of the NHESP GIS database, which includes datalayers from statewide databases such as BioMap2, Priority Habitats of rare species, Estimated Habitats of rare wildlife, Certified or Potential Vernal Pools, and Natural Communities.

   b) Review of and consultation with other sources of natural resource information, where appropriate and available (e.g., Mass Audubon, New England Wildflower Society, The Vernal Pool Association, other NGOs, local naturalists, etc.)

   c) Surveys and monitoring, by trained DCR staff and/or outside consultants, to document and map rare species and important habitats when necessary for project specific purposes or long-term documentation.

   d) If any state listed species are listed pursuant to the U.S. Endangered Species Act (16 U.S.C.A. §§ 1531 – 1544), the US Fish & Wildlife Service must approve the project and the appropriate species Recovery Plan shall be consulted.

   e) Consult and work with NHESP to identify and develop appropriate conservation practices for Natural Communities.

   f) Consider certifying potential vernal pools if applicable; apply accepted Massachusetts and federal protection guidelines around all certified or potential vernal pools (304 CMR 11.00).

B. Work closely with DFW, and consult the Comprehensive Wildlife Conservation Strategy (CWCS)[36] for guidance in protecting rare species and their habitats, and the Forestry Conservation Management Practices for Rare Species,[37] where appropriate.

C. Using the resources noted in section A, Habitat Restoration Plans should be generated to improve degraded habitats important to rare species and/or state/regional biodiversity.

D. Consult with DFW and DEP prior to conducting any work adjacent to Coldwater Fisheries habitats; apply protection guidelines recommended.

[36]Available at: http://www.mass.gov/dfwele/dfw/habitat/cwcs/pdf/mass_cwcs_final.pdf
[37]Available at: http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/forestry/forestry_cmp.htm

E. Form partnerships with friends groups, local naturalists, environmental organizations, etc., to assist in the identification, protection and monitoring of important habitats or rare species population where appropriate.

**Forest Health and Protection Guidelines:**

A. Spread of invasive epidemic forest pathogens, insects and diseases or other biological risks to the forest (such as Asian Longhorned Beetle or Emerald Ash Borer) may be controlled as part of a coordinated effort, if there is a major threat to forest health or risk to private or public natural resources.

B. Wildfires will be contained, controlled and suppressed, unless there is an approved site specific controlled fire plan and conditions are within the fire plan prescription.

C. Fire breaks, where necessary, may be created and maintained.

D. Prescribed fire may be used when it is compatible with protection of the Reserve, restoration of native communities and ecological processes, and the protection of life and property adjacent to the Reserve and surrounding landscape. The prescribed fire burn plan would be subject to the review of the local fire chief(s) and the FRSAC.

E. Where the use of pesticides is the only feasible method to remove invasive species that threaten the values of the Reserve, this approach may be considered after gaining input from the FRSAC.

**Cultural Resource Management Guidelines:**

A. As per DCR's regulatory responsibilities, any projects undertaken on DCR land must be reviewed during the planning stages by DCR's Office of Cultural Resources for their potential impacts to historic and archaeological resources.

B. Maintenance of historic buildings and structures within Reserves is allowed.

C. Vegetation management for the protection of historic or archaeological sites is allowed, with some restrictions on the time of year, types of equipment and techniques used to minimize resource disturbance, as guided by DCR Cultural Resources staff.

**Facilities, Transportation and Boundary Guidelines:**

A. Existing roads will be managed and maintained to assure continued administrative and/or emergency access. Public roads within Reserves that are open to vehicles will be reviewed for vehicle closure via gating to enhance Reserve qualities only after an evaluation of impacts to

public access, fire and emergency vehicles, and after communication with local communities and the public.

B. No new roads will be constructed.

C. Existing roads not needed for recreation, administration or emergency use may be closed and restored to their natural condition, only after consultation with local emergency management officials.

D. Replacement of existing facilities, as needed, will be allowed, but construction of new facilities where none previously existed is prohibited. Exceptions may include small-scale, low impact, context appropriate informational kiosks, universal access structures for trails, composting toilets, trailheads, parking areas and carefully designed boardwalks, or other projects that protect the integrity of the reserve interior by locating those facilities that are necessary at the edge of the reserve.

E. Maintenance and marking of property boundaries is allowed.

F. All boundaries will be located and maintained on a ten-year cycle or when needed for project implementation. Boundaries will be maintained clearly and in a way that is sensitive to adjacent private lands with visible residences.

G. All boundaries needing formal surveys will be identified. All newly acquired DCR properties should have their boundaries surveyed and marked. (Interior line boundaries should be discontinued.)

H. Boundaries will be surveyed as needed for project implementation, where trespass is an issue, or where there are disputes.

**Interpretation, Public Information, and Outreach Guidelines:**

A. DCR will seek to balance maintaining the values of an unimpeded experience and the need to address complex scientific concepts through a combination of on-site public information (notices, rules signs, etc.), interpretation (educational signage or programming), and outreach (off-site information sharing). To be consistent with the values of Reserves, on-site media will need to harmonize with the environment and intrude on a visitor's experience only when necessary.

B. A minimalist approach to interpretation and public information is appropriate for Reserves. Outreach may be more important than on-site interpretation, and there will be opportunities to highlight ecological restoration.

   a) Interpretation in Reserves should serve to prepare visitors for their experience in the Reserve. In the case of programming, it offers engaging educational opportunities.

   b) Public information provides orientation or notices about management or security issues.

c) Outreach may be informational, interpretive, or educational with the aim of attracting visitors or informing non-visitors of management rationale or activities.

C. Interpretation (programming and media) connected to Reserves should focus on the reserve's ecological services, support management goals, and be based on relevant interpretive plans; should adhere to DCR interpretive, graphic, and signage standards; and may engage friends groups, schools, universities and other organizations for support when appropriate.

D. Developed interpretive signage and public information are generally most suited for main trailheads or parking areas.

E. Trails signs should follow *DCR Trails Guidelines and Best Practices Manual* signage standards for primitive areas.[38] Interpretive media should conform to DCR's graphic standards.

F. Infrastructure for interpretation may be added, however no new infrastructure should be applied within Reserves unless exceptional circumstances warrant otherwise.

**Monitoring, Enforcement and Research Guidelines:**

A. Non-destructive, low impact research for monitoring forest conditions may be conducted. In order to meet the intended purposes of Reserves, regular monitoring and research to document changing habitat conditions are needed. For example, monitoring information from Reserves will be critical in evaluating how climate change is affecting forest ecosystems and how species are adapting to this over time. Any research proposed by an outside entity must be developed and implemented in close consultation with DCR staff to assure coordination of efforts, and copies of all research results must be provided to DCR.

B. DCR will seek partnerships with appropriate conservation organizations to assist with regular monitoring of Reserves.

C. Continuous Forest Inventory (CFI) plots will be measured on a regular cycle and data used in conjunction with ongoing research needs such as Reserve vegetation development, carbon storage and climate change.

D. Prior to conducting monitoring and research on Reserves, a proposal outlining the purpose of the research, the techniques used and the potential impacts on the land will be reviewed by the FRSAC and approved by DCR.

E. DCR acknowledges the need for active enforcement of prohibited activities (such as dumping of refuse, construction of illegal motorized or non-motorized trails, use of off-highway vehicles in areas where not allowed, or cutting of trees at boundary encroachments) and regulated activities is critical to allow Reserves to develop under natural conditions without negative

[38] *DCR Trails Guidelines and Best Practices Manual*, updated January 2010, p. 51. Available at: http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf

human impacts. However, DCR's current and historic level of resources does not allow for optimal enforcement, and joint or cooperative oversight is a long term goal.

**Special Use Guidelines:**

A. Special uses such as events and activities will be evaluated on an individual basis by DCR and may be allowed if they do not adversely impact and are compatible with the purposes of the Reserve. DCR's Special Use policy and guidelines apply.[39]

B. Existing special uses such as transmission lines, communication sites, and commercial uses that are not compatible with the intent of Reserves will be evaluated to determine if they can be relocated to another area.

C. DCR will not grant new commercial rights for communications sites. However, it should be noted that such uses are subject to legislative action, pursuant to Article 97 of the Constitution of the Commonwealth. In such circumstances, compliance with the Secretary of Energy and Environmental Affairs' "No Net Loss" policy for mitigation of loss of open space is required.[40] Full environmental permitting and review would also apply.

D. Adding new communication hardware to existing fire towers and communications sites will be allowed. All applicable permits and DCR's Special Use policy and guidelines apply.[41]

E. DCR will not grant rights for new commercial wind installations and commercial solar installations. However, it should be noted that such uses are subject to legislative action, pursuant to Article 97 of the Constitution of the Commonwealth. In such circumstances, compliance with the Secretary of Energy and Environmental Affairs' "No Net Loss" policy for mitigation of loss of open space is required.[42] Full environmental permitting and review would also apply.

F. DCR will not grant new commercial rights for transmission lines. However, it should be noted that such uses are subject to legislative action, pursuant to Article 97 of the Constitution of the Commonwealth. In such circumstances, compliance with the Secretary of Energy and Environmental Affairs' "No Net Loss" policy for mitigation of loss of open space is required.[43] Full environmental permitting and review would also apply.

G. Granting rights for new commercial uses is prohibited except to the extent necessary for activities that advance Reserves goals.

[39] Information about DCR's Special Use Permit program is available at http://www.mass.gov/dcr/permits/
[40] This policy is available on the EEA website at: http://www.mass.gov/eea/docs/eea/dcs/dcsarticle97.pdf
[41] Information about DCR's Special use Permit program is available at: http://www.mass.gov/dcr/permits/
[42] This policy is available on the EEA website at: http://www.mass.gov/eea/docs/eea/dcs/dcsarticle97.pdf
[43] This policy is available on the EEA website at: http://www.mass.gov/eea/docs/eea/dcs/dcsarticle97.pdf

# Section 3: Parklands

## *3.1 Parklands – Purpose*

DCR facilities offer an incredibly diverse mix of recreational opportunities, ranging from back country camping to urban swimming pools. Equally diverse are the size and character of properties on which these activities occur. Although public recreation occurs on all DCR properties, for many, the agency's active recreational areas are the main draw. These facilities accommodate millions of visitors each year.

As interests and recreational technologies change, the range of activities is expected to continue to evolve. DCR's intent is to continue to provide the best possible recreational experiences for the public at these facilities.

## *3.2 Management Approach for Parklands*

Many of the recreational opportunities and experiences offered by DCR are directly reliant upon the wide range of natural and cultural resources within the parks and forest system – without their protection and careful management, those opportunities and experiences would be lost. DCR is committed to continuing to provide a diverse range of recreation opportunities that are consistent with its goals for public safety, resource protection and management, public health, visitor education and enjoyment.

Management approach recommended by the Technical Steering Committee:

> *DCR should develop and implement management guidelines for Parklands that focus on enhancing recreation, while continuing to provide additional ecosystem services, including those identified for Reserves as well as the aesthetic and cultural values of the property.*[44]

Ecosystem services provided by Parklands:

- protection of ecologically significant sites
- protection of cultural resources
- provision of public outdoor recreational and environmental education opportunities

Recognizing that the focus of the FFVP was on DCR forestry practices, the TSC's primary guidance regarding Parklands management was that ". . . wood production is not a utilized ecosystem service in the Parklands. Any cutting would be limited to what is necessary to support recreational assets and uses, including public safety."[45] However, DCR's adoption of the Landscape Designation system will

[44] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p.49.
[45] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p.49.

encompass and guide all of the agency's operations, and as such, these guidelines propose that all management activities in Parklands should focus on maintaining or improving the recreational experiences of visitors.

### *3.3 Selection Criteria for Parklands*

*FFVP Recommended Allocation*: 70,000 to 90,000 acres

GIS models based upon a continuum using the best available data were utilized to guide the selection of Parklands. The most favorable units of land for designation as Parklands are those that have:

- a high surrounding population density
- forested areas with high recreational values
- a high density of officially designated trails
- established recreational areas, such as campgrounds, golf courses, etc.
- water access points for recreation
- active day use areas
- high recreational use/visitation
- easily accessible unique natural features: views, water features, chasms, unusual forest types
- unique historic/cultural features
- unique settings in comparison to the surrounding landscape
- suitable natural forested boundaries between active use areas and woodland areas

For these criteria, several existing internal and external data sets were used, including US Census data, DCR Roads and Trails data set, orthophotos, as well as internally developed intensive use area and cultural resource inventory data.

### *3.4 Management Guidelines for Parklands*

As properties that have the most recreational infrastructure and/or recreational uses, Parklands are likely also those areas that are assumed to have the highest levels of visitation. Attempting to protect and maintain areas that are heavily utilized can be a challenge. Overuse can lead to competition for space, conflicts among different user groups, and damage to resources. However, popularity can also bring with it large and active friends groups and other potentially positive partnerships.

DCR is seeking with the Parkland designation to provide clear guidance on what can be done to protect the natural, cultural, and recreational resources that form the essence of a Parkland property.

**Recreation and Public Access Guidelines:**

A. A diverse mix of recreational activities will be allowed in the wide range of Parklands properties. While not every activity will be appropriate in every location, the range across the system could include athletic field uses such as baseball and soccer, intensive uses such as swimming pools, downhill ski areas and golf courses and dispersed recreational activities such as motorized and non-motorized trail uses. Agency policies, resource protection, public safety, and recreational goals will continue to determine activities that are encouraged and/or allowed in individual properties.

B. Recreational uses should be consistent with DCR's determination for recreational demands and opportunities as assessed through planning efforts and tools.

C. Development of new intensive-use sites within Parklands (e.g., campgrounds, athletic fields, playgrounds, picnic areas, visitor centers, administrative offices, parking lots, etc.) are allowed when consistent with public access, resource protection, public safety, and management goals.

D. DCR will strive to maintain a density and diversity of trails within Parklands that protects the natural and cultural resources of each property and meets the recreational intent for the property. Proposals for new trail development need to follow the existing process established through the *DCR Trails Guidelines and Best Practices Manual*.[46] Creating loop trails that enhance recreational experiences while supporting the other values of the Parklands will be encouraged. DCR may close trails to achieve the values of Parklands.

**Silviculture and Vegetation Management Guidelines:**

A. Commercial production of wood for wood products or energy is not an objective in Parklands. Vegetation management will only occur as needed to further the purposes of Parklands to protect ecologically significant sites and cultural resources and to provide environmental education and outdoor recreation opportunities in a natural and safe setting. Within these limited purposes, DCR will implement vegetation management in an effective and low-impact manner, whether that be via hiring arboriculture firms (if budgets permit) or via bidding projects to arboriculture or forestry firms (at either no cost or small payment to DCR, which is incidental to the operation).

B. Forest habitat manipulation, vegetation management, silvicultural treatments and operations will be permitted for the following purposes:

[46] See *DCR Trails Guidelines and Best Practices Manual*, updated January 2010, pp. 12 – 35. Available at: http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf

a) Vegetation management necessary to protect public health and safety, public interests, public assets and/or restore or maintain recreation sites following significant natural disturbances or destructive insects or diseases.

b) Vegetation management necessary for the control of non-native invasive plant species.

c) Removal of plantations to restore more natural and diverse vegetative communities – if public health and safety are at risk, or to restore ecologically significant communities such as pitch pine barrens. Controlled burns to maintain significant natural communities such as pine barrens is allowed with close coordination with municipal fire and safety, local friends groups and the general public.

d) Vegetation management necessary to control erosion, to stabilize soils, or to close unauthorized trails or roads not needed for administrative or emergency purposes. Local emergency officials will be consulted in all road closures.

e) Vegetation management necessary for the development or maintenance of trails, recreation area aesthetics and existing roads.

f) Vegetation management necessary to create or maintain agricultural fields, lawns, turf, greens or scenic vistas associated with recreational or educational goals.

C. Vegetation management mandated by environmental regulatory requirements.

D. Hazardous trees or excessive fuel loads that pose significant risk to public safety may be removed.

E. Vegetation management is permitted by parties who have pre-existing legal rights (e.g., easement holders, utility easements) to perform such activity, subject, however, to standard regulatory and permitting requirements.

**Water and Soil Resource Guidelines:**

A. Management may be permitted to control erosion or stabilize soils, by closing roads and unauthorized trails, or other means such as stabilizing slopes with water bars or other erosion control structures. Local emergency management officials will be consulted for any road closures being considered.

B. Where DCR Parklands occur on local or regional public water supply watersheds, appropriate management activities may be undertaken in accordance with the Landscape Designation management guidelines, after consultation with the public water supplier and/or DEP, to confirm the need for, and the type and extent of, management actions to address water quality protection issues (e.g., due to wildfires, insect or disease outbreaks, or other unanticipated threats to water quality). See Appendix 5 for a map and list of DCR properties on public water supply watersheds.

**Habitat Protection Guidelines:**

A. Vegetation management necessary to comply with NHESP recommendations for the restoration, maintenance or enhancement of habitats for rare and endangered species and exemplary natural or rare communities may be allowed.

B. Vegetation management to support species of greatest conservation need (SGCN) as described in the CWCS may be allowed if a particular SGCN is historically and or culturally associated with a specific Parkland.

C. Identification, documentation and protection of rare species occurrences and important habitats will be addressed using the following tools:

    a) Review of the NHESP GIS database, which includes datalayers from statewide databases such as BioMap2, Living Waters, Priority Habitats of rare species, Estimated Habitats of rare wildlife, Certified or Potential Vernal Pools, and Natural Communities.

    b) Review of and consultation with other sources of natural resource information, where appropriate and available (e.g., Mass Audubon, New England Wildflower Society, The Vernal Pool Association and other NGOs, local naturalists, etc.).

    c) Surveys and monitoring (for project specific purposes or long-term documentation), by trained DCR staff and/or outside consultants, to document and map rare species and important habitats when necessary.

    d) If any state listed species are listed pursuant to the U.S. Endangered Species Act (16 U.S.C.A. §§ 1531 – 1544) the US Fish & Wildlife Service must approve the project and the appropriate species Recovery Plan shall be consulted.

    e) Consider certifying potential vernal pools if applicable; apply accepted Massachusetts and federal protection guidelines around all certified or potential vernal pools (304 CMR 11.00).

D. DCR will work closely with DFW, and consult the CWCS[47] for guidance in protecting rare species and their habitats, and the Forestry Conservation Management Practices for Rare Species,[48] where appropriate.

E. DCR will work closely with DFW to resolve conflicts between wildlife and park facilities (such as beaver flooding problems).

F. Using the resources available from NHESP, Habitat Restoration Plans should be generated to improve degraded habitats important to rare species and/or state/regional biodiversity.

[47] Available at: http://www.mass.gov/dfwele/dfw/habitat/cwcs/pdf/mass_cwcs_final.pdf
[48] Available at: http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/forestry/forestry_cmp.htm

G. DCR will consult with DFW and DEP prior to conducting any work adjacent to Coldwater Fisheries habitats; apply protection guidelines recommended.

H. Partnerships with friends groups, local naturalists, environmental organizations, etc., will be formed to assist in the identification, protection and monitoring of important habitats or rare species population, where appropriate.

**Forest Health and Protection Guidelines:**

A. Spread of major significant forest pathogens and invasive species (such as Asian Longhorned Beetle or Emerald Ash Borer) may be controlled as part of a coordinated effort if there is a major threat to forest health or risk to private or public interests.

B. Pesticide use will be allowed in limited situations for the removal of invasives, only when no other feasible alternatives are available. Removal of invasives to provide the public with examples of native vegetation and habitats and as demonstration projects for other lands and to protect the integrity of the environmentally significant sites represented within the Parklands.

C. Wildfires will be contained, controlled and suppressed unless there is an approved site specific controlled fire plan and conditions are within the fire plan prescription.

D. Fire breaks, where necessary, may be created and maintained.

E. Prescribed fire may be used when it is compatible with protection of the property, restoration of native communities and ecological processes and the protection of life and property in the Parkland and surrounding landscape. The fire burn plan would be subject to the review of the local fire chief(s).

**Cultural Resource Management Guidelines:**

A. As per DCR's regulatory responsibilities, any projects undertaken on DCR land must be reviewed by DCR's Office of Cultural Resources during the planning stages for their potential impacts to historic and archaeological resources.

B. Maintenance of historic buildings, structures and landscapes within Parklands is allowed.

C. Vegetation management for the protection of historic or archaeological sites is allowed, with some restrictions on the time of year, types of equipment and techniques used to minimize resource disturbance, as guided by the DCR's cultural resources staff.

**Facilities, Transportation and Boundary Guidelines:**

A. Existing roads will be managed and maintained according to either the DCR *Historic Parkways Preservation Treatment Guidelines* [49] where appropriate, or other applicable road standards to assure continued access.

B. New roads necessary for public, administrative and emergency use may be constructed after review for impacts to natural and cultural resources.

C. Existing roads not needed for recreation, administration or emergency use may be closed and restored to their natural condition, after consultation with local emergency management officials.

D. Construction of new facilities may occur as necessary for public and administrative use after review of impacts to natural and cultural resources.

E. Maintenance and marking of property boundaries is allowed.

F. All boundaries will be located and maintained on a ten-year cycle or when needed for project implementation. Maintain all boundaries clearly and in a way that is sensitive to adjacent private lands with visible residences.

G. All boundaries needing formal surveys will be identified. All newly-acquired DCR properties should have their boundaries surveyed and marked. (Interior line boundaries should be discontinued.)

H. Boundaries will be surveyed as needed for project implementation, where trespass is an issue, or where there are disputes.

**Interpretation, Public Information, and Outreach Guidelines:**

A. The combination of existing infrastructure, natural and cultural features, and the availability of an audience in Parklands creates a strong opportunity to connect with visitors. Therefore, formal programming and media are appropriate in Parklands.

   a) Interpretation in Parklands seeks to build emotional and intellectual connections between visitors and the resource.

   b) Public information in Parklands will provide orientation, wayfinding, and notices about management activities or security issues.

   c) Outreach may be informational, interpretive, or educational with the aim of attracting visitors or informing non-visitors of park activities and opportunities.

B. Interpretation (programming and media) connected to Parklands should focus on the natural, cultural, and recreational themes of the property; support management goals; be based on

[49] *Historic Parkways Preservation Treatment Guidelines* are available at: http://www.mass.gov/dcr/histpark.htm

relevant interpretive plans; should adhere to DCR interpretive, graphic, and signage standards; and may engage friends groups, schools, universities and other organizations for support when appropriate.

C. Informational signs and interpretive kiosks are appropriate for siting throughout Parklands in a manner consistent with the character of the facility.

D. Trails signs should follow *DCR Trails Guidelines and Best Practices Manual*[50] signage standards. Interpretive media should conform to DCR's graphic guidelines.

E. Interpretation in Parklands may take advantage of existing resources and infrastructure or may initiate new infrastructure to enhance interpretive opportunities.

**Monitoring, Enforcement and Research Guidelines:**

A. Monitoring and research projects may be conducted as approved through DCR's Special Use Permit process. Any research proposed by an outside entity must be developed and implemented in close consultation with DCR staff to assure coordination of efforts, and copies of all research results must be provided to DCR.

B. Active enforcement of prohibited or regulated activities, such as dumping of refuse, construction of illegal motorized or non-motorized trails, use of off-highway vehicles in areas where not allowed, is critical to the maintenance of resources within Parklands.

C. CFI plots will be measured on a regular cycle and data used in conjunction with ongoing research needs such as vegetation development, and forest health monitoring.

**Special Use Guidelines:**

A. Special uses such as events and activities are allowed and will be evaluated on an individual basis as provided in DCR Special Use Policies and Procedures and/or volunteer guidelines.[51]

B. Existing special uses such as transmission lines, communication sites, and commercial uses that are not compatible with the intent of Parklands will be evaluated to determine if they can be relocated to another area.

C. DCR will not grant new commercial rights for communications sites. However, it should be noted that such uses are subject to legislative action, pursuant to Article 97 of the Constitution of the Commonwealth. In such circumstances, compliance with the Secretary

[50] See *DCR Trails Guidelines and Best Practices Manual*, updated January 2010. Available at: http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf

[51] Information about DCR's Special Use Permit program is available at http://www.mass.gov/dcr/permits/

of Energy and Environmental Affairs' "No Net Loss" policy for mitigation of loss of open space is required.[52] Full environmental permitting and review would also apply.

D. Adding new or replacing existing communication hardware on existing fire towers and communications sites will be allowed. All applicable permits and DCR's Special Use policy and guidelines apply.[53]

E. DCR will not grant rights for new commercial wind installations and commercial solar installations. However, it should be noted that such uses are subject to legislative action, pursuant to Article 97 of the Constitution of the Commonwealth. In such circumstances, compliance with the Secretary of Energy and Environmental Affairs' "No Net Loss" policy for mitigation of loss of open space is required.[54] Full environmental permitting and review would also apply. Wind and solar installations that have a primary purpose of supplying electricity to a Parkland facility (for example a visitor center or maintenance facility) will be considered if the site is already impacted by an existing facility and the added impact to resources is insignificant.

F. DCR will not grant new commercial rights for transmission lines. However, it should be noted that such uses are subject to legislative action, pursuant to Article 97 of the Constitution of the Commonwealth. In such circumstances, compliance with the Secretary of Energy and Environmental Affairs' "No Net Loss" policy for mitigation of loss of open space is required.[55] Full environmental permitting and review would also apply.

G. Granting rights for new commercial uses is prohibited except to the extent necessary for activities that advance Parklands goals (e.g., food concessions associated with beaches).

[52] This policy is available on the EEA website at: http://www.mass.gov/eea/docs/eea/dcs/dcsarticle97.pdf
[53] Information on DCR's Special Use Permit program is available at: http://www.mass.gov/dcr/permits/
[54] This policy is available on the EEA website at: http://www.mass.gov/eea/docs/eea/dcs/dcsarticle97.pdf
[55] This policy is available on the EEA website at: http://www.mass.gov/eea/docs/eea/dcs/dcsarticle97.pdf

# Section 4: Woodlands

## *4.1 Woodlands – Purpose*

The forestlands of Massachusetts represent one of its finest natural assets. They provide habitat, assist with the provision of clean air and water, are a source of wood products, and are a vital part of the local economy in a number of ways. Importantly, forests are also part of the social fabric of our small state, and play an often overlooked cultural role as well. The questions and issues regarding the management of the forests under the care and control of DCR were at the heart of the issues that brought about the FFVP.

In designating approximately 40% of the State and Urban Parks system as Woodlands, DCR's intent is to assure the long-term protection and sustainable use of this valuable resource for the wide range of values, benefits and uses that it provides.

## *4.2 Management Approach for Woodlands*

The emphasis of forest management in Woodlands will be to provide the range of ecosystem services that sustainably managed forestlands offer, as well as educational examples of excellent forestry to landowners and the general public. Forestry practices will be directed at protecting forest productivity through sustainable forestry, providing resilience in watershed forests through active management, managing conditions to promote late forest successional structure and early forest successional stages, and producing high quality, high value, local forest products. Forest management will also play a role in the ecological restoration of areas that have been significantly altered by past land use and management practices such as plantations of non-native species and high-grading.

Management approach recommended by the Technical Steering Committee:

> *DCR should develop and implement management guidelines for Woodlands that demonstrate excellent forest management practices for sustainable production of wood, restoration of late successional habitat, active management of drinking water quantity and quality, creation of early successional habitat, and promotion of carbon sequestration and any other ecosystem services that benefit from relatively active manipulation of the forest. Over time, these guidelines should promote a greater emphasis on uneven-aged forests across the DCR system. At the same time, Woodlands management should include guidelines to protect rare species habitat and other natural resources, as well as the integrity and scenic quality of trails and scenic roads in the Woodlands zone.*[56]

Ecosystem Services provided by Woodlands include:

- protection of forest productivity with state of the art sustainable forestry

[56] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 52.

- restoration of late successional habitat
- protection of water supplies by increasing resilience and resistance of forests
- carbon sequestration through retention of woody debris and legacy trees in all silvicultural treatments including late successional habitat restoration
- ecological restoration of degraded natural community types (e.g., pitch pine/scrub oak barrens where human fire exclusion has led to excessive build-up of volatile fuels) and past high-graded stands
- sustainable production of renewable wood products including fuelwood and high quality timber for local markets
- provision of early-successional habitat[57] that is otherwise limited by human development

Active forest management must be carried out in the context of the ecosystem services model, which includes an awareness of the many interests in public lands management, with the goal of having a healthy forest. Foresters and forest managers will always be conscious that DCR Woodlands serve as demonstration forests. In order to achieve the high standard of forestry desired, DCR foresters will be licensed, maintain pertinent continuing forestry education, and obtain other expertise regarding state of the art forestry techniques. DCR foresters must strive to demonstrate and document as many of the following concepts within the forest management prescription as appropriate, and implement them in the field, including:

- Excellent silviculture conceptually and in practice. Prescriptions shall demonstrate how the treatment fits the regional forest type and the ecosystem processes that are present. The implementation of the prescriptions will use appropriate logging systems and equipment and demonstrate knowledgeable approaches to forestry aesthetics.
- Positive benefits to wildlife.
- Sustainable forestry practices, biologically and economically.
- Model forestry on DCR lands that are a part of municipal watersheds utilizing silviculture and Best Management Practices (BMPs) developed by DCR's DWSP.[58]
- Benefits to local economies (payments to towns through the Forest Products Trust Fund) and the Commonwealth using locally grown and harvested wood products.
- Opportunities to contribute to DCR's recreational goals.
- Opportunities to restore and maintain structural diversity in forests including late successional forest habitat and early successional habitat on both the stand and landscape level.

[57] Mass Audubon's recently released *State of the Birds 2011* report notes that there is a need to increase shrubland habitat through active management to address the significant, large scale declines seen in shrubland species (pp. 12, 23). The report recommends establishing a strategy for developing early successional habitat with DCR and other agencies (p. 56). See: http://www.massaudubon.org/StateoftheBirds/

[58] See: http://www.mass.gov/dcr/watersupply/watershed/quablmp.htm

## *4.3 Selection Criteria for Woodlands*

*FFVP Recommended allocation*: 100,000 to 150,000 acres

GIS models are based upon existing digital data and produce output that results in a continuum of values designed to assist with the process of Landscape Designation. The most favorable lands for designation as Woodlands are those:

- areas suitable for wood production based on soils, vegetation, distance from roads and past management
- sites with a history of recent silvicultural treatments
- areas where late successional characteristics could be restored via management
- areas that currently have low forest type diversity
- areas where the potential impact on communities the most dependent on the local forest economy is the greatest
- areas suitable for early successional habitat creation
- sites requiring ecological restoration or those prone to disturbance
- watershed areas that would benefit from active forest manipulation
- areas in closest proximity to wood processing facilities
- areas where forest management could increase carbon storage
- areas with good access for model forest demonstration activities
- areas suitable for demonstration purposes as a representative of forest type, age class and logging conditions

For these criteria, sixteen different datasets were used and/or created to identify and classify lands best suited for the Woodlands designation. The goal was to use the best data currently available and the best data that could be developed to identify Woodlands. For example, to identify areas most suitable for wood production, the existing "Prime Forest Soils" and "Past Management" datasets were used as well as the newly created "Vegetation Suitability" and "Distance from Roads" datasets. To assess the positive impacts on communities most dependent on the local forest economy, a "Distance to Sawmills" dataset was created (based on sawmill locations identified in January of 2010 by a UMass study) and were used along with the existing "Sawmill Woodsheds" and "Harvester Woodsheds" dataset (also from UMass researchers). Ultimately, all of these datasets were added together (for TSC criteria that used more than one dataset, the multiple datasets were added together and rescaled so that each of the twelve TSC criteria were weighted evenly) to come up with a ranking of DCR land that quantifies their relative value as Woodlands.[59]

[59] For more information on the GIS model developed for Woodlands see Appendix 9.

DCR intends to conduct further categorization of Woodlands at the forest stand level, as described below, in order to achieve Woodlands goals. (Appendix 2 has additional information on this process.)

### *4.4 Assessment and Classification of Forest Stands*

The primary goal in the assessment of forest stands is to match forest productivity and condition with broad silvicultural regimes. Note that the guidelines and directions presented here are at a broad landscape level – each site or stand considered for treatment must also be evaluated at ground level resolution.

The existing FRMPs used the Priority Timber Harvest Model,[60] developed by DCR staff, which produced silvicultural options in Active Management Areas based on forest type, stocking levels and size classes. Forest type, stocking levels, and size class were determined from aerial photographs taken and interpreted in 2003 – this data is known as the Bureau of Forestry Land Cover Classification.[61] These FRMPs will be evaluated, updated and expanded to include an assessment and classification of site quality and productivity. Information from FRMPs will also be incorporated into future RMPs as they are developed.

The TSC Report recommends classifying forest stands based on land use history and forest development as represented through origin, age and condition of stands. Generally, the classifications would depend on whether these lands were always woodland, not cultivated, cut and cultivated, or cut and pastured. The classifications suggested in the TSC Report are **Primary, Secondary, and Tertiary** forests. Unfortunately, there is not consistent, accurate statewide data available to provide a strong evaluation of primary, secondary and tertiary forests on Woodlands as defined in the TSC Report.

The guidelines for Woodlands observe the spirit and intent of the TSC Report by proposing a classification scheme that reflects the current land condition, development stage and productivity based on vegetation mapping and forest inventory data. The recommendation from the TSC carries with it the inherent message that more productive, more complex forest conditions will require more complex silviculture.

Forests with species composition, size classes and densities that indicate early stages of succession and conversely mid and later successional stages in forest development will be ranked or classified accordingly. Site productivity ratings (e.g., site index, prime soils analysis) will further refine the classification process.

Data sets that are available for classifying forest stands are:

- The Bureau of Forestry Land Cover Classification produced by James W. Sewall Co., Inc.
- The Prime Soils data layer produced by the University of Massachusetts

[60] A GIS model developed by DCR staff that utilized district specific statistics to identify and prioritize areas for active forest management.
[61] This data was created by James W. Sewall Co., Inc. for the Land Cover Classification project.

- Massachusetts Continuous Forest Inventory data.

Forest stands will be classed on a continuum and considered for silvicultural treatments that generally fit their productivity, structural complexity (or potential thereof) and diversity. The Silviculture and Vegetation Management Guidelines, below, provide information on the broad approaches to the application of silviculture. Forests that are plantations, or are developing from recent agricultural use (approximately the last 60 years), are composed of species indicative of young forest and recent regeneration (Birch-Red Maple, White Pine) and are on lower productivity sites that will rank low on the continuum of condition and productivity. Stands that are composed of species that indicate higher levels of natural disturbance such as Pitch Pine and Scrub Oak, and those particularly on lower productivity sites also will rank low on the classification continuum.

As forest stands increase in species diversity, vertical and horizontal structure, size, age, and site productivity, they will rank higher on the classification continuum and be examined for silvicultural approaches that can create and maintain higher levels of species and structural diversity. Generally even age stands that are less productive and diverse (lower on the continuum) will be considered for silvicultural approaches designed to increase landscape diversity and improve damaged and high graded stands.

## *4.5 Management Guidelines for Woodlands*

**Recreation and Public Access Guidelines:**

A. The most common types of recreation in Woodlands will include dispersed recreational uses such as hiking, mountain biking, hunting, fishing, horseback riding, primitive camping, snowmobiling, and OHV use (where compliant with DCR OHV siting criteria). Property specific regulations and policies apply.

B. DCR will strive to maintain a moderate to low density and diversity of trails within Woodlands that protects the objectives of each property as well as recreational access. Proposals for new trail development will be evaluated through the process established in the *DCR Trails Guidelines and Best Practices Manual*.[62] Creating loop trails that enhance recreational experiences while supporting the other values of the Woodlands will be encouraged. Creating small vistas along trails may be allowed. DCR may close trails to achieve the values of Woodlands.

C. Hazardous trees within a "tree length" distance from official trails, parking areas, and access roads that pose significant risk to public safety, may be removed.

D. Forestry practices that can support recreational values within Woodlands will be incorporated where feasible and designed to promote aesthetics, native vegetation, species diversity, large diameter older trees, multiple age classes, and a safe recreational experience in recreation areas and at public access points. (See also the section on Recreation and Forestry in Appendix 2.)

[62] See *DCR Trails Guidelines and Best Practices Manual*, updated January 2010. Available at: http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf

E. During timber sale activities, existing trails will be protected. Where impacts are unavoidable, DCR will include a plan for trail rehabilitation in the harvest plan according to the *DCR Trails Guidelines and Best Practices Manual*[63] and documentation of trail interfaces.

F. During timber sale activities, logging equipment will be used to control erosion or stabilize soils, by closing trails and roads not needed for administrative or emergency access. Local emergency management officials will be consulted prior to closing or restricting use of permanent roads to ensure that access for emergency purposes is maintained.

G. Where OHVs are prohibited, roads and trails used for harvesting that will not be used for other activities will be closed and stabilized. However, where OHVs are allowed, foresters will consider whether existing access for OHVs can be improved via roads and trails used to access the harvest site (by replacing poorly planned trails, stabilizing well located trails etc.).

H. Special attention and care will be given to provide long-term quality scenery, consider general property aesthetics and improve vistas where possible and appropriate.

**Silviculture and Vegetation Management Guidelines:**

A. DCR Foresters will coordinate with the Management Program Supervisor, and the DCR Park Operations staff, as well as with user groups, when vegetation management is planned. (This process is outlined in Appendix 3.)

B. Silvicultural treatments should generally promote native, diverse, healthy forests and habitats across the landscape of the Woodlands designation. The decision to choose a silvicultural system and practices to implement will be based on analysis and consideration of the forest stand and site condition (see section 4.4). Silvicultural practices on Woodlands will fall into three broad categories summarized in item D below. (For complete guidelines on treatment, timber sales, and recreation considerations, please see Appendix 2.)

C. Silvicultural treatments within a project area will be prescribed by Management Foresters at the mapped stand level. Vegetative management projects may be composed of one stand or multiple stands.

D. Silvicultural Systems, Methods and Decisions: Each stand within the project will be assessed for its history, ecological and structural characteristics as described in section 4.4. Three broad approaches to silvicultural decisions will be used recognizing the three 'level' approach recommended by the TSC. The three broad approaches will be: 1) exclude/defer harvest; 2) manage for diversity and complexity using generally uneven age systems; and 3) manage less complex or abused forest stands for improvement, with generally even aged systems.

Exclude or Defer: Some stands or areas within forestry projects may be excluded or deferred from harvest treatment to protect ecologically or culturally significant areas within Woodlands,

[63] See *DCR Trails Guidelines and Best Practices Manual*, updated January 2010. Available at: http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf

or because they are areas that are not appropriate for forestry operations due to physical limitation factors such as steep slopes. The decision to exclude or defer harvest in any given stand may be based on the occurrence of wetlands and vernal pools, rare species habitat and communities, areas of historical and cultural significance, old growth forests, riparian and trail buffers, or steep slopes. In prescriptions these areas may be called "no cut," "retention," or "inoperable" areas. Within Woodlands, large areas of sensitive resources as described above will be not be included in project prescriptions and will be effectively reserved or excluded from harvesting by their exclusion from the silvicultural prescription.

Manage for Diversity/Complexity: Innovative and complex silvicultural treatments will be used in stands where there is high potential to create and enhance vertical structure, multiple age classes, tree species diversity and large tree size classes. Those forest stands that have the immediate potential for significant diversity and are rated high from a productivity standpoint will be treated with silviculture that enhances diversity and protects productivity. Silviculture will be used to restore late-successional forest structure and characteristics. Where sites are best suited for this silvicultural approach, such as areas adjacent to Reserves or existing high quality late successional stands, trees will be retained to older ages and more downed woody debris will be retained. Silvicultural systems that use uneven-age or multiage methods of regeneration will often be used to create and maintain very diverse forest stands. Opportunities to use these systems will be given greater consideration over even age systems when weighing options for managing forest stands.

Manage for Improvement: Silvicultural systems designed to work with forest stands or sites that have been "high graded" or damaged, or are identified and classified as being less productive and less structurally diverse, will use intermediate operations such as thinning to improve growing stock and generally even age methods of regeneration. Combinations of even aged and uneven aged methods of regeneration will be considered. Stands where these systems are applied may often be currently even aged and/or on low productivity soils. Approval from the DCR Commissioner will be required for harvest openings greater than 1/3 acre designed to harvest all merchantable trees. Overall, there will be less emphasis on regeneration methods that will result in large harvest openings.

E. Plantation forests may be harvested or removed to achieve results described above. Their harvesting or removal will be constrained relative to the guidelines established in this document (i.e. size of openings, review processes).

F. Small harvests of standing live or dead or down dead trees, commonly referred to as "Home Fuelwood" will be allowed for sale to individual citizens. Home Fuelwood harvests can be used to achieve results described for the respective levels. Home Fuelwood harvests will be held to the same silvicultural and management guidelines established in this document, and subject to the Public Outreach and Consultation on Forest Cutting Plans Policy (see Appendix 3). DCR will continue and expand the current program to help meet the forest management goals within small portions of Woodlands while engaging the public and providing a local market for low quality wood from improvement cuttings. DCR will also strive to include low income families by

working with the state's low income fuel assistance programs, where feasible, and look to provide wood on landings where access into the woods is less feasible.

**Water and Soil Resource Guidelines:**

A. Manage areas around all vernal pools (certified and non-certified) according to the *Massachusetts Forestry Best Management Practices Manual*[64] and further directed by *Guidelines for Timber Harvesting near Vernal Pools*.[65]

B. Maintain soil processes by providing for the recruitment of organic inputs (retain coarse woody debris) and minimizing erosion through the use of BMPs.

C. Minimize the number of roads, skid trails, and landings.

D. Require that landings and main skid roads be stabilized, graded, and planted to appropriate native seed mixtures at the end of any operation.

E. A petrochemical spill management plan will be in place on all districts where active forest management activities take place.

F. All petroleum products, industrial chemicals, and hazardous materials must be stored in accordance with the manufacturer's specifications, and, at a minimum, in durable sealed containers.

G. Require that all harvesting machinery carry oil absorbent cloth, shovel and a 5-gallon bucket to mitigate any oil or hydraulic fluid leaks, and that any such leaks/spills be reported to the appropriate Management Forester (and to DEP, if appropriate) on the day they occur.

H. Require that all harvesting machinery be thoroughly cleaned (the exterior, undercarriage, and tires/tracks of all equipment) of mud and other debris with a high-pressure washer at a maintenance facility prior to bringing the equipment on site to minimize the introduction of invasive plant seeds and parts. Management Foresters will inspect all equipment prior to unloading at job sites.

I. Prohibit the use of harvesting machinery during the typical mud season (March 15 to May 15) or wet periods, unless waived by the DCR forester.

J. Protect highly sensitive or wet soils by limiting activities to the period when the ground is frozen or dry to prevent a reduction in site productivity and/or requiring equipment that minimizes impacts to these soils.

[64] Kittredge, David B. and Michael Parker. *Massachusetts Forestry Best Management Practices Manual.* 1999. Prepared for the Massachusetts Dept of Environmental Protection, Office of Watershed Management and the US Environmental Protection Agency, Region 1, Water Division.

[65] Massachusetts Department of Conservation and Recreation – Service Forestry program. *Guidelines for Timber Harvesting Near Vernal Pools*. Unpublished document available by contacting DCR regional offices.

K. Manage soils on a sustainable basis by minimizing erosion, compaction and displacement. Management is permitted to control erosion or stabilize soils by closing roads and unauthorized trails or other means, such as stabilizing slopes with water bars or other erosion control structures. Local emergency management officials will be consulted in any road closures.

L. Where Woodlands overlap with DCR's DWSP lands or local or regional public water supply watershed lands, management should be closely coordinated with the public water supply agency to address water quality protection issues.

**Habitat Protection Guidelines:**

A. Vegetation management necessary to comply with NHESP recommendations for the restoration, maintenance or enhancement of habitats for rare and endangered species and exemplary natural or rare communities may be allowed.

B. Vegetation management to support SGCN as described in the Massachusetts Wildlife Action Plan may be allowed if a particular SGCN is historically and/or culturally associated with a specific Woodland, and if a public process verifies support for such management prior to it being carried out.

C. Identification, documentation and protection of rare species occurrences and important habitats will be addressed using the following tools:

a) Review of the NHESP GIS database, which includes datalayers from statewide databases such as BioMap2, Priority Habitats of rare species, Estimated Habitats of rare wildlife, Certified or Potential Vernal Pools, and Natural Communities.

b) Review of and consultation with other sources of natural resource information, where appropriate and available (e.g., Mass Audubon, New England Wildflower Society, The Vernal Pool Association and other NGOs, local naturalists, etc.). Surveys and monitoring (for project specific purposes or long-term documentation), by trained DCR staff and/or outside consultants with the advice of NHESP to document and map rare species and important habitats.

c) DCR will work closely with DFW and consult the CWCS for guidance in protecting rare species and their habitats, as well as the Forestry Conservation Management Practices for Rare Species,[66] where appropriate.

d) If any state listed species are listed pursuant to the U.S. Endangered Species Act (16 U.S.C.A. §§ 1531 – 1544), the US Fish & Wildlife Service must approve the project and the appropriate species Recovery Plan shall be consulted.

[66] Available at: http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/forestry/forestry_cmp.htm

e) Consult and work with NHESP to identify and develop appropriate conservation practices for Natural Communities.

f) Wetlands and vernal pools will be mapped, documented and all vernal pools treated as certified. Potential vernal pools should be submitted for certification if applicable; apply accepted Massachusetts and federal protection guidelines around all certified or potential vernal pools (304 CMR 11.00).

D. Using the resources noted in section A, Habitat Restoration Plans should be generated to improve degraded habitats important to rare species and/or state/regional biodiversity.

E. Consult with DFW and DEP prior to conducting any work adjacent to Coldwater Fisheries habitats; apply protection guidelines recommended.

F. Form partnerships with friends groups, local naturalists, environmental organizations, etc., to assist in the identification, protection and monitoring of important habitats or rare species populations where appropriate.

**Forest Health and Protection Guidelines:**

A. Forest Insects and Diseases

a) Conduct periodic surveys to identify and quantify forest insect and disease impacts.

b) Prescribe integrated pest management approaches that treat high-risk stands, including the development of an Invasive Species Response Plan for invasive species of significant risk to forest resources.

c) Implement the draft Massachusetts Highly Destructive Forest Invasive Species Response Plan[67] for invasive species that pose a significant risk to forest resources.

B. Non-native Invasive Species

a) Conduct periodic surveys to identify, map, and quantify impacts of non-native invasive species.

b) Prescribe integrated and interdisciplinary approaches that treat existing populations while maintaining desirable native species. Integrate the removal of invasives as a requirement of timber sale contractual operations.

C. Require that all harvesting machinery be thoroughly cleaned (the exterior, undercarriage, and tires/tracks of all equipment) of mud and other debris with a high-pressure washer at a maintenance facility prior to bringing the equipment on site to minimize the introduction of

[67] See http://www.mass.gov/dcr/stewardship/forestry/docs/response_plan_invasive.pdf

invasive plant seeds and parts. Management Foresters will inspect all equipment prior to unloading at job sites.

D. Carbon sequestration

a) Manage for native vigorous vegetative growth that will both increase carbon storage and enable adaptation to climate change over time. For example, use uneven aged silvicultural systems to regenerate northern hardwoods to help maintain this forest type which is at high risk of decline in the future due to climate change.

b) Use extended rotations and forest management techniques to restore late successional forest structure.

c) Draw upon and utilize the most current research and science in applying forest management carbon sequestration strategies.

E. Use of Pesticides

a) Use pesticides only when there are no other practical alternatives.

b) Apply pesticides according to product labels and by a licensed applicator.

c) Monitor treatments for effectiveness and impacts on non-target species and areas.

F. Salvage of Dead and Dying Forest

a) Use salvage operations following standard operating forest management guidelines and *Massachusetts Forestry Best Management Practices Manual* [68] to reduce risk to human health and safety, of fire, or to reduce continued forest health threats, when necessary.

b) Consider pre-salvage operations to reduce risk to human health and safety or address forest health threats.

G. Fire

a) Inventory and maintain desirable fire roads and water drafting sites.

b) Meet Massachusetts slash law requirements.

c) Suppress wildfires to meet the following objectives:

i) Provide for the safety and well being of fire fighters and the public.

ii) Protect natural resource investments and private property.

[68] Kittredge, David B. and Michael Parker. *Massachusetts Forestry Best Management Practices Manual.* 1999. Prepared for the Massachusetts Dept of Environmental Protection, Office of Watershed Management and the US Environmental Protection Agency, Region 1, Water Division.

iii) Use minimal impact suppression tactics (MIST) in fire pre-suppression and suppression actions.

iv) Coordinate suppression tactics with the natural resource desired conditions.

d) Use mechanical treatments such as fire breaks and mowing and prescribed fire to:

i) maintain natural communities

ii) reduce the buildup of hazardous fuels and catastrophic wildfire

iii) enhance conditions favorable to rare species or communities

iv) establish desirable regeneration

v) create habitat for early successional species

e) Maintain forest health to reduce forest mortality and subsequent build-up of fuels.

**Cultural Resource Management Guidelines:**

A. As per DCR's regulatory responsibilities, any projects undertaken on DCR land – including forestry cutting plans or other silvicultural prescriptions – must first be reviewed during the planning stage by DCR's Office of Cultural Resources (OCR) for potential impacts to known and potential historic and archaeological sites.

B. Vegetation management for the protection of historic or archaeological sites is allowed, with some restrictions on the time of year, types of equipment and techniques used to minimize resource disturbance, as guided by OCR staff.

C. When designing a harvest, every effort should be made to identify pathways for equipment that avoid the creation of new (or widening existing) gaps in stone walls. If stone walls are within potential treatment areas, a site walk with OCR staff to review options and assess potential impacts and mitigation measures should take place during prescription and/or cutting plan development.

D. Upon completion of a vegetation management treatment, all slash will be removed from within any foundation or cellar hole.

E. Maintenance of historic buildings, structures, sites and landscapes within Woodlands is allowed.

**Facilities, Transportation and Boundary Guidelines:**

A. Roads

a) Maintain existing roads in accordance with established road classification systems and maintenance policy.

b) Minimize the number of truck roads, skid trails and landings.

c) Staging areas, landings, main skid trails and truck roads must be stabilized and graded at the end of any operation.

d) Protect highly sensitive or wet soils by limiting activities to periods when the ground is frozen or dry, and/or requiring equipment that minimizes impacts to these soils. Use of harvesting machinery during the typical mud season (March 15 to May 15) or wet periods should be prohibited, unless waived by the forester due to drier than normal conditions.

e) New truck road construction may be permitted in stable areas only when necessary.

f) Commercial timber management, including salvage, is allowed within road corridors, and will be designed to promote diverse native vegetation, large-diameter trees, multiple age classes and forest structures, forest health, a safe recreation experience, and quality scenery.

g) No slash should remain within 25 feet of roads.

h) Skid trails and truck roads will be carefully laid out by the forester considering grades, drainage and stream integrity.

i) Inventory and maintain desirable fire roads and water drafting sites.

j) Minimize truck road width.

k) Minimize road shoulder clearing width for safe passage and provide minimal necessary fire breaks.

l) Minimize adverse effects on wildlife migration through properly designed and maintained roads and structures (cut and fill banks, culverts, and ditches).

m) Consider the use of in-kind services to provide for skid trail and truck road maintenance during project planning and implementation.

n) Coordinate and cooperate with municipal officials on the management of roads and ownership of timber within road right-of-ways.

o) Permanently close (restore to natural condition) roads that are significantly degraded, cannot be economically repaired or serve no feasible or emergency use. Local emergency management officials will be consulted.

p) Temporarily close forest roads, using barriers and gates, which will be used minimally for administrative needs only. Local emergency management officials will be consulted.

B. Boundaries

a) All boundaries needing formal surveys will be identified. All newly-acquired DCR properties should have their boundaries surveyed and marked. (Interior line boundaries should be discontinued.)

b) Boundaries will be surveyed as needed for project implementation, where trespass is an issue, or where there are disputes.

c) All boundaries will be located and maintained on a 10 year cycle or when needed for project implementation.

d) All boundaries should be maintained clearly and in a way that is sensitive to adjacent private lands with visible residences.

C. Facilities

a) Construction of new facilities may occur as necessary for public and administrative use, consistent with Woodlands goals.

**Interpretation, Public Information, and Outreach Guidelines:**

A. Achieving the Woodlands management goals will depend on gaining community trust and support through effective communication. Interpretation supports management objectives and is based on relevant interpretive and forest management plans. Interpretation, public information, and outreach are necessary in order to be fully successful in creating demonstration model forests. Therefore, public programs around ongoing forest management in Woodlands will be a high priority for the DCR's Interpretive Services program.

a) Interpretation helps develop an awareness and understanding of a place. In Woodlands it will focus on forest management practices and the ecosystem services the land provides.

b) Public information in Woodlands provides orientation or notices about management activities, forestry activities, and security issues.

c) Outreach provides information to constituents who may or may not be Woodland visitors. Intense efforts will be made to extend outreach in conjunction with forest management projects.

d) The Public Outreach and Consultation for Forest Cutting Plans Policy has been updated to reflect many of the findings and recommendations noted throughout the FFVP and Landscape Designation process as well as public comment and input received during these processes (see Appendix 3). Changes include a public site visit to each proposed timber sale project, as opposed to only those "projects that have high public sensitivity" as called for in the former policy.

B. Interpretation (programming and media) connected to Woodlands should focus on the themes of the land and the past harvesting projects that have taken place; support management goals

and be based on relevant interpretive plans; adhere to DCR interpretive, graphic, and signage standards; and may engage friends groups, schools, universities and other organizations for support when appropriate. It is vitally important to interpret the dynamics of forest ecosystems, with and without human intervention.

C. Interpretive media (e.g., pamphlets and brochures) or programming regarding management activities will be made available at state forests and parks, in neighboring communities, and via the internet.

D. Informational signs and interpretive kiosks are most appropriate at main trailheads or parking areas, demonstration forests, and active management sites. Minimal developed interpretive signage is appropriate elsewhere within the Woodlands.

E. Trails signs should follow *DCR Trails Guidelines and Best Practices Manual*[69] signage standards for primitive areas. Interpretive media should conform to DCR's graphic guidelines.

F. Interpretation and public information requiring new infrastructure may be allowed.

**Monitoring, Enforcement and Research Guidelines:**

A. Monitoring and research projects may be conducted as approved through DCR's Special Use Permit process. Any research proposed by an outside entity must be developed and implemented in close consultation with DCR staff to assure coordination of efforts, and copies of all research results must be provided to DCR.

B. Measure Continuous Forest Inventory plots on a regular cycle and use data in conjunction with ongoing research needs such as Reserve vegetation development, carbon storage and climate change.

C. All stands that have received silvicultural treatment will be inventoried within five years of the completed treatment using the stand level inventory system used to assess the stands prior to treatment. Post treatment stand examination/monitoring will measure the same attributes so as to track the results of the forest management objectives.

D. Active enforcement of prohibited or regulated activities (such as unapproved trails or cutting of trees at boundary encroachments) is critical to maintain resources within Woodlands.

**Special Use Guidelines:**

A. Special uses such as events and activities are allowed and will be evaluated on an individual basis as provided in DCR Special Use Policies and Procedures[70] and volunteer guidelines.

[69] See *DCR Trails Guidelines and Best Practices Manual*, updated January 2010. Available at: http://www.mass.gov/dcr/stewardship/greenway/docs/DCR_guidelines.pdf

B. Research areas are managed under special-use permits and cooperative partnerships are encouraged to further collective knowledge of ecosystem functions and processes.

C. Existing special uses such as transmission lines, communication sites, and commercial uses that are not compatible with the intent of Woodlands will be evaluated to determine if they can be relocated to another area.

D. DCR will not grant rights for new commercial communications sites. However, it should be noted that such uses are subject to legislative action, pursuant to Article 97 of the Constitution of the Commonwealth. In such circumstances, compliance with the Secretary of Energy and Environmental Affairs' "No Net Loss" policy for mitigation of loss of open space is required.[71] Full environmental permitting and review would also apply.

E. Adding new or replacing existing communication hardware onto existing fire towers and communications sites will be allowed, all applicable permits and DCR's Special Use policy and guidelines apply.[72]

F. DCR will not grant rights for new commercial wind installations and commercial solar installations. However, it should be noted that commercial energy uses are subject to legislative action, pursuant to Article 97 of the Constitution of the Commonwealth. In such circumstances, compliance with the Secretary of Energy and Environmental Affairs' "No Net Loss" policy for mitigation of loss of open space is required.[73] Full environmental permitting and review would also apply. Wind and solar installations that have a primary purpose of supplying electricity to a Woodland facility (for example a headquarters facility) will be considered if the site is already impacted by an existing facility and the added impact to resources is insignificant.

G. DCR will not grant rights for new commercial transmission lines. However, it should be noted that such uses are subject to legislative action, pursuant to Article 97 of the Constitution of the Commonwealth. In addition, in such circumstances, compliance with the Secretary of Energy and Environmental Affairs' "No Net Loss" policy for mitigation of loss of open space is required.[74] Full environmental permitting and review would also apply.

H. Granting rights for new commercial uses is prohibited except to the extent necessary for activities that advance Woodland goals.

### *4.6 Forest Resource Management Plans*

The designation of DCR's State and Urban Parks properties as Reserves, Parklands and Woodlands will be reflected in edits to the existing, approved Northern Berkshires, Central Berkshires, Southern

[70] Information about DCR's Special Use Permit program is available at http://www.mass.gov/dcr/permits/
[71] This policy is available on the EEA website at: http://www.mass.gov/eea/docs/eea/dcs/dcsarticle97.pdf
[72] Information about DCR's Special Use Permit program is available at http://www.mass.gov/dcr/permits/
[73] This policy is available on the EEA website at: http://www.mass.gov/eea/docs/eea/dcs/dcsarticle97.pdf
[74] This policy is available on the EEA website at: http://www.mass.gov/eea/docs/eea/dcs/dcsarticle97.pdf

Berkshires and Western Connecticut Valley Forest Resource Management Plans. The new designations will replace the Active Forest Resource Management Areas, Intensive Use Areas, and Forest Reserves that were established in these plans.

The existing FRMPs will be evaluated, edited and expanded to reflect Landscape Designations and incorporate the guidelines presented in this document. The new Landscape Designations and guidelines will produce a change in expected outputs and will be integral to FRMP edits. Amended FRMPs will incorporate the approaches to silvicultural treatments presented in these Woodlands guidelines to guide sustainable forest management in Woodland properties. Until the existing FRMPs are updated, the Woodlands guidelines will supersede the guidelines in the existing FRMPs. Moving forward, forest management planning will occur as a part of the RMP process.

Upon finalizing the Woodlands designations, DCR will undertake projects to demonstrate excellent forestry, proposed and conducted according to the Woodlands guidelines included in this document.

# Appendices

**Appendix 1.** *Glossary*

**Appendix 2.** *Silviculture and Guidelines for Application*

**Appendix 3.** *Public Outreach and Consultation for Forest Cutting Plans Policy*

**Appendix 4.** *Land Stewardship Zoning Guidelines*

**Appendix 5.** *DCR Properties on Public Water Supply Watersheds*

**Appendix 6.** *Division of Fisheries & Wildlife Comment Letter on Draft Landscape Designations and Management Guidelines*

**Appendix 7.** *Key Changes to Management Guidelines from Draft to Final*

**Appendix 8.** *Key Changes to Landscape Designations from Draft to Final*

**Appendix 9.** *GIS Models*

**Appendix 10.** *Contributors*

**Appendix 11.** *Final Landscape Designation Maps*

# Appendix 1. Glossary

**carbon sequestration –** the incorporation of carbon dioxide into plant tissues.

**clearcut –** 1. a stand in which essentially all trees have been removed in one operation —*note* depending on management objectives, a clearcut may or may not have reserve trees left to attain goals other than regeneration; 2. a regeneration or harvest method that removes essentially all trees in a stand —*synonym* clearcutting.

> Legal definition from 304 Commonwealth of Massachusetts Regulation 11.00 pursuant to the authority granted under Massachusetts General Law c. 132, §§ 40 through 46
>
> **11.05: Standards (1) Cutting Trees (a) Silviculture**
>
> 2. Clearcutting, coppice cuts, or any regeneration cut leaving less mature trees than those required for a seed tree cut (excepting the removal cut of shelterwood, seed tree or similar systems where, in the judgment of the Director's agent, the advance regeneration is of suitable size and stocking for release) shall meet the following standards:
>    a. The maximum size of the opening created shall be ten acres unless the source of the regeneration is seeding from surrounding stands, in which case the maximum size shall be five acres. Clearcuts larger than these limits shall require a specific reason to be given and approved in the forest cutting plan showing that environmental impact is less, or that environmental benefits would be enhanced, by a larger cut. In these cases, the forest cutting plan must also state the silvicultural justification for the larger area and list the provisions necessary to insure adequate regeneration and mitigation of environmental impacts.
>    b. Clearcuts separated by less than 100 feet of forest maintained at or above "B Level" stocking shall be considered to be one clearcut.
>    c. Clearcutting cannot occur within filter and buffer strips, on slopes of 60% or more, or within wetlands.
>    d. Where regeneration of a clearcut is to be obtained by seeding from surrounding uncut mature stands of light-seeded species, the clearcut shall be so shaped that all parts are within the effective seeding range of the dominant tree species within the adjoining uncut mature timber stand. The adjoining stand must be at least 2½ acres in size.

**commercial harvesting** – the practice of forestry with the object of producing timber and other forest produce as a business enterprise or for sale to a business enterprise.

**cutting cycle** – the planned interval between partial harvests in an uneven-aged stand —*see* thinning cycle.

**developed (soils) –** refers to levels of soil formation/evolution and soil horizon formation/evolution. Soil development is influenced by climate, living organisms (especially vegetation), the nature of parent material, topography and time. Soil formation and development begins with the accumulation of parent material. As the biotic and abiotic influences affect the accumulating parent material, soils form

horizons or layers. More complex or developed soils generally have more, well defined layers and generally are more productive in regards to supporting complex vegetative communities.

**early successional habitat –** the condition of forest vegetation, in terms of species composition and structure, that is found in the early seral or successional stages of forest development. This habitat is made up predominantly of grasses, forbs, seedlings, and shrubs, and provides an environment for a diversity of birds, mammals and invertebrates.

**ecological land unit** – areas of land and water having similar characteristic combinations of physical environment (such as topography, climate, geomorphic processes, geology, soil, and hydrology), biological communities (such as plants, animals, microorganisms, and potential natural communities), and human factors (such as social, economic, cultural, and infrastructure).

**ecosystem services** – benefits provided by ecological resources and processes. These services can be broken into four broad categories: provisioning, regulating, supporting and cultural.

**forest cutting plan** – (in Massachusetts) a plan for the cutting of trees on forest land prepared and submitted in accordance with M.G.L. c. 132, §§ 40 through 46 and C.M.R. 11.00. A forest cutting plan shall meet the requirements for a notice of intent to cut under M.G.L. c. 132, §§ 40 through 46. *Approved Forest Cutting Plan* means a forest cutting plan which has been approved by the director or the Director's Agent pursuant to 304 CMR 11.04 in the form it was submitted or together with the amendments and requirements added by the Director or the Director's agent as conditions for approval. An approved forest cutting plan shall meet the requirements for a final work order required under M.G.L. c. 132, §§ 40 through 46.

**forest health –** a healthy forest condition is defined as a vibrant mix of native tree and other plant species naturally associated with soils and other physiognomic conditions present.

**forestry** – the profession embracing the science, art, and practice of creating, managing, using, and conserving forests and associated resources for human benefit and in a sustainable manner to meet desired goals, needs, and values —*note* the broad field of forestry consists of those biological, quantitative, managerial, and social sciences that are applied to forest management and conservation; it includes specialized fields such as agroforestry, urban forestry, industrial forestry, nonindustrial forestry, and wilderness and recreation forestry.

**high grading** – the removal of the most commercially valuable trees (high-grade trees), often leaving a residual stand composed of trees of poor condition or species composition —*note* high grading may have both genetic implications and long-term economic or stand health implications.

**irregular** – *of a regeneration method (e.g., irregular shelterwood)* characterized by variation in age structure (usually uneven-aged) or in spatial arrangement of trees.

**late successional habitat –** forest structural condition that resembles or is in the latest seral or successional stages of forest development. The structural condition includes live and dead (snags) standing trees that are large and often old for their species. The canopy of mature cohorts has gaps and complex vertical structure; there is a variety of tree sizes and ages. Overstory tree crowns have

morphology and architecture that provides nesting and roosting opportunities for raptors. The understory is generally developed and patchy and contains significant amounts of down woody debris. The environment of late successional habitat supports distinct associated flora and fauna species, sustains a high level of forest biodiversity and is a significant carbon sink.

**merchantable** – 1. *of trees, crops, or stands* having the size, quality, and condition suitable for marketing under a given economic condition, even if not immediately accessible for logging; 2. *of a bole or stem* the part(s) suitable for sale; 3. *of lumber* the commercial size or grade of round or sawn timber or of other forest produce, or the entire output of a sawmill except for mill culls.

**micro-site conditions –** specific conditions (temperature, humidity, sunlight, nutrient availability, soil physical characteristics, vegetation cover) different from the surrounding area. These conditions are created in a small area by features such as a rock outcrop, log, stump, small depression or similar feature.

**old growth forest**[75] **–** the (usually) late successional stage of forest development —*note 1.* Old growth forests are defined in many ways; generally, structural characteristics used to describe old growth forests include (a) live trees: number and minimum size of both seral and climax dominants, (b) canopy conditions: commonly including multilayering, (c) snags: minimum number of specific size, and (d) down logs and coarse woody debris: minimum tonnage and numbers of pieces of specific size —*note 2.* Old growth forests generally contain trees that are large for their species and site and sometimes decadent (overmature) with broken tops, often a variety of tree sizes, large snags and logs, and a developed and often patchy understory —*note 3.* Stand age, although a useful indicator of old growth, is often considered less important than structure because (a) the rate of stand development depends more on environment and stand history than age alone, and (b) dominants are often multiaged —*note 4.* Due to large differences in forest types, climate, site quality, and natural disturbance history (e.g., fire, wind, and disease and insect epidemics), old growth forests vary extensively in tree size, age classes, presence and abundance of structural elements, stability, and presence of understory —*note 5.* The minimum area needed for an old growth forest to be a functional ecological unit depends on the nature and management of surrounding areas; small areas often do not contain all old growth elements —*note 6.* An old growth forest is commonly perceived as an uncut, virgin forest with very little human-caused disturbance; some believe that the time taken for stands to develop old growth structure can be shortened by silvicultural treatments aimed at producing the above characteristics —*synonym* primary forest.

**productivity –** 1**.** *ecology* the rate at which biomass is produced per unit area by any class of organisms; 2. *ecology* the rate of new tissue formation or energy utilization by one or more organisms; 3. *ecology* the capacity or ability of an environmental unit to produce organic material; 4. *ecology* the ability of a

[75] The definition provided here is taken verbatim from the Society of American Foresters *Dictionary of Forestry* (updated July 2008). Please note that it does differ from the definition utilized in the DCR Old Growth Policy, which was adopted by the former DEM board in 1998. This policy is available at http://www.mass.gov/dcr/stewardship/forestry/docs/oldgrwpol.pdf.

population to recruit new members by reproduction; 5. *management* the relative capacity of an area to sustain a supply of goods or services in the long run.

**redundancy –** overlapping or duplicate function; in the context of forest reserve redundancy, this means that if one forest reserve is lost to disease, invasive species, pests or natural or anthropogenic disturbances, there is another similar forest reserve that functions in an ecologically similar way. Two forest Reserves that are not redundant would be a Northern hardwood forest stand on *steep slopes* and a pitch pine – scrub oak forest stand on *dry flats, acidic sed/metased* (these are "Ecological Land Unit" terms as defined by The Nature Conservancy) since each has a unique and different ecological function.

**regeneration method** – a cutting procedure by which a new age class is created; the major methods are clearcutting, seed tree, shelterwood, selection, and coppice —*synonym* reproduction method.

**reserve tree** – a tree, pole-sized or larger, retained in either a dispersed or aggregated manner after the regeneration period under the clearcutting, seed tree, shelterwood, group selection, or coppice methods —*synonym* standard, green tree retention.

**seed tree** (regeneration method) – the cutting of all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class in fully exposed microenvironment —*note* seed trees are usually removed after regeneration is established —*also* seed tree with reserves.

**shelterwood** (regeneration method) – the cutting of most trees, leaving those needed to produce sufficient shade to produce a new age class in a moderated microenvironment —*note* the sequence of treatments can include three types of cuttings: (a) an optional preparatory cut to enhance conditions for seed production, (b) an establishment cut to prepare the seed bed and to create a new age class, and (c) a removal cut to release established regeneration from competition with the overwood; cutting may be done uniformly throughout the stand (uniform shelterwood), in groups or patches (group shelterwood), or in strips (strip shelterwood); in a strip shelterwood, regeneration cuttings may progress against the prevailing wind.

**silviculture** – the art and science of controlling the establishment, growth, composition, health, and quality of forests and Woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.

**silvicultural system** – a planned series of treatments for tending, harvesting, and re-establishing a stand —*note* the system name is based on the number of age classes (coppice, even-aged, two-aged, uneven-aged) or the regeneration method (clearcutting, seed tree, shelterwood, selection, coppice, coppice with reserves) used.

**snag –** 1. a standing, generally unmerchantable dead tree from which the leaves and most of the branches have fallen —*note* for wildlife habitat purposes, a snag is sometimes regarded as being at least 10 in (25.4 cm) in diameter at breast height and at least 6 ft (1.8 m) tall; a hard snag is composed primarily of sound wood, generally merchantable, and a soft snag is composed primarily of wood in advanced stages of decay and deterioration; 2. a standing section of the stem of a tree, broken off usually below the crown; 3. a sunken log or a submerged stump or tree; 4. the projecting base of a broken or cut branch on a tree stem.

**stand** – 1. *ecology* a contiguous group of similar plants; 2. *silviculture* a contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit —*see* all-aged stand, mixed, pure, even-aged, and uneven-aged stands —*note 1.* A mixed stand is composed of a mixture of species —*note 2.* A pure stand is composed of essentially a single species —*note 3.* In a stratified mixture stand different species occupy different strata of the total crown canopy.

**stand structure** – 1. *ecology* the physical and temporal distribution of plants in a stand; 2. *silviculture* the horizontal and vertical distribution of components of a forest stand including the height, diameter, crown layers, and stems of trees, shrubs, herbaceous understory, snags, and down woody debris.

**succession –** the gradual supplanting of one community of plants by another ; the sequence of communities is called a sere, or seral stage.

**sustainable forest management** – *this evolving concept has several definitions* 1. the practice of meeting the forest resource needs and values of the present without compromising the similar capability of future generations —*note* sustainable forest management involves practicing a land stewardship ethic that integrates the reforestation, managing, growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat, and aesthetics (UN Conference on Environment and Development, Rio De Janeiro, 1992); 2. the stewardship and use of forests and forest lands in a way, and at a rate, that maintains their biodiversity, productivity, regeneration capacity, vitality, and potential to fulfill, now and in the future, relevant ecological, economic, and social functions at local, national, and global levels, and that does not cause damage to other ecosystems (the Ministerial Conference on the Protection of Forests in Europe, Helsinki, 1993) —*note* Criteria for sustainable forestry include (a) conservation of biological diversity, (b) maintenance of productive capacity of forest ecosystems, (c) maintenance of forest ecosystem health and vitality, (d) conservation and maintenance of soil and water resources, (e) maintenance of forest contributions to global carbon cycles, (f) maintenance and enhancement of long-term multiple socioeconomic benefits to meet the needs of societies, and (g) a legal, institutional, and economic framework for forest conservation and sustainable management (Montréal Process, 1993).

**thinning cycle** – the period of time between successive thinning entries, usually used in connection with even-aged stands.

**tip-up mound topography** – forest soil disruption caused by falling trees.

**whole-tree harvesting** - cutting and removing an entire upper portion of a tree consisting of trunk, branches, and leaves or needles —*synonym* full-tree harvesting

<u>References used to compose Glossary definitions:</u>

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Personal email communication with Dave King and Matthew Kelty; March 2, 2011.

# Appendix 2. Silviculture and Guidelines for Application

In Woodlands the DCR Management Forester will, in contemplating forest management activities, formulate a decision process of analyzing the forest site conditions and subsequently prescribing (or deciding against) silvicultural treatments. Often the forester must and will decide against harvesting. The exclusion of harvesting at any given time may be a deferral for the length of a cutting or thinning cycle or it may be long term exclusion due to the constraining characteristics of a site. Reasons for which harvesting is excluded within Woodlands include:

- wetlands and vernal pools
- riparian and trail buffers
- old-growth forests
- endangered species habitat and rare natural communities – appropriate surveys will be conducted (no harvests where Conservation Management Practices (CMPs) recommend not harvesting)
- wildlife habitat – retention of trees to meet diversity goals primarily to meet species habitat requirements
- areas of historical and cultural significance, where harvesting activities could destroy a resource
- steep slopes

Silviculture applied in Woodlands will be used to achieve the variety of agency goals identified in Section 4.2 of this document. Traditional silvicultural systems or a series of treatments including regeneration cutting, tending operations, protective treatments, and intermediate cuttings will most often be used to achieve DCR Woodlands goals. In some cases, timber harvesting may occur within a project that will not fit neatly in a traditional silvicultural system. Examples of singular focused cuttings to achieve one time intended results may be conducted for purposes include:

- controlling the spread of invasive pathogens, insects or plants
- removing hazardous trees along trails
- promoting habitat for rare and endangered species
- protection of cultural resources

Silvicultural systems for forest management will be designed with two broad directions:

- ***Diversity and Structure***. Create and/or maintain uneven aged or multi-aged stands with a high level of structural diversity and/or restore late-successional forest structure and characteristics.
- ***Rehabilitation and Improvement.*** Work to add diversity to high graded/damaged stands, lower productivity stands, or stands that are currently even aged.

***Diversity and Structure***

Intent: Create and/or maintain uneven aged or multi-aged stands with a high level of structural diversity and/or restore late-successional forest structure and characteristics. Silviculture with this intent will be used to create and enhance vertical structure, multiple age classes, tree species diversity and large tree size classes. On sites where it is a high priority for restoring late successional characteristics, trees will be retained to older ages and more downed woody debris will be retained. Those forest stands that have the immediate potential for significant diversity and are rated high from a productivity standpoint will be treated with silviculture that enhances diversity and protects productivity.

Guidelines: Use regeneration methods that resemble the regeneration results of small scale natural disturbance; manage to create and maintain uneven conditions on many scales of resolution (stand to landscape). Use intermediate operations to enhance late successional characteristics where appropriate.

A. Single Tree and very small group selection:

    a) Variable size group selection; from single tree to 1/3 acre.

        i) The model to determine opening size will be species shade tolerance.

            (1) Increasing shade tolerance = smaller gap

            (2) Decreasing shade tolerance = larger gap

B. Irregular and two age systems:

    a) Two age systems

        i) Use on current even age stands with species that have moderate to low shade tolerance – new openings up to 1/3 acre.

    b) Irregular shelterwood:

        i) Create and maintain irregular gaps up to 1/3 acre; create and maintain irregular forest structure, and heights of trees at stand level scale. Expand on areas of advanced regeneration reserving individual and groups of large trees.

C. Openings will be variably shaped.

D. Areas adjacent to openings will be thinned to enhance wildlife benefits and light conditions of openings.

E. All timber sale treatments must take aesthetics into high consideration. Roadside buffer requirements will be strictly adhered to and landing location and rehabilitation considered paramount. Enhancing aesthetics will be an important goal, as well as considering scenic vistas and wildlife viewing areas.

***Rehabilitation and Improvement***

Intent: Work to add diversity to high graded/damaged stands, lower productivity stands, or stands that are currently even aged. Silvicultural practices will be used generally in those stands that are less productive and less structurally diverse. The stands treated with this level of silviculture are generally even aged and are on less developed, less complex soils. Silvicultural systems will often use even age regeneration methods and stand improvement practices but not exclusively; a combination of systems that include even and uneven age methods should be sought.

Guidelines:

A. Advanced Regeneration present:

   a) Irregular Shelterwood with openings up to 5 acres with reserves/green tree retention.

   b) Single Tree and small group selection with openings up to 1/3 acre on relatively higher productivity sites and with desirable shade tolerant species present.

B. Advanced Regeneration not present:

   a) Clearcut, Shelterwood or Seed Tree with reserves/green tree retention with openings up to 5 acres.

   b) Single Tree and small group selection with openings up to 1/3 acre on relatively higher productivity sites and with desirable shade tolerant species present.

C. Conduct thinning in immature stands to promote growth on high quality, desirable trees.[76]

D. Promote diversity in size and shape of harvest openings.

E. Select Reserve or Legacy trees to be left in harvest openings that exceed 1/3 acre (see guidelines below in **Wildlife Structural and Coarse Woody Debris Guidelines**).

F. Aesthetics are a premium goal in the results of timber sale treatment. Adhere strictly to roadside buffer requirements. Landing location and rehabilitation are paramount. Enhance aesthetics; consider scenic vistas and wildlife viewing areas.

Silviculture practiced in this general approach will also be used to create habitat conditions for species that require forests in the earliest stages of succession and young forests less than 10 years old. Silvicultural systems that incorporate even-aged harvesting regeneration methods such as clearcut,

[76] If forest stands considered for treatment in this level are less than approximately 100 years old, thinning should be considered as an intermediate treatment to prepare the stand for regeneration at a later time. Thinning will maintain a cover of trees for an extended period, redistribute the growth potential of the site on more desirable higher quality trees, and allow residual trees to adjust to changing conditions (increased light, and exposure to wind).

shelterwood and seed tree (all with reserve trees) will be used to create forest openings of various sizes up to 5 acres using a public and expert consultative process. Openings above 1/3 acre will require approval from the DCR Commissioner. Emphasis will be on regenerating forest habitat in strategically selected areas and allowing the forest habitat to develop through many successional stages. Recently high graded stands adjacent to other open habitat, "pasture pine", or young forests are some examples of areas to select. The practice should be shifted across the landscape of DCR's Woodlands.

For each management forestry district, stands appropriate for early successional habitat will be mapped and prioritized working with DFW staff. DFW will advise DCR on the appropriate amount of early successional habitat needed for the district given landscape wildlife conditions and will advise DCR on the best location and timing of early successional habitat projects. An expanded public input process will occur for openings planned larger than 1/3 of an acre. Openings between 1/3 and 5 acres will be proposed on the advice of DFW (based on the Massachusetts State Wildlife Action Plan) and will require approval from the DCR Commissioner. This type of forestry has three goals: 1. to restore diversity to sites degraded from past land use; 2. to add to needed wildlife habitat for wildlife species of greatest conservation need identified in the state Wildlife Action Plan that benefit from larger patches of early-successional forest habitat; and 3. to demonstrate to other landowners how to conduct scientifically-based habitat restoration projects.

**Wildlife Structural and Coarse Woody Debris Guidelines**

*Where forest vegetation management occurs, the following guidelines apply***:**

A. Retain 1 to 3 live, large diameter (where possible >18" dbh) trees per acre and 4 live, 12" to 18" dbh trees per acre that have the potential to serve as cavity and den trees and future snags. Retention trees should be distributed uniformly, clumped or grouped, providing a random uneven distribution over the entire treatment area leaving an average of approximately 5 live, future snag trees retained per acre. Groups or clumps of future snag retention should coalesce to island patches in even age management systems providing vertical structural diversity and protection to larger legacy trees. A greater number of legacy trees should be left in riparian areas.

B. Retain all dead snags and stubs in harvest areas as safe operating conditions will allow. Leave a minimum of five snags greater than 10 inches dbh where they exist.

C. Retain on average one of the oldest, largest diameter, well formed, dominant trees (where possible > 18" dbh) per acre in harvested areas to serve as legacy trees.

D. Downed woody material (DWM) including coarse woody debris (CWD) should be maintained on site based on forest type and site productivity, generally following the Forest Guild guidelines

for DWM retention.[77] All DWM on site prior to the harvest will be retained. Maintain a minimum of at least two cords (256 cubic feet) per acre of down coarse woody debris (material 5" or greater at the tip and at least 4' long) for ground dwelling amphibians, mammals, insects, and nutrient recycling. When available, highest priority will be given to leaving large, cull logs that will remain for long periods of time.

E. Provide a diversity of horizontal and vertical forest structures by retaining both individual and groups of trees during final release regeneration harvests and by protecting desirable advanced regeneration.

**Whole Tree Harvesting and Woody Biomass Removal** – Biomass refers to vegetation removed from the forest, usually logging slash, small-diameter trees, tops, limbs, or trees not considered merchantable in traditional markets. Biomass harvesting often done in forestry operations with "whole tree harvesting" refers to the removal of logging slash, small-diameter trees, tops, or limbs. On DCR harvests this tool may be used in limited circumstances in order to:

1. Thin non-sawtimber quality trees from forest stands to redistribute growth on generally larger, more desirable retention trees that will develop into high quality, high value individuals. In developing stands chosen to direct on a path to late successional characteristics, whole tree harvesting can provide the economic means to cut noncommercial size trees.

2. Intentionally impoverish site conditions and reduce fuel loads when converting plantations on sand-plain ecosystems to native scrub oak, tree oak and pitch pine vegetation communities.

3. Improve and maintain aesthetics where visuals are a significant concern by reducing slash levels during a timber harvest.

The use of whole tree harvesting will not dictate silviculture but will allow these discussed practices to take place in the absence of a market for low quality timber. With rare exceptions, all timber sales regardless of the use of whole tree harvesting will adhere to minimum coarse woody debris retention standards in the Wildlife Structural and Coarse Woody Debris Guidelines (see above) and retain 256 cubic feet of down wood material. Possible rare exceptions may be to minimize forest fuel loading or to meet a particular wildlife species requirement.

These guidelines have been drafted recognizing the Massachusetts Department of Energy Resources (DOER) is in the process of finalizing regulations pertaining to the eligibility of biomass generation units to receive Renewable Energy Certificates (RECs) under the state's Renewable Energy Portfolio Standard (RPS). The guidelines below provide direction to the forest manager for woody biomass retention and removal and are separate from the DOER proposed regulations in practice. Purchasers of a DCR timber sale will have to determine independently how much, if any of the biomass removed will qualify for

[77] Forest Guild Biomass Working Group. *Forest Biomass Retention and Harvesting Guidelines for the Northeast*. May 2010. The Forest Guild, Santa Fe, NM. Available at: http://www.forestguild.org/publications/research/2010/FG_Biomass_Guidelines_NE.pdf

renewable energy credits. In the course of selling timber from state lands, DCR will regulate the amount of biomass removed from any given site to protect forest productivity.

The Woody Biomass Removal guidelines in this document are based primarily on the Forest Guild publication *Forest Biomass Retention and Harvesting Guidelines for the Northeast*.[78] The Forest Guild is an internationally noted organization that "promotes ecologically, economically, and socially responsible forestry – "excellent forestry"– as a means of sustaining the integrity of forest ecosystems and the human communities dependent upon them."[79] The following criteria established by the Forest Guild offer an appropriate model for evaluating sites within the Woodlands where forest harvesting takes place.[80]

A. Document soils/productivity in the area covered by Forest Resource Management Plans and specific silvicultural prescriptions. Using Natural Resource Conservation Service (NRCS) soils survey maps, identify low nutrient soil series, excessively drained or very poorly drained soils and restrict woody biomass removal. Prescriptions will contain a map indicating soil types underlying the treatment area. Additional information from Forest Productivity Mapping of Massachusetts,[81] and the Massachusetts CFI site index maps should be used to determine soil productivity.

B. Provide direction within the silvicultural prescription for woody debris retention and removal that is based on documented soil productivity.

    a) Do not remove limbs and tops from sites that have low nutrient soils, that are excessively drained or poorly drained, and are rated as low productivity sites unless the object is to impoverish the site, i.e.to help promote and maintain pitch pine – oak savannahs in the southeast.

    b) In areas that do not qualify as low nutrient or low productivity where 1/3 or more of basal area is being removed on a 15 to 20 year cutting cycle, retain 1/4 to 1/3 of tops and limbs.

    c) Increasingly nutrient rich sites (higher productivity) and/or more basal area retention during harvest and/or longer cutting cycle allows for less limbs and tops left on the site to protect site productivity.

C. Timber Sale Contracts will be written so that coarse woody debris, wildlife structural retention standards are met. Contracts will limit the removal of biomass based on the productivity analysis and silvicultural prescription.

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[78] Forest Guild Biomass Working Group. *Forest Biomass Retention and Harvesting Guidelines for the Northeast*. May 2010. The Forest Guild, Santa Fe, NM. Available at: http://www.forestguild.org/publications/research/2010/FG_Biomass_Guidelines_NE.pdf

[79] The Forest Guild – see: http://www.forestguild.org/mission.html

[80] Forest Guild Biomass Working Group. *Forest Biomass Retention and Harvesting Guidelines for the Northeast*. May 2010. The Forest Guild, Santa Fe, NM. Available at: http://www.forestguild.org/publications/research/2010/FG_Biomass_Guidelines_NE.pdf

[81] MacConnell, W.P., D.W. Goodwin, and K.M.L. Jones. *Forest Productivity Mapping of Massachusetts.* Massachusetts Agricultural Experiment Station, 1991. Amherst, MA. Research Bulletin Number 735, 45p.

D. Plan harvests if at all possible for winter so that removal of leaves and needles from the site is minimized.

**Harvesting and Timber Sale Guidelines**

A. All silviculture treatments will be directed by a written prescription developed by Management Forestry Staff and approved by the Program Supervisor. The prescription will contain required information per the outreach policy, which is located in Appendix 3.

B. Management Foresters will conduct a pretreatment inventory of each proposed timber sale site. Information gathered in the inventory will be the basis for the silvicultural prescription. Pre-treatment inventory will include forest overstory, understory (including herbaceous vegetation/ground cover) and coarse woody debris.

C. Timber Sale Contracts and Cutting plans will be signed by the Management Forestry Program Supervisor representing the landowner, the Commonwealth of Massachusetts.

D. Prior to drafting silvicultural prescriptions foresters will consult with the DCR Staff Archaeologist about cultural resources within a prescription area, and conduct a review of all pertinent and available information on rare and endangered species or wetland resources affecting a prescription area. Field reconnaissance that identifies and maps stone walls, wetland resources and vernal pools will take place prior to drafting prescriptions.

E. Silvicultural Prescriptions will include a preliminary logging plan map.

   a) The logging plan map will be a part of the timber sale prospectus and contract. It will indicate pre -designated primary permanent skid roads.

   b) The logging plan map will indicate wetlands, waterways, areas of rare and endangered species and stone walls to be protected during the harvesting activity.

F. Logging equipment will be appropriate to the forest type and structure, and presence of advanced regeneration. Silviculture will dictate the use of equipment for harvesting. Contracts will list allowed equipment on each timber sale. Permanent haul roads and primary skid roads will be laid out and marked prior to the sale; their location and standards will be specified contractually.

   a) Thinning or uneven age management systems retaining greater than 80 square feet of basal area per acre should use small cable log skidders or cut to length systems coupled with forwarders. Grapple skidders exceeding 120” wheelbase should not be used where average retained basal area exceeds 80 square feet.

   b) Design standards for forestry equipment will be based on forest conditions and site/soil characteristics for integration in Forest Resource Management Plans.

c) Logging equipment preferred and allowed for a forestry project will be specified in the silvicultural prescription and timber sale contract.

d) Proven local experience with equipment will be factored toward harvester selection to accomplish a silvicultural goal.

e) Timber sale contracts should provide penalties for the destruction of regeneration and residual crop trees to be protected.

G. Trees will be designated for removal with either the "Take Tree" marking method or the "Leave Tree" method. The marking method (take tree, leave tree, color of paint) will be specified in the timber sale contract and communicated during the site visit (See Appendix 3 – Public Outreach and Consultation for Forest Cutting Plans Policy).

a) Take Tree Marking - Trees to be cut and or removed will be marked/painted at breast height and stump. All other trees are retained.

b) Leave Tree Marking – Trees to be retained during a harvest will be marked/painted at breast height and stump. Trees not marked are designated for cutting and or removal.

H. Forest management on DCR lands will, wherever possible, exceed current BMPs identified in the *Massachusetts Forestry Best Management Practices Manual*.[82]

a) Use of BMPs should be documented in the silvicultural prescription and timber sale contract.

**Recreation and Forestry**

The most common recreation forestry interface will be hiking trails within the Woodlands. These guidelines build upon the approved Forest Resource Management Plans and the TSC recommendations. Official designation of trails will be via the DCR – MA Forest and Parks: Road and Trail Inventory and Survey.

National or significant trails such as the Appalachian Trail will use the following guidelines:

A. DCR will establish a "Primary Corridor" with a 200 foot wide area on each side of trail and a "Secondary Corridor" with a 300 foot wide area on each side of primary trail corridor (a total 500 foot wide area on each side of the trail).

B. In accordance with the Appalachian National Scenic Trail (AT) local management plan and the Memorandum of Understanding (MOU), within the "Primary Zone," the AT will be the "Primary Feature" for which the lands are managed. Forest management practices shall be limited to

[82] Kittredge, David B. and Michael Parker. *Massachusetts Forestry Best Management Practices Manual.* 1999. Prepared for the Massachusetts Dept of Environmental Protection, Office of Watershed Management and the US Environmental Protection Agency, Region 1, Water Division.

those practices that are directly beneficial to the Trail, as determined by the local planning process and agreed upon in the Massachusetts Appalachian Trail Management Plan. Should forest management activities take place on adjoining lands, logging trails will avoid crossing the Trail wherever possible.

C. Forest management that takes place within the "Secondary Corridor" of the AT will be consistent with the AT MOU.

D. Should forest management take place within the primary or secondary corridors, skid trails should not cross the AT unless there are no feasible alternatives. If skid trails must cross the trail, they should cross perpendicular to the trail.

E. Forest management within the primary and secondary corridors of other significant trails will be designed to promote native diverse vegetation, large diameter trees, multiple age classes and forest structures, forest health, a safe recreation experience, and quality scenery.

F. Slash, as a result of forest management within 50 feet of the trail, should result in a light and natural appearing forest ground cover.

G. Natural resource managers will coordinate with park supervisors, trail managers and user groups when vegetation management is planned.

All other trails (mapped and officially designated) that interface with forest management will include a 50 foot wide corridor on each side of the road or trail and use these guidelines:

A. Sustainable forest management, including salvage, is allowed within road and trail corridors.

B. Forest management within the trail corridors will be designed to promote native diverse vegetation, large-diameter trees, multiple age classes and forest structures, forest health, a safe recreation experience, and quality scenery.

C. Slash, as a result of forest management within 25 feet of interior forest, roads, interstate, intrastate, and local trails, shall meet the Massachusetts Slash Law, and should result in a light and natural appearing forest ground cover.

D. Skid trails should avoid crossing trails whenever possible and if crossings are necessary, they should cross perpendicular to the trail. Any impacts to a trail from such crossing shall be rehabilitated upon project completion.

E. Natural resource managers will coordinate with park supervisors, trail managers and user groups when vegetation management is planned.

F. Natural resource managers will coordinate with park supervisors, local emergency management officials and user groups to determine if "field identified" roads and trails (not mapped or signed) should have corridor forest management guidelines applied, have no special treatment, or should be closed and rehabilitated.

**Incentives to Process Wood Locally and Support Local Economies and Communities**

A. Prospective timber sale purchasers that are certified under the Department of Agricultural Resources' Commonwealth Quality Seal program[83] will be given a priority incentive in bidding on DCR timber sales. A system will be developed where qualified, prospective purchasers/bidders who meet the requirements of the Commonwealth Quality Seal program will be given preference in the evaluation of the bids.

[83] Information on the Commonwealth Quality Seal program for Forestry is available at: http://www.mass.gov/agr/cqp/sectors/forestry/app-package.htm

## Appendix 3. Public Outreach and Consultation for Forest Cutting Plans Policy

*The following is an update to the DCR Public Outreach and Consultation for Forest Cutting Plans Policy approved by the DCR Stewardship Council in 2007. This update incorporates key elements of the Forest Futures Visioning Process, Technical Steering Committee Recommendations, and the DCR Bureau of Forestry's commitment to conduct excellent forestry operations.*

**POLICY:** This policy is intended to provide guidance on the Department of Conservation and Recreation's (DCR) internal review, public notice of, and comment on forest management plan implementation, and timber harvesting (forest cutting) projects.

**APPLICABILITY:** This policy applies to commercial timber sales and home fuelwood projects in DCR State Forests, Parks, and Reservations.

**TABLE OF CONTENTS:**



**APPENDICES[84]:**



[84] ***Note:*** *Appendices noted above and referenced within the policy refer to appendices that are a part of the complete policy document and are not referencing appendices of the Landscape Designation Management Guidelines document. These appendices have not been altered in this policy update, and are not included here so as not to cause confusion. Please refer to the complete version of this policy document posted on the Bureau of Forestry's website, which includes all appendices referenced within:* *http://www.mass.gov/dcr/stewardship/forestry/docs/Final%20Public%20Notification%20Policy.pdf*

**PROCEDURES:**

**I. Responsibility:**

1. The DCR, acting through its Bureau of Forestry, is responsible for the conservation, health, and management of forest vegetation within DCR's State Forest, Park and Reservation system.

2. The Bureau of Forestry endeavors to meet and exceed the Massachusetts Forestry Best Management Practices (Appendix 1); Landscape Designation Management Guidelines (Appendix 3); statewide forestry guidelines in coordination with the Division of Fisheries and Wildlife; and Forest Resource Management Plans and Resource Management Plans pursuant to MGL Ch. 21, § 2F; and is responsible for meeting the standards of the regulations promulgated by the Massachusetts Forest Cutting Practices Act: 304 CMR 11.00 – 11.10 Forest Cutting Practices (Appendix 2) and other requirements of the law such as the Wetlands Protection Act and Endangered Species Act.

**II. Public Notice of Proposed Timber Harvesting Summaries and Vegetative Management Projects:**

1. For all commercial forest product sales that require a Forest Cutting Plan (Appendix 6), and for home fuelwood sales, or any significant forest vegetation management project, Management Foresters will prepare proposed Timber Harvesting Summaries (Appendix 4) after consultation, coordination and approval from the responsible Regional Director or their designee, Park Supervisors, and State Lands Management Program Supervisor.

2. The proposed Timber Harvesting Summaries will include: the municipality where the project is located; facility name; project's Forest Management district; Management Forester contact information (telephone number, e-mail address, and mailing address); project name; project location description; forest stand description; proposed preliminary silvicultural treatment; aesthetic, recreation, and environmental conditions and considerations such as forest Reserves, high conservation value forest; and designated scenic by-ways; topographic map of the area with the area of the proposed work marked, and any other basic identifying information that the Bureau finds appropriate.

3. The proposed Timber Harvesting Summaries and Vegetative Management Project proposals will be completed two times a year, on or about July 1 and January 1. Interim proposed timber harvesting summary plans may be posted at any time on an emergency basis. Examples of emergency situations are high mortality due to forest insects and diseases, blowdown, fire, snow and ice damage, rare species habitat needs, and treatment of invasive species infestation.

4. Proposed Timber Harvesting Summaries will be made publicly available by posting on the Bureau of Forestry's web page at http://www.mass.gov/dcr/stewardship/forestry/manage/ProposedForestProductsSales.htm and in hard copy at the DCR Boston office, the Regional Headquarters, and the Park administrative offices (site of proposed harvesting project).

5. The Timber Harvesting Master Summary List, a table listing a summary of all projects under consideration and active projects, will be posted on the Bureau of Forestry web page. The table will include project status, a link to each proposed Timber Harvesting Summary and project silvicultural prescription.

6. All proposed harvest project sites will be posted with a sign that informs the public of a proposed harvesting project and provide Management Forester contact information.

7. Public information meetings will be held twice annually, on or about the third Thursday of January and July at each DCR Regional Headquarters (Amherst, Lowell, Carver, Pittsfield and the Clinton Field Office). Management Foresters will be available from 3pm until 5pm and from 6pm until 8pm to present to the public and answer questions on the newly posted proposed Timber Harvesting Summaries. The public meetings will be announced through a DCR press release, on the DCR website, and through electronic mail to stakeholders.

**III. Internal and External Review:**

1. During the Timber Harvesting Proposal and Summary preparation process, Management Foresters will consult with Regional Directors or their designee, State Forest/Park Supervisors, DCR Bureau of Planning and Resource Protection staff, Recreation staff, other pertinent DCR Operations staff, and MA Division of Fish and Wildlife staff to assess the proposed projects and their effect on the respective state forest, park, or reservation. Management Foresters and staff will identify projects with wetland resource areas, rare or endangered species habitat, certified vernal pools, cultural resources, high public sensitivity, possible conflicts with intensively used areas, special and important public, geological or historic places. Issues of concern will be identified in the Timber Harvesting Summary along with steps for mitigation.

2. Twice a year, on or about July 1 and January 1, the DCR will post the Proposed Timber Harvest Summaries on the Bureau of Forestry web page. The webpage will include a link to the table listing all proposed and active harvesting projects, and Management Forester contact information for the purpose of soliciting public comments.

3. Written public comments will be accepted for 45 days after the posting of the proposed Timber Harvesting Summaries.

4. After review and consideration of all public comments received, the Bureau of Forestry will prepare a written response from DCR, which will be coordinated in consultation with qualified resource specialists, the Regional Director or their designee, Park Supervisor, State Lands Management Program Supervisor and Director of Forest Stewardship. The response will be posted on the Timber Harvest Summary web page.

5. Management Foresters will prepare the silvicultural prescription (Appendix 5) after the DCR prepares and posts responses to written public comments. The silvicultural prescription will account for legitimate concerns raised internally and externally during the comment solicitation

process. All silvicultural prescriptions will be approved by the State Lands Management Forestry Program Supervisor before a project proceeds.

6. The silvicultural prescription will be posted on the DCR Bureau of Forestry web page. The prescription will also be linked from the Timber Harvesting Master Summary List.

7. A site visit will be offered for *all* planned commercial timber sales and home fuelwood harvests. The site visit will provide information to all interested parties describing the purpose of the treatment, silviculture that will be implemented, how the area will change visually, practices to protect wetlands and endangered species, and steps to stabilize disturbed areas.

**IV. Timber Harvesting Project Design:**

1. **Silvicultural Prescription** - After public concerns have been addressed, a detailed Silvicultural Prescription will be prepared adhering to regulations in 304 CMR 11.00 – 11.10 Forest Cutting Practices; the Massachusetts Endangered Species Act; Wetlands Protection Act; Bureau of Forestry policy, direction, and guidelines; and applicable planning documents.

    a. The Management Forester will prepare a comprehensive silvicultural prescription (Appendix 5) based on a stand level inventory or stand examination of the forest stands in the proposed treatment area. The required elements of all prescriptions, regardless of scale, include descriptions of:

        i. Site Data
        ii. Stand Data
        iii. Evaluation of Data, Prescription and Expected Results
        iv. Documentation of Prescription and Data

For full silvicultural prescription requirements see Appendix 5. The Silvicultural Prescription will be made available for public review on the Bureau of Forestry Timber Harvest Summary web page http://www.mass.gov/dcr/stewardship/forestry/manage/ProposedForestProductsSales.htm, during the project site visit, from the project's respective Management Forester and prescription author, or at the Regional or Field Office.

2. **Forest Cutting Plan Preparation:**

    a. The Management Forester will prepare a Forest Cutting Plan (Appendix 6) using data and information gathered for the Harvesting Summary and Silvicultural Prescription. The Forest Cutting Plan will be prepared according to 304 CMR 11.00 – 11.10, Forest Cutting Practices. Qualified specialists such as Archaeologists, Hydrologists, Biologists, Ecologists, and staff from the Natural Heritage and Endangered Species Program will be consulted as needed.

b. Cutting Plans as required will be submitted to the Bureau of Forestry's Service Forestry Program for approval.

c. Cutting Plans as required will be submitted to the local Conservation Commission.

d. Cutting plans will be submitted to municipalities in which the forest cutting will take place.

The Forest Cutting Plan will be made available for public review at the project's respective DCR Regional or Field Office, on the DCR website, or at the respective project location's city or town conservation commission.

**V. Project Implementation:**

Upon completion of the process set forth above, the project will proceed.

# Appendix 4. Land Stewardship Zoning Guidelines

***Final Update: July 2012***

The Department of Conservation & Recreation's Mission:

***To protect, promote and enhance our common wealth of natural, cultural and recreational resources for the well being of all.***

## I. Authorization and Purpose

The Department of Conservation & Recreation (DCR) has a very broad and dynamic mission that encompasses protection of resources, providing the public with access to recreational opportunities, and active forest management. This multi-faceted mission sometimes results in complex management challenges. To help meet its mission, DCR has developed a two tier system for guiding the management of all state forest and park properties[85] under its care:

1) Landscape Designations - applied statewide to assess and guide management activities throughout the DCR state forest and park system; and
2) Land Stewardship Zoning, and the RMP process of which it is a part, addresses the agency's statutory responsibilities in M.G.L. Chapter 21: Section 2F to prepare management plans that: encompass all reservations, forests and parks; provide for the protection and stewardship of natural, cultural, and recreational resources under the agency's management, and ensure consistency between recreation, resource protection and sustainable forest management. Land Stewardship Zoning is applied to DCR state forest and park properties on an individual basis during the Resource Management Planning process, incorporating site specific information to guide management of specific areas within these properties.

These two systems, while applied at different levels – statewide scale vs. site specific scale – work in an integrated fashion to accommodate primary ecosystem services while recognizing and providing site specific resource protection. Table 1 illustrates how these two systems work together.

The DCR is committed to protecting important natural and cultural resources while simultaneously providing for sustainable public access and recreation across all properties. The DCR is also committed to complying with all state and federal regulations and policies and meeting all state health and building codes - responsibilities that are central to the agency's mission and statutory charge.

## II. Landscape Designations

The Forest Futures Visioning Process, an advisory initiative undertaken in 2009 – 2010, recommended the establishment of three landscape designations to differentiate and prioritize ecosystem values at a statewide scale. Acting upon that recommendation, DCR undertook an effort in 2010-2011 to designate all of the properties within the DCR State Parks System as either Reserves, Parklands, or Woodlands, as a means to establish the primary ecosystem services provided by these properties, guide management

[85] These management systems do not apply to DCR's Division of Water Supply Protection properties.

decisions based upon these services, and communicate the agency's landscape scale management objectives to the public.

The designations have been determined via the use of available GIS information drawing upon statewide resource databases, and incorporating extensive input from DCR field staff and the public. These designations are designed to provide a framework for overarching management guidelines that are applicable to properties within the state forest and park system.

The three landscape designations are:

- Parklands focus on providing public recreation opportunities while protecting resources of ecological and cultural significance.
- Woodlands demonstrate exemplary forest management practices for landowners and the general public, while supporting the range of ecosystem services that sustainably-managed forests offer, including a diversity of native species and age classes, and compatible recreation opportunities.
- Reserves provide backcountry recreation experiences and protect the least fragmented forested areas and diverse ecological settings. Successional processes will be monitored to assess and inform long-term forest stewardship.

## III. Resource Management Plans and Land Stewardship Zoning

The Land Stewardship Zoning Guidelines defines three types of zones to ensure resource protection based upon site specific field data, and provides guidance for current and future management based upon resource sensitivities. Inventory and assessment of resources during preparation of a Resource Management Plan (RMP) is factored into land use management and decision making, and provides guidance for stewardship of these resources. The process results in zoning of areas and specific sites within DCR properties based on their sensitivity to recreation and management activities that are appropriate for each facility as recognized during the RMP process. In this way, the Land Stewardship Zoning system helps to "ensure that recreation and management activities do not degrade ecological, cultural, or experiential resources and values."[86]

The three Land Stewardship Zones provide a general continuum to categorize resources (relative to potential degradation from human activities) from undisturbed sites with highly sensitive resources, through stable / hardy resources, to sites that have been developed and consistently used for intensive recreation or park administration purposes.

The Land Stewardship Zoning system also includes Significant Feature Overlays that may be applied to highlight resource features that have been assessed and documented by professional resource specialists. Information on the significant features is brought into the RMP process via review of previous research projects and associated designations. Significant Feature Overlays can be applied in any of the three Land Stewardship Zones. An example is a natural or cultural resource, recognized through professional inventory / research (such as an Area of Critical Environmental Concern or National Historic District), which cuts across more than one Land Stewardship Zone. Management and protection of these resource features is guided by specific management recommendations that have been developed by resource specialists. An expanded description of Significant Feature Overlays is provided at the end of Section VI.

Application of the three-zone system**,** including Significant Feature Overlays, to individual DCR properties during the RMP process is facilitated by gathering available field data related to natural and

[86] *Capacity Reconsidered: Finding Consensus and Clarifying Differences.* Journal of Park and Recreation Administration, Spring 2011, Vol. 29, No. 1, pp. 1-20.

cultural resources, recreational uses, and developed facilities, and reviewing available data sources including BioMap 2 and NHESP Priority habitat information. As a part of this approach:

- lands of special resource sensitivity and significance are identified and mapped, and
- resource and landscape features such as priority habitat areas, wetlands, streams and ponds are mapped,
- new information is brought into the RMP process through public input.

This type of mapping and data collection, based on the best information currently available, provides the basis for subsequent analysis and ultimately the development and application of appropriate management guidelines for specific resources, designed to provide greater protection to valuable natural or cultural assets. This process identifies specific areas for specialized resource management guidance beyond those protections already provided by standard best management practices and legal regulations, such as the agency's Old Growth policy, or Coastal Zone Management's Barrier Beach Management Guidelines. Highly sensitive ecological or cultural assets identified through this process may be found within any of the three Landscape Designations.

## IV. Forest Resource Management Plans

Another key tool in DCR's land management activities are the Forest Resource Management Plans (FRMPs) that have been completed for large geographic areas within the western part of the state. The FRMPs identify silvicultural treatments for properties or portions of properties that have been identified through the Landscape Designation process as being suitable for active forest management. These plans will be amended for consistency with the final Landscape Designations. Information and data collected in the FRMPs related to forested areas is similar to what is gathered for an RMP and will be utilized in the development of RMPs for properties located in these areas. As DCR continues to develop RMPs for its properties, forest management planning will occur as a part of the RMP process. Forest management decisions and activity in designated Woodlands will be directed by the Landscape Designation Management Guidelines which lay out procedures that include the identification of different approaches to appropriate silivicultural treatments to ensure resource protection.

## V. Planning Integration

With the two tier planning approach – a statewide scale and a site specific scale - it is critical to understand how they work together in an integrated fashion to provide overall guidance to resource management and assist with administrative decisions. Landscape Designations will be used to inform the RMP process and the application of LSZ zones. Specific management guidelines associated with each LSZ zone are intended to provide additional protection and stewardship for site-specific natural and cultural resources and to ensure consistency among the activities that are allowed in each property under the broad management guidelines described for each Landscape Designation.

In most cases, the Landscape Designation and the LSZ zoning systems will work in coordination with each other to set high-level land management priorities based on ecosystem services, and to supplement those priorities with site specific resource protection and management guidelines. RMPs identify and assess specific resources and site conditions at a finer scale than the Landscape Designation process. However, the vertical and horizontal integration of these two systems, as exhibited in Table 1, allows us to apply consistency across processes.

**Table 1. Landscape Designation & Land Stewardship Zoning – A Land Management Framework**

| **Landscape Designation Management Guidelines ➔*** <br><br> **Land Stewardship Zones ⬇ **** | **Reserve** – ***The least fragmented forested areas where ecological processes will predominate and inform management, and where commercial timber harvesting is not allowed.*** | **Woodland** – ***Forested areas actively managed for forest health, resource protection, sustainable production of timber, and recreation.*** | **Parkland** – ***Areas providing public recreation opportunities, connections to nature, and protection and appreciation of natural and cultural resources.*** |
|---|---|---|---|
| **Zone 1** – ***Highly sensitive resources requiring special management approaches.*** | Rare species habitat, natural communities, archaeological sites, or fragile cultural sites identified as being sensitive to / easily degraded by human activities. | | |
| **Zone 2** – ***Resources that support recreational and management activities appropriate to the site.*** | Large areas of natural vegetation and associated natural and cultural features, including rare species habitat, that is compatible with dispersed recreation. | Forest stands and associated natural and cultural features, compatible with dispersed recreation **and active forest management** intended to enhance species and age class diversity. | Stable / hardy natural and cultural landscapes, where a variety of outdoor recreation activities can be provided in a sustainable manner. |
| **Zone 3** – ***Intensive use areas such as recreational sites or maintenance areas.*** | **New zone 3s will not be established in Reserves**. <br><br> *Exception* – an RMP may identify existing intensive use areas missed during designation and not already captured in a Parklands designation area, in which case the application of a zone 3 may be considered. | Intensive recreation and park administration areas currently embedded within the forested landscape. | Areas that require regular maintenance by DCR staff, including altered landscapes in active use, intensive recreation areas, and park administration areas. Sites that may accommodate administrative or intensive recreation areas to meet future demands. |

*See *Landscape Designations for DCR Parks & Forests: Selection Criteria and Management Guidelines* for complete management guidelines for Reserves, Parklands and Woodlands.

** For a complete description of management guidelines for each zone, please see Section IV of this document.

## VI. Land Stewardship Zones

Each of the three Land Stewardship Zones have general management guidelines that are intended to provide additional protection for natural and cultural resources and to ensure consistency among resource stewardship, recreation and sustainable forestry. In addition, specific management recommendations derived during the preparation of each individual RMP are designed to ensure that management practices are tailored to the resources within the facility, factor in and assess existing uses, and address site specific management challenges and opportunities.

### *Zone 1*

Management Objective:
*Protection of sensitive resources from management or other human activities that may adversely impact the resources.*

A. General Description

This zone encompasses areas with highly sensitive ecological and cultural resources that require additional management approaches and practices to protect and preserve the special features and values identified in the Resource Management Plan. Zone 1 areas are not suitable for future intensive development.

B. Examples

Examples identified as being highly sensitive to human activities include rare species habitat or natural communities, areas with concentrations of sensitive aquatic habitats, excessively steep slopes with erodible soils, archaeological sites or fragile cultural sites, where stewardship of these resources must be the primary consideration when assessing management and recreational activities in these areas.

C. General Management Guidelines

- **Recreation and Public Access:** In general, recreation activities will be limited to dispersed, low impact, non-motorized recreation and dependent on assessment of specific resource sensitivity and stewardship considerations by resource specialists - e.g. NHESP, MHC, DCR Bureau of Planning and Resource Protection - in conjunction with field staff. Snowmobiles may be permitted on existing designated trails during the appropriate time of year and according to DCR policies and regulations. Existing trails will be evaluated for compatibility with resource protection goals. Trails will be discontinued if discontinuance furthers sensitive resource protection and does not compromise public safety. Proposals for new activities will be strictly evaluated, and management guidelines will be applied by resource specialists for the protection of resources and to address specific issues.

- **Vegetation Management:** Commercial timber harvesting is not permitted. Vegetation management may occur for public safety purposes, removal of invasives, stewardship of cultural sites, or historic vista maintenance.

- **Water and Soil:** Management will focus on erosion control to protect sensitive natural and cultural resources.

- **Habitat Protection:** Public access will be guided away from sensitive rare species habitat and sensitive Priority Natural Communities. Long-term protection strategies will be developed in

consultation with the NHESP; Habitat Management Plans will be prepared in advance of proposed management activities.

- **Forest Health and Protection:** Spread of invasive species, forest pathogens and wildlfires may be controlled if a threat to sensitive natural or cultural resources is identified.

- **Cultural Resources:** Public access will be guided away from archaeological or historic sites sensitive to human activity and reoriented to areas that can sustain appropriate recreational activities. Management activities will focus on protection of sensitive archaeological and historic sites. Use of metal detectors, artifact collecting and digging is prohibited.

- **Facilities and Transportation:** Existing roads may be maintained to assure continued administrative and/or emergency access according to either the DCR Historic Parkways Preservation Treatment Guidelines or guidelines associated with DCR Forest Road Classification System. Roads identified as unnecessary for administrative and/or emergency access will be evaluated for compatibility with resources, and discontinued if discontinuance furthers sensitive resource protection and only after consultation with local emergency services personnel.

- **Interpretation, Public Information and Outreach:** Interpretation and public information related to the sensitive natural and cultural resources may be provided through programs, kiosks and other outreach venues that will avoid impacts to the actual resources.

- **Monitoring, Enforcement and Research:** Professional research projects in support of sensitive natural and cultural resource protection may be permitted with approval of the Director of State Parks & Recreation and the Director of Forest Stewardship. Baseline conditions will be evaluated and monitoring will be conducted to document changes, dependent on capabilities and availability of operational resources for staff and outside experts.

- **Special Use:** In general, Special Uses other than research projects described above will not be permitted.

### *Zone 2*

Management Objective
*Provide for a balance between the stewardship of natural and cultural resources and recreational opportunities which can be appropriately sustained.*

A. General Description

This zone encompasses stable yet important natural and cultural resources. Zone 2 is a very important component to DCR's management responsibilities, because the protected landscape within this zone provides a buffer for sensitive resources, recharge for surface and groundwater, and large areas where existing types of public recreation activities can be managed at sustainable levels.

B. Examples

Examples include areas of non-intensive use that contain diverse ecosystems, rare species habitat that is compatible with dispersed recreation and sustainable management practices, and cultural resources that are not highly sensitive to human activities.

C. General Management Guidelines

- **Recreation and Public Access:** Resources will be managed to support a variety of safe, sustainable recreation opportunities that are compatible with the long-term stewardship and character of natural and cultural resources. New public access may be allowed depending upon existing area trail densities, purpose and need, physical suitability of the site, and specific guidelines for protection of rare species habitat and archaeological resources, as reflected in DCR's *Trails Guidelines and Best Practices Manual*.

- **Vegetation Management:** Vegetation may be managed for public safety purposes, stewardship of cultural sites, vista maintenance, maintaining native biodiversity, protection of recreational assets and ecological management and restoration, provided that the management activities are consistent with the applicable Landscape Designation for the property. Commercial timber harvesting will be limited to properties designated as Woodlands.

- **Water and Soil:** Prevent soil erosion via BMPs for management and recreational activities. Maintain water quality of surface and groundwater resources with pollution prevention and holistic watershed management strategies.

- **Habitat Protection:** Maintain and where possible enhance habitat for rare species, Priority Natural Communities, and ecological diversity. Management activities in NHESP designated Priority Habitat areas must follow guidelines of an approved Habitat Management Plan.

- **Forest Health and Protection:** Potential for wildfires may be lessened through fire prevention strategies. Spread of wildfires will be controlled for public safety purposes. Forest stands may be managed to lessen adverse effects of forest pathogens. Invasive species that are degrading native ecosystems may be controlled depending on availability of operational resources and trained volunteers.

- **Cultural Resources:** Management will ensure long-term stewardship of archaeological and historic sites. Newly discovered sites will be documented and inventoried in consultation with MHC. All proposed projects must be reviewed by the DCR Bureau of Planning and Resource Protection Office of Cultural Resources during their planning stages to determine potential impacts to cultural resources. Use of metal detectors, artifact collecting and digging is prohibited.

- **Facilities and Transportation:** In Parklands and Woodlands, new roads necessary for recreation, administration or emergency use may be constructed if consistent with resource management goals, after review for impacts to natural and cultural resources. Existing roads that are not required for administrative or public safety purposes may be closed and restored to a natural condition after consultation with local emergency services personnel. Roads will be maintained according to either the DCR Historic Parkways Preservation Treatment Guidelines or guidelines associated with DCR Forest Road Classification System.

- **Interpretation, Public Information and Outreach:** Interpretation will be focused on enhancing the variety of environmental education opportunities, and on building public support for the long-term stewardship of natural and cultural resources.

- **Monitoring, Enforcement and Research:** Monitoring and research projects may be conducted as approved through the Special Use Permit process. Enforcement of prohibited or regulated activities is critical related to public safety, enjoyment of appropriate recreation activities and long-term stewardship of natural and cultural resources.

- **Special Use:** Special uses may be allowed, and will be evaluated on an individual basis as provided in DCR's Special Use Policies and Procedures.

### *Zone 3*

Management Objective

*Provide public access to safe and accessible recreational opportunities, as well as administrative and maintenance facilities that meet the needs of DCR visitors and staff.*

A. General Description

This zone includes altered landscapes in active use, and areas suitable for future administrative, maintenance and recreation areas. The resources in this zone can accommodate concentrated use and require regular maintenance by DCR staff.

B. Examples

Examples of areas of concentrated use include park headquarters and maintenance areas, parking lots, swimming pools and skating rinks, paved bikeways, swimming beaches, campgrounds, playgrounds and athletic fields, parkways, golf courses, picnic areas and pavilions, and concessions. Examples of future use areas include disturbed sites with no significant ecological or cultural values and not suitable for restoration, identified through the RMP or in a Master Plan as being suitable for intensive recreation or park administration sites. Note: Development would be preceded by detailed site assessments to ensure protection of natural and cultural resources.

C. General Management Guidelines

- **Recreation and Public Access:** Intensive recreation areas will be managed to maintain public health and safety. Agency policies, resource protection and recreational goals will determine activities that are supported in individual properties.

- **Vegetation Management:** Commercial timber harvesting is not permitted. Native species will be used for landscaping. Trees and other vegetation may be removed or trimmed for public safety, vegetative health, protection of cultural resources, and aesthetic purposes.

- **Water and Soil:** Management will focus on maintaining water quality for water-based recreation, including implementation of strategies to prevent erosion ans siltation and remediation of pollution sources. Employ Best Management Practices to capture, treat and recharge storm water run-off.

- **Habitat Protection:** Management will focus on identifying, documenting and protecting rare species habitat, in consultation with the NHESP.

- **Forest Health and Protection:** Spread of forest pathogens and invasive species may be controlled if there is a threat to native ecosystems that surround the intensive recreation or park administration sites.

- **Cultural Resources:** Historic sites that are the focus of intensive public visitation will be managed to minimize degradation of the historic resource. Proposed projects must be reviewed by the DCR Bureau of Planning and Resource Protection's Office of Cultural Resources during the planning

stages for potential impacts to historic and archaeological resources. Historic buildings, structures, objects, sites and landscapes will be preserved in original use or adaptively reused when appropriate for park uses or in compatible use, such as through the Historic Curatorship Program. Use of metal detectors, artifact collecting and digging is prohibited.

- **Facilities and Transportation:** Continue efficient use of existing facilities or employ appropriate reuse of existing facilities to minimize new impacts. Roads will be maintained according to either the DCR Historic Parkways Preservation Treatment Guidelines or guidelines associated with DCR Forest Road Classification System. New roads and facilities may be established as necessary for public and administrative use after review for potential impacts to natural and cultural resources. Adaptive reuse of historic resources for park or other appropriate uses is encouraged.

- **Interpretation, Public Information and Outreach:** Interpretive programs may be provided in association with intensive recreation sites or activities. Programs will be aimed at building public support for the long-term stewardship of natural and cultural resources.

- **Monitoring, Enforcement and Research:** Monitoring will focus on water quality related to water-based recreation activities. Enforcement of prohibited and regulated activities will be conducted to provide for public safety and enjoyment of appropriate recreation activities.

- **Special Use:** Special uses may be allowed, and will be evaluated on an individual basis as provided in DCR's Special Use Policies and Procedures.

### *Significant Feature Overlays*

Management Objective
*The purpose of the overlays is to provide precise management guidance in order to maintain or preserve the recognized resource features regardless of the zone in which they occur.*

A. General Description

The three land stewardship zones may be supplemented with significant feature overlays that identify formally designated or recognized resources. These resource features have been recognized through research and assessment by professional resource specialists. Information on the significant features is brought into the RMP process via review of previous research projects and associated designations.

B. Examples

A natural or cultural resource, recognized through professional inventory / research, which cuts across more than one land stewardship zone, such as:

- National Register Historic District
- Areas subject to public drinking water regulations
- Priority habitat for species that are not sensitive to human activities
- Biomap2 Core Habitat
- Designated Areas of Critical Environmental Concern

A natural or cultural resource, recognized through professional inventory / research, which is located in an area characterized by intensive visitor use. In these cases, the Significant Feature Overlay is

used to highlight the potential conflict between resource stewardship and ongoing visitor use, and provide mitigation strategies. Examples include:

- A NHESP Priority Natural Community associated with a summit that is also a popular destination for hikers.
- A barrier beach that provides habitat for rare shorebirds, and is subject to CZM barrier beach management guidelines and coastal wetlands regulations, but also supports thousands of visitors during the summer season.
- A significant cultural site such as Plymouth Rock that is subject to ongoing, intensive visitation.

C. Management Guidelines

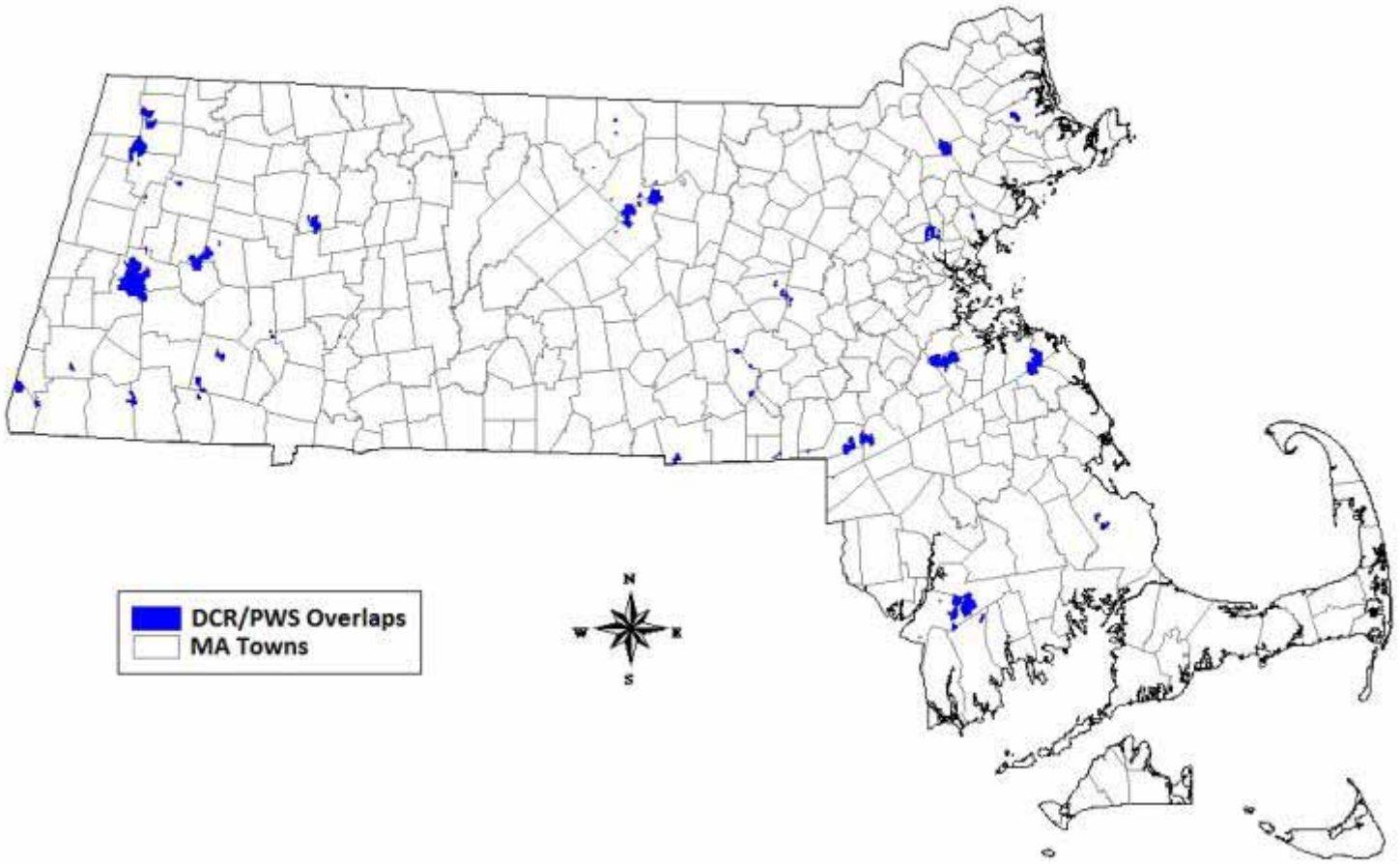
Specific management guidelines are provided by resource specialists and/or by the professional staff of the agency or NGO that assessed the significant resource feature or has a regulatory role for protection of the resource. Examples include MHC requirements for treatment of historic resources within National Register Historic Districts, and NHESP guidelines for Priority Natural Community habitat stewardship.

# Appendix 5. DCR Properties on Public Water Supply Watersheds

Some DCR properties lie within the watershed areas for surface water supplies of public water supply reservoirs, and thus may require special management attention to minimize adverse impacts on water quality. Designation of these watershed lands as Woodlands would provide for maximum management flexibility. However, for various reasons, some of these lands were designated as Reserves or Parklands. In such cases, the Management Guidelines (see the **Water and Soil Resources Guidelines** in Sections 2.6 and 3.4) allow for appropriate management activities to be undertaken on those lands in accordance with the Landscape Designation Management Guidelines, after consultation with FRSAC (if a Reserve), and the public water supplier and/or DEP, to address water quality protection issues (e.g., due to wildfires, insect or disease outbreaks, or other unanticipated threats to water quality). The Public Outreach and Consultation for Forest Cutting Plans Policy would also apply.

The following map and table show locations of these surface water supply watershed lands, and identify the DCR facility, the name of the Public Water Supplier, and the Landscape Designations for those properties.

## DCR Lands on Public Water Supply Watersheds



## DCR Facilities on public water supply (PWS) watersheds with Landscape Designations

| DCR Facility Name | Town(s) | Designation* | PWS Name | Type of PWS** |
|---|---|---|---|---|
| ACUSHNET CEDAR SWAMP STATE RESERVATION | DARTMOUTH | R | FALL RIVER WATER DEPARTMENT | ESW |
| ALEWIFE BROOK PARKWAY | CAMBRIDGE | P | CAMBRIDGE WATER DEPARTMENT | SW |
| ANGLE TREE MONUMENT RESERVATION | PLAINVILLE; N. ATTLEBOROUGH | P | ATTLEBORO WATER DEPT | SW |
| APPALACHIAN TRAIL CORRIDOR | WASHINGTON; HINSDALE | P | PITTSFIELD DPU WATER DEPT | SW |
| APPALACHIAN TRAIL CORRIDOR 3 | DALTON | R | DALTON FIRE DISTRICT | ESW |
| ASHBURNHAM STATE FOREST | ASHBURNHAM | W | ASH/WIN JOINT WATER AUTHORITY | SW |
| ATTITASH PUBLIC ACCESS | MERRIMAC | P | AMESBURY DWP WATER DIV. | SW |
| BAY CIRCUIT TRAIL | ROWLEY | P | IPSWICH DPU WATER DEPT | SW |
| BIKE TRAIL: FRESH POND SIDEPATH | CAMBRIDGE | P | CAMBRIDGE WATER DEPARTMENT | SW |
| BIKE TRAIL: S. NEW ENGLAND TRUNKLINE | BELLINGHAM; BLACKSTONE | P | RHODE ISLAND SOURCE | RI |
| BLUE HILLS RESERVATION | MILTON; RANDOLPH; QUINCY; CANTON; BRAINTREE | P | BRAINTREE WATER & SEWER DEPT. | SW |
| BLUE HILLS RESERVATION | RANDOLPH | P | TRI TOWN WATER BOARD | SW |
| BLUE HILLS RESERVATION | RANDOLPH | P | RANDOLPH/HOLBROOK WATER BOARD | SW |
| BOAT RAMP | HOPKINTON | P | RHODE ISLAND SOURCE | RI |
| C.M. GARDNER STATE PARK | HUNTINGTON | P | SPRINGFIELD WATER & SEWER COMMISSION | ESW |
| CALLAHAN STATE PARK | MARLBOROUGH; FRAMINGHAM; SOUTHBOROUGH | P | MWRA | ESW |
| CHESTER-BLANDFORD STATE FOREST | BLANDFORD | W | SPRINGFIELD WATER & SEWER COMMISSION | SW |
| CONWAY STATE FOREST | CONWAY | W | SOUTH DEERFIELD WATER SUPPLY DIST | SW |
| CONWAY STATE FOREST | CONWAY | W | NORTHAMPTON WATER DEPT | SW |
| CONWAY STATE FOREST | CONWAY; WILLIAMSBURG | W | NORTHAMPTON WATER DEPT | SW |

| | | | | |
|---|---|---|---|---|
| DOUGLAS STATE FOREST | DOUGLAS | R, (P) | RHODE ISLAND SOURCE | RI |
| EAST MOUNTAIN STATE FOREST | GREAT BARRINGTON | R | GREAT BARRINGTON FIRE DIST | ESW |
| F. GILBERT HILLS STATE FOREST | FOXBOROUGH; WRENTHAM | W | ATTLEBORO WATER DEPT | SW |
| FLYNN RINK | MEDFORD | P | MWRA | ESW |
| FRANKLIN STATE FOREST | WRENTHAM | P | RHODE ISLAND SOURCE | RI |
| FREETOWN-FALL RIVER STATE FOREST | FREETOWN; FALL RIVER | W, (P) | FALL RIVER WATER DEPARTMENT | SW, ESW |
| FREETOWN-FALL RIVER STATE FOREST | FREETOWN | W | TAUNTON WATER DEPARTMENT | SW |
| FREETOWN-FALL RIVER STATE FOREST | FREETOWN | W | NEW BEDFORD DEPT. OF PUB. INFRASTRUCTURE | SW |
| FRESH POND PARKWAY | CAMBRIDGE | P | CAMBRIDGE WATER DEPARTMENT | SW |
| GARDNER VETERANS SKATING RINK | GARDNER | P | GARDNER WATER DEPARTMENT | SW |
| HAROLD PARKER STATE FOREST | N. ANDOVER; ANDOVER; MIDDLETON; N. READING | W, (P) | DANVERS WATER DEPT. | SW |
| HUNTINGTON STATE FOREST | HUNTINGTON | W | HOLYOKE WATER WORKS | SW |
| LEOMINSTER STATE FOREST | WESTMINSTER; PRINCETON | W | FITCHBURG DPW, DIV. OF WATER SUPPLY | ESW |
| LEOMINSTER STATE FOREST | LEOMINSTER | W | LEOMINSTER WATER DIVISION | SW |
| LEOMINSTER STATE FOREST | LEOMINSTER; WESTMINSTER; PRINCETON; FITCHBURG | W | LEOMINSTER WATER DIVISION | SW |
| LEYDEN STATE FOREST | LEYDEN | W | GREENFIELD WATER DEPARTMENT | SW |
| LYNN WOODS RESERVATION | LYNN; SAUGUS | P | LYNN WATER & SEWER COMM | SW |
| MARLBOROUGH-SUDBURY STATE FOREST | STOW; HUDSON | W, (P) | MAYNARD DPW, WATER DIVISION | ESW |
| MARLBOROUGH-SUDBURY STATE FOREST | MARLBOROUGH | W | MWRA | ESW |
| MAUDSLAY STATE PARK | NEWBURYPORT | P | NEWBURYPORT WATER DEPARTMENT | SW |
| MIDDLESEX FELLS RESERVATION | STONEHAM; WINCHESTER; MEDFORD | P | WINCHESTER WATER DEPT | SW |
| MIDDLESEX FELLS RESERVATION | STONEHAM; MEDFORD | P | MWRA | ESW |
| MONTAGUE STATE FOREST | MONTAGUE | W | TURNERS FALLS WATER DEPT | ESW |
| MOUNT EVERETT STATE RESERVATION | SHEFFIELD; MOUNT WASHINGTON | R, (P) | BERKSHIRE SCHOOL | ESW |

| | | | | |
|---|---|---|---|---|
| MOUNT GREYLOCK STATE RESERVATION | WILLIAMSTOWN; N. ADAMS | R | WILLIAMSTOWN WATER DEPT | ESW |
| MOUNT GREYLOCK STATE RESERVATION | ADAMS; CHESHIRE; NEW ASHFORD | R | ADAMS FIRE DISTRICT | ESW |
| MOUNT GREYLOCK STATE RESERVATION | NEW ASHFORD; CHESHIRE | R, (P) | CHESHIRE WATER DEPT | ESW |
| MOUNT GREYLOCK STATE RESERVATION | NORTH ADAMS; ADAMS; WILLIAMSTOWN | R, (P) | NORTH ADAMS WATER DEPT | SW |
| MOUNT TOM STATE RESERVATION | HOLYOKE; EASTHAMPTON | P | HOLYOKE WATER WORKS | ESW |
| MOUNT WASHINGTON STATE FOREST | MOUNT WASHINGTON | W, (R) | EGREMONT WATER DEPT | SW |
| MYLES STANDISH STATE FOREST | PLYMOUTH | R | PLYMOUTH WATER DEPARTMENT | ESW |
| OCTOBER MOUNTAIN STATE FOREST | WASHINGTON | W, (R) | PITTSFIELD DPU WATER DEPT | SW |
| OCTOBER MOUNTAIN STATE FOREST | WASHINGTON; LEE; BECKET | W, (R), (P) | LEE WATER DEPT | SW, ESW |
| OCTOBER MOUNTAIN STATE FOREST | WASHINGTON | W | PITTSFIELD DPU WATER DEPT | SW |
| ORANGE STATE FOREST | ORANGE | R | ORANGE WATER DEPT | ESW |
| PERU STATE FOREST | PERU; WORTHINGTON; MIDDLEFIELD | W | SPRINGFIELD WATER & SEWER COMMISSION | SW, ESW |
| PINE SWAMP | IPSWICH | P | IPSWICH DPU WATER DEPT | SW |
| SANDISFIELD STATE FOREST | SANDISFIELD; NEW MARLBOROUGH; MONTEREY | W | MONTEREY WATER COMPANY | ESW |
| SE MASS BIORESERVE | FREETOWN; FALL RIVER; DARTMOUTH | W | FALL RIVER WATER DEPARTMENT | SW, ESW |
| SE MASS BIORESERVE | FREETOWN; FALL RIVER | W | NEW BEDFORD DEPT. OF PUB. INFRASTRUCTURE | SW |
| SOUTH NEW ENGLAND TRUNKLINE TRAIL | BELLINGHAM | P | RHODE ISLAND SOURCE | RI |
| SOUTH WATUPPA BOAT RAMP | FALL RIVER | P | FALL RIVER WATER DEPARTMENT | ESW |
| STONE ZOO | STONEHAM | P | MWRA | ESW |
| TOLLAND STATE FOREST | TOLLAND; BLANDFORD | R | SPRINGFIELD WATER & SEWER COMMISSION | SW |
| TYLER FLOOD CONTROL SITE | MARLBOROUGH | P | MARLBOROUGH DPW WATER DIV. | SW |
| UPTON STATE FOREST | UPTON; WESTBOROUGH | W | WESTBOROUGH WATER DEPARTMENT | SW |

| | | | | |
|---|---|---|---|---|
| UPTON STATE FOREST | UPTON; HOPEDALE; HOPKINTON | W | RHODE ISLAND SOURCE | RI |
| WACHUSETT MOUNTAIN STATE RESERVATION | WESTMINSTER; PRINCETON | P | FITCHBURG DPW, DIV. OF WATER SUPPLY | SW, ESW |
| WACHUSETT MOUNTAIN STATE RESERVATION | PRINCETON | P | WORCESTER DPW, WATER SUPPLY DIVISION | SW |
| WESTMINSTER STATE FOREST | WESTMINSTER | W | FITCHBURG DPW, DIV. OF WATER SUPPLY | SW |
| WILLOWDALE STATE FOREST | IPSWICH | R | IPSWICH DPU WATER DEPT | SW |
| WINDSOR STATE FOREST | WINDSOR | W | PITTSFIELD DPU WATER DEPT | SW |
| WOMPATUCK STATE PARK | HINGHAM; COHASSET; SCITUATE; NORWELL | P | COHASSET WATER DEPT | SW |
| WOMPATUCK STATE PARK | HINGHAM; NORWELL | P | HINGHAM/HULL AQUARION WATER CO | SW |
| WORTHINGTON STATE FOREST | WORTHINGTON | W | SPRINGFIELD WATER & SEWER COMMISSION | SW, ESW |
| WRENTHAM STATE FOREST | PLAINVILLE; WRENTHAM | P | ATTLEBORO WATER DEPT | SW |

*** Designations**: R=Reserves; P=Parklands; W=Woodlands
*Note: For Facilities with more than one entry in the Designation column, the first entry signifies the primary Designation; entries in parentheses indicate Designations covering lesser acreages.*

**** Type of PWS**: SW=active surface water supply; ESW = emergency supply; RI = Rhode Island PWS

## Appendix 6. Division of Fisheries & Wildlife Comment Letter on Draft Landscape Designations and Management Guidelines

Commonwealth of Massachusetts

# Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

Commissioner Edward M. Lambert Jr.
Department of Conservation and Recreation
251 Causeway Street
Boston, MA 02114

**RE: DFW public comment on DCR's Proposed Landscape Designation**
Submitted to: designation.comments@state.ma.us

Dear Commissioner Lambert:

The Department of Fish and Game (DFG) and the Division of Fisheries and Wildlife (DFW) appreciate the opportunity to provide comments on the Department of Conservation and Recreation's (DCR) proposed Landscape Designations and Management Guidelines for state forests and parks. DFW recognizes that these documents are the result of significant efforts on the part of DCR.

DFW was pleased that Technical Steering Committee (of the Forest Futures Visioning Process) recommended that DCR, in consultation with DFW, "establish a formal ongoing planning and adaptive management process for addressing habitat needs" and that "DCR coordinate closely with DFW to identify opportunities for integrating the early successional habitat creation into management of lands identified for forestry demonstrations."

DFW also appreciates the efforts by DCR and EOEEA staff to consult with DFW on the proposed landscape designations and that DCR's proposed Management Guidelines require consultation with DFW to identify and manage areas for early-successional habitat on DCR lands for Species of Greatest Conservation Need (SGCN) as identified in DFW's Comprehensive Wildlife Conservation Strategies Plan (i.e. State Wildlife Action Plan).

Consultation and discussions between DCR and DFW were productive and provided an opportunity for both agencies to understand their particular goals and priorities. DFW appreciates the discussions held between DCR and DFW over the course of the public comment period and the time extension granted for submitting our comments, which has allowed for more collaboration between the two agencies. The discussions were focused primarily on:

1) The Fisheries and Wildlife Board's review and approval of DCR's Landscape Designations of co-owned properties as well as consistency of DCR's Landscape Designations with pre-existing



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Resource Management Plans (RMPs) and Memorandums of Understanding (MOUs) between DCR and DFW governing management of these properties,

2) Ensuring that DCR's proposed Management Guidelines allow for habitat management for sustaining biological diversity, specifically SGCN and the Massachusetts Endangered Species Act (MESA) species list. It should be noted that MESA listed species (except for state-listed plants) are included as SGCN species.

3) Integrating DFW and DCR goals to allow for habitat management on DCR lands to sustain biodiversity, including habitat management for SGCN and MESA listed species.
Based on the outcome of these discussions, DFW recommends that DCR consider the following in the final Landscape Designations and Management Guidelines for DCR Parks and Forests:

1) <u>Co-owned properties:</u>

- Recognize in the final management guidelines and landscape designations document that DCR will follow existing DCR Resource Management Plans and associated MOUs between DCR and DFW for the following co-owned properties which total 5,306 acres:

  **Jug End State Reservation and WMA** (1,171 ac.) - Proposed WOODLAND
  **Hawes Parcel within the SE Mass Bioreserve** (3,378 ac.) – Proposed WOODLAND
  **Quashnet Woods State Reservation** (395 ac.) – Proposed WOODLAND
  **Mount Watatic Reservation** (277 ac.) – Proposed WOODLAND

The existing RMPs and MOUs are consistent with established goals, policies, and practices for management on state Wildlife Management Areas and already reviewed and approved by the Fisheries and Wildlife Board, including allowing flexibility in the size of openings created by habitat management.

2) <u>DCR Management Guidelines</u>

- In cooperation with DFW, DCR should incorporate language into the DCR Management Guidelines which allow for flexibility in the size of openings created by habitat management to benefit SGCN and MESA state-listed species where appropriate on co-owned properties consistent with existing RMPs and MOUs.

DFW has serious concerns relating to DCR's proposed limit on forest openings of 1/3 to 5 acres within Guidelines for Silviculture for the Woodlands designation. Given that openings greater than 5 acres are necessary or enhance habitat conditions for SGCN species, particularly those which rely on young forest and shrublands, pitch pine scrub oak systems, and grasslands, DFW notes with concern that this type of habitat management (where it involves logging) would not be allowed under the current DCR policy. DFW encourages DCR to reconsider this policy in the future and would actively support efforts to enhance habitat with larger openings, at carefully selected locations.

In the short term, DFW requests that DCR amend the Management Guidelines to allow for openings larger than 5 acres on the above-listed DCR/DFW co-managed properties. DFW would like to pursue some significant near-term habitat management projects on these properties that

are supported by federal funding, and would do so in close coordination with DCR, which would include a public process led by DFW.

Specific SGCN species, some of which are also MESA state-listed species, are listed for each of these three habitats below:

**Species of Greatest Conservation Need in Young Forests and Shrublands**

| State Listing Status | Taxon Grouping | Scientific Name | Common Name | State Status |
|---|---|---|---|---|
| **State-listed** | Reptiles | *Elaphe obsoleta* | Eastern Ratsnake | E |
| | Birds | *Vermivora chrysoptera* | Golden-Winged Warbler | E |
| | | *Oporornis philadelphia* | Mourning Warbler | SC |
| | Mammals | *Synaptomys cooperi* | Southern Bog Lemming | SC |
| **Not Listed** | Reptiles | *Coluber constrictor* | Black Racer | -- |
| | | *Heterodon platirhinos* | Eastern Hognose Snake | -- |
| | Birds | *Bonasa umbellus* | Ruffed Grouse | -- |
| | | *Buteo platypterus* | Broad-Winged Hawk | -- |
| | | *Caprimulgus vociferus* | Whip-poor-will | -- |
| | | *Colinus virginianus* | Northern Bobwhite | -- |
| | | *Dendroica discolor* | Prairie Warbler | -- |
| | | *Empidonax traillii* | Willow Flycatcher | -- |
| | | *Falco sparverius* | American Kestrel | -- |
| | | *Pipilo erythrophthalmus* | Eastern Towhee | -- |
| | | *Scolopax minor* | American Woodcock | -- |
| | | *Spizella pusilla* | Field Sparrow | -- |
| | | *Toxostoma rufum* | Brown Thrasher | -- |
| | | *Vermivora pinus* | Blue-winged Warbler | -- |
| | | *Zonotrichia albicollis* | White-throated Sparrow | -- |
| | Mammals | *Sylvilagus transitionalis* | New England Cottontail | -- |
| | Lepidoptera | *Hadena ectypa* | A Noctuid Moth | -- |

**Species of Greatest Conservation Need in Pitch Pine/ Scrub Oak Systems**

| State Listing Status | Taxon Grouping | Scientific Name | Common Name | State Status |
|---|---|---|---|---|
| **State-listed** | Reptiles | *Terrapene carolina* | Eastern Box Turtle | SC |
| | Birds | *Circus cyaneus* | Northern Harrier | T |
| | | *Asio otus* | Long-eared Owl | SC |
| | | *Pooecetes gramineus* | Vesper Sparrow | T |
| | Beetles | *Cicindela patruela* | Barrens Tiger Beetle | E |
| | | *Nicrophorus americanus* | American Burying Beetle | E |
| | Lepidoptera | *Abagrotis nefascia* | Coastal Heathland Cutworm | SC |
| | | *Acronicta albarufa* | Barrens Daggermoth | T |
| | | *Anisota stigma* | Spiny Oakworm | SC |
| | | *Apodrepanulatrix liberaria* | New Jersey Tea Inchworm | E |
| | | *Callophrys irus* | Frosted Elfin | SC |
| | | *Catocala herodias gerhardi* | Gerhard's Underwing | SC |
| | | *Chaetaglaea cerata* | Waxed Sallow Moth | SC |
| | | *Cicinnus melsheimeri* | Melsheimer's Sack Bearer | T |
| | | *Cingilia catenaria* | Chain Dot Geometer | SC |
| | | *Digrammia eremiata* | Three-lined Angle Moth | T |

| State Listing Status | Taxon Grouping | Scientific Name | Common Name | State Status |
|---|---|---|---|---|
| | | *Eacles imperialis* | Imperial Moth | T |
| | | *Erynnis persius persius* | Persius Duskywing | E |
| | | *Euchlaena madusaria* | Sandplain Euchlaena | SC |
| | | *Hemaris gracilis* | Slender Clearwing Sphinx Moth | SC |
| | | *Hemileuca maia* | Barrens Buckmoth | SC |
| | | *Hypomecis buchholzaria* | Buchholz's Gray | E |
| | | *Itame sp. 1* | Pine Barrens Itame | SC |
| | | *Lycia rachelae* | Twilight Moth | E |
| | | *Lycia ypsilon* | Pine Barrens Lycia | T |
| | | *Metarranthis apiciaria* | Barrens Metarranthis | E |
| | | *Psectraglaea carnosa* | Pink Sallow Moth | SC |
| | | *Ptichodis bistrigata* | Southern Ptichodis | T |
| | | *Stenoporpia polygrammaria* | Faded Gray Geometer | T |
| | | *Zale sp. 1* | Pine Barrens Zale | SC |
| | | *Zanclognatha martha* | Pine Barrens Zanclognatha | T |
| **Not Listed** | Reptiles | *Coluber constrictor* | Black Racer | -- |
| | | *Heterodon platirhinos* | Eastern Hognose Snake | -- |
| | Birds | *Caprimulgus vociferus* | Whip-poor-will | -- |
| | | *Colinus virginianus* | Northern Bobwhite | -- |
| | | *Dendroica discolor* | Prairie Warbler | -- |
| | | *Pipilo erythrophthalmus* | Eastern Towhee | -- |
| | | *Toxostoma rufum* | Brown Thrasher | -- |
| | Lepidoptera | *Schizura apicalis* | Plain Schizura | -- |
| | | *Zale curema* | No common name | -- |

**Species of Greatest Conservation Need in Grasslands**

| State Listing Status | Taxon Grouping | Scientific Name | Common Name | State Status |
|---|---|---|---|---|
| **State-listed** | Birds | *Circus cyaneus* | Northern Harrier | T |
| | | *Bartramia longicauda* | Upland Sandpiper | E |
| | | *Tyto alba* | Barn Owl | SC |
| | | *Asio flammeus* | Short-Eared Owl | E |
| | | *Pooecetes gramineus* | Vesper Sparrow | T |
| | | *Ammodramus savannarum* | Grasshopper Sparrow | T |
| | | *Ammodramus henslowii* | Henslow's Sparrow | E |
| | Mammals | *Synaptomys cooperi* | Southern Bog Lemming | SC |
| | Beetles | *Cicindela purpurea* | Purple Tiger Beetle | SC |
| | | *Nicrophorus americanus* | American Burying Beetle | E |
| | Lepidoptera | *Abagrotis nefascia* | Coastal Heathland Cutworm | SC |
| | | *Callophrys irus* | Frosted Elfin | SC |
| | | *Cycnia inopinatus* | Unexpected Cycnia | T |
| | | *Digrammia eremiata* | Three-lined Angle Moth | T |
| | | *Erynnis persius persius* | Persius Duskywing | E |
| | | *Euchlaena madusaria* | Sandplain Euchlaena | SC |
| | | *Faronta rubripennis* | The Pink Streak | T |
| | | *Grammia phyllira* | Phyllira Tiger Moth | E |

| State Listing Status | Taxon Grouping | Scientific Name | Common Name | State Status |
|---|---|---|---|---|
| | | *Ptichodis bistrigata* | Southern Ptichodis | T |
| **Not Listed** | Reptiles | *Heterodon platirhinos* | Eastern Hognose Snake | -- |
| | Birds | *Colinus virginianus* | Northern Bobwhite | -- |
| | | *Falco sparverius* | American Kestrel | -- |
| | | *Scolopax minor* | American Woodcock | -- |
| | | *Sturnella magna* | Eastern Meadowlark | -- |

DFW also points out that some MESA state-listed plant species can benefit from disturbances created by habitat management. DFW is encouraged that within DCR's proposed Management Guidelines, there is specific language contained under a sub-section on Habitat Protection Guidelines which provides an opportunity for managing the habitat associated with these species, but recommends that DCR work with DFW to ensure that these Guidelines do not unnecessarily restrict habitat management.

3) **Integrate DFW and DCR Habitat Management on DCR Lands**

- DFW recommends that DCR consider jointly planning habitat management projects in the future which benefit SGCN and state-listed species on DCR properties which are not necessarily co-owned, but which are of significant value and importance to the conservation of those species and habitats.

There is a significant opportunity for DFW and DCR to jointly integrate habitat management projects towards sustaining biodiversity on state lands in the future. DCR's proposed Management Guidelines already recognize this opportunity. By combining expertise, resources, DFW and DCR can make strides in meeting both agencies' missions. DFW received broad public support without opposition for its habitat management goals and practices to sustain biodiversity on state Wildlife Management Areas during a 2010 public review. During the review, DFW received public comment that integration and coordination among DCR and DFW should occur relative to habitat management.

In summary, public lands in general offer the best opportunities for long-term management and conservation of biodiversity in the Commonwealth given the constraints and change in ownership and landowner goals. DFW notes that the Forest Futures Visioning Recommendations recognize this and recommend that DFW and DCR work together to develop habitat management plans that balance the two agencies' missions. Toward this end, DFW looks forward to future opportunities for integration of habitat management with DCR and appreciates DCR's consideration of these recommendations on the proposed Landscape Designations and Management Guidelines.

Sincerely,

Wayne F. MacCallum

Wayne F. MacCallum

Cc: Commissioner Mary Griffin
Fisheries and Wildlife Board

## Appendix 7. Key Changes to Management Guidelines from Draft to Final

What follows is a summary of the major changes made to the Landscape Designation management guidelines from the draft to this final version. These changes have been made to reflect input provided during the seven public workshops held in the Spring of 2011, written comments received and additional DCR staff input.

***Foreword***

- The DCR Commissioner has provided a foreword to the final version of the Guidelines

***Section 1***

- Reaffirmation made that public access will continue within all three designations.
- A summary of the external and internal review of the draft designations and guidelines has been added.
- Notation made of a few properties that have not been given a designation due to special circumstances.
- Process by which future acquisitions will receive designations has been added.
- Better articulation of the integration of agency planning processes, and clarification of the relationship between Landscape Designations and the Land Stewardship Zoning system that is applied during the Resource Management Planning process has been provided. A new matrix illustrating the relationship between the two is included.
- Reaffirmation of site specific data development during the RMP process.
- Clarification made regarding public processes and trail projects.
- Clarification of use of statutory and regulatory guidelines and agency policy in review of proposed activities prior to completion of an RMP.
- Clarification on process for reviewing existing FRMPs and incorporation of Woodlands guidelines and Public Outreach Policy.
- Reaffirmation made regarding ongoing consultation with DFW on these guidelines and coordination to assess implementing the Statewide Wildlife Action Plan on DCR properties included.
- Legislative citations added to regulatory references.
- Reaffirmation of DCR's commitment to the use of the information in BioMap 2 stated.
- Reaffirmation of DCR's commitment to public process included.

***Sections 2, 3 & 4***

- Purpose statement added to the beginning of the discussion of each designation.
- Patch Reserve discussion moved within the document to the Reserves section.
- Reference to existing Large Reserves established in 2006 made.
- Clarification regarding DCR's potential future designation of Wilderness areas, using the intent of the federal definition of wilderness as a guide only, and applied at the scale of the DCR Wildlands program.
- Language added regarding engaging friends groups and other organizations to support interpretive efforts.
- Parameters of research proposals and results incorporated.
- Parameters of commercial energy installations in Parklands or in Woodlands incorporated.
- Reference to Mass Audubon's *State of the Birds 2011* report included.
- Categorization of silvicultural levels 1, 2 and 3 replaced with more descriptive language discussing the different silvicultural approaches to be taken based upon resource assessments of the site and the stand. Note that methodologies have not changed significantly since the draft, but changes in language have been made for clarification purposes in response to comments, and to help provide some distinction between the former Level 1 from a Zone 1.
- Clarified that Home Fuelwood harvests are subject to the same silvicultural and management guidelines and are also subject to the Public Outreach Policy.
- Language regarding protection of trails during timber sales included.

***Appendices***

Appendices reordered; note that the Glossary is now an Appendix rather than in the main body of the report, and the former Appendix 3, the Summary of the Recreation Opportunity Spectrum, has been removed to reduce confusion.

*Appendix 1: Glossary* – additional terms (such as forest health) and definitions provided, and additional sources included.

*Appendix 2: Silviculture and Guidelines for Application* –Replacement of the Levels 1, 2, and 3 labels with more descriptive language regarding the silvicultural approaches that will be followed to improve stand diversity and rehabilitate or improve others, or where forestry does occur. Language included regarding regulation of the amount of biomass removed for forest productivity protection.

*Appendix 3: Public Outreach and Consultation for Forest Cutting Plans Policy* - New appendix, updating the policy to reflect an expanded policy of public outreach; note: site walks incorporated now before any harvest.

*Appendix 4: Land Stewardship Zoning Guidelines* – New appendix, updating the Land Stewardship Zoning Guidelines to facilitate the TSC-recommended integration of DCR's key planning systems. Includes a matrix showing the relationship between Landscape Designations and Land Stewardship Zoning, revised zone and overlay descriptions, clarification of agencies use of BioMap2 and NHESP data during the zoning process, and expanded general management guidelines. Zone 1 includes language clarifying protection of ecologically and culturally sensitive resources.

*Appendix 5: DCR Properties on Public Water Supply Watersheds* – Clarification that the Public Outreach and Consultation for Forest Cutting Plans Policy will apply.

*Appendix 6: Division of Fisheries & Wildlife Comment Letter on Draft Landscape Designations and Management Guidelines* – New appendix, sharing the comments provided by DFW. These were not posted with the other public comments as they were formally submitted after the public comment deadline and posting.

*Appendix 7: Key Changes to Management Guidelines from Draft to Final* – New appendix, summarizing major changes in this document.

*Appendix 8: Key Changes to Landscape Designations from Draft to Final* - New appendix, summarizing major changes in the property designations.

*Appendix 9: GIS Model Descriptions* – The GIS models used to develop the ELUs, and identify potential Parklands and Reserves have been added.

*Appendix 10: Landscape Designation Maps* – maps now included as an appendix of this document.

# Appendix 8. Key Changes to Landscape Designations from Draft to Final

Review of comments received from public meetings and in writing on specific Landscape Designations, and an overview of the decisions made based on these comments and subsequent DCR review.

**Changes made to Designations**

**Baldpate Pond State Forest**

*Note: Baldpate, Cleaveland Farm, Boxford, Harold Parker and Georgetown-Rowley SF reviewed collectively – due to location, and numerous comments received regarding all of these properties. Segregated here for clarity and for ability to note discussions regarding each property.*

Draft Designation– Woodland

Final Designation– Parkland

Discussion - Written comments opposed Woodland Designation. Baldpate is surrounded by suburban development, with many small house lots. Ranked low for all three designations, and was originally designated a Woodland due to proximity to some of the others that had been draft designated as Woodlands. Decision made to change Baldpate from Woodlands to Parklands.

**Buckley-Dunton Lake in October Mountain State Forest**

Draft Designation – Woodland

Final Designation – Parkland bubble around lake and recreation area

Discussion – Requests received to designate an area encompassing this lake a Reserve. Upon further review, an intensive use area not captured earlier was identified. Decision made to designate a Parklands area encompassing the lake, parking lot, boat launch, beach and trail in this area to reflect current recreational uses and simultaneously address concerns about forest management in this area.

**Cleaveland Farm State Forest**

*Note: Baldpate, Cleaveland Farm, Boxford, Harold Parker and Georgetown-Rowley SF reviewed collectively – due to location, and numerous comments received regarding all of these properties. Segregated here for clarity and for ability to note discussions regarding each property.*

Draft Designation – Woodland

Final Designation – Parkland

Discussion – Former tree farm prior to DCR ownership, and heavily managed in the past, good Woodlands score. Extensive public comments submitted requesting a change. Reassessment of access issues, growth in this region and consideration of adjacent property designations led to the decision to designate Cleaveland Farm a Parkland.

**Connecticut River Greenway State Park**

Draft Designation – Reserve

Final Designation – Parkland

Discussion– DCR has recently completed a number of acquisitions for this park. The property did not rate high for Woodlands, and it does not offer a typical Reserve experience. The federal America's Great Outdoors initiative, which was launched by the Obama Administration in 2010, seeks to partner with communities to restore cherished places, support conservation partnerships, restore critical ecosystems, support rural economies and increase public access to natural areas. Through this program, a national blueway initiative was created and the Connecticut River named as a multi-state blueway. In addition, the New England Governors Association Commission on Land Conservation has also focused on the Connecticut River in its "Connect People to the Outdoors New England" report. Both efforts envision future trail enhancements and recreational opportunities, consistent with resource protection. In consideration of the possibility for future federal resources and regional partnerships to advance these goals on DCR's Connecticut River Greenway, the decision was made to designate this collection of small parcels a Parkland, to more closely align with these efforts.

**Georgetown-Rowley State Forest**

*Note: Baldpate, Cleaveland Farm, Boxford, Harold Parker and Georgetown-Rowley SF reviewed collectively – due to location, and numerous comments received regarding all of these properties. Segregated here for clarity and for ability to note discussions regarding each property.*

Draft Designation – Woodland

Final Designation – Parkland

Discussion – Comments for this property voicing support for a Reserve. Georgetown-Rowley scored well for Woodlands and has good potential for demonstration forestry, home fuel wood, and general thinning opportunities. Due to the relative high scoring of this property as a Parkland, and the growth experienced in this region, the decision was made to designate Georgetown-Rowley a Parkland.

**Mohawk Trail State Forest & Savoy Mountain State Forest**

Draft Designation – Mohawk – Reserve; Savoy – Woodland

Final Designation – Mohawk – no change; Savoy – small Reserve area carved out

Discussion – Based on documented old growth in Savoy captured through the 2006 EEA Reserve effort and written comments mentioning the same, the decision was made to expand the Reserve designation into Savoy to encompass the old growth areas.

**Mt. Watatic Reservation**

Draft Designation – Woodland

Final Designation – Not assigned a designation

Discussion – Due to multiple ownership and joint stewardship by 6 different parties – DCR, DFW, the towns of Ashburnham and Ashby, and 2 local land trusts - with related but different missions, concerns were expressed that DCR should not designate this property. Based on input received at the spring public meetings and written comment, Mt. Watatic will not be designated, but could be in the

future if so desired by the different owning entities. Management of the property will follow the guidelines in the existing management plan.[87]

**Pittsfield State Forest and Balance Rock State Park**

*Note – overview provided here for both properties as these two properties are contiguous and were reviewed jointly. Also note RMP currently in progress for this planning unit.*

Draft Designation – Pittsfield: primarily Woodland with some Parklandss; Balance Rock: Parkland

Final Designation – Pittsfield: Woodland with expanded Parkland area, helping to capture more recreation intensive use areas; Balance Rock: Woodland with a decreased Parkland area

Discussion –Many comments received from recreational user groups about damage to trails from past forest management activities. Pittsfield scored highly as a Woodland. Further review resulted in an expansion of the parkland area in Pittsfield to capture a larger recreational use area not previously included. Balance Rock's Parkland area was refined using additional information related to the size of the intensive use area.

**Wendell State Forest/Warwick State Forest**

Draft Designation – Woodland and Reserve combination

Final Designation – Modifications made resulting in several changes

Discussion – Requests were received to adjust some of the designation boundaries in both properties to avoid impacts to some inholdings and to consider management in adjacent properties owned by Mass Audubon and private owner(s). Other issues included: watershed management areas, forest legacy projects, the desire to stitch together large blocks for both designations, recognition and utilization of the highest value forestry in the state and thoughtful proposals from the towns that provided consideration for municipal interest in timber revenue. Based on extensive and extremely thoughtful comment and field review by staff, an area of Reserve in Wendell State Forest was expanded to the powerline easement and Bear Mountain Road. In Warwick State Forest all lands, with the exception of Parkland carve-out areas, north of Hastings Heights Road, Athol Road, Northfield Road, and White Road will be Woodlands and the large contiguous piece that Flag Road goes through will be designated as a Reserve.

**<u>Other Designation Changes Considered</u>**

**Beartown State Forest and October Mountain State Forest**

Draft Designation – Beartown: Reserve; October Mountain: roughly 2/3 Woodland and 1/3 Reserve

Final Designation – no change

Discussion – Long discussion and assessment of comment letters received questioning the draft designations from both perspectives (some requesting more Reserve; others requesting more

[87] The existing management plan can be found on the DCR website at: http://www.mass.gov/dcr/stewardship/rmp/rmp-mtWatatic.htm

Woodland). Both properties have similar characteristics in terms of size, usage, and history of management, making decisions difficult. Other options considered included swapping the designations, or designating each facility as half Reserve, and half Woodland. DCR staff reviewed other protected open space around both facilities, and focused on the existing road networks and the municipal drinking water supply protection area in the north. Decision made to leave these two designations unchanged.

**Blue Hills Reservation**

Draft Designation – Parkland

Final Designation – no change

Discussion –Two comment letters suggested this property be changed to a Reserve. RMP recently completed includes Zone 1 areas applied through the Land Stewardship Zoning, which provides a higher level of protection and different management practices for a considerable portion of the property. Property has high trail density, high surrounding population and multiple intensive use areas. Decision made to retain the Parkland designation.

**Boxford State Forest**

*Note: Baldpate, Cleaveland Farm, Boxford, Harold Parker and Georgetown-Rowley SF reviewed collectively – due to location, and numerous comments received regarding all of these properties. Segregated here for clarity and for ability to note discussions regarding each property.*

Draft Designation – Reserve

Final Designation – no change

Discussion – Support expressed for Reserve designation, therefore no change was made to this designation.

**Conway State Forest**

Draft Designation – Woodland

Final Designation – no change

Discussion – Comments submitted by the Conway Conservation Commission (and some individuals) to designate this property a Reserve. Support for Woodlands designation received in comments from the Northampton Water Commission for watershed management, as half of the property falls within a surface water protection area. Property rates moderate/moderate for Reserves, and very high for Woodlands, and has been actively managed in the past. Decision made to retain the draft Woodland designation.

**Douglas State Forest**

Draft Designation – Reserve

Final Designation – no change

Discussion – Comment received suggesting that this property should be designated as a Parkland due to high trail density. Property scores highly for a Reserve, represents only one of two

Reserves in its ELU, and is a very large contiguous block of forest. Decision made not to change the designation.

**F.G. Hills State Forest**

Draft Designation – Woodland

Final Designation – no change

Discussion – Comments received from recreational users requesting Parkland designation; concerns regarding trails and trail density. Property has a history of active management here with a sawmill on site. Decision made to retain the draft Woodland designation.

**Gilbert A. Bliss State Forest**

Draft Designation – Reserve with a Parkland portion

Final Designation – no change

Discussion – One comment received noting an abundance of recreational uses and requesting a Parkland designation. Property was one of the original Reserves designated in 2006, and ranks very highly in the Reserves model. Decision made to retain the draft Reserve designation.

**Granville State Forest**

Draft Designation – Woodland

Final Designation – no change

Discussion - Comment received about certain designations being restrictive of OHV use statewide. Landscape Designation Management Guidelines do not restrict OHV use simply based on the property designation. Decision made to keep draft Woodland designation.

**Harold Parker State Forest**

*Note: Baldpate, Cleaveland Farm, Boxford, Harold Parker and Georgetown-Rowley SF reviewed collectively – due to location, and numerous comments received regarding all of these properties. Segregated here for clarity and for ability to note discussions regarding each property.*

Draft Designation – Woodland

Final Designation – no change

Discussion – Harold Parker scored well for Woodlands and has good potential for demonstration forestry, home fuel wood, and general thinning opportunities. Recreational opportunities at Harold Parker are compatible with Woodlands. Decision made to keep as draft Woodland designation.

**Hawksnest State Park**

Draft Designation – Woodland

Final Designation – no change

Discussion – One comment received suggesting that this property should be a Reserve based upon its ecological values, and for water supply protection. This property was identified as a Woodland not only to allow for a potential site for the home fuelwood program on Cape Cod, but also to provide

for water supply protection and to balance designations within this ELU. Property scored medium and low on the Reserve model. DCR field staff indicates this property is good for home fuelwood purpose (pine and oak). This is also a property that is co-managed by DFW, who expressed a strong interest in retaining flexibility to allow for active forest management. Decision made to retain the draft Woodland designation.

**Holyoke Range State Park**

Draft Designation – Reserve

Final Designation – no change

Discussion – Recreational users submitted comments requesting a Parkland designation due to concerns regarding potential trail closures. Property ranks high for Reserves, with unique ecological attributes and high habitat diversity. Decision made to retain the draft Reserve designation.

**Middlesex Fells Reservation**

Draft Designation – Parkland

Final Designation – no change

Discussion – Comment letters received suggesting that this facility should be designated a Patch Reserve. The Fells has the highest trail density in the entire DCR system, high surrounding population density, and an approved RMP that addresses protection of critical resources through land stewardship zoning. Decision made to retain the draft Parkland designation.

**Mt. Tom State Reservation**

Draft Designation – Parkland

Final Designation – no change

Discussion – Comment letter received noting this property is an Important Bird Area. Located adjacent to Holyoke Range, the recreational usage is high, and the property does not have as many reserve-like qualities as others in this region and ELU. Decision made to retain the draft Parkland designation.

**Mt. Washington State Forest**

Draft Designation – Part Reserve; Part Woodland in the northern area adjacent to Jug End

Final Designation – no change

Discussion – Comment received suggesting that the split designations would result in fragmentation to an important Reserve area. However, the section that is Woodland is separate from the Reserve area, and no fragmentation would occur. The area in question scores well for Woodlands, and is adjacent to Jug End, which is co-managed with the Department of Fish and Wildlife for Woodland values. Decision made to retain the draft partial Reserve, partial Woodland designation.

**Peru State Forest**

Draft Designation – Woodland

Final Designation – no change

Discussion – Suggestion was made that as a large unit next to Middlefield SF (designated as a Reserve) that Peru SF should also be designated as a Reserve to increase the size of area in Reserve. Middlefield SF, however, is in a different ELU than Peru SF. Neither community submitted comments this round. Decision made to retain the draft Woodland designation.

**Robinson State Park**

Draft Designation – Parkland

Final Designation – no change

Discussion –Letter received supporting this designation; no discussion or change necessary.

**Rutland State Park**

Draft Designation – Woodland with a small Parkland area

Final Designation – no change

Discussion – Letter received supporting this designation; no discussion or change necessary.

**Sandisfield State Forest**

Draft Designation – Woodland

Final Designation – no change

Discussion – Comment received concerning OHV use in the area. As Woodland designation in and of itself does not impact OHV use, and OHV use is not currently allowed here but rather in nearby Tolland SF, the draft designation was retained.

**Sandy Point State Reservation**

Draft Designation – Reserve

Final Designation – no change

Discussion – Suggestion made that as a small facility this should be a patch reserve, and should not count towards the total acreage target for Reserves. Decision made to retain the draft Reserve designation.

**Shelburne Falls State Forest**

Draft Designation – Parkland

Final Designation – no change

Discussion – Comment submitted requesting to change this to a Reserve. One parcel is about 10 acres and includes a fire tower, the other is an intensive recreational use area with access to the Deerfield River, and the Mohican/Mohawk trail runs through it. Due to heavy recreational use and assets, decision made to retain the draft Parkland designation.

**Upton State Forest**

Draft Designation – Woodlands with Parklands core at Civilian Conservation Corps HQ area

Final Designation – no change

Discussion – Comments received suggesting an expansion of the Parklands area to capture the loop road constructed by the CCC, both as a historic resource and as an area reflecting the primary area of use. Decision made to retain the draft designation and to capture those cultural and sensitive natural areas in the Land Stewardship Zoning to be conducted as part of an RMP.

**Wachusett Mountain State Reservation**

Draft Designation – Parklands

Final Designation – no change

Discussion – Comment reflected concern regarding the old growth stand at Wachusett and its need for protection. The old growth will still be protected at Wachusett through not only the DCR Old Growth policy, but also through Land Stewardship Zoning, which has zoned this area a Zone 1, the most protective Land Stewardship Zone. Given the extensive level of recreational infrastructure as well as the roadway and summit infrastructure, decision was made to retain the draft Parkland designation.

**Willowdale State Forest**

Draft Designation – Reserve

Final Designation – no change

Discussion – Comments received from recreational users suggesting that there are too many trails on this property for a Reserve designation. Concerns expressed that Reserve designation will automatically lead to trail closures, which is not the case. This property rated high for Reserve potential, and is currently the only large Reserve in the Northeast. Decision made to retain the draft Reserve designation.

**Wompatuck State Park**

Draft Designation – Parklands

Final Designation – no change

Discussion – Comment requested changing this designation to a Reserve, to balance the percentage of acreage of each designation within this ELU, and its natural resource values. There are other Reserves in this ELU, and this property includes a very active campground, is a heavy mountain biking area, and has remains of a former military installation. Decision made to retain the draft Parkland designation due to heavy recreational use and assets.

# Appendix 9. GIS Models

### Ecological Land Units and the Reserves Model

The primary recommendation for Landscape Designation by the Technical Steering Committee (TSC) was that DCR should establish "large, intact forest reserves in each of the major ecological settings"[88] representing Massachusetts forest biodiversity. Further, reserve design should ideally follow "principles of conservation biology that direct us to develop a connected network of large, well-buffered forest reserves with minimal internal fragmentation."[89]

To achieve this, the Forestry Internal Working Group developed a GIS 'Reserves' analysis model with guidance from The Nature Conservancy (TNC). The analysis has the following three distinct steps:

1: Ecological Grouping to identify major ecological settings in MA

2: Creating numeric 'Reserves' scores

3: Scaling scores for better relevance

1. Ecological Grouping to identify major ecological settings in MA

The DCR owns and manages properties that span the entire state, and support an astounding array of habitat types, recreation opportunities and cultural values. Within this diverse range though, are groups of facilities that are tied together by unique ecological characteristics. For instance forested DCR facilities located in higher elevations are intrinsically different from forested properties situated in richly silted river valleys. Or one group of properties might represent hilly lands with loose, fertile soils and dense vegetation whereas another might refer to those facilities that are on flat, coastal soils with scrubby vegetation.

Ecological grouping of DCR facilities helps identify such facilities that share similar, unique features. Drawn from an analytical approach used by TNC in their "Lower New England-Northern Piedmont ecoregion Conservation Plan," it provides a way of reducing many thousands of acres of DCR land into ecological groupings of properties. Together, the groups represent the diversity of physical and natural characteristics contained within DCR properties throughout Massachusetts.

Ecological Land Unit (ELU) groups for DCR owned and managed facilities were derived using a methodology established by the TNC. An ordination analysis was used to group DCR properties together based on three factors: elevation, geology and landform (a measure of topography). Properties that have similarities for these three basic attributes also tend to have similar vegetation and habitats. These groupings are referred to as Ecological Land Unit or ELU groups.

[88] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 36. Available at: http://www.mass.gov/dcr/news/publicmeetings/tsc_final_recommendations.htm
[89] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 37. Available at: http://www.mass.gov/dcr/news/publicmeetings/tsc_final_recommendations.htm

The groupings were created using the software program PC-ORD with a TWINSPAN ordination analysis. Results were interpreted with help of TNC experts to group together DCR properties that are most similar to each other in terms of their ecological setting, measured through elevation, geology and landform data (provided by the TNC). Eleven ELU groups of DCR properties emerged and were presented to DCR foresters with specific knowledge of DCR facilities, for verification. Where knowledge of the property suggested the necessity, slight alterations to the ELU groupings were made and then checked against the ordination analysis.

The primary use of these 11 ELU groups of DCR properties was to ensure equitable distribution of Reserves throughout the state.

In some instances, ELU groups provided key context to aid designation decisions. For example, if a particular ELU group had an overwhelming number of facilities that were designated as Woodlands and comparatively less in Reserves, it was a clue to more closely examine the facilities that were close-calls and re-designate in favor of Reserves. All decisions were evaluated by foresters and supervisors who had intimate knowledge of the areas so that there was some field verification of these model driven decisions.

The ELU groups were less applicable to the designation of Parklands which have a broader range of characteristics and are not mutually exclusive with other designations (i.e. they can co-exist).

**ELU groups were created as follows:**

1. We started with a GIS dataset that contained current DCR owned and managed facilities.

2. This list was formatted prior to the analysis as follows:

a) Some facilities were grouped together to better reflect their management structure. Almost all treated thus are very similar facilities that are adjacent or nearby and though named differently, are managed by the same supervisor/crew for an adjacent property. An example is Abigail Adams S.P., Stodders Neck and Webb Memorial S.P.
b) Some facilities were grouped together due to naming discrepancies. This is mostly in the case of adjacent facilities that may be named differently due to legal deed details, but that are considered to be part of the same facility by the DCR. An example is Brewster and Nickerson State Forests.
c) Many facilities less than 25 acres in size were left out of the ordination analysis and not given an ELU group. These properties were not analyzed for Reserves potential given that their small size would make them unlikely candidates for reserves. In addition, the scale of the available ecological data was incompatible with these very small properties and would lead to a compromise in the overall accuracy of the model. Certain exceptions were made based on specific knowledge of facilities. For example in the Abigail Adams/Stodders Neck/Webb combination mentioned above has significant natural, undeveloped areas. Therefore these smaller facilities received designations (most turned out to be best suited as ‘Parklands’)
d) Facilities with highly 'developed' characteristics were also left out of this grouping exercise and Reserves score calculation. Examples of these are: pools, rinks, playgrounds, and boat ramps. They were excluded because they have few or no qualities that would qualify them as Reserves.
e) Some very linear facilities were excluded for similar reasons. An example is Hammond Pond Parkway.

This step of grouping facilities by name/management or excluding them was our effort at diligent input formatting to ensure that the models were as representative of reality as possible. The ELU grouping that came out of the ordination analysis took accurate notice of the true character of the facilities and reflected this diligence. The Abigail Adams/Stodders Neck/Webb Memorial example above for instance: all were small facilities with a lot of recreational use and development in terms of trails. They were not eliminated by us per the small size/developed rules but included to account for the natural areas in Webb Memorial S.P. In the designation process though, in spite of being part of an ELU group, their developed 'Parklands' nature came to dominate and they were designated as Parklands.

3. Our amended list of facilities and the ELU data was fed into the TWINPSAN program and the analysis was run.

4. Initial model results were interpreted by a DCR GIS analyst and then confirmed by an analyst from TNC with expert knowledge and experience of the process. The interpretation of ordination results is a subjective exercise in pattern recognition so is a reiterative process requiring multiple passes. Numerical patterns were read to identify clusters of DCR properties and then the ecological characteristics used as a descriptor to fact-check the accuracy of the clusters. If there was consistency in the ecological description of the various properties in that cluster, it could be considered a valid group. If not, patterns were re-read to see if some of the mismatched properties in the cluster had a better fit in another cluster.

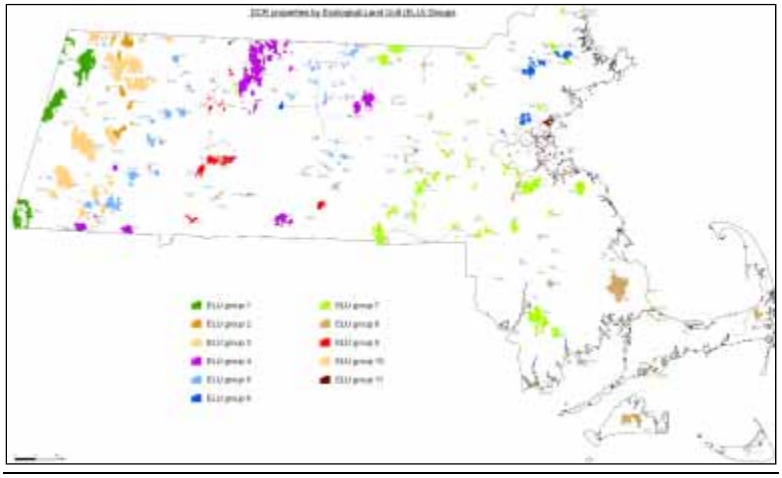
5. ELU groups created from the ordination analysis were checked by foresters and administrators with detailed knowledge of the properties. Where they felt that a facility fit better in a different ELU group, the TWINSPAN analysis was checked and if possible the facility was assigned to a different, more fitting group. In the few instances that a ELU group reassignment was suggested, the TWINSPAN data did in fact support the re-group since there are multiple ways of interpreting the TWINSPAN results.

6. The final ELU groups were used for background and context when individual GIS models were compared in assigning Landscape Designations.

**An ELU is any combination of these 3 variables:**

| Topography | Geology | Elevation Zone |
|---|---|---|
| Cliff | Acidic sedimentary | Very Low (0-800') |
| Steep slope | Acidic shale | Low (800-1700') |
| Flat summit or ridgetop | Calcareous | Medium (1700-2500') |
| Slope crest | Moderately Calcareous | High (2500-4000') |
| Sideslope –N facing | Acidic granitic | Alpine (4000+'} |

| | | |
|---|---|---|
| Sideslope – S facing<br><br>Cove or footslope-N facing<br><br>Cove or footslope–S facing<br><br>Hilltop flat<br><br>Hill / gentle slope<br><br>Valley bottom or gentle toeslope<br><br>Dry flat<br><br>Wet flat<br><br>Flat at bottom of steep slope<br><br>Stream<br><br>River<br><br>Lake or pond | Intermediate or mafic<br><br>Ultra mafic<br><br>Deep fine-grained sediments<br><br>Deep coarse-grained sediments | |



**The11 ELU groups identified for DCR properties, and their descriptions**

| **ELU group** | **Primary ELU traits** *i.e. all/almost all properties in this ELU group share these characteristics* | **Secondary traits** *i.e. some property sub-groups in this ELU group share these characteristics* |
|---|---|---|
| 1 | Mid elev, Mod calcareous sed/metased, gentle hill, cool & warm sideslopes, dry & wet flats, flat hilltop, valley/toeslope | Mid-high elev, Acidic sed/metased, Hilltop (flat)<br><br>Mid-high elev, Mod calcareous sed/metased<br><br>Mid elev, Acidic sed/metased, Flat at bottom of steep slope |

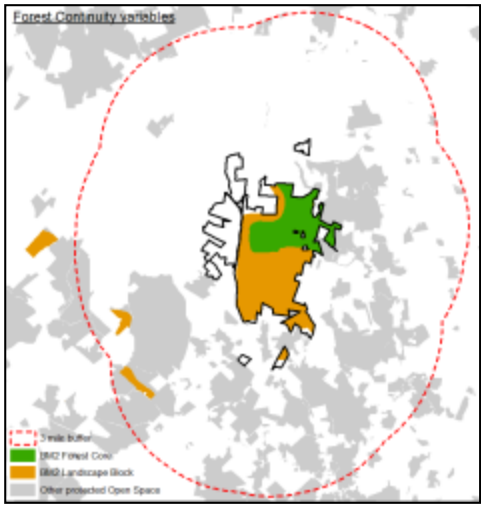
| | | |
|---|---|---|
| 2 | Mid-high elev, Acidic sed/metased, flat hilltop, gentle hills,cool & warm sideslopes, dry & wet flats, valley/toeslope AND<br><br>Mid elev, Acidic sed/metased, Sideslope (cool & warm),cove/footslope(cool), flat at bottom of steep slope, wet flats, valley/toeslope | N/A |
| 3 | Mid elev, Acidic sed/metased, .<br><br>Sideslope (cool & warm), cove/footslope(cool & warm), flat at bottom of steep slope, wet flats, valley/toeslope | Mid-high elev, Acidic sed/metased, flat hilltop, gentle hills, cool & warm sideslopes, dry & wet flats, valley/toeslope |
| 4 | Mid elev, Acidic sed/metased, Sideslope (cool & warm), cove/footslope(cool & warm), flat at bottom of steep slope, wet flats, valley/toeslope | Mid elev, Mafic/intermediate granitic,<br><br>gentle hill, cool & warm sideslopes, dry & wet flats AND<br><br>Mid elev, Acidic sed/metased, Sideslope cooler aspect |
| 5 | Mid elev, Acidic sed/metased, flat hilltop, gentle hills, wet & dry flats, cool & warm sideslopes, valley/toeslope | Mid elev, Mod calc sed/metased, flat hilltop, gentle hills, cool & warm sideslopes, dry & wet flats, valley/toeslope, Low elev, mod calc sed/metased |
| 6 | Low elev, Mafic/intermediate granitic, gentle hills, wet & dry flats, warm sideslopes, valley/toeslope, flat hilltop | N/A |
| 7 | Low elev, Acidic granitic, flat hilltop, gentle hills, wet & dry flats, cool & warm sideslopes, valley/toeslope | Mafic/intermediate granitic |
| 8 | Low elevation, Coarse sediments, wet & dry flats, valley/toeslope | <u>Sub-group 1:</u><br><br>Low elevation, Mod calcareous sed/metased, gentle hills,<br><br>wet & dry flats, cool & warm sideslopes, valley/toeslope<br><br>AND Low elevation, Acidic granitic, Cove/footslope<br><br>cool & warm aspect<br><br><u>Sub-group 2:</u><br><br>Low elevation, Acidic sed/metased, flat hilltop,<br><br>gentle hill, wet flats, lake/pond/reservoir |

| | | |
|---|---|---|
| | | Sub-group 3:<br><br>Low elevation, Coarse sediments, flat hilltop, gentle hill, cool & warm sideslopes (some also have Acidic Granitic) |
| 9 | Low elevation, Acidic sed/metased,flat hilltop, gentle hills, wet & dry flats, cool & warm sideslopes, valley/toeslope, slope crest | N/A |
| 10 | Coastal zone, Coarse sediments, wet & dry flats | Sub-group 1: Coastal zone, Acidic granitic, gentle hills, wet & dry flats<br><br>Sub-group 2: Coastal zone, Acidic sed/metased, flat hilltop, gentle hills, wet flats AND Coastal zone,<br><br>Coarse sediments, wet & dry flats, valley/toeslope |
| 11 | Coastal zone, Fine sediments, flat hilltop, gentle hills, wet & dry flats, cool & warm sideslopes, valley/toeslope | N/A |

2. Creating numeric 'Reserves Potential' scores

Two GIS models were created to evaluate DCR properties for Reserve potential using (mainly) TNC's Biomap 2 data: the Forest Continuity model and the Biological Systems Model.

The **Forest Continuity** model was used as the primary indicator of Reserves potential. It is the direct visualization of the TSC directive that DCR should establish "large, intact forest reserves in each of the major ecological settings"[90] representing Massachusetts forest biodiversity. The model evaluates DCR facilities to find those that have the most intact forests and are surrounded by other protected and intact forests. Recently released Biomap 2 data on Landscape Blocks and Forest Cores provided good data for intact forests.




To incorporate the second essential value of being "connected networks of large, well-buffered forest reserves,"[91] occurrences of these intact forests were considered not only within, but also ***nearby*** DCR facilities. This was done by adding a 3 mile buffer or ring around each

[90] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 36. Available at: http://www.mass.gov/dcr/news/publicmeetings/tsc_final_recommendations.htm

[91] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 37. Available at: http://www.mass.gov/dcr/news/publicmeetings/tsc_final_recommendations.htm

DCR property. In addition, nearby protected lands, whether forested or not, were also factored in to account for future Reserves potential and increased connectedness. The variables composing this 'Forest Continuity' data layer are:

1) Biomap 2 Forest Core (within property)
2) Biomap 2 Landscape Blocks (within property)
3) Biomap 2 Forest Core (within 3 miles of property)
4) Biomap 2 Landscape Blocks (within 3 miles of property)
5) Other protected Open Space (within 3 miles of property)

The method used to derive numerical 'scores' for Forest Continuity for each DCR property is as follows:

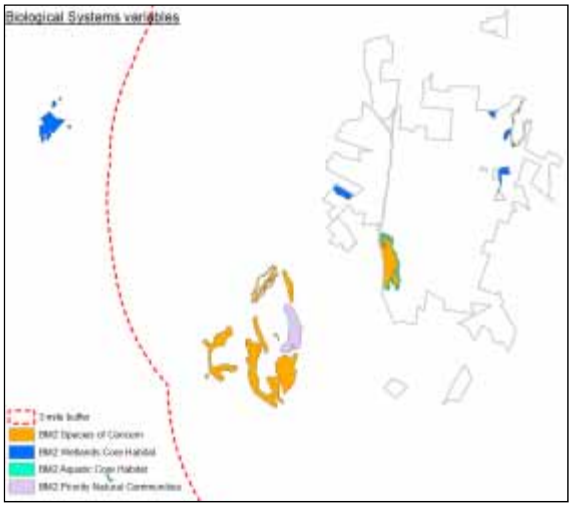
1. Area calculation:
   Areas of each data variable within or near each DCR property were calculated. ArcMap 9.3 Geoprocessing tools like intersect and clip were used to arrive at these acreages for the Forest Core and Landscape data. The buffer tool was used to create a 3 mile ring around DCR properties and the same data acreages calculated within this buffer. Protected Open Space (defined as any property publicly owned in perpetuity in the MassGIS Open Space data layer) was similarly calculated within this ring. Each DCR property thus had 5 acreages calculated, one for each variable listed above.

2. Ranking area for each variable:
   For each DCR property, each of the above 5 acreages were classified on the basis of where they fell in the range of values for their ELU group. To do this, acreages calculated in the first step were grouped according to Natural Breaks (Jenks) method using 3 classes for each ELU group of DCR properties. Using the Natural Break method creates classes "based on natural groupings inherent in the data" (ArcGIS Desktop 9.3, ESRI documentation). The class limits calculated by this method were used to classify the lowest class as 1 (lowest in the range), the middle class, 2 (middle of the range) and the highest class, 3 (highest in the range).

   For example, in ELU group 1, all 10 DCR properties in that group were symbolized on 'Forest Core' acres in ArcMap using 3 Natural Breaks. The 3 classes created by ArcMap were 0 – 422.22 , 422.23 – 3606.62 and 3606.63 – 7262.28. All properties that had Forest Core from 0 to 422.22 acres (the lowest class) were given a Forest Core Relative score of 1, meaning that amongst all the properties in ELU group 1, these properties had the lowest amount of Forest Core in them. Properties in the middle class for Forest Core, were given a score of 2 and those from 3606.63 – 7262.28 (the highest class) were given a score of 3. In effect, DCR Properties within this ELU group were ranked in terms of Forest Core through comparison with their peers within the same ELU group.

   This process was repeated for each of the 5 variables considered to indicate 'Forest Continuity'. So each DCR property had 5 scores calculated for each of the 5 'Forest Continuity' variables listed above.

The **Biological Systems** Model was considered to be a secondary model when evaluating DCR properties because the habitat principles it assessed were less emphasized by the TSC report than the 'intact forest' concepts included in the Forest Continuity Model. It was further meant to be a tie-breaker measure to add intelligence to designation decision making in cases of 'close calls' where a property might be well suited to more than one designation.




The components of the Biological Systems model are:

1) Biomap 2 Species habitat
2) Biomap 2 Wetland Core Habitat
3) Biomap 2 Aquatic Core Habitat
4) Biomap 2 Priority Natural Communities

The method for calculating acreages and ranking scores for each of these variables was identical to that of the 'Forest Continuity' model. At the end of the process, each DCR property had 4 acreages calculated for each of Biological Systems variables listed above as well as a rank for the acreage to evaluate it in the context of other properties in the ELU group.

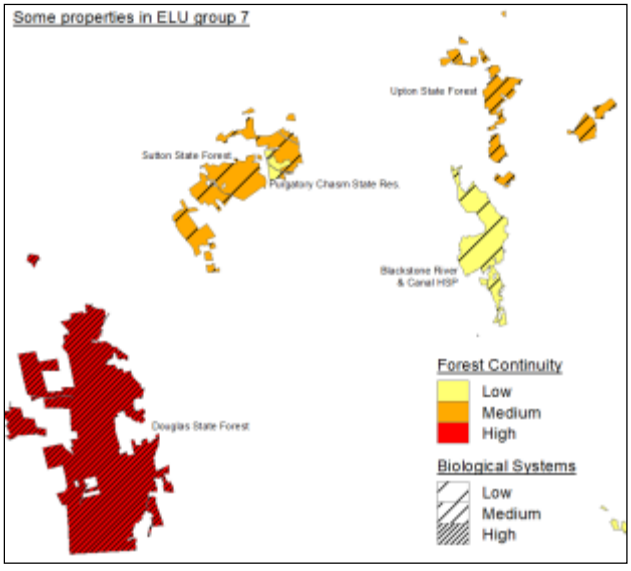
## 3. Scaling scores across groups of properties

One of the goals of designating Reserves across DCR lands was to ensure that they were distributed across each of the major ecological settings of the state. To achieve this, the numeric model scores created for all properties statewide were evaluated separately for each ELU group and broken into three categories. The lowest range of scores within a particular ELU group was considered to represent the lowest Reserves potential within that unique ecological setting. The middle data range was considered 'Medium' potential and the highest 'High'. Each ELU group of DCR properties was similarly evaluated and each property within the ELU group given high, medium and low scores accordingly. This scaling was applied to both Forest Continuity and Biological Systems data layers.

The steps for this analysis were:

1. Composite score calculation:

For Forest Continuity - a straight addition of the 5 ranks for each Forest Continuity variable for each DCR property yielded a composite raw score. For example, a particular property might have had a low rank for 'Forest Core' (1), medium for 'Landscape Block' (2), high for adjacent



Forest Core (3), medium for adjacent Landscape Block (2) and low for adjacent open space (1). The composite Forest Continuity score for such a property would be 9.

Similarly, for Biological Systems - that property might have had a low rank for Species habitat (1), medium for Wetland Core Habitat (2), medium for Aquatic Core Habitat (2) and high for Priority Natural Communities (3). The composite Biological Systems score for such a property would be 7.

2. Ranking composite scores:

Composite scores (for each of the 2 models) from above were grouped into 3 classes per Natural Breaks (Jenks) distribution for the ELU group the property belongs to. Properties that had raw composite scores in the lowest class were given a rank of 'Low' and so on, as described earlier. These were considered the final Forest Continuity scores that indicated Reserves Potential.

## Parklands GIS model

The Technical Steering Committee (TSC) recommendations for designating Parklands included 'DCR lands in heavily populated areas," "density of officially designated trails" (with denser trails being more appropriate for Parklands) and "level of recreational visitation" (with areas of high visitation such as campsites, scenic areas being more appropriate for Parklands).[92] Accordingly the GIS model for Parklands included data layers representing High Trail Density, High population density and Intensive Use areas.

The scope of this analysis was statewide and did not produce a relative measure (Low, Medium and High) like Reserves and Woodlands but a binary indicator of whether a facility, or a part of it, either does or doesn't have any parkland potential according to the given criteria.

The steps and data layers for the Parklands model were:

1. High trail density data creation
2. Areas of intensive recreational use data creation
3. High population density data creation
4. Combine into a final 'Parklands' datalayer

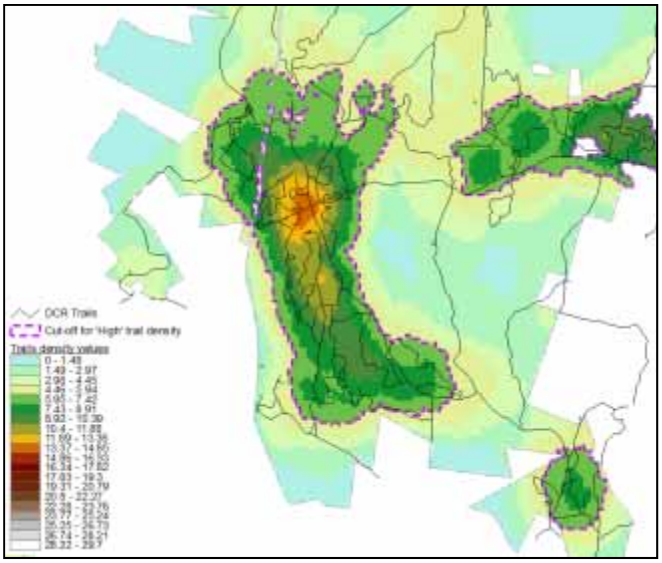
1. High Trail Density data creation

'High trail density' data was based on DCR's most current draft trails collected by DCR staff using global positioning systems (GPS). Public Roads that might be included in the functional trails system were excluded. In addition, existing Bicycle Trails and Long Distance Trails were added to the dataset from existing MassGIS data.

[92] *Final Report - Forest Futures Visioning Process Recommendations of the Technical Steering Committee*. April 21, 2010, p. 39. Available at: http://www.mass.gov/dcr/news/publicmeetings/tsc_final_recommendations.htm

Trail density was calculated using the 'Line Density' tool in ArcMap 9.3. This raster process evaluates each cell in a property for trail density, based on the length of trails occurring within a search radius (or neighborhood) of that cell. After some trial and error, a search radius of 0.25 miles was determined to accurately capture areas of truly dense trails. The result was a grid showing varying degrees of trails density for each DCR property. The numerical values in this grid are not meaningful except as a relative measure of density.

Next, statewide trail density values were interpreted using the Natural Breaks (Jenks) method to help determine a cut-off level for what should be considered 'high' density of trails. There was no scientific method of determining where the ideal cut-off should be but seeing the natural distribution helped to place trail density within the context of the entire state. Smaller, urban, recreational facilities that were covered with extensive trail networks for instance, would jump out as having 'high' trail density but choosing a trail density value from such a property might exclude a smaller area of dense trails in a larger, less urban facility. Comparing parks of different settings and sizes helped to determine what could be fairly considered to be truly 'dense' trails, regardless of other factors. The cut-off value in the trail density grid that was chosen in this particular case was 6. So any portion of any DCR property with a trail density value over 6 was considered to have 'high' trail density. A data layer was created for these 'high' trails density areas.




A property with 'High' density trails on over 40% of its total area, was considered to have Parklands potential in its entirety. Properties with less than 40% 'high' density trails were considered to have Parklands potential only where the areas of high density trails occur (so part of the property may have good Parklands potential). The 'High Trails density' data layer thus contains entire DCR properties (where over 40% is 'high' density per the GIS analysis) as well as portions of properties (where under 40% of the property is 'high' density).

2. <u>Areas of intensive recreational use data creation</u>

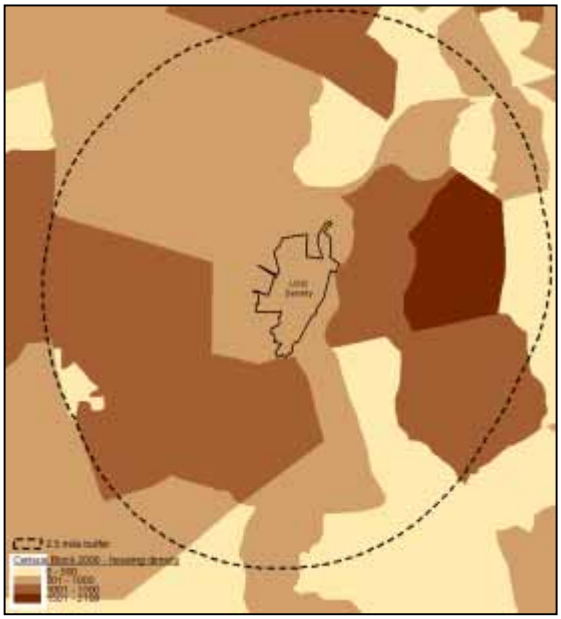
"Intensive use areas" for DCR properties were digitized into a data layer by DCR staff. They include constructed or developed administrative, maintenance and recreation sites, structures and resilient landscapes that accommodate concentrated use by recreational visitors and require intensive maintenance by DCR staff. Examples include park headquarters and maintenance areas, parking lots, swimming beaches, campgrounds, picnic areas and pavilions, open fields designed for high recreation use, and attractions such as waterfalls and scenic lookouts. Delineated areas are considered to have parklands potentials regardless of their setting within intact forests or urban areas. The shapes digitized were based on trail maps, GPS data (where available) and

orthographic (aerial) photos and were verified and/or refined by staff with good field knowledge of the properties.

To allow for possible future enlargement of these areas as well as to include a margin of privacy, a buffer of 500 feet was applied to the areas. Further examination of each intensive use area led to a fine tuning of this buffer to better represent conditions on the ground. For instance, where a playground foot print includes strips of woods on its margins, the buffer might have been dropped as an unnecessary measure. In other instances, the buffering process in GIS might have created misleading artifacts such as when buffering a parking lot on one side of a road leads to the creation of a patch of 'intensive use' on the other side that road. The idea of the buffer is to accommodate a small degree of unplanned expansion along the margins of use, rather than any sweeping and generalized plans of development.

3. <u>High Population Density data creation</u>
The best data available for population density was Census 2000 Block Group data.

Statewide statistical distributions of housing density (as measured in Census 2000) were examined help determine 'High', 'Medium' and 'Low' population density areas of Massachusetts.



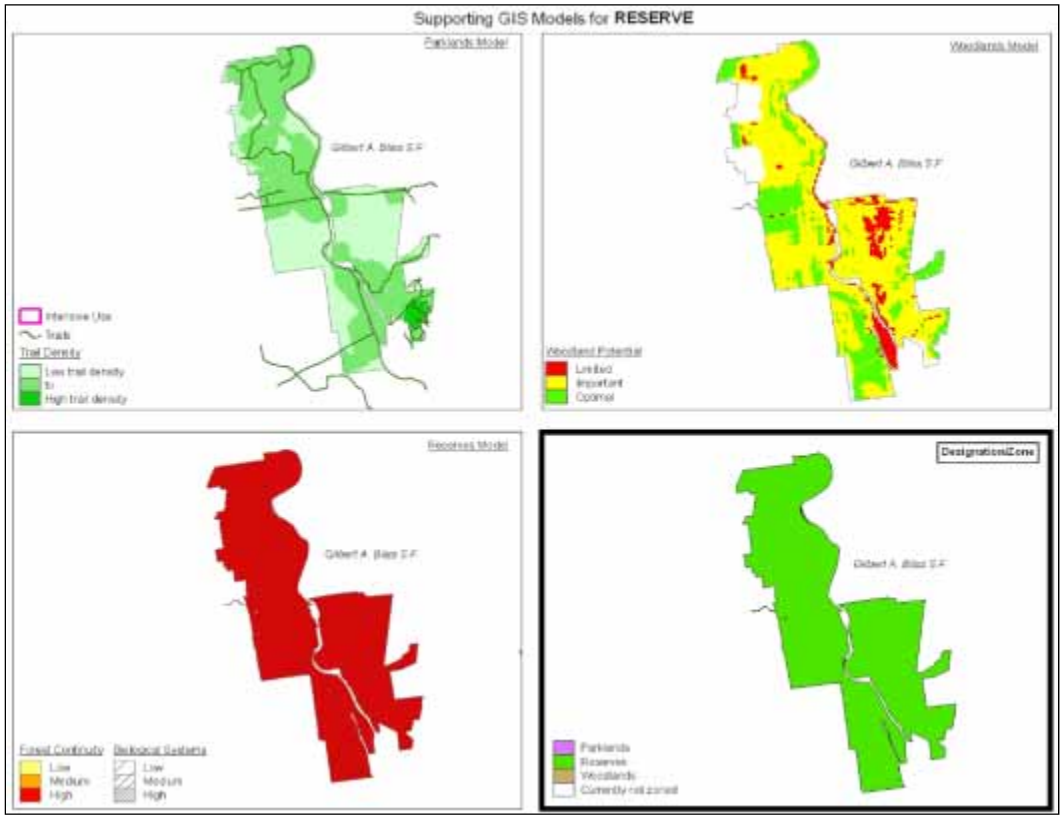
A combination of GIS geoprocessing tools were used to calculate population density within 2.5 miles of each DCR facility. The radius used to measure surrounding population density is straight line distance from the property boundary rather than travel time (since the TSC recommendation was to account for areas of dense population and not to track where visitors came from). The exact radius was determined through trial and error as there are no scientific guidelines for it. Multiple radii were tested, greater and less than 2.5 miles. Housing densities derived from the buffers were checked against how the Census Block data classified housing density. The image on the right shows a quartile distribution of data used by MassGIS to represent Housing Density. This was used as a benchmark to compare density calculations from different radii. Radii of 5, 1 and 1.5 miles were amongst many tested. Depending on the buffer size a property might turn out to have 'medium' housing density when a good proportion of Census Blocks surrounding it are obviously 'high'. A buffer too large dilutes the effect of true density values given that the density numbers are to be averaged within the radius. A buffer too small would give undue weight to properties that are in more urban areas and skew results against properties in less urban areas that nevertheless have high density for that region. The factor driving determination of the ideal radius was that urban properties should not skew results against less urban yet populated ones. Both 'Medium' and 'High' density properties were considered to indicate 'high' density in the final assessment of DCR properties in the Parklands analysis.

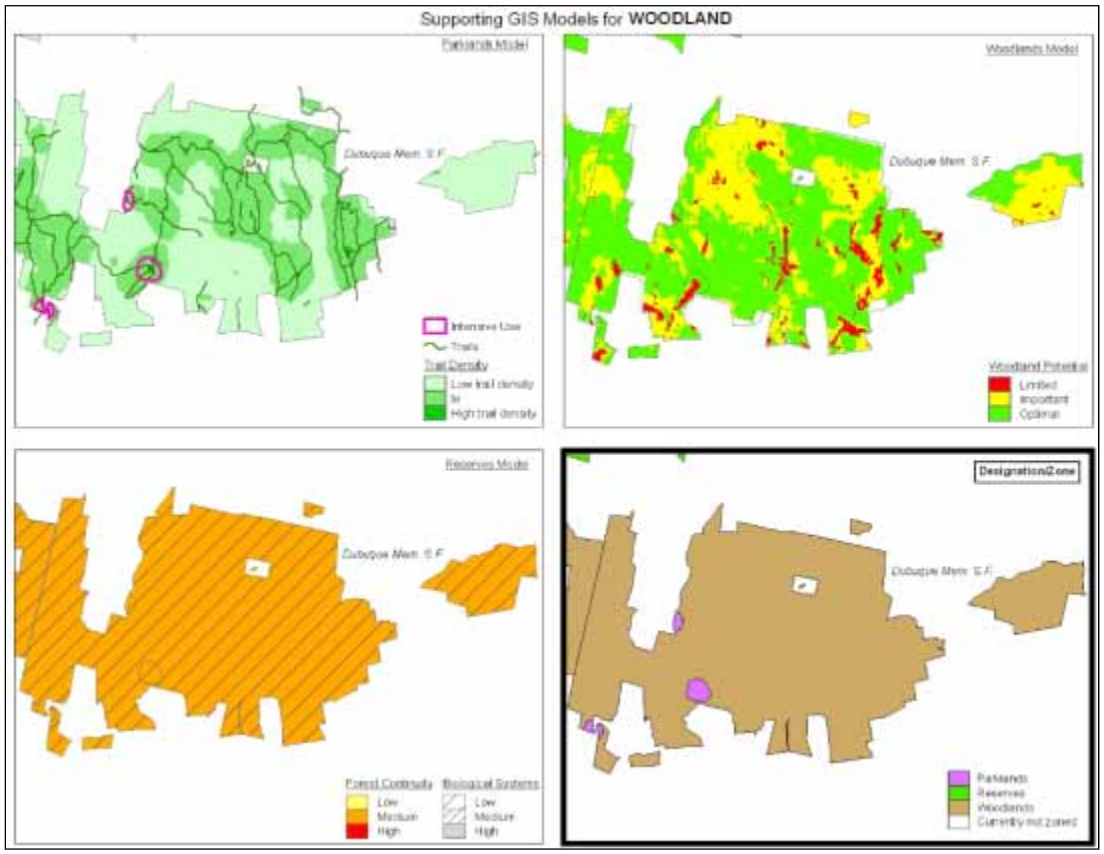
Census areas of measurement are 'Block Groups' which do not conform to either DCR property shapes or the buffers of DCR properties being used, proportions were used to approximate population densities. Housing density for portions of each Census Block that fell within a property's buffer, were averaged find an approximate population density score for each DCR facility.

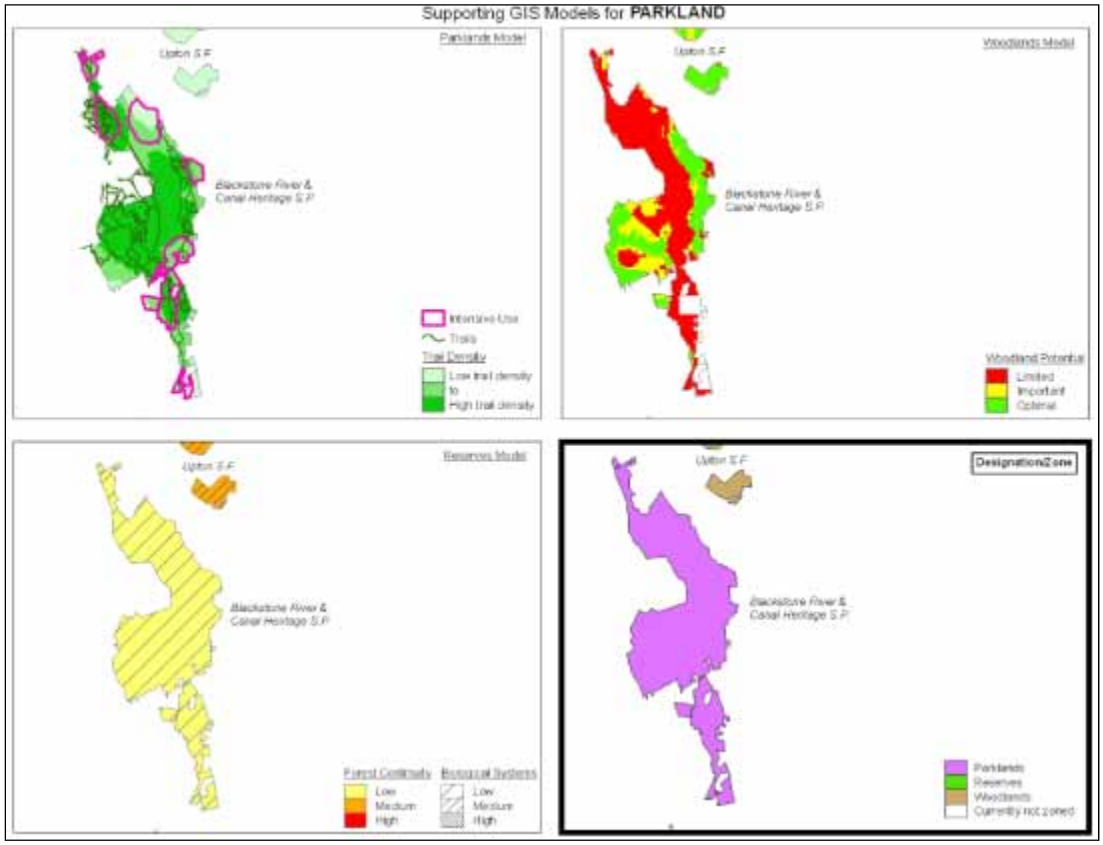
All properties within 'Medium' and 'High' population density levels are considered to have high parklands potential.

4. <u>Combine into a final 'Parklands' datalayer</u>
   All the three data layers above were merged together to create a final layer that shows areas of DCR facilities, or in cases, entire facilities that have the potential to be zoned as Parklands.

Below are examples of how the Woodlands, Reserves and Parklands models guided designations decisions. For each DCR property shown, each of the model results are shown along with the final landscape designation they led to.




Supporting GIS Models for WOODLAND
Parklands Model
Dubuque Mem. S.F.
Intensive Use
Trails
Trail Density
Low trail density
High trail density
Woodlands Model
Dubuque Mem. S.F.
Woodland Potential
Limited
Important
Optimal
Reserves Model
Dubuque Mem. S.F.
Forest Continuity
Low
Medium
High
Biological Systems
Low
Medium
High
DesignationsZone
Dubuque Mem. S.F.
Parklands
Reserves
Woodlands
Currently not zoned


Supporting GIS Models for PARKLAND
Parklands Model
Upton S.F.
Blackstone River & Canal Heritage S.F.
Intensive Use
Trails
Trail Density
Low trail density
to
High trail density
Woodlands Model
Upton S.F.
Blackstone River & Canal Heritage S.F.
Woodland Potential
Limited
Important
Optimal
Reserves Model
Upton S.F.
Blackstone River & Canal Heritage S.F.
Forest Continuity
Low
Medium
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Biological Systems
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Medium
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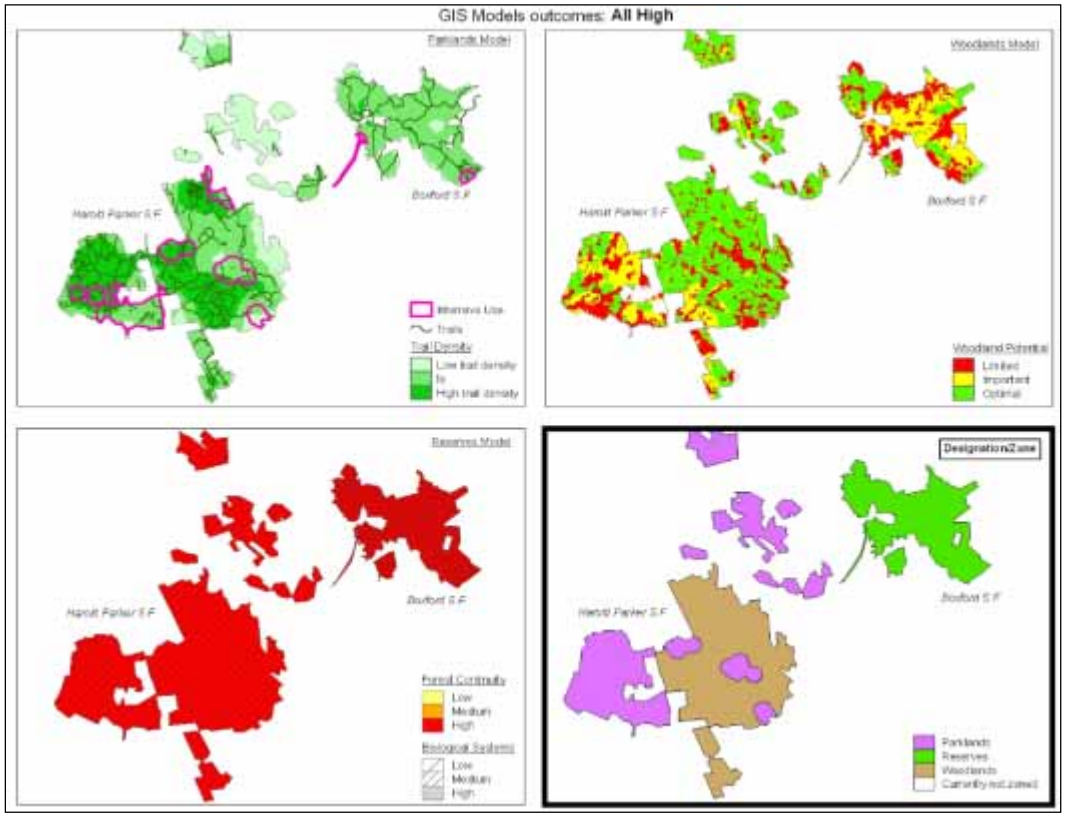
Upton S.F.
Designations2one
Blackstone River & Canal Heritage S.F.
Parklands
Reserves
Woodlands
Currently not zoned


GIS Models outcomes: All High
Parklands Model
Harold Parker S.F.
Boxford S.F.
Intensive Use
Trails
Trail Density
Low trail density
to
High trail density
Woodlands Model
Harold Parker S.F.
Boxford S.F.
Woodland Potential
Limited
Important
Optimal
Reserves Model
Harold Parker S.F.
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Forest Continuity
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Designations2one
Harold Parker S.F.
Boxford S.F.
Parklands
Reserves
Woodlands
Currently not zoned

## Active Forest Management Model Used to Rank Woodlands

Plain English Guide

The purpose of this model is to identify the best DCR DSPR lands for Active Forest Management (AFM). It uses a number of input datasets (described below) to rank land based on assigned values to produce this relative ranking of Woodlands.

Each of the twelve criteria is weighted evenly. Output grids are created for 95.5% of all DCR DSPR lands (the remaining 4.5% did not have data to support the model). The actual GIS processes used are described in the "Active Forest Management Model" document.[93]

### TSC Final Recommendations – Suggested Criteria for Woodlands (with Data Sources):

1. *Areas suitable for wood production* – Prime Forest Soils, Vegetation Suitability, Distance from Roads, Past Management
2. *Sites with a history of recent silvicultural treatments* – Past Management
3. *Areas where late successional characteristics could be restored via management* – Late Successional
4. *Forest type diversity* – Forest Diversity
5. *Potential impacts on communities most dependent on the local forest economy* – Distance to Sawmills, Sawmill Woodsheds, Harvester Woodsheds
6. *Areas suitable for early successional habitat creation* – Early Successional
7. *Sites requiring ecological restoration or prone to disturbance* – Ecological Restoration, Prone to Disturbance, Past Areas of Defoliation
8. *Watershed areas that would benefit from active forest manipulation* – Water Supply Protection Zones
9. *Proximity to wood processing facilities* – Distance to Sawmills, Sawmill Woodsheds
10. *Areas where forest management could increase carbon storage* – 2005 Forest Land
11. *Areas with good access for model forest demonstration activities* – Distance from Roads
12. *Suitability of site as a representative of forest type, age class and logging conditions for demonstration purposes* – Past Management, Vegetation Suitability, Fire Risk Areas, Prime Forest Soils

[93] This is an unpublished internal document outlining the process – it is available from DCR upon request.

**Data Sources and Processes:**

**1. Prime Forest Soils** – *forest soils with higher productivity are more appropriate for AFM*

**High value** is given to the most productive soils for growing trees.

**Low value** is given to the least productive soils for growing trees.

**2. Vegetation Suitability** – *certain forest types of different size and stocking classes are more appropriate for AFM than others*

**High value** is given to certain tree species that are large in size, overcrowded and would therefore respond well to active management to increase the growing space and encourage the best trees to thrive.

**Low value** is given to certain tree species that are small in size, already have adequate room for growth and therefore don't need active management to realize their highest growth potential.

**3. Past Management** – *if there has been past management, it has a higher value for AFM and the greater the number of past entries, the higher the value*

**High value** is given to areas that have been managed more frequently in the past.

**Low value** is given to areas that have not been managed much or at all in the past.

**4. Late successional** – *forest management can encourage late successional characteristics in certain forest stands*

**High value** is given to forest areas appropriate for late successional characteristic restoration, such as non-plantations or high stocking (density) or large tree size.

**Low value** is given to forest areas not appropriate for late successional characteristic restoration, such as plantations, medium to low stocking (density) or small tree size.

**5. Forest Type Diversity** – *forests with lower type diversity are better suited for management – this dataset uses species types, predominance, size class, stocking levels and past disturbance regimes as a measure of forest type diversity*

**High value** is given to forest areas with the lowest level of diversity since they represent greater opportunities for forest management to increase forest diversity.

**Low value** is given to forest areas with the highest level of diversity since they are already diverse.

**6. Distance to Sawmills** – *forest lands with shorter travel distances on public and forest roads to sawmills can be harvested more efficiently*

**High value** is given to areas close to sawmills since it is more economical to move forest products from forest to sawmill (this is based on measured travel distance).

**Low value** is given to areas far from sawmills since it is increasingly expensive to move forest products from forest to sawmill (this is based on measured travel distance).

**7. Sawmill Woodsheds** – *sawmill annual procurement volume ranges determine the effective forest zone of contribution (i.e., woodshed) in determining which forest lands can be harvested more efficiently*

**High value** is given to areas close to sawmills since it is more economical to move forest products from forest to sawmill (this is based on non-road linear distance).

**Low value** is given to areas far from sawmills since it is increasingly expensive to move forest products from forest to sawmill (this is based on non-road linear distance).

**8. Harvester Woodsheds** – *lands closer to 2010 licensed timber harvesters have a higher value for AFM, this dataset assumes that for lots > 5 acres, most harvesters would be willing to travel 25 (but not 50) miles based on Kittredge, et al research*

**High value** is given to areas close to licensed timber harvesters since it is more economical for them to be interested in timber sales on forests closer to their home.

**Low value** is given to areas far from licensed timber harvesters since it is increasingly expensive for them to be interested in timber sales on forests farther from their home.

**9. Early Successional** – *forest management can encourage early successional habitat creation in certain forest stands*

**High value** is given to forest areas appropriate for early successional habitat creation such as plantations, certain tree species, small tree size and open areas.

**Low value** is given to forest areas not appropriate for early successional habitat creation (inverse of above).

**10. Ecological Restoration** – *forest stands requiring ecological restoration (i.e., restoration of forests with native composition, structure, pattern and ecological processes) are well suited for forest management*

**High value** is given to forest areas appropriate for ecological restoration such as plantations or pitch pine/scrub oak communities.

**Low value** is given to forest areas not appropriate for ecological restoration (inverse of above).

**11. Prone to Disturbance** – *forest stands that are susceptible to natural disturbance are well suited for forest management*

**High value** is given to forest areas prone to natural disturbances such as insects, fire, windthrow, ice and beaver activity since forest management can help to restore a healthier more resilient forest.

**Low value** is given to forest areas not prone to natural disturbances (inverse of above).

**12. Past Areas of Defoliation** – *forest lands within insect infestation, disease outbreak or natural weather event areas have a higher value for AFM*

**High value** is given to forest areas that have had more recorded tree defoliation occurrences since forest management can help to restore a healthier more resilient forest.

**Low value** is given to forest areas that have had fewer recorded tree defoliation occurrences.

**13. Water Supply Protection Zones** – *forest lands within public water supply watersheds could benefit from active forest management*

*Zone A is land between surface water source and various smaller buffers*

*Zone B is land between surface water source and various larger buffers*

*Zone C is land not in Zone A or B but within the watershed of the surface water source*

**High value** is given to forest areas that are within Zones A, B or C.

**Low value** is given to forest areas that are not within Zones A, B or C.

**14. 2005 Forest Land** – *all forested land both increase the amount of carbon stored and the rate at which carbon is sequestered*

**High value** is given to forested land.

**Low value** is given to non-forested land.

**15. Distance from Roads** – *those lands that are closer to roads capable of supporting logging vehicles have a higher value for AFM*

**High value** is given to areas closer to roads since it is more economical and environmentally sound to access forest products close to a road so new roads don't have to be constructed.

**Low value** is given to areas further from roads since it is more costly and has a greater environmental impact to access these forest products.

**16. Fire Risk Areas** – *lands with the highest fire risk have the highest value for AFM (includes parameters for vegetation rate of spread and fuel load, topography for fuel moisture (aspect) and fire intensity (slope), and wildland urban interface)*

**High value** is given to areas with a higher fire risk since they would benefit from forest management to reduce this risk.

**Low value** is given to areas with a lower fire risk.

**Creating the Final AFM Grid:**

Each of the 12 TSC Criteria is weighted evenly (e.g., "Areas suitable for wood production" have 4 inputs and are scaled down and end up with the same weighting as "Forest type diversity" which only has 1 input). The 12 criteria are added up so any area with a value greater than 0 is added to the total score. If an area scores high on most of the 16 datasets described above, it will rank high for Woodlands, if an area scores low on most of the 16 datasets described above, it will rank low for Woodlands. An example of a high score would be an area on productive soils, close to a road, close to a sawmill, with past forest management, in a water supply zone, and prone to natural disturbance. Conversely, an example of a low score would be an area with low fire risk, no past defoliation, far from roads and timber harvesters, with high forest type diversity and small tree size.

Some of the input datasets are used more than once (e.g., Prime Forest Soils, Vegetation Suitability, Distance from Roads, Past Management, Distance to Sawmills and Sawmill Woodsheds). The reason is that Distance from Roads, for example, is useful for ranking areas suitable for wood production as well as areas with good access for model forest demonstration activities. Sawmill Woodsheds, for example, is useful for ranking potential impacts on communities most dependent on the local forest economy as well as proximity to wood processing facilities.

This dataset was classified into 3 categories with the same amount of area representing the categories "Limited", "Important" and "Optimal" for Woodlands.

**DCR Property Average**

The dataset described above was additionally processed to calculate an average AFM value for each DCR DSPR property (not including new properties acquired since the vegetation data was created in 2003). These property averages were used in the Landscape Designation process and compared to the model outputs for Reserves and Parklands to help guide the decision making process.

## Active Forest Management Model – Bare Bones Technical Guide

The purpose of this model is to identify the best DCR State Parks lands for Active Forest Management (AFM) based on the recommendations of the Technical Steering Committee (TSC). It uses a number of vector shapefiles and grids to rank land based on values given each of the input datasets (as described below) to produce this relative ranking of Woodlands.

The model converts all shapefiles to grids (with a value that ranges from 0 to 10) and then adds each of the twelve criteria inputs up. For TSC recommendations that required more than one input data source (#1, 5, 7, 9 and 12 listed below), these datasets had their values added up (e.g., since criteria #1 has four input grids, these values potentially range from 0 to 40). These multiple input source grids were then rescaled down to 0 to 10 so that each of the twelve TSC criteria was weighted evenly. Output grids are created for 95.5% of all DCR State Parks lands (the remaining 4.5% did not have data to support the model). The actual GIS processes used are described in the "Active Forest Management Model" document.

**TSC Final Recommendations – Suggested Criteria for Woodlands (with Data Sources):**

1. *Areas suitable for wood production* – Prime Forest Soils, Vegetation Suitability, Distance from Roads, Past Management
2. *Sites with a history of recent silvicultural treatments* – Past Management
3. *Areas where late successional characteristics could be restored via management* – Late Successional
4. *Forest type diversity* – Forest Diversity
5. *Potential impacts on communities most dependent on the local forest economy* – Distance to Sawmills, Sawmill Woodsheds, Harvester Woodsheds
6. *Areas suitable for early successional habitat creation* – Early Successional
7. *Sites requiring ecological restoration or prone to disturbance* – Ecological Restoration, Prone to Disturbance, Past Areas of Defoliation
8. *Watershed areas that would benefit from active forest manipulation* – Water Supply Protection Zones
9. *Proximity to wood processing facilities* – Distance to Sawmills, Sawmill Woodsheds
10. *Areas where forest management could increase carbon storage* – 2005 Forest Land
11. *Areas with good access for model forest demonstration activities* – Distance from Roads
12. *Suitability of site as a representative of forest type, age class and logging conditions for demonstration purposes* – Past Management, Vegetation Suitability, Fire Risk Areas, Prime Forest Soils

**Data Sources and Processes:**

**1. Prime Forest Soils** – *forest soils with higher productivity are more appropriate for AFM*

Value:
10 – Prime 1
8 – Prime 2
6 – Prime 3 and 3W
4 – Statewide and SW
2 – Local and LW
0 – Unique and Non-Forest

Input: ***PRIME FOREST SOILS*** (from MassGIS)

Output: ***PFGRID***

This dataset is missing all data from Franklin County – for this areas, we used an average number based on the average value from Berkshire and Hampshire counties = Prime 3 (both counties had this average).

**2. Vegetation Suitability** – *certain forest types of different size and stocking classes are more appropriate for AFM than others*

| | | |
|---|---|---|
| Value of 10 for: MajorGroups | | 1 White/Red Pine |
| | | 2 Hemlock |
| | | 3 Spruce-Fir |
| | | 5 Northern Hardwoods |
| | | 6 Birch – Red Maple |
| | | 7 Oak |
| | or SubTypes | SR Red Spruce |
| | | SF Spruce-Fir |
| | | SN Norway Spruce – White Spruce Plantation |
| | | PP Pitch Pine |
| | | PO Pitch Pine - Oak |
| | | PS Pitch Pine - Scrub Oak |
| | | SO Scrub Oak |
| | and Stocking | 1 High (A or > 120 $ft^2$/ac) |
| | | 2 Medium (B/A or 60 – 120 $ft^2$/ac) |
| | and Size | 4 Small Sawtimber (10.9 – 15" mmd) |
| | | 5 Large Sawtimber (> 15" mmd) |
| | | 9 Uneven Aged (3 or more age classes) |
| Value of 5 for: | Same as "Value 10" except: | |
| | Stocking | 3 Low (C/B or 40 – 60 $ft^2$/ac) |
| | | 4 Sparse (< 40 $ft^2$/ac) |
| Value of 1 for: | Same as "Value 10" except: | |
| | Stocking | all 4 levels |
| | and Size | 1 Seedling (< 1" dbh, < 10' tall) |
| | | 2 Sapling (> 1" – 4.6" dbh, < 30' tall) |
| | | 3 Pole (> 4.6 – 10.9" mmd) |
| | and SubTypes | RC Red Cedar |
| | | LA Larch Plantation |
| Value of 0 for: | Everything else | |

Input: ***SEWALL LAND CLASSIFICATION*** (developed for DCR under contract)

Output: ***VEGGRID***

**3. Past Management** – *if there has been past management, it has a higher value for AFM and the greater the number of past entries, the higher the value*

Value 10 – 5 past management entries
9 – 4 past management entries
8 – 3 past management entries
7 – 2 past management entries
6 – 1 past management entries
0 – no past management entries

Input: ***FOREST CUTTING PLANS*** (developed by DCR Management Forestry staff)

Output: ***PASTMANGRID***

**4. Late successional** – *forest management can encourage late successional characteristics in certain forest stands*

Value 10 – forest areas appropriate for late successional characteristic restoration
(***inverse of below***)
Non-plantations and
Stocking (1 – high) and
Size (5 – large Sawtimber) and
MajorGroups (1 – 5, 7)

Value 0 – forest areas not appropriate for late successional characteristic restoration
Plantation SubTypes (LA, RP, SN, SP, WL) or SubTypes (PO, PP, PS, SO) or
Stocking (2 – medium, 3 – low, 4 – sparse) or
Size (1 – seedling, 2 – sapling, 3 – pole, 4 – small sawtimber, 9 – uneven aged) or
MajorGroups (0 – non-forest, 6 – birch – red maple, 8 – swamp softwoods, 9 – swamp hardwoods, 10 – water/non-forested wetlands)

Input: ***SEWALL LAND CLASSIFICATION*** (developed for DCR under contract)

Output: ***LATEGRID***

**5. Forest Type Diversity** – *forests with lower type diversity are better suited for management – this dataset uses species types, predominance, size class, stocking levels and past disturbance regimes as a measure of forest type diversity*

| | | |
|---|---|---|
| Value | 10 | 1 forest type polygon within the analysis area (lowest level of diversity) |
| | 9 | 2 forest type polygons within the analysis area |
| | 8 | 3 forest type polygons within the analysis area |
| | 7 | 4 forest type polygons within the analysis area |
| | 6 | 5 forest type polygons within the analysis area |
| | 5 | 6 forest type polygons within the analysis area |
| | 4 | 7 forest type polygons within the analysis area |
| | 3 | 8 forest type polygons within the analysis area |
| | 2 | 9 forest type polygons within the analysis area |
| | 1 | 10 forest type polygons within the analysis area (highest level of diversity) |

Input: ***SEWALL LAND CLASSIFICATION*** (developed for DCR under contract)

Output: ***DIVERSITYGRID***

**6. Distance to Sawmills** – *forest lands with shorter travel distances on public and forest roads to sawmills can be harvested more efficiently*

Value:
10 – within 10 kilometers (6.2 miles)
8 – within 20 kilometers (12.4 miles)
6 – within 30 kilometers (18.6 miles)
4 – within 40 kilometers (24.8 miles)
2 – within 50 kilometers (31.0 miles)
0 – greater than 50 kilometers away (31.0 miles)

Input: ***SAWMILL DISTANCE*** (developed by DCR Management Forestry staff)

Output: ***SAWDISTGRID***

**7. Sawmill Woodsheds** – *sawmill annual procurement volume ranges determine the effective forest zone of contribution (i.e., woodshed) in determining which forest lands can be harvested more efficiently*

Value:
10 – > 44 to 52
9 – > 40 to 44
8 – > 35 to 40
7 – > 31 to 35
6 – > 27 to 31

5 – > 21 to 27
4 – >16 to 21
3 – > 13 to 16
2 – > 8 to 13
1 – 0 to 8

Input: ***SAWMILL_WOODSHEDS*** (developed by UMass Department of Natural Resources Conservation and used by permission)

Output: ***SAWMILLGRID***

**8. Harvester Woodsheds** – *lands closer to 2010 licensed timber harvesters have a higher value for AFM, this dataset assumes that for lots > 5 acres, most harvesters would be willing to travel 25 (but not 50) miles based on Kittredge, et al research*

Value
10 – > 163 to 201
9 – > 143 to 163
8 – > 123 to 143
7 – > 103 to 123
6 – > 74 to 103
5 – > 34 to 74
4 – > 20 to 34
3 – > 14 to 20
2 – > 5 to 14
1 – 0 to 5

Input: ***HARVESTER_WOODSHEDS*** (developed by UMass Department of Natural Resources Conservation and used by permission)

Output: ***HARVESTERGRID***

**9. Early Successional** – *forest management can encourage early successional habitat creation in certain forest stands*

Value (from ***SEWALLVEGETATION***)
10 – forest areas appropriate for early successional habitat creation
Plantation SubTypes (LA, RP, SN, SP, WL) or
Size (1 –seedling, 2 – sapling, 3 – pole) and
MajorGroups (1 – 7)

(from ***LANDUSE2005***)

10 – non forest areas appropriate for early successional habitat creation
Crop (1), Pasture (2), Open (6), Transitional (17), Powerline/Utility (24) or Brushland/Successional (40)

Value (from ***SEWALLVEGETATION***)
0 – forest areas not appropriate for early successional habitat creation
(inverse of above)

(from ***LANDUSE2005***)
0 – areas not appropriate for early successional habitat creation
(inverse of above)

Input: ***SEWALL LAND CLASSIFICATION*** (developed for DCR under contract) and ***LANDUSE2005*** (from MassGIS)

Output: ***EARLYGRID***

**10. Ecological** Restoration – *forest stands requiring ecological restoration (i.e., restoration of forests with native composition, structure, pattern and ecological processes) are well suited for forest management*

Value 10 – forest stands requiring ecological restoration (plantations or pitch pine/scrub oak)
0 – all other areas

Input: ***SEWALL LAND CLASSIFICATION*** (developed for DCR under contract)

Output: ***ECORESGRID***

**11. Prone to Disturbance** – *forest stands that are susceptible to natural disturbance are well suited for forest management*

Value 10 – forest stands prone to natural disturbance
0 – all other areas

Input: ***SEWALL LAND CLASSIFICATION*** (developed for DCR under contract)

Output: ***DISTURBGRID***

**12. Past Areas of Defoliation** – *forest lands within insect infestation, disease outbreak or natural weather event areas have a higher value for AFM*

Value: 10 – 10 and above
9 – 9
8 – 8
7 – 7
6 – 6
5 – 5
4 – 4
3 – 3
2 – 2
1 – 1
0 – 0

Input: ***BUGS34 to BUGS09*** (from MassGIS)

Output: ***DEFOLGRID***

**13. Water Supply Protection Zones** – *forest lands within public water supply watersheds could benefit from active forest management*

*Zone A is land between surface water source and various smaller buffers*
*Zone B is land between surface water source and various larger buffers*
*Zone C is land not in Zone A or B but within the watershed of the surface water source*

Value 10 – forest land within water supply protection zone A, B or C
0 – all other land

Input: ***DCR_ID6*** (from MassGIS)

Output: ***WATERGRID***

**14. 2005 Forest Land** – *all forested land both increase the amount of carbon stored and the rate at which carbon is sequestered*

Value 10 – forested land
0 – all other areas

Input: ***LANDUSE2005*** (from MassGIS)

Output: ***FORESTGRID***

**15. Distance from Roads** – *those lands that are closer to roads capable of supporting logging vehicles have a higher value for AFM*

Value:
10 – Within 750 foot buffer (229 meters)
8 – Within 1,500 foot buffer (457 meters)
6 – Within 2,250 foot buffer (686 meters)
4 – Within 3,000 foot buffer (914 meters)
2 – Within 3,750 foot buffer (1,143 meters)
0 – Outside of 3,750 feet

Input: ***EOTROADS*** (from MassGIS), ***DCR ROAD AND TRAIL DATA*** (developed by DCR Management Forestry staff and consultants) and road data from surrounding states

Output: ***ROADBUFGRID***

**16. Fire Risk Areas** – *lands with the highest fire risk have the highest value for AFM (includes parameters for vegetation rate of spread and fuel load, topography for fuel moisture (aspect) and fire intensity (slope), and wildland urban interface)*

Value:
10 – >25 – 45
9 – >24 – 25
8 – >23 – 24
7 – >22 – 23
6 – >21 – 22
5 – >20 – 21
4 – >18 – 20
3 – >14 – 18
2 – >9 – 14
1 – >6 – 9
0 – 0 – 6

Input: ***WLDFR_OLY_RC*** (developed by DCR Management Forestry staff with UMass Department of Natural Resources Conservation)

Output: ***FIREGRID***

**Creating the Final AFM Grid:**

Each of the 12 TSC Criteria is weighted evenly (e.g., "Areas suitable for wood production" have 4 inputs grids and are scaled down and end up with the same weighting as "Forest type diversity" which only has 1 input) to create the grid ***AFMGRID2*** (values range from 0 to 104). The 12 criteria are added up so any

area with a value greater than 0 is added to the total score. If an area scores high on most of the 16 datasets described above, it will rank high for Woodlands, if an area scores low on most of the 16 datasets described above, it will rank low for Woodlands. An example of a high score would be an area on productive soils, close to a road, close to a sawmill, with past forest management, in a water supply zone, and prone to natural disturbance. Conversely, an example of a low score would be an area with low fire risk, no past defoliation, far from roads and timber harvesters, with high forest type diversity and small tree size.

Some of the input datasets are used more than once (e.g., Prime Forest Soils, Vegetation Suitability, Distance from Roads, Past Management, Distance to Sawmills and Sawmill Woodsheds). The reason is that Distance from Roads, for example, is useful for ranking areas suitable for wood production as well as areas with good access for model forest demonstration activities. Sawmill Woodsheds, for example, is useful for ranking potential impacts on communities most dependent on the local forest economy as well as proximity to wood processing facilities.

This grid was classified into 3 quantiles representing the categories “Limited” (0 – 52), “Important” (53 – 60) and “Optimal” (61 – 104).

**DCR Property Average**

The ***AFMGRID2*** grid was processed to calculate an average AFM value for each DCR DSPR property (not including new properties acquired since the vegetation data was created). These property averages were used in the Landscape Zoning designation process and compared to the model outputs for Reserves and Parklands to help guide the decision making process.

# Appendix 10. Contributors

***Department of Conservation and Recreation***

| | |
|---|---|
| Andy Backman | Director, Office of Regional Planning |
| Gary Briere | Chief, Bureau of Recreation |
| Dave Celino | Chief Fire Warden |
| Peter Church | Director, Forest Stewardship |
| Mike Fleming | Planner, Bureau of Forestry |
| David Goodwin | Assistant Program Manager, Management Forestry |
| William Hill, CF | Program Supervisor, Management Forestry |
| Paul Jahnige | Director, Greenways & Trails Program |
| Chandreyee Lahiri | GIS Specialist, GIS Office |
| Nathanael Lloyd | Director, GIS Office |
| Paul Lyons | Environmental Analyst, Division of Water Supply Protection |
| Joe Orfant | Director, Bureau of Planning & Resource Protection |
| Tim Rayworth | Environmental Education Coordinator, Bureau of Ranger Services |
| Jessica Rowcroft | Planner, Bureau of Planning & Resource Protection |
| Jason Silva | Commissioner's Chief of Staff |
| Chris Williams | Deputy Chief Park Ranger, Bureau of Ranger Services |
| Tim Zelazo | District Manager, Division of State Parks |

***Department of Fish and Game, Division of Fish and Wildlife***

| | |
|---|---|
| Tom O'Shea | Assistant Director of Wildlife |
| John Scanlon | Forestry Project Leader |

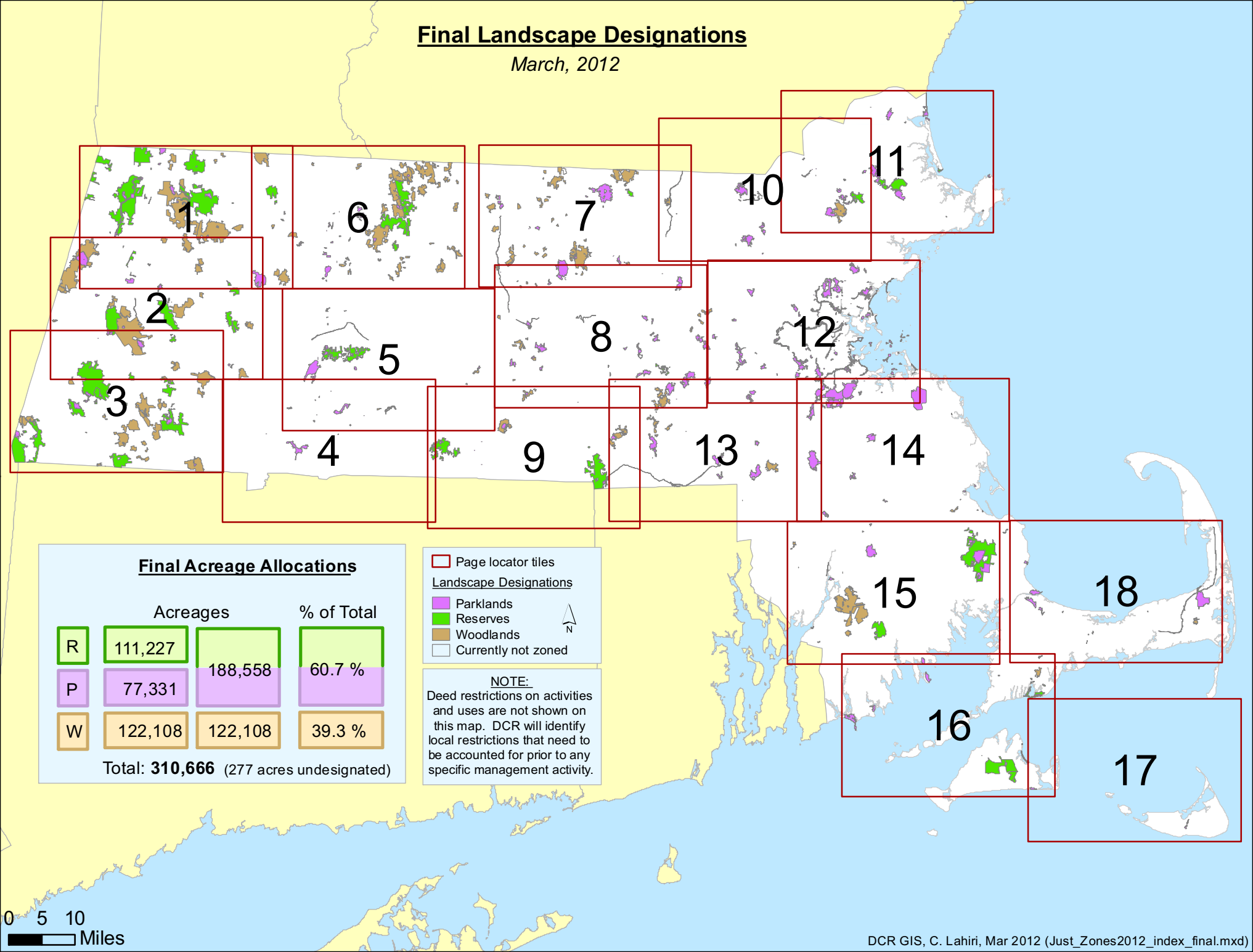
***Executive Office of Energy and Environmental Affairs***

| | |
|---|---|
| Stephanie Cooper | Assistant Secretary for Land and Forest Conservation |
| Bob O'Connor | Director of Land and Forest Conservation |

# Appendix 11. Final Landscape Designation Maps

# Final Landscape Designations

*March, 2012*




## Final Acreage Allocations

| | Acreages | | % of Total |
|---|---|---|---|
| R | 111,227 | 188,558 | 60.7 % |
| P | 77,331 | | |
| W | 122,108 | 122,108 | 39.3 % |

Total: **310,666** (277 acres undesignated)

Page locator tiles

Landscape Designations

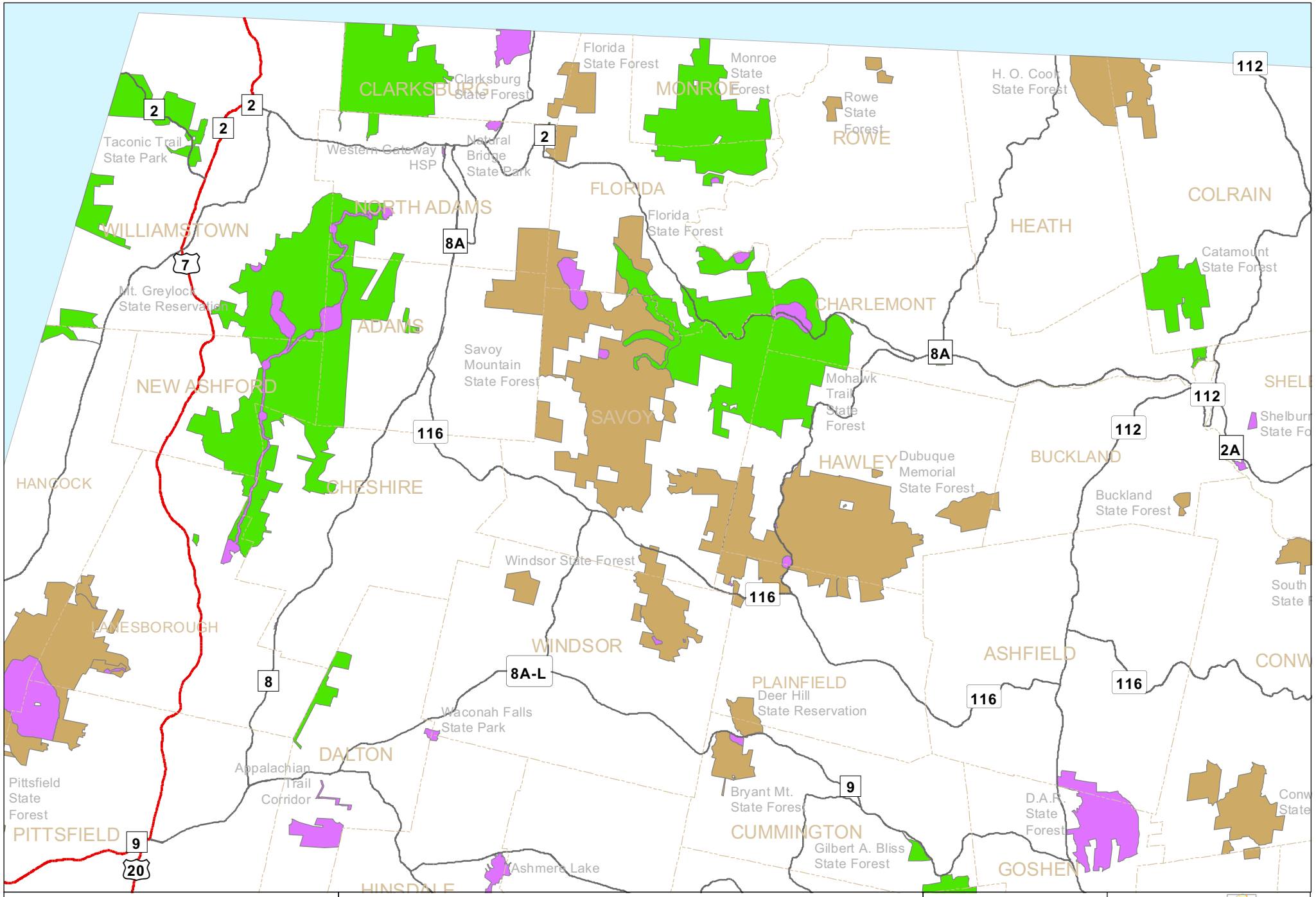
- Parklands
- Reserves
- Woodlands
- Currently not zoned

N

NOTE:
Deed restrictions on activities and uses are not shown on this map. DCR will identify local restrictions that need to be accounted for prior to any specific management activity.

0 5 10 Miles

DCR GIS, C. Lahiri, Mar 2012 (Just_Zones2012_index_final.mxd)




Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

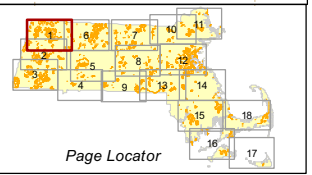
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

# LANDSCAPE DESIGNATIONS

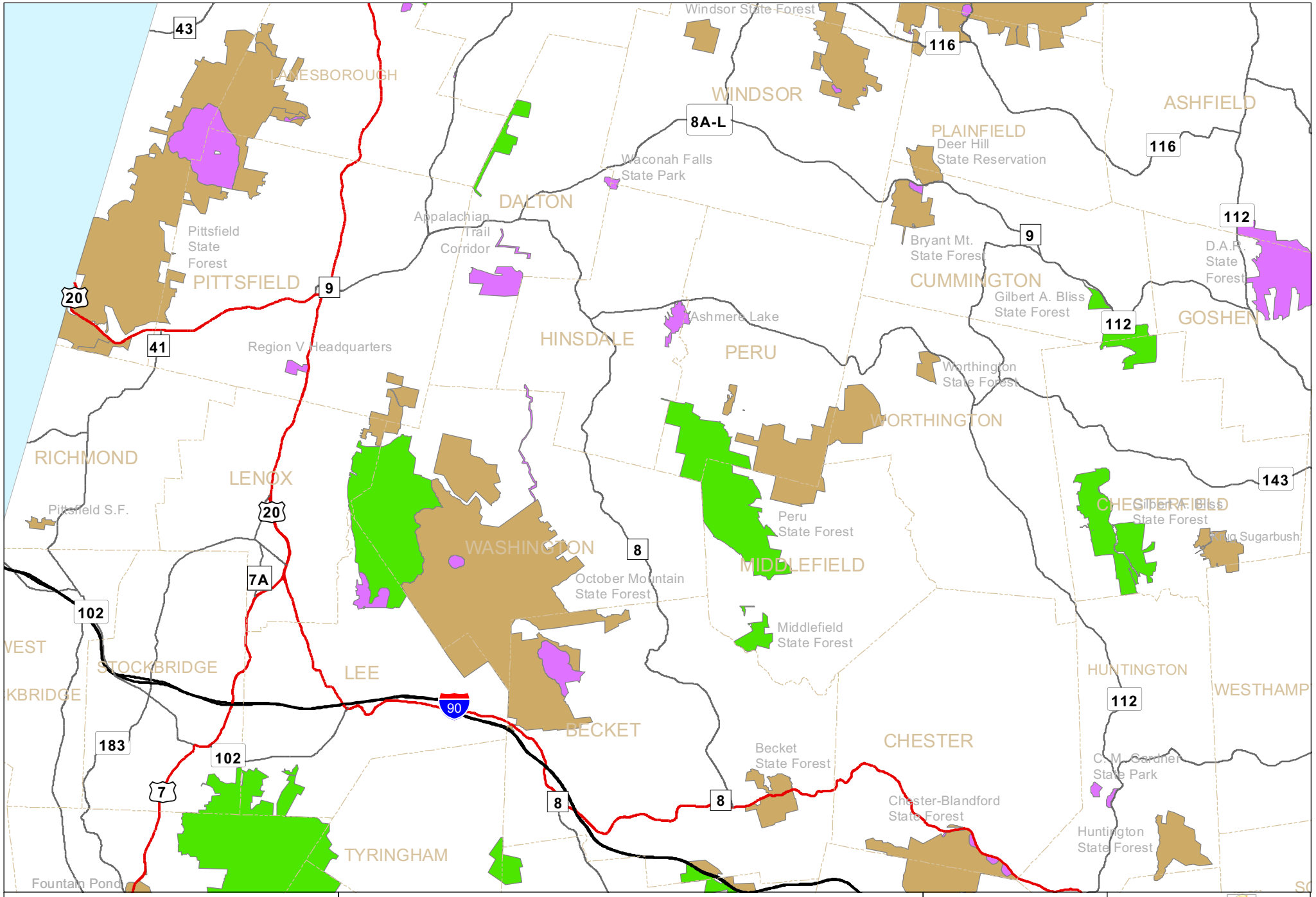
## Berkshire - North

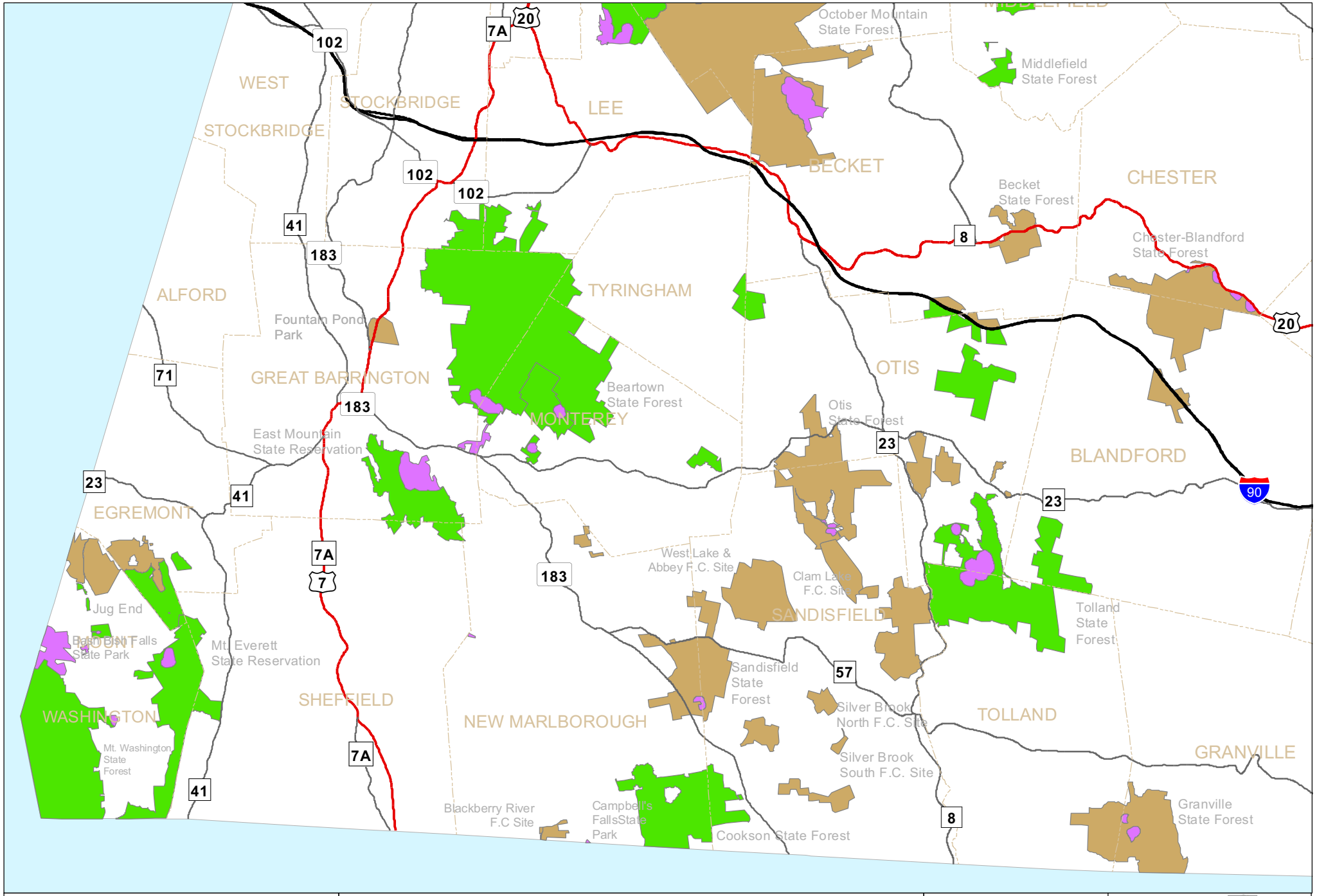
*(locator page 1)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm



*Page Locator*


Windsor State Forest
LANESBOROUGH
WINDSOR
ASHFIELD
PLAINFIELD
Deer Hill
State Reservation
Waconah Falls
State Park
DALTON
Appalachian
Trail
Corridor
Pittsfield
State
Forest
PITTSFIELD
Bryant Mt.
State Forest
CUMMINGTON
Gilbert A. Bliss
State Forest
D.A.R.
State
Forest
GOSHEN
Ashmere Lake
HINSDALE
PERU
Region V Headquarters
Worthington
State Forest
WORTHINGTON
RICHMOND
LENOX
Pittsfield S.F.
Peru
State Forest
CHESTERFIELD
Gilbert A. Bliss
State Forest
Rte Sugarbush
WASHINGTON
October Mountain
State Forest
MIDDLEFIELD
Middlefield
State Forest
VEST
STOCKBRIDGE
LEE
HUNTINGTON
KBRIDGE
WESTHAMP
BECKET
CHESTER
Becket
State Forest
C.M. Gardner
State Park
Chester-Blandford
State Forest
Huntington
State Forest
TYRINGHAM
Fountain Pond
43
116
8A-L
9
112
20
41
7A
102
143
8
90
183
7
Landscape Designations
Parklands
Reserves
Woodlands
Currently not zoned
0 1 2 Miles
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd
N
LANDSCAPE DESIGNATIONS
Berkshire - Central
(locator page 2)
NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm
Page Locator




Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

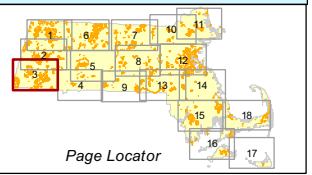
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

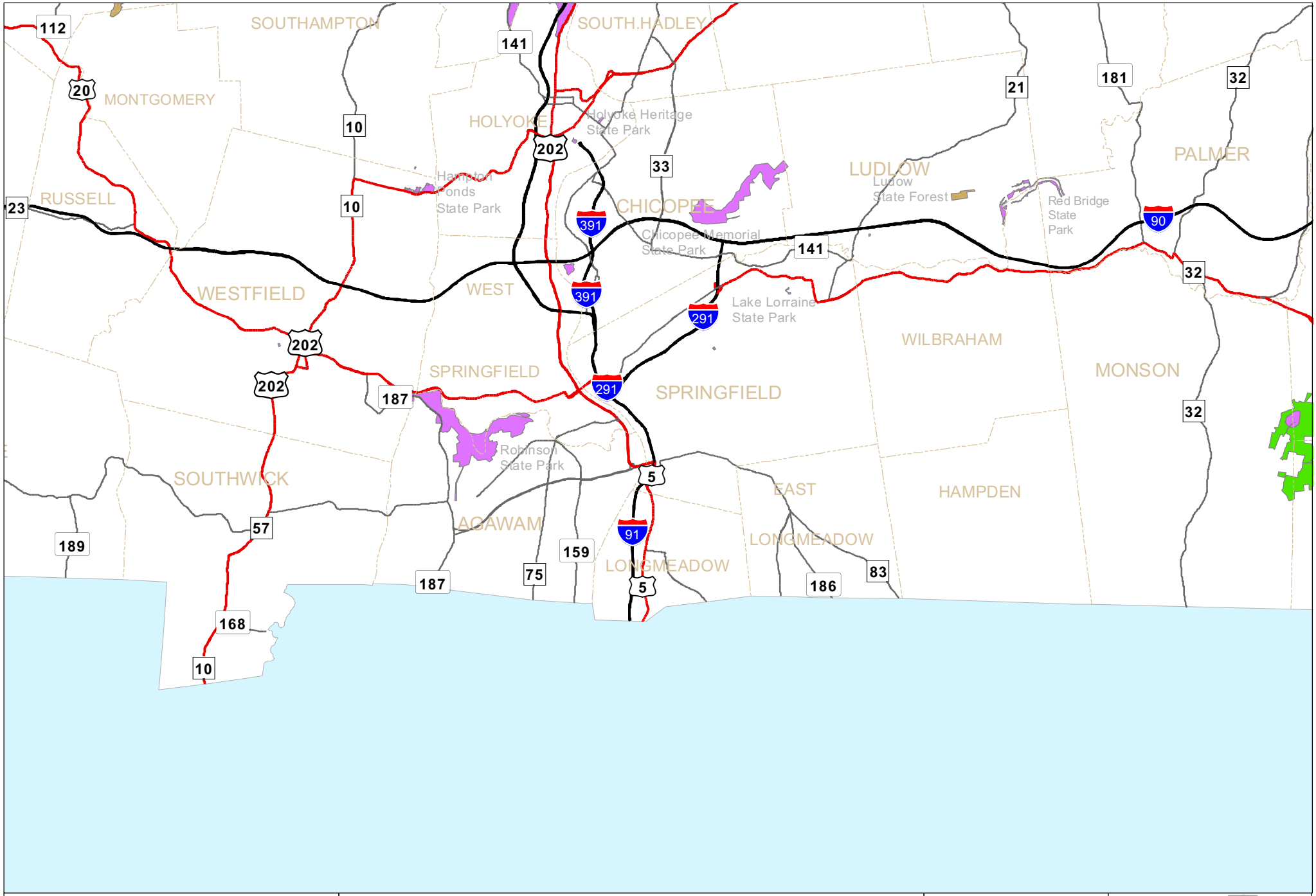
# LANDSCAPE DESIGNATIONS

## Berkshire - South

*(locator page 3)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm






Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

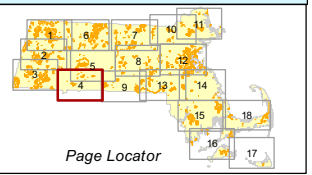
N

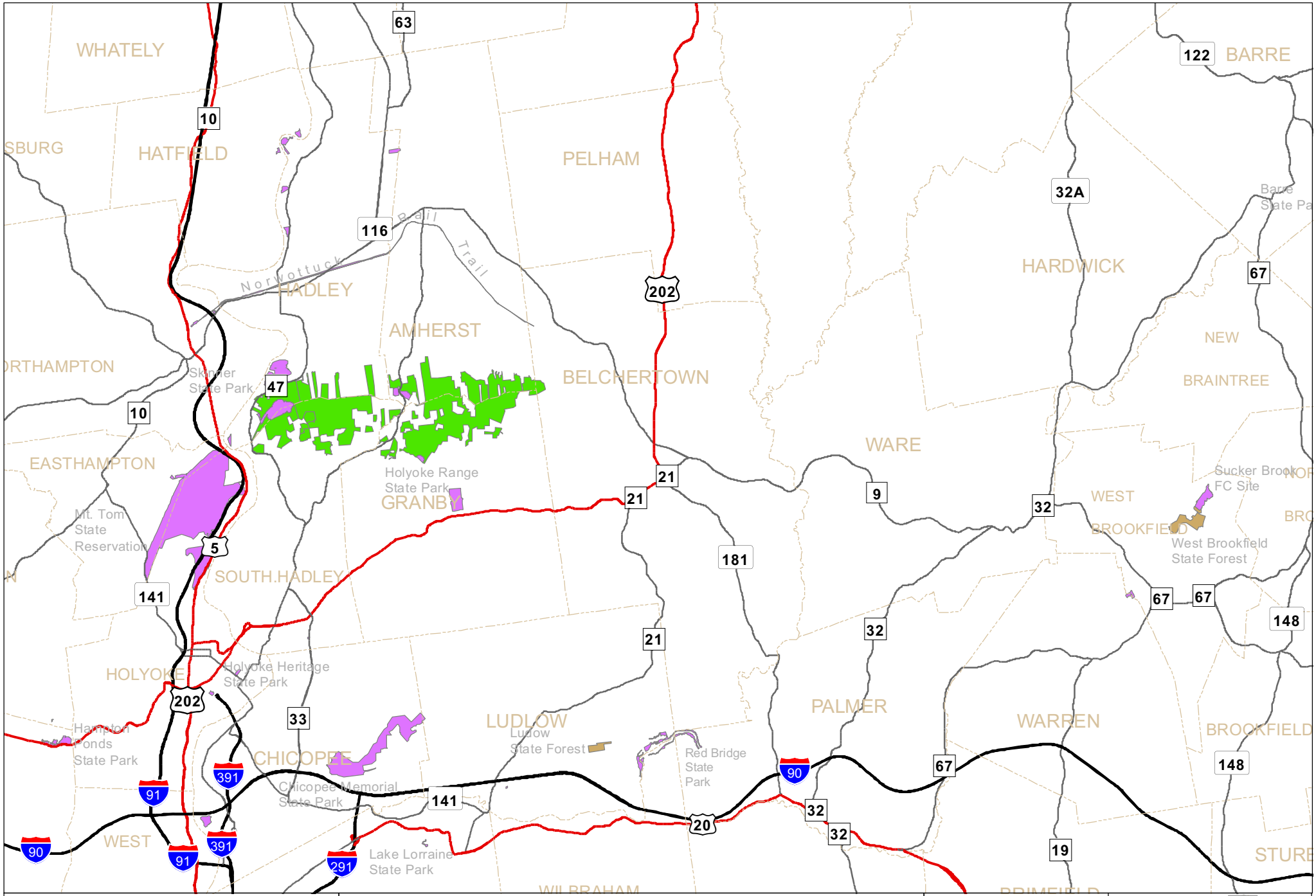
# LANDSCAPE DESIGNATIONS

## Valley - South

*(locator page 4)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm






Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

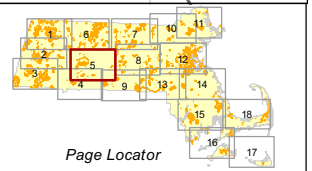
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

# LANDSCAPE DESIGNATIONS

## Valley - Central

*(locator page 5)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm



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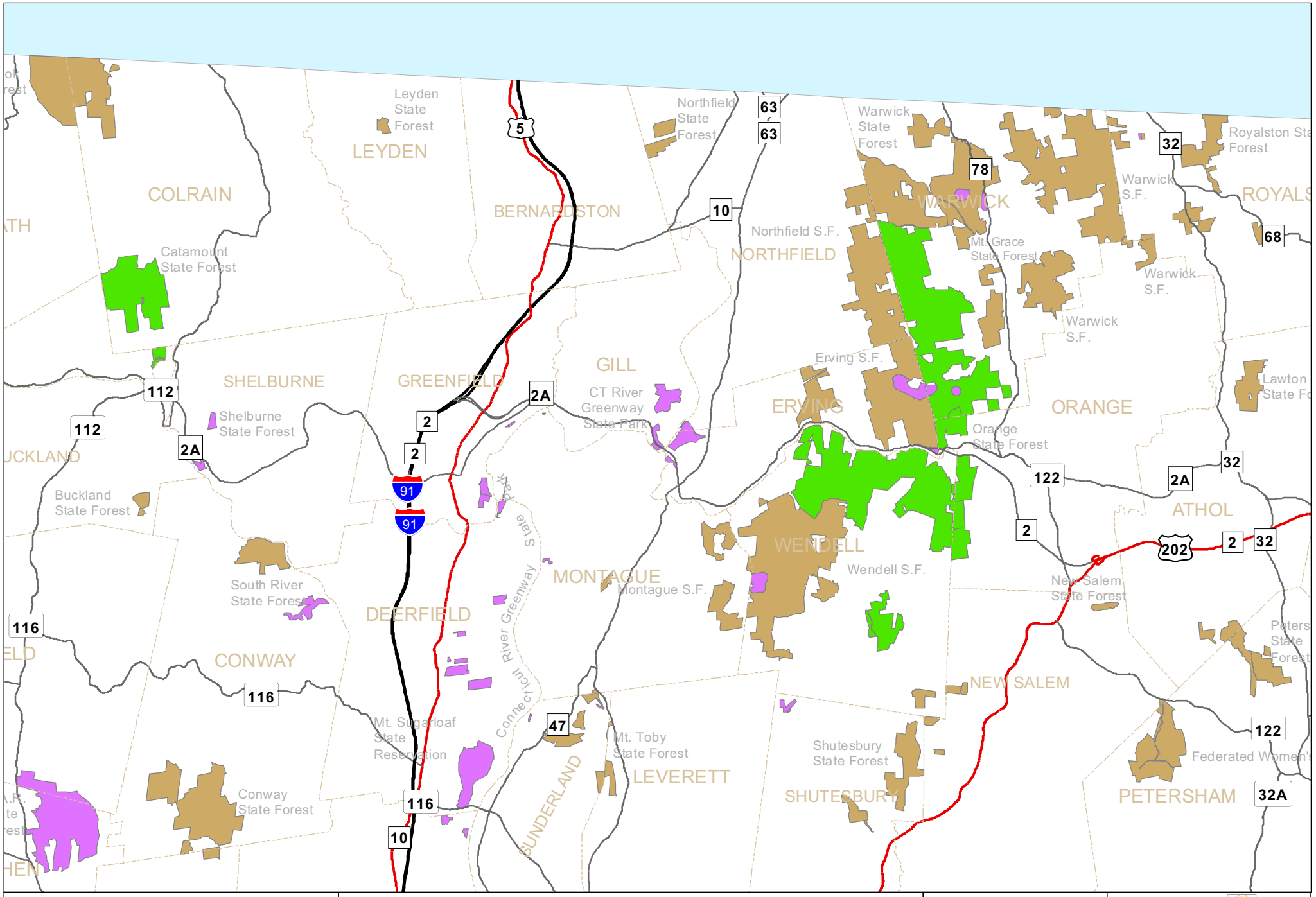



Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

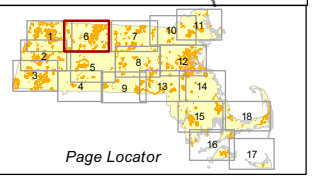
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

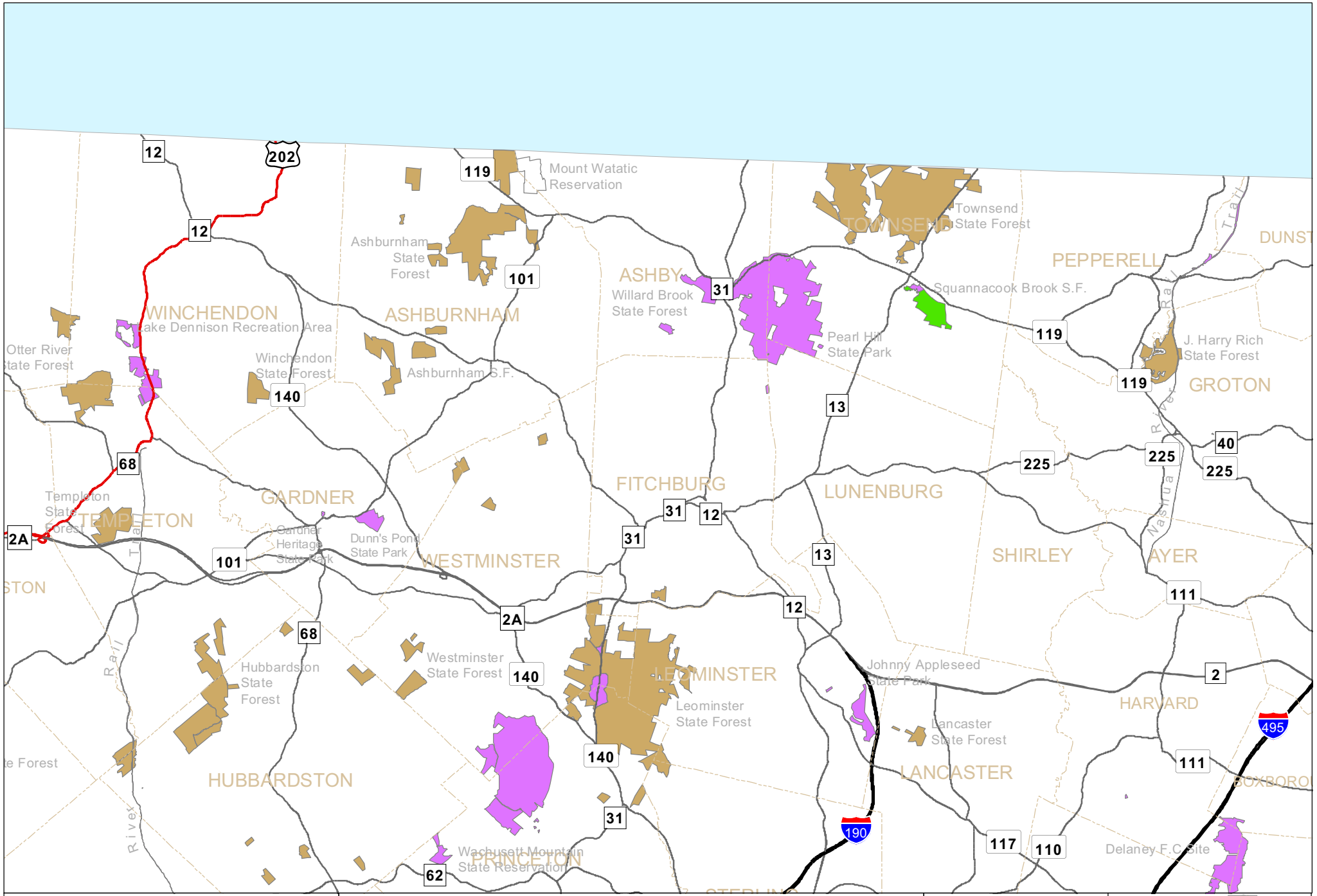
# LANDSCAPE DESIGNATIONS

## Valley - North

*(locator page 6)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm




12
202
12
119
Mount Watatic Reservation
Ashburnham State Forest
101
ASHBY
Willard Brook State Forest
31
TOWNSEND
Townsend State Forest
PEPPERELL
Squannacook Brook S.F.
119
J. Harry Rich State Forest
119
GROTON
WINCHENDON
Lake Dennison Recreation Area
ASHBURNHAM
Otter River State Forest
Winchendon State Forest
140
Ashburnham S.F.
Pearl Hill State Park
13
68
225
225
40
225
Templeton State Forest
GARDNER
FITCHBURG
LUNENBURG
TEMPLETON
31
12
2A
Gardner Heritage State Park
Dunn's Pond State Park
31
13
SHIRLEY
AYER
101
WESTMINSTER
111
12
2A
68
Hubbardston State Forest
Westminster State Forest
140
LEOMINSTER
Johnny Appleseed State Park
2
Leominster State Forest
HARVARD
495
Lancaster State Forest
140
111
HUBBARDSTON
LANCASTER
31
190
117
110
Delaney F.C. Site
Wachusett Mountain State Reservation
62
PRINCETON
Landscape Designations
Parklands
Reserves
Woodlands
Currently not zoned
0 1 2 Miles
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd
N
LANDSCAPE DESIGNATIONS
Worcester - North
(locator page 7)
NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm
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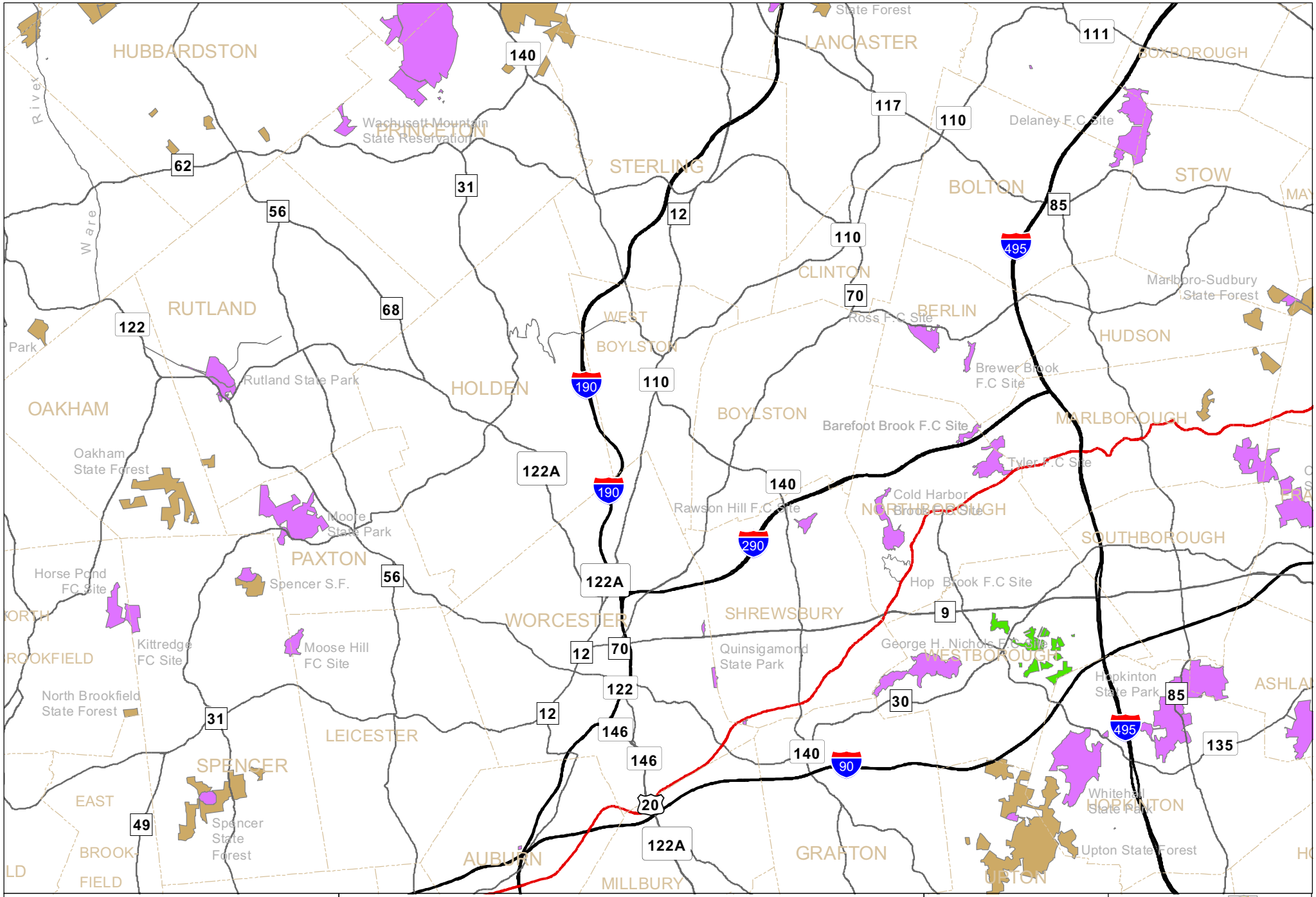



Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

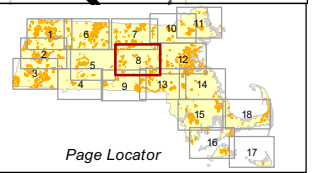
N

# LANDSCAPE DESIGNATIONS

## Worcester area

*(locator page 8)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm




Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

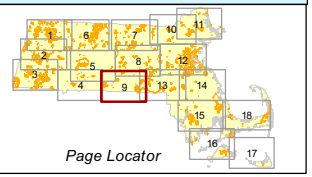
N

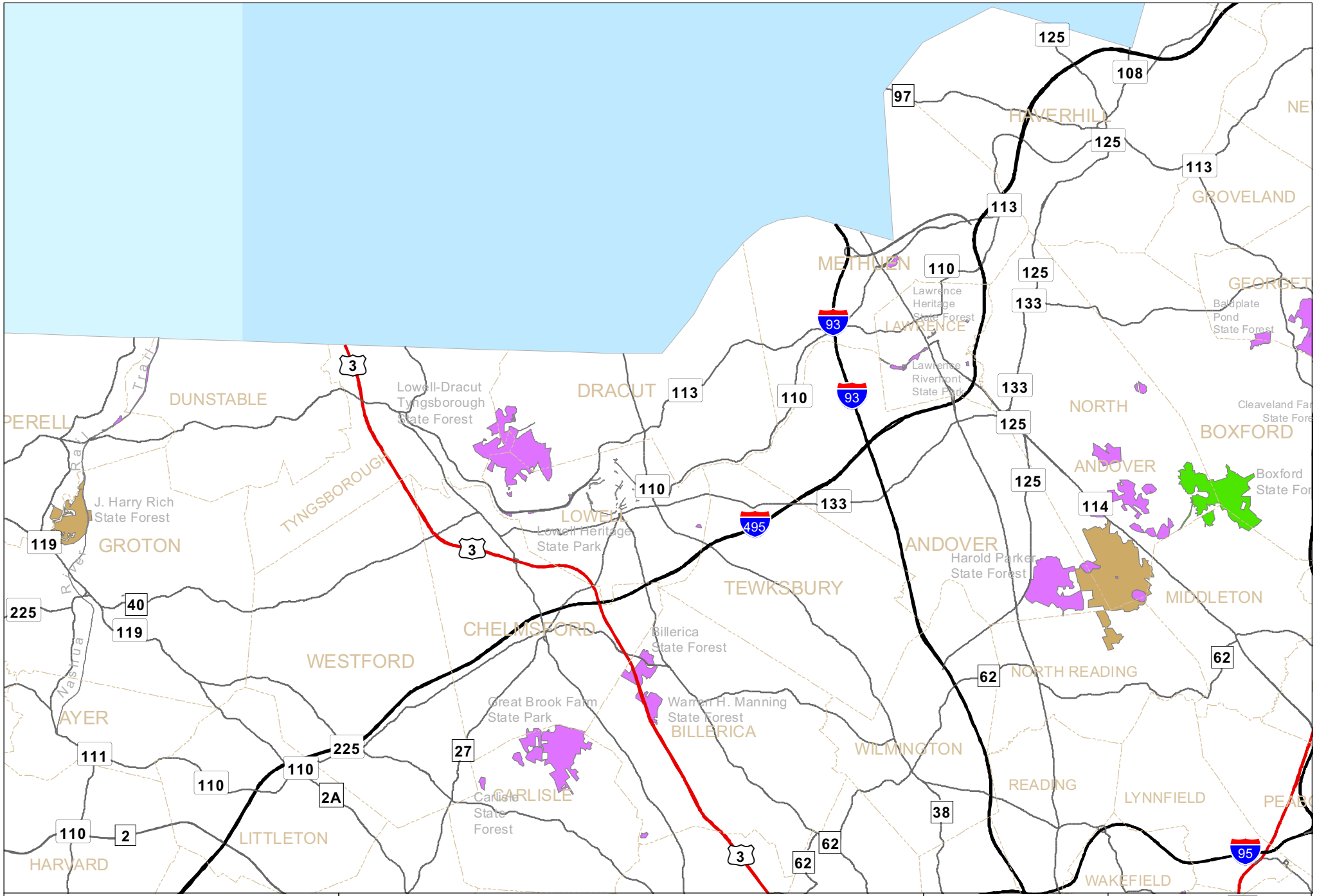
# LANDSCAPE DESIGNATIONS

## Worcester - South

*(locator page 9)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm






Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

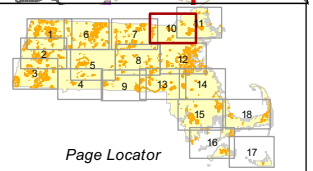
N

# LANDSCAPE DESIGNATIONS

## Lowell area

*(locator page 10)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm



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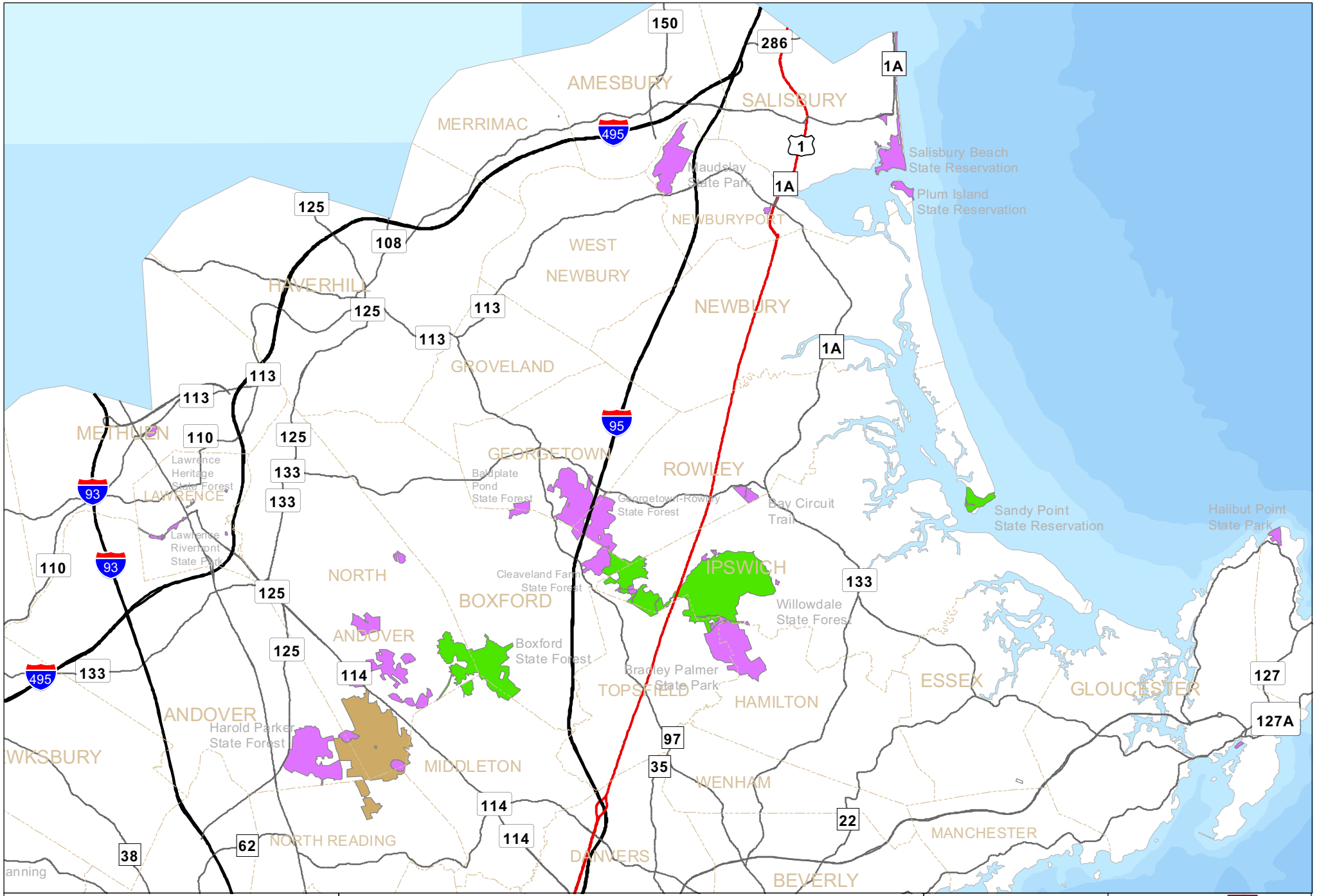



Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

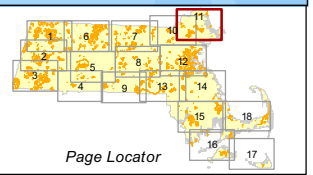
N

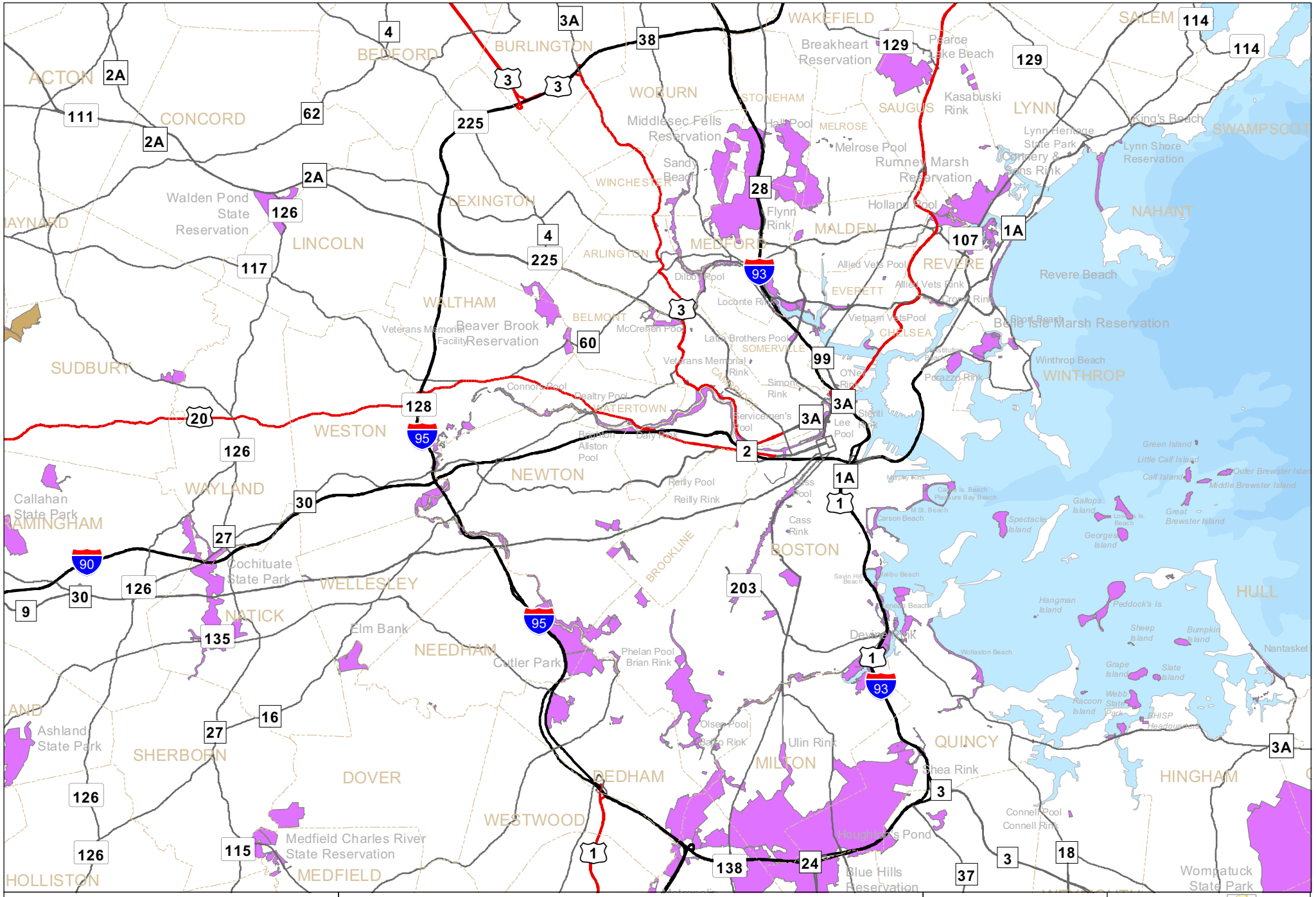
# LANDSCAPE DESIGNATIONS

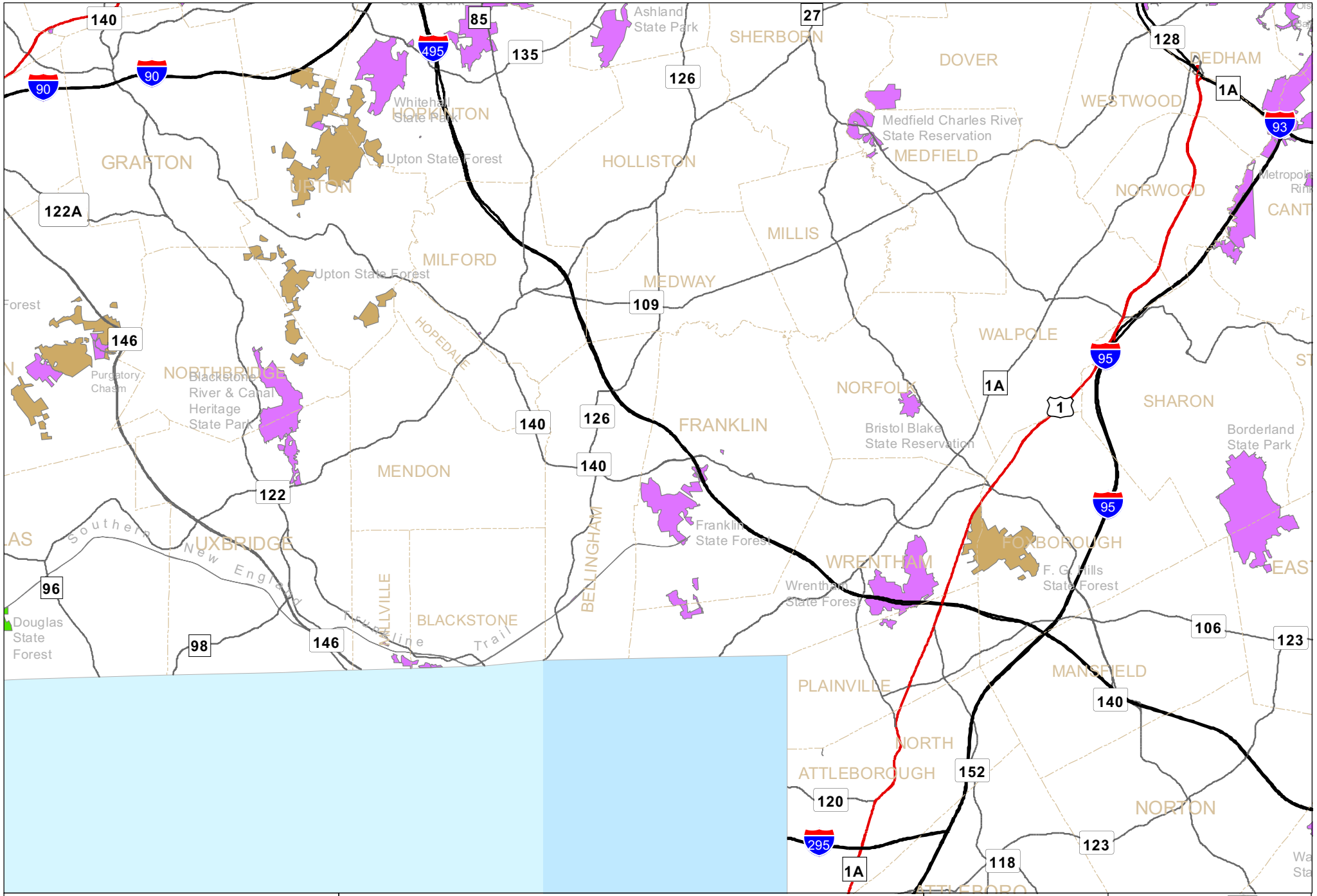
## Northeast

*(locator page 11)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm




ACTON
CONCORD
BEDFORD
BURLINGTON
WOBURN
STONEHAM
WAKEFIELD
SAUGUS
LYNN
SALEM
SWAMPSCOTT
NAHANT
MALDEN
MELROSE
MEDFORD
REVERE
EVERETT
CHELSEA
WINTHROP
Revere Beach
Lynn Shore Reservation
Breakheart Reservation
Pearce Lake Beach
Kasabuski Rink
Middlesex Fells Reservation
Melrose Pool
Rumney Marsh Reservation
Lynn Heritage State Park
Cannery & Sons Rink
King's Beach
Walden Pond State Reservation
LINCOLN
LEXINGTON
WINCHESTER
ARLINGTON
Sandy Beach
Flynn Rink
Holland Pool
Allied Vets Pool
Allied Vets Rink
Crown Rink
Dilboy Pool
Locante Rink
Vietnam Vets Pool
Short Beach
Belle Isle Marsh Reservation
Winthrop Beach
Porazzo Rink
WALTHAM
Beaver Brook Reservation
Veterans Memorial Facility
BELMONT
McCrehen Pool
Latta Brothers Pool
SOMERVILLE
Veterans Memorial Rink
O'Neill Rink
Simoni Rink
SUDBURY
Connors Pool
Dealtry Pool
WATERTOWN
Servicemen's Pool
Lee Pool
Steriti Rink
Allston Pool
Daly Rink
WESTON
NEWTON
Reilly Pool
Reilly Rink
Cass Pool
Cass Rink
Callahan State Park
WAYLAND
FRAMINGHAM
Cochituate State Park
WELLESLEY
BROOKLINE
BOSTON
Carson Beach
M St. Beach
Pleasure Bay Beach
Spectacle Island
Gallops Island
Georges Island
Great Brewster Island
Green Island
Little Calf Island
Calf Island
Outer Brewster Island
Middle Brewster Island
Hangman Island
Peddock's Is
Sheep Island
Bumpkin Island
Nantasket
Grape Island
Slate Island
Raccoon Island
Webb State Park
DHSP Headquarters
HULL
NATICK
Elm Bank
NEEDHAM
Cutler Park
Phelan Pool
Brian Rink
Devine Rink
Wollaston Beach
Malibu Beach
Savin Hill Beach
Ashland State Park
SHERBORN
DOVER
DEDHAM
MILTON
Olsen Pool
Ulin Rink
Shea Rink
QUINCY
HINGHAM
Connell Pool
Connell Rink
WESTWOOD
Medfield Charles River State Reservation
MEDFIELD
HOLLISTON
Blue Hills Reservation
Wompatuck State Park
Ponkapoag Pond
2A
111
62
225
3A
38
129
114
28
107
1A
117
126
4
3
60
99
128
20
95
2
1A
1
30
27
90
9
135
16
24
138
37
18
115
203
93
Landscape Designations
Parklands
Reserves
Woodlands
Currently not zoned
0 1 2 Miles
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd
N
LANDSCAPE DESIGNATIONS
Boston - North Shore
(locator page 12)
NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm
Page Locator




Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

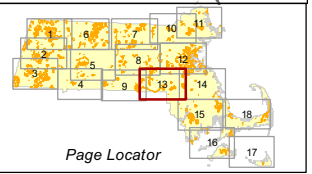
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

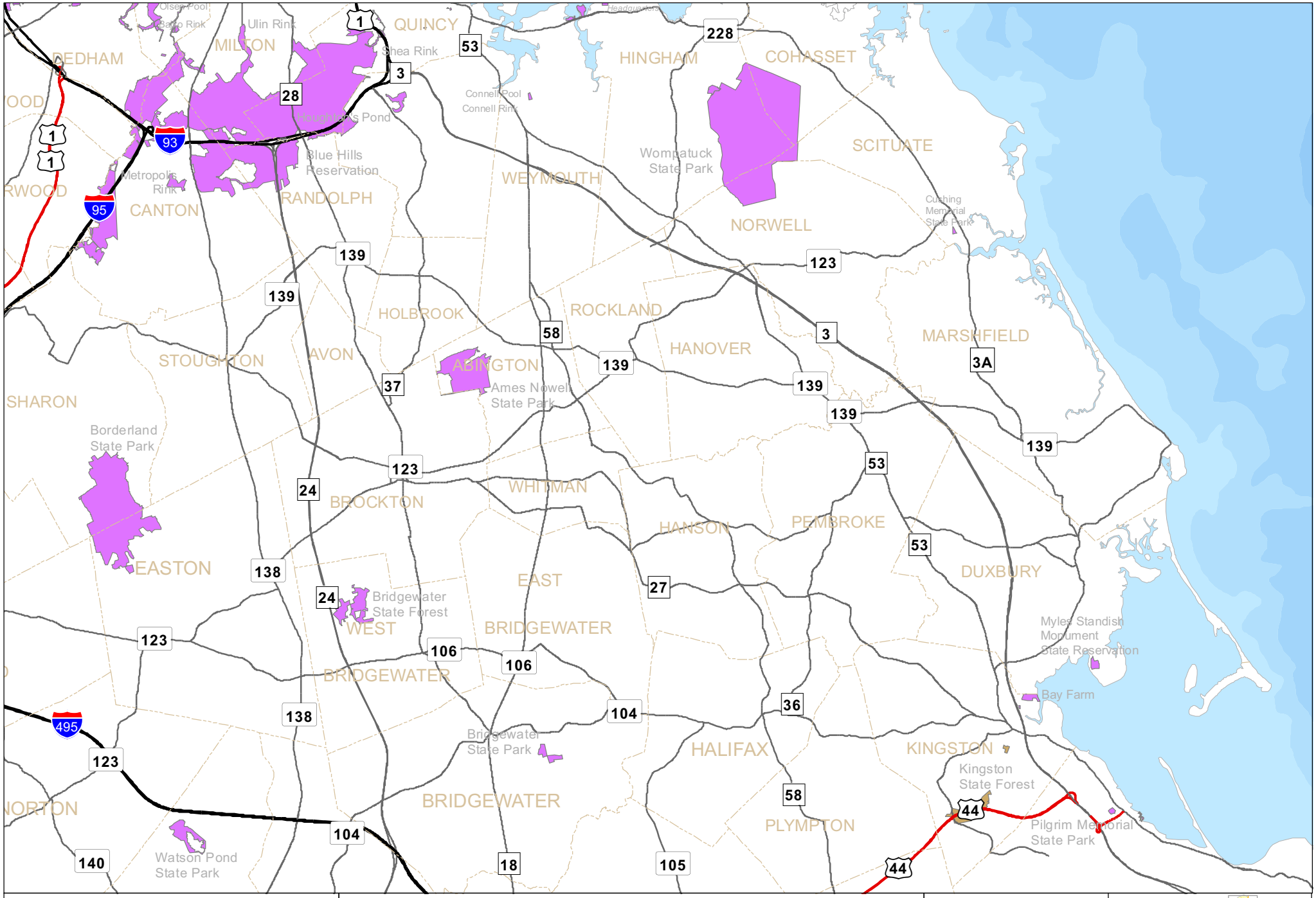
# LANDSCAPE DESIGNATIONS

## Franklin area

*(locator page 13)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm






Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

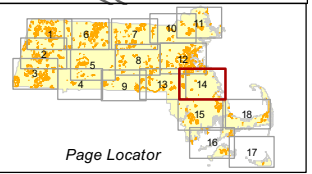
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

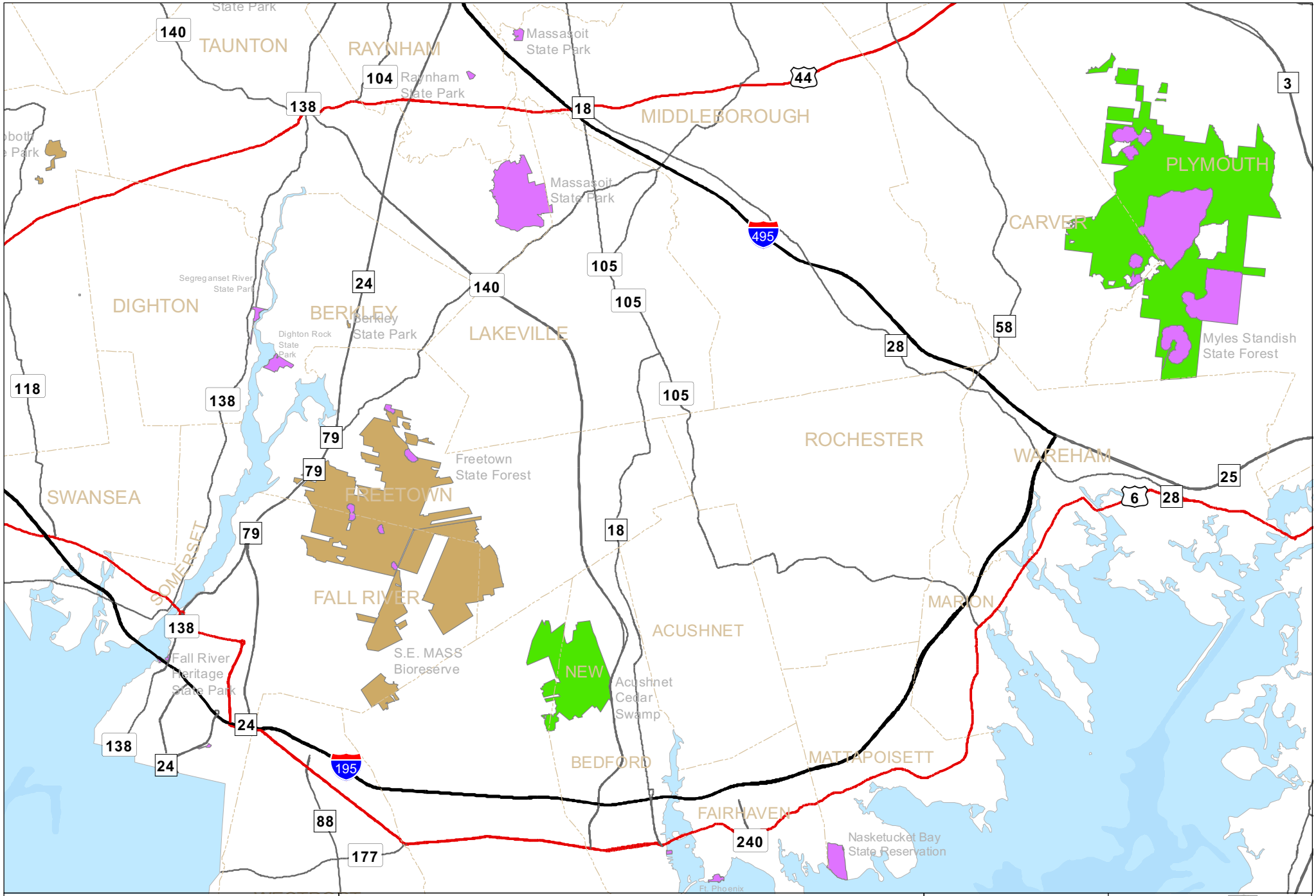
# LANDSCAPE DESIGNATIONS

## Boston - South Shore

*(locator page 14)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm






Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

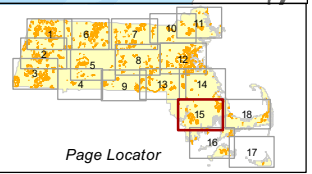
March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

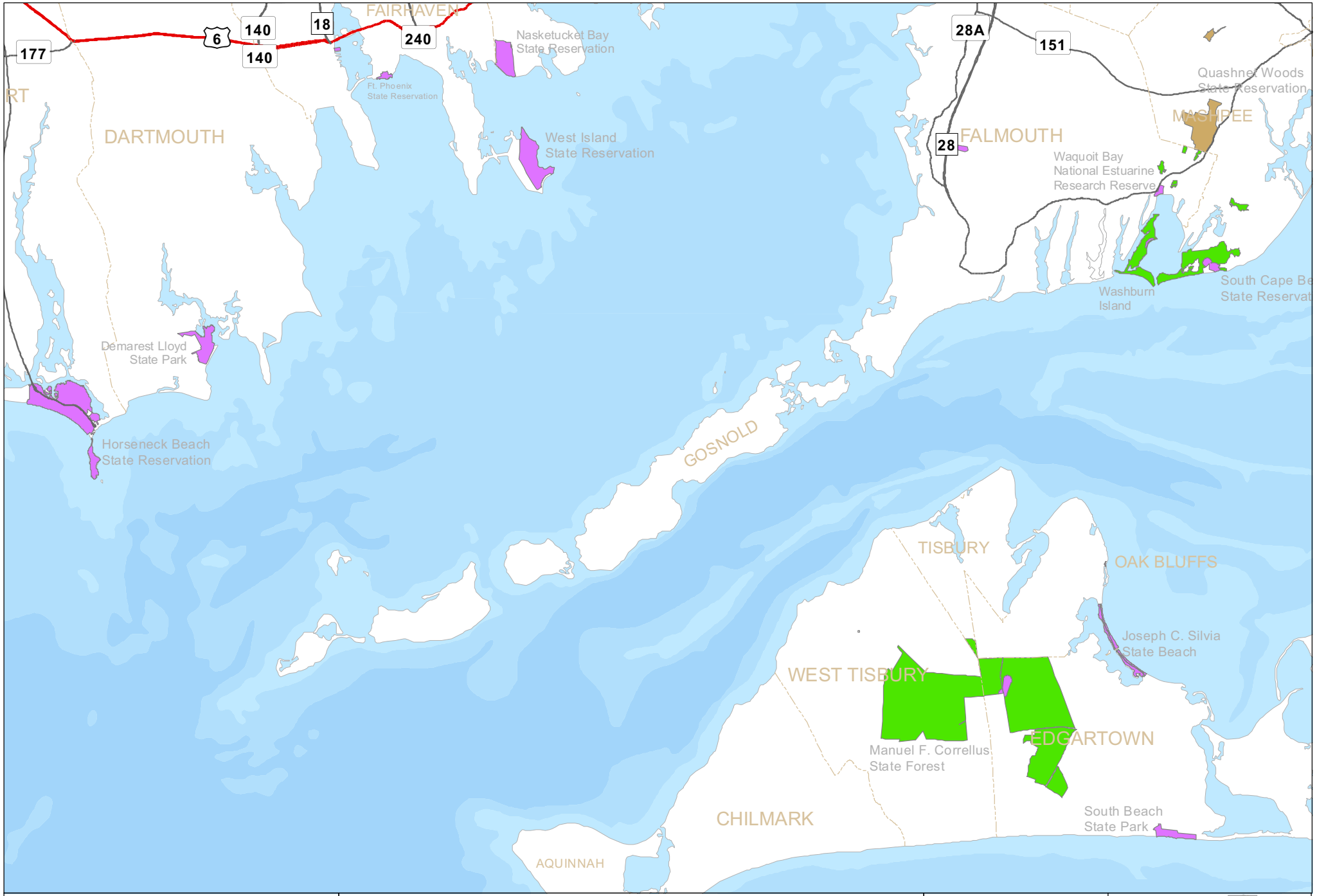
# LANDSCAPE DESIGNATIONS

## Southeast

*(locator page 15)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm






Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

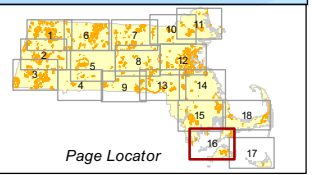
N

# LANDSCAPE DESIGNATIONS

## South and Marthas

*(locator page 16)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm




Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

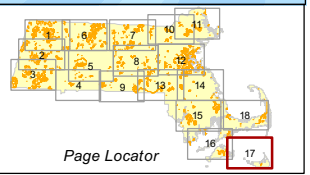
N

# LANDSCAPE DESIGNATIONS

## Nantucket

*(locator page 17)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm




*Page Locator*


Landscape Designations

- Parklands
- Reserves
- Woodlands
- Currently not zoned

0 1 2 Miles

March 2012
DCR GIS, C. Lahiri
Just_Zones2012.mxd

N

# LANDSCAPE DESIGNATIONS

## Cape Cod

*(locator page 18)*

NOTE: Deed restrictions on activities and uses are not shown on this map.DCR will identify local restrictions that need to be accounted for prior to any specific management activity.
MORE INFO: http://www.mass.gov/dcr/ld/landscapedesignations.htm