Department of Conservation and Recreation
Division of State Parks and Recreation

Southern Berkshire District Forest Resource Management Plan

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Executive Summary

Department of Conservation and Recreation Forest Management Framework

The Department of Conservation and Recreation (DCR) is responsible for the care and stewardship of State Forests, Parks, Reservations, Beaches and Recreational facilities across the Commonwealth. DCR carefully manages the public's land and natural resources for many purposes and uses that are broadly outlined in legislation establishing the agency's responsibilities. The agency manages approximately 285,000 acres of State Forests, Parks, and Reservations system lands within DCR's Division of State Parks and Recreation (DSPR). DSPR is comprised of DCR properties outside of the metropolitan Boston area, with the exception of the Quabbin and Wachusett watershed areas which are managed by DCR's Division of Water Supply Protection.

Forest Resource Management Plans (FRMPs) are designed to guide the management of State Forests, Parks, Reservations, and associated natural resources. Under the FRMPs, forest management is conducted as part of an integrated approach to establish long-term sustainable levels for *all* resources and uses. Landscapes and ecosystems are dynamic systems; accordingly, FRMPs are designed to be adaptable to new conditions and information.

Many of the goals of the FRMPs are intended to balance competing interests and values. FRMP are needed to:

- Provide direction for the sustainable and integrated management of all natural and cultural resources by defining standards and guidelines;
- Determine the location and extent of forest lands to be set aside as Forest Reserves and Active Forest Management Areas;
- Restore and maintain native forests to have greater vegetative diversity of size and age classes, improved wildlife habitat, and increased resilience to disturbances;
- Balance recreational use and aesthetics enjoyed by Massachusetts residents and visitors with sustainable forest management
- Manage for multiple ecosystem services such as: water filtration, a steady flow of water to streams and rivers, air purification, and carbon sequestration over the long-term;
- Restore the ecological function of our forests while also meeting today's challenges of forest fragmentation from sprawl development, global climate change, and invasive species;

- Maintain the viability of rare species and their habitat, and provide for the health of native species and vigor of forests;

- Help supply locally produced "green" products and energy and support the sustainable viability of local forest economies; and

- Provide educational opportunities through "leading by example" about forest values and uses.

Recent Factors Impacting DCR's Forest Resource Management Planning Process

Prior to 2004, there were no comprehensive publicly reviewed Forest Resource Management Plan standards and no Forest Reserves on Massachusetts' state lands. No surveys for rare and uncommon species were conducted prior to harvesting. There were no Conservation Best Management Practices for rare species, no public notifications of future harvests, no forest vegetative community maps linked to the continuous forest inventory data, and no road, trail or recreation inventory and condition surveys guiding the management of DCR DSPR system lands. All of these improvements are a result of DCR's efforts over the past four years to implement better forest management practices. During the years prior to these improvements, DCR conducted harvests on thousands of acres of its lands relying on the skills and training of its management foresters to administer these operations[1]

Many of the following factors influenced and changed DCR forests across the state over the last 30 years.

- Privately owned forestland in Massachusetts—which greatly outnumbers and surrounds DCR forests—is being divided up into smaller and smaller parcels. This fragmentation places added stress on DCR lands, making landscape-scale management increasingly difficult. Fragmentation poses a significant threat to biodiversity today, as species find their habitats divided by impassible roads and other barriers, more invasive species are introduced into previously large forest blocks, and countless sources of non-point pollution are introduced. It threatens the viability of many ecological communities in the future, as their breeding populations are reduced and their ability to migrate in the face of climate change is diminished.

- Plantations of non-native red pine and Norway spruce that were not previously thinned are now excessively overstocked (dense), mature, and highly susceptible to mortality from competition for sunlight, water, and nutrients and heavy damage from forest insects, diseases, and windthrow.

[1] For example, within the Southern Berkshire District properties, during the 1980s harvesting activities totaled 3,616 acres; in the 1990s, 1,379 acres, and from 2000 to 2008, 1,641 acres. It should be noted that prior to 2003, the database may not include all the harvesting that may have occurred. During the 1990s, harvesting activities were greatly reduced as foresters were primarily deployed to re-measure the Continuous Forest Inventory plots over a three year period.

- The majority of DCR native forests have progressed from 50 to 80 years of age. They are now more mature and many are excessively overstocked.

- Global climate change is now a generally accepted process that will potentially have profound impacts on the current species composition of Massachusetts' forests and the habitat they provide. Climate change may also increase erratic and extreme weather patterns and increase the severity of threats from invasive species. The benefits of carbon sequestration by our forests, the reduction of our "carbon footprint"[2] through use of locally-produced forest products, and sources of renewable energy have captured the attention of policy makers as part of climate change plans, such as those called for by the Massachusetts Climate Act of 2008.

- For centuries, forest products (such as flooring and furniture) used to be both grown and produced in Massachusetts. In the past decades, Massachusetts' consumption of forest products has increased, but its production has significantly declined, such that the vast majority—over 95%—of forest products consumed here are now produced in other states or, more commonly, other countries. This increases Massachusetts' carbon footprint and encourages harvesting in places where standards and practices are at best under-regulated and at worst ecologically devastating.

- Invasive species are now threatening our native forests. Insects such as Asian Longhorned Beetle, Emerald Ash Borer and Hemlock Woolly Adelgid are highly destructive species that pose an immediate and significant threat to the forest. Imported plants such as Oriental bittersweet, multi-flora rose, and Japanese barberry are slowly invading and occupying our forests.

In 2004, Massachusetts' publicly-owned forests achieved Forest Stewardship Council "green certification" status as well-managed and sustainable forests through an independent, third-party audit system developed and supported by many national and international environmental organizations. The goals of "green certification" were: to improve forest management and forest management planning; to improve coordination among the three divisions responsible for Massachusetts forest management (the Division of Fisheries and Wildlife within the Department of Fish and Game, and the Divisions of State Parks and Recreation, and Water Supply Protection within DCR); to improve landscape-level forest management; and to improve public involvement in the management of the state-owned forests to ensure they are sustainably managed.

From 2004 to 2006, the Forest Forum—a diverse group of organizations and individuals with a wide range of interests—developed and committed to five broad goals for Massachusetts forests. Participating members included environmental advocates, ecologists, mill owners, harvesters, forest landowners and professional foresters. This group endorsed the following consensus-based goals: to conserve Massachusetts forests from development; to sustain the economic viability of forests; to strike a balance between working forests and forest reserves; to protect forest health;

[2] Carbon footprint is a measure of the impact of human activities on the level of carbon dioxide in the atmosphere as it relates to climate change and on the environment generally. It is intended to capture the impacts of emissions from burning fossil fuels for electricity generation, transportation, manufacturing processes, and heating, as well as emissions associated with human land use (e.g., land clearing).

and to educate the public about forest values and human connection to forests. The FRMPs incorporate these goals.

Currently, the Patrick administration has allocated significant resources toward three land conservation goals, one of which is to protect working landscapes. This includes sustainable forest management to support local economies. In addition, energy legislation aimed at shifting the Commonwealth to renewable and local sources of energy, including bio-energy and bio-fuels, passed in 2008.

In 2009, Massachusetts will seek recertification of state-owned forests under the Forest Stewardship Council "green certification" standards. The five-year FSC "green certification" audit will provide an opportunity for DCR to seek additional public input to understand and address the diverse and complex issues involved in forest management decisions on DCR lands. In addition, the DCR FRMPs call for a 5-year interim review and monitoring report to make adjustments as part of the adaptive management strategy—one of the cornerstones of the FRMP approach planning approach.

The DCR FRMPs build upon information from the following:

1) The ***Landscape Assessment and Forest Management Framework for each of the 14 Massachusetts Eco-regions***, These Assessments provide ecological data on landscape-level natural resource trends and issues that are important to our DCR forests such as the need to increase early and late successional habitat to enhance biodiversity and the need to maintain native forests without invasive species;

2) The system of large-scale Forest Reserves, totaling approximately 50,000 acres of state lands, where management will be primarily through natural processes. These reserves were established in 2006 after extensive scientific analysis and public involvement;

3) Maintenance of the DCR's "Green Certification" status of well-managed and sustainable forests through FSC independent expert field audits to meet broadly reviewed and accepted criteria; and

4) The ***Wildlands and Woodlands*** report (Harvard Forest, 2004) which lays out a vision that forest reserves (wildlands), surrounded by larger areas of woodlands, be protected from development.

5) Extensive public notification, participation, and comments resulted in the integration of public input in the final FRMP.

Why Cutting Trees is Part of DCR Forest Management

It is important to utilize harvesting (the cutting and bringing to market of forest products) as a tool to manage DCR properties because it contributes to the following forest management goals:

- Speed the restoration of non-native and dead, dying, damaged, or at-risk plantations to resilient communities of native species.

- Control new or expanding invasions of non-native pests, pathogens, or trees.

- Restore, more quickly than can be accomplished through natural disturbance, our predominantly 80-year forest to one with greater diversity of size and age classes, in order to provide more diverse wildlife habitat and increase resilience to climatic changes that may place significant and catastrophic risk to a single age-class forest.

- Provide "in-kind services" used to cut and remove hazardous trees from areas near roads, campgrounds, trails, and other areas where they pose a safety hazard to the public (the cost of such removal is estimated at $150 per small tree and over $450 per larger tree). "In-kind services" are also used to fix eroded woods roads, recreation trails, install gates and remove invasive species.

- Provide a source of forest products for the public. Provide local economic benefits in the form of employment, and revenue to local cities and towns through deposits from the Forest Products Trust Fund.

- Provide a model of reasonable and sustainable forest management strategies for the tens of thousands of private landowners who own 80% of the 3 million acres of forests in Massachusetts.

When trees are harvested on public land, DCR ensures that it is done sustainably and in a manner that does not compromise other forest values. Forest management is conducted by professional licensed foresters, according to the FRMP standards and guidelines, the DCR Public Notification Policy for timber sales and the following Massachusetts laws: Forest Cutting Practices Act, Wetlands Protection Act, Endangered Species Act and the Massachusetts Slash Law. DCR prepares preliminary "project summaries," detailed silvicultural prescriptions, and timber sale contracts for all timber sales. All proposed timber sales are posted on DCR's webpage for public review, competitively bid, inspected for contractual compliance, and continuously overseen and monitored for full compliance.

Clearcutting (the removal of all trees in areas greater than two acres) is not a standard treatment under this FRMP. However, there are some circumstances under which clearcutting may be considered, including forests with widespread mortality from disease, insects, or windthrow, or snow and ice damage. The decision to use such management will be made only after close evaluation by the Program Supervisor and Chief Forester, as well as a public field trip at the site. Reserve trees will be maintained where practicable.

Applicable Forest Resource Management Legislation

Various Commonwealth laws, the state Constitution, and sound forestry practices require that DCR manage state forests for a range of purposes and goals. These include:

- Article 97 of the Articles of Amendment to the Constitution of the Commonwealth of Massachusetts (1972): "The people shall have the right to clean air and water, freedom from excessive and unnecessary noise, and the natural, scenic, historic, and esthetic qualities of their environment; and the protection of the people in their right to the conservation, development and utilization of the agricultural, mineral, forest, water, air and other natural resources is hereby declared to be a public purpose."

- M. G. L. Chapter 21, Section 2F (2003): "Said management plans shall include guidelines for the operation and land stewardship of the aforementioned reservations, parks and forests, shall provide for the protection and stewardship of natural and cultural resources and shall ensure consistency between recreation, resource protection, and sustainable forest management."

- M. G. L. Chapter 132, Section 31 (State Forests) (enacted 1914 and revised 2003): "[The State Forester] shall reforest and develop such lands, and may, subject to the approval of the Commissioner, make all reasonable regulations which in his opinion will tend to increase the public enjoyment and benefit therefrom and to protect and conserve the water supplies of the commonwealth.

- M. G. L. Chapter 132, Section 40 (enacted 1943 and revised 1983): "It is hereby declared that the public welfare requires the rehabilitation, maintenance, and protection of forest lands for the purpose of conserving water, preventing floods and soil erosion, improving the conditions for wildlife and recreation, protecting and improving air and water quality, and providing a continuing and increasing supply of forest products for public consumption, farm use, and for the wood-using industries of the commonwealth."

Resource Management and Forest Resource Management Planning Processes

FRMP planning is an important component of DCR's statewide Resource Management Planning (RMP) Program. The RMP program provides a framework for managing DCR lands based upon a comprehensive inventory and assessment of environmental, recreational, and operational resources, an identification of the unique characteristics of an individual DCR property or planning unit, the development of clear management goals and objectives, and an implementation plan to guide the short and long-term management of DCR Forests, Parks, and Reservations. The RMP Program works across agency divisions and bureaus and coordinates with the DCR Stewardship Council regarding program development and the adoption of RMPs.

FRMPs serve as baseline information focusing on forest resource management and will be integrated into future RMPs that address the wide range of issues noted above. The FRMPs are based on extensive resource inventory information, and are designed and developed to protect

natural and cultural resources and recreational uses and values in the context of forest management. This information is developed and analyzed at the site-specific level using field and aerial inventories and Geographic Information Systems (GIS) analysis. While future property-specific RMPs will contain additional information, such as more details on existing infrastructure and facilities, operational and maintenance needs, staffing needs and priorities, the FRMPs provide foundational resource information and related management recommendations in support of the Department's RMP requirements, pursuant to MGL Ch. 21 S. 2F.

The FRMPs include site specific maps (see example on page 11) designating the three land management regimes: Forest Reserves**,** Intensive Use, and Active Management Areas, which coincide with the RMP zoning principles:

- Zone 1 – Highly sensitive areas designated as Forest Reserves where forest management is primarily by natural processes.
- Zone 2 –Areas where sustainable forest management can be practiced alongside dispersed recreation.
- Zone 3 – Intensive use recreation areas and administrative facilities where forest management is intended to provide for public safety, maintain a diversity of very large trees, and aesthetically pleasing setting.

Participation by the public, DCR and other state agency staff has been a key feature of FRMP development. The public outreach process that began in 2004 has included nine (9) public presentations and discussions on the Forest Reserves, the Landscape Ecological Assessment, the "green certification" process and the FRMPs including three (3) formal public comment periods. Notices for all public meetings were distributed to over 900 individuals and organizations, posted in the Environmental Monitor, and disseminated via group e-mails.

A summary of public comments and DCR responses is contained in Appendix K of the FRMP.

The Southern Berkshire District Forest Resource Management Plan

The Southern Berkshire District (SBK) Forest Resource Management Plan was prepared by the Department of Conservation and Recreation with input from staff with expertise in ecology,

biology, archaeology, and recreation, as well as from licensed foresters. The FRMP will be used by DCR foresters to direct management activities for the 19 SBK DCR properties consisting of approximately 42,965 acres of land.

Parks, Forests, and Reservations in the Southern Berkshire District managed by DCR

Property	Acres
Mt. Washington State Forest	4,578
Bash Bish Falls State Park	407
East Mountain State Forest	2,009
Mt Everett Reservation	2,039
Jug End State Reservation	19
Jug End State Reservation and WMA	1,171
Appalachian Trail Corridor	540
Otis State Forest[3]	4,703
Beartown State Forest	10,526
Fountain Pond Park	250
Arthur Wharton Swann State Forest	850
Sandisfield State Forest	3,982
Cookson State Forest	2,798
Silver Brook North F.C. Site	160
Silver Brook South F.C. Site	53
Clam Lake F.C. Site	500
Campbells Falls State Park	138
Tolland State Forest	5,809
Granville State Forest	2,432
Total	**42,965**

The SBK FRMP was developed with the best information and data available and focuses on the following areas: biological diversity; recreational uses; forest roads, trails and boundaries; climate change and carbon sequestration; cultural resources; vegetation management; and inventory, monitoring and evaluation. Within these areas, the plan:

- Meets the Commonwealth of Massachusetts' forest management legal mandates, strategic goals and objectives;

- Addresses forest resource management issues identified by the public;

[3] This includes the 904 acre Spectacle Farm which was acquired in June of 2007. A separate forest resource management planning analysis will be conducted and amended to the SBK FRMP

- Informs resource managers and the public about how the forest resources in the SBK district will be managed;

- Provides a framework for the integration of sustainable management for wildlife, rare plants and animals, soils, water, cultural resources, and forest uses and activities;

- Provides a long-term sustainable forest management strategy (105 years) with focus on the short-term implementation schedule (next 15 years); and,

- Provides for adaptive management and change by directing and monitoring activities of DCR land managers, including interim 5-year plan reviews (in years 5 and 10 of the plan); 15-year plan revision, if needed; and ongoing long-term ecological monitoring.

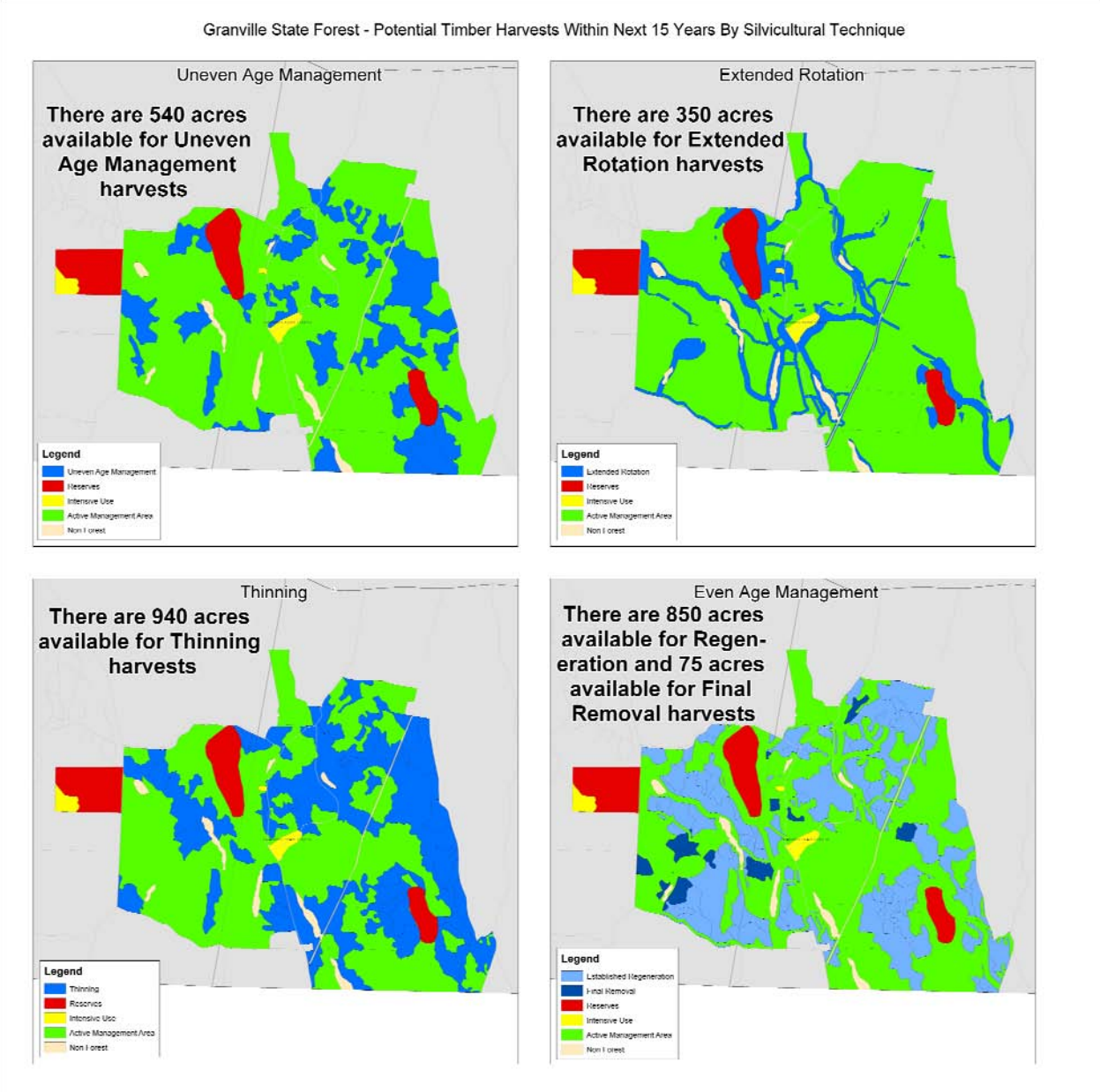
The FRMP meets the above goals following a balanced, strategic approach which is described in more detail below.

Different strategic management regimes for the SBK Forests

Management Regime	Acres in District	% of District	Management Theme
Forest Reserves	9,695	22.5%	Dominated by natural processes, set aside from active forestry
Active Management over 150-year period adjacent to recreation areas and forest reserves and in northern hardwood stands	8,023	19%	Thinning to promote growth and health in very large trees and harvesting to stimulate new forest growth with very large trees, wildlife trees, and snags remaining beyond a 150-year period[4]
Active Management over 105-year period for wildlife diversity and in conifer, mixed conifer/hardwood and other hardwood stands	21,013	49%	Thinning to promote growth and health in large trees and harvesting to stimulate new forest growth with large trees, wildlife trees, and snags remaining beyond a 105-year period
Intensive Use	533	1%	Administrative and developed recreation sites such as campgrounds and trailhead parking areas. Forest management to provide for public safety, maintain a diversity of very large trees, and an aesthetically pleasing setting[5]
Other:			
Non-Forest	2,797	6.5%	Soils and wetlands that do not support forest
Spectacle Farm	904	2%	Recently acquired lands
Total	42,965	100%	

Within the approach described above, the following sections summarize the key components of the Southern Berkshire District FRMP. The full description of each section is contained in the main text of the plan.

[4] "Thinning" means partial harvests of about ½ of the forest canopy spread evenly throughout, with a goal of improving health, increasing growth of remaining trees, species diversity, and the compatibility of species to the specific conditions of the site. Creating young forest growth in the understory is not a goal of thinning.
[5] Most activities described above will generate some revenue, the precise amount of which will be determined by the specific combination of management strategies in any given year.



Example maps. See full plan for a series of maps such as these centered on Granville State Forest. Maps indicate areas (in red) that will be set aside as large or small forest reserves, areas that will be managed using uneven-aged management techniques, intensive use areas, and areas where a range of management techniques may be used over time.

Southern Berkshire Forest Vegetation Management

The SBK DCR system lands are heavily forested and are primarily composed of forests that are approximately 80 years of age (27,500 acres or 64% of the property in the district). The forest in general is presently in relatively good health; however, tree mortality is occurring at an increasing rate due to composition, age, and density of the forests. While some tree mortality is a natural part of the forest aging process, excessive mortality associated with overcrowded forest conditions, forest pests (insects and diseases) and environmental stresses (drought and wind) can be minimized through proper management. Presently, the forest is composed predominately of northern hardwoods, hemlock, and white pine. There are approximately 450 million board feet of standing timber and an annual growth of approximately 13 million board feet per year. The mortality is approximately 5.3 million board feet per year. This indicates that the forests are sequestering carbon at a net rate equivalent to the mass in 7.7 million board feet a year, plus associated larger tops, downed woody debris and roots associated with trees of increasing size.

Forest management within the Active Forest Resource Management Areas is carried out to achieve the following goals:

- Meet rare species, wildlife habitat, and biodiversity goals;
- Reduce the risks of catastrophic disturbances such as insects, disease, and wildfires;
- Restore and maintain native ecosystems;
- Provide a more natural balance of age classes for forest successional types, including increasing older and younger age classes;
- Reduce the threat and potential area of excessive forest mortality by improving growth and vigor of the forest;
- Enhance future carbon storage and sequestration capacities;
- Restore native species to sites where they have traditionally grown prior to overcutting, the introduction of invasive species, and agricultural impacts; and,
- Provide a sustainable flow of locally produced forest products, renewable energy sources, and local economic benefits.

Areas selected for forest management to meet the above goals are then prioritized in order of the following criteria:

1. Forest stands in which management has previously been conducted, in order to: 1) release new forest growth in the understory; 2) conduct a second thinning to continue to improve forest composition and health; and 3) establish new forest growth in the understory;

2. Forest stands that are at imminent risk of mortality from insects, disease, fire, etc;

3. Forest stands that are poorly stocked and do not fully occupy the site or in stands that are currently stocked with species that are ill-suited to the site such as non-native red pine and Norway spruce on northern hardwood sites;

4. Low quality forest stands where cuttings could improve the quality of the forest;

5. Forest stands that are homogeneous in age and/or species composition (generally 80 years old); and,

6. Overstocked forest stands where thinning will restore a diversity of species suited to the site, improve growth and insect/disease resistance, and accelerate the growth and maintenance of large tree forests.

Biological Diversity

Biological diversity can be defined as the totality of genes, species, and ecosystems in a given place, as well as the ecosystem structure and function—the ecosystem processes—that support and sustain life. Forest management practices provide habitat for the range of species found within the planning area, thereby helping sustain biological diversity. This FRMP promotes biological diversity by:

- Protecting rare species and their habitat through pre-harvest biological surveys conducted by experts on all proposed timber sales, and proper management and maintenance of rare species habitat, including mandatory consultation with the Massachusetts Department of Fisheries and Game, Natural Heritage and Endangered Species Program on all vegetation and/or ground disturbing projects;

- Protecting uncommon natural vegetation communities and species through pre-harvest surveys and management practices consistent with the stewardship of such resources;

- Implementing guidelines from Rare Species Conservation Management Practices that will be followed within known priority or estimated habitat for rare species (these guidelines can be accessed online at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/forestry/forestry_cmp.htm);

- Establishing an approximately 7,149-acre Mount Washington State Forest complex large-scale Forest Reserve, and approximately 2,546 acres of small-scale Forest Reserves distributed throughout the rest of the district, to provide late-successional native forest habitat where forest succession and natural processes are allowed to occur relatively free of human intervention;

- Establishing approximately 8,023 acres of older, 150-year rotation forests managed according to uneven age and some even age silvicultural principles to promote healthy, multi-age, large stand areas with complex structure that complement Forest Reserves,

trail and road corridors, aquatic corridors and buffers, and rare species habitat, where possible;

- Protecting aquatic resources such as lakes, rivers, streams, riparian areas, wetlands, and vernal pools, by establishing and properly managing these areas and their associated buffer zones or filter strips;

- Establishing approximately 2,535 acres of young forest across the District in each 15-year planning period, located so as to minimize the fragmentation (break-up) of designated blocks of contiguous forest reserves;

- Improving species and age class diversity of the predominately 80-year-old even-aged forest, including replacing the non-native plantation monocultures with diverse native species and age classes;

- Managing all SBK lands for appropriate native species by inventorying and scheduling the removal of non-native vegetation through the treatment of known populations of invasive species, requiring equipment to be free of a potential source of invasive species, post harvest invasive species surveys, and quickly treating new populations of invasive species; and,

- Providing direction for the retention and maintenance of complex forest structures such as legacy, wildlife, and den trees, and the retention of coarse woody debris on the forest floor.

Recreational Activities and Uses

This FRMP does not directly address recreational uses and policies. However, it takes into consideration the recreational facilities and uses that occur within the SBK District lands, such as camping, hiking, fishing, cross-country skiing, picnicking, snowmobiling, and scenic driving. All trails, roads, and existing recreational facilities are buffered by mapped transition areas, where the forest will be managed for older and larger trees and forest floor woody debris will be managed at natural levels, designed to maintain high recreation and visual quality objectives. Additional details of recreational uses and future enhancements will be addressed in RMPs developed for specific properties or management units within the SBK. The following are highlights of the forest management direction as it relates to recreational uses:

- Managing the vegetation in the trail corridors with sensitivity to the protection and aesthetics of the trail system and ensuring that the trails are maintained to DCR standards consistent with the FRMP objectives;

- Evaluating unauthorized trails for potential removal or inclusion into the DCR trail system;

- Allowing snowmobile use on designated trails when there is snow cover;

- Prohibiting off-highway vehicle use on all DCR lands in this District; and,

- Requiring adherence to the DCR Special Use permitting process for special use applications and review of proposed special uses for compatibility with the FRMP direction.

Climate Change and Carbon Sequestration

Climate change and carbon sequestration are two key forest resource issues emerging on a local, regional, national and global scale. According to the *Massachusetts Climate Protection Plan* (2004), "[c]limate change could have serious impacts on the state's diverse ecosystems, native species and may encourage the spread of non-native species." The SBK FRMP recognizes climate change as resulting from increases in temperature due primarily to elevated greenhouse gas levels that are caused primarily by human activities such as the burning of fossil fuels.

As temperatures increase globally, Massachusetts forest species composition will undoubtedly change over time. Vegetation models predict that the range of forest communities will slowly shift north, with the composition of Massachusetts' forests becoming more typical of forests currently found farther south. Climate change will also likely alter historic precipitation levels and form (snow, rain, etc.), which will also affect Massachusetts forests. Other likely effects include increased frequency and intensity of fires, insect and disease infestations, and erratic weather patterns such as damaging winds, drought, flood, and ice.

Forests play a significant role in keeping carbon dioxide out of the earth's atmosphere by sequestering carbon. It is estimated that forests contain approximately 75% of the earth's biomass. The carbon annually taken up by Massachusetts forests and vegetation equals an estimated 8% of the carbon emitted by humans in Massachusetts (*Massachusetts Climate Protection Plan).*

Massachusetts is studying the role of forests in climate change. Forests are highly complex systems, and there is no scientific consensus on the impact of harvesting on carbon sequestration. in middle-aged forests like those found in most of Massachusetts. Harvesting increases the growth rates of the remaining trees. Local use of forest products may replace fossil fuels for electricity generation and heating, and various non-renewable materials[6] in consumer products, thereby reducing or slowing carbon emissions into the atmosphere by sequestering it in durable forest products.

[6] Energy intensity (or embodied energy) of materials is measured as the amount of energy consumed in the acquisition of raw material, processing, manufacture, transportation, and construction. Lumber has an embodied energy of 1,380 MJ/m³; recycled aluminum, 21,870 MJ/m³; recycled steel 37,210 MJ/m³; PVC 93,620 MJ/m³; virgin steel 251,200 MJ/m³; virgin aluminum 515,700 MJ/m³ (Architecture 2030). This means that using steel or aluminum requires from 16 to 182 times the amount of energy required to produce timber.
"Carbon footprint" is a broader measure of the impact human activities have on the environment, specifically as they relate to greenhouse gas emissions (generally, carbon dioxide). It applies to behaviors as well as materials.

While established carbon-accounting models predict that carbon uptake declines as a function of forest age, this may not always be the case. In one study, harvesting was seen to reduce carbon sequestration rates immediately after harvesting is completed, until forest growth or regeneration occupies the site (O'Donnell, 2007). Research at Harvard Forest in central Massachusetts found a middle-aged forest still increasing carbon sequestration rates (Urbanski, 2006). Other research also suggests older forests may still sequester carbon (Bormann and Likens, 1979; Keeton 2007). Establishing the nature of the relationship with any certainty will require comprehensive, long-term monitoring and analysis; such certainty is unlikely to be arrived at in the near future. FRMPs were created with the best information currently available.

In consideration of potential climate change biological impacts to forests and with a goal of increasing the rates of carbon sequestration, the SBK Plan includes the following strategy:

- Continue to expand DCR forests via land acquisitions and private landowner incentives. This reduces the likelihood of deforestation land use change, one of the leading contributors of carbon emissions, and maintains the carbon sequestering functions of Massachusetts forests;

- Designate, protect, and monitor a forest reserve system of 9,695 acres (22.5% of SBK DCR system lands) that, in their present condition, serve as carbon sinks (meaning they store more carbon than they release);

- Diversify the SBK 80-year old forests into a more complex forest composed of native species with various age classes and structures;

- Continue to provide the opportunity to offset carbon dioxide sources by storing carbon in forest products;

- Adjust the FRMP based on new research forest studies and data from monitoring information as required by the 2008 Massachusetts Climate Act, and climate change adaptation priorities.

Cultural Resources

Cultural resources (historic and pre-historic) are identified and evaluated by DCR Cultural Resources staff for significance. Appropriate site plans are developed to protect and maintain significant cultural resources. In some cases, cultural resources may be enhanced through specific management activities or presented to the visiting public through interpretive, educational programs. The SBK FRMP calls for the inventory, consultation, protection and interpretation of cultural resources.

Roads, Trails and Boundaries

There are approximately 207 miles of DCR-owned forest roads and trails within the SBK properties. Generally, roads and trails are minimally maintained, sometimes resulting in unsafe access and degradation of water quality due to soil erosion and sedimentation. Some road and trail maintenance and re-construction is occurring through forest management activities, volunteer efforts, and occasionally as part of DCR projects. DCR's goal is to ensure that the transportation network will be safe and environmentally sound. In addition, the network should have a minimum impact on the natural resources of the DCR system while serving public safety needs and allowing visitors to enjoy and experience these resources. While temporary skid roads and landings are necessary to complete harvests, no new forest roads are anticipated during this 15-year planning period.

There are approximately 276 miles of DCR property boundaries within the SBK district, approximately 72 miles of which were recently maintained (between July 1, 2003 and June 30, 2007). There are a relative small but undetermined number of boundaries that may require professional surveys. DCR's goal is to locate and post all boundaries and maintain them on a 10-year cycle.

Forest Management Guidelines and Recommendations

Using the previously mentioned goals and criteria in the Forest Vegetation section to choose sites, **this plan recommends and commits to the annual management of no more than 450 acres—1.0 percent** within the 42,965 acres of DCR lands in this District—during the initial 15-year implementation period. **Each subsequent 15-year implementation period will have a unique combination of the forest management practices described below.**

While the maximum sustainable ceiling acreage laid out in each of the three categories described below totals 815 acres annually, **the total acreage selected each year from all three categories combined will not exceed the 450 acre limit committed to by this plan**, nor will it exceed the limits established below for each type of management. The distribution of forestry activities chosen to make up these 450 acres per year will be based on forest inventory, resource mapping data, and integration of all resources, activities and uses according to the FRMP.

- **Regeneration harvest openings to create young forest:** No more than 0.5 percent (197 acres per year) of the entire SBK DCR system lands (42,965 acres). No more than 27 of 197 acres will be uneven-aged management consisting of small group (3-4 trees up to 1/2 acre) selection harvesting methods. Selective harvesting creates a balanced forest stand with a range of age classes, an "all aged" forest. No more than 86 of the 150 acres will be even-aged harvests removing residual overstory trees where previous shelterwood harvests have established a new forest of about 10-15 years in age. Both uneven and even aged forest management system will maintain a component of the very largest and most valuable trees (legacy trees); trees that have cavities (wildlife trees); snags; and course woody debris for nutrient recycling and wildlife purposes;

- **Preparatory shelterwood treatment:** No more than 0.4 percent (169 acres per year). Preparatory shelterwood treatment is designed to stimulate a young forest of desirable species while maintaining a shelter of mature trees;

- **Thinning of overstocked stands:** No more than 1.0 percent (450 acres per year) of overstocked stands where crowding negatively affects growth and health. Some 11,550 acres (770 acres per year) have been identified as overstocked forest stands within the SBK District. Thinning results in a diversity of native species suited to site conditions and is designed to restore a forest condition that is more resilient to damage, insects, and disease. Thinning also captures imminent mortality to provide opportunity for local forest products that slow the release of carbon, and energy that reduces the burning of fossil fuels.

Establishing now a mix of forest reserves, 105-year, and 150- year rotation forests, DCR forests will in the future be markedly older and have a greater diversity of ages and species than many surrounding private forests, which are typically either not harvested, or not selectively harvested and thinned. At the end of the 105-year period, very young forest (0-14 years) will increase from 3% to 5%—an important increase in a wildlife habitat type that is used by 50% of vertebrates and which provides most of the life needs for 20% of vertebrates. Very young forest areas will be selected to maximize their ecological benefits and complement other components of the landscape. Massachusetts' original forest contained much more age and structural diversity than the current 80-year old "even-aged" forest. This plan will help restore some of that diversity while strengthening the forests to meet the challenges that lie ahead.

Present Condition and Desired Condition

	Age class				
	0-14 yrs	**15-59 yrs**	**60-89 yrs**	**90+ yrs**	**Uneven Age**
Present	1%	23%	48%	16%	2%
2110 goal	7%	20%	14%	39%	10%

This plan lays out the first 15 years of implementation of a long-term 105-year vision. It will be reviewed through monitoring in year five and year ten as more information is gathered and the effectiveness of its implementation can be assessed. The impacts of climate change and new information evaluated in the course of these reviews may alter the plan. At the end of the 15-year initial plan period, the strategy will again be reviewed and revised based on the current state of science and in response to the concerns of the citizens of Massachusetts.

Inventory, Monitoring, and Evaluation

This FRMP was developed to be adaptable to future information generated from the evaluation of inventory and monitoring data. It is expected to improve over time. The level and intensity of

monitoring will be dependent on the availability of funding. The following summarizes the key inventory, monitoring, and evaluation requirements.

- Data on the condition or status of vegetation, cultural resources, rare species, invasive species, boundaries, roads, recreation and uses, etc. should continue to be collected over time;

- Upon completion and five years after completion, all forest management projects should be monitored or sampled for meeting SBK FRMP and "green certification" requirements, effectiveness, and impacts;

- Interim monitoring reports will be completed at year 5 and 10 of the first 15-year implementation cycle and the FRMP will be adjusted if needed.

- Long-term ecological monitoring at the landscape, site and species level, should be continued to evaluate and compare Forest Reserves and areas under active management regimes, in cooperation with the University of Massachusetts and other partners.

Southern Berkshire District Forest Resource Management Plan

I. Forest Resource Management Plan Process

This section summarizes the Forest Resource Management Planning process, the FRMP format, and gives the reader guidance on how to use the plan effectively.

Forest Management Framework

The Department of Conservation and Recreation (DCR) is responsible for the care and stewardship of State Forests, Parks, Reservations, Beaches and Recreational facilities across the Commonwealth. DCR carefully manages the public's land and natural resources for many purposes and uses that are broadly outlined in legislation establishing the agency's responsibilities. DCR prepared Forest Resource Management Plans (FRMPs) in coordination with the public to address many broad public goals and their application in specific forested areas. These FRMPs cover approximately 285,000 acres of State Forests, Parks, and Reservations system lands within DCR's Division of State Parks and Recreation (DSPR). DSPR is comprised of DCR properties outside of the metropolitan Boston area, with the exception of the Quabbin and Wachusett watershed areas, which are managed by DCR's Division of Water Supply Protection.

Planning Process and Outline

The Forest Resource Management Planning process is based on the concept of stepping down in geographic scales: from the regional landscape, to the Southern Berkshire District (SBK), to the individual forest, park, or reservation. Overall, the plan is based on meeting Massachusetts' statutes, enabling legislation, and regulations that establish the Department of Conservation (DCR), the State Forest and Parks system, and the Bureau of Forestry management forestry program. "Green Certification" sustainability conditions and requirements further guide the planning process to ensure the long-term sustainability and adequate management of the Commonwealth's natural resources, activities, and uses.

The plan is informed by baseline natural resource information, public issues, and recommendations contained in the *Landscape Assessment and Forest Management Framework for the Berkshire Ecoregions.*

The planning process identified public issues and opportunities for the Berkshire Highlands, Taconic Mountains, and Marble Valley Ecoregions, and the Western Connecticut Valley District. This plan contributes towards meeting the public needs, desires, and expectations for the State Forest and Park system.

The District Overview, which follows the public issues, introduces the DCR-DSPR lands contained within the Southern Berkshire District. This section contains the present resource and use conditions, desired conditions, and management guidelines for recreation and natural resource managers.

There is more detailed information on the District Overview below. There follows information on measurable outputs (public expectations), inventory, monitoring and evaluation direction, and public involvement documentation. Finally, the appendices include detailed information and supporting documentation.

District Overview

This section uses a filtering approach to identify three (3) management areas: Reserves; Intensive Use Areas; and Active Forest Management Areas.

The Reserve areas consist of small and large-scale reserves where passive management will occur. The Intensive Use Areas consist of developed facilities and structures such as administration sites, campgrounds, playgrounds, and parking lots. Vegetation management will be applied in Active Forest Management Areas to meet the biodiversity and forest structural goals of this plan. Each section provides information on the **present condition**, the **desired condition**, and the **management guidelines** designed to reach the desired condition.

Present Condition – The present condition information provides baseline information on the resource in text and/or table form. It is also where map references for the resource may be found. These present conditions are intentionally broad as they apply to all the DCR-DSPR lands in the district.

Desired Condition – The desired condition is a general goal statement describing the resource condition that can be achieved by full implementation of this plan.

Management Guidelines – One of the most important outputs of the planning process is the establishment of management guidelines. Management guidelines are the means by which the desired conditions can be achieved. Natural resource mangers will use these guidelines to prioritize, direct, and implement management activities to ensure that daily work follows the planning framework and consistently furthers the objectives in the FRMP throughout DSPR. Although the plan provides flexibility for on-the-ground decisions, the management guidelines serve as a check to meet the specific goals and standards set forth in this plan. The management guidelines in the main body of this plan apply to all DSPR lands in the Southern Berkshire District.

Maps & Tables

Most of the plan sections have maps and tables that support the text information. District level maps display information on a landscape or district level (Appendix A). Property level maps display information on a State Park, Forest, or Reservation level, (Appendix B).

Additional Appendices

Following the map appendices are additional appendices containing the public comments and response, glossary, statutory policies, references, and other supporting materials.

Intended Users

This plan is designed for use by a variety of audiences. Decision makers may be interested in the planning process, public involvement, land and resource allocation, expected outcomes, and costs and benefits. The public might be most interested in the personally important public issues, zoning and management area land allocation, where uses and activities may or may not occur, and management guidelines. The Forest Resource Management Plan is part of the social contract with the citizens of the Commonwealth, and a commitment by the government to safeguard and enhance the public well-being through management of the State Forest and Parks system lands.

While this is a public document developed in consideration of public comment, its ultimate purpose is operational: to direct DCR staff in the implementation of sustainable land and forest management. Recreation and natural resource managers are the appointed stewards of the Commonwealth's valuable public natural resources; the public trust is preserved through their careful and responsible execution of their duties. The value of this Forest Resource Management Plan ultimately rests on the faithfulness with which they adhere to its dictates.

II. Purpose, Need, and Guiding Principles

1. Legislative mandate

The Department of Conservation and Recreation (DCR) Division of State Parks and Recreation (DSPR), is responsible for the stewardship and management of over 285,000 acres of state forests, parks, and reservations. Various Commonwealth laws, the state Constitution, and sound forestry practices require that DCR manage state forests for a range of purposes and goals. These include:

A. Article 97 of the Articles of Amendment to the Constitution of the Commonwealth of Massachusetts (1972): "The people shall have the right to clean air and water, freedom from excessive and unnecessary noise, and the natural, scenic, historic, and esthetic qualities of their environment; and the protection of the people in their right to the conservation, development and utilization of the agricultural, mineral, forest, water, air and other natural resources is hereby declared to be a public purpose."

B. M. G. L. Chapter 21, Section 2F (2003): "Said management plans shall include guidelines for the operation and land stewardship of the aforementioned reservations, parks and forests, shall provide for the protection and stewardship of natural and cultural resources and shall ensure consistency between recreation, resource protection, and sustainable forest management."

C. M. G. L. Chapter 132, Section 31 (State Forests) (enacted 1914 and revised 2003): "[The State Forester] shall reforest and develop such lands, and may, subject to the approval of the Commissioner, make all reasonable regulations which in his opinion will tend to

increase the public enjoyment and benefit therefrom and to protect and conserve the water supplies of the commonwealth.

D. M. G. L. Chapter 132, Section 40 (enacted1943 and revised 1983): "It is hereby declared that the public welfare requires the rehabilitation, maintenance, and protection of forest lands for the purpose of conserving water, preventing floods and soil erosion, improving the conditions for wildlife and recreation, protecting and improving air and water quality, and providing a continuing and increasing supply of forest products for public consumption, farm use, and for the wood-using industries of the commonwealth."

2. Purpose

This Forest Resource Management Plan (FRMP) partially meets the intent of MGL Chapter 21 Section 2F regarding the preparation of management plans by providing strategic sustainable forest management direction for 19 DSPR system properties on 42,965acres[7] in the Southern Berkshire (SBK) District (See Appendix H). **The purpose of this FRMP is to:**

A. Provide direction for the sustainable and integrated management of all natural and cultural resources by defining standards and guidelines;

B. Address the forest resource management issues identified by the public

C. Inform the public on how the forest resources in the SBK District shall be managed

D. Restore and maintain native forests—that are presently dominated by 80-year-old forests over large areas—to have greater diversity of size and age classes, improved wildlife habitat, and increased resilience to disturbances;

E. Restore ecological function to forests while also meeting today's challenges of forest fragmentation from sprawl development, global climate change, and invasive species;

F. Manage for multiple ecosystem services such as: water filtration, a steady flow of water to streams and rivers, air purification, and carbon sequestration over the long-term;

G. Maintain the viability of rare species and their habitat, and provide for the health of native species and vigor of forests;

H. Balance recreational use and aesthetics enjoyed by Massachusetts residents and visitors with sustainable forest management

I. Help supply locally produced "green" products and energy and support the sustainable viability of local forest economies;

J. Provide educational opportunities through "leading by example" about forest values and uses.

[7] Acres used in this report are the best available at the time of publication.

3. Methods

A. Develop a long-term strategy (105 years) for the sustainable management of SBK lands;

B. Develop a specific short-term (next 15 years) implementation schedule to meet desired long-term conditions;

C. Determine the location and extent of forest lands to be set aside as Forest Reserves and Active Forest Management Areas;

D. Provide resource management implementation and monitoring guidance;

E. Meet Forest Stewardship Council green certification standards.

4. Planning Principles

A. The FRMP was developed with the best information and data available, based upon the following planning principles:

1) Consideration of larger landscape-scale patterns and surrounding activities
2) Adaptability to change over time, as new biological and social conditions and information become available
3) Consideration of ecological, social, and economic factors
4) Adherence to ecologically and economically sustainable and environmentally sensitive practices
5) Provision of clear strategic implementation and monitoring directives
6) Thorough documentation of key present conditions, desired conditions, goals, and objectives
7) Coordination with recreational planning to produce a balanced resource protection strategy

B. Forest management planning and FRMPs are an important component of the overall framework of DCR's Resource Management Planning (RMP) Program. DCR's RMP Program is based upon M.G.L. Chapter 21: Section 2F, which requires DCR to develop resource management plans for all agency reservations, parks and forests. The RMP Program is located within the Office of Natural Resources and works across agency divisions, bureaus and programs, and coordinates with the DCR Stewardship Council regarding program development and adoption. FRMPs prepared by the Bureau of Forest Fire Control and Forestry will be integrated into RMPs as RMPs are prepared and completed for each DCR reservation, park or forest. For more information about the RMP Program, please consult the following web page: http://www.mass.gov/dcr/stewardship/rmp/.

5. Forest Stewardship Council Green Certification

A. On May 11th 2004, the State of Massachusetts received Forest Stewardship Council (FSC) endorsed Green Certification for the State lands managed by the principal agencies of the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA):

1) Department of Recreation and Conservation (DCR), Division of State Parks and
2) Recreation (DSPR) – 285,000 acres
3) Department of Fish and Game (DFG) – 110,000 acres
4) DCR, Division of Water Supply Protection (DWSP) – 45,000 acres
5) Re-Certification of the Quabbin Reservoir (DCR–DWSP) – 59,000 acres

Under the sponsorship of the FSC, Scientific Certification Systems (SCS) promotes responsible forest management by certifying environmentally appropriate, socially beneficial, and economically viable forest management. Consumers purchasing products bearing the FSC and SCS labels can be assured that their wood products come from forests that have been responsibly managed to FSC standards.

B. The goals of FSC certification are to:

1) Improve forest management practices on state forestlands
2) Identify opportunities for coordination of forest management among the three state forest management agencies
3) Encourage improvements in private forestland practices, by providing examples and building toward market incentives for verified sustainable management practices
4) Improve public understanding and confidence of active forest management practices on state forestlands, by providing an independent, FSC-accredited audit of those properties
5) Increase timber revenues through increasing sustainable forestry and acres in Green Certification

The Forest Stewardship Council is an international organization that evaluates, accredits, and monitors independent forest product certifiers. SCS is accredited as a certifier by the FSC and uses an accredited set of standards based on the FSC principals and criteria in its evaluation activities.

III. The SBK Regional Landscape

The Southern Berkshire District is located in four ecoregions (as fully described in the *Landscape Assessment and Forest Management Framework for the Berkshire Ecoregions*). The higher elevations and corresponding cooler climate of the Berkshires lead to vegetation patterns more typical of northern New England with spruce-fir and northern hardwood forests dominating the landscape. Lakes and ponds are relatively abundant in the area.

The SBK district drains into four different watersheds. The percentage of the district landscape draining into each is as follows: 50% Housatonic, 28% Farmington, 19% Westfield and 3% drains into the Hudson River watershed.

The Housatonic basin occupies most of the southwest corner of the state and is known for its marble outcrops that create lime rich ponds, streams, and wetlands. From cool, rich mesic forests to calcareous fens on the broad, smoothly rolling Housatonic Valley floor, the basin supports a variety of important and uncommon natural communities and habitats for its many rare species. Particularly distinctive of the watershed, and important state wide, are marl ponds and slow hard water streams in beaver-inhabited wetlands. Much less of the lowland—where many of the rare species occur—is protected than are the higher elevation, forested, parts of the watershed. Although the Housatonic is regulated by power plants and reservoirs, and is diverted for municipal water supplies, a minimum low flow is maintained. The main stem of the Housatonic is relatively low gradient and meanders through agricultural lowlands. There are multiple dams in the higher gradient portion north of Great Barrington. Only a relatively small acreage remains of formerly large floodplain forests. Moderate-flowing waters of the main stem and some tributaries support mussels on sand and gravel substrates. Most of the tributaries are fast-flowing in the hills, then slowly pass through broad wetlands once they reach the valley floor. The cold, well-oxygenated upper waters support a diverse native fish community and the invertebrates upon which many of them depend.

The Farmington and Westfield Rivers drain east through rugged terrain from the Berkshire Plateau into the flatter Connecticut Valley. The area is sparsely populated, with large areas of unfragmented forest blocks. The West Branch of the Westfield is the largest entirely unmanaged river in the state. Although a minimum flow is maintained in the other branches of both the Westfield and Farmington, they are regulated by dams, reservoirs, and diversions for municipal water supply. Although the presence of dams and impoundments that collect silts and finer sands limits mussel habitat, mussels are found in some of the moderately flowing portions of streams where there is firm sand and cobble substrate. High-energy riverbanks and riverside rock outcrop communities are important along these quickly flowing rivers. These ledge outcrops and cobble-bottoms provide distinctive habitat for rare aquatic plants. Cold water flowing rapidly over rocky substrates provides important habitat for diverse communities of fish and bottom dwelling invertebrates.

The heavily forested Hudson watershed includes Mt. Greylock, the highest elevation in Massachusetts, the low, flatter Hoosic River valley, and the steep terrain of the Taconic Mountains. Development focuses around the moderate-gradient valley. Groundwater withdrawals, industrial use, and flood control have altered the natural flow regime of the river.

The north flowing Hoosic provides a corridor for northern species to reach the cool high elevation areas that they need. Very steep headwater streams, rough terrain, lime rich lowlands, and associated variety in vegetation characterize the area. Spruce and fir mixed with northern hardwoods and calcium rich wetlands and ponds in the lowlands are distinctive habitats found in the Hudson basin. Shallow calcareous ponds provide habitat that is uncommon in the eastern portion of the state for aquatic plants and other aquatic organisms.

Approximately 39% (131,002 acres) of the land in the SBK Berkshire District Landscape is protected (fee ownership or conservation restrictions held by state, federal, or municipal government, or non-governmental conservation organizations). The present landscape is characterized by forests with dispersed, sparse residential development. Population is concentrated in the cities of Lee and Great Barrington in the western portion of the SBK district, and Westfield on the eastern edge of the district. Like the rest of the state, modern social issues are resulting in an increasingly more dispersed development pattern throughout the district.

The structure and composition of today's forest in this region, on a landscape scale, is heavily influenced by past land use, particularly agricultural use dating from colonial times, subsequent farm abandonment, and past logging practices. Soil cation depletion and a number of insect and disease disturbances also affect the forest in this area.

2. Population and development

The estimated population (based on the 2000 U.S. Census) of the Berkshire Ecoregions is 300,000. Population estimates for the 70 communities in the Berkshire Ecoregions range from 93 to 45,793. Many of these communities are small towns. Half (35) of all communities in the Berkshire Ecoregions have populations of fewer than 1,500. The cities in the Berkshire Ecoregions with the largest population are: Pittsfield (45,793), Westfield (40,072), Northampton (28,978), and North Adams (14,681). The highest population densities are in Pittsfield (1,194/sq. mi.) and Easthampton (1,159/sq. mi.), followed by Greenfield (859/sq. mi.), Northampton (850/sq. mi.), Westfield (824/sq. mi), and North Adams (822/sq. mi.). As is typical of small rural communities, residential development is often dispersed across the landscape, meaning that many residents live in close proximity to (and often surrounded by) the forest. This results in a different relationship to and understanding of the natural world than is typical of more urban dwellers. Communities in the Berkshire Ecoregions grew by an average of just under 12% from 1980 to 2000 (versus a statewide average of 18%).

The amount of developed land in the 70 communities in the Berkshire Ecoregions increased by approximately 50% from 1971 to 1999, with 19 communities experiencing greater than 70% increases. Build-out analyses conducted by EOEEA several years ago indicates that the population in the 70 communities could more than triple if all available buildable land was developed.

One result of the recent population growth and development trends is the further subdivision of large forested tracts into smaller units. Approximately 28% of the forestland in the Berkshire Ecoregion is publicly-owned. While this is somewhat higher than the state as a whole (in which about 24% is publicly-owned) (Petersen, 2000), the majority of the forest land is still privately owned.

It is estimated that the number of landowners with fewer than 50 acres of timberland has more than doubled since 1973 (USDA/FS, 2002) in Massachusetts. This can have a strong influence on how our forestland is managed since owners of relatively small blocks of forest are less likely to manage their land for forest products. They may also be more reluctant to allow others on their land for hunting, fishing and other recreational activities, thereby increasing the pressure on the publicly-owned lands to meet these demands.

Massachusetts is the third most densely populated state, yet it has the eighth highest percentage of forest cover. Massachusetts has long recognized that the state's extensive forests furnish a broad array of benefits that support our quality of life. The state's forest ecosystems provide habitat for wildlife, a resource base for timber production, a wide range of opportunities for recreation, a natural filter to purify the air and water, and a vital source of aesthetic pleasure. As development rates have outpaced population growth over the past four decades, the state has sought ways to ensure that forest resources are used in a sustainable manner.

3. Climate change

Climate change and carbon sequestration are two key forest resource issues emerging on a local, regional, national and global scale. According to the *Massachusetts Climate Protection Plan* (2004), "[c]limate change could have serious impacts on the state's diverse ecosystems, native species and may encourage the spread of non-native species." The SBK FRMP recognizes climate change as resulting from increases in temperature due primarily to elevated greenhouse gas levels that are caused primarily by human activities such as the burning of fossil fuels.

As temperatures increase globally, Massachusetts forest species composition will undoubtedly change over time. Vegetation models predict that the range of forest communities will slowly shift north, with the composition of Massachusetts' forests becoming more typical of forests currently found farther south. Climate change will also likely alter historic precipitation levels and form (snow, rain, etc.), which will also affect Massachusetts forests. Other likely effects include increased frequency and intensity of fires, insect and disease infestations, and erratic weather patterns such as damaging winds, drought, flood, and ice.

Forests play a significant role in keeping carbon dioxide out of the earth's atmosphere by sequestering carbon. It is estimated that forests contain approximately 75% of the earth's biomass. The carbon annually taken up by Massachusetts forests and vegetation equals an estimated 8% of the carbon emitted by humans in Massachusetts (*Massachusetts Climate Protection Plan).*

Massachusetts is studying the role of forests in climate change. Forests are highly complex systems, and there is no scientific consensus on the impact of harvesting on forest carbon sequestration in middle-aged forests like those found in most of Massachusetts. Harvesting increases the growth rates of the remaining trees. Local use of forest products may replace fossil fuels for electricity generation and heating, and various non-renewable materials[8] in consumer

[8] There are various metrics of materials sustainability. Energy intensity (or embodied energy) of materials is measured as the amount of energy consumed in the acquisition of raw material, processing, manufacture, transportation, and construction. Lumber has an embodied energy of 1,380 MJ/m³; recycled aluminum, 21,870

products, thereby reducing or slowing carbon emissions into the atmosphere by sequestering it in durable forest products.

While established carbon-accounting models predict that carbon uptake declines as a function of forest age, this may not always be the case. In one study, harvesting was seen to reduce carbon sequestration rates immediately after harvesting is completed, until forest growth or regeneration occupies the site (O'Donnell, 2007). Research at Harvard Forest in central Massachusetts found a middle-aged forest still increasing carbon sequestration rates (Urbanski, 2006). Other research also suggests older forests may still sequester carbon (Bormann and Likens, 1979; Keeton 2007). Establishing the nature of the relationship with any certainty will require comprehensive, long-term monitoring and analysis; such certainty is unlikely to be arrived at in the near future. FRMPs were created with the best information currently available.

In consideration of potential climate change biological impacts to forests and with a goal of increasing the rates of carbon sequestration, the SBK Plan includes the following strategy:

- Continue to expand DCR forests via land acquisitions and private landowner incentives. This reduces the likelihood of deforestation land use change—one of the leading contributors of carbon emissions—and maintains the carbon sequestering functions of Massachusetts forests;

- Designate, protect, and monitor a forest reserve system of 9,695 acres (23% of SBK DCR system lands) that, in their present condition, serve as carbon sinks ;

- Diversify the SBK 80-year old forests into a more complex forest composed of native species in different vegetative communities, with various age classes and structures;

- Remove, contain, or mitigate the impacts of non-native species, and minimize their future spread, which will likely increase with continued climatic change

- Build capacity to offset carbon dioxide emissions from non-renewable energy sources such as coal, oil, and gas by storing carbon in local forest products;

- Manages forests in longer rotations (105 and 150 year cycles) designed to increase carbon sequestration as opposed to shorter commercial and economic rotations (70 to 80 year cycles) designed to maximize revenue and forest products

- Adjust the FRMP based on new research forest studies and data from monitoring information as required by the 2008 Massachusetts Climate Act, and climate change adaptation priorities.

MJ/m^3; recycled steel 37,210 MJ/m^3; PVC 93,620 MJ/m^3; virgin steel 251,200 MJ/m^3; virgin aluminum 515,700 MJ/m^3 (Architecture 2030). This means that using steel or aluminum requires from 16 to 182 times the amount of energy required to produce timber.

"Carbon footprint" is a broader measure of the impact human activities have on the environment, specifically as they relate to greenhouse gas emissions (generally, carbon dioxide). It applies to behaviors as well as materials.

Carbon resource conservation strives to encourage activities that remove or keep more carbon out of the atmosphere and discourage activities that release carbon into the atmosphere. Massachusetts cannot wait for final, scientific consensus to take action. It is therefore promoting integrated conservative strategies to maintain working forests and their safe storage of carbon. Massachusetts will promote local forest product networks and energy solutions. It seeks to use forest carbon markets to encourage the retention of higher value-added products in the local timber industry, which currently exports most unfinished product out of state. It will also pursue the use of sustainably harvested biofuels to offset fossil fuel consumption, planting trees in urban areas to reduce the heating and cooling load of buildings, and the use of wood products instead of more energy-intensive materials such as concrete, plastics, and steel.[9] The state's goal is to fully incorporate net greenhouse gas emissions impacts when making forest management and land use decisions.

Supporting Maps:

Appendix A, #1 Southern Berkshire Management Forestry District
Appendix A, #2 Southern Berkshire District – Land Use – Land Cover
Appendix A, #3 Southern Berkshire District - Protected Open Space

The SBK landscape consists of 340,052 acres. There are 131,002 acres (approximately 39%) that have some type of long-term protection. The following table shows the ownership of these protected lands.

[9] Energy intensity (or embodied energy) of materials is measured as the amount of energy consumed in the acquisition of raw material, processing, manufacture, transportation, and construction. Lumber has an embodied energy of 1,380 MJ/m³; recycled aluminum, 21,870 MJ/m³; recycled steel 37,210 MJ/m³; PVC 93,620 MJ/m³; virgin steel 251,200 MJ/m³; virgin aluminum 515,700 MJ/m³ (Architecture 2030).

Protected forestland in the Northern Berkshire District, by ownership

Owner	Acres	Percent of Total Protected Land
Federal	3,434	2.6%
State Agencies		
DCR State Parks and Forests	40,837	30.8%
DFG Wildlife Management Areas	4,815	3.7%
DCR/DFG jointly owned	1,171	0.9%
Other Commonwealth	318	0.2%
Municipal	20,904	16.0%
Private – Chapter 61,61A, 61B	23,483	17.9%
Private – Non-61	15,744	12.0%
Conservation Trust	5,462	4.2%
Land Trust	988	0.8%
Non-Profit	6,079	4.6%
Other	7,522	5.7%
Unknown	707	0.5%
Total	**131,002**	**100%**

IV. Public Issues and Opportunities

The most important feature of the FRMP is the coordination and participation in the development of the plan by the public and DCR and other state agency staff. The following is a summary of the public outreach process:

- **Forest Reserve** deliberations: three public meetings and a formal public comment period
- **Berkshire Landscape Assessment** deliberations: two public meetings and a formal public comment period
- **Southern Berkshire District** deliberations: three public meetings and a formal public comment period

Public notification of meetings and public comment opportunities occurred through mailings to over 900 individuals and organizations, press releases, Environmental Monitor publications, emails, and posting of information on the DCR Bureau of Forestry web pages. Pre-planning public issues are located in section *IV. Public Issues and Opportunities* and responses to all written public comments in *Appendix K. Public Comments*.

V. District Overview

The Southern Berkshire (SBK) District contains approximately 42,965 acres in the state forest and parks system, including the newly acquired Spectacle Farm Property. These lands range from the 10,526-acre Beartown State Forest to the 19 acre Jug End State Reservation. There are different administrative boundaries for forest fire control, forest management, service forestry, and recreation programs. All information in this plan is based on the Southern Berkshire's Forest Management District. Since information is collected by the forest management district, properties have been arranged by this district. This plan is in a loose-leaf folder format so that information can be interchanged and arranged as needed. The properties in the SBK District have been grouped into four management units for administration of the forest management program. The following table shows the groups, properties, forest numbers, and acres:

Management units, properties, forest numbers, acres in the SBK District

Management Unit	Forest number	Property	Acres
12	120	Mt. Washington State Forest	4,578
12	121	Bash Bish Falls State Park	407
12	124	East Mountain State Forest	2,009
12	125	Mt Everett Reservation	2,039
12	126	Jug End State Reservation	19
12	126	Jug End State Reservation and WMA	1,171
12	127	Appalachian Trail Corridor	540
Unit 12 total			10,763
13	130	Otis State Forest[10]	4,703
Unit 13 total			4,703
14	140	Beartown State Forest	10,526
14	141	Fountain Pond Park	250
14	142	Arthur Wharton Swann State Forest	850
Unit 14 total			11,626
15	150	Sandisfield State Forest	3,982
15	152	Cookson State Forest	2,798
15	154	Silver Brook North F.C. Site	160
15	154	Silver Brook South F.C. Site	53
15	155	Clam Lake F.C. Site	500
15	156	Campbells Falls State Park	138
Unit 15 total			7,631
16	160	Tolland State Forest	5,809
16	161	Granville State Forest	2,432
Unit 16 total			8,241
Total			**42,965**

Other (non-DSPR system) protected lands in the Southern Berkshire landscape provide complementary natural resource values, protection of BioMap core areas, and opportunities for cooperative resource management. See Appendix E for a list of protected lands within 1 mile of a DCR-DSPR property by ownership.

Although current use properties (privately owned properties managed under the Chapter 61 and 61A programs) are not permanently protected, they do provide and support a large matrix of 23,483 actively managed forested acres representing 18% of the SBK landscape.

[10] This includes the 904 acre Spectacle Farm which was acquired in June of 2007. A separate forest resource management planning analysis will be conducted and amended to the SBK FRMP

VI. Forest Resource Management Area Direction

1. General Standards and Guidelines

The following standards and guidelines apply to all DSPR system lands:

A. **Policies:** DSPR must follow all applicable Commonwealth laws, regulations, executive orders, policy, and documented direction.

B. **Standards, Guidelines and Management Area Delineations:** In general, standards, guidelines and management area delineations should be followed according to the district forest management plan. Minor, site-specific adjustments to the standards, guidelines and management area delineation may occur with documented rationale and approval by the Forest Management Program Supervisor and Chief Forester. Management area delineations were determined primarily through the application of GIS forest and resource data. Field reconnaissance may result in the need to make adjustments according to the natural and physical features of the site.

C. **Education**: Education efforts should emphasize and encourage the DSPR mission and management, natural resource protection, safety, responsible use, and personal responsibility.

D. **Vegetation and Forest Products:**

1) A contract or specific permission is required for the removal or cutting of all forest vegetation and products.

2) Where campfires are allowed, firewood collection is limited to dead and down wood in the immediate camping area.

E. **Openings:**

1) Existing fields, vistas, and wildlife openings may be maintained if consistent with wildlife habitat requirements, cultural needs, and scenery management objectives.

2) New fields, vistas, and wildlife openings if consistent with wildlife habitat requirements, cultural needs, and scenery management objectives, may be created and maintained except in Forest Reserve Areas

F. **Water and Soil:** All projects and activities shall comply with Forest Best Management Practices.

G. **Commercial Minerals:** Mining, oil and gas development, etc. are not allowed within DSPR system lands as per 304 CMR 12.11.

H. **Common Variety Minerals**: Development of common variety minerals (sand, gravel, top soil, etc.) is not allowed within DSPR system lands as per 304 CMR 12.11.

I. **Rock and Mineral Collection:** The collection of mineral specimens is not allowed within DSPR system lands without a special use permit as per 304 CMR 12.11.

J. **Metal Detectors:** The use of metal detectors is prohibited on DSPR system land

K. **Air Quality:** Air quality related values within DSPR system lands should be protected from adverse impacts associated with management and use.

L. **Boundaries:**
   1) All DSPR system land boundaries should be surveyed, marked and posted where feasible.

   2) Boundaries will be marked and posted prior to any land disturbing activity adjacent to private lands.

   3) Boundaries should be maintained on a 10-year schedule.

   4) Property boundaries on newly acquired tracts should be marked within a two-year period after the acquisition date.

M. **Roads:** Facilities associated with roads designed as part of the National Scenic Byway system must be managed in accordance with Federal Highway Administration direction in the "National Scenic Byways Program—Program Information."

N. **Land Protection:** In-holdings and land adjacent to existing DSPR system lands may be protected through fee acquisition or conservation restrictions based on DSPR land protection priorities, dependent upon available funds.

O. **Appalachian National Scenic Trail (AT):** Management of the AT must follow the National Trails Systems Act, as amended (P.L. 90-543). This Act is implemented according to:

   1) The Comprehensive Plan for the Protection, Management, Development, and Use of the Appalachian National Scenic Trail

   2) Memorandum of Understanding Guidance Document for The Appalachian National Scenic Trail in the Commonwealth of Massachusetts, MOU 2490-01-003 dated April 3, 2003 between the Commonwealth, the National Park Service, the Appalachian Trail Conference, and the Appalachian Mountain Club.

   Consistent with the existing agreement, DSPR will consult with the Appalachian Trail Conference and the Appalachian Mountain Club on management actions that may affect AT values.

Management will be guided by the following documents as amended:

1) Appalachian Trail Conference. *Appalachian Trail Design, Construction, and Maintenance (ATC Stewardship Manual*, second edition, 2000).

2) Local DSPR approved AT Management Plans.

3) Where the AT follows a DSPR road system or road within DSPR system lands, road maintenance may be done as needed on drainage structures, closure devices, road bed and management of vegetation for safe vehicle access.

P. **Clearcutting:** Clearcutting (the removal of all trees in areas greater than two acres) is not a standard treatment under this FRMP. However, there are some circumstances under which clearcutting may be considered, including forests with widespread mortality from disease, insects, or windthrow, or snow and ice damage. The decision to use such management will be made only after close evaluation by the Program Supervisor and Chief Forester, and after a public field trip at the site. Reserve trees will be maintained where practicable.

2. Forest Reserves

There are approximately 9,695 acres of Forest Reserves in the Southern Berkshire District.

A. The need for Forest Reserves

1) Passively-managed Forest Reserve areas are those areas that are "set-aside" from the traditional land management base. They protect important landscape features, provide habitat for species that utilize older and complex forest structure, serve as controls for research, and as places where natural systems and disturbance regimes can function relatively free of human interference.

   Forest reserves lay the secure groundwork for ensuring Massachusetts has mature and old growth forests and wildlands in the future. They provide potential refugia for unique ecosystems and species assemblages and may provide habitat for invertebrate wildlife and soil micro-organisms that have not been well studied to date. While no forestland in Massachusetts is free of human impact from ubiquitous influences such as air pollution and invasive, exotic organisms, forest reserves can still help increase the likelihood that representative examples of biodiversity indigenous to an area are conserved.

2) Reserves provide "control" areas for comparison to "treatments" applied to harvested sites—they are the necessary prerequisite for ensuring sustainable, adaptive management of other lands into the future. Forest reserves provide reference sites for objective assessment of the sustainability of forest management practices (Norton, 1999) and are essential for practicing adaptive resource management (Walters and Holling, 1990). Reserves create opportunities for connectivity within the landscape, conservation of

species and processes, buffering against future uncertainty, and other hard to measure but valuable functions (Hunter, 1996).

By comparing the species and communities that occupy reserves over time to those on harvested sites, forest managers can measure the effects of different management regimes and adjust them as needed to ensure that forestry practices on DSPR lands sustain all components of biological diversity.

3) In addition, forest reserves provide unique recreational and aesthetic opportunities. Public comment indicates that Reserve areas would serve as a spiritual resource for many residents of the Commonwealth.

4) Wood products harvested from public and private lands support rural economies, and revenues generated from harvesting on private forestlands are essential for making the retention of private forestland in forest use an economically viable. Reserves allow us to assess and to verify the sustainability of harvesting on both public and private forestlands. DSPR maintains that harvesting and reserves are important and complimentary elements of comprehensive natural resource conservation.

5) DSPR has established the following objectives, strategy and benefits of reserves on state forest lands:

   a. *Objectives*: Provide an ecological reference condition, late successional habitat, and socially important forested areas where management occurs only from natural processes.

   b. *Strategy*: To the greatest degree possible, allow natural disturbance processes to determine the structure and composition of the forest ecosystem. Facilitate biological monitoring to establish baseline data on species and communities that occupy forest ecosystems reserved from commercial timber harvesting.

   c. *Benefits*: Enables rigorous assessment of the ecological sustainability of commercial harvesting on active management sites through establishment of ecological reference conditions. Provides unique recreational and aesthetic opportunities in biologically mature forest habitats that will develop over time in reserves.

B. Reserve size

1) A goal of reserves is to understand how natural disturbance processes shape the structure and composition of forest ecosystems. Accordingly, some reserves should be equal or greater in size than the largest expected natural disturbance patch. Natural disturbances are common in southern New England forests and range from frequent, small disturbances (e.g., annual wind events that disrupt <1 acre of forest canopy) to occasional, catastrophic disturbances (e.g. major windstorms that disrupt as much as 5,000 contiguous acres of forest canopy once every few centuries). The following table shows expected disturbances, magnitude and return intervals:

Typical disturbance in Southern New England forests, by size and frequency

	Disturbance						
	Tornado	**Hurricane**	**Down-burst**	**Large Fire**	**Insect Outbreak**	**Ice Storm**	**Flood**
Maximum size of severe damage patch (acres)	5,000	803	3,400	57-150	?	< 5	?
Return interval (years)	100-300	60-200	?	400-6,000	10	2	20-100

2) DSPR supports having some large reserves of 5,000 acres or more, that represent the diversity of forest ecosystems that occur in Massachusetts. The Nature Conservancy (TNC) has conducted extensive research on reserve design and has proposed that reserves of 15,000 acres or more be established to insure that a portion of the reserve will likely occur in a biologically mature forest at all times, while other portions will likely be recovering from recent disturbances throughout time.

3) The shortcomings of using a single species (fine filter) approach to biodiversity conservation are increasingly clear. Accordingly, this plan emphasizes conservation of ecological communities and ecosystems, explicitly addressing natural processes and the landscape-level factors that sustain them. One goal of ecoregional and district-wide planning is to identify viable examples of all types of ecosystems at an appropriate scale to conserve their component species and processes. Ecoregions are important "coarse filters" for the conservation of most common species, wide-ranging fauna such as large herbivores, predators, and forest interior birds. The size and natural condition of the matrix forest allow for the maintenance of dynamic ecological processes and meet the breeding requirements of species that utilize late-successional forest habitat.

4) There are approximately 9,695 acres in Forest Reserve Areas. This does not include the 904-acre Spectacle Farm. All Forest Reserve Areas are identified as "High Conservation Value Forest" according to the Forest Stewardship Council Northeast Standards for sustainable and well-managed forests (Appendix D).

5) There are both large and small-scale Forest Reserves on DSPR system lands. Large-scale Forest Reserves use a coarse filter approach to protect relatively complete ecological communities and ecosystems, while small-scale Forest Reserves apply a fine filter approach to protect specific landform and habitat features. The SBK contains one large-scale Forest Reserve (Mt. Washington Forest Reserve) and numerous dispersed small-scale Forest Reserves.

Supporting Maps:

Appendix A, #4 Forest Interiors
Appendix B, #1, 10, 19, 28, 37, 46, 55, 64, 73, 82 Property Level – Reserves, Intensive Use and Active Management Areas

C. Large-scale Forest Reserves

There are approximately 7,149 acres in the Mount Washington Forest Reserve Area complex.

1) The process of identifying large-scale Forest Reserves takes into account landscape features, past land use, ownership patterns, and social costs and benefits. The EOEEA working group that recommends large-scale reserve candidates worked under the following assumptions when determining potential large-scale reserve locations:

    a. Large-scale Forest Reserves are designed to:

        i. Represent late successional habitat and baseline control data and information for each ecoregion
        ii. Withstand and recover from large-scale disturbance processes
        iii. Provide viable and adequate breeding habitat for characteristic and area-sensitive species
        iv. Although anchored in large state-owned lands, large Forest Reserves can be supplemented by federal, municipal, non-profit, and private holdings

    b. Twenty-one (21) relatively unfragmented "forest blocks" were identified through a statewide Forest Reserve planning process. These forest blocks represent some of the best opportunities for conserving large-scale Forest Reserve systems in the Commonwealth. These areas are the least fragmented by roads and have the largest patches and greatest percentage of interior forest, key components of successful Forest Reserves.

    c. Representation of Massachusetts' forest types is best achieved by stratifying large Forest Reserves by ecoregion.

    d. Approximately 20% of EOEEA system lands in total may be in a large (approximately 10%) or small (approximately 10%) scale reserve status (result of analysis and public involvement).

2) Beginning with these assumptions, the working group developed nine criteria with which to evaluate the original 21 forest blocks. EOEEA then convened a stakeholder workshop to evaluate, revise and weight these criteria. The resulting 11 criteria were weighted according to the relative importance assigned by the stakeholders:

Forest block evaluation criteria and assigned weight

Characteristic	Weight
Acreage of Old Growth	0.268
Acreage of Valley Bottom Land	0.188
% Protected land in surrounding area	0.115
% forest cover in 1830	0.114
Number of viable rare communities	0.108
% forest cover in surrounding area	0.051
% BioMap Ambystomid habitat	0.047
% riparian and wetland forest	0.035
Acreage of largest interior forest	0.025[11]
% forest interior	0.025
% Living Waters CSW	0.023

3) Following this analysis, feasibility criteria (e.g., road density, ORV use, infrastructure density, adjacent land use, utility use, past land use) were used to evaluate potential Forest Reserves. All large-scale Forest Reserves received a field review. Following both biodiversity evaluation and feasibility review, a large scale statewide forest reserve system was created.

D. Present Condition of Large-scale Reserves

The Mount Washington Reserve consists of significant portions of the Mt. Washington, Mt Everett, Bash Bish Falls, and Appalachian Trail properties, which are owned and managed by DSPR, and portions of the Jug End Reservation and WMA which is jointly owned and managed by the Division of Fish and Wildlife (DFW). It is augmented by several large properties owned by the Nature Conservancy. The Reserve is predominantly forested with oak, northern hardwood and hemlock cover types. Ridgetop stands of scrub oak and/or pitch pine make up a relatively small, but ecologically significant portion of the entire area. None of the properties in the Reserves allow off-road vehicle use.

[11] Forest interiors are defined as forest land that is greater than 1,000 meters from major highways (4+ lanes), 300 meters from state highways, train corridors, developed and open lands and 100 meters from local roads

Forest Types and Acres on DSPR system lands in the Mount Washington Reserve

Forest Type	Acres
Administration	1
Agriculture	1
Beech, Birch, Maple	791
Cliffs	8
Hemlock Hardwood	1,706
Mixed Oak	511
Northern Red Oak	121
Oak Hardwood	3,238
Open Water	15
Pitch Pine – Scrub Oak	29
Poplar – Aspen	13
Red Maple	8
Rocky Summit	26
Scrub Oak	7
Shallow Marsh Meadow or Fen	18
Sugar Maple	5
White Birch	4
White Pine	9
White Pine – Hardwood	267
White Pine – Hemlock	29
No Data	348
Mt. Washington Reserve Total Acres	**7,149**

E. Desired Condition of Forest Reserves

The desired condition for the Forest Reserves are late-successional native forests where forest succession and natural disturbances are allowed to proceed relatively free of human intervention. Human use is allowed, however, uses and activities must be consistent with providing a natural relatively undisturbed landscape.

The table on the following page shows the predicted age class distribution of the Small and Large Scale Forest Reserve Areas minus regeneration level natural disturbance.[12]

[12] Numbers in this plan are derived from several different sources (such as GIS anaylsis, Continous Forest Inventory Plots, and aerial photo interpretation). Any differences in comparable numbers in the tables or text are either due to using different sources or due to rounding.

Predicted age class distribution of SBK Small- and Large-Scale Forest Reserve Areas, minus regeneration level natural disturbance.

	Age class, size, description					
	0-14 years old Regenerating-Sapling 0-4.5" dbh	**15-59 years old** Poles 4.6-10.9" dbh	**60-89 years old** Sawlogs 11-14.9" dbh	**90+ years old** Large Sawlogs 15"+ dbh	**Uneven aged** All size classes	**Non Forest**
Present Distribution	2.8%	29.4%	51.3%	10.3%	1.2%	5.0%
Acres	271	2,851	4,970	1,001	117	485
2020 Distribution	0.0%	22.4%	33.6%	37.8%	1.2%	5.0%
Acres	0	2,172	3,261	3,660	117	485
2035 Distribution	0.0%	12.6%	19.6%	61.6%	1.2%	5.0%
Acres	0	1,221	1,901	5,971	117	485
2050 Distribution	0.0%	2.8%	19.6%	71.4%	1.2%	5.0%
Acres	0	271	1,901	6,921	117	485
2065 Distribution	0.0%	0.0%	12.6%	81.2%	1.2%	5.0%
Acres	0	0	1,221	7,872	117	485
2080 Distribution	0.0%	0.0%	2.8%	91.0%	1.2%	5.0%
Acres	0	0	271	8,822	117	485
2095 Distribution	0.0%	0.0%	0.0%	93.8%	1.2%	5.0%
Acres	0	0	0	9,093	117	485
2110 Distribution	0.0%	0.0%	0.0%	93.8%	1.2%	5.0%
Acres	0	0	0	9,093	117	485
Total Desired Distribution	0.0%	0.0%	0.0%	93.8%	1.2%	5.0%
Acres	0	0	0	9,093	117	485

F. Management Guidelines for Large-scale Reserves

1) Recreation, Public Access, and Visual Resources within Forest Reserves

A. Recreational activities that may be allowed are hiking, hunting, fishing, bird watching, mountain biking, snowmobiling and horseback riding.

B. ORV use is prohibited

C. When there is snow cover (4+ packed inches), snowmobile use is allowed on designated trails and unplowed roads

D. Intensive, development-dependent recreation and administrative sites are not permitted

E. New trail construction is permitted only if limited to stable areas and are relocations of exiting trails to avoid adverse impacts to late-successional forest habitat, rare species, water quality, and to known or potential archaeological sites

F. Minimal cutting of vegetation to maintain DSPR identified public vistas and trails is permitted

G. Hazardous trees directly adjacent to the trail, of imminent, substantial risk to public safety may be cut.

2) Silviculture and Vegetation Management within Forest Reserves

A. Habitat manipulation and traditional silvicultural treatments and operations are not permitted with the following exceptions:

i. Natural Heritage & Endangered Species Program recommendations used to restore, maintain or enhance habitat for rare and endangered species, and exemplary rare communities

ii. Restore native vegetation by removing non-native and off-site plantations

iii. Control of non-native invasive species will be permitted

iv. Vegetation management will be permitted to control erosion or stabilize soils, close roads, or close unauthorized trails

v. Limited cutting of vegetation is allowed for maintenance of trails and existing roads and to protect historic archeological sites

B. Acreage in the reserve is excluded from the annual sustainable harvest calculation

C. Research that causes no adverse impact to the Forest Reserve will be permitted through a formal written proposal process, approved in advance by the Commissioner or their designee

D. New fields, vistas, and wildlife openings are prohibited

3) Water and Soil Resources within Forest Reserves

a. Management may be permitted to control erosion or stabilize soils by closing roads and unauthorized trails, or other means

4) Forest Health and Protection within Forest Reserves

a. Spread of major significant forest pathogens may be controlled if there is a major threat to forest health or risk to private or public interests as determined by the State Forester

b. Non destructive, low impact research for monitoring forest conditions may be established

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

d. Fire breaks may be maintained in fire prone types of vegetation

e. Prescribed fire may be used when it is compatible with protection of the Forest Reserve, restoration of native communities and ecological processes, and the protection of life and property in the reserve or the surrounding landscape

5) Facilities, Transportation, and Boundaries within Forest Reserves

a. No new roads will be constructed

b. Existing roads not needed for recreational or administrative use may be closed and restored to their natural condition

c. Passage through the area is allowed on existing stable roadbeds or trails

d. Existing roads will be managed and maintained according to DSPR road standards to assure continued access

e. Construction of new facilities is prohibited. Exceptions may include small-scale, low impact, natural appearing informational kiosks, universal access structures for trails trailheads and parking, and carefully designed boardwalks

6) Special Uses within Forest Reserves

a. Special uses such as events and activities will be evaluated on an individual basis and may be allowed.

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

c. New communications sites are prohibited

Wind towers are prohibited

G. Small-Scale Forest Reserves

There are approximately 2,546 acres in small-scale Forest Reserves. This does not include any of the Spectacle Farm land, that may eventually be designated as Reserve land.

1) Present Condition

There are a number of areas in the SBK district that traditionally have not been managed for forest products due to their sensitivity and inaccessibility. In the past, the Department's Land Zoning system designated research, natural and wildland areas that were also set aside from vegetation management. The process to identify and designate small-scale forest reserves used the same selection criteria as the large-scale Forest Reserve process without the size restriction. The table below shows the acreage in small-scale Forest Reserve Areas by facility.

Acres in small-scale Forest Reserves by facility

Facility	Acres
Appalachian Trail Corridor	105
Beartown State Forest	507
Clam Lake F.C. Site	137
Cookson State Forest	350
East Mountain State Forest	333
Granville State Forest	164
Otis State Forest	769
Sandisfield State Forest	96
Tolland State Forest	85
Total	**2,546**

2) Desired Condition

The desired conditions for the small-scale Forest Reserves are the same as the desired conditions for the large-scale Forest Reserves.

3) Management Guidelines for Small-Scale Reserves

The management guidelines for small-scale Forest Reserves are the same as those for large-scale Forest Reserves.

3. Intensive Use Areas

There are approximately 533 acres of Intensive Use Areas in the SBK district. This does not include any of the acres in Spectacle Farm acres that may be Intensive Use Areas.

A. General Description

The Intensive Use Areas 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 DSPR 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.

Supporting Maps:

Appendix B, #1, 10, 19, 28, 37, 46, 55, 64, 73, 82 Property Level – Reserves, Intensive Use and Active Management Areas

B. Present Conditions of Intensive Use Areas

The following table lists the Recreational Assets found in the Southern Berkshires District. Not all of these resources are in the Intensive Use Areas, but they must be considered in the forest and vegetation resource management activities.

Intensive Use facility assets on DSPR system properties in the SBK district

State Forest or Park	Facility Assets
Beartown State Forest	**Dams:** Benedict Pond Swann Lodge Stone House **Boat Launches:** Benedict Pond Lake Buel **Campgrounds / Day Use:** Benedict Pond Campground 12 Sites Benedict Pond Day Use Area **Parking Area:** Day Use Area - Beach (12) ORV Parking Lot(12) CCC Site Parking Lot(10) Lake Buel Parking Area(40) Appalachian Trail Parking Area (6) **Trails:** Appalachian Trail (5.6 mi) Other Trails (27.6)

Cookson State Forest	**Dams:** 1000 Acre Pond **Boat Launches:** 1000 Acrea Pond
East Mountain State Reservation	Trails: Appalachian Trail (1.7 mi)
Granville State Forest	**Dams:** CCC Dam Bahre Pond **Campgrounds/Day Use Area:** Halfway Brook Camping area (22 sites) **Parking Areas:** Entrance Parking Area (3) Circle Lot (20) Campground (10) Halfway Brook Lot (8) **Trails**: All Trails (14.8 mi)
Otis State Forest	**Dams:** Upper Spectacle Pond **Boat Launches:** Upper Spectacle Pond Big Pond **Trails:** All Trails (4.1 mi)
Sandisfield State Forest Silver Brook North and South F.C. Site Clam Lake F.C. Site Area	**Dams:** York Lake West Lake Abbey Lake North Silver South Silver Clam Lake **Boat Launches**: York Lake West Lake **Parking:** York Lake Parking Area (50) West Lake Parking Area (10) **Trails:** All Trails (7 mi) **Campgrounds/Day Use Areas:** York Lake Day Use Area
Tolland State Forest	**Dams:** Otis Reservoir **Boat Launces:** Otis Reservoir **Campgrounds/Day Use Areas:** Tolland Camp Ground (93 Sites)

Tolland State Forest	Tolland Day Use Area **Trails:** All Trails (11.2 mi) **Parking:** Boat Launch Parking Area (30) Day Use Parking Area
Mt. Washington Mt. Everett Bash Bish Falls	**Campgrounds/Day Use Areas:** Ashley Hill Campground (10 Sites) Bash Bish Day Use Area Guilder Pond Day Use Area **Trails:** Appalachian Trail (7.4 mi) Other Trails (19.6 mi) **Parking:** Mt. Washington Head Quarters Lot (30) Bash Bish Day Use Lot (25) Mt. Everett Lower Parking (10) Guilder Pond Day Use Parking (25) Race Brook Falls Parking (7)

There are approximately 2.8 acres of non-native and off-site plantations (Eastern white pine, red pine, and Norway spruce – white spruce) in the Intensive Use Areas.

C. Desired Conditions of Intensive Use Areas

Visitors should expect safe recreational opportunities that are balanced with resource conservation goals.

D. Management Guidelines for Intensive Use Areas

1) Recreation, Public Access and Visual Resources in Intensive Use Areas

A. Vegetation management will be conducted to promote and maintain native vegetation of low maintenance, long-term durability, and low hazardous risk

B. A hazardous tree and vegetation survey should be conducted annually, prior to opening the facility

C. Trees and vegetation identified as high hazards should be safely removed as soon as possible

D. Intensive Use Areas with high levels of high hazardous trees and vegetation should be closed and rehabilitated until risks are acceptable

E. Slash, as a result of forest management within 50 feet of Intensive Use Areas, should result in a light and natural-appearing forest ground cover.

2) Silviculture and Vegetation Management in Intensive Use Areas

A. Acreage in the Intensive Use Areas is excluded from the annual sustainable harvest calculations

B. Vegetation treatments may be conducted to improve public safety related to hazard trees, forest health, wildfire fuel reduction, fire suppression, and improve access for recreation and environmental education programs

C. Invasive exotic species should be removed wherever possible

D. Emphasis will be on maintaining native vegetation with value to wildlife species

E. Non-native and off-site plantations should be managed, when possible, in a manner that gradually restores the native forest within the intensive use area. Plantations that are dead or dying may need to be more intensively managed to reduce the public hazards and accumulation of excessive slash and debris. Where possible, the goal is to maintain a forested setting and actively restore the native forest within the intensive use area.

F. Small-scale wildlife habitat improvements may be conducted

G. Landscape plantings will consist of native materials in natural resource areas and historically compatible species in cultural resource areas

3) Water and Soil Resources in Intensive Use Areas

A. Surface water resources may be used for recreation within the constraints of maintaining public safety and water quality

B. Surface water and associated wetland vegetation will be managed following the guidelines established in the Wetlands Protection Act

C. Ground water resources may be utilized for day use and camping facilities

D. Soils should be sustainably managed to minimize erosion, compaction and displacement

4) Forest Health and Protection in Intensive Use Areas

A. Spread of major forest pathogens may be controlled through environmentally sound programs

B. Wildfires will be contained, confined and controlled in a safe and aggressive manner

5) Facilities, Transportation and Boundaries in Intensive Use Areas

A. All main roads and bridges will be constructed or maintained to support vehicular traffic to meet administrative, recreation and natural resource management access needs with public safety considerations as the primary management objective

B. Use of roads by logging trucks or other commercial traffic may be restricted during periods of high visitor use

4. Active Forest Resource Management Area

There are approximately 31,833 acres in Active Forest Resource Management Areas, including 29,036 acres of productive forest and 2,797 acres of non-forest. The 904-acre Spectacle Farm is not included in the Active Forest Resource Management Area total.

1. General Description

Active Forest Resource Management Areas include the full range of sustainable forest management, recreation activities, and natural resource uses. These areas are suitable and available for active vegetation management to achieve the desired conditions. However, not all lands within this active management area will actually be managed, due to physical and feasibility limitations. Management and use occur in a sustainable manner after consideration of temporal and spatial factors. For example, forest management may occur in a variety of locations over time, but on a very small percentage of land on an annual basis. All proposed projects including forest management, wildlife, recreation, trails, etc. must be designed to achieve the desired conditions and meet management guidelines.

Supporting Maps:

Appendix B, #1, 10, 19, 28, 37, 46, 55, 64, 73, 82 Property Level – Reserves, Intensive Use and Active Management Areas

2. Recreation, Public Access, and Visual Resources within Active Forest Resource Management Areas

A. Present Condition of Recreation, Public Access and Visual Resources within Active Forest Resource Management Areas

Recreational opportunities and aesthetic quality are important to all visitors to DSPR system lands. The SBK lands are used for many types of recreation. Uses include camping, hiking, cross country skiing, snowshoeing, horseback riding, birding, nature study, mountain biking, sightseeing, swimming, hunting, and fishing.

The following table shows the acres in road and trail corridors (areas along trails where vegetation management is modified to meet safety and aesthetic concerns) by facility. More specific trail and road information for each property can be found in the management unit appendices. Any roads or trails that may exist on the Spectacle Farm

property are not included. More specific trail and road information for each property can be found in the management unit appendices.

Acres in road and trail corridors subject to aesthetic modification of vegetation management by facility

Facility	Acres in road or trail corridors
Appalachian Trail Corridor	350
Arthur Wharton Swann State Forest	171
Bash Bish Falls State Park	20
Beartown State Forest	1,133
Campbells Falls State Park	1
Clam Lake F.C. Site	14
Cookson State Forest	129
East Mountain State Forest	282
Fountain Pond Park	10
Granville State Forest	169
Jug End State Reservation & WMA	83
Mt. Everett State Reservation	623
Mt. Washington State Forest	224
Otis State Forest	198
Sandisfield State Forest	164
Silver Brook North/South F.C. Sites	8
Tolland State Forest	373
Total	**3,951**

Supporting Maps:

Appendix A, #5 Southern Berkshire District – Reserves, Intensive Use and Active Management Areas
Appendix B #2, 11, 20, 29, 38, 47, 56, 65, 74, 83 Property Level – Hydrology Buffers
Appendix B #3, 12, 21, 30, 39, 48, 57, 66, 75, 84 Property Level – Road and Trail Corridors

Statistics have been generated showing acres and percentages of each community within the SBK District. These numbers are broken down for each town by Reserve Areas, Intensive Use Areas, and Active Management Areas (not including the new Spectacle Farm property)

Forest management regime components, by town in the Southern Berkshire District

Town	Acres in District	Percent of Town in District	Percent of District	Acres in Reserve	Percent in Reserves	Acres in Intensive Use	Percent in Intensive Use	Acres in Active Management	Percent in Active Management
Alford	7,378	100%	2.2%	0	0.0%	0	0.0%	0	0.0%
Becket	3,352	11%	1.0%	127	3.8%	0	0.0%	87	2.6%
Blandford	21,829	64%	6.4%	0	0.0%	0	0.0%	698	3.2%
Egremont	12,082	100%	3.6%	774	6.4%	20	0.2%	359	3.0%
Granville	27,562	100%	8.1%	29	0.1%	14	0.1%	1,625	5.9%
Great Barrington	29,310	100%	8.6%	610	2.1%	297	1.0%	6,038	20.6%
Lee	7,495	43%	2.2%	75	1.0%	0	0.0%	547	7.3%
Monterey	17,519	100%	5.2%	229	1.3%	41	0.2%	4,217	24.1%
Montgomery	1	0%	0.0%	0	0.0%	0	0.0%	0	0.0%
Mount Washington	14,325	100%	4.2%	6,006	41.9%	13	0.1%	889	6.2%
New Marlborough	30,654	100%	9.0%	298	1.0%	8	0.0%	2,783	9.1%
Otis	24,294	100%	7.1%	659	2.7%	93	0.4%	2,337	9.6%
Russell	6,340	55%	1.9%	0	0.0%	0	0.0%	0	0.0%
Sandisfield	33,903	100%	10.0%	285	0.8%	0	0.0%	5,727	16.9%
Sheffield	31,098	100%	9.1%	401	1.3%	0	0.0%	217	0.7%
Southwick	10,834	53%	3.2%	0	0.0%	0	0.0%	0	0.0%
Stockbridge	7,924	52%	2.3%	0	0.0%	0	0.0%	450	5.7%
Tolland	20,985	100%	6.2%	203	1.0%	47	0.2%	2,678	12.8%
Tyringham	12,068	100%	3.6%	0	0.0%	0	0.0%	386	3.2%
West Stockbridge	9,516	80%	2.8%	0	0.0%	0	0.0%	0	0.0%
Westfield	11,584	38%	3.4%	0	0.0%	0	0.0%	0	0.0%
Total	**340,054**		**100%**	**9,696**	**2.9%**	**533**	**0.2%**	**29,038**	**8.5%**

B. Desired Condition of Recreation, Public Access and Visual Resources within Active Forest Resource Management Areas

The desired condition is a state forest or park where a variety of passive and active natural resource-based recreational opportunities and uses occur in a safe and environmentally sustainable manner that is consistent and compatible with natural resource management goals. The aesthetic and visual qualities of the recreation and other use areas provide a variety of forested experiences. The ORV study and subsequent formulation of policies are completed and the results are incorporated in the SBK Forest Resource Management Plan.

C. Management Guidelines for Recreation, Public Access and Visual Resources within Active Forest Resource Management Areas

1. Sustainable forest management practices for recreation, public access and visual resources shall be designed to promote native vegetation, species diversity, large-diameter trees, multiple age classes, a healthy forest, a safe recreation experience, and aesthetics through uneven-aged (five 30 year entries totaling 150 years) and extended rotation (150 years) even aged forest management systems.

2. Special attention and care should be given to provide long-term quality scenery within DSPR system lands.

3. In general, management should promote native, diverse, healthy forests and habitats. Adjacent to recreation areas, emphasis should be given to vegetation that is safe to the public and consists of older and larger trees with multiple age classes to provide long-term quality scenery management.

4. Scenery management should be planned according to the following road and trail corridor and socially important area guidance:

   a. Appalachian National Scenic Trail

   The Appalachian National Scenic Trail (AT) includes 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).

   i. Sustainable forest management, including salvage may be allowed as long as they are consistent with Appalachian National Scenic Trail (AT) local management plan and the MOU. Practices shall be planned to meet the objectives of the AT primary and secondary corridors.
   ii. Should forest management take place within the primary or secondary corridors, skid trails should not cross the AT unless there are no feasible alternatives.
   iii. Forest management within the AT primary and secondary 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.

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

b. Interstate, Intrastate and Local Roads and Trails:

Interstate and Intrastate roads and trails include a 100 foot wide corridor on each side of the road or trail. Local roads and trails that are included in the DSPR road and trail database (mapped and officially designated) include a 50 foot wide corridor on each side of the road or trail.

i. Sustainable forest management, including salvage, is allowed within road and trail corridors.
ii. Forest management within the trail corridors will be designed to promote native diverse vegetation, large-diameter trees, multiple age classes and forest structures, healthy forest, safe recreation experience, and quality scenery.
iii. 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.
iv. Natural resource managers will coordinate with park supervisors and user groups when vegetation management is planned.
v. Natural resource managers will coordinate with park supervisors 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.

c. Socially Important Areas

Socially Important Areas are Forest Reserves, Intensive Use Areas and other areas identified during the proposed timber harvest public notification process. Socially Important Areas will have a transitional corridor to the Active Management Area of approximately 100 to 300 feet wide.

i. Sustainable forest management, including salvage, is allowed within and adjacent to the socially important area transition corridor.
ii. Forest management within the corridor will be designed to promote native diverse vegetation, large-diameter trees, multiple age classes and forest structures, healthy forest, safe recreation experience, and quality scenery.
iii. Slash, as a result of forest management within and adjacent to 25 feet of the socially important area, should result in a light and natural appearing forest ground cover.
iv. Natural resource managers will coordinate with park supervisors and user groups when vegetation management is planned.

B. Silviculture and Vegetation Management within Active Forest Resource Management Areas

The maintenance of appropriate native biodiversity is the underlying silvicultural and vegetation management goal on all state forest and parks lands. Biological diversity is, in part, a measure of the variety of plants and animals, the communities they form, and the ecological processes (soil, climate, water, nutrient cycling, disturbance, etc.) that sustain them. With the recognition that each species has value, individually and as part of its natural community, maintaining appropriate native biodiversity has become one of the most important natural resource management goals.

This is accomplished by applying both coarse and fine filter approaches. A coarse filter approach to conserving appropriate native biodiversity involves maintaining a variety of ecosystems; it assumes that a representative array of ecosystems (types and ages) will contain the vast majority of the species in the region. The fine filtered approach is directed towards individual species known to be rare and strives to catches them even if they “passed through” the coarse filter.

These filters are applied on DSPR system lands by first creating large and small-scale Forest Reserves to promote natural relatively undisturbed forest conditions and provide late successional habitat. The overlying goal on the remaining lands will be to promote appropriate native biodiversity through the protection, restoration, and maintenance of rare species and their habitat, rare natural communities and related species, and an effort to balance the forest age classes. The species composition and structure of the forests are equally important biodiversity elements and will be taken into consideration.

The Silvicultural and Vegetation Management Section is organized in the following subsections: conservation of rare species, restoration and maintenance of native ecosystems, and the establishment and maintenance of a diversity of forest types, age classes, and forest structures.

A. Rare Species

1. Present Condition of Rare Species

The Massachusetts Endangered Species Act (MESA), M.G.L. Ch. 131A, and its regulations (321 CMR 10.00) prohibit the taking of any state-listed rare plant or animal species. MassWildlife’s Natural Heritage and Endangered Species Program regularly updates and publishes *The Natural Heritage Atlas* that shows the Estimated Habitats of rare wetlands wildlife and the Priority Habitats of all state listed rare species. Rare species include those that are of Endangered, Threatened, or of Special Concern as defined in the MESA.

“Endangered" means any species of plant or animal in danger of extinction throughout all or a significant portion of its range, and species of plants or animals in danger of extirpation as documented by biological research and inventory.

"Threatened," means any species of plant or animal likely to become an endangered species within the near future throughout all or a significant portion of its range, and any

species declining or rare as determined by biological research and inventory and likely to become endangered in the foreseable future.

"Special Concern" means any species of plant or animal which has been documented by biological research and inventory to have suffered a decline that could threaten the species if allowed to continue unchecked or that occurs in such small numbers or with such restricted distribution or specialized habitat requirements that it could easily become threatened within Massachusetts.

All Rare Species habitat is identified as "High Conservation Value Forest" according to the Forest Stewardship Council Northeast Standards for sustainable and well-managed forests (Appendix D).

See Appendix F for a list of the 95 rare species that are currently known to occur in the SBK area. Additionally, this appendix includes a list of the 22 rare species that are currently known to occur only on DSPR land in the district.

"Priority Habitats" delineate habitats for rare plant and animal populations protected under the MESA Regulations (321 CMR 10.00). They are comprised of GIS polygons indicating the approximate extent of rare species habitat based on records in the National Heritage and Endangered Species Program. The following table shows the priority habitat for the SBK District.

Priority habitat in the SBK District

2006 Priority Habitat Data	**Acres**
NHESP Priority Habitat polygons on non-DSPR lands in the Northern Berkshire District	*47,287*
NHESP Priority Habitat polygons on DSPR lands in the Northern Berkshire District	*9,806*
Appalachian National Scenic Trail Corridor	429
Bash Bish Falls State Parkt	407
Beartown State Forest	152
Campbells Falls State Parkt	10
Cookson State Forest	81
Jug End State Reservation and WMA	1,188
Mt. Everett State Reservation	2,034
Mt. Washington State Reservation	3,972
Otis State Forest	114
Sandisfield State Forest	37
Tolland State Forest	1,381
Total	**57,093**

Estimated Habitats delineate the approximate geographical extent of habitats of state-protected rare wildlife (not plants) and indicate approximate locations of certified vernal pools for use with the Wetlands Protection Act Regulations (310 CMR 10.00). The following table shows the Estimated Habitat for the SBK District:

Estimated Habitat in the SBK District

2006 Estimated Habitat Data	Acres
NHESP Estimated Habitat polygons on non-DSPR lands in the Northern Berkshire District	*37,524*
NHESP Estimated Habitat polygons on DSPR lands in the Northern Berkshire District	*9,708*
Appalachian National Scenic Trail Corridor	429
Bash Bish Falls State Parkt	407
Beartown State Forest	152
Campbells Falls State Parkt	0x
Cookson State Forest	0x
Jug End State Reservation and WMA	1,188
Mt. Everett State Reservation	2,011
Mt. Washington State Reservation	3,972
Otis State Forest	65
Sandisfield State Forest	37
Tolland State Forest	1,381
Total	**47,232**

Supporting Maps:

Appendix B, #4, 13, 22, 31, 40, 49, 58, 67, 76, 85 Property Level – Rare Species

2. Desired Condition of Rare Species

The desired condition is a forested landscape where rare species and their habitats are appropriately valued, protected, and conserved. In addition, DSPR staff will work cooperatively with the Natural Heritage and Endangered Species Program to conduct periodic rare species and habitat inventories and surveys for the conservation, restoration and maintenance of rare species.

3. Management Guidelines for Rare Species

a. Consult with Massachusetts Natural Heritage and Endangered Species Program (NHESP) Atlas for known occurrences or habitats of rare species during all project planning

b. Survey for rare and uncommon species, habitats, and natural vegetation communities during all field operations. Training and protocols will be developed in cooperation with the NHESP

c. Submit to NHESP for review and recommendations the silvicultural prescription or project report with species and habitat considerations when rare and uncommon species, their habitats, or natural vegetation communities are located

d. Meet intent and standards of rare species Conservation Management Practices as they are approved by NHESP for all species currently listed or delisted (such as the Spring Salamander and Spotted Turtle) since the preparation of this plan. These practices can be accessed online at http://www.mass.gov/dfwele/dfw/nhesp/regulatory_review/forestry/forestry_cmp.htm

e. Continue to cooperatively develop with NHESP Conservation Management Practices for the protection of rare species and their habitats

B. Native Vegetation

1. Present Condition of Native Vegetation

For over 5,000 years, people have moved plants with commercial value all over the globe. In Massachusetts, the Civilian Conservation Corp was very active in establishing plantations on areas that were previously cleared for agriculture, cut over, and/or burned. Many of these planted species were non-natives such as Norway spruce and Scots pine, or native trees that were planted out of their historic ranges (off-site) such as red pine and larch. The DSPR system lands in the SBK district contain approximately 928 acres of non-native and off-site plantations. Although these plantations are not usually invasive (invasive non-native species are discussed in the forest health section) and may contain valuable wood products, they support markedly lower diversity of native flora and fauna when compared to native forest types. The benefits (wood production) do not outweigh the negative ecological effects and potential threats of these plantations.

2. Desired Condition of Native Vegetation

The desired condition is a forest where appropriate native biodiversity is supported through the maintenance and restoration of native ecosystems and species components. Non-native species will be removed and the area restored to native conditions where possible through the application of active vegetation management including silvicultural treatments and prescribed fire.

3. Management Guidelines for Native Vegetation

a. Restore non-native forest conditions to native and natural conditions

b. Maintain a diversity of native forest types and age classes

c. Provide for an appropriate diversity of native species including herbs, forbs, and woody vegetation

Maintain non-native and off-site plantations only where their removal would have severe environmental consequences or in areas where they provide other societal benefits, such as high use recreational areas or historical context.

C. Forest Type and Age Class Diversity

A major factor influencing forest biodiversity in Massachusetts is the composition, age structure and distribution of forest types and their forest successional stages. This is important from a biological diversity perspective because each forest successional stage provides different components of species life cycle needs and each stage may have a different, although not usually unique, set of species. Because various plant and animal species are associated with different stages of succession, balancing the age structure of a forest provides the widest range of habitats and therefore biological diversity. Thus, when viewed on the time scale of forest succession and the spatial scale of landscapes, active vegetation management provides for and enhances biological diversity.

1. Present Condition of Forest Type and Age Class Diversity

The SBK district's forest vegetation is currently composed of approximately 1% early-successional forest habitat (0 to 14 years old), 71% mid-successional forest habitat (15 to 104 years old), 2% uneven aged forest, 15% late-successional forest habitat (114+ years old), and 9% non-forested. These are distributed over nine general forest types. The following table displays the breakdown of total acreage in the SBK district by age class and forest type.

Present SBK District Forest Vegetation by forest type and size class (acres)

	Non Forest	**0-14 years old** Regenerating-Sapling 0-1.4" dbh	**15-59 years old** Poles 1.5-10.9" dbh	**60-90 years old** Sawlogs 11-17.9" dbh	**90+ years old** Large Sawlogs 18" + dbh	**Uneven aged** All size classes	**All types**
Total Current Distribution	8.6%	1.4%	23.4%	48.0%	15.5%	2.0%	100%
Total Sustainable Distribution	8.6%	6.8%	20.5%	13.6%	39.5%	9.9%	100%
Open Lands	763.5	0.0	0.0	0.0	0.0	0.0	763.5
White/Red Pine	0.0	28.3	300.7	1,921.1	1171.1	297.8	3719.0
Hemlock	0.0	29.63	3,116.7	6,203.3	713.68	39.51	10,102.9
Spruce-Fir	0.0	10.26	135.24	132.9	101.07	1.78	381.2
Pitch Pine/Scrub Oak	0.0	26.6	3.1	8.2	0.0	0.0	37.9
Northern Hardwoods	0.0	95.7	2,325.2	4,025.3	1051.8	371.0	7,869.1
Birch-Red Maple	0.0	67.1	70.8	43.6	0.0	0.0	181.5
Oak	0.0	273.5	3,495.6	7,830.3	3466.4	126.0	15,191.8
Swamp Softwoods	0.0	0.0	39.37	0.0	0.0	0.0	39.4
Swamp Hardwoods	0.0	40.7	327.8	9.1	11.4	0.0	388.9
Water & Open Wetlands	2,859.9	0.0	0.0	0.0	0.0	0.0	2,859.9
No Data	525.8	0.0	0.0	0.0	0.0	0.0	472.8
Total	**4,149.1**	**571.8**	**9,814.5**	**20,173.8**	**6,515.5**	**836.1**	**42,060.7**[13]

Supporting Maps:

Appendix B, #5, 14, 23, 32, 41, 50, 59, 68, 77, 86 Property Level – Vegetation

Appendix B, #6, 15, 24, 33, 42, 51, 60, 69, 78, 87 Property Level – Vegetation with Resource Overlays

[13] This total does not include the data from Spectacle Farm since it is a recent purchase and a forest inventory has not yet been completed

2. Desired Condition of Forest Type and Age Class Diversity

The desired condition is a forest where appropriate native biodiversity is provided through the maintenance of habitats where all successional stages are represented for each forest type. Biodiversity is further provided through a planned range of species composition and structural components and a well functioning forest ecosystem.

Native forest will be managed according to the following three sustainable management regimes:

1. Even-age regeneration system at 105 years rotation (expected culmination point of mean annual increment and annual incremental growth),
2. Extended rotation at 150 years, and
3. Uneven-aged regeneration system involving at least 5 distinct management entries (approximately one every 30 years).

Intermediate thinnings should be anticipated when forest tree densities (stocking) are at a high level, and where competition for sunlight, water, and nutrients pose limiting factors. The following table shows the desired age and size class distribution of the Active Forest Resource Management Areas over the next 105 years[14].

Future condition of **Active Forest Management Areas** within the SBK over the next 105 years

	0-14 years old Regenerating-Sapling 0-4.5" dbh	**15-59 years old** Poles 4.6-10.9" dbh	**60-89 years old** Sawlogs 11-14.9" dbh	**90+ years old** Large Sawlogs 15"+ dbh	**Uneven aged** All size classes	**Non Forest**
Present Distribution	0.9%	21.9%	49.0%	17.4%	2.3%	8.5%
Acres	300	6,963	15,555	5,515	719	2,711
2020 Distribution	9.0%	15.6%	31.8%	22.4%	12.7%	8.5%
Acres	2,865	4,942	10,099	7,124	4,023	2,711
2035 Distribution	9.0%	17.3%	14.6%	37.9%	12.7%	8.5%
Acres	2,865	5,486	4,642	12,036	4,023	2,711
2050 Distribution	9.0%	19.0%	14.6%	36.2%	12.7%	8.5%
Acres	2,865	6,030	4,642	11,492	4,023	2,711
2065 Distribution	9.0%	27.1%	8.3%	34.5%	12.7%	8.5%
Acres	2,865	8,595	2,621	10,948	4,023	2,711
2080 Distribution	9.0%	27.1%	10.0%	32.7%	12.7%	8.5%
Acres	2,865	8,595	3,165	10,404	4,023	2,711
2095 Distribution	9.0%	27.1%	18.0%	24.7%	12.7%	8.5%
Acres	2,865	8,595	5,730	7,839	4,023	2,711
2110 Distribution	9.0%	27.1%	18.0%	24.7%	12.7%	8.5%
Acres	2,865	8,595	5,730	7,839	4,023	2,711
Total Sustainable Distribution	9.0%	27.1%	18.0%	24.7%	12.7%	8.5%
Acres	2,865	8,595	5,730	7,839	4,023	2,711

[14] Forest Reserve stand and tree characteristics, such as species, age, diameter and size are estimated based on the natural progression of stand growth dynamics without natural and human-caused disturbance. It should be understood, however, that disturbances affecting forest and tree characteristics are both inevitable and unpredictable.

When combined with Forest Reserve Areas, the age class and structure for all DSPR lands in the Southern Berkshire District will be distributed as follows:

Total future condition of **all SBK lands**

	0-14 years old Regenerating -Sapling 0-4.5" dbh	**15-59 years old** Poles 4.6-10.9" dbh	**60-89 years old** Sawlogs 11-14.9" dbh	**90+ years old** Large Sawlogs 15"+ dbh	**Uneven aged** All size classes	**Non Forest**
Present Distribution	1.4%	23.4%	48.0%	15.5%	2.0%	7.6%
Acres	571	9,814	20,174	6,516	836	3,191
2020 Distribution	6.8%	16.9%	31.8%	24.8%	9.9%	7.6%
Acres	2,865	7,114	13,358	10,434	4,140	3,191
2035 Distribution	6.8%	16.0%	15.6%	42.0%	9.9%	7.6%
Acres	2,865	6,707	6,543	17,656	4,140	3,191
2050 Distribution	6.8%	15.0%	15.6%	43.0%	9.9%	7.6%
Acres	2,865	6,301	6,543	18,062	4,140	3,191
2065 Distribution	6.8%	20.5%	9.2%	44.0%	9.9%	7.6%
Acres	2,865	8,595	3,842	18,469	4,140	3,191
2080 Distribution	6.8%	20.5%	8.2%	44.9%	9.9%	7.6%
Acres	2,865	8,595	3,436	18,875	4,140	3,191
2095 Distribution	6.8%	20.5%	13.6%	39.5%	9.9%	7.6%
Acres	2,865	8,595	5,730	16,581	4,140	3,191
2110 Distribution	6.8%	20.5%	13.6%	39.5%	9.9%	7.6%
Acres	2,865	8,595	5,730	16,581	4,140	3,191
Total Sustainable Distribution	6.8%	20.5%	13.6%	39.5%	9.9%	7.6%
Acres	2,865	8,595	5,730	16,581	4,140	3,191

3. Management Guidelines for Forest Type and Age Class Diversity in Active Forest Resource Management Areas:

a. Consolidate vegetation management activities where possible to emulate some natural disturbance processes, maximizing treatment effectiveness and efficiencies, and if applicable, decreasing the edge effect from harvesting

b. Conduct vegetation management activities in accordance with accepted silvicultural practices and guidelines

c. Coordinate vegetation management activities where practicable, desirable and feasible with adjacent lands. Consider the surrounding local landscape patterns during the development of project level plans.

d. Implement vegetation management on a 15-year planning cycle

e. Prioritize vegetation management to meet the following natural resource objectives :

1. Meet rare species habitat and biodiversity goals
2. Reduce the risks of catastrophic disturbances such as insects, disease, and wildfires
3. Restore and maintain native ecosystems
4. Provide a more appropriate balance of age classes for forest successional types, including increasing older and younger age classes
5. Reduce the threat and potential area of excessive forest mortality by improving growth and vigor of the forest
6. Enhance future carbon storage and sequestration capacities
7. Restore native species to sites where they have traditionally grown prior to overcutting, the introduction of invasive species, and agricultural impacts
8. Provide a sustainable flow of forest products and appropriate native biodiversity by balancing the age classes for each forest type

f. Select stands for meeting the above vegetation management objectives by further prioritization in order of the following criteria:

i. Forest stands in which management has previously been conducted, in order to: 1) release new forest growth in the understory; 2) conduct a second thinning to continue to improve forest composition and health; and 3) establish new forest growth in the understory;
ii. Forest stands that are at imminent risk of mortality from insects, disease, fire, etc;
iii. Forest stands that are poorly stocked and do not fully occupy the site or in stands that are currently stocked with species that are ill-suited to the site such as non-native red pine and Norway spruce on northern hardwood sites;
iv. Low quality forest stands where cuttings could improve the quality of the forest;
v. Forest stands that are homogeneous in age and/or species composition (generally 80 years old); and,
vi. Overstocked forest stands where thinning will restore a diversity of species suited to the site, improve growth and insect/disease resistance, and accelerate the growth and maintenance of large tree forests.

g. **Even-age management (105 Year Rotation):**

i. **Preparatory shelterwood treatment:** No more than 0.4 percent (169 acres per year). Preparatory shelterwood treatment is designed to stimulate a young forest of desirable species while maintaining a shelter of mature trees.

ii. **Reserve shelterwood final harvest:** No more than 0.4 percent (169 acres per year) of the entire SBK DCR system lands (42,965 acres) will be even-aged harvests removing residual overstory trees where previous shelterwood harvests

have established a new forest of about 10-15 years in age. This even aged forest management system will maintain a component of the very largest and most valuable trees (legacy trees); trees that have cavities (wildlife trees); snags; and course woody debris for nutrient recycling and wildlife purposes.

i. **Even-age management (150 Year Rotation):**

i. Manage approximately 13% (4,023 acres) of the forest vegetation in the Active Forest Resource Management Areas (approximately 9% of all DSPR lands in the SBK District) in an extended rotation (approximately 150 years). For this management period, regeneration harvests are not planned.

ii. Select stands for extended 150 year rotation management systems in areas that complement Forest Reserves, trail and road corridors, aquatic buffers, and/or rare species habitats where possible.

iii. Manage extended rotation stands according to even aged silvicultural principles of preparatory shelterwood treatment and reserve shelterwood final harvest to promote healthy, multi-age, large stand areas with complex structure

j. Uneven-age management systems:

i. Manage approximately 13% (4,000 acres) of the forest vegetation in the Active Forest Resource Management Areas (approximately 9% of all DSPR lands in the SBK District) in an uneven age management 150 years rotation system. Uneven aged forest management systems will maintain a component of the very largest and most valuable trees (legacy trees); trees that have cavities (wildlife trees); snags; and course woody debris for nutrient recycling and wildlife purposes.

ii. No more than 27 acres per year will be uneven-aged management consisting of small group (3-4 trees up to 1/2 acre) selection harvesting methods. Selective harvesting creates a balanced forest stand with a range of age classes, an “all aged” forest.

iii. Manage group selection stands according to at least five (5) relatively equal entries to promote healthy, multi-age, and large forest stand areas with complex structure.

k. **Thinning[15] of overstocked stands:**

No more than 1.0 percent (450 acres per year) of overstocked stands where crowding negatively affects growth and health. Some 11,550 acres (770 acres per year) have been identified as overstocked forest stands within the SBK District. Thinning results in a diversity of native species suited to site conditions and is designed to restore a forest condition that is more resilient to damage, insects, and disease. Thinning also captures imminent mortality to provide opportunity for local forest products that slow the release of carbon, and energy that reduces the burning of fossil fuels. Thinning will occur on even aged and uneven aged stands.

Establishing now a mix of forest reserves, 105-year, and 150- year rotation forests, DCR forests will in the future be markedly older and have a greater diversity of ages and species than many surrounding private forests, which are typically either not harvested, or not selectively harvested and thinned. At the end of the 105-year period, very young forest (0-14 years) will increase from 3% to 5%—an important increase in a wildlife habitat type that is used by 50% of vertebrates and which provides most of the life needs for 20% of vertebrates. Very young forest areas will be selected to maximize their ecological benefits and complement other components of the landscape. Massachusetts' original forest contained much more age and structural diversity than the current 80-year old "even-aged" forest. This plan will help restore some of that diversity while strengthening the forests to meet the challenges that lie ahead.

Present Condition and Desired Condition

	Age class				
	0-14 yrs	**15-59 yrs**	**60-89 yrs**	**90+ yrs**	**Uneven Age**
Present	1%	23%	48%	16%	2%
2110 goal	7%	20%	14%	39%	10%

This plan lays out the first 15 years of implementation of a long-term 105-year vision. It will be reviewed through monitoring in year five and year ten as more information is gathered and the effectiveness of its implementation can be assessed. The impacts of climate change and new information evaluated in the course of these reviews may alter the plan. At the end of the 15-year initial plan period, the strategy will again be reviewed and revised based on the current state of science and in response to the concerns of the citizens of Massachusetts.

The following referenced maps in Appendix B show potential (ceiling) timber harvest areas within the next 15 years under four different silvicultural systems – uneven age management, extended rotation, thinning and even age management (including regeneration and final removal harvests).

[15] "Thinning" means partial harvests of about ½ of the forest canopy spread evenly throughout, with a goal of improving health, increasing growth of remaining trees, species diversity, and the compatibility of species to the specific conditions of the site. Creating young forest growth in the understory is not a goal of thinning.

Supporting Maps:

Appendix B, #9, 18, 27, 36, 45, 54, 63, 72, 81, 90 Property Level – Potential Timber Harvests

4. Wildlife and Structural Guidelines

Where forest vegetation management occurs, the following guidelines apply:

A. Retain on average at least three live, large diameter (where possible >18" dbh) cavity or den trees per 5 acres, up to a maximum of three trees per acre, either as individuals, or 1/4 to 1/3 acre groups or islands for cavity nesting species. A greater number of trees should be left in riparian areas. Retain 2-5 smaller diameter cavity trees where possible.

B. Retain as many snags and stubs as possible in harvested areas in compliance and consideration of O.S.H.A. "Danger Tree" regulations

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. Maintain 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 individuals and groups of trees during final release regeneration harvests and by protecting desirable advanced regeneration

D. Water and Soil Resources in Active Forest Resource Management Areas

1. Present Condition of Water and Soil Resources in Active Forest Resource Management Areas

a. Water resources

i. The lands in the SBK have a variety of water related features such as streams, rivers, ponds, lakes, marshes, wetlands, and vernal pools. Rare mussels live in some of the moderately flowing portions of streams where there are firm sands and cobbles. In steeper, more rapid streams, ledge outcrops and cobble-bottoms provide specialized habitat for rare aquatic plants. Fast-flowing cold water supports diverse communities of invertebrates, which in turn support coldwater fish communities.

ii. Forests provide a very effective natural buffer that holds soil in place and protects water purity. Trees, understory vegetation, and organic material on the forest floor reduce the impact of falling rain and help to insure that soil is not carried into streams and waterways.

iii. All Municipal watershed areas and 1,830 forested lands (forested lands that have not ever been cultivated) are identified as "High Conservation Value Forest," according to the Forest Stewardship Council Northeast Standards for sustainable and well-managed forests. The following table shows the acreage of lands within 100 feet of a stream, wetland, lake, pond, or other aquatic feature by facility.

Land within 100 feet of streams, wetlands, lakes, ponds, or other aquatic features, by facility (excludes land on the Spectacle Farm property)

Facility	Acres
Appalachian Trail Corridor	49
Arthur Wharton Swann State Forest	111
Bash Bish Falls State Park	31
Beartown State Forest	721
Campbells Falls State Park	66
Clam Lake F.C. Site	114
Cookson State Forest	833
East Mountain State Forest	42
Fountain Pond Park	15
Granville State Forest	318
Jug End State Reservation & WMA	59
Mt. Everett State Reservation	107
Mt. Washington State Forest	315
Otis State Forest	734
Sandisfield Staate Forest	749
Silver Brook North F.C. Site	52
Silver Brook South F.C. SITE	36
Tolland State Forest	1462
Total	5,811

c. Soils

The soils on the SBK lands have been grouped into nine forest productivity classes, based on the soil texture, drainage rate, available moisture and slope position. Productivity classes relate to the amount of forest biomass that can be grown on the soils. All class 1, 2, and 3 soils are considered highly productive. Although productivity classes are based on biomass production, studies have also shown that more productive soils also support a higher level of biodiversity. Soil productivity

classes are further modified by a wetland or poorly drained "wet" modifier. These resulting nine classes are defined in the table below:

Forest Productivity Classes of SBK soils

Class	Name	White Pine Ft^3 /ac/year	White Pine Site Index	Red Oak ft^3 /ac/year	Red Oak Site Index	Acres in District
0	Non-forested	0	0	0	0	76,729
1	Prime 1	>155	>70	>55	>65	44,428
2	Prime 2	120-154	60-69	45-54	60-64	59,697
3	Prime 3	85-119	50-59	40-44	55-59	45,173
3W	Prime 3 – Wet	85-119	50-59	40-44	55-59	4,746
S	Statewide Importance	65-84	45-49	35-39	50-54	85,512
SW	State Importance - Wet	65-84	45-49	35-39	50-54	1,753
L	Local Importance	<65	<45	<35	<50	17,843
LW	Local Importance - Wet	<65	<45	<35	<50	4,174
U	Unique	N/A	N/A	N/A	N/A	0

Supporting Maps:

Appendix A, #6 Southern Berkshire District – Watersheds, Public Water Supply and Surface Water Supply Protection Zones A, B and C

Appendix B, #7, 16, 25, 34, 43, 52, 61, 70, 79, 88 Property Level - Prime Soils

2. Desired Condition of Water and Soil Resources in Active Forest Resource Management Areas

The desired condition is a forest that promotes and maintains the integrity of healthy, functioning aquatic ecosystems, vertebrate and invertebrate populations, water chemistry, nutrient input, and instream structure.

The desired condition is a forest where soils are conserved and managed for long term productivity. Practices will be designed to keep as much forested land as possible in a productive status, minimize erosion, displacement, compaction, and rutting, and provide for nutrient recycling. The loss of calcium and other limiting nutrients will be monitored on a regional scale.

3. Management Guidelines for Water and Soil Resources in Active Forest Resource Management Areas

a. Meet rare species habitat needs and MA Forestry Best Management Practices requirements

b. Manage areas around all vernal pools (certified and non-certified) according to the "Guidelines for Timber Harvesting near Vernal Pools." In addition apply the following restrictions:

   i. Pool Depression: Keep tops and slash out of the pool depression.
   ii. From zero to 50 feet from the edge of the pool: No equipment is allowed to operate in this area. Logs should be winched or felled from this area.
   iii. From 50 to 100 feet: Only partial cuts are allowed. Maintain shading and acceptable microclimates for amphibians. The vegetative composition within the buffer should favor older mature hardwood species.
   iv. From 100 to 200 feet from the pool edge: Avoid operating in conditions that would create ruts deeper than 6 inches, and minimize disturbance of the leaf litter and forest floor.

a. Promote and provide for the present and future recruitment of large diameter coarse woody debris in filter strips

b. Maintain soil processes by providing for the recruitment of organic inputs and minimizing erosion

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

d. Require that landings and main skid roads be stabilized and graded at the end of any operation

e. Require that all petroleum products, industrial chemicals, and hazardous materials be stored in accordance with manufactures specifications, and at a minimum in durable sealed containers

f. Require that all petroleum spills be reported to the appropriate Management Forester. Petroleum spills of less than 10 gallons will be remediated through removal and proper disposal off-site. Petroleum spills of 10 gallons or more require verbal notification of the Massachusetts Department of Environmental Protection (MassDEP) within 2 hours of gaining knowledge of the spill. To notify MassDEP, call its Emergency Response section at the toll-free 24-hour statewide number: 1-888-304-1133.

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

h. 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

i. Manage soils on a sustainable basis by minimizing erosion, compaction and displacement.

E. Cultural Resources in Active Forest Resource Management Areas

1. Present Condition of Cultural Resources in Active Forest Resource Management Areas

Cultural resources are important artifacts of past human behavior and a wide variety of State and Federal legislation exists to provide for their protection. Cultural resources include historic buildings (e.g., homesteads, mills, churches), structures (e.g., dams, roads, stone walls), and archaeological sites (prehistoric and historic).

DSPR's Cultural Resource Management program is designed to ensure that future generations will have the opportunity to understand, appreciate, and learn about the past. The Department is determined to implement the existing preservation laws in a timely manner in order to properly manage the cultural resources within its State and Urban Parks system.

The Southern Berkshire (SBK) contains numerous examples of the full range of cultural resources. A Cultural Resource Sensitivity Map has been produced for each property within the SBK to assist property managers and foresters. Each map is based on what is known as Archaeological Site Location Criteria, which in turn is based on soil drainage characteristics, proximity to a fresh water source, and degree of slope. The resulting maps show archeological sensitivity "bubbles" where further review and limitations may be necessary before a project can proceed. Specific information on the cultural resources for each property may be found in Appendix G on Cultural Resource Protection and its accompanying tables..

Supporting Maps:

Appendix B, #8, 17, 26, 35, 44, 53, 62, 71, 80, 89 Property Level – Archeologically Sensitive Areas

2. Desired Condition of Cultural Resources in Active Forest Resource Management Areas

The desired condition is to identify, and evaluate the condition and significance of cultural resources within the properties for which DSPR provides stewardship. Based on this initial set of findings, plans to protect and maintain significant cultural resources within the SBK state forest and park lands will be formulated. In some cases, cultural

resources may be enhanced through specific management activities or presented to the visiting public through interpretative, educational, and programmatic formats.

3. Management Guidelines for Cultural Resources in Active Forest Resource Management Areas

a. Identify projects that could have potential impacts to cultural resources, should they exist within the limits of the proposed projects

b. Prepare and submit a silvicultural prescription or project scope to DCR's staff Archaeologist for review during the proposed silvicultural or project planning stages, if all or a part of the project falls within an archeological sensitivity "bubble." The Archaeologist will determine whether known, or potential, cultural resources may exist and what management enhancements, limitations and/or restrictions may be necessary to implement the proposed project and protect the cultural resources at the same time.

c. Specific guidelines for the protection of cultural resources on all projects:

   i. Incorporate the DCR Archaeologist's recommendations for managing (protecting, restoring, maintaining and interpreting) potential and existing cultural resources into the stand's harvest prescriptions or project scope

   ii. Prohibit activities that disturb the integrity of known cultural resources, or which could have an adverse affect if they did exist (i.e., potential sites)

   iii. Minimize soil disturbance (compaction, displacement, rutting) inside the archeological sensitivity "bubbles." Typically this will include limitations or restrictions on the season of the year during which the harvest or project can occur, and/or the types of equipment and machinery that can be employed

   iv. Minimize creation of new openings in stone walls. Repair any necessary opening(s) following the completion of the operation or stockpile removed stones if the opening will be used in the future

   v. Prohibit the placement of slash within cellar holes or on foundations

   vi. Avoid the placement of landings within 25 feet of cellar holes where possible

   vii. Cap abandoned open wells in a manner that maintains the integrity of the historic feature

   viii. Interpret cultural resources for programmatic and educational purposes, dependant upon significance, feasibility and funding

ix. Maintain or cultural resources through careful vegetation management and the removal of woody debris when recommended by DSPR's staff Archaeologist

F. Forest Health and Protection in Active Forest Resource Management Areas

1. Present Condition of Forest Health and Protection in Active Forest Resource Management Areas

a. Forests are subject to a variety of natural and human-influenced damaging agents that may affect long-term forest health, such as insects, disease, fire, wind, snow, ice, and non-native invasive species.

b. Current major forest health issues in the SBK

i. Insects and disease

Hemlock woolly adelgid
Ash decline
Beech Bark disease
Armillaria fungus
Diplodia fungus
Gypsy Moth and Tent Caterpillar outbreaks
Red Pine Scale
Emerald ash borer (potential future threat)
Sudden oak death (potential future threat)
Asian long-horned beetle (potential future threat)
Sirex wood wasp (potential future threat)
Non-native invasive species

ii. Invasive exotic/non-native plants

A complete inventory of invasive exotic plants currently does not exist for the SBK District, but most common invasive plants are present and include:

a. **Trees**

Black Locust
Norway Maple

b. **Shrubs and Vines**

Oriental bittersweet
Japanese barberry
Black Shallow-wort
Shining (or Glossy) Buckthorn
Common Buckthorn
Japanese Honeysuckle
Morrow's Honeysuckle and other shrub honeysuckles
Autumn Olive
Multiflora Rose

c. **Herbaceous Plants and Perennials**

Goutweed or Bishop's Weed
Yellow Iris
Japanese Knotweed
Purple Loosestrife
Garlic Mustard

iii. Fire

Most forests including those in the SBK District are relatively resistant to catastrophic fire and of low fire risk. Historically, Native Americans burned certain forests to improve early successional habitat for hunting. In modern times, fires most often result from careless human actions.

Although not a prime influence in these forests, the risk of unintentional and damaging forest fires can increase as a result of accumulation of naturally dying vegetation in periods of drought and logging activity, if the slash (tree tops, branches, and debris) is not treated correctly. Adherence to the Massachusetts slash law minimizes this risk. Under the law, slash is to be removed or modified in buffer areas near roads, boundaries, and critical areas, and lopped close to the ground to speed decay.

Depending on the fuel types, fire risk and habitat goals for the site-specific area, fire can be a management tool to favor certain species of plants such as oak, provide habitat for wildlife such as ruffed grouse, or reduce the risks of hazardous fuel accumulation.

iv. Climate change

According to the Massachusetts Climate Protection Plan (Appendix J), "[c]limate change could have serious impacts on the state's diverse ecosystems, native species and may encourage the spread of non-native species. It would also likely alter the natural range of many different plants and animals. Over the long term, warming could intensify droughts and damage forest ecosystems". The SBK FRMP aims to provide a long-term sustainable strategy (105 years) and short-term (next 15 years) implementation schedule. While the extent of the effects of climate change are not fully understood, many likely effects related to non-native species, damage to forest ecosystems, and more droughts, are well known. This Plan has been designed to anticipate these and other effects of climate change by:

a Recognizing the carbon sequestration benefits of young, vigorously growing forests, the plan provides for a more balanced structure of age classes

b Without being able to predict the specific changes in native forest ecosystems that climate change will cause, the plan focuses on sustainability and ecosystem function rather than species distribution

c The plan focuses attention on the problem of non-native invasive species, which will likely increase with continued climatic change

v. The state will continue its efforts to maintain existing forests, increase land conservation areas, and give incentives for native (non-invasive) reforestation of previously forested area. The amount of carbon stored or sequestered by these activities will be measured and monitored over time to ensure that real carbon benefits accrue, and to better understand the long-term benefits of such programs.

2. Desired Condition of Forest Health and Protection in Active Forest Resource Management Areas

The desired condition is a healthy, diverse, native forest with a reduced occurrence of undesirable, non-native, invasive species. It should have a low threat of catastrophic fire and have the infrastructure to allow efficient response to wildfire and for the application of prescribed fire.

3. Management Guidelines for Forest Health and Protection in Active Forest Resource Management Areas

a. Forest Insects and Diseases

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

ii. 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

iii. Implement the draft Massachusetts *Highly Destructive Forest Invasive Species Response Plan* for invasive species that pose a significant risk to forest resources

iv. To address hemlock woolly adelgid (HWA) risk:

A. Survey hemlock stands with greater than 50% stocking of hemlock for the presence of HWA
B. Consider the selection of representative hemlock stands for long term protection from HWA by environmentally safe biological control and use of systemic pesticides

C. Consider hemlock stands for treatment (regeneration, thinning, or salvage) when the majority of the hemlock trees (greater than 50%) are infected with HWA
D. Consider hemlock stands for thinning to improve tree vigor and possible resistance to HWA infestation
E. Collect hemlock seed from representative hemlock stands to be stored in genetic banks

b. Non-native Invasive Species

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

ii. Prescribe integrated and interdisciplinary approaches that treat existing populations while maintaining desirable native species

iii. Take reasonable preventative measures during projects to limit the spread of existing populations and the introduction of new populations, including inspection of all equipment prior to unloading at the job sites. If the management forester feels there is a threat of introduction of plant parts or seed the operator will be required to thoroughly clean the exterior, undercarriage, and tires/tracks of his/her equipment with a high-pressure washer at a maintenance facility prior to bringing the equipment on site. Cleaning will substantially reduce the chance of spreading invasive exotic plant seeds/roots from a previous work site.

c. Carbon sequestration

i. Manage for native vigorous vegetative growth that will both increase carbon storage and enable adaptation to climate change over time.

ii. Consider carbon resource management, including age class representation as one criterion in the management plan of state forests and other public lands.

iii. Support research on the role of controlled and uncontrolled forest fires in returning carbon to the soil rather than emitting it into the atmosphere.

d. Use of Pesticides

i. Use pesticides only when there are no other practical alternatives

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

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

e. Salvage of Dead and Dying Forest

i. Use salvage operations following standard operating forest management guidelines to reduce risk to human health and safety, of fire, or to reduce continued forest health threats, when necessary

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

f. Fire

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

ii. Meet Massachusetts slash law requirements

iii. Suppress wildfires to meet the following objectives:

A. Provide for the safety and well being of fire fighters and the public
B. Protect natural resource investments and private property
C. Use "Light Hand On The Land" prevention and suppression tactics
D. Coordinate suppression tactics with the natural resource desired conditions

iv. Use mechanical treatments and prescribed fire to maintain natural communities; reduce the buildup of hazardous fuels; enhance conditions favorable to rare species or communities; establish desirable regeneration; and create habitat for early successional species

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

G. Facilities, Transportation, and Boundaries in Active Forest Resource Management Areas

1. Present Condition of Facilities, Transportation, and Boundaries in Active Forest Resource Management Areas

There are approximately 207 miles of roads and trails within the SBK properties. Generally, roads and trails are minimally maintained, resulting in unsafe access and degradation of water quality due to soil erosion and sedimentation. Some road and trail maintenance and re-construction is occurring through forest management activities, volunteers, and occasionally as part of DSPR projects. DSPR's goal is that the transportation network will be safe and environmentally sound. In addition, the network should have a minimum impact on the natural resources of our forest and park system while serving public safety needs and allowing visitors to enjoy and experience these resources.

The following table displays road and trail type with the condition and mileage summary by property (not including the Spectacle Farm property):

Type, condition, and mileage of roads and trails in the SBK District, by facility

Facility	Type	Condition	Miles
APPALACHIAN TRAIL CORRIDOR	Forest Road/Trail	Good	0.1
	Trail	Good	4.2
	Trail	Fair	0.6
	Trail	Poor	0.6
ARTHUR WHARTON SWANN SF	Forest Road/Trail	Good	0.4
	Forest Road/Trail	Fair	1.1
	Public Road	Good	0.8
	Public Road	Fair	0.9
	Trail	Good	1.3
	Trail	Fair	0.1
BASHBISH FALLS STATE PARK	Administrative Road	Good	0.3
	Administrative Road	Fair	0.1
	Trail	Fair	1.2
	Trail	Poor	0.1
BEARTOWN STATE FOREST	Administrative Road	Good	1.0
	Administrative Road	Fair	0.3
	Forest Road/Trail	Good	5.0
	Forest Road/Trail	Fair	3.1
	Forest Road/Trail	Poor	0.9
	Public Road	Good	5.8
	Public Road	Fair	7.9
	Trail	Good	17.2
	Trail	Fair	14.0
	Trail	Poor	6.0
CLAM LAKE F.C. SITE	Administrative Road	Good	0.8
	Forest Road/Trail	Fair	0.4
	Trail	Fair	0.1
COOKSON STATE FOREST	Forest Road/Trail	Good	6.5
	Forest Road/Trail	Fair	3.0
	Forest Road/Trail	Poor	1.3
	Public Road	Good	0.1
EAST MOUNTAIN STATE FOREST	Administrative Road	Good	0.6
	Forest Road/Trail	Good	0.3
	Forest Road/Trail	Fair	1.5
	Forest Road/Trail	Poor	0.1

	Trail	Good	2.5
	Trail	Poor	0.1
FOUNTAIN POND PARK	Trail	Good	0.6
	Trail	Fair	0.2
GRANVILLE STATE FOREST	Administrative Road	Good	0.7
	Forest Road/Trail	Good	0.7
	Forest Road/Trail	Fair	1.7
	Forest Road/Trail	Poor	0.1
	Trail	Good	4.8
	Trail	Fair	5.0
	Trail	Poor	1.5
JUG END STATE RESERVATION & WMA	Administrative Road	Good	0.5
	Forest Road/Trail	Good	1.2
	Forest Road/Trail	Fair	1.7
	Forest Road/Trail	Poor	0.6
	Other	Fair	0.1
	Trail	Good	1.6
	Trail	Good	1.6
	Trail	Fair	0.3
	Trail	Poor	0.3
MT EVERETT STATE RES	Administrative Road	Fair	0.5
	Forest Road/Trail	Good	0.4
	Public Road	Good	1.0
	Trail	Good	7.4
	Trail	Fair	3.0
	Trail	Poor	0.7
MT WASHINGTON STATE FOREST	Forest Road/Trail	Good	0.8
	Forest Road/Trail	Fair	0.8
	Public Road	Good	0.1
	Trail	Good	4.5
	Trail	Fair	10.1
	Trail	Poor	2.4
OTIS STATE FOREST	Administrative Road	Fair	0.7
	Administrative Road	Poor	0.1
	Forest Road/Trail	Good	1.7
	Forest Road/Trail	Fair	2.4
	Forest Road/Trail	Poor	0.3
	Public Road	Good	1.2
	Public Road	Fair	1.0
	Trail	Good	3.2

	Trail	Fair	5.3
	Trail	Poor	1.0
SANDISFIELD STATE FOREST	Administrative Road	Fair	0.8
	Administrative Road	Poor	0.5
	Forest Road/Trail	Good	1.3
	Forest Road/Trail	Fair	1.4
	Forest Road/Trail	Poor	0.1
	Public Road	Good	3.3
	Public Road	Fair	0.5
	Trail	Good	1.5
	Trail	Fair	3.0
	Trail	Poor	1.2
SILVER BROOK NORTH F.C. SITE	Administrative Road	Good	0.3
	Administrative Road	Fair	0.2
	Administrative Road	Fair	0.1
TOLLAND STATE FOREST	Administrative Road	Good	0.3
	Administrative Road	Fair	0.1
	Administrative Road	Poor	0.3
	Forest Road/Trail	Good	0.5
	Forest Road/Trail	Fair	0.7
	Forest Road/Trail	Poor	0.8
	Public Road	Good	2.2
	Public Road	Fair	6.5
	Public Road	Poor	0.5
	Trail	Good	4.7
	Trail	Fair	8.6
	Trail	Poor	6.7

There are approximately 276 miles of DSPR property boundaries (not including the newly acquired Spectacle Farm property). Approximately 72 miles of boundaries were recently maintained from FY 2004 to FY 2007. There are a small but undetermined number of miles of boundary that may need professional surveys. DSPR's goal is to locate and post all boundaries and maintain them on a 10-year cycle.

Length of perimeter boundary in miles by facility

Facility	Perimeter (miles)
Appalachian Trail Corridor	9.7
Arthur Wharton Swann State Forest	5.9
Bash Bish Falls State Park	5.3
Beartown State Forest	48.1
Campbells Falls State Park	3.9
Clam Lake F.C. Site	4.1
Cookson State Forest	14.4
East Mountain State Forest	14.4
Fountain Pond Park	3.0
Granville State Forest	10.5
Jug End State Reservation	0.9
Jug End State Reservation & WMA	9.3
Mt. Everett State Reservation	13.5
Mt. Washington State Forest	20.2
Otis State Forest	39.1
Sandisfield Staate Forest	29.3
Silver Brook North F.C. Site	2.4
Silver Brook South F.C. SITE	1.3
Tolland State Forest	40.2
Total	**275.4**

2. Desired Condition of Facilities, Transportation, and Boundaries in Active Forest Resource Management Areas

The desired condition of DSPR properties is that they are surveyed and properly maintained to protect the Commonwealth's natural resources and minimize private and public timber trespassing and encroachments by adjacent landowners.

The desired condition is a transportation network that is safe, effective, efficient and environmentally sound. The network should have the minimum impact necessary on the natural resources of our forest and park system while serving public safety needs and allowing visitors to enjoy and experience these same resources.

3. Management Guidelines for Facilities, Transportation, and Boundaries in Active Forest Resource Management Areas

a. Roads

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

ii. Staging areas, landings and main skid roads must be stabilized and graded at the end of any operation

iii. All petroleum products, industrial chemicals, and hazardous materials must be stored in accordance with manufactures specifications, and at a minimum in durable sealed containers

iv. 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

v. 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

vi. New road construction permitted in stable areas only when necessary

vii. Commercial timber management, including salvage, is allowed within road corridors

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

ix. No slash should remain within 25 feet of roads

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

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

xii. Inventory and maintain desirable fire roads and water drafting sites

xiii. Minimize road width

xiv. Encourage canopy cover over roads

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

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

xvii. Maintain roads in accordance with established road classification systems and maintenance policy

xviii. Consider the use of in-kind services to provide for road maintenance during project planning and implementation

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

b. Boundaries

i. Identify all boundaries needing formal surveys

ii. Survey boundaries needed for project implementation, where trespass is an issue, or where there are disputes. Other boundaries needing to be surveyed will be completed where feasible, as funding is available

iii. Locate and maintain all boundaries on a 10 year cycle or when needed for project implementation

iv. Identify and maintain all boundaries clearly and in a way that is sensitive to adjacent private lands with visible residences

v. All newly-acquired DSPR properties should have their boundaries surveyed and marked. Interior line DSPR boundaries should be obliterated

5. Special Features and Natural Communities

A. A special feature is areas any area that contains unique ecological, aesthetic, or historic features, but is not covered under any of the previously sections. Examples include large rock ledges, research areas, historic agricultural landscapes, gorges, cliffs, and rich mesic forests.

All rare natural communities are identified as “High Conservation Value Forest” according to the Forest Stewardship Council Northeast Standards for sustainable and well-managed forests.

The variety of these areas requires that management options be adaptable to protect, conserve, or promote their values.

B. Special features in the SBK district:

Natural Communities
Ledges and Cliffs
Gorges
Open Fields
Agricultural Landscapes
Research Areas
Waterfalls
Mountaintop Habitat

SBK Natural Communities:

Natural communities are assemblages of species that occur together in space and time. These groups of plants and animals are found in recurring patterns that can be classified and described by their dominant biological and physical features, as done in NHESP's *Classification of Natural Communities of Massachusetts*. Natural communities tend to be more finely described than are the broad forest types, and include non-forested assemblages. Natural communities may be restricted or widespread in their distribution across the state, and they may be naturally large or small. NHESP has a ranking system that reflects statewide abundance of the types of natural communities. An additional system sets criteria for ranking quality of each type of natural community. NHESP uses the combined ranking systems to track different types of natural communities for conservation prioritization. Most occurrences of the least common types and the best of the most common types are of interest.

A large, heterogeneous, matrix forest usually contains a mix of natural community types, with multiple occurrences of small patch communities, examples of larger patch types, and examples of the surrounding, prevailing, matrix forest. However, the dynamic nature of communities is such that those in individual areas are expected to change over time. In reserves, there should be space for change and movement of community types so that over the long term, all types can continue to occur. Large animals often make use of multiple communities in mosaics as parts of their habitats. This report's section on Biodiversity addresses the idea of the coarse filter approach to protecting appropriate native biodiversity, and the sections on Water and Soil Resources focus on the physical features that provide diversity of habitat. These sections compliment the ideas of identifying and managing natural communities that in turn supplement the larger view of forest resource management to maintain the state's appropriate native biodiversity.

a. Present Condition

The lands in the SBK support a variety of types of natural communities occurring in the varied conditions of the hills, slopes, valleys, wetlands and waters of the district. While all areas of the district have not been fully inventoried for uncommon natural communities, several types of particular interest are known in the SBK, including on DCR lands. Calcium rich wetlands of the Berkshire Marble Valleys are particularly important statewide and support very uncommon natural communities and rare species. Other natural communities that develop on ridge tops, ledges, cliffs, talus slopes, seeps, floodplains, riparian zones,

wetlands, and in gorges (some mentioned in the special features section of this report) are often uncommon types of natural communities that NHESP considers priority for conservation. Rich Mesic forests, a particularly species rich type of forest community, are best developed in the Marble Valleys and have good examples in SBK.

The following tables list the NHESP natural communities currently known (2005) from DCR lands in the SBK, and those known from the entire district, any of which might also occur on DCR lands. NHESP tracks all types of natural communities ranked S1, S2, and S3, as well as exemplary (best) occurrences of S4 and S5 types. Types are defined in the *Classification of the Natural Communities of Massachusetts*, version 1.3, each with its S-rank, and the S-ranks are defined there in detail.

Natural Communities are not regulated. S (state abundance) ranks are on a 1 to 5 scale, with S1 being considered vulnerable, generally having 1 to 5 good occurrences, and S5 being demonstrably secure. Community types ranked S1, S2, and S3 are priority for conservation protection.

NHESP Rare Natural Communities known to exist on DCR lands in the Southern Berkshires

Natural Community	NC Type	Year Last Seen	State Rank
Calcareous seepage marsh	Wetland	1991	S2
Hickory – hop hornbeam forest/woodland	Upland	1998	S2
High-energy riverbank	Wetland	2000	S3
Rich, mesic forest community	Upland	1998	S3
Ridgetop pitch pine – scrub oak community	Upland	1998	S2
Spruce-tamarack bog	Wetland	2000	S2
Certified vernal pool	Other (Ecological)	2000	Not ranked

NHESP Rare Natural Communities known to exist generally in the Southern Berkshires

Natural Community	NC Type	Year Last Seen	State Rank
Acidic shrub fen	Wetland	1998	S3
Black ash-red maple-tamarack calcareous seepage swamp	Wetland	1999	S2
Calcareous basin fen	Wetland	1991	S1
Calcareous forest seep community	Upland	2000	S2
Calcareous pondshore/lakeshore	Wetland	1999	S2
Calcareous rock cliff community	Upland	2000	S3
Calcareous rocky summit/rock outcrop community	Upland	2001	S2
Calcareous seepage marsh	Wetland	1999	S2
Calcareous sloping fen	Wetland	1997	S2
Calcareous talus forest/woodland	Upland	2000	S3
Circumneutral talus forest/woodland	Upland	2000	S3
Hickory - hop hornbeam forest/woodland	Upland	2001	S2
High-energy riverbank	Wetland	2000	S3
Kettlehole level bog	Wetland	1998	S2
Level bog	Wetland	1998	S3
Major-river floodplain forest	Wetland	1999	S2
Rich, mesic forest community	Upland	1998	S3
Ridgetop pitch pine - scrub oak community	Upland	2001	S2
Small-river floodplain forest	Wetland	1999	S2
Spruce-tamarack bog	Wetland	2000	S2
Transitional floodplain forest	Wetland	1997	S2
Yellow oak dry calcareous forest	Upland	2000	S2
Certified vernal pool	Other (Ecological)	2006	Not ranked

b. Desired Condition

The desired condition is a landscape where special features and natural communities are appropriately valued, protected, conserved, and managed where necessary. In addition, DCR staff will work cooperatively with the Natural Heritage and Endangered Species Program to identify areas with possible priority natural community occurrences (for example from aerial photo interpretation, CFI data, or ongoing forestry surveys). In addition, restoration and/or maintenance of known priority natural community occurrences will be jointly undertaken where feasible (for example, removing exotic invasive species, or conducting prescribed fires in appropriate community types and locations). Removing plantations, as discussed in the Native Vegetation section, will generally enhance native communities.

C. Management Guidelines

1. Natural Communities

   a. Inventory, record, map, evaluate, and monitor uncommon or priority natural communities.

b. Management of priority natural communities should consider ecosystem function, for example, downed wood and old snags will remain, and streams that naturally flood will be allowed to do so where possible. Prescribed fire and fire management plans should be instituted to maintain fire-controlled natural communities where appropriate and possible.

c. Rich mesic forests and other nutrient-rich communities are highly sensitive to disturbance and the possible introduction of non-native invasives. Management will be restricted to the removal of non-native species and silviculture will be restricted to techniques to promote multi-age, native forests with minimal disturbance.

d. Management of the non-forested and low-productivity natural communities within the generally forested landscape should recognize their special habitat values and susceptibility to human disturbance.

e. In general small patch communities should be managed with measures necessary to protect the values of the special features that support the natural communities.

2. Agricultural landscapes

Agricultural landscapes include old fields, pastures, and fencerows. These landscapes will be recognized and promoted through management, such as regular mowing and field restoration where possible. In general:

a. Larger fields are more valuable than smaller fields

b. Mowing should be restricted until after July 15 to allow ground nesting birds time to fledge

c. Trees encroaching on fields should be removed or pruned to maintain the historical landscape and field values

d. Fence rows provide valuable habitat but can also be a source of invasive exotics

e. Historic fields should only be cleared and restored when they are large and the value of the new habitat outweighs possible fragmentation

3. Ledges and cliffs

Ledges and cliffs provide unique habitat and aesthetic values. Many species use these areas for nesting, feeding or basking sites, and people are attracted to these areas for recreational activities or the views they provide. In general:

a. Management in these areas should promote multi-age native forests

b. Ground skidding or other activities that could alter the hydrology or physical structure of these areas should be avoided

c. Clearing of vegetation for views will be allowed where ecological function is not impacted

d. In some cases vegetation may be cleared if it promotes habitat values such as basking sites for reptiles

4. Research areas

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

5. Gorges and special water features

   Gorges and special water features such as waterfalls provide unique habitat and recreational values. In general, these areas will be managed in accordance with streamside BMPs. There may be cases where more restrictive measures are necessary to protect the values of these special features. In the SBK District all sites included in this category are located within Reserves and will be managed only to provide for public safety.

6. Mountaintop habitat

   Mountaintop habitats are found primarily in the Mt Washington/ Mt Everett area. They include areas of scrub oak, stunted hardwoods and blueberry/ huckleberry. Also included are small stands of very rare stunted pitch pine. Most are included in the Mt. Washington Reserve.

   a. Generally these stands are self-sustaining and require no management. The stands should be monitored and a variety of interventions including prescribed fire or removal of competing trees will be allowed if necessary.

   b. Active management of pitch pine stands may be necessary to control competing hardwoods. Any management will be the result of consultation with qualified ecologists.

VII. Measurable Outputs and Costs

The Department of Recreation and Conservation, Bureau of Forestry, partially fulfills its mission of providing income from the sale of forest products through the use of silvicultural practices designed to balance ecological, social and economic considerations. The enabling legislation that created the Bureau of Forestry states that the State Forests shall be “in perpetuity income producing. ” This legislation goes on to say that the Bureau shall manage to “improve” these forests. This balance is at the heart of the Bureau’s mandate and its social responsibility. Under

M.G.L. Chapter 132, the Commonwealth's Bureau of Forestry exists to protect the public interest in the both the private and public forestlands of Massachusetts. The public interest includes water conservation, flood and soil loss prevention, wildlife habitat, recreation, protection of water and air quality, and a continued and increasing supply of forest products. The Department provides for forest products in an ecologically and socially responsible and environmentally sensitive manner.

The Department meets its responsibility by focusing on desired conditions for all resources. A desired condition is a statement describing the desired biological, physical and/or social condition or context. The Department will consider silvicultural options to modify existing stand conditions in order to meet desired vegetative conditions.

The Department fulfills its mission to provide forest products by designing silvicultural operations in which timber products are offered for sale to private contractors. This provides direct income to the Commonwealth, and the "value added" results of processing these products benefits many sectors of the Massachusetts economy. All harvesting is done in a manner that meets appropriate native biodiversity needs, is socially responsible and can occur in a long-term sustained manner. The SBK is part of the state lands system that has been "green certified" as sustainable forest management based on the Forest Stewardship Council principles and verified by an independent audit team - Scientific Certification Systems.

1. Outputs

A. Recent historic output levels

Historic Forest Product Outputs

Total DSPR land in SBK (acres)	42,965 [16]
Active Forest Resource Management Area (acres)	31,753
Total acres treated 1993 – 2007	2,104
Annual average acres treated 1993 – 2007	140
Annual average volume harvested 1993 – 2007	691 mbf 259 cords

B. Maximum sustainable management level

1. Ecologists and foresters used historic harvest levels and careful assessment of current and expected future conditions in SBK forests to determine the maximum sustainable management level. In light of the many stressors impacting forests today, and likely to impact them in the future, the ceiling was established using a precautionary principle. It is necessary to formally establish an upper bounds of sustainability in order to accurately plan the level at which forests will actually be managed. The ceiling is a tool for planning annual management levels for the next 15 years, and a means of quantitatively measuring their sustainability. It will be re-calculated for each subsequent planning period.

[16] Includes 904 acres for Spectacle Farm

The allowable sustainable harvest ceiling is a conservative estimate of the management that *could be* conducted in SBK forests while sustaining ecosystem function, preserving aesthetics and the integrity of recreation and other forest values, and maintaining the capacity of the whole landscape to adapt and respond to unforeseen stressors and impacts. The ceiling is less than the annual growth, which would theoretically result in no net loss of standing volume, but would leave no room for contingency.

The actual planned harvest level is well below the ceiling.

2. The following two tables establish limits for different treatment types in order to estimate the potential upper bounds of forest product output if management were conducted for a) one year; and b) a full 15-year planning cycle. Because this plan does not recommend management at the ceiling level, the actual output will be lower.

a) Annual allowable sustainable management ceiling and estimated output of forest products

Treatment	Acres	Cords	MBF
Extended Rotation[17]	0	0	0
Uneven Age Management	27	162	378
Shelterwood Establishment Regeneration	169	837	746
Removal of Overstory with Reserves	169	1,263	2,250
Thinning*	770	1,922	1,490
Total	**1,135**	**4,184**	**4,864**

b) Sustainable management ceiling and estimated output for 15-year planning cycle, projected for the period 2007 – 2021

Treatment	Acres	Cords	MBF
Extended Rotation[18]	0	0	0
Uneven Age Management	405	2,430	5,670
Shelterwood Establishment Regeneration	2,535	12,555	11,190
Removal of Overstory with Reserves	2,535	18,945	33,750
Thinning*	11,550	28,830	22,350
Total	**17,025**	**62,760**	**72,960**

* - Thinning is based on all stands within the Active Management Area that are at or above the "A" stocking level (overstocked stand)

Volumes calculated from CFI inventory data.

[17] Regeneration is not scheduled during this 15 year planning period, however, thinnings may be scheduled to maintain species composition, growth rates and tree vigor

[18] Regeneration is not scheduled during this 15 year planning period, however, thinnings may be scheduled to maintain species composition, growth rates and tree vigor

3. Revenue estimate

   For the purpose of budgetary projections, the potential revenue resulting from sustainable management levels was calculated. If management was conducted at the sustainable ceiling, it is estimated the annual revenue would be $650,000.

   The actual revenue will probably be much less, because the SBK FRMP recommends only 450 acres be harvested or managed annually, and because the composition of treatments will vary from year to year. If the majority of management activities in a given year are thinnings, there may be little revenue.

C. Recommended actual level of management

1. Presently there is the capacity to implement the FRMP standards on 450 acres per year, approximately 40% of the annual sustainability ceiling of 1,135 acres.

2. Using the previously mentioned site-selection criteria, this plan recommends that no more than 450 acres (1.0% of the 42,965 acres of DCR land in the district) be managed each year during the initial 15-year implementation period. Each subsequent 15-year implementation period will have a unique combination of treatment types, as described below. The capacity to implement the FRMP standards on 450 acres will require adequate staff to plan and carry out forestry projects.

3. While the maximum acreage laid out in each of the three treatment types described below totals 1,135 acres annually, **the total acreage selected each year will not exceed the 450 acre limit recommended by this plan**, nor will it exceed the limits established below for each type of management. The distribution of forestry activities chosen to make up these 450 acres per year will be based on forest inventory, resource mapping data, and integration of all resources, activities and uses according to the FRMP.

4. Treatment types

   a. **Regeneration harvest openings to create young forest:** No more than 0.5 percent (197 acres per year) of the entire SBK DCR system lands (42,965 acres). No more than 27 of 197 acres will be uneven-aged management consisting of small group (3-4 trees up to 1/2 acre) selection harvesting methods. Selective harvesting creates a balanced forest stand with a range of age classes, an “all aged” forest. No more than 86 of the 150 acres will be even-aged harvests removing residual overstory trees where previous shelterwood harvests have established a new forest of about 10-15 years in age. Both uneven and even aged forest management system will maintain a component of the very largest and most valuable trees (legacy trees); trees that have cavities (wildlife trees); snags; and course woody debris for nutrient recycling and wildlife purposes;

b. **Preparatory shelterwood treatment:** No more than 0.4 percent (169 acres per year). Preparatory shelterwood treatment is designed to stimulate a young forest of desirable species while maintaining a shelter of mature trees;

c. **Thinning of overstocked stands:** No more than 1.0 percent (450 acres per year) of overstocked stands where crowding negatively affects growth and health. Some 11,550 acres (770 acres per year) have been identified as overstocked forest stands within the SBK District. Thinning results in a diversity of native species suited to site conditions and is designed to restore a forest condition that is more resilient to damage, insects, and disease. Thinning also captures imminent mortality to provide opportunity for local forest products that slow the release of carbon, and energy that reduces the burning of fossil fuels.

5. Estimated costs for implementation of recommended management level[19]

	Number of resources	**Annual operating cost**
Foresters	2[20]	$100,000
Contract foresters	2	$40,000
Vehicles	2	$12,000
Supplies and Equipment		$5,000
Road maintenance		$30,000
Boundary maintenance		$20,000
Annual monitoring		$5,000
Invasive species control		$21,000
Total annual operating costs		$233,000
Backlog annual boundary surveying		$25,000
Backlog road maintenance		$150,000
10-year CFI Inventory (2010)		$30,000

[19] Costs are direct costs only; indirect costs are not included.
[20] Currently there is one full time Forester in the SBK District with one Assistant Forester position vacant

VIII. Inventory, Monitoring, and Evaluation

The Department is committed to the principles of adaptive management. Adaptive management uses the best information available to make decisions on the management of the DSPR system lands, monitors the results for effectiveness, and uses new information as it becomes available. The following is a summary of adaptive management inventory procedures for the SBK District:

1. Project Level Management

DCR is already conducting long-term ecological monitoring on various sites throughout the state, in cooperation with the University of Massachusetts. The continuation of these monitoring activities is an important component of this Forest Resource Management Plan.

A. Inventory

a. Initiate all management projects with a general walk through of areas most likely to meet objectives (see individual property appendices – Management Practices)

b. Project and silvicultural prescriptions require the quantitative documentation of stocking level, species composition and quality of overstory and regeneration. If necessary, this data should be collected.

c. Inventory selected area for cultural resources

d. Inventory selected area for rare landforms, habitats, and species

e. Inventory selected area for invasive species

B. Monitor

i. During treatment monitor for:

1. Best Management Practices compliance
2. Road and Infrastructure Condition
3. Natural Heritage Requirements
4. Cultural Resource Protection
5. Silvicultural Prescription
6. Forest Product Accountability
7. Other Contractual Requirements

ii. Post Treatment (approximately 5 years after treatment) monitor for:

a. Forest health
b. Regeneration success and composition
c. Best Management Practices
d. Invasive species

e. Unauthorized ORV use
g. Road and boundary conditions

C. Evaluate

i. Contractor performance

ii. Departmental personnel performance

iii. Fulfillment of FRMP and silvicultural objectives

iv. Effectiveness of the treatment

2. District Level Management

A. Inventory
Begin by 2023; after that every subsequent 15 year planning cycle

1. Re-measure Bureau's Continuous Forest Inventory plots

2. Road conditions

3. Boundary Condition

B. Monitor
Begin by 2023; after that every subsequent 15 year planning cycle

1. Forest health

2. Biodiversity

3. Regeneration

4. Best Management Practices

5. Invasive species

6. Unauthorized ORV use

7. Road and boundary conditions

8. Forest Reserves

9. New information

10. New public issues

11. Unauthorized digging and collecting around historic archaeological sites and features

12. Soil productivity including the loss of nutrients such as calcium

13. Ecological monitoring at the landscape, stand and species level to compare biodiversity in Forest Reserves and active management areas

C. General Program Management Review
To be conducted at the District level every 5 years

a. Plan implementation

b. Monitoring and Evaluation Efforts

c. Currency of FRMP

d. Public Involvement

e. Relationships with others

D. Evaluate and report

i. Monitoring data should be evaluated against the desired condition of the FRMP to determine the effectiveness of the Plan and the need to update it.

ii. A report should be prepared summarizing the results. This report will consider if:

a. Additional treatments are needed to meet the desired conditions
b. Desired conditions need to be modified because of survey, inventory, or new information
c. Existing management guidelines are effective and complete
d. Any new information, research or new issues need to be considered.

IX. Public Involvement

The State Forests and Parks are public resources and must be responsive to societal needs while using the best available science and maintaining options for future generations. Public involvement is critical to Forest Resource Management Planning and implementation. Public involvement is an ongoing process that consists of gathering input, analyzing, evaluating and responding to input and sharing information. The Bureau will be responsible to stakeholders through the public involvement process, implementation, evaluation, and reporting.

A. Project Level

1. Meet all regulations for review of projects. This will include review of all projects by conservation commission, select boards.

2. Consider public comments (Appendix K) as they relate to project level prescriptions

B. Property Level

Berkshire Ecoregional meeting: 11/22/2004
Number attending: 55

SBK Draft Forest Resource Management Plan meeting: 2/1/2007
Number attending: 12

Notify the public through the Environmental Monitor if there is a need to update the SBK plan. The notice will include specific FRMP proposed changes with rationale.

Develop and publish for review a SBK Stakeholders Report within 10 years from the approval of the SBK plan to track implementation efforts and share the results of monitoring and evaluation.