CHAPTER 5
PUBLIC/PERMITTED USE

UNIVERSAL ACCESS

Forest-based outdoor activities in both active and passive forms are widely enjoyed by people of all ages and abilities. Time in the woods is increasingly important as much of society has turned indoors for entertainment. Nature provides opportunities for exercise and physical well-being, meeting unique challenges, learning new skills and gaining healthy perspectives on modern life. A day on the water or an evening around the campfire brings family and friends together to make personal discoveries and connections with each other. Disability awareness and consideration of diverse needs will lead to greater inclusion in these valuable recreational opportunities.

One in five Americans has a disability. Persons with disabilities comprise 19% of the total national population, constituting the largest minority group in the United States.

Like any minority group, there is great diversity and individuality within the whole. Upholding broad universal access standards enables people of all abilities to satisfy their need for nature and recreation.

DEC staff play an essential role in providing universal access to recreational activities that are often rustic and challenging by nature, and ensuring that facilities are not only safe, attractive and sustainable but also compatible with resources. Fortunately, there are existing accessibility guidelines for the built environment (buildings, bridges, roads and trails), and draft federal accessibility guidelines for outdoor developed areas that recognize this delicate balance and help us to incorporate physical accessibility into the natural environment. Beyond these guidelines, the principles of "universal design" aid in effective planning and design of future facilities from the ground up with consideration of ease-of-use for everyone from children to elders, including people with disabilities.

One in five Americans has a disability as it is defined in the Americans with Disabilities Act (ADA). Every person can face some level of difficulty or impairment at some point in their lives. Since the passage of the ADA in 1990, a growing record of legal decisions has provided guidance as to what constitutes disability and how best to provide accommodation. The best policy is not to make assumptions about any particular user's ability, but to make programs and facilities accessible to the largest population possible.

With steps and a ramp, this horse mounting platform at the Otter Creek Trail System in Lewis County provides for many diverse users including children

UNIVERSAL ACCESS

Universal access incorporates multiple layers of inclusion:

Physical Inclusion
site/facility scale

Universal Design
Non-segregated activity
Access route connections
Accessibility Guidelines

- Clear floor space
- Surfacing
- Changes in level
- Turning space
- Protruding object range
- Reach ranges
- Operable parts
- Signage

Administrative Inclusion

People-first language
Inclusive outreach
Disability awareness
Availability of large-print
Sign language interpreter
Accessible public meetings

Programmatic Inclusion
regional/statewide scale

Access across DEC programs

- Fishing
- Hunting and Trapping
- Birdwatching
- Camping
- Trails, etc.

Focus on abilities

County features a hardened natural surface that meets or exceeds width requirements, a universal picnic table with extended tabletop, a fire ring with raised base and thin walls, a tent pad, and connection to an accessible path (not shown).

MANAGEMENT REQUIREMENTS

The ADA, along with the Architectural Barriers Act of 1968 (ABA) and the Rehabilitation Act of 1973, Title V, Section 504, have had a profound effect on the manner by which people with disabilities are afforded equality in their recreational pursuits. The ADA is a comprehensive law that prohibits discrimination against people with disabilities in employment practices, in the use of public transportation, telecommunication facilities, and public accommodations. Title II of the ADA applies to the Department and requires, in part, that reasonable modifications must be made to its services and programs, so that when those services and programs are viewed in their entirety, they are readily accessible to and usable by people with disabilities. This must be done unless such modification would result in a fundamental alteration in the nature of the service, program, or activity or, such modification would create an undue financial or administrative burden on the Department. Since recreation is an acknowledged public accommodation and program of the Department, and because there are services and activities associated with that program, the Department is

obligated to comply with the ADA, Title II and ADA Accessibility Guidelines, as well as Section 504 of the Rehabilitation Act.
The ADA requires a public entity to thoroughly examine each of its programs and services to determine the level of accessibility provided. This examination involves the identification of all existing programs and services and an assessment to determine the degree of accessibility provided to each. The assessment includes the use of the standards established by Federal Department of Justice Rule as delineated by the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and/or the New York State Uniform Fire Prevention and Building Codes, as appropriate.

Inventory and Assessment

The level of existing access will be monitored at the regional and statewide level by DEC staff including the statewide Universal Access Coordinator and Regional Access Coordinators. UMPs will also be reviewed to ensure access in appropriate areas across programs and geographic areas.

Currently adopted ADAAG establishes guidelines for buildings, like this privy facility on Basswood Pond State Forest in Otsego County

The inventory and assessment of recreational facilities takes place through the development of UMPs. The need for new or upgraded facilities will also be addressed within each UMP. The Department is not required to make each of its existing facilities and assets accessible. This plan includes guidelines for the inventory and assessment of all the recreational facilities that support the programs and services available within a particular unit.

Existing Guidelines

The ADA requires public agencies to employ specific guidelines to ensure that buildings, facilities, programs, and vehicles are accessible to people with disabilities. The Access Board, a federal government agency, has issued the ADAAG for this purpose. The Department of Justice Rule provides authority for these guidelines.

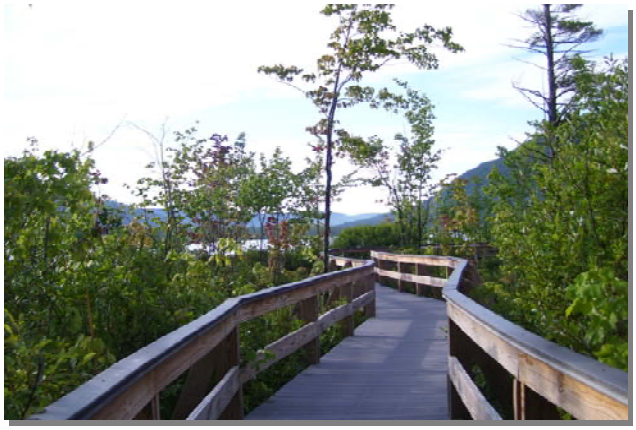
Currently adopted ADAAG address the built environment: buildings, ramps, sidewalks, and rooms within buildings. Boating and fishing facilities are addressed under the ADA/ABA amendments of 2004. The Access Board has proposed guidelines to expand the ABA to cover outdoor developed facilities: trails, campgrounds, picnic areas, and beaches on Federal lands.

UNIVERSAL ACCESS

The proposed guidelines are contained in the October 19, 2009 Draft Final Accessibility Guidelines for Outdoor Developed Areas.

ADAAG apply to newly constructed structures and facilities and alterations to existing structures and facilities. Further, the guidelines apply to fixed structures or facilities, i.e., those that are attached to the earth or attached to another structure that is attached to the earth.

When the Department is planning the construction of new recreational facilities or assets that support them, or the alteration of existing recreational facilities or assets that support them, it must consider providing access to the facilities or elements for people with disabilities. The standards which exist in ADAAG and the ADA/ABA or are contained in the proposed federal guidelines, also provide guidance to achieve modifications to trails, picnic areas, campgrounds (or campsites), and beaches in order to obtain programmatic compliance with the ADA.



Labrador Hollow Unique Area in Onondaga County

Universal Design

Taking ADAAG one step further, the Department can now apply the Principles of Universal Design. Universal design makes products and environments usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. The intent is to do so from the beginning of a project at little or no extra cost. Universal design benefits people of all ages and abilities (Mace 2008).

Principles of Universal Design

Equitable Use - The design is useful to people with diverse abilities.

Flexibility in Use - The design accommodates a wide range of individual preferences & abilities.

Simple and Intuitive Use - Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills or current concentration level.

Perceptible Information - The design communicates information effectively to the user, regardless of the conditions or the user's sensory abilities.

Tolerance for Error - The design minimizes hazards and the adverse consequences of accidental or unintended actions.

Low Physical Effort - The design can be used efficiently and comfortably with minimal fatigue.

Size and Space for Approach and Use - Appropriate size and space is provided for approach, reach, manipulation, and use regardless of the user's body size, posture, or mobility.

Application of the Americans with Disabilities Act Accessibility Guidelines (ADAAG)

Current ADAAG, the ADA/ABA and proposed guidelines for outdoor developed areas will be used in assessing existing facilities to determine accessibility compliance. Management recommendations in UMPs will be proposed in accordance with the ADAAG and ADA/ABA for the built environment, the draft guidelines for outdoor developed areas, the principles of Universal Design, the New York State Uniform Fire Prevention and Building Codes, and other appropriate guiding documents. Until such time as the proposed guidelines for federal lands apply to state governments, the Department is required to use the best information available to comply with ADA. This information includes, among other things, the proposed guidelines.

ADDITIONAL RESOURCES

DEC Accessible Recreation – Information on DEC's Universal Access Program, the MAPPWD permit and a listing of accessible recreation destinations, including facilities on State Forests can be found at www.dec.ny.gov/outdoor/34035.html

Final and Draft ADAAG can be found at www.access-board.gov

Principles of Universal Design can be found at www.design.ncsu.edu/cud/about_ud/udprinciples.htm

MOTORIZED ACCESS PROGRAM FOR PEOPLE WITH DISABILITIES

The Department's Motorized Access Program for People with Disabilities (MAPPWD) permits qualifying people with disabilities to use motor vehicles along specific routes for access to programs, such as hunting and fishing, on state lands. These routes are provided to facilitate access to these traditional programs and not for the support of ORV or ATV riding activities. This program provides access to significant recreational opportunities throughout the state and is one more way that New York is opening the outdoors to people with disabilities. This permit program is maintained pursuant to DEC Commissioner's Policy 3 (CP-3).

ADDITIONAL RESOURCES

DEC Commissioner's Policy 3 – www.dec.ny.gov/regulations/64558.html

MAPPWD permits may be obtained from Regional DEC Foresters through regional DEC offices. The permit provides access for those who seek solitude, connection to nature, undisturbed wildlife habitat, and inclusion with fellow sportspeople. Permit holders can use specified vehicles to travel beyond the reach of public roads, to areas where others must hike or bike.

UNIVERSAL ACCESS

A listing of MAPPWD routes is at www.dec.ny.gov/docs/lands_forests_pdf/mappwdroutes.pdf and is distributed to permit holders. MAPPWD routes and the types of vehicles allowed on the routes are carefully selected to protect natural areas and recreational activities. Access is restricted to designated routes only. All routes are subject to closure due to seasonal conditions or maintenance.

In the development of UMPs, existing and potential MAPPWD routes will be assessed along with other recreational facilities and assets. Routes will be evaluated for the degree to which they provide inclusion and access to DEC programs and recreational opportunities. Motorized access will be considered only where non-motorized access such as a foot trail that is improved to meet proposed accessibility guidelines is not feasible due to terrain or other considerations. MAPPWD routes are carefully located in areas which are able to support this use. It has been DECs experience that these designated routes receive low levels of use and a low impact nature of use. As a result, the use has been sustainable and has not created unacceptable adverse impacts with the exception of trails which have also experienced illegal ATV and OHV use. DEC will continue to monitor MAPPWD routes to prevent overuse or abuse and unacceptable impacts.

IMPACTS OF PROVIDING UNIVERSAL ACCESS

Providing Universal Access in many cases, does not create any additional environmental impacts, such as when accessible picnic tables and fire rings are provided in place of traditional features. In some cases, the hardening of trails and parking lots reduces impacts related to potential erosion, creating a positive benefit. There are however, some instances, such as trail widening and lengthening to reduce running slope, that may require the removal of vegetation, use of heavy equipment and visual impacts in excess of that associated with traditional trail construction. Indirect impacts may include higher levels of illegal off road vehicle use due to “inviting” conditions. Increased construction and maintenance costs can in some situations be related to providing access, especially where natural drainage of surface water must be accommodated. These potential negative impacts are addressed through application of creative designs, vehicle barriers, and proper trail layout to avoid unnecessary construction-related development.

Universal access will only be provided where it will not fundamentally alter the character or recreational programs of an area. The goal is to maximize accessibility while protecting the natural setting to the greatest extent possible, thereby preserving the fundamental experience for all. A minimum tool approach will be used to implement this vision, resulting in projects that blend into the natural environment and protect the landscape.

"UA" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Universal Access (UA) Objective I – Apply a minimum tool approach to provide a recreational program that is universally accessible.

UA Action 1 – Consider opportunities to enhance universal access to State Forest recreational programs and facilities in all UMPs.

UA Action 2 – Update operations staff universal design guidebook to reflect the most current guidelines by 2012.

UA Action 3 – Develop DEC universal access policy by 2016.

UA SEQR Alternatives Analysis and Thresholds

The **no-action alternative**, or in other words, continuing with current management approaches, has been selected as the **preferred alternative**. State Forests will continue to be managed to provide accessible recreational opportunities, following the most current available guidelines, considering inclusive access to all programs, and application of a universal design approach to new construction, as described above.

No other alternatives have been considered as DEC is dedicated to providing access for recreationists of all abilities.

SEQR Analysis Threshold: Compliance with the guidelines and strategies of this section will avoid and minimize potential impacts associated with the need to provide universal access and no further SEQR analysis is required.

FORMAL AND INFORMAL PARTNERSHIPS AND AGREEMENTS

Conservation and stewardship partnerships are increasingly important, especially for public land management agencies. Considering the fact that resources will always be limited, collaboration across political, social, organizational and professional boundaries is necessary for long-term success and sustainability. Encouraging the development of cooperative and collaborative relationships is and can be done through DEC's Adopt-A- Natural Resource Program and the development of UMPs. Successful collaborative efforts build on common ground established by a sense of place or community; mutual goals or fears or a shared vision. Collaborative efforts recognize that partnerships are made up of people and not institutions and mobilize support and resources from numerous sources. In their book Making Collaboration Work - Lessons from Innovation in Natural Resource Management, authors Julia Wondolleck and Steven Yaffee address the question of "why collaborate?" (Wondolleck and Yaffee 2000). Their answer: "collaboration can lead to better decisions that are more likely to be implemented and, at the same time, better prepare agencies and communities for future challenges."

State Forests are owned by the people of the state and entrusted to DEC for sustainable management. DEC will in turn, encourage public involvement and citizen participation in management of the land. Public comment is encouraged throughout the management planning process. In addition, user groups, such as equestrian or mountain bike clubs, can support Department regulations, help plan for appropriate use, and assist in maintenance of trails and other facilities. This ensures that, with Department oversight, State Forests will meet the needs of people most actively engaged in use of the land. Shared benefits are also realized by cooperating with college based researchers and Native American Nations.

ADOPT-A-NATURAL RESOURCE AGREEMENTS

Historically, State Forests have provided open space for outdoor recreational activities that require minimal facilities. The intensity of recreational use was once low, with few environmental impacts or user conflicts. During the 1990s, demand for recreational trails increased substantially (NYS DEC 2001).

To help meet the increasing demand for recreation, DEC increasingly depends on partnerships with recreation groups to help maintain, enhance, and construct recreational assets. Partnerships between

FORMAL and INFORMAL PARTNERSHIPS and AGREEMENTS

recreation groups and DEC are formalized through the Department's Adopt a Natural Resource (AANR) Program. The program is authorized by Section 9-0113 of the Environmental Conservation Law. The statute authorizes DEC to enter into stewardship agreements for activities it approves for the preservation, maintenance, or enhancement of state-owned natural resources. These agreements are generally written for a three to five year term.

ADDITIONAL RESOURCES

DEC's AANR Policy – www.dec.ny.gov/regulations/2568.html

Volunteerism is the cornerstone of the AANR program. It is a means for completing work that helps preserve, maintain and enhance natural resources at minimum cost to the state. Individuals and groups interested in providing volunteer services are afforded a formal opportunity to propose activities that meet management needs of state-owned natural resources. Such activities may involve remediating vandalism, establishing or maintaining access or nature trails, building camping sites, providing interpretive services for school groups and other citizens, managing fish and wildlife habitats, and otherwise providing positive benefits to the natural resource.

The AANR program has been very successful in parts of the state. Since the inception of the program, volunteers have built lean-tos, cleared miles of trails from ice storm damage, built miles of new trail, groomed snowmobile trails, and have removed refuse. There are currently 113 active AANRs on State Forests facilitating countless hours of volunteer assistance. These volunteer construction and maintenance activities add significant value to the State Forest system and the people it serves.

The Department's AANR partners are strongly committed to enhancing and protecting natural resources. Not surprisingly, these AANR partners have developed a strong sense of ownership and are very interested (and often involved) in the planning and natural resource management activities that take place on the State Forests in their area.

It is important that recreational development initiated by AANR partners is not allowed to incrementally increase to an unsustainable level. DEC must consider the impact from increased use on other management goals or other recreational uses. Even though a volunteer organization may offer the needed materials and labor to develop a new facility, DEC must consider the full range of impacts, including long-term maintenance and the balancing of multiple uses. In most cases, this can only be accomplished within the UMP process.

TEMPORARY REVOCABLE PERMITS

Any group organizing research activity or a competitive or group event must apply for a Temporary Revocable Permit (TRP) from the Department. Historically, TRPs have been issued for lean-to construction, cross country races, forest insect research, wildlife research, town road maintenance and utility line right-of-way work among many other purposes.

TRPs allow foresters to carefully review and oversee the variety of special events and proposed activities that sometimes occur on State Forests. Through the TRP review process, DEC avoids conflicting uses of state land and situations that could threaten health, public safety or integrity of natural resources. The permits also enable corrective actions by neighboring parties, which would otherwise be prohibited by regulation, such as the cutting of hazard trees that pose a threat to adjoining properties.

ADDITIONAL RESOURCES

DEC's TRP Policy – www.dec.ny.gov/regulations/51387.html

In general, TRPs are required for any activity that exceeds normal permissible levels of usage or access. TRP authorization does not provide exemption to any existing state laws and regulations. There is a $25 administrative fee for this permit. To hold any event, a sponsoring organization must request permission in writing at least 30 days in advance of the date of the proposed activity. The TRP applicant or sponsoring organization must provide proof of liability insurance. TRPs are authorized by DEC policy.

NATIVE AMERICAN INVOLVEMENT

Public lands are a vital resource that is used by Native American peoples. Much of their activity is quiet and unnoticed, but none the less very important. Access to DEC State Forests, which often are one of the few natural green spaces available, serves their needs from both a utilitarian and a spiritual sense.

DEC manages forests that contain a wide variety of habitat. This variety supports an array of plant life, of which many species, both common and scarce, serve Native American healers as medicine. Tribal members also hunt, trap and fish on state lands. Quiet, rugged, remote locations on State Forest lands serve some of the spiritual needs of tribal members.

Excellent partnerships can be formed with local tribes. For example, in Region 6, DEC forestry staff have had a long-standing AANR with the St. Regis Mohawk Tribe dealing with a species of special cultural concern to the tribe, the black ash tree. Black ash is the species of choice for Northeast Native Americans for producing splint basketry because of its special qualities. Families and communities are literally woven together, and traditions are passed on through storytelling and interaction while log gathering, log pounding, splint cleaning and basket making. State Forests contain the vital black ash resource, and cooperative efforts have been taken with the tribe to improve, propagate and utilize the black ash on state lands.

Such special uses of state lands may be accommodated via either a Temporary Revocable Permit or AANR agreement. In the process of developing a State Forest UMP, effort should be taken to contact and work with any Indian Nations within or near the acreage covered in the

UMP. Nations will be notified of and invited to participate in all "initial scoping" and "draft review" public meetings.

ADDITIONAL RESOURCES

DEC Commissioner's Policy CP-42 – Contact, Cooperation & Consultation with Indian Nations
www.dec.ny.gov/regulations/64558.html

The Seneca Nation of Indians was also very cooperative when emerald ash borer was discovered near Randolph, assisting in setting traps, participating in strategy discussions and expressing openness to any other suggestions as to how they could assist in the detection and eradication efforts.

EDUCATION AND RESEARCH

Educational activity on State Forests falls into three categories.

- Static interpretive materials (kiosks, signs, walking tours, etc.) *(Refer to Visual Resources, page 132 and Infrastructure, page 162)*
- Public outreach to the community *(Refer to Supporting Local Communities, page 245)*
- Scientific research conducted on State Forest lands

Research activity will be supported on State Forest lands by accommodating researchers and educators where possible and appropriate. Research activity will be conducted via a DEC-issued Temporary Revocable Permit. Often, the resources that draw researchers have unique ecological value or rare historic value. Foresters must ensure that rare and unique resources are not impacted by repeated research activity.

"PRT" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Partnership (PRT) Objective I – DEC will collaborate with local organizations and governments to accomplish mutual goals.

PRT Action 1 – Complete an update to DEC's TRP policy by 2011.

PRT Action 2 – Propose a centralized AANR management program to encourage and facilitate the assistance of recreational user groups, to be designed and proposed for regional review by 2013.

PRT Objective II – Consider the full range of impacts from AANRs and recurring TRPs, including long-term maintenance and the balancing of multiple uses in all UMPs.

PRT SEQR Alternatives Analysis and Thresholds

The **no-action alternative**, or in other words, continuing with current management approaches, has been selected as the **preferred alternative**. State Forests will continue to be managed utilizing AANR agreements and TRPs to formally partner with stakeholder groups and accommodate certain uses of State Forests, as described above.

SEQR Analysis Threshold: Compliance with the guidelines and strategies of this section related to the use of partnerships will avoid and minimize potential impacts resulting from organized events, use by partnership groups and other uses of State Forests, requiring no additional SEQR analysis. SEQR thresholds for specific projects by volunteers have been established in the recreation and infrastructure sections of this plan.

RECREATION

The demand for recreational use of State Forests has greatly increased in recent years. Recreational planning is now a major component of State Forest UMPs and includes diverse pursuits such as snowmobiling, horseback riding, hunting, trapping, fishing, picnicking, cross-country skiing, snowshoeing, bird watching, geocaching, mountain biking and hiking. The archer, dog sledder, rock climber and orienteering enthusiast also enjoy their sport on State Forests. Outdoor recreation opportunities are an important factor in quality of life. We often learn to appreciate and understand nature by participating in these activities. However, repeated use of the land for recreational purposes can have significant impacts.

Sandy Pond Beach Unique Area, on the eastern shore of Lake Ontario in Oswego County can only be reached by boat. It provides a great spot for recreation and, importantly, rare dune grass habitat

ADDITIONAL RESOURCES

Outdoor Recreation – DEC's website contains pages for some of the more popular outdoor activities and recreational information. These pages are linked at www.dec.ny.gov/62.html.

Environmental Conservation Law (ECL), Article 1 requires the Department first and foremost to protect New York's environmental resources. This requires planning, monitoring and management of recreational use in order to prevent and mitigate impacts to the environment. Responsible management also reduces the potential for conflicts between multiple uses. Even the lowest impact uses, such as hiking or canoeing, can leave an impression on the land. But with proper management, tomorrow's users will have the same quality experience as today's users and the environmental quality of State Forests will be undiminished for future generations of New Yorkers.

HISTORICAL BACKGROUND

The recreational use of state forests has gradually evolved as society's interest in outdoor recreation has grown. In the early years of the state forests, from the 1930's through the 1960's, there was little interest in outdoor recreation on state forests other than the traditional activities of hunting, fishing and trapping. During the late 1960's and into the 1970's, the

RECREATION

interest in outdoor recreation bloomed in America. It was during this period of time that the first recreational trails became established on State Forests. Trails were often located on historic access routes such as abandoned roads, old farm lanes and cow paths without full awareness or proper planning used to determine the best locations.

Rafting in the Zoar Valley Multiple Use Area, Erie County

As interest in outdoor recreation continued to grow through the 1980's and 1990's, DEC sought to accommodate new recreational demands, compatible with state forests, by improving or developing recreational trails or facilities. Many trails and facilities were developed by authorized volunteer groups without oversight and planning or were developed to meet short term goals, accommodating light use or a single use only. Such facilities have not held up under the stress of increased, multiple use. Now, as demand continues to grow, and with limited staff and financial resources to address recreation concerns, DEC needs to make coordinated management decisions across the landscape to ensure that adequate recreational opportunities, compatible with State Forests, are available while also protecting the environment from recreational impacts and minimizing conflicts between competing recreational user groups.

Mitigation of Environmental Impacts from Recreational Use

In order to minimize impacts related to recreational use, DEC relies on a combination of management planning, along with public education, enforcement of regulations and permit issuance. If public education and enforcement of general regulations are not sufficient to protect resources in a particular area, property-specific regulations may be developed.

Management Planning

The public process of unit management planning is critical to minimizing recreational impacts. This process provides the opportunity for DEC to hear the needs and desires of the people who use the land and to balance these needs in an appropriate manner in a public forum. At the same time, user groups are provided the opportunity to discuss the conflicts between their chosen recreation, and find compromise solutions. Also, greater public awareness of the many demands on the land can lead to more responsible use. Finally, interaction through the management planning process helps to support and engage Adopt a Natural Resource (AANR) partner groups that value the State Forest resource.

Trails may need to be closed entirely or restricted to specific uses when environmental impacts or user conflicts reach unacceptable levels. Management planning must involve the assessment of trail conditions and user compatibility, and setting site-specific parameters under which trails will be closed.

Public Education

DEC's preferred method of mitigating recreational impacts is through a comprehensive public education process. This process includes use of DEC's public website along with on-site signage, brochures and seasonal stewardship employees who can serve to educate the public in the use of State Forests with a minimal impact, and the rules for the use of State Forests.

Enforcement of Regulations

The New York State Environmental Conservation Law establishes broad provisions for protection of the environment. To provide further clarity, DEC has worked with the people of the state to develop rules and regulations that apply specifically to State Forests (ECL Article Section 190.0 -190.10). The development and enforcement of rules and regulations enhance public safety and protect environmental resources. DEC Forest Rangers have the direct responsibility to enforce all laws and regulations on State Forests. This necessitates regular patrols, especially in areas prone to greater use.

ADDITIONAL RESOURCES

Use of State Lands Regulations (ECL Article Section 190.0 -190.10) – available at: www.dec.ny.gov/regs/4081.html

The following activities are prohibited on State Forests:

General Prohibited Activities

- Operating a motorized vehicle on State Forests – except on roads posted and designated as open
- Polluting or disposing of litter, refuse, or waste material on State Forests or in any water resources on State Forests
- Operating a motorized vehicle at a speed in excess of 25 miles per hour on any road under DEC jurisdiction through State Forests
- Use or possession of paint ball guns
- Use or possession of breakable targets, including but not limited to clay pigeons and glass containers
- Gambling
- Intentionally obstructing public vehicular or pedestrian traffic
- Posting notices or signs
- Selling alcoholic beverages

- Obstructing public safety officers or DEC employees from performing their legal duties
- Establishing permanent structures, including tree stands or blinds, except under certain conditions.
- Leaving personal property unattended on State Forests, with the exception of a:
  1. Geocache that is labeled with the owner's name and address and installed in a manner that does not disturb the natural conditions of the site or injure a tree;
  2. Camping structure or equipment that is placed and used legally pursuant to camping regulations, provided that equipment is not left unattended for over 48 hours;
  3. Trap or appurtenance that is legally placed and used during an open trapping season;
  4. Tree stand or hunting blind that does not injure a tree, is properly marked or tagged with the owner's name and address or valid hunting or fishing license number, and is placed and used during big game season, migratory game bird season, or turkey season;
  5. Wildlife viewing blind or stand that is placed for a duration not to exceed 30 days in one location per calendar year, does not injure a tree, and is properly marked or tagged with the owner's name and address or valid hunting or fishing license number.

Additional prohibitions necessary for public safety and mitigations developed for natural resource protection are provided under each recreational activity discussed below.

Issuance of Permits for Special Events, Group Events and Planned Activities

Special events, group events and planned activities are regularly accommodated on State Forests through the issuance of a Temporary Revocable Permit (TRP). These events include snowmobile, bicycle, horse and orienteering races and events, runs, rides or competitions (eg. biathlons and triathlons), archery and fishing tournaments, along with re-enactments, encampments and sponsored hikes.

See page 182 for a description of DEC policy regarding TRPs.

USE OF ROADS

DEC roads provide access within state forests. These roads vary in construction standards and allowed uses. Public highways owned or maintained by municipalities (state, county and townships) also provide access to the forests and, in some cases, continue through the forests.

Motor vehicle use is allowed on state forests only on roads that are signed for such use. Some roads may be closed or restricted to motor vehicle travel at certain times of the year, such as in the winter to restrict motor vehicle access because these roads are not plowed. Other roads

may be temporarily closed during summer months due to timber harvesting. Road closures are often related to safety and access issues.

Motor vehicle use is not considered to be a recreational program of DEC, but rather a means of access for recreation and other uses. Therefore, facilities are not developed in order to meet a demand solely for motorized use. The existing road system has provided adequate access to most state forests. In recent years, new roads are occasionally built to access remote sections of forest land. DEC also recognizes the negative impacts associated with new roads such as fragmentation as discussed in the Infrastructure section of this plan.

Information on road construction, road types, and construction impacts is found in the Infrastructure section of this plan. *(Refer to page 157)*

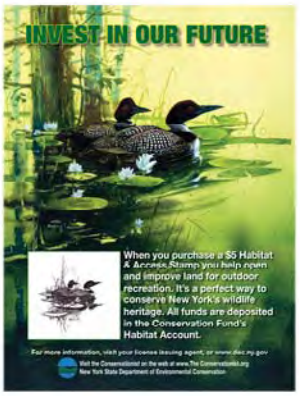
All roads and trails are closed to use by ATVs, unless they are otherwise designated and signed. *(Refer to page 213)*

Impacts and Mitigations (related to use of roads) – Along with public access by road, there are problems of abuse: littering, dumping of trash, illegal vehicle use. Trash pickup costs thousands of dollars in collection costs and tipping fees. Gatherings for parties usually results in littering, improper fires, and vandalism. Illegal motor vehicle use on closed roads and trails can create serious erosion problems which are very expensive to repair. There are safety problems, legal constraints and user conflicts pertaining to discharge of firearms and bows from roads. Containing the size of road systems, responding to elevated use, preventive public education and law enforcement efforts are critical to mitigating these impacts.

WILDLIFE-RELATED RECREATION

State Forest lands are open to wildlife viewing and with few exceptions, are open to public hunting, fishing and trapping with appropriate licenses. More than 2,000,000 person-days of hunting take place on State Forests annually, and approximately 570,000 person-days of freshwater fishing are estimated for the lakes, ponds and streams located on State Forests (OPRHP 2008). Hunting, trapping and fishing licenses are sold at many town offices, numerous retailers of outdoor equipment – where

Habitat/Access Stamp Program
This program provides funds for projects like building boat launches and fishing platforms for public access and planting native vegetation for improved habitat.
www.dec.ny.gov/permits/329.html



regulation booklets can also be obtained, and via the phone or internet. For more information regarding hunting and fishing seasons, hunting regulations, places to hunt in New York, and trapping or fishing on state lands, please see DEC's Outdoor Recreation web page or contact the appropriate DEC Regional Office.

Hunting

This accessible hunting blind enables broader participation in hunting

Big game hunters often visit State Forests, seeking white-tailed deer and black bear in the fall, while small game enthusiasts hunt for ducks, ruffed grouse, wild turkey, and other small game like the snowshoe hare. Legal hunting is allowed on most State Forests but is restricted or prohibited where there are special hunting regulations such as in intensive use areas and some Unique Areas. Posting of private lands has limited hunting opportunities and increased hunting pressure on public lands open to hunting. However, the demand for hunting, as measured by license sales, has declined in eight of the past ten years. The declining participation in hunting appears to be greater among those from urban or suburban communities than from rural areas. This trend is predicted to continue.

Hunting has long been associated with state forests. Hunting (especially big game hunting for deer) has a very positive effect on hardwood forest management and vegetative biodiversity. Deer are browsers and eat hardwood vegetation, especially young trees. When populations become large, it is possible for the deer to over-browse the forest. Over-browsing can prevent the growth of new trees and reduce species diversity in the forest. *This issue is addressed in detail on page 291 in the Deer Management section of this plan.*

Impacts and Mitigations – Improper camping, illegal off-road vehicle use, litter, indiscriminate shooting of trees and illegal taking of wildlife are environmental impacts associated with hunting. In New York State, all hunters must take and pass an education course to obtain a license. This course teaches safety, ethics, wildlife management and biology. Legal hunting is a compatible activity on state forests

ADDITIONAL RESOURCES

Hunting – www.dec.ny.gov/outdoor/hunting.html

Regulations – www.dec.ny.gov/regs/2494.html

Multiple Use Conflicts – Hunters have noted problems when encountering people with pets. Pets may be unleashed and may chase or harass wildlife. Some pet owners afield during hunting seasons feel that hunters are a danger to themselves and their pets. Hunters have also noted damage to state forests by motorized vehicles and horses. Other hunters have expressed the

desire to use motor vehicles to travel into the forest and remove harvested game. Users of foot trails, campers, horseback riders, cross country skiers, mountain bikers, nature observers, and owners of unleashed pets feel their safety is threatened during hunting seasons. Most non-hunters are aware of the arrival of hunting season and have learned to limit their use of State Forests on weekends during big game gun hunting season.

Trapping

Trapping is the placing, setting, staking or checking of traps for the taking, killing or capturing of wildlife or assisting another person with these activities. Trapping does not require trails on state forests and usually occurs near streams and in wet areas away from trails. Furbearers such as beaver, fisher and river otter are sought by trappers (U.S. Fish and Wildlife Service 2006) where they can be legally trapped. Raccoon, fox, skunk, muskrat and mink, to name a few, may also be trapped on certain State Forests where there is an open season.

ADDITIONAL RESOURCES

Trapping –www.dec.ny.gov/outdoor/355.html

Regulations – www.dec.ny.gov/outdoor/9209.html

Trapping has been a traditional and effective method of controlling animals such as beaver. The prohibition of trapping would allow an uncontrolled buildup of the beaver population which has proven to back up water, causing damage to manmade structures and woodland. Trapping is pursued by a relatively small number of sportsmen. In 1997-98, approximately 9,000 trapping licenses were sold throughout the state. The demand for trapping is expected to remain steady, although it may fluctuate with changing fashion trends and fur markets.

Impacts and Mitigations – Off-road vehicle use and illegal taking of wildlife are environmental impacts associated with trapping. Trapping is regulated by Article 11 of the Environmental Conservation Law of New York State. Trapping seasons are set by DEC. In New York State, all trappers must take and pass an education course to obtain a license. This course teaches safety, ethics, wildlife management and biology. Legal trapping is a compatible and suitable activity on state forests.

Fishing

The many waters on State Forests support thriving communities of sportfish. The common warmwater sportfish include smallmouth and largemouth bass – the most frequently sought after fish in the state, as well as chain pickerel, northern pike, walleye, bluegill, pumpkinseed, rock bass, black crappie and brown bullhead. In waters that maintain suitable temperatures for coldwater fish (maximum temperatures do not exceed 70 degrees F for

extended periods), common coldwater sportfish include rainbow, brown and lake trout. These coldwater lakes, ponds and streams may be stocked with brook, brown or rainbow trout to supplement existing trout populations, or to provide a trout fishery where trout are incapable of maintaining themselves. Larger, deeper waters may also be stocked with lake trout.

ADDITIONAL RESOURCES

Fishing – www.dec.ny.gov/outdoor/fishing.html

Regulations – www.dec.ny.gov/outdoor/7917.html

Fishing has a long tradition on State Forests. Although angler surveys have shown a decline in the number of anglers in New York over the past two decades, public input to DEC indicates that fishing is still very important to State Forest users.

Brook trout, New York's state fish, and a species identified as being of greatest conservation need in New York, is found in many of the small, coldwater streams found on State Forest land. It is essential that riparian habitat is protected and water quality is maintained in these waters. Brook trout can also be found in ponds, but are very intolerant of competition from other non-native fish species. DEC is working to restore and maintain brook trout in many ponds. The primary threats to these populations are non-native fish species, typically via bait bucket introductions. To address this, waters managed for brook trout are typically managed with regulations that prohibit the use of baitfish. Where possible, brook trout ponds are stocked with native "heritage" strains of brook trout.

New York is a member of the Eastern Brook Trout Joint Venture (EBTJV) which is comprised of a diverse group of partners, including state fish and wildlife agencies, federal resource agencies, academic institutions, and private sector conservation organizations. The EBTJV is working to conserve native brook trout and their habitats. The EBTJV has already produced a range-wide population assessment; completed extensive work that identifies key threats, and developed conservation strategies to protect, enhance, and restore brook trout and their habitats.

Impacts and Mitigations – Improper camping, off-road vehicle use, litter, and the illegal taking of fish are environmental impacts associated with fishing. Fishing is regulated by Article 11 of the Environmental Conservation Law of New York State. Fishing seasons in New York are set by DEC. Legal fishing is a compatible activity except where prohibited by regulation.

Viewing Natural Resources

ADDITIONAL RESOURCES

Watchable Wildlife – www.dec.ny.gov/outdoor/55423.html

This category includes activities such as birding, nature photography and wildlife observation. Between 1980 and 1995, the US Fish and Wildlife Service reported that all regions of the country experienced at least a 52% increase in nature viewing activities. The

demand for birding, wildlife/nature observation and similar activities is predicted to continue to increase. State forests offer large, relatively undisturbed natural areas where people can enjoy nature viewing activities. Forestry activities on state forests have traditionally created, maintained and protected a wide variety of habitats required for a diversity of wildlife and plant species.

Impacts and Mitigations – Environmental impacts of viewing natural resources are minimal. The Environmental Conservation Law prohibits anyone from removing or destroying natural or cultural artifacts found on state land. The law also states that songbirds and their nests and other wildlife will not be molested or disturbed at any time, except during any open season on these animals. Viewing natural or cultural resources is compatible with state forests.

Multiple Use Conflicts – Activities that have been reported to conflict with natural resource viewing include off-road motorized vehicle use and hunting. Users generally desire a minimum of disturbance and tend to view state forests as places to escape from the daily noise of society and motor vehicles.

ADDITIONAL RESOURCES

Back-Country Camping – www.dec.ny.gov/outdoor/41282.html

Regulations – www.dec.ny.gov/regs/4081.html

CAMPING

State Forests provide abundant opportunities for camping of a rustic, undeveloped character. Most areas are open to dispersed, primitive, back-country camping while other areas may accommodate use only on designated campsites. Only a few, if any, amenities are offered for camping on State Forests. Where camping sites are designated, there may be nearby parking areas, mowed or cleared areas for camping, picnic tables, fire rings and latrines. Running water, heated facilities, and electricity are not available. There is no fee for camping on State Forests. However, a stay of longer than 3 days in one location or camping in groups larger than 10 persons requires a permit, obtained from the regional Forest Ranger listed at www.dec.ny.gov/about/50303.html.

Dispersed, primitive back-country camping is an appropriate activity, except where specifically prohibited. Individuals may camp throughout State Forests provided they camp at least 150 feet from roads, marked trails, streams, ponds, lakes, and other water bodies. This dispersed camping spreads the impact over a large area and mitigates negative effects, since most sites rarely see repeated use. Camping near roads is often preferred by hunters during hunting seasons. Hunters frequently pull their trucks or campers off the road onto old log landings or

other cleared areas to camp over an extended stay while hunting nearby. This use is accommodated through the issuance of a temporary permit.

There are some areas where dispersed camping would cause unacceptable degradation of the area and sanitation issues. These are usually areas with a level of use that is higher than normal (eg. in scenic areas and near water bodies) or on sensitive sites, which deserve a higher level of protection. In these areas, camping has been restricted to designated sites only. These sites have been designed and built to withstand repeated occupancy and concentrated use, allowing the remainder of the area to stay in a more natural state. Camping at some designated sites on some State Forests may also require a permit. Permits are used to limit the amount of use where necessary to ease overcrowding, reduce user conflicts, and for resource protection.

Lean-to on Sugar Hill State Forest in Schuyler County; most designated campsites on State Forests are undeveloped tent sites

Impacts and Mitigations – Environmental impacts of camping on designated sites may include soil compaction, litter, human waste, and unauthorized cutting of trees for use as firewood. Dispersed camping may cause water pollution from camping too close to water sources, degradation of trees around campsites, and disturbance to wildlife. Camping may also cause damage to rare species or cultural resources. The regulations for camping on State Forests and Unique Areas are listed in Title 6, Chapter II, Part 190 of the New York State Environmental Conservation Law.

Signage, in areas with a high level of use, is used to remind campers to practice campfire safety and follow rules, including requirements to carry-in-carry out and use dead and downed wood only. Camping sites may occasionally be designated "Reserved ♿"; such a site may only be used by a qualified person with a disability and that person's associated camping group.

Multiple Use Conflicts – Activities that may conflict with camping include off-road motorized vehicle use and hunting during hunting seasons. Conflicts may result from choosing inappropriate sites for camping, such as forest access road turnarounds or along private land boundaries.

WATER-BASED RECREATION

Swimming

Swimming is permitted on State Forests, unless specifically prohibited by sign or regulation. Lifeguard supervision is not provided on State Forests. Anyone swimming on State Forest shall be responsible for risks associated with their activity.

Impacts and Mitigations – Environmental impacts of swimming are greatest at those areas which receive heavy use. Impacts may include litter, damage to dunes, shoreline erosion, destruction of vegetation, and disturbance to riparian wildlife. Swimming may be prohibited in specific areas, for example, Unique Area properties where habitat requires protection.

Non-Motorized Boating, Canoeing & Kayaking

The bodies of water typically found on State Forests are well suited to non-motorized boating. In many cases, this is the only suitable form of boating on State Forests. Many of the ponds on state forests are man-made and were originally built for waterfowl nesting. Most ponds are spring fed, so there is usually not a great inflow of water except in the spring after snow melt. Because of their small size, these ponds would be greatly affected by pollution. The dikes of the ponds may be especially susceptible to erosion from wave action that would be created from motorized boating. These ponds are typically shallow and contain stumps from dead trees that can be a hazard to navigation of any boat.

Impacts and Mitigations – Environmental impacts of non-motorized boating are minimal. At present there are no regulations or statutes prohibiting the launching and use of human-powered craft on any of waters on State Forests.

Motorized Boating

Due to the size of most of the waters on state forests, few people use motorized watercraft on them. Certain State Forest properties provide access to waters adjacent to state lands, but which are not wholly within the boundaries of the State Forest. Use of boats on these waters may be regulated by DEC or other government agencies. Electric and gas-powered motors are permitted on water bodies unless otherwise posted against such use or where prohibited by regulation.

Impacts and Mitigations – Environmental impacts of motorized craft include noise, shoreline damage, and air and water pollution. Due to the unique characteristics of each pond or lake, use is generally regulated on a case by case basis during unit management plan preparation or by Environmental Conservation Law. The DEC can regulate activities only on those ponds where the DEC controls the entire shoreline. 6 NYCRR Part 190.8 (t) www.dec.ny.gov/regs/4081.html prohibits mechanically propelled watercraft on some small ponds and water bodies which are too fragile or shallow or contain submerged stumps. This section also places a 25 Horsepower limit on boats using Long Pond in Chenango County. In addition, regulations have been established for the use of boat launching sites within Part 190.24. Signage at boat launching

sites is employed to remind boaters of rules prohibiting inappropriate use, leaving unattended vehicles and boats, obstructing access, erecting structures, building fires, conducting business or mooring for over 24 hours.

Multiple Use Conflicts – Conflicts occur between motorized and non-motorized boating activities.

TRAIL-BASED RECREATION

Trail-based recreation occurs throughout State Forests on roads as well as on a variety of trails. Most roads and trails are open to multiple uses, creating demands and impacts on the land. The issues associated with trail use are best-addressed from an overarching perspective that considers these many uses and demands. DEC will consider proposals for development of additional trails or the use of undesignated trails to accommodate local use of State Forests on a case-by-case basis.

Trail Supporter Patch Program
This program helps maintain New York State's trails including those on State Forests.
www.dec.ny.gov/outdoor/36016.html

In the 1980's-90's, trails were often developed in response to local demand without proper planning or consideration of long-term consequences. Volunteers were authorized to locate and construct trails. This was done without adequate understanding of proper trail location, design and construction requirements. Trails were constructed to minimum standards that were intended to accommodate a low level of use. Years later, these trails are receiving a greater amount of use than originally was anticipated. Trails were also designed for single uses without regard for future multiple uses of the same trail. For example, portions of cross country ski trails were originally located on areas of poor soil drainage because they were intended to be used during frozen conditions. However, years later, as demand for trails increased, those same trails have become used by horse riders or mountain bikers. Poorly planned trails have become eroded, muddy paths resulting in unsafe and unpleasant conditions for trail users and unhealthy conditions for the environment. In the 1990's mountain biking became a significant activity on state forests resulting in increased use of trail systems on state forests. In some areas trail users have constructed their own trails without approval from DEC, often in unsuitable locations. In other areas, long distance trails established across state forests and private lands sometimes cause problems on the property of adjacent landowners or in nearby communities. These issues must be addressed to ensure healthy state forests with quality recreational opportunities in the future.

Adopt-A-Natural Resource Partnerships

The development and maintenance of recreational trails on State Forests can often be best accomplished through the AANR Program, in accordance with guidance in the Infrastructure

section of this plan and with any applicable UMP. An AANR Agreement is required prior to construction, to further detail guidelines and responsibilities related to the trail. Trail locations proposed by AANR partners on State Forests must be approved by DEC personnel in advance of construction. AANR stewards developing trails from private lands across State Forests must follow the prescribed procedure for addressing new trail proposals. DEC will assume no administrative or financial responsibility for trail segments outside of State Forests. Following construction, the sponsor must maintain the trail to DEC standards.

See page 182 for a description of DEC policy regarding AANR agreements.

Management Planning

Proper management of trail-based recreation is aided greatly by the unit management planning process (see "Mitigation of Environmental Impacts from Recreational Use" above).

Resolving Multiple Use Conflicts

Conflicts between different types of trail use will be minimized, and if necessary, use will be separated. Often, separating use occurs with the changing season (e.g. snowmobiling and mountain bicycling). If demand exists for a type of trail use in an area where it is appropriate but cannot be separated from other trail uses, the use will be allowed on existing trails where shared use will not lead to unacceptable conflicts between trail users or unacceptable physical impacts.

Educating users about the kinds of use allowed on a particular trail is an important tool in reducing user conflicts. On shared-use trails, DEC will inform visitors about the types of trail uses allowed and will promote the principles of trail-sharing etiquette through trailhead signs and publications. Trail use will be monitored. Should monitoring reveal that the addition of a new type of trail use has caused unacceptable levels of conflict between trail users or unacceptable physical impacts to a trail, appropriate action will be taken to reduce such conflicts or impacts. As a last resort, action may include elimination of a type of trail use from the trail, or closing the trail entirely.

Trail Condition Assessments

As staffing and funding are available, it would be helpful to develop a program for carrying out regular trail assessments on State Forests to identify maintenance needs and avoid overuse and erosion. Factors that would be evaluated are: suitability of trail use and location, condition of trail surface, and need for erosion control. Assessment forms could be used to track

maintenance needs and costs, obtain budget review and approval, and assemble a request for the next year's regional work projects.

Foot Trail Use - Hiking, Snowshoeing and Trail Running

Hiking includes the use of foot trails for day hikes as well as long distance multi-day backpacking trips. Trail runners use foot trails for training or exercise. In winter, snowshoers and cross country skiers also use foot trails, primarily for day use excursions. A variety of different types of foot trails can be found on state forests. These include long-distance linear trails, loop trails, destination trails and interpretive trails. There are 1,211 miles of combined road and trail available for hiking on State Forests.

Accessible Trails

Pedestrian trail access for people with disabilities is one category of trails that are needed on state forests. These trails do not only provide access for those with disabilities but they also are often preferred by others such as elderly or families with children and baby strollers. More foot trails and associated facilities, meeting ADAAG standards, must be developed to accommodate people with disabilities where possible and appropriate.

Interpretive Trails

More interpretive foot trails and loop trails are also needed on state forests. Currently, there are few interpretive foot trails on state forests. Additional trails with interpretive information are needed to provide opportunities throughout the state for the public to learn about and appreciate the unique features found on state forests. Additional foot trails are also needed to provide or improve access to some existing trails or facilities.

Impacts and Mitigations – Environmental impacts of hiking include trail compaction and erosion from poor trail design or overuse. As is the case with most other uses, trails can become widened or braided when users deviate from the course of the trail to avoid wet areas or other obstacles. Trail surfaces can also become degraded when the ground is too soft to support use of the trail. Proper design and construction, monitoring of trail conditions, and trail closures can help to mitigate impacts. Otherwise, all areas of state forests are open to foot travel except for special restricted areas around NYS Department of Corrections facilities. Competitive events require a TRP from DEC.

Multiple Use Conflicts – Public input to DEC has indicated that people using foot trails prefer trails be restricted to pedestrian use only because they have a variety of conflicts with other recreationists, especially with motorized use, mountain bikers and horse riders. They are

concerned that foot trails maintained by volunteers can be damaged from these other uses resulting in increased trail erosion and maintenance. These activities sometimes require wider trails and may have more environmental impact on the foot trail than pedestrians do. The riding, driving or leading of horses is prohibited on foot trails on lands under the jurisdiction of the DEC, except where foot trails are part of a publicly maintained road, or are specifically designated to allow travel by horses. They have also expressed concern about hunting because they feel in danger using the trails during hunting season. Hunting is generally a safe activity with relatively short seasons, however, anyone afield during hunting season should wear some blaze orange clothing to increase their visibility to others and reduce their risk for injury. Those seeking to use foot trails and not encounter hunters can obtain the dates of the hunting seasons to better plan their trip.

Long-Distance Foot Trails

Where appropriate, development of long-distance trails that cross UMP units and DEC regions will be encouraged. However, long-distance trails will not be located where anticipated levels of use on new or existing trails or increased access to adjacent areas will have unacceptable impacts on natural resources or the recreational experiences of visitors. Because most long-distance trails cross both public and private lands, the forester will coordinate with private landowners, the managers of other involved public lands and trail organizations in the development and management of long-distance trails.

Each long distance trail system has its own character, acceptable uses and in some cases even its own formal design standards. To the fullest extent possible accommodations will be made for these criteria on trail sections which pass through State Forests.

This section of the Finger Lakes Trail crosses the Cheningo Creek using large boulders in place of a traditional bridge. Taylor Valley State Forest, Cortland County

The Finger Lakes Trail (FLT) is a good example of a long distance trail system with its own character and standards, and is also the only long distance trail of which there is any appreciable mileage found on State Forests. According to the Finger Lakes Trail Conference's website, the FLT travels 561 miles from Allegany State Park to the Long Path in the Catskills. In addition, the FLT trail system includes branch, loop and spur trails totaling another 351 miles. The FLT is also an official component of the 4,600 mile long North Country National Scenic Trail. FLT trail mileage is split almost evenly between public and private lands creating interesting management challenges. This over 40 year old trail system was constructed and is maintained by an extensive and very dedicated group of volunteers on State Forests under Adopt-a-Natural Resource Agreements. Through its long history the FLT has been constructed and is maintained

as a single use hiking trail. This is a very important issue since the trail was designed and built to standards which can't sustain most other uses. In addition, a majority of the private landowners who allow the trail to cross their properties only allow it to be used by hikers.

To the fullest extent possible DEC will accommodate the FLT as a single use foot trail on State Forests in respect for neighboring private landowners who host the trail under that constraint and in full understanding that the present layout, design and volunteer support is limited to the extent that the trail system can only be sustainably managed as a foot trail. There may be very limited exceptions, where segments of the FLT on State Forests may be open for other or multiple uses under the following terms:

1. When the FLT or another neighboring trail is temporarily relocated:
   -- to accommodate other management activities, or
   -- due to a DEC-imposed closure due to safety concerns, and where it is not feasible for the re-route to accommodate the FLT as a single use foot trail, in the affected section. Examples of this temporary situation might include places where the re-route must follow a Public Forest Access Road or another existing multiple use trail segment or where another trail must be relocated onto the FLT footprint.
2. Where the FLT passes through a State Forest which is also dedicated to an extensive system of trails, accommodating other recreational uses, and it is not feasible or avoidable to have some trail overlaps.
3. When the Finger Lakes AANR partner requests a re-route and the only feasible accommodation includes use of an existing multiple use trail or a PFAR.

Cross-country Skiing

Cross country skiing is allowed anywhere on State Forests other than on trails posted as closed for this use. Cross country skiers prefer loop trails. There are 881 miles of cross country ski trail on State Forests. In addition to the hundreds of miles of old logging roads, firebreaks, public forest access roads and unimproved trails, there are also more formal designated trails, some of which are groomed by Volunteers under AANR Agreements. Some of these are designed for classic style skiers and others for skate style which requires a wider track. To maintain the rustic character of state forests, trails will generally not be groomed. The designated ski trails on state forests are all designed for the beginner to intermediate skill level. No trails are designated for skiing where the conditions would require an expert skill level. Individuals should call their local DEC Lands and Forests office for more information.

DEC does not have the resources to remove snow from all parking areas. In some cases, the local Towns plow parking areas which are accessed by Town roads. If this service is not provided, some facilities may have to be closed.

Impacts and Mitigations – Environmental impacts of cross country skiing are minimal. Competitive and organized group events require a TRP from the Department.

Multiple Use Conflicts – Activities that have been reported to conflict with cross country skiing include hiking, snowshoeing, taking pets on trails, snowmobiling and motorized vehicle use. Toboggans, sleds and snowmobiles are not permitted on designated ski trails.

Equestrian

Horseback riding, driving or leading is permitted on State Forest lands unless otherwise prohibited by law, regulation, posted notice or this subdivision. 762 miles of designated trails and Public Forest Access Roads are available for equestrian use.

Most trail systems on State Forests are designed to accommodate use where people trailer their horses to the trail to ride. This use requires significant infrastructure for the tender of horses, including outdoor stalls, water supply and manure pits, and occurs in a limited number of locations. However, concentrating this use makes it easier to mitigate potential impacts.

There currently exist user-created, un-designated, “private” trails established and used by local horseback riders on state forests. These trails typically access state forests from private land and they have been located and constructed without approval from DEC. Because these trails may be in unsuitable locations and do not receive regular maintenance, they are likely to become eroded. To address this problem, DEC will allow use of these trails provided that they are in suitable locations, they meet Department technical specifications for design and a sponsor enrolls the trail under the Adopt-A-Natural Resource program. After enrollment under the Adopt-A-Natural Resource program, the trails on state forests will be designated as DEC horse trails and the sponsors may be responsible for maintaining them to DEC specifications. By officially recognizing these trails as DEC horseback riding trails, the Department will be able to track them for maintenance while also making them available for public use.

Impacts and Mitigations – Horseback riding is a compatible use of state forests when the trails are properly located, designed and maintained. Environmental impacts of equestrian use on state forests include trail erosion, muddy conditions, manure, unauthorized trail clearing, and

damage to trees from leaving horses tethered up at locations outside of horse stalls. Trails are most vulnerable to damage and erosion during periods of wet and muddy ground conditions. Generally these are the months of November, December, March and April. Trails may be closed during the regular seasons of wet weather to protect the trails from deteriorating. 6NYCRR Part 190 prohibits anyone from riding or leading a horse on snow covered cross-country ski or snowmobile trails, foot trails, or on land devoted to intensively developed facilities. Competitive/organized trail rides require a TRP from the Department.

Trails in eroded, muddy condition are environmentally unacceptable, unsafe and unpleasant to use. Trails not specifically designed to support equestrian use are especially vulnerable to erosion and are not suitable for horseback riding.

Multiple Use Conflicts –Horseback riders may experience conflicts with those who hike, hunt, snowmobile, camp without horses, target shoot, or mountain bike. Many conflicts relate to the concern for people becoming injured when horses are surprised by unexpected actions from others.

Mountain Biking

Mountain bikes are permitted to travel on any existing road or trail on State Forests unless the road or trail is posted as closed for this use. Riding occurs across a variety of track types and trail conditions. Trails can range from being fairly flat and easily ridden to steeper, narrow “single track” trails with frequent elevation and direction changes, more suitable for the advanced rider.

There are different styles of mountain bike riding characterized by the motivation, conditioning and personal preferences of the participant. Family and leisure riders may travel at a slow to moderate pace on relatively gentle ground on easy-to-ride trails. These riders tend to stop frequently to enjoy the sights and sounds of the forest. Some riders seek a recreational experience that offers challenging physical and technical riding opportunities in a natural forest setting. Competitive riders travel at a faster pace on all types of terrain in order to get a more physically challenging workout. A small percentage of riders gravitate to extreme mountain biking. This type of riding is for professional or advanced riders who do not depend on any certain trail type. Advanced riders travel at various speeds over difficult and steep terrain where there are obstacles such as rocks, roots and logs in the path of the rider. Input to DEC has indicated a preference for single track loop trails and for technically challenging trails.

The majority of mountain bike trails on State Forest are for beginner to intermediate users and are designed to be compatible with the natural setting of the State Forest and safety of the users. These trails do not include man-made structures which would negatively impact the

aesthetics of the State Forests, however in some instances, natural features like small fallen logs, rocks and exposed roots, occurring naturally in the trail, may be left to provide intermediate and advanced level challenges.

Impacts and Mitigations –Soil impacts from mountain biking include widening of trails to avoid obstacles such as water and downed trees. Trail braiding results from several paths in close proximity which avoid the same obstacle. Rutting occurs when the ground is too soft to support the weight of the vehicle and rider, especially during wet periods. Ruts collect rain water and runoff, keeping the trail wet, and also channel water, leading to erosion of the trail. On unsuitable soils, trails need constant maintenance to control erosion. Where erosion cannot be controlled, the trails need relocation or closure. Trees are often cut or damaged when trails are established by any user, including mountain bikers, without authorization. Water quality impacts include siltation of nearby water resources from riding on wet and muddy trails; erosion of stream banks where the trail crosses a stream; and erosion of trail surface. Aesthetic impacts result from muddy, rutted, poorly designed and maintained trails that are unpleasant to other users of the forests.

As stated above, mountain biking is allowed on all trails unless posted otherwise. Trails posted closed for mountain biking may be imposed during unusual periods of wet weather or if other conditions exist that create incompatibilities to mountain biking. Constructing unauthorized trails, or placing objects (trail structures designed for advanced users, such as jumps, expert ramps, trick bridges, etc.) in or near a trail for the purpose of offering additional riding challenges is prohibited. Such obstacles pose a safety hazard to trail riders and are a liability concern for the state. All mountain bikers riding on State Forests are encouraged to follow the International Mountain Bicycling Association (IMBA) Rules of the Trail www.imba.com/about/trail_rules.html.

Multiple Use Conflicts – Mountain bike conflicts may occur when horseback riders and horses are startled when they are approached from behind and taken by surprise. Right of way is a common conflict occurring between mountain bikers and hikers on the same trail. Mountain bikers sometimes feel threatened by the presence of hunters on or nearby the trails.

Snowmobiling

Snowmobiling is permitted on any snow covered trail on State Forests other than designated ski trails and ski slopes (see 6NYCRR Section 190.8[d]), unless the trail is posted as closed for this use. A majority of the dedicated snowmobile trails on State Forests are a part of the Statewide Trail System. Trails are located on unplowed town roads, DEC roads and on woodland trails. Corridor trails are usually routed along roads or wider trails.

ADDITIONAL RESOURCES

State Forests Containing Corridor Trails – A map of statewide connector trails is developed bi-annually by NYS OPRHP. Contacts for this map and other snowmobile information can be found at http://nysparks.state.ny.us/recreation/snowmobiles/contact.aspx

RECREATION

There are also numerous secondary trails that spur from the corridor trails. The overall system traverses over 10,000 miles across public and private lands in New York State and is managed by the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) with the assistance of volunteers from numerous snowmobile clubs. The NYS Snowmobile Trail Fund, which is supported by a portion of snowmobile registration fees, is also administered by OPRHP and used to fund trail grooming and maintenance. Segments of the Statewide Snowmobile Trail System on State Forests are maintained by DEC operations staff and volunteer clubs under the AANR program and are partially funded by the trail fund. All trail grooming on State Forests is completed by these AANR volunteer clubs.

Impacts and Mitigations – Environmental impacts of snowmobile trails include air and noise pollution, unauthorized tree cutting and trail creation, and litter. The legal use of horses and the illegal use of ATVs on snowmobile trails in other seasons can create environmental problems on the snowmobile trails. In most cases, the snowmobile trails were designed to be used only in winter. Many of the trails are on soil that does not support activity when the ground is not snow covered. If the trails are used for only snowmobiling, they need little or no maintenance. Use of snowmobile trails in other seasons necessitates maintenance. The New York State Snowmobile Trail Manual published by OPRHP offers these additional environmental considerations: trails should avoid deer wintering yards, wetlands and other sensitive areas. Trail layouts should strive for good snow retention. For safety, trails will avoid crossing bodies of water.

Snowmobilers on Stewart State Forest in Orange County

Multiple Use Conflicts – Snowmobiling may conflict with hiking, cross country skiing, snowshoeing, and wildlife populations. Horses may conflict with snowmobiles on snowmobile trails. Other problems include lack of trail etiquette, poor trail layout, poorly constructed bridges, poorly located signs, and illegal use of trails by ATVs and/or dirt bikes. Neighboring landowners have problems with riders trespassing. Neighboring landowners may have noise conflicts when corridor trails are used at night.

OTHER RECREATIONAL ACTIVITIES

Orienteering

Orienteering is a sport of navigation using maps and a compass. The object is to run, walk, ski or snowshoe to a series of points shown on a map in the shortest amount of time. Orienteering is a compatible use of state forests. State Forests provide ideal areas for orienteering because they are large and remote forested areas where participants can travel long distances while remaining on public land. At the current level of participation, this is a low-impact activity which

causes few conflicts with other activities on state forests. Improved maps and information on State Forests will provide a better orienteering experience.

Dog Training / Field Trials

Dog training involves training dogs to hunt and retrieve. Training may involve the shooting of blanks to accustom the dog to guns firing, setting up situations that may be encountered while hunting and teaching the dog obedience to commands. A field trial is a competition to test the skills of the hunting dog. Opportunities are limited on state forests because dog training and field trials require large unwooded areas which are generally not found on state forests.

Impacts are minimal but include noise from vehicles, dogs, whistles and gunfire, compaction and disturbance of soil where there are parking and staging areas. Dog training and field trials can conflict with other nearby recreational activities because of the noise and from the increased traffic on the roads and on the land. Dog training and field trials may disturb wildlife due to the hunting and retrieving activity. The statutes concerning dog training, field trials are found in Article 11, Title 9 of the ECL.

Dog training and field trials are acceptable uses of State Forests.

Hang Gliding

Hang gliding is the use of a rigid-framed, wing-shaped glider for non-powered flight. The pilot flies the glider in the prone position. Launch sites are located on ridge tops where thermal updrafts are utilized for flight. Participation in this activity on state forests is limited by topography.

Environmental impacts include maintaining a cleared area for a launch site, constructing an access road for vehicles to transport flying apparatus to the launch site, and maintaining a cleared landing site for emergency landings. A temporary revocable permit (TRP) is required before a launch site may be used for hang gliding. The TRP will only be issued to a hang gliding club recognized by the US Hang Gliding Association before using the launch site. The TRP will further stipulate that each club member must be certified by the club as being qualified and competent to use a hang glider to gain access to the launch site. Hang gliding may conflict with private property owners when there is a landing on private property without permission. Also, traffic on launch site access roads may present liability and safety issues.

Where the proper site exists and an acceptable access route to the site is available, hang gliding is an acceptable use of state forests. Currently there is only one site on State Forest land that is used for hang gliding purposes.

Paint Ball

Paint ball games are combat simulation games where the participant uses an airgun for a "weapon." The airgun powered by CO_2 cartridges, fires a paint ball at high velocity, which

splatters on impact. Participants wear safety equipment, including goggles, ear protection and vests. Neutral safety zones, where no weapons can be fired and safety equipment can be removed, are established on the playing fields. Paint ball activities are generally done in organized group events but can be conducted individually.

Paint ball activities may conflict with other uses on the state forests. Conflicts between other users and management activities are possible. Environmental impacts include litter, intensive use of a small number of acres and aesthetics. To conduct timber sales, DEC uses tree marking paint to mark trees for harvest. Paint on trees, as a result of paint ball activity could easily be mistaken for tree marking paint. This confusion could alter timber harvests and have a long term negative impact on the forest. There is a potential hazard to other recreational users. Non-participants could be seriously injured if they were inadvertently shot by a paint ball. Paint ball activities would require exclusive use of an area, which is not appropriate for state forests.

The use of paint ball guns on state forests is prohibited by 6 NYCRR Section 190.8(ff). It is not an appropriate activity due to safety and aesthetic concerns.

Target Shooting

Target shooting includes trapshooting, skeet shooting and silhouette shooting, or shooting to sight-in guns or to improve the accuracy of a weapon for hunting. There is also shooting using targets glass bottles, cardboard boxes, clay pigeons and plastic jugs.

The primary concern with target shooting is safety. Without a proper backstop, projectiles can travel long distances and strike unintended targets. Shooting without knowing where a bullet will strike is the cardinal sin of shooting. Damage to trees is a very significant impact from target shooting. Litter is also a large problem. Broken and whole clay pigeons, spent shell casings, broken glass, cardboard and plastic are litter left behind by target shooters. Target shooting as practiced on state forests may conflict with other activities.

Shooting at any breakable target on State Forests is prohibited under 6 NYCRR 190.8(bb). This includes items such as glass bottles and clay pigeons.

RECREATION POLICIES AND GUIDANCE

Best Management Practices

Best Management Practices (BMPs) are those methods, procedures, and/or devices that are designed to prevent or minimize soil erosion, water run-off, damage to natural resources or wildlife habitat, pollution, pathogens, or other negative environmental or aesthetic impacts when conducting various management activities. Use of BMPs are not typically required by regulation or policy, but are incorporated into management activities.

Soil and Water Protection BMPs
(Refer to page 110.)

Infrastructure Construction and Maintenance BMPs
Includes BMPs and guidelines for roads, points of access, signage, trails, campsites and other facilities. *(Refer to page 157)*

Universal Access

The Americans with Disabilities Act (ADA) mandates that it is the duty and responsibility of public agencies to ensure that people with disabilities have access to public recreational programs and facilities. While State Forests are generally rustic in nature, there are opportunities for universal access to hunting, fishing, wildlife viewing, nature immersion and other recreational programs. Over the past decade, many parking areas, trails, access routes, platforms and other surfaces and facilities on State Forests have been upgraded or designed as described in the Universal Access section on *page 173* of this plan. In addition, some roads and trails are open by permit only, to motor vehicle access by people with disabilities.

Limits to Recreational Development

It is important that recreational use is not allowed to incrementally increase to an unsustainable level. DEC must consider the impact from increased use on other management goals or other recreational uses. Even though a volunteer organization may offer the needed materials and labor to develop a new facility, DEC must consider the full range of impacts, including long-term maintenance and the balancing of multiple uses. In most cases, this can only be accomplished within the UMP process or a similar formal public process.

Commercial Use of State Forests

Commercial enterprises occasionally approach DEC requesting the use of state forests for developing new trails or accessing existing recreational trails or other facilities. The development of trails on state forests connecting to a commercial facility may be beneficial to the activities or facilities on the state forest. For example, commercial enterprises can complement trails on state forests because they can provide, on adjoining lands, amenities such as electricity, flush bathrooms, food and supplies or other desired services not available on state forests. However, there can also be negative consequences to such development including trail construction and maintenance costs and impacts to other uses or features on state forests. Furthermore, when such trails originate from commercial recreation facilities, they give the impression that the commercial entity in some way controls that portion of the state forest. The decision on whether to allow commercial use of state forests depends upon numerous factors and will need to be approved through a written agreement with DEC. In no instances will exclusive use of State Forests be granted to any user, including commercial enterprise or their paying customers. In addition, vendors are not allowed to operate on State Forests.

RECREATION

Availability of Recreation Information on State Forests

Informational materials consist of the various methods used to communicate with the public, including brochures, signs, maps, information boards, presentations and web sites which disperse recreation information on state forests.

During management planning meetings, many people have commented about the adequacy and availability of information and educational materials. There is increased demand for recreational information including additional and improved maps of state lands; trail etiquette education to reduce user conflicts; more information about available opportunities; information and signs explaining what is permitted and not permitted on state forests; and more interpretive signs and information.

In order to provide more information to the public with improved maps, brochures and signs, DEC will assess current availability through the UMP process. The availability of official and accurate information has been improved through the use of the DEC website and will be updated during UMP development.

Inventory of Existing Recreational Facilities

Using GIS, DEC staff have gradually built and continue to develop an inventory of recreational assets on State Forests. This information can be accessed through DEC's "Mapping Gateway" at www.dec.ny.gov/pubs/212.html via the State Lands Interactive Mapper as well as in Google® Earth and Google® Maps format. It is a priority to update this information during UMP development so that accurate information is available to recreational users.

"REC" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Recreation (REC) Objective I - Illegal activities will be prevented, environmental impacts reduced and public safety assured as recreational use is accommodated on State Forests.

REC Action 1 – Develop a Backcountry Steward program to provide public education and assistance on State Forests with higher levels of public use. Program to be in place by 2012.

REC Objective II – Provide public information regarding recreational opportunities on State Forests. In individual UMPs assess the need in areas of higher levels of public use, for the use of signs, kiosks, outreach to user groups, Backcountry Stewards, online resources and working with neighboring landowners (Neighborhood Watch groups).

REC Action 2 – At least every 10 years, during UMP development, a web page for each State Forest will be created or updated, including an electronic, printable map showing the location of recreational amenities on the State Forest

REC Objective III - Recreational facilities and amenities will be provided and maintained such that they are safe, functional, universally accessible and environmentally sound. Each UMP shall inventory existing recreational amenities and provide an implementation schedule and budget for recreation management actions, which will be subject to change based on funding or staffing constraints.

> **REC Action 3** – Develop a program for carrying out regular trail assessments on State Forests by 2020.

REC Objective IV – Enhancement of sporting wildlife habitat will be considered in UMPs.

REC SEQR Alternatives Analysis and Thresholds

The **no-action alternative**, or in other words, continuing with current approaches to recreational management, has been selected as the **preferred alternative**.

Due to public demand for forest-based recreation and related quality-of-life and economic benefits, the alternative of reducing support of recreational activities and facilities has not been selected.

The option of dramatically increasing the level of recreational use and development on State Forest cannot be accommodated due to the constraints and concerns expressed in this plan.

SEQR Analysis Threshold: Compliance with the guidelines and strategies of this section will avoid and minimize potential impacts resulting from recreational use and development. Any development of facilities with potable water supplies, septic system supported restrooms, camping areas with more than 10 sites or development in excess of other limits established in this plan will require additional site-specific environmental review under SEQRA.

OFF-HIGHWAY AND ALL-TERRAIN VEHICLE USE

Off-road motorized recreational activities have grown in popularity over the past two decades. These include four-wheel drive vehicles (also referred to as off highway vehicles or OHVs), ATVs, UTVs and off-road motorcycles. For the discussion of these various vehicles the plan they will collectively be referred to as OHVs and ATVs. Impacts and issues associated with OHVs are much the same as those associated with ATVs, therefore for the purpose of this plan, DEC policy as regards State Forests will be applied to both vehicle types alike.

An **All-Terrain Vehicle (ATV)** is any self-propelled vehicle manufactured primarily for use on off-highway trails or in off-road competitions and that is not more than 70 inches wide and weighs no more than 1,000 pounds dry weight. This includes vehicles with two or more wheels. Snowmobiles are not included and are subject to other regulations.

An **Off-Highway Vehicle (OHV)** is designed for use off highways, weighs more than 1,000 pounds, and is wider than 70 inches. An OHV may also be designed for and registered for highway use. An OHV differs from most vehicles because it is usually a four-wheel- drive vehicle. This means it gets traction from all four wheels. This makes the vehicle capable of traveling on almost every type of terrain.

Some people own and operate these types of vehicles as a relatively benign means of conveyance to access programs like hunting and fishing. Many off-road enthusiasts, however, enjoy a riding experience that includes characteristics such as challenging mud holes and steep hill climbs, as is often depicted in ATV manufacturer ads and on ATV club web pages. As discussed below, those types of uses, as well as other attributes of recreational ATV use are not compatible with State Forest management goals and cannot be successfully managed on State Forest lands.

Environmental impacts from ATV and OHV use include soil erosion, displacement and compaction, direct impacts to streams and wetlands from ATV crossings, including increased siltation and turbidity, noise, disturbance to wildlife and their habitats, damage to vegetation, and air pollution. ATV use impacts neighboring landowners and conflicts with other recreational pursuits.

Illegal use of ATVs and OHVs on State Forest roads and trails officially closed to ATV and OHV use is frequent, difficult to prevent, and presents significant enforcement issues. Despite a variety of signs, gates, boulders, and other barriers designed to notify ATV and OHV users that particular roads and trails are closed to their use, a large amount of illegal riding continues to occur on these prohibited areas. Illegal use of ATVs presents significant enforcement problems because illegal riding often occurs in remote areas, where apprehension of violators is difficult and impoundment of unregistered ATVs is impractical.

ATVs raise substantial safety concerns in comparison with various recreational activities because they are especially prone to accidents. In a 17-year period, New York State recorded

OFF-HIGHWAY and ALL-TERRAIN VEHICLE USE

137 ATV-related fatalities, and New York has been ranked third highest in the nation for ATV-related deaths.

The environmental impacts (including noise), intensity, and nature of both legal and illegal ATV use has been shown to cause other recreational uses to decline, and in some cases completely cease, once an area is opened for ATV use.

Over the years, attempts have been made to accommodate off highway and all terrain vehicle use on several State Forests but in each case, the use was not sustainable. Serious issues with soil erosion, illegal off-trail use and trail rutting developed. In all cases DEC was not able to find acceptable ways to mitigate the impacts, even when organized user groups were included in the process. In the end, each of the former off-road vehicle trail systems was closed.

Assessment of Current ATV Opportunities

Riding currently occurs on private lands in most rural areas. Farm families often use ATVs and OHVs in their work. Private and club trails exist in numerous locations. In addition, there are commercial ATV facilities in New York State which are open to the public.

DEC administers certain conservation easement lands where the state has acquired the public recreation right for ATV use. On these lands, DEC may designate specific routes that are opened through a public recreation management planning process.

ATV use is also allowed on highways designated by regulation (for state roads) or local law or ordinance (for municipal roads) pursuant to the requirements of Vehicle and Traffic Law §2405 (1), requiring that the designating authority determine that it is otherwise impossible for ATV's to gain access to trails or areas adjacent to the highway and posted for ATV use by the state or local authority having jurisdiction over the highway. A number of towns, primarily in the western Adirondack and Tug Hill regions have opened town roads to ATV use under this statute.

Certain State Forest and Forest Preserve routes are open to motor vehicle use only by those who have a DEC-issued Motorized Access Permit for People with Disabilities (MAPPWD) *(Refer to page 177).* The permits allow the individual to ride only on marked and designated routes where the public use of motor vehicles is prohibited.

There are no recreational trail systems dedicated primarily to ATV riding on State Forests, due to unsuccessful attempts in the past and other limitations and concerns expressed in this chapter. There are however, limited instances in which DEC has designated short sections of road for ATV use in order to connect adjacent areas that are legally open to ATV use.

ATV Background

Prior to 1983, DEC regulations allowed motor vehicles (including four-wheel-drive trucks, motorcycles and ATVs) anywhere on State Forests except where there were signs prohibiting such use. Unsuitable areas were signed to prohibit motor vehicle use. This approach led to widespread use of motor vehicles on State Forests resulting in serious rutting and erosion problems in many areas. The signs prohibiting motor vehicle use were often removed by the public, making it difficult to enforce the law restricting use in certain areas. In response to this problem, the regulations were changed in 1983 to allow motor vehicle use only on signed roads and trails or through a permit issued by DEC (see 6 NYCRR Section 190.8[m] and Vehicle and Traffic Law §2405). Appropriate roads and trails were then signed for motor vehicles to accommodate local use. Signing these roads and trails created short sections of designated trails. This did not satisfy the recreational demand for a long-distance loop trail system. The low mileage of short trail sections also contributed to illegal off-trail use.

In 1986, Article 48-b of the Vehicle and Traffic Law was established which required all ATVs to be registered for a ten dollar fee with 50% of the fee allocated to the New York State ATV Trail Development and Maintenance Fund. The law specified that no more than 25% of the money in this fund could be made available to the NYS Office of Parks, Recreation and Historic Preservation and the DEC for ATV trail development and maintenance on state lands. The counties were also to be given funds to compensate them for the costs associated with ATV trail development and maintenance. In 1990, the state legislature abolished the fund and used the money to balance the budget. ATV and off-road motorcycle riders are still required to pay the ten dollar registration fee despite the lack of a dedicated fund.

ATV Case Study: New Michigan State Forest (1985)

In 1985, a loop trail for ATV use was established on New Michigan State Forest (Chenango 5 & 24). The trail was approximately 20 miles long and it received much use. ATV riders eventually became dissatisfied with the trail because it was considered too short and there were no other trail systems to ride. ATV riders desired a longer trail similar to the Brookfield Trail system in Madison County which contains 59 miles of off-road horse trails on five State Forests and includes camping facilities. The loop trail on New Michigan State Forest was closed in 1988 due to not meeting the public demand, excessive mud holes and soil erosion.

ATV Case Study: Anderson Hill State Forest (1993-1997)

ATV riding was also allowed through permits issued to clubs for competitive events on Anderson Hill and nearby State Forests in Tompkins and Tioga counties in the Southern Tier. The permits allowed trails to be established and signed for temporary use during the event. This led to problems as the public would ride ATVs on the signed trail before the event. After the race, the trail markers were removed and water diversion structures were constructed to prevent erosion on the trail. Unfortunately, residual use of the trail continued. A visible trail exists to this day, and it continues to attract illegal use. Illegal use by local ATV and motorcycle riders has resulted in damage to the water diversion structures and has caused soil erosion.

OFF-HIGHWAY and ALL-TERRAIN VEHICLE USE

ATV Case Study: Morgan Hill State Forest and Taylor Valley State Forest (1985)

ATV trails were also established in Cortland County in 1985. A 6.5 mile trail was established on the Morgan Hill State Forest (Cortland 4) and a 3.5 mile trail was established on the Taylor Valley State Forest (Cortland 2). Both of these trails were signed for use by motor vehicles weighing less than 1,500 pounds. In 1991, an assessment of both trails revealed significant environmental problems. The trails were eroding, badly rutted and contained numerous mud holes. In the short span of 6 years, the trails were in need of either relocation or complete rehabilitation to make them acceptable for use. In addition, many unauthorized or illegal trails had been established by trail users. These unauthorized trails were unacceptable for use due to their environmental impacts. Both of the trails in Cortland County were closed for motor vehicle use in 1991 due to their excessive deterioration from use which caused unacceptable environmental impacts.

ATV Case Study: Proposed trail system on the Treaty Line Unit (1993)

In 1993, the Department issued a position paper regarding all-terrain vehicles on State reforestation areas. The paper states that an ATV trail system is consistent with ECL however; the Division of Lands and Forests must determine whether a proposed trail is compatible with the natural resource as well as with administrative, cultural and recreational demands and uses. This paper led to the examination of the State Forests for a location to potentially develop an ATV trail system.

The draft Treaty Line UMP proposed the development of an 80- to 100-mile ATV trail system. The Treaty Line Unit consists of Chenango 9 & 15 and Broome 2 in Region 7 and Delaware 2, 4, 5, 6 and 9 in Region 4. This unit was chosen as the most feasible location in the region to develop an ATV trail system. The proposal was withdrawn from the final plan due to significant public opposition, unresolved environmental issues of air and noise pollution, potential conflicts with other users and neighbors, and the impact of the trail system causing significant socially unacceptable changes in the character of the Treaty Line State Forests and surrounding area.

The proposed trail system included a number of measures to mitigate the impacts through trail design, layout, patrol and maintenance. The trail proposal was strongly supported by ATV trail groups. Environmentalist groups were strongly opposed. Other recreational users were greatly divided in support of and opposition to the trail proposal. Hikers and birders generally opposed the trail proposal, while other recreationists more often supported the trail proposal. Most local residents opposed the ATV trail proposal even though the trail system would potentially have provided an economic boost to the region through increased tourism and growth of associated…

… continued: Proposed trail system on the Treaty Line Unit (1993)

… small businesses. Comments in opposition to the trail mentioned concerns over increased traffic, trespassing, safety, noise and environmental degradation. Most landowners who lived in the neighborhood of the proposed trail were very strongly opposed to the change in character this trail would bring to the immediate area and concerns will illegal use spilling out on their lands.

In addition, a 1993 DEC position paper states "all cost associated with an ATV Trail must come from an ATV Trail maintenance and development fund. No costs will be directly charged to Department resources." Although such a fund once existed in New York, it no longer does. Recently, attempts have been made by interest groups to reestablish an ATV trail fund through new legislation. Without an ATV trail development and maintenance fund, sufficient staffing to properly administer, maintain and patrol the proposed ATV trail system was not guaranteed. The Treaty Line ATV trail system proposal was withdrawn based on the criteria that it was not both environmentally compatible and socially acceptable.

ATV Case Study: DEC Region 6 (1985-2008)

In the 1980s, all of the multi-use trails in the Brasher State Forest were opened to ATV use; 36 different trails were opened as well as all 15 Truck trails. Use was low to minimal to begin with, consisting mainly of local ATV enthusiasts who lived adjacent to the State Forest. In a relatively short time, ATV use escalated dramatically, and environmental issues began to surface.

By the early 1990s, ATV use was curtailed on trails that had become badly rutted or which had developed severe mudholes. In most cases, "Braid Trails" were illegally established by ATV riders to avoid the obstacles created by previous ATV activity. With no funding source available to maintain the trails or remediate damage, unacceptable environmental impacts led to further closures. By 2000, 12 trails remained open, and by 2004, only five trails remained legally opened to ATV use. Illegal ATV use continued to occur on the closed trails. Illegal braid trails continued to be created, and unauthorized new trails saw ATV use.

DEC worked with a local ATV club to remediate damage to several key trails, and the volunteers did some excellent work to fix the damage that had occurred on those trails. The rest of the trails that were closed due to ATV damage have yet to be remediated due to a lack of funding. A 2006 DEC legal opinion found that within NYS Vehicle and Traffic Law, ATV's and regular public motor vehicle traffic could not share use on the same public roads and trails over long distances. Since the few remaining open trails were linked by miles of Truck Trails that remained open to car and truck traffic, all roads and trails were closed to ATV traffic.

OFF-HIGHWAY and ALL-TERRAIN VEHICLE USE

Public Input

In the process of Unit Management Planning for numerous State Forests throughout the state, extensive public input regarding ATV and OHV use has been gathered. This input is very similar from one state land unit to another. Input gathered in development of the DRAFT Region 7 Recreation Master Plan is representative of that given throughout the state.

ATV Case Study: Region 7 Recreation Master Plan (2001-2002)

DEC staff in Central New York (Region 7), which holds more State Forest acreage than any other region of the state, conducted an extensive public review of recreational activity on State Forest lands. Five public meetings were held at different locations throughout the region during the month of January 2002. Each meeting offered a brief overview of the completed Draft Recreation Master Plan for State Forests, as presented by DEC staff, followed by a session to receive public comments. All formal comments received at these meetings were recorded, along with hundreds of mail-in comments submitted to DEC following the meetings.

Comments received by the Department concerning ATV use on State lands were numerous and varied. Strong sentiments both for and against ATV use were expressed at the public meetings and in the written comments that followed.

Input from ATV riders included a variety of ideas and comments. ATV riders want access to existing trails or would like new trails constructed. They feel that the benefits they receive are not proportional to the registration fees paid to DMV. Off-highway motorcycle (OHM) enthusiasts are looking for trails 100 miles in length with portions of the trail designed specifically for OHM verses three- and four- wheel ATVs. ATV riders are looking for varied terrain and challenges in trails. Hill climbs and terrain courses are a desired part of a trail system.

Additional comments received from ATV riders in the public meetings and questionnaires include the following:

- Allow ATVs on truck trails.
- Develop a facility for camping and ATV riding.
- Allow ATVs on snowmobile trails.
- Allow people to use ATVs to remove game during spring and fall hunting seasons.

The following are responses to the question “What can DEC do to reduce conflicts?”

- Supervise ATV riders through use of clubs.
- Install gates to control ATV access.
- Allow clubs to develop separate ATV trails.
- Educate DEC on ATVs.

Comments from those who don’t ride ATVs were mixed. Environmental organizations and people who primarily participated in hiking, birding or cross-country skiing tended to be strongly opposed to development of ATV trails. They felt that ATV riding is not compatible with State Forests. Other groups of recreationists tended to have more mixed opinions.

ATV IMPACTS AND CONSTRAINTS

ATV Use on Conservation Easement Lands

It is important to note that the analysis of impacts and constraints associated with State Forest lands is not applicable to Conservation Easements. The important differences include: rights retained by fee owners; differences in road standards; and use by and wishes of the fee owners and surrounding landowners. ATV use may be found to be compatible with the different set of circumstances found on Conservation Easement lands.

A properly sited, maintained and restricted ATV trail system could provide for ATV use. However, this is the most difficult type of trail system to properly locate and develop on State Forests due to the potential environmental impacts, constraints and the possibility of conflicts associated with the activity and the desire by ATV riders for a long-distance loop trail system. Many constraints limit the potential for the development of an ATV trail system and include:

- **Maintenance** – Preventing and controlling erosion and rutting is an expensive and difficult proposition. In most cases trails must be maintained by moving large quantities of gravel into remote wooded locations with manual labor or small specialized equipment. A full-time maintenance staff with a significant budget would be required to maintain a viable trail system. The types of hardened trails the Department would construct are not the type of trails a majority of the ATV or OHV users desire.
- **Potential conflicts with neighbors of State Forests** - State Forests are generally located in rural settings with a moderate level of housing development in the immediate area. Homes and building lots adjacent to State Forests are highly valued on the market. People who live near State Forests often choose to live there because it is a relatively quiet, undisturbed location. Neighbors are often opposed to the development of ATV trails because of increased ambient noise and disturbance levels.

  Even though State Forests are “working” forests, harvesting normally only occurs on 1% of the land area or less on an annual basis and there is usually over 30 years between harvests. Gas well pad development also occurs on State Forests, but its impacts are controlled and directed toward suitable sites which are closed and remediated within a relatively short timeframe.

  ATV use can create impacts that spread across the State Forests and neighboring lands, occur much more frequently, and occur without end. This constitutes a major change of the character of a State Forest. Neighbors are frequently concerned that ATV trail riders on State Forests may ride off the trail and go across the property line onto their land. In addition, increases in traffic patterns on local rural dirt roads and associated dust produced by trucks and trailers are issues which have blocked proposed off-road vehicle trail development on State Forests in the past.

OFF-HIGHWAY and ALL-TERRAIN VEHICLE USE

- **Potential conflicts with other recreationists** - Recreationists who value and use State Forests because they provide places where one can experience solitude are opposed to the development of ATV trails because of concerns such as noise, pollution, disturbance to wildlife and ground or vegetation impacts. The impacts, intensity, and nature of both legal and illegal ATV use has been shown to cause other recreational uses to decline, and in some cases completely cease, once an area is opened for ATV use.

ATVs have made hiking this trail difficult and unpleasant

- **Size of the forest area or group of forests** - An ATV trail system suitable for day use must be at least 30-40 miles long. The area under consideration for trail development should be at least 5,000 acres or larger to accommodate this size of a trail system.
- **Environmental impacts** - Public use of ATVs can cause significant, adverse impacts to natural resources, including soil degradation; destruction of vegetation; disruption of local hydrology; increases in surface runoff and erosion; direct impacts to streams and wetlands from ATV crossings, including increased siltation and turbidity, destabilization of shorelines, destruction of in stream and riparian habitat, and destruction of vegetation; fuel discharges, resulting in degradation of water quality; air pollution; and impacts on wildlife including direct mortality, habitat modification, and disturbance.

  Increased runoff and erosion from ATV impacts occur across the landscape and have serious consequences for soil and water quality *(Refer to page 107)* causing increased sedimentation and turbidity in multiple water bodies throughout the forest. These factors can affect biological health, for example, a stream's ability to support trout populations or aquatic plants' ability to photosynthesize. Sedimentation from recurring ATV damage often increases with successive storm events.

- **Design requirements for a suitable trail** - The DEC's 1993 position paper stated that any consideration for trails in New York will stay within standards established by the US Forest Service. The paper also stated that all trail locations should have stable soils and avoid steep or wet areas. Therefore, it is critical that the area chosen for a potential trail system have few areas of poorly drained soils. Otherwise, portions of a trail system on poorly drained soils need costly improvements to the trail surface and drainage to prevent those areas from becoming muddy or eroded. Establishing a trail on poorly drained soils without improvements to prevent trail erosion is unacceptable to DEC. The

position paper also required that critical wildlife areas and significant habitats be avoided. Unfortunately a trail system designed to these specifications cannot provide the experience a majority of ATV/OHV enthusiasts are looking for: steep challenging terrain and mud holes.

- **Air and noise pollution** - There are varying opinions about the environmental impacts of the air pollution produced by ATVs. Presently, it is not possible to measure air pollution caused specifically by ATV's. Noise pollution is generally an issue of concern for those who currently use or live near State Forests as described above. The 1993 position paper states that machines will be monitored for compliance with muffler requirements and a minimum 1,000 foot buffer zone must be left between the trail and neighboring private structures. Leaving a 1,000 foot buffer zone from private structures precludes ATV trail construction, as it is nearly impossible to accomplish due to the pattern of ownership of State Forests and private lands.
- **Enforcement challenges-** Where ATV trails have been opened in the past, enforcement staff found it very challenging if not impossible to prevent illegal use. This issue is not as significant on conservation easement lands, since there are enforcement resources (landowners, lessees) available beyond DEC's enforcement staff.
- **Cost** – While poorly drained soils commonly found on many State Forests are unsuitable for trail development, marginally acceptable soils would require extensive and costly improvements to the trail surface and drainage to prevent those areas from becoming muddy or eroded. There is currently no dedicated funding source to support an ATV trail system. The high costs for construction, maintenance and operation of an ATV trail system on public lands are best assumed by an agency with a formal fee structure and on-site staffing including an enforcement presence. Other agencies responsible for providing recreation opportunities on public lands include the NYS Office of Parks, Recreation and Historic Preservation and county and local parks. Trail systems may be best developed by collaboration between private landowners.

ATV Positive Impacts

Accommodating ATV use could potentially have some positive impacts on the communities surrounding State Forests. Benefits that come from ATV use include individual recreational benefits and may include jobs, income to businesses, and tax income. Limited studies have shown evidence for trip-related spending by ATV enthusiasts (Karasin 2003).

Off road vehicles can also provide a means of access for recreationists who have impaired mobility. This use is accommodated by the DEC-issued Motorized Access Permit for People with Disabilities (MAPPWD) *(Refer to page 177)* which allows qualifying people with disabilities to use motor vehicles along specific routes for access to programs, such as hunting and fishing on state lands.

OFF-HIGHWAY and ALL-TERRAIN VEHICLE USE

ATV Demand and Trends

Advertising in sportsmen/outdoor magazines and TV programs has resulted in a growing number of machines and riders seeking riding opportunities. It is expected that demand for this activity will continue to increase.

As the statewide landscape continues to become subdivided into fragmented private land parcels, State Forests, with a relatively large land area in public ownership, are expected to face greater pressure to accommodate ATV use. However, in the midst of these trends, State Forests also are becoming more valuable for the various ecosystem services (water quality, habitat, forest retention) and non-motorized recreational opportunities they provide. It is important to note that within the context of the statewide landscape, public lands make up approximately 18% of the total land area, whereas 82% is in private ownership with no public mandate for conservation. State Forests make up just 2.5% of the total land area in New York State.

STATE FOREST ATV POLICY

The mission of the DEC Division of Lands and Forests is "to care for and enhance the lands, forests and natural resources in the state of New York for the benefit of all through the care, custody, and control of state-owned lands, and promotion of the use and protection of all natural resources." This is a broad mission which reflects that DEC has many other responsibilities beyond satisfying public recreation desires. Rather, recreation opportunities are provided on DEC lands that are compatible with other multiple uses and the ecosystem management approach described previously in this plan.

Based on evaluation of past efforts to accommodate ATV use and the many impacts and constraints associated with off road vehicles, the Department will not permit ATV use on State Forests , except;

- as may be considered to accommodate a "connector trail" through Unit Management Planning or a similar public process; and
- on those specific routes designated for use by DEC-issued Motorized Access Permit for People with Disabilities (MAPPWD).

ATV Trail System

An ATV trail system, minimum of 30-40 miles long and at least 5,000 acres or larger, that is sited wholly or substantially on State Forests cannot be accommodated.

Any smaller trail system will not meet the desire by ATV riders for a long-distance loop trail system and has proven to increase illegal use and natural resource damage and therefore cannot be considered.

Connector Trails

In the event another entity is establishing a legitimate public ATV trail system on lands adjacent to a State Forest, and a State Forest is needed to serve as a connecting link, or in the event that a State Forest road or trail could serve to connect already designated ATV trails open to the public, DEC will evaluate and consider the proposal. Any such trail proposal must comply with state law, department policy and regulations. If it is determined to be environmentally compatible, a connecting trail could be established on the State Forest. This would be dependent on the availability of sufficient funds to establish and maintain a sustainable trail. The State Forest based connector trail, if approved, must follow the shortest environmentally acceptable route available.

The inclusion of a connector trail in a UMP and the subsequent establishment of any such trail could only occur if it does not compromise the protection of the natural resources of the Unit, significantly conflict with neighbors of State Forests, nor interfere with other established recreational areas. Such designation shall only occur through the amendment or adoption of a UMP or another process which provides similar opportunities for public review and comments and full SEQRA review of the proposed designation.

Connector trails will be monitored to ensure that legal use does not lead to illegal off-trail use within State Forest lands or on neighboring private property. Should illegal use increase significantly adjacent to any connector trail, that trail will be subject to closure.

Vehicle and Traffic Law

A DEC legal opinion concerning ATVs as they relate to the Vehicle and Traffic Law §2405 was rendered in 2006 and has since been upheld in several court rulings. The legal opinion stated that ATVs and regular motor vehicle traffic could not share use on the same public highways except in specific, well-defined instances. Since the few trails remaining open on State Forests were linked by miles of Public Forest Access Roads that remained open to car and truck traffic, this led to the closure of all but one remaining trail.

OFF-HIGHWAY and ALL-TERRAIN VEHICLE USE

"ATV" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

All Terrain Vehicle Use (ATV) Objective I – Limited ATV use will be accommodated via consideration of opportunities to enhance access to State Forest recreational programs under DEC's MAPPWD program in all UMPs

ATV Objective II – Limited ATV use will be accommodated on State Forests via consideration of requests for ATV connector routes on a case-by-case basis following criteria detailed above, including a formal public input process.

ATV SEQR Alternatives Analysis and Thresholds

The **no-action alternative**, which in this case involves limited accommodation of ATVs and OHVs on State Forests with connector trails and as a necessary component of the MAPPWD program, following the criteria established above, has been chosen as the **preferred alternative**.

The alternative of closing State Forests to all ATV and OHV use has not been chosen since this option would not allow DEC to accommodate individuals with disabilities and would provide unreasonable barriers to the development of trail systems on neighboring private and municipal lands in regions where State Forests dominate the landscape.

The alternative of developing extensive ATV trail systems on State Forests has not been selected due to past failed experiences (many of which are recounted above), issues with illegal use and increasing budgetary and staffing constraints.

SEQR Analysis Thresholds: Limited ATV accommodations and related mitigations outlined in this section will avoid and minimize potential impacts to the maximum extent practicable and no further SEQRA review will be conducted.

MINERAL RESOURCES

New York State is rich in minerals which are extracted for industrial and construction uses throughout the state. Sand and gravel account for the vast majority of the state's 2,200 active mines. Oil, gas and solution salt-mining wells are also economically important in New York State with more than 75,000 wells drilled in the state since the late 1800s; about 14,000 of these are still active and new drilling continues.

The Division of Lands and Forests is responsible for managing surface impacts from Oil and Gas Exploration and Development on State Forests. These activities are regulated under a lease and permits which include special terms and conditions required by the Department to reduce overall impacts and include mitigation measures. A bond is always required to insure all terms are satisfied.

The regulation of subsurface impacts related to Oil and Gas development and protection of underground aquifers as well as the protection of correlative rights of all owners are the responsibility of the DEC Division of Mineral Resources and are not discussed in this plan. The Division of Mineral Resources acts as the oil and gas leasing agent for New York State.

There are currently 132 active wells on State Forest lands and 76 inactive wells located mostly in DEC Regions 8 and 9. There are no commercial mines on State Forests. Management of mineral resources on State Forest properties is unique, in that the Division of Lands and Forests works in cooperation with others, most notably the Division of Mineral Resources, the Office of General Services and the Public Service Commission.

"Minerals" constitutes any substance which is removed or extracted from beneath the earth's surface, in whatever form (solid, liquid, or gas). Mineral activity on State Forests falls into three categories.

- **Oil, Gas and Solution Mining** – Exploration and production of oil, natural gas, and solution salt and storage of natural gas
- **Mining** – Surface mining of sand, gravel, shale and other aggregate
  – Underground mining of "hard rock" minerals
- **Emerging issues** – Geologic sequestration of carbon is an emerging science where utility plants powered by fossil fuels are adapted to capture carbon that would have otherwise been released into the air. The captured carbon is then to be injected into depleted oil, gas or saline formations, or porous shale strata far below the surface.

Well drilling on State Forest land over the Trenton-Black River natural gas formation

MINERAL RESOURCES

Minerals and Property Rights – The "Split Estate" Case

Minerals, as with any other property right, can be severed from the fee estate. This is usually done by means of a mineral deed or mineral rights reservation, thus creating a split estate. (Leases do not confer permanent rights to the lessee. A deed or reservation, on the other hand, permanently transfers rights from the grantor to the grantee.) In these situations, mineral rights are considered the dominant estate, meaning they take precedence over other rights associated with the property, including those associated with controlling the surface. However, the mineral owner must show due regard for the interests of the surface estate owner and occupy only those portions of the surface that are reasonably necessary to develop the mineral estate.

"Split Estate" In split estate situations, the surface rights and subsurface rights (such as the rights to develop minerals) for a piece of land are controlled by different parties.

In some areas of the state, there are significant issues with "split estate" mineral control. In limited cases, the state only controls the surface and did not (or could not) acquire the mineral rights associated with the State Forest parcels. The mineral rights may be controlled by another government entity (usually US Department of the Interior – Bureau of Land Management) or a private party.

When another party controls the subsurface minerals, there is potential for impacts to the surface estate. The degree of impact depends on a number of factors:

1) What type of mineral development can be reasonably foreseen? Hard rock mining and surface mining are likely to have a greater surface impact than oil and gas development.

2) What does the mineral estate owner actually hold? The entire mineral estate? Only rights to oil, natural gas, and other fluid minerals? Only mineral rights within certain formations? Only rights to surface mine gravel deposits?

3) Are rights to the mineral estate time-limited? For example, in certain areas of the state, it is not uncommon for timber companies to sell a piece of property, subject to a 10-year reservation of timber rights and a like reservation of the rights to mine for sand and gravel (primarily for maintenance of interior roads serving the property).

In almost all situations the courts have held that the owner(s) of the mineral estate has the right to make "reasonable use" of their estate. Therefore, the surface owner is forced to negotiate when, where, and how much impact constitutes "reasonable use." DEC will prioritize acquisition of the mineral estate wherever it is split from a State Forest tract.

EXPLORATION AND PRODUCTION OF OIL, NATURAL GAS AND SOLUTION SALT

Oil, natural gas and solution salt drilling has been historically centered in the southern tier of western New York.

Natural gas production equipment on Hill Higher State Forest in Chautauqua County

Oil

The first commercial oil well drilled in New York was the "Job Moses #1" well, drilled in 1864, near Limestone, NY. The oil industry expanded rapidly in the late 19th century leading to the development of numerous oil wells across the landscape, especially in Cattaraugus and Allegany counties. In the early days of the industry, these wells were unregulated and un-inventoried. Many uncapped, inactive wells would later be transferred to the state during the acquisition of State Forest tracts.

ADDITIONAL RESOURCES

Database of oil, gas, and solution mining wells is available in DEC's mineral resources GIS layer.

Natural Gas

The natural gas industry went through a similar expansion with the 1930s exploration and development of the Oriskany Sandstone, the more recent exploration of the Medina natural gas play in the Southern Tier in the 1980s and exploration of the Trenton – Black River formation within the last decade. In general, the development of natural gas has trended eastward over time, from the western part of the state to the Hudson Valley. During this time, many gas wells have been developed on State Forest lands in DEC Regions 7, 8 and 9 under lease agreements.

The demand for natural gas has the potential to be a significant and growing source of development increase due to new technologies that enable industry to effectively extract natural gas from the Marcellus shale play. The following pages contain more detail on these emerging trends.

Solution Salt

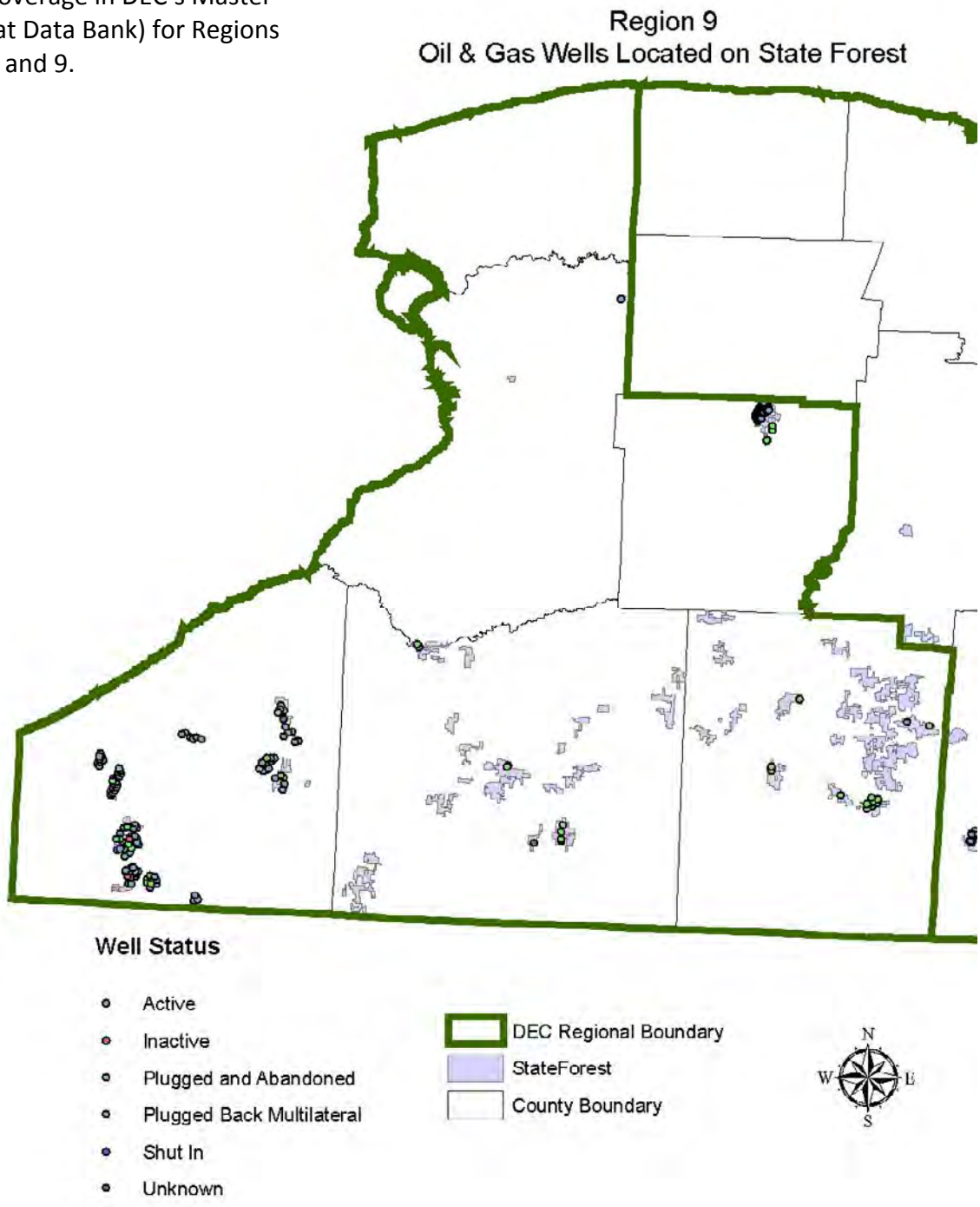
Solution salt mining is a process whereby salt is removed from underground reservoirs using water that is pumped in and out. The first solution salt well in New York drilled to exploit salt as a mineral resource was drilled near Syracuse, NY. Solution salt mining is currently confined to Regions 8 and 9, with historic sources in Region 7. Solution salt mining does not impact any State Forest properties, although solution salt is produced from the Carlton Hill Multiple Use Area (administered by the Division of Fish, Wildlife, and Marine Resources and not subject to this plan) in Region 9.

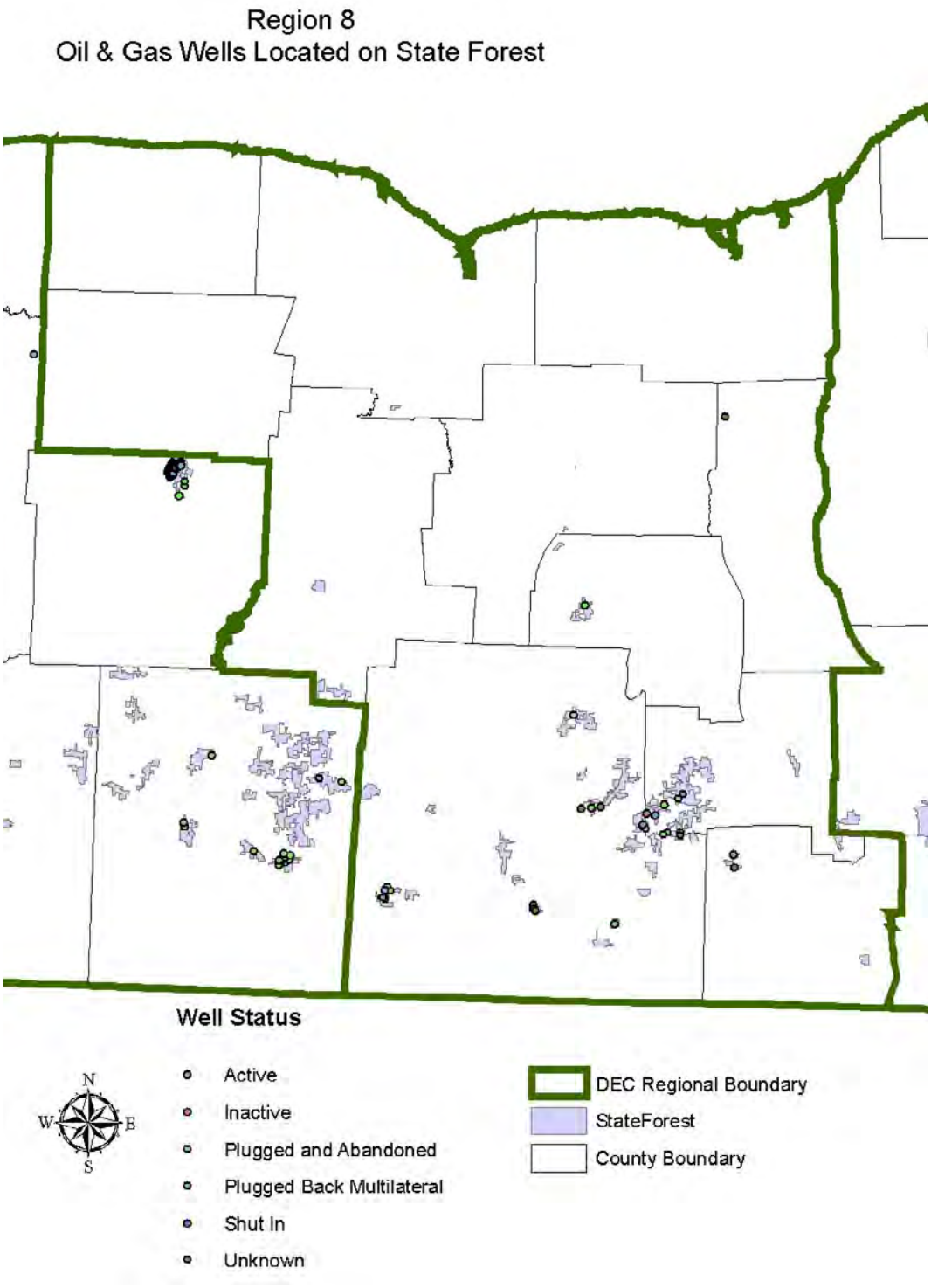
MINERAL RESOURCES

Existing Oil and Gas Development on State Forests

There are currently 132 active wells and 76 inactive wells on State Forest lands.

The following series of maps shows existing individual wells* (as they appear in the oil and gas well coverage in DEC's Master Habitat Data Bank) for Regions 6/7, 8 and 9.





* **Please note:** these maps are only accurate where the well pads producing from state lands are located on state land parcels. They do not show wells which access "state" minerals from well pads located on adjoining private lands.

MINERAL RESOURCES

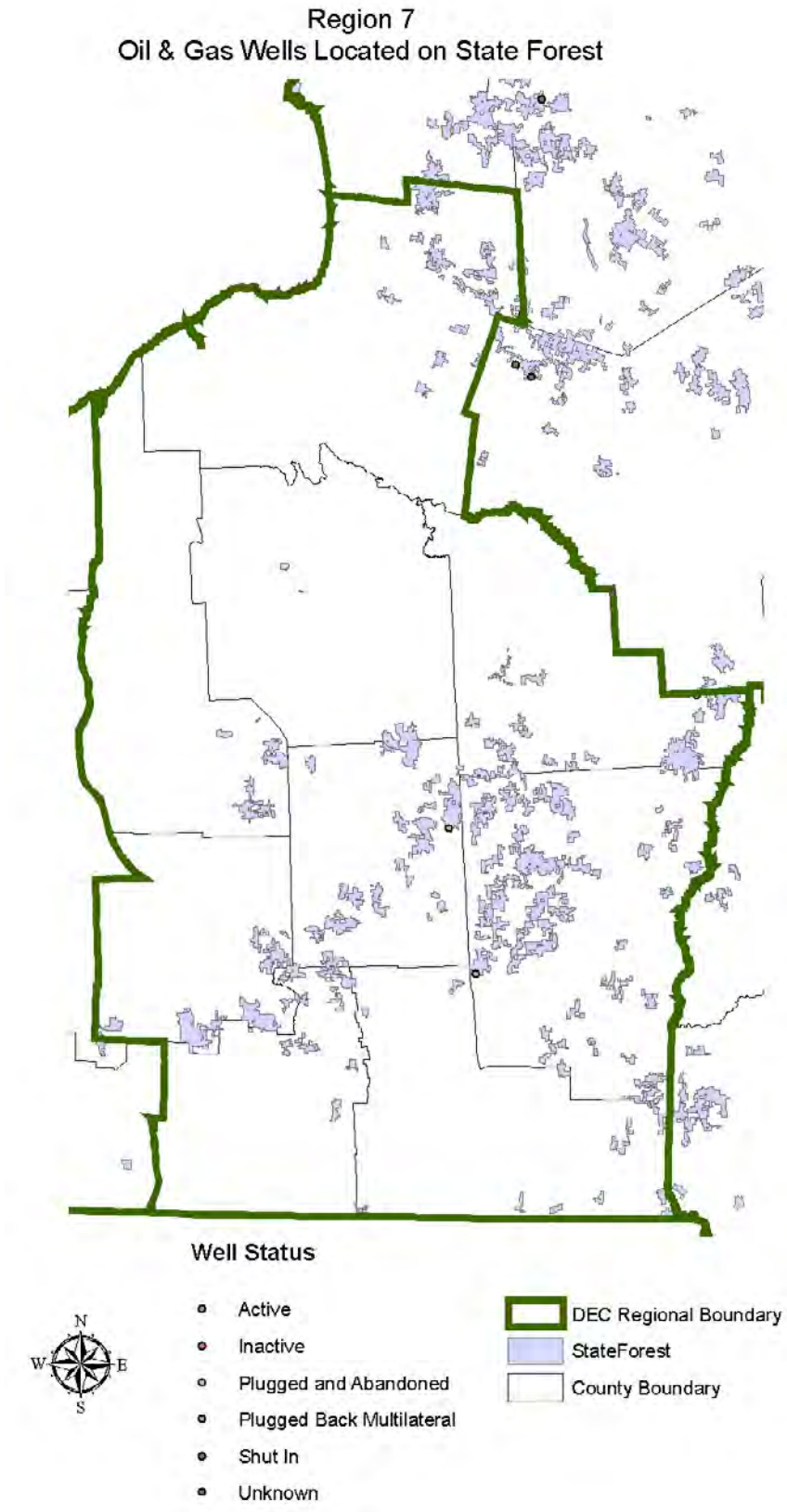
Oil and Gas Demand and Trends

Demand for oil and gas varies, depending on general economic conditions and activity. To forecast demand is difficult, however it is worth noting that the industry is currently (July of 2009) at the bottom of a business cycle with low wellhead prices and relatively low production. Peaks and valleys in price and production (and corresponding variance in demand for leasing State Forest parcels) should be expected over the term of this plan.

Recently, the technologies of horizontal drilling and high-volume hydraulic fracturing have created the conditions for industry to seek development of the **Marcellus Shale** formation. Questions have been raised about environmental and community impacts, including concerns related to water use and management, and the composition of the fluids used for fracturing the shale.

Hydraulic Fracturing

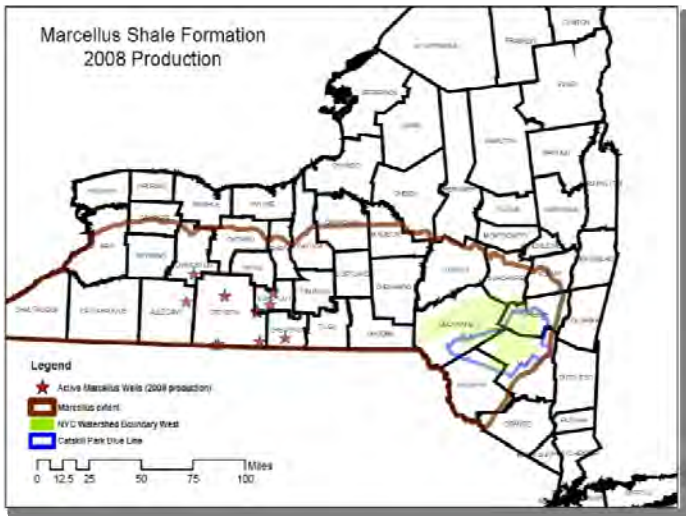
A significant amount of concern with high-volume hydraulic fracturing has been expressed both within and



outside DEC. The Division of Mineral Resources is currently (October of 2010) reviewing public comment on a supplement to its Generic Environmental Impact Statement to deal with the high volume hydraulic fracturing production procedures needed to access this natural gas resource. No exploration or extraction of the Marcellus Shale formation using high volume hydraulic fracturing will be considered for permitting on State Forest lands until current efforts to assess and analyze its environmental impacts have been completed, and the additional reviews described below have been performed.

In the event that high-volume hydraulic fracturing is permitted in New York State, State Forests might be nominated for leasing. In that case, the Division of Lands and Forests will need to conduct a thorough review, including public meetings, for each State Forest nominated for leasing. This review will follow the tract assessment process, described later in this section, to assess surface impacts and prevent surface development that is not compatible with the ecosystem management and resource protection goals of this plan. However, high-volume hydraulic fracturing poses the potential for increased surface impacts beyond those of traditional wells. Potential impacts include but are not limited to air pollution from compressor stations, fragmentation of large forest blocks, soil compaction, impairment of recreational use, threats to wildlife from open air fracturing fluid lagoons, noise pollution from regular truck traffic and high levels of activity during the breeding seasons of at-risk species such as raptors, thrushes and warblers. Potential mitigations include but are not limited to siting wellpads off of state lands with drilling access under state lands, at their periphery, or away from areas with high recreational demand. It is anticipated that there will be some leasing nominations that cannot be accommodated on State Forests should these surface impacts be left without mitigation.

Due to the unique issues related to the protection of New York City and Syracuse drinking water supplies, these watersheds will be excluded from the pending generic environmental review process for natural gas drilling using high-volume horizontal drilling in the Marcellus shale formation. Instead, applications to drill in these watersheds will require a case-by-case environmental review process to establish whether appropriate measures to mitigate potential impacts can be developed. Applicants for natural gas drilling permits using high-volume horizontal drilling in these watersheds will need to meet special requirements relating to the unfiltered surface water supply, including conducting individual environmental reviews to address the continuation of their respective Filtration Avoidance Determinations. Mineral exploration that



does not utilize high volume hydraulic fracturing will continue, consistent with the existing GEIS and leases.

Natural Gas Development

Further development could also occur in the Trenton – Black River and Theresa formations, although low wellhead prices for natural gas may dampen enthusiasm for these deeper formations. These developments will, most likely, result in further nominations of State Forests for new leases. Exactly when or if additional lease sales may occur is unclear at this time, **but no new leases for Marcellus Shale development utilizing high volume hydraulic fracturing will be undertaken until current efforts to assess and analyze its environmental impacts have been completed.**

Oil and Gas Policies and Guidance

Lease Agreements

Oil and gas production from State Forest lands, where the mineral rights are owned by the state, are only undertaken under the terms and conditions of an oil and gas lease.

This service rig is an example of the heavy equipment that is needed to drill and work over a natural gas well.

As surface managers, the Division of Lands and Forests will evaluate any concerns as they pertain to new natural gas leases on State Forest lands. **Consistent with past practice, prior to any new leases, DEC will hold public meetings to discuss all possible leasing options**, including: forgoing leases; leasing with no surface occupancy, and entering leases with proper environmental protections in place. No mineral leases will be considered on State Forest properties that are part of the State Nature and Historical Preserves or in the Adirondack and Catskill Forest Preserves.

ADDITIONAL RESOURCES

"New York State Leasing of State Lands for Oil and Gas Development; 2009 Report" is available at www.dec.ny.gov/energy/1579.html

Listing of current State Forest leases is available at http://www.dec.ny.gov/docs/lands_forests_pdf/sfoilgasleases.pdf

Construction activities associated with oil and gas development are usually regulated through the use of a Temporary Revocable Permit (TRP) and the terms and conditions of a permit to drill. Long term operation of the facilities constructed under the TRP is covered under the lease.

Tract Assessments

Whenever lands are considered for leasing, DEC will conduct a comprehensive tract assessment process to determine where the lands are able to support or accommodate related surface impacts. The site specific conditions for limiting impacts on natural resources will be drafted by land managers in coordination with Mineral Resource staff and incorporated into contract documents. These conditions will include but not be limited to criteria for site selection, mitigation of impacts and land reclamation upon completion of drilling.

A number of factors will be considered during the "tract assessment process" to determine the compatibility of surface disturbance associated with natural gas development including, but not limited to, proximity to wetlands, riparian areas, slope steepness, recreation trails, rare, threatened or endangered species, and other unique ecological communities. Compatibility will be determined during field inspection and the tract assessment process on a case by case basis.

The following areas will be considered non-compatible for any activity associated with oil or gas exploration or extraction:

- water bodies wetlands and a 250 foot buffer around them
- slope greater than 15%
- archeological and cultural concerns
- known occurrences of rare and endangered species
- Natural Areas not related to buffers and slope
- spring seeps, vernal pools, and an appropriate buffer

Individual tract assessments for each forest within a Unit, and determinations made regarding exclusion zones will be completed prior to leasing, and will be incorporated into the lease agreement. Any parcel designated for non-surface entry in the lease will no longer be subject to the review process detailed above due to the prohibition of surface disturbance(s). Exceptions to the tract assessments are possible if additional analysis, protective measures, new technology, or other issues warrant a change in compatibility status of an area.

Sanford West lease road in DEC Region 9 was developed to support a natural gas well site

The process of locating well sites will be

guided by a drilling hierarchy that incorporates stand management objectives. The hierarchy will first consider drilling in areas such as fields and conifer plantations. Drilling options will decrease as stand management moves from even aged to uneven aged conditions. The least favorable locations for drilling will be in stands managed for old growth characteristics. Upon completion of drilling, well sites will be reclaimed with native vegetation to a condition consistent with the surrounding stand management objectives.

DEC may consider well pad densities of greater than one well pad in 320 acres only when the additional impact can be managed with heightened mitigation measures and well location restrictions. These will address well site placement, along with routing considerations for supporting roads and pipelines. Well pad densities of one well pad in **40 acres** or greater will not be considered.

To ensure the compatibility with natural resources, land managers will review and evaluate all proposals for surface disturbance associated with gas leasing. This will determine the suitability of these activities and will include a review of the well siting and drilling pad development plans, well site disturbance and the location of distribution, collection and utility lines. **It is recognized that DEC's review will result in the use of "no-occupancy leases," thereby reserving some sensitive State Forests (or parts thereof) from any oil and gas development impacts. Under this type of lease, well pads, access roads and gathering pipelines will not be located on the State Forest.**

Access Roads

Access roads associated with well sites will not exceed 14' in width between ditches and will be designed to maintain closed canopy conditions, where appropriate. On turns and intersections roads will not exceed a total cleared width of 36 feet. Roads will be constructed with gravel over filter fabric to minimize soil disturbance. Upon completion of drilling, access roads may be closed to the public and will be reclaimed to a condition capable of supporting both vegetation and periodic access to maintain the well site. Site restoration will be a condition of the lease and will be authorized by a Temporary Revocable Permit (TRP).

Pipelines

The production of natural gas is not possible without a pipeline from the wellhead to the point of consumption. "Gathering" lines serve to collect natural gas from several different wells. "Transmission" lines generally begin at the point where two or more "gathering" lines intersect. Either of these types of pipelines may be subject to regulation by the Public Service Commission, depending on length and operating pressure. DEC does not have the legal authority to issue easements for pipeline or utility corridors, other than as granted by an active lease on the state-administered parcel.

The Sunoco Pipeline on Moss Hill State Forest in Steuben County, developed before State Forest land acquisition

The Frost Pipeline on South Bradford State Forest in Steuben County exhibits the surface impact that occurs with pipeline development

An important issue to consider is the amount and location of pipelines needed. Pipelines presently located on State Forests have created restrictions of forest uses due to the precautions which must be taken to cross the pipeline. DEC is regularly faced with requests to site transmission lines across State Forests. In most cases, Department staff are successful in routing these lines around State Forest lands. However, there are those cases where routing across State Forest is the most "environmentally friendly" alternative. DEC's ability to respond to this type of request is currently extremely limited. There are many instances where this type of facility was historically authorized under a (long expired) Temporary Revocable Permit, leaving pipelines in place without legal authority. These situations will be identified in their corresponding UMPs with recommendations for their final disposition (closing or legislatively establishing real property rights for its continued use, on a case by case basis).

ADDITIONAL RESOURCES

DRAFT Guidelines for Pipeline Construction on DEC Administered State Lands – 4/19/07, can be found at http://www.dec.ny.gov/docs/lands_forests_pdf/sfpipelines.pdf

Although it is not a rationale for pipeline construction, it should be recognized that in some instances pipelines may offer recreational opportunities to users of State Forests. Because the lines are buried, some pipelines have proven to make very good snowshoeing and cross-country skiing corridors, and may also be used by hikers in other seasons.

MINERAL RESOURCES

The Bureau of State Land Management has developed a draft guidance document dealing with pipelines. This pipeline guidance document will be expanded to include strategies for dealing with existing utility corridors and establishment of new utility corridors for transmission lines, as it is now focused on "gathering" lines. A complete solution to the pipeline and utility corridor issues may require legislative action.

The transportation of gas though pipelines and utility lines will be located adjacent to Public Forest Access Roads or the existing disturbed areas created to construct the well sites wherever possible. Exceptions must be approved by the Division of Lands and Forests. Additional surface disturbance associated with such construction will be considered in areas other than uneven-aged stands which are managed for closed canopy conditions. Surface disturbances such as pipeline construction will also be excluded from protected areas within these stands which are managed to exclude tree cutting and other disturbances.

Seismic Exploration

Seismic exploration is the search for mineral deposits by the recording and interpretation of artificially induced shock waves in the earth. Shock waves are generated by shallow borehole explosives such as dynamite, or vibratory mechanisms mounted on specialized trucks (Pendleton 2008). These procedures are used to determine what subsurface structures are present and may help to define the extent and distribution of natural gas fields. The Bureau of State Land Management and the Division of Mineral Resources have developed a guidance document dealing with seismic exploration on State Forests.

ADDITIONAL RESOURCES

Guidelines for Seismic Testing on DEC Administered State Land – 12/20/07, can be found at http://www.dec.ny.gov/docs/lands_forests_pdf/sfseismic.pdf

Requests to use State Forest land to conduct geophysical (such as seismic survey), geochemical and/or surface sampling procedures will require an approved lease and a Temporary Revocable Permit. Sampling procedures are less invasive than development operations and will be subject to DEC's seismic testing guidelines. Only the lessee, or parties authorized by the lessee, can be issued a TRP. Seismic exploration on State Forest lands, including lands under public rights-of-way, will not be allowed without a current lease and TRP.

Natural gas storage well on Rock Creek State Forest in Steuben County

Public Involvement

This plan establishes statewide policy for the exploration and production of oil and gas, through a process of public involvement and review. As individual UMPs are developed, this policy will be included by reference.

Generally, the Division of Mineral Resources conducts public involvement activities prior to conducting a lease sale. Following the tract assessment previously mentioned, DEC's Division of Lands and Forests and Division of Mineral Resources will hold joint public meetings and solicit comments. Consideration of any new leasing on State Forests will be conducted in an open and transparent manner which will involve public meetings as part of the decision making process.

Storage of Natural Gas

Underground storage of natural gas in New York is, generally, undertaken in either depleted production formations or in salt caverns, either created by solution salt mining or purposely created for this use. There are currently six natural gas storage sites beneath State Forests; four in Zoar Valley MUA, one in Cameron State Forest and one in Greenwood State Forest/Rock Creek State Forest. Gas storage under State Forest parcels has been occurring since at least the early 1960s.

ADDITIONAL RESOURCES

Listing of current State Forest leases including natural gas storage is available at http://www.dec.ny.gov/docs/lands_forests_pdf/sfoilgasleases.pdf

The northeastern portion of the country and New York State in particular, is already a very large consumer of oil and gas resources. The demand for natural gas storage is likely to increase through the period covered by this plan as the use of natural gas increases in relation to "dirtier" burning oil and coal.

Storage Policy

DEC's current oil and gas leases do not permit storage (or at least not storage of gas produced elsewhere). In the case of a storage proposal, the proponent would need to come to the Department to obtain the necessary rights through a storage lease. A proposal may require a UMP amendment process, including additional public meetings and full compliance with SEQRA. Any proposal for gas storage development must be consistent with the objectives of this Plan.

Oil and Gas Laws and Regulations

The applicable laws relating to the exploration for and production of oil and gas from State Forests are:

- Environmental Conservation Law Article 23
- Environmental Conservation Law Section 9-0507

MINERAL RESOURCES

Regulations applicable to state lands leased for oil and gas production are found on 6NYCRR Part 550 – 557.

Some pipeline/utility corridors may fall under the regulatory authority of the Public Service Commission, and as such are governed by a different set of laws:

- Public Service Commission Law, Article 7, Titles 120 through 130, inclusive

ADDITIONAL RESOURCES

MOU regarding management of mineral resources on state lands along with assembled laws and regulations pertinent to oil and gas development is available at http://www.dec.ny.gov/docs/lands_forests_pdf/sfoilgasmou.pdf

Please note that facilities which are subject to an Article 7 review by the Public Service Commission are excluded, by statute, from the provisions of the State Environmental Quality Regulations (SEQR). The Article 7 review stands in place of the normal environmental quality review.

Environmental impacts related to oil and gas exploration and development on State Forests have been reviewed in the 1992 GEIS for oil and gas activity and its supplemental findings for public lands; under the SGEIS being developed for activity in the Marcellus Shale formation; and within this plan. Gas exploration and development on State Forests will be in full compliance with SEQR and will be in compliance with the 1992 Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program.

A Memorandum of Understanding was established in 1986 between the Division of Lands and Forests and the Division of Mineral Resources establishing a framework for cooperation between the respective divisions on the management of mineral resources on state lands.

The applicable state laws relating to storage of natural gas on State Forest properties are:

- Environmental Conservation Law Section 23-1103
- Environmental Conservation Law Section 9-0507
- Environmental Conservation Law Article 23, Title 13

In addition, should these storage facilities store, or propose to store fluid minerals which are involved in interstate transport, they would be subject to regulation at the federal level by the Federal Energy Regulatory Commission.

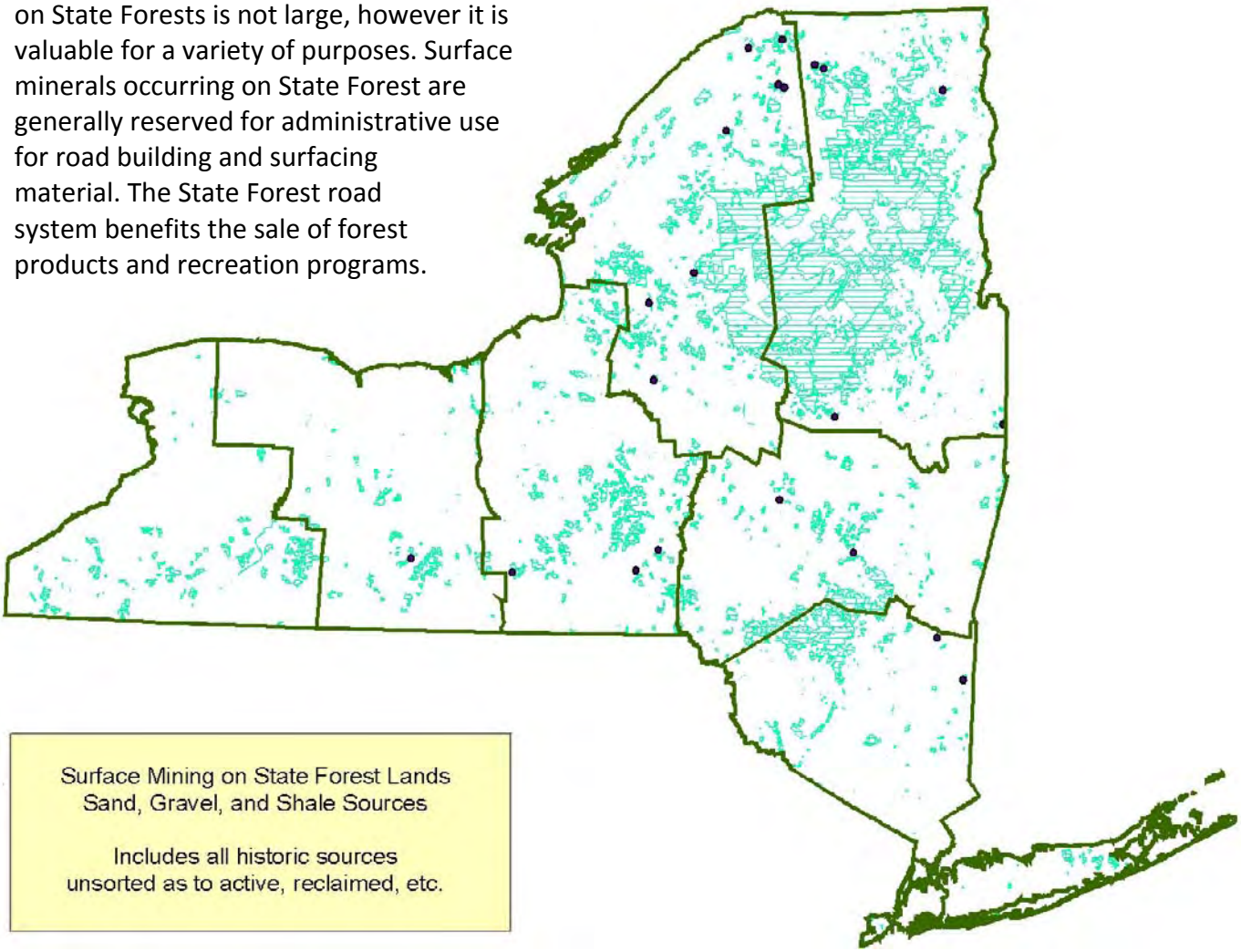
MINING

New York is rich in minerals which are mined for industrial and construction uses. Under Article 7 of the New York State Consolidated Laws, any citizen of the United States may apply for permission to explore and/or extract any mineral on state lands. At present, there are no mining contracts, permits or operations on State Forest lands across the state.

Surface Mining of Sand, Gravel and Shale

Historically "common variety" minerals including limestone, sand, gravel, shale and other aggregate materials have been produced, statewide, from State Forests, both for use in development projects within the forests and for commercial sale. The majority of commercial sales from State Forest properties occurred prior to state acquisition.

The type and amount of surface minerals present on State Forests is not large, however it is valuable for a variety of purposes. Surface minerals occurring on State Forest are generally reserved for administrative use for road building and surfacing material. The State Forest road system benefits the sale of forest products and recreation programs.



MINERAL RESOURCES

Underground Mining of Hard Rock Minerals

Metal ores and gem minerals, such as garnet, are mined chiefly in mountainous regions. Salt is extracted from rich deposits in central and western New York where extensive mines occur; both active and historic. Zinc, fibrous talc, and wollastonite are still being actively mined in the North Country region. Underground mining of lead, iron (in several forms) and graphite also occurred in both the North Country and Hudson Valley regions. Historically, some limestone (for cement) was mined from underground locations in the Hudson Valley region.

There is no existing underground mining on State Forest lands and no known impacts from historical mining activity. Mine subsidence and collapse has been an issue with historic mines, particularly in central and western New York. The landslide situation in the Tully Valley brine fields and the Akzo salt mine collapse, near Retsof, NY are rather startling examples. Neither of these situations involved state lands, although there are state lands in close proximity. Subsidence from historic mines in the Adirondacks has occurred in the past and may pose a significant problem in the future on or adjacent to state lands.

Mining Policies and Guidance

Current Department policy is to decline any commercial mining application(s) pertaining to State Forest lands, as the impacts from these activities are not compatible with the purposes for which Reforestation Areas were purchased. In the rare cases of larger deposits, a land exchange procedure may be appropriate. This could be handled as a “land for land” exchange or a “minerals for land” exchange, depending on the specific situation. This should be analyzed on a case by case basis for each UMP.

Small-scale surface mining may be permitted if the Department deems it necessary for infrastructure purposes. This mining activity will remain below the thresholds established in ECL, above which a Mined Land Reclamation Permit is required (1,000 tons or 750 cubic yards, whichever is less, removed from the earth during twelve successive calendar months; this is approximately equal to 40-50 tandem-axle (10-wheeler) dump truck loads).

If DEC proposes future mineral resource extraction within any Unit, then the Regional Forester/Operation Supervisor and Mined Land Reclamation Specialist will determine if a mined land reclamation permit is required before excavation begins. If determined that proposed annual extraction requirements will be above present Mined Land Reclamation Law thresholds, then a mining and reclamation permit application will be prepared and submitted to the Regional Mined Land Reclamation Specialist for review and approval before any excavation takes place.

If it is determined that a mined land reclamation permit is not required, but mineral resources will be extracted for infrastructure maintenance and construction necessitated by DEC, the basic mining and reclamation standards will be followed. If extraction takes place at any level on State Forest lands, the exact location of the area to be disturbed will be mapped and be incorporated in Unit Management Planning until all sites are closed and reclaimed according to Division standards.

Mining Laws and Regulations

The applicable state laws relating to the exploration for and production of common variety minerals from State Forest properties are:

- Environmental Conservation Law, Article 23, Title 27, all sections
- 6 NYCRR Section 190.8 (a), (g); also, if a Mined Land Reclamation Law permit is issued, 6NYCRR Part 420 would also apply

Underground mining is also regulated by the Federal Mine Safety and Health Act of 1977 (USC Title 30, Chapter 22) and the federal rules and regulations promulgated by the Mine Safety and Health Administration.

EMERGING ISSUES

Injection Wells (Disposal by Injection)

According to the United States EPA, "an injection well is a device that places fluid deep underground into porous rock formations, such as sandstone or limestone, or into or below the shallow soil layer. These fluids may be water, wastewater, brine (salt water), or water mixed with chemicals. Injection wells have a range of uses that include waste disposal, enhancing oil production, mining, and preventing salt water intrusion." (See EPA website http://water.epa.gov/type/groundwater/uic/basicinformation.cfm#what_is.)

There are no injection wells located on State Forest lands. As disposal by injection becomes a more critical issue, proposals to drill new injection wells or use existing depleted production wells may arise. If and when such proposals are made, no decision will be made without an opportunity for public comment to be presented and an assessment of all potential environmental impacts. Although there are no injection wells on State Forests, there are several brine disposal wells in New York State. There are no wells in New York State that are permitted for the disposal of hydraulic fracturing fluids. Regardless of the substance being disposed of, this type of disposal requires:

- A SPDES permit from DEC's Division of Water;
- Permission from US EPA to operate an Underground Injection Control disposal well;
- Permission from the Division of Mineral Resources to drill a new well or convert an existing well to this use (should an existing well be proposed for use).

- Written approval of the surface owner.

Carbon Capture and Sequestration

Carbon capture and storage is a means of mitigating fossil fuel emissions, based on capturing carbon dioxide (CO_2) from large point sources such as fossil fuel power plants, and storing it away from atmosphere by different means. Although CO_2 has been injected into geological formations for various purposes, the long term storage of CO_2 is a relatively new concept.

This emerging technology is yet to be comprehensively developed but is a potential activity for consideration. This technology is very early in the development process, with even a pilot project some distance in the future.

ADDITIONAL RESOURCES

A DEC pamphlet explaining **Carbon Capture and Sequestration** is available at http://www.dec.ny.gov/docs/lands_forests_pdf/ccspamphlet.pdf

The impacts of this technology are as yet unknown, as there have not been any long-term studies completed. Useful rock formations, including areas with wells that reach depleted production formations, could be the subject of this type of proposal.

Production leases currently in place may not be sufficient for this use. Any proposals of this type would be predicated on obtaining a storage lease for the property in question.

"MR" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Mineral Resources (MR) Objective I - Provide for natural gas and other mineral resource exploration and development while protecting natural resources and quality recreational opportunities.

MR Action 1 – Apply a hierarchical approach that classifies areas of each State Forest into four categories as part of a tract assessment to be conducted prior to leasing.

Category A - Compatible with well pad, road, and utility development.

Category B - High Forest Canopy Areas with one well pad per State Forest.

Category C - 250 foot stream and designated recreational trail buffers. Not compatible with well pad development; may be compatible with road and utility development.

Category D – Infrastructure Exclusion areas. Not compatible with well pad, road, or utility development.

MR Objective II – Clarify DEC's position on outstanding issues affecting the management of mineral exploration, extraction and transportation on State Forests.

MR Action 2 – Adapt the draft guidance for pipelines on State Forests to the DEC policy system and expand it to include guidance on strategies for dealing with existing pipeline corridors and establishment of new pipeline corridors by 2014. If the issue of existing unauthorized pipelines cannot be sufficiently addressed at the policy level, propose legislation to resolve the issue.

MR Action 3 – Finalize and adopt the current draft policy on seismic exploration within 2011.

MR Action 4 – Adopt policies addressing disposal by injection and carbon capture and sequestration by 2020.

MR Action 5 – Adopt a policy on tract assessments for oil and gas leasing, based on mineral character and expected mineral activity, site condition, and public use by 2015.

MR Action 6 – Adopt a policy on water use for oil and gas extraction, based on information in the Division of Mineral Resources GEIS.

MR Objective III – Prioritize acquisition of the mineral estate wherever it is split from a State Forest tract.

MR SEQR Alternatives Analysis and Thresholds

The **preferred alternative** (also the **no-action alternative**) is for DEC to consider any nominations from the oil and gas industry for leasing on a case-by-case basis, conducting a tract assessment and public input meeting(s) prior to granting any new lease. The analysis process and mitigations detailed above in this section will be followed. However, as fully explained below, this preferred alternative excludes any permitting involving high volume hydraulic fracturing pending the outcome of the Division of Mineral Resource's supplemental Generic Environmental Impact Statement relating to high volume hydraulic fracturing production procedures, and any other environmental impact assessments specific to State Forest lands the DEC deems necessary.

Another alternative would be to close State Forests to all future leasing. This alternative has not been selected because minerals leasing provides economic benefits and resources needed by society. Development on public lands, with heightened protections and oversight, has proven to be a compatible use of State Forests.

SEQR Analysis Thresholds:
With the exception of high volume hydraulic fracturing, the tract assessment process set forth in this Plan analyzes identified impacts, and establishes mitigation measures relating to oil and gas developments as it applies specifically to State Forests. Compliance with the guidelines of this tract assessment process will avoid and minimize identified potential impacts resulting from mineral resource activities.

MINERAL RESOURCES

Further site-specific environmental review under SEQRA will be required for any proposals for oil and gas development on State Forests involving:

- well drilling plans which exceeds well pad densities of greater than one well pad in 320 acres or which does not comply with limitations identified through a tract assessment;
- proposals for carbon injection and storage; or
- waste water disposal.

No exploration or extraction of the Marcellus Shale formation using high volume hydraulic fracturing will be considered for permitting on State Forest lands until current efforts to assess and analyze its environmental impacts have been completed through the Division of Mineral's supplemental Generic Environmental Impact Statement, and any other environmental impact assessments specific to State Forest lands the DEC deems necessary.

SUPPORTING LOCAL COMMUNITIES

TOURISM

State Forests can be an economic asset to the local communities that surround them. It is estimated that more than three out of every four Americans participate in active outdoor recreation of some sort each year (Outdoor Industry Foundation 2006). When they do, they spend money, generate jobs, and support local communities. When recreationists travel to visit State Forests, they often spend money for such things as gas, food, lodging, supplies and equipment. The amount they spend depends on how far they have travelled to reach their destination, how long they stay, and what activities they undertake while they are there.

Nelson Swamp Unique Area in Madison County has accessible hardened trails, a viewing platform and signage that helps provide a positive experience for visitors and greater potential for interpretive tours

The size of this economic contribution is difficult to determine without direct surveys of State Forest users. There are many estimates of how much money outdoor recreationists spend each year. The Outdoor Industry Foundation estimates that active outdoor recreation generates nearly $800 million in annual state tax revenue and produces $11.3 billion annually in retail sales and services in New York. Unfortunately, there is no way to tell what portion of that amount should be attributed directly to the existence of State Forest lands.

Local communities can take advantage of the presence of State Forests by encouraging businesses to cater to State Forest users as part of their business planning. Local chambers of commerce or regional RC&D councils might undertake surveys of State Forest recreationists to find out what goods and services they would be most likely to purchase during their stay in the area.

TAXES PAID

The New York State Real Property Tax Law provides that all Reforestation Areas (96% of all State Forests) are subject to taxation for school and town purposes. Certain reforestation areas

are also subject to taxation for county purposes. Most Unique Areas and Multiple Use Areas (4% of all State Forests) are exempt from taxation. All of these lands are assessed as if privately owned.

FIREWOOD

The provision for local individuals to enter State Forests under a timber sale agreement to cut firewood for their use has been an important longstanding tradition in many rural communities. This tradition, as well as the opportunities it presents for collaboration, education, outreach and community support, is supported by the Division. Unfortunately, as staffing levels continue to decrease these programs have been cut back. The DEC will make an effort to continue this program, though delivery of the program may be inconsistent and difficult to maintain at current staffing levels.

COMMUNICATION AND EDUCATION

It is important that local governments and stakeholders are notified of UMP meetings and included in the long-term planning process to integrate their concerns and desires whenever possible. Communication and education would be enhanced by the employment of more seasonal stewards, as mentioned elsewhere in this plan.

"LC" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Supporting Local Communities (LC) Objective I - Provide revenue to New York State and economic stimulus and jobs for local communities and businesses.

LC Action 1 – Increase the level of timber harvesting on State Forests at least to 1990's levels, not to exceed the statewide sustainable threshold.

LC Action 2 – Support local governments and school districts through payment of property taxes according to law.

LC Objective II – Improve local economies through forest-based tourism.

LC Action 2 – Provide local chambers of commerce and regional RC&D councils information about State Forests and the opportunities they present.

LC Objective III – Protect rural character and provide ecosystem services and open space benefits to local communities.

LC SEQR Alternatives Analysis

Preferred alternative: Continuing to support local communities on an economic and environmental basis (the **no action alternative**) has been chosen as the preferred alternative. The vast majority of the goals in this plan directly or indirectly support local communities by enhancing local economies and quality of life.

CHAPTER 6
FOREST MANAGEMENT AND HEALTH

FOREST PRODUCTS

TIMBER

Early forestry activities on State Forests focused on planting and growing trees rather than selling them, as much of the land acquired was abandoned farmland (hence the category of Reforestation Areas). The Civilian Conservation Corps (CCC) planted millions of seedlings on State Forests during the 1930s. Non-forested areas that were not planted by the CCC reverted naturally to forest. Many of the properties acquired did have some forested areas, as most farms had a woodlot which served as a source of heating fuel for the home.

During the 1940s and 50s, the sale of timber from State Forests dealt primarily in firewood, fence posts, poles, and Christmas trees, due to the fact that the majority of the stands available for management were of smaller diameter classes. Available markets and staffing were a boon to forest management efforts, since thinning and tending operations of relatively young stands could be accomplished through commercial sales, rather than having to pay contractors to do the work.

Over time the acreage of larger timber increased and with it the proportion of sales that were comprised primarily of sawtimber. It was not until the mid-1990s that sawtimber sales comprised more than half of the acreage harvested in a given year. The demand for smaller wood continued to exist, in the form of firewood and pulpwood markets, and to a lesser extent, post and pole sales.

Cut logs produced from State Forest lands

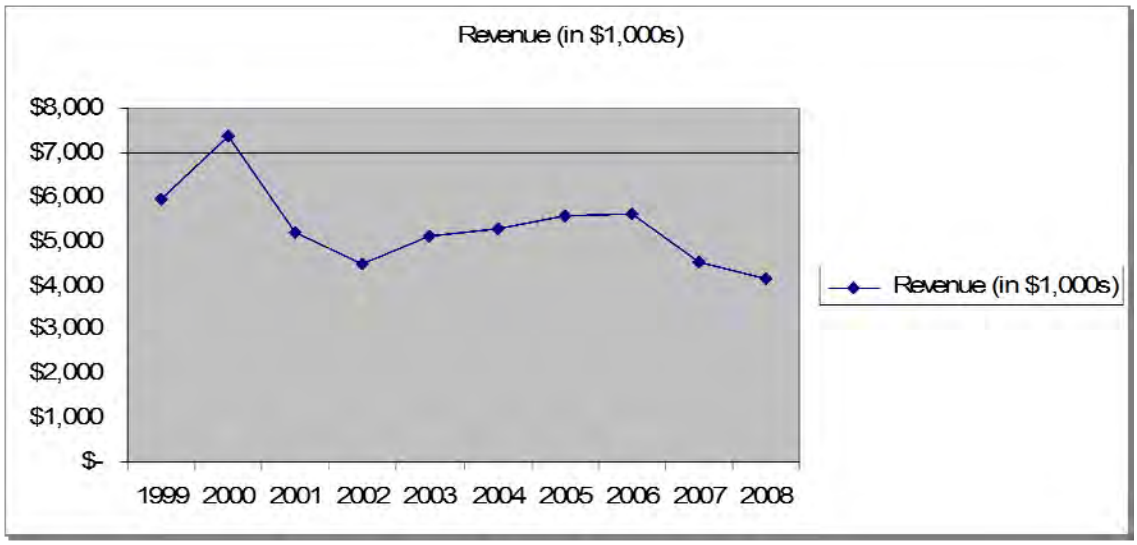
Existing Conditions and Trends

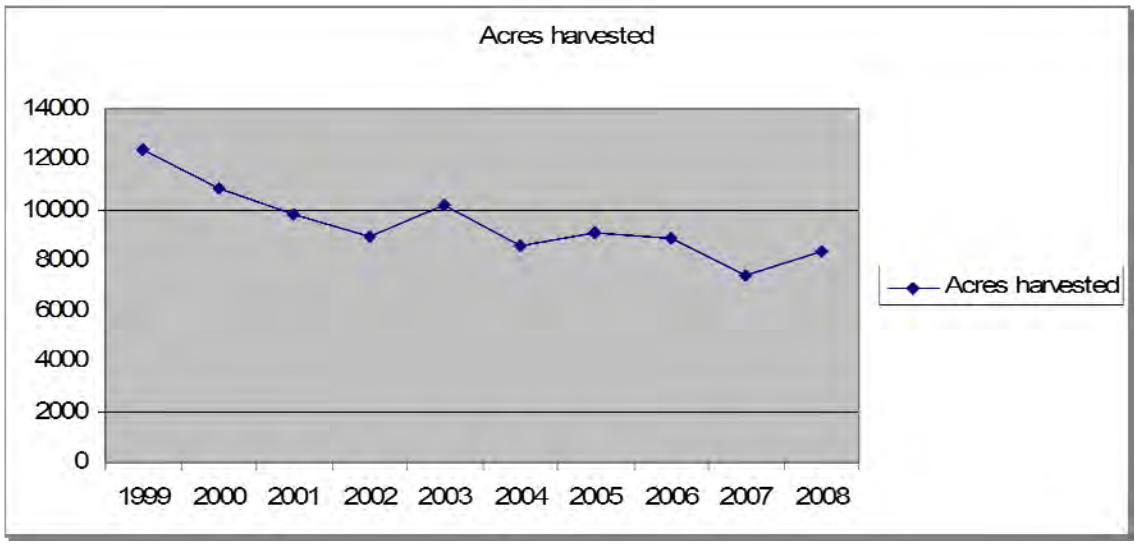
During the ten-year period between Fiscal Year (FY) 1999 and FY 2008, sales of forest products from State Forests generated **average revenues of $5,317,564 per year**. This represents roughly 2% of the total value of forest products harvested from public and private lands in New York State each year. The highest amount of revenue from forest product sales on State Forests for any one year during that period was $7,354,224 in FY 2000, and the lowest was $4,140,788 during FY 2008. (Note: The state fiscal year runs from April 1 through March 31.)

The acreage harvested during that same period exhibited a relatively steady decline, with the exception of FY 2002-03. The highest area harvest was 12,372 acres harvested in FY 1999-2000, and the lowest area was 7,427 acres harvested in FY 2007-08. The **average number of acres**

FOREST PRODUCTS

harvested per year was 9,439. This average is just over 2% of the total forested acreage on public and private lands that receives some form of harvest each year.
Interestingly, the increase or decrease in area harvested did not necessarily correspond with a similar decrease in revenue, although the general trend of both is slightly downward. The following two graphs depict the changes in revenue and acres harvested from FY 1999 to 2008.





In FY 2009-10, the total harvested area was 7,221 acres, reflecting a downward trend in acreage harvested that is projected to continue with the decline in staffing. This represents just under 1% of State Forest acreage harvested (majority of harvests are thinning cuts) per year.

The timber market in general has seen a downward trend during the recent recession, but this is reflected more in the revenue figures than in the acreage figures. Obviously, as timber prices

have dropped, the amount of revenue received by the state from the sale of timber has decreased accordingly, even in the face of a slight increase in harvesting activity.
Some further data provides additional context when considering the above-referenced figures. In terms of direct impacts only, the total statewide economic contribution of the forestry/logging and wood products manufacturing industries (including paper production not associated with a NYS pulp mill) is as follows:

- $9 billion value of shipments
- $3.7 billion contributed annually to state gross product
- $8.2 billion total value of shipments (6% of NYS manufacturing value of shipments)
- $1.6 billion in forest-based recreation as tourism expenditures

The total payroll for the forestry/logging and wood products manufacturing industries (including paper product production not associated with a NYS pulp mill) is $1.7 billion. The manufacturing portion of this number ($1.6 billion) represents about 7% of total NYS manufacturing payroll.

The total employment for forestry/logging and wood products manufacturing industries (including paper product production not associated with a NYS pulp mill) is over 55,000. The manufacturing portion of this number (51,000) represents about 8% of total NYS manufacturing employment.

Timber Harvesting and Staffing

The number of acres harvested in a given year is affected most by staffing levels and the occurrence of events that necessarily take staff time away from timber sales. Similar to revenue and acreage, the Bureau of State Land Management has experienced a general **downward trend in the number of staff** over the past decade. This decline is likely to continue, given the state's fiscal climate, and the number of foresters likely to retire in the next few years. A proposal has been offered to the Division of Budget, requesting permission to hire two new foresters, based on the recommendations in the 2006 Comptroller's Audit. The audit noted that hiring staff to mark and administer timber sales was a revenue positive action; that is, the amount of revenue generated by the additional timber sales staff would be greater than the cost of hiring those staff. Specifically, the report estimated that, over the three-year period studied, an increase of 17 foresters would have created a net revenue increase of $3.7 million per year.

Growth Versus Removal

Another factor that is likely to affect the amount of timber harvested in future years is the report prepared by SUNY-ESF estimating the periodic annual growth increment on State Forests. The report indicates that approximately 41% of the timber added through annual growth is not removed through harvesting. (To be clear, Forest Preserve lands were not

FOREST PRODUCTS

factored in this study.) The report concludes, among other things, that "forest growth on State Forest lands has a positive net production of 0.119 MBF/ac/yr, equivalent to 72,866 MBF per year." (Note: MBF stands for thousand board feet.) This means that ***after*** accounting for mortality and harvest removals, the volume of timber on State Forests is increasing by over 72 million board feet per year. Current harvest totals have averaged roughly 43 million board feet per year over the past 10 years. This is a rough approximation, as certain forest products are reported in tons or cords, and converting these amounts to board feet cannot be done exactly.

Comparing harvest rates to the net growth rate of the forest provides a valuable yardstick to measure sustainability. However, it must be recognized that sustainable management relies more on promotion of biodiversity, high-quality habitat and forest resiliency than a simplistic approach of cutting below the net growth rate. Therefore, on a year-over-year or unit-level basis, removals may need to temporarily exceed the growth rate to create the desired future conditions or to respond to natural disasters and invasive outbreaks. An example would be the ice storms and blowdowns of the late 1990's that necessitated large-scale salvage harvests.

Public Input

Overall public input regarding the State Forest timber sale program is mixed, and varies widely based on the geographic location in question. Not surprisingly, in areas closer to urban population centers, public comments demonstrate that a higher value is placed on the availability of public land for recreation, whereas comments in more rural areas typically show a propensity to place more worth on the jobs and economic input that State Forest lands can generate for local communities.

Public comments in most areas also indicate that people want to know that timber harvests are conducted in an environmentally responsible and sustainable manner. Some of the specific areas of concern expressed are:

- Water quality
- Soil erosion
- Wildlife habitat
- Biodiversity
- Effects on recreational facilities
- Impacts on adjacent public lands
- Visual impacts

These recently harvested logs are stacked among residual trees

One common theme is that many members of the general public are willing to accept timber harvesting on public land, but would like to know that controls are in place to make sure the harvesting is

done responsibly, and would also like to know that there are areas of state land that will not be logged.

Comments are received from time to time, indicating opposition to all timber harvesting on State Forests. In some cases, these individuals have a change of mind if they have an opportunity to discuss their concerns directly with DEC Foresters, and gain a better understanding of the ecological goals behind the harvest.

While there is a small number of comments received from time to time indicating opposition to all timber harvesting on State Forests, comments opposing specific harvesting practices such as clearcutting are more common. Further discussion regarding clearcutting and other forest management tools is found under Active Forest Management on *page 81*.

There is also a segment of the population that strongly supports timber harvesting on State Forests. This obviously includes members of the timber industry, but also encompasses those people who understand that conservation of natural resources allows the use of those resources so long as they are not being depleted.

Timber Harvesting Standards and Guidance

Guidance pertaining to timber sales has been somewhat inconsistent as far as format, but has been issued steadily over the years. Previously, Title 8400 of the Policies and Procedures Manual still constituted the main body of guidance for the management of State Forests. The manual was issued in 1977, but has since become outdated. Guidance memos have been issued and are summarized and compiled in the Summary of Sales Memoranda. This compendium is updated regularly on an approximately semi-annual basis.

Proposed changes to policies, standards and guidance

The primary alteration to the timber sale program will be the use of the "Quick Contract" process, whereby the Office of the State Comptroller (OSC) approves standardized language in the documents that are used in the sale process. By using this process, it is anticipated that the time necessary for contract approval will be reduced by as much as four weeks or more.

Legislation has also been proposed raising the contract amount at which OSC approval is required. Currently, sales over $10,000 must be approved by the OSC. The proposed legislation, if approved, would raise this amount to $50,000. Contracts under this amount would still need to be reviewed and approved by the Contract & Grant Development Unit in the DEC Central Office. The purpose of these two proposals is to streamline the timber sale process, resulting in greater potential revenue to the state.

In addition, a 2009 annual surveillance audit included a discussion regarding logging damage to residual stands. No formal guidance has been provided to regional staff directing them to include

language concerning residual damage in timber harvesting contracts, nor has any guidance been provided as to what language would be appropriate if it were included. Such guidance will be developed and provided to regional staff as part of the implementation of this plan.

Laws, regulations and policies

Environmental Conservation Law (ECL) § 9-0505 authorizes DEC to "sell the trees, timber and other products" from State Forest lands. Trees to be sold must be designated before the sale, and must be sold for not less than fair market value. Sales over $10,000 must be approved by OSC. Any sale for more than $500 must be made to the highest responsible bidder through an open public bidding process. Sales of products valued at less than $500 may be conducted without bidding the sale, so long as Department staff can provide that the state receives fair value for the product being sold.

Timber Harvesting Impacts and Mitigations

The practice of timber harvesting inherently includes the potential for significant environmental impacts if specific mitigation measures and BMPs are not properly employed. Resources that are potentially impacted and related mitigations are listed below.

- Forest soils
- Water quality
- Aesthetics
- Rare and endangered species and unique natural areas
- Cultural and historic sites
- Recreational facilities and assets

An increase in the size of the program would likely increase the potential for water quality impacts, but the use of Best Management Practices and adherence to the Special Management Zone Rules should adequately ensure that water quality impacts would be minimal. Standard reviews of the Natural Heritage Database should minimize potential impacts to known instances of protected species and sensitive habitats. Visual impacts could increase, particularly in association with even-aged management systems, but could be mitigated using appropriate screening measures and configuring sale layouts to minimize such impacts. A larger number of timber harvests could result in greater conflict with recreational users. This impact could be mitigated by better communication with the public on upcoming harvests, and better education about benefits of timber management.

NON-TIMBER FOREST PRODUCTS

Non-timber forest products have been a very small part of the sales program. The following products have been sold from State Forests at one time or another:

- Maple Sap
- Hay
- Shrubs for landscaping
- Scrap metal (such as derelict vehicles, unusable metal structures, etc.)

Demand for most non-timber forest products has historically been very limited. Those sales that have taken place have been conducted using the local sale process (i.e., the value of the sale has been less than that which would require OSC approval). There is very little change anticipated in the level of activity in this area, with the exception of maple syrup tapping, which is addressed below.

Perishable items, such as mushrooms, ginseng, and other plants or fruits, could be sold under the authority of ECL § 9-0505, but have not been because of logistical limitations. Existing staff levels do not permit the close sale supervision that would be required to ensure that contractors only removed the amount of material agreed to in the sale contract.

Support for selling non-timber products has been quite localized. There was a brief time during which comments were received supporting the picking of mushrooms on State Forests, mainly related to proposed regulations that would allow a minimal amount of such gathering.

Hay

Over the years, a number of fields on State Forests have been managed to provide hay for use by local farms. In all cases, these were fields that were present at the time of acquisition and were considered important for the support of area agricultural business. Over time, management of these open fields has evolved to use the sale of hay as a means of maintaining grassland habitat. All hay sales are now managed with input from DEC biologists to prohibit hay cutting and harvesting during peak nesting periods.

To protect soil productivity and fertility, hay will only be sold under multi-year contracts which include requirements for soil testing and any indicated liming or fertilization needs. When resources are available and soil fertility and habitat quality are in decline, DEC may hire contractors to manage grassland in order to rebuild and maintain fertile soils by; cutting and mulching or allowing the grass to remain on site; liming and fertilizing in accordance with soil tests; or replanting.

Maple Syrup

Limited tapping of maple trees for sap, using buckets, has been permitted on State Forests under forest product sales contracts for over 60 years, as authorized by ECL § 9-0505. In the 2006 Legislative session, an amendment was made to ECL § 9-0505 which specifically listed maple sap as a forest product. Although this amendment did not actually grant new authority to the DEC to sell maple sap, it has sparked interest from maple syrup producers.

FOREST PRODUCTS

Existing Conditions and Trends

Since the amendment to ECL § 9-0505, interest in producing maple sap from State Forests has increased. The Empire State Forest Products Association has expressed support for tapping on DEC lands, under certain conditions, and the New York State Maple Producers Association has also urged DEC to implement a tapping program.

Roadside tree tapping with buckets continues on State Forests to this day, serving smaller producers and hobbyists. To date, DEC has not permitted large scale tapping with tubing collection lines on State Forests due to concerns with impacts on other users, contract term limits, economics, limited staffing and the potential for resource damages, as further explained below.

Economic Considerations

Tubing collection systems are very expensive for maple producers to install. According to the New York Maple Producers Association, collection systems typically cost in the vicinity of eight to ten dollars per tap. The tubing and associated support wires must remain in the woods year-round for a long enough period to give the producer a return on their investment. DEC does not have the authority to enter into forest product sales contracts with a term exceeding five years, which may not be long enough to satisfy the economic need of maple syrup producers.

The economic impact of tapping on the resource must also be considered. When a maple tree is initially tapped, income from tapping runs between 75 cents and $4 a tree. Income is strongly dependent on the size of the trees being tapped. Offsetting this income is the effect on the value of the tree. The holes drilled for the taps cause staining of the wood above and below the holes. This staining can drastically decrease the value of the lumber or veneer produced from the tree. It is therefore extremely important that trees selected for tapping are those that are of such quality that they are not likely to produce high quality lumber or veneer.

Staffing levels in the Division of Lands and Forests have dropped 20% over the past eight years while the Division's land management responsibilities have grown with the addition of over a million new acres of fee and easement property. This constraint alone makes it difficult to take on a new and labor intensive program.

Multiple Use Management Concerns

The extensive sap collection systems have the potential to impact other forest recreationists, especially on more popular properties and those with developed formal trail systems. Tubing systems must connect every tap and tree to a mainline pipe using gravity to feed the sap to a bulk storage tank, usually of at least two thousand gallons in capacity. Tubing lines are supported by wires connect to adjoining trees, which must be attached properly to reduce damages. The tubing and wire systems used on State Forests would need to be set at a height that does not preclude most other uses of the area, and would need to be maintained and monitored at sufficient intervals to ensure that the tubing does not impede public access to the area.

Resource protection concerns also extend to the access roads used to service the operation. Maple tapping occurs in early spring when forest access roads are normally saturated with water and least able to support vehicle use. This is the time of year when most logging operations on State Forests are shut down by DEC. Yet these are the times the sap is running and access is required. Additionally, many maple stands do not have adequate access to allow tapping.

Potential for Maple Tapping on State Forests

There are areas on State Forests which could be considered for tapping if additional staffing resources were available and the necessary access roads were to be well drained and stable during spring thaw. There are areas of State Forests which are reserved from harvesting; therefore the economic losses (to timber value from tapping) would not have to be considered. Potential stands would be dominated by sugar and red maple trees and located on steep slopes, growing in poor soils, or dedicated to other goals such as the development of late-successional habitat (*refer to page 48*). There are also some maple stands, composed mainly of trees which have developed in relatively open growing conditions, and which as a result, have little potential for developing high quality sawtimber or veneer values.

State Forests are legislatively dedicated to multiple uses. It is unlawful for DEC to allow any use that by its nature excludes all other uses. Semi-permanent installation of tubing lines, lasting through multiple seasons or years, could prevent other users, such as hunters from utilizing an area for extended periods. This would be considered an exclusive use. Therefore, DEC will only consider maple tapping that involves collection of sap with a system that will not inappropriately preclude the use of the area by others.

The UMP process will be used to identify potential maple tapping stands, considering the above criteria and staff availability. This approach provides a transparent decision-making process and allows other user groups to express their viewpoints.

FOREST PRODUCTS

"FP" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Forest Products (FP) Objective I – Sustainably manage State Forests such that no forest resource is used or removed at a rate greater than the rate at which it is produced, and such that the overall quality of all resources is maintained or improved.

Actions related to timber management:

FP Action 1 – Harvesting on State Forests will be conducted at a rate which does not exceed annual net growth rates as established by the 2010 SUNY College of Environmental Science and Forestry study of the periodic annual increment on State Forests, until such time as additional data is collected and analyzed. Harvesting rates will be established on a regional basis by the Bureau of State Land Management and incorporated into annual work plans.

FP Action 2 (also AFM 2) – Re-establish a statewide system of permanent sample plots on State Forests to provide an accurate and detailed picture of forest growth, mortality and removals (harvests) following the same protocol and methodology as used to develop the forest statistics for New York's forests by the US Forest Service Forest Inventory and Analysis Unit. Plots are to be established by 2013.

FP Action 3 – Using data from the permanent sample plots established under FP Action 2, calculate the sustainable harvest threshold once every five years. The first calculation will be completed in 2014.

FP Action 4 (also AFM 1) – Manage forests using timber sales to improve forest health, increase the diversity of species, enrich habitats and diversify forest stand structure in order to enhance the resiliency of ecological systems and forest sustainability. Harvests will be planned in such a way as to develop a wider range of forest successional stages. To accomplish this action, UMPs will develop harvesting plans and schedules.

FP Action 5 – Develop invasive species BMP language to be included in all forest product harvest and construction contracts, to protect State Forest lands from the introduction, establishment and spread of invasive species. Language to be completed by 2011.

FP Action 6 – Develop guidance for regional staff regarding contract language addressing damage to residual stands. Guidance to be completed by 2012.

Actions related to non-timber forest products:

FP Action 7 – Through the UMP process, identify stands which may be considered for producing maple sap, using criteria described above and future guidance and standards to be developed.

FP Objective II – Educate the public about the benefits of silviculture.

FP Action 8 - Develop and publish brochures explaining the benefits of silviculture.

FP Action 9 - As opportunities arise, demonstration areas should be developed to provide education about silvicultural activities undertaken on State Forests.

FP (Timber Harvesting) SEQR Alternatives Analysis and Thresholds
In the most basic terms, there are three possible alternatives to the current timber harvesting program: increase harvesting to the sustainable levels that occurred in the 1990's, discontinue or decrease the size of the program, and continue the harvesting program in its present form (the **no-action alternative**).

Another alternative; discontinuing or decreasing the size of the program, would reduce DEC's ability to meet ecological objectives such as: improving the biodiversity, health, productivity, and sustainability of State Forest lands; increasing recreational opportunities; soil conservation; water quality protection; carbon sequestration; and wildlife and fish habitat improvement. The economic consequences of not conducting timber sales are foregoing revenues to the state and missing opportunities to stimulate local economies. For these reasons, this alternative has not been chosen.

The **no-action alternative;** continuing the program in its current form and at its current activity level is not likely to produce any adverse environmental impacts that are not addressed in other sections of this plan. However, similar to the alternative of reducing the program, this alternative would forego the opportunities to meet ecological objectives and stimulate local economies.

Preferred alternative: Increasing the size of the program to the sustainable levels that occurred in the 1990's would obviously mean a larger volume of wood being harvested and an increase in net revenue. According to the SUNY-ESF report referenced above, current harvest volumes could be doubled without exceeding growth. In addition harvesting levels will need to increase in order to accommodate ecological goals established in this plan, such as dealing with aging plantations, invasive species, and the need for maintained biodiversity.

SEQR Analysis Thresholds: Timber management and harvesting procedures, levels and strategies, as established in this section will avoid and minimize potential impacts to the maximum extent practicable and no further SEQRA review will be conducted, except as discussed elsewhere in this plan. SEQR analysis and thresholds for specific harvesting methods and use of pesticides to accomplish plantation management goals have been addressed in the Active Forest Management section. Timber harvests shall be conducted only where DEC foresters can ensure that harvest activity conforms to the sustainable management guidelines described herein.

FOREST PRODUCTS

FP (Non-timber Forest Products) SEQR Alternatives Analysis and Thresholds

The alternatives for the sale of non-timber forest products are similar to those for the timber sale program: increase the size of the program, discontinue or decrease the size of the program, and continue the program in its present form (the **No Action alternative**). Given the extremely small size of the program, discontinuing it and continuing it in its present form are nearly identical options, and will be treated as such for the purposes of the following discussion.

Increasing the size of the program is not likely to have significant environmental impacts, so long as the program is not increased to the degree that the amount of products being sold is greater than the amount being produced. Since the program is miniscule at present, a substantial increase would be necessary to reach a point where resources were being unsustainably extracted. This alternative has not been chosen due to staffing constraints and potential impacts on other uses.

Preferred alternative: Continuing the program in its current form (no action) will have no significant environmental impacts, due to the small extent of operations undertaken in the program, the small volume of resources being harvested, the renewable nature of those resources, and the small size of the equipment used to harvest them.

SEQR Analysis Threshold: Management strategies established in this section for non-timber forest products, under the preferred alternative will not create significant adverse impacts and no further SEQRA review will be necessary.

PLANTATIONS

Beginning in 1929, to solve the serious problem of soil erosion on newly acquired Reforestation Areas, a massive tree planting campaign, using labor provided by the Civilian Conservation Corps (CCC), was used to establish vast plantations. The CCC planted millions of trees on hundreds of thousands of acres of reforestation areas in the 1930s and 40s. Department work crews and crews from correction camps planted trees in the 1950s, 60s and 70s on reforestation and multiple use areas. Plantations have helped provide landscape-scale species diversity on State Forests that is seldom found on private land. The mix of natural hardwood stands and conifer plantations found on State Forests have created diverse wildlife habitat as well as aesthetically pleasing forest landscapes.

In the early years after initial establishment, conifer plantations provided excellent habitat for a variety of wildlife such as snowshoe hare. As the plantations grew, wildlife species utilizing the conifer cover changed to include red squirrels, grouse and a variety of song birds and hawks. In some cases the conifer cover was used by deer as wintering areas, and in others oak plantations provided hard mast that would otherwise not be found on the landscape.

Management activities in the early years included establishing and maintaining fire lanes around the perimeter of the plantations as well as releasing them from competing vegetation. Eventually, easily accessible stands were treated through non-commercial thinning and, less commonly, pruning of crop trees.

When the original plantations were established, the trees were planted in rows. A row thinning operation involves removing rows of trees. Usually a number of adjacent rows are removed in order to attain the desired result. Single tree selection involves removing individual trees on an even basis across the whole plantation. Small-group selection occurs when small groups of trees are selected for removal on an even basis across the whole plantation. Many of the early treatments were row thinnings to help establish access to and within the plantations for future management activities. Early treatments were accomplished with labor provided by Department work crews. The more remote plantations usually received no treatment at all.

Row thinning on Sugar Hill State Forest in Schuyler County

Commercial Development

In the 1970s, markets for softwood pulpwood developed in parts of the state. These markets were predominately for spruce. As a result

many of the easily accessible stands were commercially thinned for the first time. As with most first plantation treatments, many of the pulpwood sales were row thinnings to help establish access. Once access was established in these plantations subsequent treatments were primarily single tree selection thinnings. Over time, markets for softwood pulpwood, sawtimber, cabin logs, landscape timbers, utility poles, and wood chips have developed, resulting in increased demand for softwoods grown on State Forests. The increased demand has resulted in the development of numerous softwood timber buyers and loggers that rely almost solely on State Forest plantations as their source of raw material. In other areas of the state, where softwood pulpwood markets did not develop in the 70s, softwood plantations were left unthinned.

Equipment and Technology

Some of the early commercial thinnings were accomplished by removing four-foot-long pieces of pulpwood from the woods using a farm tractor and cart. Continuing advancements in equipment technology have seen a progression from this simple system to more complicated systems. Today, many logging operations utilize machines to do most of the work. Harvesting machines can be used to cut and delimb the trees, while other machines such as forwarders and skidders are used to bring the trees out of the woods. Some logging operations still consist of one person with a chainsaw and farm tractor, but with the trend towards mechanization of tree harvesting, these smaller operations are becoming rare. Plantation management has changed and will continue to evolve as demand and technology change over time.

A conifer plantation tree canopy viewed from the forest floor

Ecosystem Value of Conifer Plantations

Since the establishment of the State Forest system, plantations have helped control erosion and improve water quality, provided species and habitat diversity on the landscape, and contributed to local economies by helping to establish a segment of the forest products industry that utilizes softwood species (softwood plantations provide unique forest products such as utility poles and cabin logs). Most of these benefits were goals outlined in the Reforestation Law. DEC has met these goals in the past and will continue to meet these goals through sound forest management, following established standards and procedures for managing plantations.

Conifer plantations are invaluable on State Forests as a source of forest products and because they provide a type of habitat that is not commonly found on the landscape. Maintaining conifer/conifer-hardwood mixed stands is an extremely important component of ecosystem management. Conifer stands, whether natural or planted, satisfy a variety of wildlife needs.

Some species derive most or all of their year-round requirements from conifer stands, while an even greater array of species incorporate conifers as an essential or highly sought-after component of their habitat on a year-round or seasonal basis. Examples of such species include snowshoe hare, spruce grouse, pine martin, fisher, oven bird, Cooper's hawk, and northern saw-whet owl. Conifers provide thermal cover in the winter and escape cover year-round. The potential value of plantations becomes particularly important because of the extensive loss of native conifers due to past demands and harvesting practices. The limited amount of early-stage growth of native conifers, particularly of hemlock, limits the abundance of many wildlife species. Management programs that provide for the creation and maintenance of several stages of conifer growth (both natural and planted) are essential to the needs of many wildlife species and desirable for the maintenance of a high wildlife species richness (Chambers 1983).

CURRENT CONDITION OF PLANTATIONS

Currently, most of the softwood plantations on State Forests are original plantations that were established in the 1930s and 40s or second generation plantations that are a result of the removal of the original plantations over the past 20 years or so. These two types of plantations represent opposite ends of the life cycle of a softwood plantation. The original plantations are reaching or are at biological maturity, while the second generation plantations are young. A third type consists of plantations that were planted in the 1950s, 60s, and 70s. These plantations are closer to what can be considered the middle of the life cycle of a softwood plantation.

The original plantations are between 70 and 80 years old and are usually comprised of softwood species such as Norway spruce, white spruce, red pine, Scots pine, white pine, jack pine, European larch, and Japanese larch. Some plantations are purely of one species, while others are combinations of two or more species. Small plantations of other softwood species such as Austrian pine, balsam fir, Douglas fir, Dunkeld larch, red spruce, white cedar, and pitch pine may occasionally be found. In some areas, there are experimental plantations of species such as lodgepole pine, limber pine, and others.

In accordance with the Environmental Conservation Law, most of these plantations have been actively managed to produce pulpwood and timber. The periodic removal of the smaller, unhealthy, or damaged trees through thinning operations has allowed the larger, healthier trees left behind to grow more quickly. In many cases, it has also allowed softwood and hardwood seedlings and saplings to grow on the forest floor. There are different types of thinning operations, including row thinning, single tree selection, small-group harvesting, or some combination thereof.

All three types of thinnings have been practiced in many of the original plantations on State Forests. Some of the more accessible plantations have been thinned two or three times. In

PLANTATIONS

plantations that were row thinned, strips of mature softwood trees alternate with strips of much younger softwood and hardwood seedlings and saplings. Plantations that received single tree selection now contain large-diameter trees that are more evenly spaced than in stands that were row thinned. Often in these plantations there is a carpet or dense understory of hardwood and softwood seedlings and saplings, but sometimes there is very little understory. Plantations that were thinned through small-group harvesting contain open patches that are usually occupied by hardwood and softwood seedlings and saplings.

In areas of the State where pulpwood markets did not develop in the 1970s, most of the original plantations were not thinned. Plantations that are not accessible, either because of wet ground conditions or their distance from a good road, were also left unthinned. The trees in these plantations are tightly spaced, small in diameter, and have small crowns. The health of these trees is usually very poor because there are a large number of trees on the site competing for limited resources. These unthinned plantations demonstrate very clearly how much improvement in tree growth and health can be achieved through thinning operations. Usually, very little sunlight reaches the forest floor in these plantations because of how closely spaced together the trees are. As a result, there are very few hardwood or softwood seedlings or saplings growing under the plantation trees.

Another potential problem in unthinned plantations is overcrowding, which leads to tall trees with very little live crown. When the ratio of the tree's height to its diameter gets too large (due to lack of timely management), the tree's ability to remain upright declines dramatically. Research at Bartlett Tree has shown that tree stability is best at ratios of 50:1 or less. Plantation trees can reach ratios of up to 100:1.

Both the thinned and unthinned original plantations have begun to reach biological and economic maturity. As the trees reach biological maturity, they become less vigorous and their ability to thrive on marginal sites begins to decline. As trees grow older their ability to fend off disease and recover from physical injuries lessens. Their large crowns and sometimes shallow root systems make them susceptible to damage from weather events such as high winds, snowstorms and ice storms. The main types of weather-related damage to softwood plantations are as follows:

- **Windthrow**. Also called blowdown, windthrow occurs when high winds cause the trees to fall over. During a high wind event, the large crowns of the trees catch the wind, causing them to bend and sway. This puts a tremendous amount of strain on the root systems of the trees. On sites with shallow, rocky, or wet soils, the root systems aren't strong enough or deep enough to anchor the trees against the force of the wind. As a result, the trees tip over, frequently taking neighboring trees with them.
- **Ice and snow damage.** The many branches and needles of softwood trees can accumulate large amounts of ice and snow. As ice and snow accumulates, it puts stress on the trunks of the trees. If a tree develops a heavy enough ice or snow load, the trunk

of the tree can snap. Sometimes the trunk will snap close to the top of the tree, resulting in the tree losing only a small portion of its crown. Other times the trunk will snap at a point closer to the ground, resulting in the tree losing most or all of its crown. The ice and snow load in the crown of the tree can also cause the entire tree to tip over, resulting in damage similar to the windthrow damage described above.

Usually, ice and snow damage occurs in conjunction with wind. The action of wind combined with the weight of ice or snow in the crowns of the trees results in the trees either snapping off or tipping over. Regardless of how the damage is done, once a portion of a plantation is damaged, the remainder of the plantation is more susceptible to similar damage. This is because the root systems and crowns of plantation trees are intertwined, causing the trees to act as a unit in response to wind. As the trees sway in the wind, each tree relies on and assists its neighbors to resist the force of the wind. Once trees start to fall over or snap off, an opening is created, which allows stronger winds into the plantation. During subsequent weather events, the trees around the edges of that opening don't have as many neighbors to support them, so they are more likely to fall over or snap off. Another factor is a domino effect that occurs when trees that tip over fall on neighboring trees, causing them to fall over as well.

Because many plantations were established on the less fertile, shallow, rocky or wet soils found on hilltops and mountaintops across the State, these plantations are much more susceptible to storm damage than plantations that are located on deep, well-drained soils. This is because the shallow, weak root systems that are developed by trees growing in poor soil conditions are less able to support the trees during storm events. The trees in plantations that are on good, well-drained soils develop deep, strong root systems that are better able to handle the stresses produced by a storm event.

There are also some areas where hardwood trees were planted when certain State Forest lands were acquired. Plantations of red oak, sugar maple and white oak can be found on some State Forests. Some of these experimental plantations have not fared well, while others have thrived, depending on site/species compatibility. There are also a small number of plantations of white cedar and black locust that have been managed over the years to produce fence posts.

In recent years, attempts have been made to establish new plantations of red and white oak on State Forests. The presence of white-tailed deer can make it difficult for these plantations to succeed. The deer eat the buds that form on the seedlings, hindering their growth. Tree shelters and fences have been used to prevent the deer from browsing on the seedlings, but such measures are expensive and difficult to maintain.

PLANTATION MANAGEMENT

Regardless of the thinning methods that are used, a softwood plantation can only be thinned so many times before it becomes necessary to remove the overstory trees altogether. When a

PLANTATIONS

plantation gets to the point where removing more trees through thinning would leave an insufficient number of trees behind, it becomes necessary to remove the overstory trees. This type of operation is called either a clearcut if regeneration is not established, or an overstory removal if there is sufficient regeneration present.

Clearcuts are also sometimes necessary in plantations that are either highly susceptible to storm damage or have already been damaged by storm events. In addition, plantations that were never thinned due to inaccessibility or lack of pulpwood markets usually have to be clear-cut. Unthinned plantations that are 70 to 80 years old are usually in poor health or are not vigorous enough to respond to a thinning operation. More information and SEQR analysis of the use of clearcuts can be found in the Active Forest Management section on *page 81*.

When a plantation is removed, either through natural events or timber harvest, a decision must be made to either retain the site as a softwood plantation or allow it to convert to natural forest (either hardwood or softwood, depending on the natural regeneration that is present).

Conversion from a plantation to a natural forest can occur if advanced regeneration is in place. Advanced regeneration is seedlings and/or saplings that have naturally seeded in under the plantation. Frequently, depending on the size and shape of the plantation, the proximity of hardwood trees, and past management activities, there can be a large amount of hardwood advance regeneration on the site. If the advanced regeneration is composed primarily of desirable species, often the decision is made to allow the regeneration to take over the site after the original plantation is removed. On well suited sites, softwoods may be replanted.

> The "**desirable tree species**" will be different in each site and situation. Undesirable hardwood advance regeneration would consist of species that won't provide sufficient economic or biological value as the next forest stand.

Artificial Regeneration

Frequently there is inadequate softwood advance regeneration to occupy the site after the clear cut, and often there is undesirable hardwood advance regeneration. In these situations, softwood seedlings are planted on the site to establish a second generation plantation. The original plantation is harvested by clear cutting, and if necessary the site is prepared for planting by removing competing vegetation, either through herbicide application or mechanical means. In the spring or fall following a herbicide application, softwood seedlings are planted across the site on a specified uniform spacing. The seedlings are planted by hand, using hand tools such as a hoe-dad or dibble. Norway spruce is the most commonly replanted softwood species, due to its ability to thrive on many different types of sites, its greater wood volume production in comparison to other species, its resistance to deer browsing, its importance for habitat diversity, and its relatively low susceptibility to insect and disease problems. Other

species that are planted include white spruce, European larch, Japanese larch, red pine, and white pine.

Site preparation and plantation re-establishment are often done as post harvest requirements under state timber sale contracts.

Site preparation prior to tree planting often includes herbicide applications that target specific vegetation that will compete with the new plantation. Application methods will use the safest products available that have the least environmental impact. Herbicide applications are always performed under the supervision of a licensed herbicide applicator. As with timber harvesting activities, the herbicide application and tree planting activities are overseen by a DEC Forester.

This plan serves as the Generic Environmental Impact Statement for the application of herbicides on State Forests associated with silvicultural activities. (*Refer to the Active Forest Management topic "Pesticide/Herbicide Use" on page* 81 *of this plan.*)

After several years of slow growth and root establishment, seedlings begin to grow at a faster rate. However, depending on site conditions, competing vegetation will frequently seed into the area and rapidly out-compete the planted seedlings. At this time it may be necessary to remove the competing vegetation either through mechanical or chemical means. This may have to be done more than once before the planted seedlings grow large enough to fully occupy the site, thereby preventing undesired woody vegetation from seeding in.

In an average year, approximately 150,000 seedlings are provided by the Saratoga Tree Nursery to be planted on State Reforestation Areas. This translates into approximately 200 acres planted annually statewide.

Natural Regeneration

As discussed above, advanced regeneration may be present, allowing the establishment of natural forest. Plantations may also be converted to natural forest by clearcutting in the absence of advanced regeneration, so long as adequate seed source is available in adjacent stands and site conditions do not pose a risk of erosion.

PLANTATION MANAGEMENT GUIDANCE

The following management recommendations will apply to both existing plantations and plantation species that have been regenerated naturally. Some State Forests currently are managed under the guidance of a completed UMP. In this case many of the management decisions may have already been made. For State Forests where no plan exists, these management recommendations can help land managers in establishing a long term management direction for plantations on State Forest Lands.

PLANTATIONS

Within UMPs, the landscape assessment will determine the appropriate goals of conifer cover on the specific State Forests within the unit.

The conifer component will be made up of:

- Naturally regenerated conifers
  - Artificial planting of conifers may be chosen as appropriate when natural regeneration is not feasible to meet the UMP objectives
- Planted non-native and native species
  - Native species will receive first consideration
  - Only approved non-native species, which are non-invasive may be used
- Species selection will be based on:
  - soil compatibility
  - insect and disease resistance.
  - forest product marketability
  - growth rates
  - value as wildlife habitat
  - ability to naturally regenerate
  - availability of seedlings for planting

ADDITIONAL RESOURCES

Program Policy: Plantation Management on State Forests – Developed by the Bureau of State Land Management. http://www.dec.ny.gov/docs/lands_forests_pdf/sfplantationpolicy.pdf

Program Policy: Clearcutting on State Forests – Developed by the Bureau of State Land Management. http://www.dec.ny.gov/docs/lands_forests_pdf/clearcuttingpol.pdf

Rules for Establishment of Special Management Zones on State Forests – June 2008. Developed by DEC Division of Lands and Forests. http://www.dec.ny.gov/docs/lands_forests_pdf/sfsmzbuffers.pdf

Rutting Guidelines for Timber Harvesting and TRPs on State Forests – May 2008. Developed by the Bureau of State Land Management. http://www.dec.ny.gov/docs/lands_forests_pdf/ruttingguidelines.pdf

Stand Treatments

Pre-commercial and commercial treatments can both be used to manage plantations. Pre-commercial treatments may be necessary to improve younger stands; however commercial treatments are the preferred mode of treatment. As with all forest management activities, stand analysis should be conducted first, in order to determine if treatment is necessary. The type of treatment shall be determined using the appropriate

A commercial treatment on Bush Hill State Forest in Cattaraugus County

stocking guide for the species chosen as crop trees. A stand diagnosis and prescription shall be prepared for all treatments.

ADDITIONAL RESOURCES

Stocking Guides for Plantation Management:

Gilmore, Daniel W. and Briggs, Russell D.; NJAF 20(1) 2003; A Stocking Guide for **European Larch** in Eastern North America.

Gilmore, Daniel W. and Palik, Brian J.; NC-246 2005; A Revised Managers Handbook for **Red Pine** in the North Central Region.

Halligan, J.P. and Nyland, R.D.; NJAF 16(3) 1999; Relative Density Guide for **Norway Spruce** Plantations in Central New York.

Lancaster, Kenneth F. and Leak, William B.; NE-41 1978; A Silvicultural Guide for **White Pine** in the Northeast.

New York State Department of Environmental Conservation, Division of Lands and Forests, Bureau of State and Private Forestry, State Forest Timber Management Handbook Volume I, September 1976.

New York State Department of Environmental Conservation, Timber Management Handbook, July 24, 1985.

Commercial Treatment

Given the increase in demand for low grade forest products in many areas of the state, commercial treatments are now feasible in a majority of the State Forest plantations. Commercial treatments are preferred over pre-commercial treatments. Plantations to be treated commercially will receive either an intermediate thinning or be regenerated. Commercial treatments provide raw materials to the forest products industry, help stimulate the economy by providing jobs and revenue to the state of New York and contribute to meeting land management goals. Therefore, if feasible, treatments in State Forest plantations will be done commercially.

Pre-commercial Treatment

Some planting has been done in recent years. These younger plantations may need pre-commercial treatment prior to the trees reaching a diameter suitable for a forest product. Harvest access and technique during intermediate treatments should be designed to minimize residual stand damage in canopy and sub-canopy trees and minimize ground disturbance and soil compaction in the general harvest area. The upper threshold of acceptable damage to the residual stand will be established by the sale administrator and added as a contract term in the Notice of Sale.

PLANTATIONS

During intermediate treatment and regeneration cuttings efforts should be made to protect advanced regeneration where possible by employing harvesting techniques to minimize impacts (through directional felling or by utilizing mechanical harvesting equipment and appropriate sale layout) and, when possible, by harvesting during winter months when snow levels are sufficient to provide protection from felled trees and harvesting equipment.

- Release of planted or naturally regenerated seedlings may be necessary if 50% or more of the crop trees are overtopped by interfering vegetation. Release may include cutting overtopping interfering vegetation or herbicide treatment of broadleaved species of overtopping vegetation (if herbicide, treatment must follow the guidelines and SEQR analysis thresholds established in this plan).
- Non-commercial thinning may be the first treatment in both planted and naturally regenerated stands. Thinning should occur when interfering vegetation threatens to out compete the crop trees or the stocking level has reached the A-line on the appropriate stocking guide. Some naturally regenerated softwood stands may attain a very high level of stocking soon after establishment. These stands may require some form of thinning in the early stages of development. Strip cuts or mechanical thinning may be the only practical method of treatment in very dense seedling-sapling stands. As with any first treatment in a stand, access for future forest management activities should be considered.
- Pruning of softwood trees is not currently economically viable.

Perpetuating Plantations or Converting to Natural Forest Conditions:

Many of the plantations on State Forests have matured and are in various levels of declining health and vigor. As with any forest in this condition, these plantations have reached or passed economic maturity. The most severely declining plantations should be identified and regenerated first before mortality negatively impacts the stand.

There are two primary methods of stimulating regeneration under plantations: 1) natural regeneration of plantation species of trees or naturally occurring tree species from surrounding forests which would result in conversion to a natural forest type; and 2) artificial planting of trees appropriate for the site which would continue or perpetuate the plantation. Each regeneration method is most appropriate under certain conditions. As an example, natural regeneration, when a seed source of preferred species are present and environmental conditions – soil type, slope and aspect, and low deer densities to name a few - are right, is most cost-effective because the land manager does not have to purchase and plant seedlings. Most plantations on State Forests may fall within this category.

However, some species of conifers may not be prevalent in the landscape and may also be difficult to regenerate naturally without significant site preparation. Therefore, natural regeneration of some species may require intensive site preparation to prepare a seed bed that

will allow regeneration to become established. Therefore, planting on specific sites might be the best ecological decision if maintaining a softwood component in the landscape is the desired goal for biological diversity of habitat types.

Converting to Natural Forest Conditions through Even-aged Silviculture

As the forester evaluates each declining plantation for management considerations she typically has a number of options to choose from her silvicultural toolbox. In general, it is the Bureaus policy to manage plantations on State Forests in such a way as to move towards a more natural forest succession by weighing all options (including but not limited to thinning, conversion cuttings, or doing nothing) and to promote natural regeneration over artificial regeneration .

Converting a plantation stand to a natural forest condition through even-aged silviculture can be accomplished in a number of ways. The plantation can be managed over time to stimulate desired regeneration to establish under the mature plantation trees. This regeneration may germinate from the plantation overstory or from trees in nearby stands. There are many techniques foresters use to stimulate this regeneration potential including thinning the plantation overstory by removing poorly formed and stressed trees to allow sunlight down to the forest floor and, in certain conditions, by weeding out undesirable trees and vegetation in the understory. Silviculturally, the two methods of overstory preparation for regeneration include seedtree and shelterwood cuts. Eventually, the plantation should develop a dense "carpet" of seedlings ready to be released. At this point, an overstory removal may be conducted to release the newly established regeneration.

Clearcutting in Plantations

In rare circumstances plantation trees should be removed before advanced regeneration has been established. This removal, essentially clearcutting, may occur in one of two cases; either the action has been identified in a UMP or other formal public process or the action becomes necessary when the condition of the majority of plantation trees meets one or more of the following criteria:

- More than 75% of the plantation species basal area (BA) exhibits declining health and vigor, caused by one or more biotic or abiotic factors;
- More than 75% of the plantation species BA is susceptible to excessive wind and weather damage or insect and disease damage within the next five years;
- More than 75% of the plantation species BA exhibits excessive wind and weather damage or insect and disease damage;
- A combination of decline, susceptibility and damage affects more than 75% of the plantation species BA (ex. 25% showing signs of decline, 25% susceptible to wind throw, and 30% with broken tops);

PLANTATIONS

- The plantation poses a forest health or public safety risk.

Evidence of decline, susceptibility, or damage must be documented in the stand prescription with justification of why alternatives (i.e. do nothing, thinning, herbicide, or other alternative option) are not appropriate.

Artificially Regenerating a Plantation

As discussed earlier, the Bureau recognizes that conditions may require planting seedlings after a clearcut. This is called artificial regeneration. Conditions that may result in the decision to plant trees may include the presence of undesirable vegetation in surrounding stands, high deer browse hindering the success of natural regeneration, the lack of a seed source for desirable species, evidence of repeated intermediate treatments that have not resulted in adequate desirable regeneration, or other unique conditions.

An artificially regenerated (replanted) plantation after one growing season with seedling shelters

If the forester decides to artificially regenerate a stand after a clearcut she should consider establishing native species over non-native species and a mixture of species types over a mono-type (single species). However, in clearcuts where high deer browsing has prevented natural native species from regenerating successfully foresters may decide to choose non-native, non-invasive species that are less palatable by deer and are more likely to successfully grow.

Artificial regeneration of approved non-native species (species not native to North America prior to European settlement) may be considered only if it is determined the non-native species does not have invasive properties (outcompetes native species in a natural state), has a New York invasive risk assessment of medium or less, is more suited for the site due to soil and other properties, is resistant to wildlife impacts, can outcompete undesirable vegetation, is most appropriate to reach desired ecological goals, and is available.

List of approved non-native species - January, 2010:

- Norway Spruce (*Picea abies*)
- Scotch Pine (*Pinus sylvestris*)
- Japanese larch (*Larix kaempferi*)
- European larch (*Larix deciduas*)
- Hybrid larch (*Larix x europlepis* Henry)

Uneven-aged Management in Plantations:
Uneven-aged management may be used to manage plantations of native softwoods, Norway spruce or to convert even-aged plantations into uneven-aged hardwood stands over time. Uneven-aged management may be desirable in highly visible stands or stands adjacent to high use recreation areas.

FUTURE NEEDS FOR PLANTATION MANAGEMENT

Non-commercial treatments such as site preparation, tree planting, release and non-commercial thinning have been accomplished through sale related work due to lack of staff and funding. Release and non-commercial thinning can be done with acceptable success through sale related work. However, in some areas of the state site preparation and tree planting have only a moderate to poor success rate when accomplished through sale related work.

Also, if DEC is dedicated to maintaining plantations on State Forest Lands, the Saratoga Tree Nursery must remain open as a reliable source of quality tree seedlings.

Plantation Management (PM) Objective I – Provide guidance to regional staff regarding the management of plantations on State Forests.

PM Action 1 – Adopt proposed Program Policy ONR-DLF-1 Plantation Management on State Forests.

PM SEQR Alternatives Analysis and Thresholds

The **no-action alternative** as regards plantation management, would involve a "business as usual" approach. This approach has not been adopted because there is a wide variation in management approaches between DEC regions where some regions are converting a majority of plantations to natural forest cover while others are re-establishing new plantations, and a more balanced approach is preferred.

Another alternative is to allow plantations to naturally decline, without active management, and transition to natural forest cover. This alternative has not been adopted because this would elevate risks from disease and insect infestations as well as introduce some risk of wildfire due to poor health in overmature stands. Also, the failure to produce forest products would affect local economies and would drive many small sawmills, which specialize in softwoods, out of business. An indirect impact would result from shifting existing demand to other forests, regions or countries where harvesting methods may not be sustainable. Another impact would be our failure as a State to complete the restoration of State Forests, which were originally acquired for reforestation.

PLANTATIONS

The **preferred alternative** is to establish formal program policies for the management of plantations on State Forests. Under this alternative, plantations will be more uniformly managed across the state to protect sensitive sites, rare and endangered species and to meet other ecological goals while continuing to produce forest products and stimulate local economies; following retention standards, a clearcutting policy and an overall plantation management policy.

No other alternatives have been considered.

SEQR Analysis Threshold: Plantation management strategies established in this section will avoid and minimize potential impacts to the maximum extent practicable and no further SEQRA review will be conducted. However, SEQR analysis and thresholds for specific harvesting methods and use of pesticides to accomplish plantation management goals have been addressed in the section titled Active Forest Management.

FOREST HEALTH

Threats and challenges to New York's forest health are principally: global climate change, invasive plant and animal species, loss of habitat connections across the landscape, and poor reestablishment of desired trees and plants following natural or human caused disturbances.

Change is inevitable. Scientists have come to understand that disturbance is necessary for many kinds of forests and that it is the frequency, kind, degree and rate of change that is important, not necessarily the change itself (Botkin 1990). Not all changes are beneficial, especially those not integral to natural processes. Human introduced changes, such as those caused by the introduction of invasive species can cause drastic, sudden and permanent changes to the ecosystem and seriously disrupt forest health.

New York's forests are remarkably resilient, as demonstrated by how well they have reestablished themselves following large scale land clearing associated with European settlement. However, trends in economic globalization combined with exponential growth in human population continue to significantly impact the species composition, resiliency and function of New York's forest ecosystems.

Forest health will be pursued with the goal of maintaining biodiversity. Any agent that decreases biodiversity can have a deleterious effect on the forest as a whole and its ability to withstand stress.

Forest health in general should favor the retention of native species and natural communities or species that can thrive in site conditions without interrupting biodiversity.

The ecological health and function of forests is dependent on a carefully balanced interdependence of species. Degradation caused by a disturbance such as invasive insect activity or improper forest management can leave forests prone to further mortality. New York's forests are under constant stress from native pests such as pine beetles and tent caterpillars. These stresses are increasing due to changing site conditions caused by climate change, as well as the threat of damage from invasive species.

INVASIVE SPECIES

Economic globalization has brought tremendous benefits to many people. Unfortunately, those benefits have also come with a high cost. As global trade and travel have increased, so have the introduction of non-native species. While many of these non-native species do not have adverse effects on the areas in which they are introduced, some become invasive in their new ranges, disrupting ecosystem function, reducing biodiversity and degrading natural areas.

FOREST HEALTH

Invasive species have been identified as one of the greatest threats to biodiversity, second only to habitat loss. Invasive species can damage native habitats by altering hydrology, fire frequency, soil fertility and other ecosystem processes. Some invasive species can also be harmful or poisonous to humans or livestock and can have negative impacts on agriculture.

In addition to causing environmental damage, invasive species can have a tremendous economic impact as well. It is estimated that invasive species cost the US over a hundred billion dollars a year in agriculture losses and control costs. Invasive species can also hamper recreational opportunities by reducing access, degrading the quality of recreational areas and altering the aesthetic beauty of scenic natural areas.

The leafless trees in this photo are dead ash trees, infested by the Emerald Ash Borer. A forest that is composed of a single species majority is more prone to attack

Newly found populations of invasive species may be controlled or even eradicated. If an invasion is detected when the population is small and manageable, eradication may be possible. However, if an infestation goes undetected and the population becomes well established, the best option may be to enact control efforts with the goal of lessening its impact or preventing its spread.

Insects and Disease

When a non-native insect or disease is introduced from another country, the natural controls in its native range are often lacking in its new "home" causing epidemic population levels and rampant infestations. The introduction of American chestnut blight fungus *(Cryphonectria parasitica)* in the United States illustrates this point. "The blight fungus disease was first observed in the U.S. [at the Bronx Zoo] killing American chestnuts *(Castanea dentata)* in 1904… after being imported … to the US from Asia on imported chestnut trees. …The disease spread like fire throughout the eastern states, and across the entire natural range of the American chestnut. By the 1920s, the disease had even reached southern Ontario, and by the 1930s, the entire stock of American chestnuts was infected, with most of them dying. By 1940, over three and a half billion American chestnuts had been lost to the fungus. In less than four decades, a dominant American tree species had been converted to a threatened species." (Rellou 2002).

Over the past 80 years similar situations with exotic diseases and insects have dramatically altered New York State Forests including:

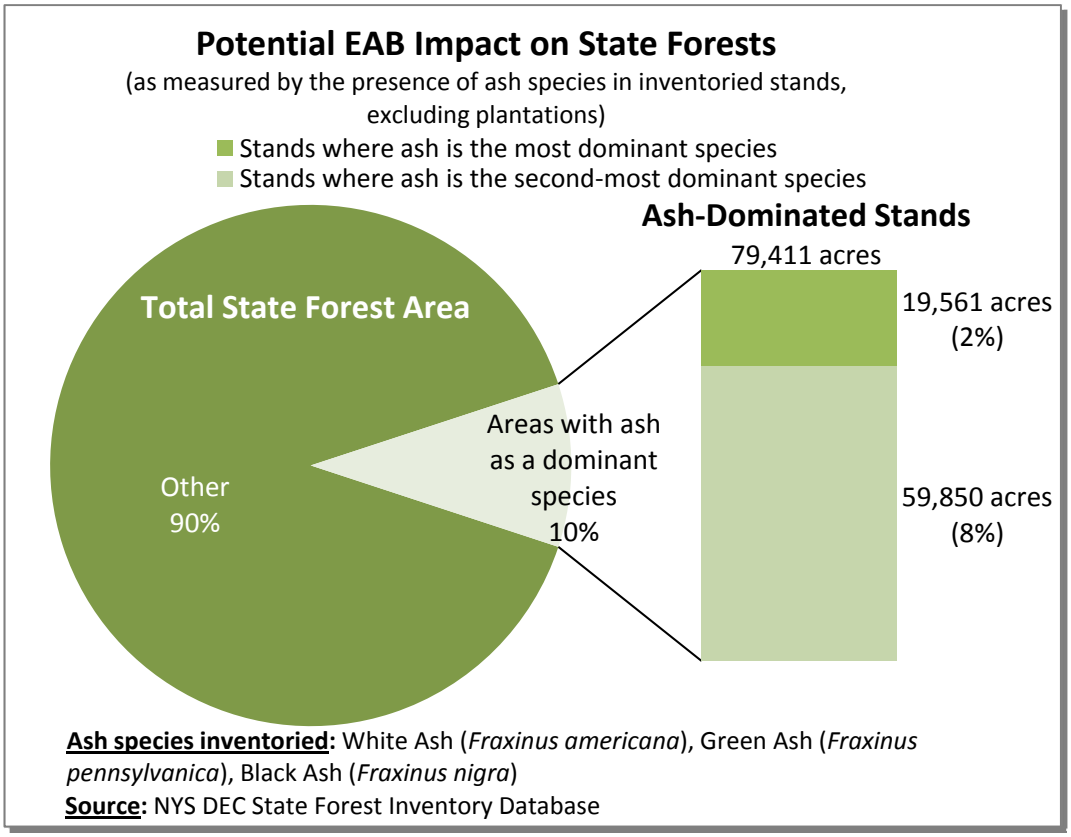
- Dutch elm disease *(Ophiostoma novo-ulmi)* devastated American Elm *(Ulmus americana)*;

- Beech bark scale (*Cryptococcus fagisuga*)/ nectria fungus complex (*Nectria galligena* and *N. coccinea* var. *faginata*) has caused a dramatic dieback of American beech trees;
- Butternut canker caused by an exotic fungus (*Sirococcus clavigignenti-juglandacearum)* is pushing Butternut (*Juglans cinerea*) into a threatened status.
- Gypsy Moth (*Lymantria dispar)* caterpillars' repeated defoliation of oaks, apple, basswood, birch, poplar and willow trees can lead to widespread mortality.

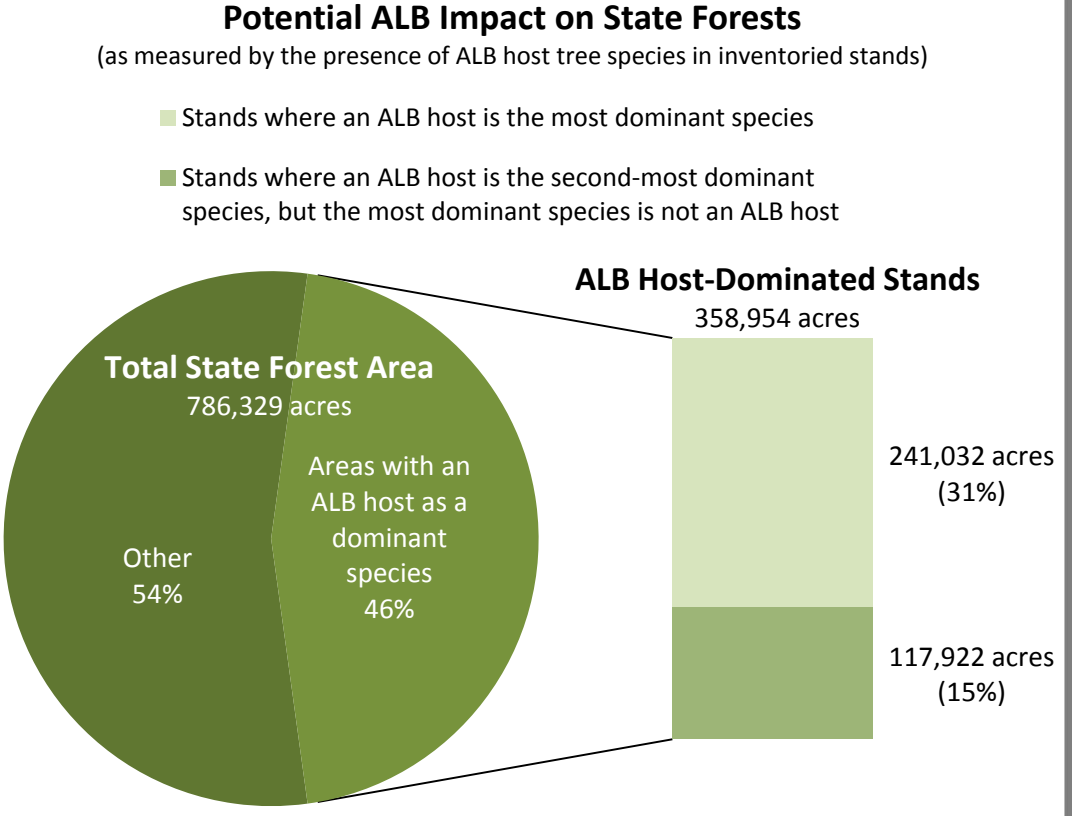
More recent introductions threaten New York State Forests as well, including;

- Asian Long-horned Beetle (ALB), *Anoplophora glabripennis,* which kills all maple varieties, alder, birch, elm, horse chestnut, poplar and willow;
- Emerald Ash Borer(EAB), *Agrilus planipennis,* which kills all ash species;
- Hemlock woolly adelgid (HWA), *Adelges tsugae,* which kills eastern hemlock (*Tsuga canadensis)*;
- Sudden Oak Death, *Phytophthora ramorum,* which infects all oaks, Douglas fir and rhododendrons among its hosts.

Tunneling damage caused by the Emerald Ash Borer



FOREST HEALTH



Plants

It has been estimated that about 1/3 of all the plant species presently known to occur in New York are non-native. Of these, some have demonstrated the ability to crowd out native vegetation, alter local ecology, or cause harm to people or animals. Some examples include:

- Purple loose-strife (*Lythrum salicaria*) and certain non-native species in the genus *Phragmites*, which displace native wetland vegetation;
- Japanese barberry (*Berberis thunbergii*) , which inhibits regeneration of native species;
- Japanese knotweed (*Fallopia japonica*), which can dominate riparian areas and accelerate erosion;
- Common buckthorn (*Rhamnus cathartica*), which can dominate upland areas;
- Norway maple (*Acer platanoides*), which creates very heavy shade, discouraging herbaceous and understory vegetation.

- Giant hogweed (*Heracleum mantegazzianum*), which reduces the skin's ability to filter sunlight, causing severe burning.

Invasive Species Management Strategy

Through active management practices, DEC staff and contractors have the potential to unknowingly introduce and spread invasive species, and at the same time, the ability to prevent or reduce their impacts. Silvicultural practices, ranging from wildlife enhancement to land-use conversion influence invasive species growth, reproduction, and dispersal. Recognizing and predicting the response of individual species to these practices will enable managers to take steps to prevent or reduce the impact of invasive species on the State Forests and surrounding lands.

Past management efforts for invasive species on State Forests have primarily focused on minimizing the spread of newly documented and immature infestations before they have the chance to become well-established. The long-term strategy for managing invasive species on State Forest lands uses a combination of the following techniques: prevention, cooperation and collaboration, inventory and monitoring, early detection and rapid response (EDRR), treatment and control, and restoration. The forest as a whole must contain sufficient diversity and vitality to withstand future threats. State Forests must be managed carefully so as not to expose ecological systems to damage. State Forest lands must be monitored for the presence of damaging agents that can include fungi, insects, diseases and harmful plants.

Cooperation with federal, private and state partners helps DEC staff stay ahead of new threats by understanding the biology, symptoms, hosts, and available control strategies of many of the insects and diseases that can harm trees and forests in New York State. DEC's Forest Health Program gathers, analyzes, and reports on tree pest and disease information. The highest priority is placed on early detection of and rapid response to high-impact invasive species that may threaten the health of New York's forests. The role of the Office of Invasive Species Coordination (OISC) is to support the New York State Invasive Species Council in ensuring that the state has a comprehensive and well-coordinated system for preventing and managing the many ecological, economic and human health threats posed by invasive plants, animals and pathogens.

Preventing an introduction is the preferred strategy and the first line of defense against invasive species. Prevention measures are usually the most cost-effective means to minimize or eliminate the environmental and economic impacts caused by an invasive species.
EDRR is the second line of defense against invasive species. The early detection of a new invasive species can result from formal monitoring systems, such as networks of trained professionals or volunteers, or from public inquiries to agencies or organizations. The rapid response process begins once a potentially new infestation has been reported to an agency (e.g., state or federal resource agencies, public land managers) or organization (e.g., PRISMs,

FOREST HEALTH

private land managers) whose mission includes responding to invasions. EDRR of new invasions greatly improves the likelihood of species eradication and eliminates the need for long-term management and control programs.

Treatment and control measures are usually the last line of defense against invasive species. If an invasive species goes undetected and the population becomes well established, the most effective action may be control to lessen its impact or strategies to slow its spread to unaffected areas. In these cases, populations are typically beyond eradication, but can usually be managed or confined to tolerable levels.

Aquatic Invasive Species

Although water-based activities are not as prevalent on State Forests as land-based activities, there is still a significant risk that recreationists, contractors and other people entering State Forests could contribute to the spread of aquatic invasive species. Of particular concern are the illegal introduction of fish species via the dumping of bait buckets, and the failure to properly clean and disinfect boating and fishing equipment, which can spread invasive plant species and fish diseases. A complete discussion of these issues and recommended disinfection practices can be found at www.dec.ny.gov/animals/50121.html.

Invasive Species Management Principles

The call for a management approach that balances sustainable forestry with the need to preserve native or non-invasive plant and animal communities is a challenging and complex task. Understanding the relationship between management practices and invasive species is paramount. Invasive species can eliminate all productive uses on infested sites and can be very expensive to control or eradicate if an inappropriate action is taken.

ADDITIONAL RESOURCES

Invasive Species Guidance Documents

DEC, with assistance from the Invasive Species Council agencies and Advisory Committee member organizations, is in the process of developing several new documents relevant to the management of invasive species. Those documents include:

- Generic Environmental Impact Statement (GEIS) for Rapid Response Actions
- Rapid Response Framework for Invasive Species
- Comprehensive Management Plan for Invasive Species
- Lists of Prohibited, Regulated and Unregulated Non-native Plant and Animal Species

These documents will be posted as they are finalized, at www.dec.ny.gov/lands/64567.html

The following principles will be used to manage invasive species on State Forest lands:

1. Learn to identify invasive plants and animals and address their presence in UMPs
Knowing which invasive plants and animals are likely to invade a region and being able to identify those species aids in preventing their spread and quickly responding to new threats.

2. Prevent the introduction of invasive plants and animals to uninfested sites.
Invasive species can be introduced to a site by moving infested equipment, soil, sand, gravel, borrow, fill and other off-site material. Monitoring disturbed areas and proper sanitation of equipment will help prevent new infestations. Best Management Practices (BMPs) to prevent the introduction of invasive species include:

- Clean equipment prior to visiting site.
- Begin activities in uninfested areas before operating in infested areas.
- Use native plants and weed-free seed and mulch (straw, wood fiber).
- Use fill that does not have invasive plant seeds or material.
- Keep equipment on site during the entire project.
- Incorporate invasive plant prevention into road work layout, design, and decisions. Use uninfested areas for staging, parking and cleaning equipment. Avoid or minimize all types of travel through infested areas, or restrict to those periods when spread of seed or propagules are least likely.
- When possible, to suppress growth of invasive plants and prevent their establishment, retain relatively closed canopies.

3. Contain and treat new invasive plants and animals or those not yet well established.
Controlling small infestations is more effective and economical than trying to control well-established, rapidly spreading infestations. Selected control measures need to be based on species biology and the individual characteristics of an infestation.

4. Minimize transport of invasive plants and animals from infested to uninfested areas.
Invasive species can be spread by moving infested materials and equipment. Cleaning vehicles and equipment is the most effective method of preventing an introduction. Best Management Practices (BMPs) involving the transport of off-site material and equipment include:

- Determine the need and identify sites where equipment can be cleaned. Seeds and plant parts need to be collected when practical and effectively disposed of (e.g., burned, buried, dried, bagged and taken to landfill, etc.). Remove mud, dirt, and plant parts from project equipment before moving it into a project area and clean all equipment before leaving the project site, if operating in infested areas.
- Inspect material sources at site of origin to ensure that they are free of invasive plant material before use and transport. Treat infested sources for eradication, and strip and stockpile contaminated material before any use.

- Inspect and document the area where material from treated infested sources is used annually for at least three years after project completion to ensure that any invasive plants transported to the site are promptly detected and controlled.
- Minimize roadside sources of seed that could be transported to other areas.
- Periodically inspect system roads and rights-of-way for invasion. Inventory and mark infestations and schedule them for treatment.
- Avoid working in infested areas if possible. Postpone work until invasive plants have been eliminated from the site.
- Perform road maintenance such as road grading, brushing, and ditch cleaning from uninfested to infested areas to help prevent moving seeds and plant material from infested areas into adjacent uninfested areas.
- Clean road graders and other equipment immediately after operating in infested areas.
- Clean all dirt and plant parts from the top and underside of mower decks.

5. Minimize soil disturbance.

Invasive plants prefer and often thrive under disturbed conditions. Do not disturb the soil unless absolutely necessary. BMPs for activities involving soil disturbance include:

- Before starting ground-disturbing activities, inventory invasive plant infestations both on-site and in the adjacent area.
- Minimize soil disturbance and retain desirable vegetation in and around area to the maximum extent possible.
- Monitor infested areas for at least three growing seasons following completion of activities. Provide for follow-up treatments based on inspection results.
- Avoid, where possible, grading roads or cleaning ditches where new invaders are found.
- When it is necessary to conduct soil work in infested roadsides or ditches, schedule activity when seeds or propagules are least likely to be viable and to be spread.
- Quarantine soil from infested area to prevent off-site spread.

6. Maintain desirable species.

Establishing and maintaining competitive, non-invasive desirable plants along roadsides and disturbed areas prevents or slows establishment of invasive plants. Best Management Practices (BMPs) for re-vegetating disturbed areas include:

- Re-vegetate all disturbed soil, except on surfaced roads, in a manner that optimizes plant establishment for that specific site, unless ongoing disturbance at the site will prevent establishment of invasive plants.
- Use local seeding guidelines and appropriate mixes, but realize that many species previously recommended for this purpose are now presenting invasive problems.

- Use native material where appropriate and available. Re-vegetation may include planting, seeding, fertilizing, and mulching.
- Monitor and evaluate success of re-vegetation in relation to project plan.
- When re-vegetating areas that were previously dominated by invasive plants, try to achieve at least 90% control of the invasive before attempting restoration.

7. Accomplish invasive species management work with the "minimum tool" approach.
Management actions will be reviewed to determine the minimum action or tool (practices, tools, equipment, and regulations) that will accomplish the task. Management will seek the approach from available alternatives that will have the least impact on the resources while still being able to accomplish the desired goal. The minimum tool approach has important implications regarding use of **control methods**.

8. Manage invasive species with interdisciplinary scientific skills.
Invasive species management involves acquiring a working knowledge of complex relationships and requires the skills of natural resource professionals and researchers who work as a team in focusing on preserving biodiversity and native ecosystems.

Invasive Species Control Methods

Management options should be selected with consideration for the likelihood of success, the location and size of forest stands, the age of infestation, past methods used at the site, time of year, sensitive native flora or fauna within or adjacent to the target infestation, available resources, and adjoining and nearby land uses.

The application of control methods will be determined using **Integrated Pest Management** (IPM). IPM is a science-based decision-making process that guides land managers when investigating a pest situation. The IPM approach determines the most appropriate and cost effective management solution for the specific pest situation. IPM includes identification of the pest, understanding the use and significance of a site or the importance of protecting unique resources, and education of the people involved. IPM also establishes pest tolerance levels and monitoring protocols. Then, with the help of technical experts and on a case–by-case basis, DEC foresters develop an effective, site specific and low risk strategy to manage the pest. This includes altering conditions which attracted pests to the site in the first place. IPM often involves changing human behavior as well.

ADDITIONAL RESOURCES

Invasive Plant Control Methods, including information regarding control of specific species of concern can be found at http://www.dec.ny.gov/docs/lands_forests_pdf/sfinvasivecontrol.pdf

The following priorities will guide the application of control methods with varying degrees of environmental impacts. The most impactive methods hold the lowest priority and will not be

FOREST HEALTH

applied unless all higher priority methods are not effective. Low priority methods will be applied in concert with higher priority methods in order to increase effectiveness. As new technologies are developed, they will be incorporated into State Forest management following appropriate review and assessment.

1. **Silvicultural Remedies**
   Changes in forest composition and structure may create conditions that are less favorable to some invasive species.

2. **Hunting**
   Invasive and nuisance species can be kept in balance within the ecosystem by applying hunting as addressed within the Deer Management section of this plan.

3. **Mechanical Control**
   Digging, pulling or cutting may be effective in altering site conditions to control invasives and directly controlling some plant species.

4. **Grazing**
   Although many invasive plants may be resistant to applied scientific grazing, this method may be appropriate for some species. Grazing on State Forest lands would require the availability of an agricultural partner along with staff and funding resources.

5. **Biological Control**

   Biological control is the science of reconnecting invasive plants with the specialized natural enemies that often limit their density in their native ranges. The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) is responsible for controlling introductions of species brought into the United States for biological control of plants, in accordance with the requirements of several plant quarantine laws, the National Environmental Policy Act, and the Endangered Species Act. Petitions for release of plant biological control agents are judged by a Technical Advisory Committee, which represents the interests of a diverse set of federal and other agencies. (Van Driesche, et al. 2002)

6. **Herbicide Treatment**
   All pesticide/herbicide use will conform to guidelines identified in the Active Forest Management section on *page 81.*

Invasive Species Laws and Policies

The State of New York's official policy, enacted into law, is "to conserve, improve and protect its natural resources and environment..," (ECL §1-0101(1)) and it is DEC's responsibility to carry out this policy. As set forth in ECL §3-0301(1) DEC's broad authority includes, among many other things, the power to:

- Manage natural resources to assure their protection and balanced utilization;
- Protect and manage fish and other aquatic life and wildlife;

- Promote control of pests and regulate use of pesticides;
- Promote control of weeds and aquatic growth, develop methods of prevention and eradication, and regulate herbicides.

ECL § 9-1303 requires DEC to control and prevent the spread of forest insects and forest tree diseases. Similarly, ECL § 11-0325 gives DEC the authority to undertake fish and wildlife control measures to prevent the introduction or spread of a disease which endangers the health and welfare of fish and wildlife populations, domestic livestock, or the human population.

ECL Title 17 of Article 9 essentially requires that New York State agencies implement the recommendations of the 2005 New York State Invasive Species Task Force *Final Report* to the Governor and Legislature. ECL § 9-1705(5)(b) gives the Invasive Species Council the authority to identify actions taken to respond rapidly to and control populations of invasive species; and ECL § 9-1705(5)(c) gives the council the authority to develop a comprehensive plan that will address, among other things, prevention, early detection and rapid response.

CONTROL OF INTERFERING VEGETATION

Foresters manage forests with the goal of improving forest health, promoting biodiversity and enhancing forest productivity. These management goals may, from time to time, be impacted by interfering vegetation – either exotic invasive plants or over-abundant and interfering indigenous plants like hay-scented fern (*Dennstaedtia punctilobula)*, American beech (*Fagus grandifolia*) or striped maple (*Acer pensylvanicum*). Methods are chosen which maximize interfering vegetation control while protecting overall forest health and productivity (growth). For example, interfering vegetation may need to be controlled when: protecting a threatened species like hart's-tongue fern (*Asplenium scolopendrium* var. *americanum*) from an exotic invasive plant; perpetuating pitch pine (*Pinus rigida*) in the Albany Pine Bush; or establishing a desired species mix of Appalachian hardwoods.

Interfering Vegetation: Vegetation that uses the common resources (space, light, water, and nutrients) of a forest site needed by preferred trees for survival and growth (Glossary of Forestry Terms in British Columbia, Ministry of Forests and Range, March 2008)

Foresters have many options for controlling interfering vegetation to increase the success of their management decisions. With all management decisions, each option comes with benefits and drawbacks. However, foresters choose the option that best controls interfering vegetation most efficiently and economically while minimizing negative environmental impacts. Common practices foresters apply to control interfering vegetation include:

- **Do nothing** – When interfering vegetation becomes established, the forester may choose not to take action, for biological, economic or societal reasons. If this option is

chosen however, future control measures may be more expensive and may have more of an impact on the site. If this situation occurs the management objective for the site might fail or take much longer to achieve success.

- **Hand pulling** – Foresters may choose to have a crew enter the site and remove the interfering vegetation by hand. . This method of control may be successful in removing individual small occurrences of some species. However, this method is very labor intensive and expensive, has the potential for negatively impacting the site by disturbing growing conditions for desired plants, and is therefore typically limited to very small sites of less than two acres. Additionally, this method is not appropriate for removing species that can re-grow from root fragments unless workers can be sure to remove all plant material above and below ground.
- **Chainsaw cutting** – This option is adequate for sites requiring the control of individual large woody stems (typically small trees and shrubs) like hop hornbeam (*Ostrya virginiana*) and ironwood (*Carpinus caroliniana*). Although labor intensive and moderately expensive, chainsaw cutting can target very specific interfering vegetation with minimal site disturbance to surrounding vegetation and soils. Chainsaw cutting to control interfering vegetation can also be conducted at the same time as other silvicultural activities such as timber harvests and requires little additional expertise beyond the safe use of a chainsaw. Unfortunately, in many circumstances chainsaw cutting does not kill the target plants. Some of the more common interfering vegetation such as American beech (*Fagus grandifolia*) and striped maple (*Acer pensylvanicum*) can actually rapidly re-grow from root and stump sprouts after the main stem has been cut. However, by incorporating herbicide treatments after the cutting, either on the cut stump or on the foliage of the resulting sprouts, may improve the chances of successfully removing of this type of aggressive re-sprouting interference.
- **Mechanical removal** – Mechanical removal may include disking or mowing. Disking or mowing by large equipment can effectively and efficiently treat large areas in a short period of time. This option may be expensive but cost-effective compared to other options at a similar scale. The use of disking and mowing in New York is not very common and not readily available as an option for forest management. Additionally, the action of mechanical removal is non-discriminatory (it will destroy desired vegetation as much as interfering vegetation), is extremely site intensive, and may do significant damage to residual trees purposefully left on the site. Most methods of mechanical removal are limited to sites that are relatively flat, dry and free from large obstacles such as boulders – conditions relatively uncommon in New York forests. However, there are times when mechanical removal is appropriate to maintain desired herbaceous forbs and grasses in open land areas or to maintain early successional habitat. Mechanical removal may also improve growing conditions for exotic invasive plants just as well as for the preferred plants.

- **Fire –** Fire can be used to control interfering vegetation if the desirable species in the stand can withstand temperatures that will kill the undesirable species. In New York, oak forest types are best suited to being managed using prescribed fire, because oak seedlings and saplings are able to survive fire temperatures that will kill most of the plant species that commonly cause regeneration difficulties. Prescribed fires are only executed when weather and fuel conditions (wind, relative humidity, temperature, fuel levels and moisture content) are optimal to support a manageable controlled burn.

  To learn more about fire in New York please refer to the Fire Management section on page 303 of this plan.

- **Herbicide Application** – Herbicide use for the control of interfering vegetation will comply with guidelines identified in the Active Forest Management section on *page 81.*

"FH" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Forest Health (FH) Objective I – Promote overall forest health on State Forests, using timber sales to improve forest health and the diversity of species, habitats and structure in order to enhance the resiliency of ecological systems and forest sustainability. Harvests will be planned in such a way as to develop a wider range of forest successional stages. Harvest schedules will be developed as part of Unit Management Planning to further this objective.

FH Objective II – Protect State Forests from introduced diseases and invasive plant and animal species through cooperation with the Division's Forest Health program.

FH Action 1 – Complete development of the State Forest Invasive Species Response Plan, establishing step by step procedures to address invasive insect and disease outbreaks, by the end of 2010.

FH Action 2 – Identify, prioritize and address infestations within each UMP.

FH Action 3 – Develop invasive species BMP language to be included in all forest product harvest and construction contracts, to protect State Forest lands from the introduction, establishment and spread of invasive species. Language to be completed by 2011.

FH Action 4 – Develop and publish an educational brochure about invasive species BMPs for recreational users by 2014.

FH Action 5 – Develop species-specific guidelines for control of invasives to be used by all DEC staff undertaking activities on State Forests. Guidelines to be developed by 2012.

FOREST HEALTH

FH SEQR Alternatives Analysis and Thresholds

The **preferred alternative** (also the **no-action alternative**) is to continue to enhance overall forest health following the strategies, guidelines and actions discussed above. This involves the application of all components related to integrated pest management, including the use of targeted pesticide applications when all other options have been exhausted.

Another alternative would involve a hands-off approach to forest health issues. The option of letting nature take its own course is not viable, considering the real and imminent threats from human-introduced invasives and diseases and climate change. Human-induced impacts threaten natural systems and, in some cases, will lead to species extirpation if not controlled or mitigated.

The alternative of pesticide use has been addressed specifically in the active forest management section of this plan.

SEQR Analysis Threshold: Compliance with the guidelines and strategies of this section will avoid and minimize potential impacts resulting from forest health activities to the maximum extent practicable and no further SEQRA review will be conducted. However, specific mitigations and thresholds for pesticide use have been established in a separate “pesticides and herbicides” section of this plan.

MANAGING DEER IMPACTS

White-tailed deer are arguably the most significant wildlife resource in New York State from an economic, social and ecological perspective. Economically, benefits derived from deer include direct and indirect expenditures on hunting and wildlife observation. Losses are primarily associated with: agricultural crop damage; damage within forests to woody and herbaceous plants; damage in urban areas to ornamental plantings; adverse health impacts associated with deer (e.g., Lyme disease), and deer-vehicle collisions.

Ecologically, deer are considered a keystone herbivore. A keystone species is a species that has a disproportionate effect on its environment relative to its abundance (Paine 1995). The overabundance of deer can lead to the local extirpation of certain preferred herbaceous plant species, alter forest composition by favoring certain tree species over others, and alter habitat structure and food resource availability for other wildlife species.

Deer also have intrinsic value as a native wildlife species. For these reasons, it is unavoidable that deer management, and the setting of goals and objectives related to deer populations and impacts, is complex and often contentious.

The DEC Division of Fish, Wildlife and Marine Resources (DFWMR) is vested with the management of white-tailed deer in the state; as with all wildlife species in New York, deer are property of the state (ECL 11-0105) . Deer management in New York occurs at a multitude of scales, ranging from broad-scale statewide management to decisions focused on an individual-property. Land managers try to balance the needs and desires of the public with the possible impacts of deer on biodiversity and forest health.

History

The history of white-tailed deer in New York since 1492 mirrors the history of most other game species, across North America. The deer density in North America at the time of first European contact is hypothesized to have been 3.1 to 4.2 deer/km^2 (8-11 deer/sq. mi) (McCabe and McCabe 1994). Present-day deer population density estimates for much of New York are actually significantly higher. Upon European settlement of the continent, the deer population

MANAGING DEER IMPACTS

began to slowly decline. Over the next 350 years, the herd shrank to 35 to 50% of its former size. In the era following the Civil War, wildlife was under the greatest hunting pressure ever. During this time period, commonly referred to as the "era of exploitation" (1870-1920), deer numbers were reduced to 1 to 2% of their pre-European population (McCabe and McCabe 1994). As a result deer were extirpated from much of New York.

The devastation wrought on wildlife populations by unregulated market hunting and habitat loss during this period ushered in the beginnings of the modern era of wildlife management – an era during which game populations have largely rebounded and flourished because of the acceptance of science-based management, underpinned by a sound understanding of species' life histories and ecology, and the enactment of federal and state wildlife laws, which established hunting licenses and seasons, bag limits, and means of legal taking. It is extremely likely that deer densities now present in many localities of the state greatly exceed historic densities.

At present, deer populations in New York reflect a number of factors. Annual and short-term variations in populations are largely attributable to winter severity in northern NY and allowable harvest, specifically the allocation of Deer Management Permits (DMPs – permits for antlerless deer) in southern portions of NY. Long-term changes in habitat condition associated with land-use change, ecological succession, and possibly chronic deer overabundance may also have significant effects on deer populations; however, these effects are less obvious and more difficult to understand, quantify, and address when devising deer management strategies. As road density and vehicle use has increased and predator populations have also increased, non-hunting sources of deer mortality have likely also increased over the past 50 years. However, deer populations have also generally grown through this period and mortality associated with these sources is not generally sufficient to control deer populations (Vreeland 2002).

EXISTING CONDITIONS

Currently, DFWMR manages deer populations on the scale of a Wildlife Management Unit (WMU). Deer population levels in each WMU are monitored through the trends in annual deer harvests, bow logs and nuisance complaint levels. DFWMR sets goals for desired deer population levels within a WMU through recommendations of local stake-holders. Stake-holders represent the full range of interested citizens concerned with deer population size in an individual WMU. Based on these recommendations, DFWMR sets the number of DMPs available annually to manage the deer population closer toward the objective level. Statewide, there are a total of 92 WMUs, 89 of which are open to deer hunting.

ADDITIONAL RESOURCES

For more information on WMUs and the Citizen Task Forces go to www.dec.ny.gov/animals/7211.html

Deer Management Assistance Program

The Deer Management Assistance Program (DMAP) is an additional tool that allows landowners and resource managers to implement site specific deer management on their lands by allowing the harvest of additional deer. Applicants must qualify in one of five categories (agriculture, forest regeneration, significant natural communities, municipality, or custom deer management) to be considered for the program. A trial program for using this tool on State Forests where deer populations are negatively impacting forest health is being implemented.

Deer Impacts on Forest Ecosystems

The impacts of deer on forests are very well documented. Deer impacts have been demonstrated in countless instances of primary research and have generated numerous review articles (Waller and Alverson 1997) (Cote, Rooney and Tremblay 2004) (Latham, et al. 2005) and books dedicated solely to the topic (McShea and Rappole, Herbivores and the ecology of forest understory birds 1997). Researchers recognize that as deer populations increase, their impact on the ecosystem structure and function will also increase.

As deer browse, they select for individual plants in order to meet seasonally-based nutritional needs. Through selective browsing and foraging, deer can dramatically affect herbaceous and woody plant composition of a forest by preferentially selecting highly nutritious and palatable species while avoiding less nutritious or unpalatable species. Direct impacts to individual plants may include reduced growth rates, reduced or absent reproductive output, or mortality. For overstory tree species such as oak, reproductive output may be affected by consumption of propagules, including seeds (acorns), fruits, suckers, stump sprouts etc.; for herbaceous plants, consumption of flowers, seed heads, or fruits may limit reproduction. The selection of preferred specimen within a species may result in the elimination of individual plants with particular qualities. This could have significant impacts on the quality and representative stocking of the species at a population level. Selection by species has negative effects on preferred species and affects forest composition. For herbaceous plants, these effects may include local rarity, genetic isolation, and extirpation. For tree species, regeneration of preferred browse species may be severely impacted or eliminated, threatening the long term sustainability of a forest cover type following natural disturbance or timber harvest.

Furthermore, non-preferred invasive species, such as Japanese barberry and Japanese stiltgrass, and native species, such as hay-scented fern, Pennsylvania sedge, and mountain laurel, are given a competitive advantage over species preferred by deer and, after many years of overabundant deer, come to dominate the understory of many forested sites. These conditions can persist even after a drastic reduction in deer density occurs.

Aside from direct impacts on vegetation, deer can have indirect impacts on other trophic levels by simplifying forest structure and competing for food resources. Deer browsing can severely

MANAGING DEER IMPACTS

degrade the habitat quality for bird species requiring areas of dense understory for nesting or foraging. Overabundant deer degrade the vertical structural diversity of forest habitats by eliminating the shrub/sapling layer and decreasing the diversity of the ground layer.

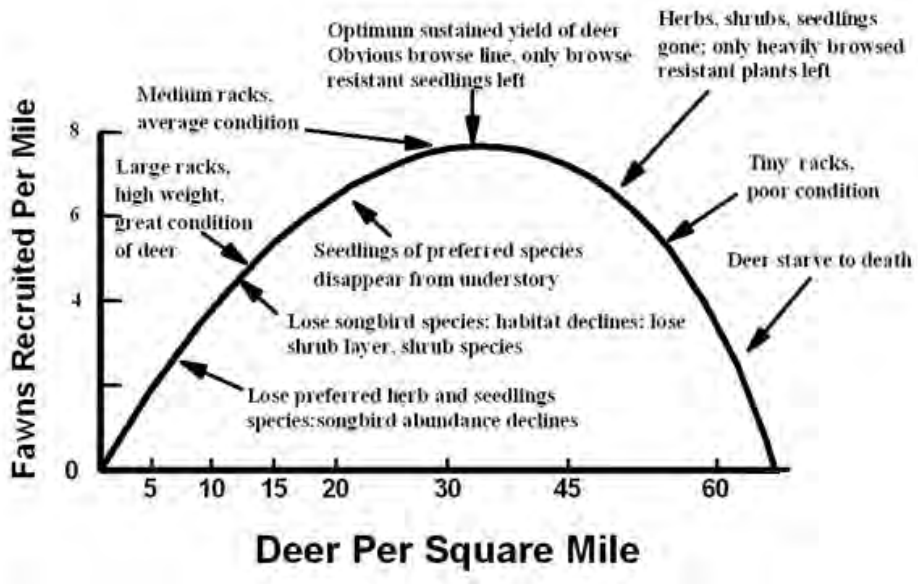
Deer-attributed changes to forest structure and composition can have significant negative effects on the diversity and abundance of forest-breeding birds (Casey and Hein 1983) (deCalesta, Effect of white-tailed deer on songbirds within managed forests in Pennsylvania 1994) (McShea and Rappole 2000). Declines in bird diversity result from both the loss of ecological niches with habitat simplification and an increased exposure to nest predators as habitat complexity decreases (McShea and Rappole, Herbivores and the ecology of forest understory birds 1997). A decrease in vegetation density may reduce food, cover, and nesting sites, while increasing nest predation rates, even in large forest tracts (Leimgruber, McShea and Rappole 1994). Populations of birds that nest or forage on the ground or in the understory grow after deer reduction, along with increasing vegetation cover and diversity (McShea and Rappole 2000). Bird species of conservation concern in New York that may be impacted by deer browsing include wood thrush, worm-eating warbler, cerulean warbler, black-throated blue warbler, Louisiana waterthrush, ruffed grouse, and Canada warbler. Direct competition by deer for mast crop resources can impact small mammal populations as well (McShea and Rappole 1992) (McShea and Schwede 1993).

The Ripple Effect

Deer impacts on bird species don't end there. Those impacts have a "ripple effect" on other parts of the ecosystem. For example, deer browsing removes the understory habitat of the Yellow-billed Cuckoo, an impact that further affects the forest because the Yellow-billed Cuckoo is one of the few North American birds that readily eat hairy caterpillars (ex. tent caterpillars and forest tent caterpillars). They also eat gypsy moths. This bird species is a natural control for caterpillar species that left unchecked could do serious damage to the tree canopy and affect the forest as a whole. Their population is often abundant when an outbreak of these pests occurs. (Ickes 1992) For example, prior to a major tent caterpillar outbreak that occurred in 2003-05, regular bird surveys indicated that Yellow-billed Cuckoos were scarce on Fort Drum, in northwestern New York. During the outbreak, the population expanded rapidly and although it has since declined, it is still above pre-outbreak levels.

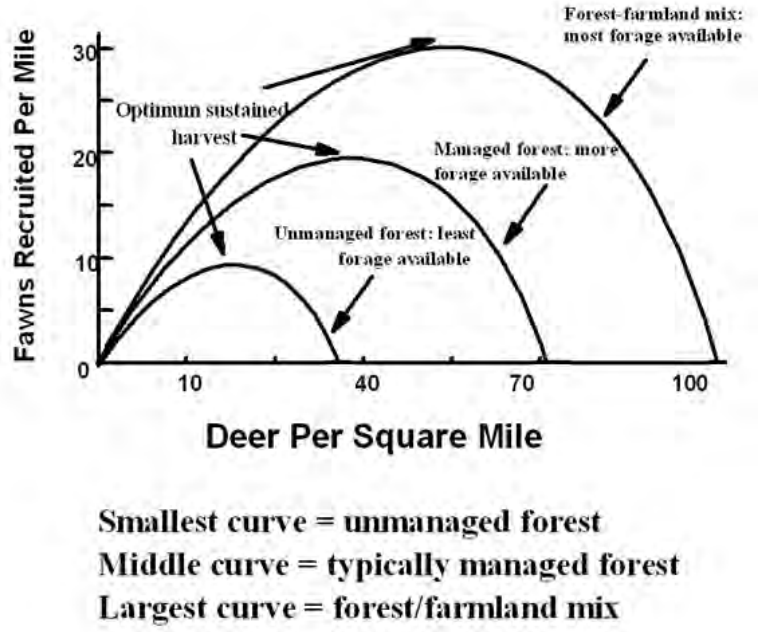
The maximum deer density that is acceptable for the successful regeneration of herbaceous and woody plants can vary from property to property depending upon the previous and current forest management regime, site productivity, and availability of forage within the surrounding landscape. In forests that are actively managed for wood products, such as many of DEC State Forests, the managed disturbance regime within such a forest allows for the increased production of forage thus allowing the forest to sustain higher deer populations than a typical unmanaged forest, such as the Adirondack Forest Preserve. Further, the presence of agricultural land in close proximity to forest land increases the ability of that landscape to support deer. However, when deer use of the landscape varies seasonally, such as concentration in and near agricultural areas in summer and fall but concentration in forested areas in winter and spring, deer populations can continue to exert unsustainable levels of browse pressure on those forests. Therefore, land managers need to understand and evaluate landscape context and influences of deer behavior when considering deer impact to a particular State Forest. (Figure 2)

Figure 1 (deCalesta and Pierson 2005)



MANAGING DEER IMPACTS

Figure 2 (deCalesta and Pierson 2005)



STRATEGIES FOR MANAGING DEER IMPACTS

The following recommendations will guide management of deer impacts on State Forests.

Participation in Citizen Task Force Meetings for WMU's which contain State Forests.
In most landscapes, State Forests represent only a small portion of the forest base within each WMU. It would be impractical and inefficient to develop and attempt to implement deer management at the State Forest level. For this reason, State Forest managers will seek to participate as advisors in all Citizen Task Forces and as stake-holders where appropriate and will rely on the expertise and assistance of DFWMR.

The Bureau of State Land Management will designate or recommend a regional representative to attend all citizen task force meetings pertaining to the management of deer within a WMU that contains State Forest properties. The representative should be a person (such as the State Forest land manager), who has a distinct knowledge and familiarity of the browse impacts present on the State Forests located within the WMU. Performance of browse impact surveys on these properties preceding such meetings will be encouraged to offer insight as to the state of the deer herd and its interaction with the resources on property open to the public for hunting.

Work Planning to Assess Deer Herd Impacts on State Forests and Monitor the Effectiveness of Management Actions:

There is limited ability to manage deer impacts using silvicultural systems. The most effective method of keeping deer impacts in line with management objectives is to monitor impacts while observing and managing the herd (Stout 2005). On properties where deer are suspected of impacting values and objectives associated with biodiversity and timber management, such impacts will be inventoried and assessed. Any management actions taken to address deer over-abundance will also need to be assessed to determine if in fact the action taken is accomplishing the stated objective of reducing impacts. This will require a commitment of time and resources by inter-Divisional staff to develop a protocol for assessing the impacts of deer and the appropriate management response needed to address those impacts.

Developing an Inventory Protocol for the Assessment of Browse Impacts:

Staff will work with DFWMR and leading experts in the field of deer management to develop a simple and acceptable protocol for conducting an inventory of deer impacts on State Forests, as well as providing a simple tool for use by private landowners. The protocol should include the following specifications:

1) The protocol needs to be adaptable to the different regions of the state, and different ownerships. The protocol shall primarily be used as a stand-alone inventory of deer impact, but may also be integrated with the State Forest Inventory Program for properties in which Forest Inventory is being conducted for that fiscal year.
2) The protocol needs to be quantitative. It should avoid using subjective observational data that could vary depending upon the person assigned to do the inventory. Example: Fixed radius plots combined with a percent of browse impact.

Developing State Land Deer Management Guidelines for making decisions related to addressing Deer Impacts on State Forests:

Once a protocol has been instituted, a model needs to be developed to indicate the level of deer impacts within the forest and if action needs to be taken to reduce those impacts. A Deer Impact Index such as the one developed in (Marquis, Ernst and Stout 1992) would be an excellent tool to translate objective data recorded in the field into a description of the impacts and their level of severity. Recommendations for actions would then need to be developed.

Developing Capacity to Create a State Forest Fencing Program:

The use of high fences to exclude deer from large areas of the forest is the most effective method to mitigate the negative impacts of deer upon understory plants within a forested area. As stated previously, negative impacts associated with deer overabundance can persist even after reduction of deer density occurs. Fencing portions of State Forest lands that have been impacted by excessive deer browse will prevent loss of “high-preference” browse-intolerant herbaceous plants that may otherwise become locally rare or extirpated from the ecosystem. Such species could include trillium, Indian cucumber, Canada mayflower, etc. (Rawinski 2008).

MANAGING DEER IMPACTS

The Bureau of State Land Management has considered a fencing program intended to exclude deer from areas on State Forest properties where the impacts associated with deer browse are contributing to the loss of species diversity and the failure of silvicultural objectives. The state of Pennsylvania and the Allegheny National Forest both have successfully employed temporary deer exclosures to allow establishment of forest regeneration in areas with excessive deer population levels. This is a very effective but very expensive method which is well beyond existing funding capacity.

The only viable means of supporting this program and other needed deer management strategies would be to re-invest a portion of every timber sale's proceeds into a dedicated fund for the purpose of regenerating forest stands and mitigating deer impacts. A similar program in Pennsylvania has been established with part of the income from their State Forest timber sales.

The effect of deer browsing is dramatically illustrated in the above pictures where, deer have been excluded from one side of the fencing. Conditions were identical on both sides before construction of the fence.

Applying for use of DMAPs on State Forests:

In some cases, WMU-wide deer take objectives are not sufficient to address impacts occurring on a specific property. In these cases, the land manager may seek approval from the DFWMR Regional Wildlife Manager for participation in the Deer Management Assistance Program (DMAP) until such time as deer impacts can be reduced and the Deer Take Objectives can be reviewed through the citizen taskforce. As stated previously, DMAP permits are issued to a landowner or land manager for the purpose of reducing the deer herd on a specific property. On state lands enrolled in DMAP, the forester responsible for the management of the subject property will be the designated agent for the distribution of DMAPs and harvest reporting to DFWMR. The program will utilize a fair, equitable and effective system for issuing permits developed with approval of DFWMR staff. Regions participating in DMAP will be expected to

develop a hunter database intended to keep track of DMAP recipients and conduct follow up surveys/personal interviews with DMAP recipients intended for the purpose of generating harvest reports in accordance with DFWMR policy. Refer to DFWMR guidelines for reporting procedure.

Hunter Access and Demographics

It is recognized that DMAPs are not the only answer and may not always provide the solution to the impacts of overabundant deer. Big game hunters can provide an important and viable means of deer population control, which should be enhanced when possible. Issues related to hunter access and demographics can be influential factors related to the effectiveness of a targeted deer reduction program. This means that, on State Forests, land managers must consider provision of maps, web-based information, road access and parking availability. Closely monitoring vegetation response to reduced deer populations on individual properties will offer insight to the land manager regarding other issues that may be impeding hunter success and the subsequent reduction of deer impacts. The land managers can then use such information to implement management strategies to address these factors.

Deer Density

Land managers are encouraged to participate in surveys of deer density on State Forests where negative impacts to vegetation are evident, especially when actions have been taken or may be taken to reduce impacts by reducing deer density. Deer are notoriously difficult to count and there is no widely agreed upon survey method in the scientific community. Survey methods documented in scientific literature and supported by popular use, such as pellet surveys, will be supported on State Forests impacted by deer herbivory. These surveys are not intended to nor will provide an exact count of the deer population. Instead, these surveys shall be used to provide an index of abundance that can be tracked over time to analyze population trends and herd response to deer reduction programs.

While the measurement of deer abundance may provide insight to the relationship between a property's deer density and corresponding impacts, ultimately, the success of measures enacted to reduce deer density on a specific property should be measured in terms of any changes in impact levels to the vegetation. Vegetation monitoring, including the use of browse surveys, permanent plots studies, and/or deer exclosures, shall be conducted to evaluate changes in vegetation impact relative to the effectiveness of DMAP or other mitigation strategies.

Strategies for Mitigating Deer Impacts on State Forests

In addition to hunting, deer impact mitigations should include but not be limited to deer exclosures, invasive species removal and site preparation. Another mitigation strategy is to adapt silvicultural practices that utilize more even-aged management, particularly by converting plantations to early successional seedling/sapling hardwood stands; use large group and patch cutting instead of single tree or small group selection harvests in stands with uneven-aged

MANAGING DEER IMPACTS

management directions; and group treatments or harvested areas to overwhelm the existing deer population.

Additionally, if a State Forest is enrolled in the DMAP the timing of silvicultural treatments also should be considered. The temporary reduction in deer density created by the focused hunting effort of DMAP creates a window of opportunity to establish and grow tree regeneration. Harvests should be scheduled in anticipation of enrolling a property in DMAP and throughout the period deer densities are reduced as a result of DMAP. This increase in forest management will not only overwhelm the ability of the remaining deer to significantly impact subsequent regeneration, but will result in habitat that is more capable of supporting the new deer population.

"DM" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Deer Management (DM) Objective I – Monitor the impact of deer browsing on forest health and regeneration.

DM Action 1 – Develop an inventory protocol for the assessment of deer browse impacts and deer density. Protocol should include thresholds for when inventories should be conducted and guidelines for monitoring effectiveness of actions taken. Protocol to be developed by 2014.

DM Action 2 – Develop a list of strategies appropriate for addressing unsustainable levels of deer density on State Forests. Develop guidelines including impact thresholds, to assist staff in deciding which strategies to use in addressing deer impacts. Strategies and guidelines to be developed by 2014.

DM Action 3 – Conduct deer density and browse impact inventories on State Forests using protocol developed in DM Action 1. Initiate impact inventories no later than 2015 in high priority areas.

DM Action 4 – Participate in Citizen Task Forces where State Forests are part of a WMU.

DM Objective II – Address issues of over-browsing.

DM Action 5 - Improve hunter access and success rates by providing web-based information and maps, and by enhancing road access and parking availability.

DM Action 6 – Work with DFWMR biologists to identify and employ active deer population control measures, such as DMAP issuance, fencing to mitigate impacts when and where excessive browsing is identified.

DM SEQR Alternatives Analysis and Thresholds

The **no-action alternative**, or in other words, continuing with current management approaches, has not been selected. There are a few areas of the state where the above actions are being implemented, but throughout the State Forest system as a whole,

noticeable deer browse impacts continue to occur. This alternative is not acceptable, considering the severe impacts deer over-browsing can have on future forest structure as well as some protected species.

The overall **preferred alternative** is to enhance monitoring and actively manage deer populations in conjunction with DFWMR biologists. The preferred alternative also considers the interests of deer hunters and will lead to sustainable deer population levels.

There are a number of individual deer population control methods which have been considered as alternatives and listed under DM Objective II. Of these, the preferred alternative is to implement DM Action 5. This alternative is preferred as it has been proven to be effective and furthers other recreational goals. Only when this action has been fully implemented and monitoring still shows excessive browsing, shall additional population control methods under DM Action 6 be employed.

SEQR Analysis Threshold: Compliance with the guidelines and strategies of this section will avoid and minimize potential impacts resulting from managing deer impacts. Use of any deer population control methods other than those actions proposed within this section would likely be unproven and controversial, requiring additional site-specific environmental review under SEQRA.

FIRE MANAGEMENT

Statewide, fire currently plays a small role in shaping New York's forests; but in some areas it is an ever-present danger, and in some ecological regimes, it is a necessary component. Some natural communities are dependent on fire for renewal and growth.

Public education has reduced the incidence and extent of wild land (forest) fires in New York over the past 100 years. When fires do break out, New York's climate and vegetation tend to make them relatively easy to suppress. But during periods of drought, New York has seen historically significant wildfires that have caused serious damage to forest soils and human settlements.

Fire management on State Forest lands will entail the suppression of fires, both natural and human-induced as well as the application of prescribed fire under appropriate conditions. The goal of this is to maintain fire-replicated natural communities and prevent extreme fire danger that could threaten natural and human communities. The cumulative impact related to suppression of fire over time can lead to excessive fuel loads that can be dangerous in drought conditions. Maintaining the presence of fire in appropriate areas can keep fuel loads in check.

Prescribed Fire is used to approximate the natural vegetative disturbance of periodic fire occurrence. This vegetative management tool is used to maintain fire dependent ecosystems and restore those outside their natural balance. Generally, low intensity prescribed fire, is applied by trained experts to clear ground of dangerous fuels like dead wood and brush. This low-intensity fire is vital to the life cycles of fire-dependent range and forest lands. (USFS, website www.fs.fed.us/fire/fireuse/rxfire/rx_index.html) Prescribed fires are also used as a tool to control the buildup of excessive fuel levels which could contribute to disastrous and uncontrollable wildfires. Prescribed fires are only executed when weather and fuel conditions (wind, relative humidity, temperature, fuel levels and moisture content) are optimal to support a manageable controlled burn.

The Division of Lands and Forests is heavily reliant on the support and cooperation of the Division of Forest Protection and Fire Management. Their Forest Rangers review fire plans for state lands, help oversee and develop prescribed fire programs and are responsible for maintaining an organization which is capable of responding to wildland fire. In the protected areas of fire districts and fire towns, Forest Rangers share dual jurisdiction with village and town fire departments under the General Municipal Laws.

NEW YORK'S FIRE HISTORY

Prior to European settlement in New York State, use of fire was widespread among hunting and gathering societies. Fire was used to encourage berries, harvest natural grains and nuts, and shape a habitat rich in game. Fire hunting was a common practice in the fall, and fires sustained

FIRE MANAGEMENT

the herbaceous landscape frequented by elk, deer, buffalo and turkey. The forests around native settlements were periodically burned to eliminate underbrush and other herbaceous cover. This practice effectively thinned out the forest, creating areas suitable for agriculture and reducing the opportunity for ambush by marauding enemies. Early European explorers often referred to clearings by fire as “barrens” or “deserts,” and they were common sights. However, in New York, mountains, river bottoms, swampy lowlands and denser boreal forests were more or less spared from annual fire setting.

European settlement expanded the process of agricultural reclamation begun by the aboriginal tribes. More forested land was cleared and new villages were created. Domestic grasses and managed pastures replaced the harvesting of natural foodstuffs and wildlife. Forest land was also cleared to satisfy the ever increasing demand for lumber. Slash-heavy logging practices, widespread logging and dry weather between 1880 and 1910 led to intense wildfires, especially in the Adirondack and Catskill mountains.

During this era, New York State initiated a fire protection system, led by fire wardens and a newly formed group known as forest rangers, covering the most fire prone areas. From the 1880s until the 1990s, the state’s fire management activities were focused on fire suppression. Except for occasional regional fires and outbreaks in the early 1940s and 1960s, favorable climatic conditions, along with the state’s suppression and prevention efforts have led to reduced numbers of fires and acreage burned in recent years.

Causes of Wildfire

There are many different causes of wildland fires. The leading cause of wildland fire on New York State’s public lands is unattended campfires. Overall in New York State, human caused wildfires are the leading category of reported fires and debris burning is the leading human cause. Over the past 20 years, lightning strikes have accounted for approximately four percent of the total reported fires in the state. However, in 2002, at the end of a five year drought, lightning caused 12 percent of the total fires reported.

Wildfire Detection

Wildfire detection and reporting has evolved over time, since the first fire tower in New York was constructed in 1905 on Balsam Mountain in the Catskills. Through the late 1980s fire towers manned by fire tower observers were the principal tool used to report smokes. A number of fire towers were constructed amidst large holdings of State Forest lands in the Southern Tier and Hudson Valley in order to protect those lands from fire. Additionally, the CCC's built many miles of truck trails and fire breaks and hundreds of water holes for better access, to prevent fire spread and to aid in extinguishment when fires occurred.

Today, none of the fire towers are manned for the express purpose of fire detection. DEC uses aerial detection flights, flown as conditions warrant during fire season, detection by DEC staff and reports from civilian aircraft and the public.

Trends

The number of prescribed burns is anticipated to increase throughout the state, focusing primarily on perpetuation of fire dependent communities, along with increasing interest in hazard fuel reduction and habitat manipulation projects. This trend is dependent on the availability of DEC resources and assistance from other partners such as The Nature Conservancy.

Fire Danger Rating Areas

Fire Danger Rating Areas are zones with similar climatic and vegetative conditions that are monitored for susceptibility to wildfire. Monitoring is achieved with the assistance of Remote Automatic Weather Stations that provide real-time weather conditions, allowing the fire danger to be updated on a daily basis. The following Fire Danger Rating Areas contain significant areas of State Forest lands and have a tendency for elevated fire danger.

Long Island

The central portion of the area, or as it is known locally, the Central Pine Barrens, has large tracts of pine barrens species such as pitch pine, scrub oak, black oak and scarlet oak, creating different communities such as dwarf (pitch) pine, pitch pine/oak, oak/pine, pine/oak/heath and to a lesser extent upland hardwoods. Agricultural areas and grasslands as well as many small and large pockets of phragmites are also found.

Large fires on Long Island are typically wind-driven. July, August and September see the most severe fire behavior. The sea breeze can influence wind driven fires with high rates of spread and diurnal 180 degree wind shifts. Dense stands of pine/oak/ scrub oak/heath can produce flame lengths of 15 to 30 feet. Crown fires can be sustained in closed stands of pitch pine or in stands of scrub oak with leaves that over-winter.

Hudson Valley

Mixed northern hardwoods of oak, maple, hickory, ash, cherry and beech dominate the area. Some scattered pockets of hemlock, fir, pine and red cedar are also present.

The primary carrier of fire is timber litter or grass. Spread rates are low to moderate. Fire intensity may be low to high with flame lengths usually less than four feet. Spotting and torching is possible. Duff fires with high resistance to control are common during summer periods with sustained periods of drought.

Southern Tier

This FDRA is a combination of forested land and abandoned agricultural land. Primary forest types are oak/hickory and northern hardwoods. Abandoned agricultural lands generally have a majority grass/shrub component.

FIRE MANAGEMENT

Spring fire behavior in the grass fuel types during moderate weather conditions will produce flame lengths between 4-12 feet and ROS between 78-104 chains per hour, if not influenced by initial attack or other conditions. Typical fire behavior in hardwoods will produce flames of 1-5 feet with ROS between 2-8 chains per hour. Higher fire intensities are observed in the oak/hickory types and may contribute to problem fire behavior, especially if an understory of rhododendron is present.

FIRE-REPLICATED OR DEPENDANT NATURAL COMMUNITIES

Grasslands and Oak Openings

Grasslands

Prescribed fire can be used to improve the quality of grassland habitat for bird species such as the Henslow's sparrow, grasshopper sparrow, bobolink, and savannah sparrow. The quality of habitat in grasslands is reduced for many bird species when shrubs and other successional species encroach into open fields. Prescribed fire is intended to remove the build-up of dead vegetation, encourage new grass growth, and control undesirable vegetation such as thistle, milkweed, goldenrod, asters, and various shrub species.

Maintenance of grassland habitat on Long Pond State Forest in Chenango County

A typical management objective, applied to fields on Long Pond State Forest, is the prevention of shrub cover from increasing beyond 5%. Management activities will generally occur during the non-breeding season to minimize effects on breeding birds.

ADDITIONAL RESOURCES

USGS Management Guidelines – The USGS has published guidelines for specific grassland bird species at: www.npwrc.usgs.gov/resource/literatr/grasbird/

Oak Openings

The globally rare plant communities commonly referred to as "oak openings" or "oak savannahs" are composed of native prairie plants, usually surrounded by Oak - Hickory forests. Considered to be "fire climax" communities, fire has played a key role in establishing them and assuring their continued existence. Historically, fires were set by Native Americans or caused by lightning strikes. Without prescribed fire, these communities will weaken over time and disappear from the landscape. Fire produces bio-chemical effects which cannot be duplicated by other management actions.

The DEC manages the 230 acre Rush Oak Openings Unique Area, located in southern Monroe County. This site is the only known intact oak opening remaining in New York State and is the easternmost remaining oak opening. Oak openings were very common in the Midwest (where the prairie met eastern forests) prior to European settlement.

Oak openings can be variable in size, from just an acre to several thousand acre complexes. Characteristic species include indian grass (*Sorghastrum nutrans*), little bluestem (*Schizachyrium scoparium*), butterfly - weed (*Asclepias tuberosa*), and wild bergamot (*Monarda fistulosa*) along with scattered specimens of chinquapin oak (*Quercus muhlenbergii*), northern red oak (*Quercus rubra*) and white oak (*Quercus alba*).

Pine Barrens

Long Island Central Pine Barrens

The pitch pine, oak, and ericaceous shrub dominated forests of the Long Island Central Pine Barrens represent an extremely volatile fuel type with a long history of severe fires. They are the most dangerous wildland fuel complex in the Northeast. Coupled with a dense human population and decades of extensive development, the Central Pine Barrens presents a significant wildland-urban interface hazard. These fire-dependent barrens are also an important habitat for a variety of rare, threatened, and endangered plant and insect species.

David Sarnoff Preserve in Suffolk County is part of the Long Island Pine Barrens

Most of the area is comprised of an overstory of pitch pine and/or tree-sized oak in varying densities, with either a scrub oak or huckleberry/blueberry understory. Open areas are dominated by scrub oak. Many stands have a heavy accumulation of litter and duff.

Following a recent round of catastrophic fires in 1995, the Central Pine Barrens Commission formed a Wildfire Task Force to develop a coordinated approach to fire management. The DEC and The Nature Conservancy are joint partners in the Long Island Central Pine Barrens Forest Fuel Reduction and Ecological Restoration Demonstration Site, funded in part by a federal grant issued under National Fire Plan. The goal is to apply prescribed fire or mechanical fuel reduction techniques at a landscape level. In order to reach beyond state lands, local demonstration projects have been undertaken for public education and as a learning opportunity for land managers to observe firsthand the results of different types of fuels management.

FIRE MANAGEMENT

Albany Pine Bush

The Albany Pine Bush represents one of the best remaining examples of an inland pine barrens ecosystem in the world. This gently rolling sand plain is home to a unique diversity of animals and plants, including 20 rare species and two rare natural communities. DEC is a member of the Albany Pine Bush Preserve Commission, which administers the preserve, which includes state land as well as private and municipal land.

A formal protection plan guides the future management and protection of the unique inland Pine Barrens habitat, home of the endangered Karner Blue Butterfly. Prescribed fire and mechanical treatment are used to encourage native species of grass, wild blue lupine (*Lupinus perennis*), pitch pine (*Pinus rigida*) and scrub oak (*Quercus ilicifolia*) and to inhibit hardwood invasion by species such as quaking aspen (*Populus tremuloides*), black cherry (*Prunus serotina*, and gray birch (*Betula populifolia*).

GUIDELINES FOR FIRE MANAGEMENT

The use of prescribed fire will be addressed, where applicable, in Unit Management Plans. UMPs that address prescribed fire should clearly state goals and objectives for the use of fire on the unit. Engaging in partnership with multiple DEC programs, state agencies, non-profit groups, municipalities and private landowners is vital to implementing fire management policies. Protocols and procedures for the use of prescribed fire and fire suppression response have been developed by DEC's Division of Forest Protection and Fire Management. The chief role of land managers is to offer input on ecological and biological concerns as well as the public notification procedures to be included in prescribed fire plans.

Fuels Management and Prescribed Fire

Fuels management may include use of prescribed fire, mechanical treatments, or chemical treatments, or any combination. A safe and effective prescribed fire program can mitigate risks to people and their communities, and restore and maintain healthy, diverse ecological systems using fuels management. Short term impacts associated with prescribed fire listed below should be considered in light of the long term benefits to forest health and reduced fire hazard.

There are a number of potential short-term impacts associated with prescribed fire, including:

- The risk of a fire burning out of control and the resulting danger posed to personal property and public safety and health.
- The safety risks for staff
- The impact of smoke on neighboring communities, especially on individuals with respiratory sensitivities
- The impact on wildlife species
- Aesthetic impacts

- Impacts on recreational use of the area after the burn
- Impacts to non-target vegetation if the prescribed fire intensity is exceeded.

The following mitigation measures will be employed to address potential impacts:

- Prescribed fires in grasslands will be timed to limit impact during breeding and nesting season
- All prescribed fire projects must have an approved prescribed fire plan prior to ignition.
    - All prescribed fire plans must contain measurable objectives and a predetermined prescription that defines conditions under which a prescribed fire may be ignited to reduce the chance of an escaped fire.
    - Prescribed fire plans will also establish acceptable wind directions to avoid smoke impacts on population centers and travel corridors.
    - Plans will incorporate public notification protocols
    - Staff members conducting prescribed fires will be required to follow safety protocols.
    - Areas to be treated (burn units) will be delineated and sized to reduce visual impacts

Wildfire Prevention and Suppression

The impacts from wildfires are similar to and greater than those from prescribed fires. Most wildfires occur during periods of high fire danger and their intensity is far greater than would be permitted under a prescribed fire. Intense fires can seriously impact forest soils, riparian areas and valued natural communities. As a result, it is the Department's policy to prevent and control wildfires on State Forest lands. The risk of fuel loading in non-fire dependent natural communities and hardwood stands that form the majority of New York's State Forests is minimal and does not require fuel reduction by letting wildfires burn.

DEC's wildfire prevention and suppression program strives to mitigate or avoid wildfire impacts by applying the following measures:

- Fuel loading and fire danger are monitored by Forest Rangers during fire seasons.
- Wildfires on State Forest lands are reported to DEC's Division of Forest Protection and Fire Management.
- Timber sales contracts require all harvesting equipment to have spark arresters.
- When significant mortality from blowdown, disease or insect infestation creates high fuel loading, salvage harvests are conducted to mitigate the risk.
- The public is encouraged to use campfires responsibly.

FIRE MANAGEMENT

- Methods of reducing impacts of wildfire suppression on the ecosystem should be incorporated into fire suppression activities, and low-impact methods should be deployed whenever possible (i.e. indirect attack methods).

"FM" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Fire Management (FM) Objective I – Support Forest Rangers in their traditional responsibilities of controlling the ignition and spread of wildfire on State Forests.

FM Objective II – Maintain naturally occurring fire-dependent communities on State Forests.

FM Action 1 – Continue to conduct prescribed burns in conjunction with Forest Rangers to perpetuate fire dependent communities.

FM SEQR Alternatives Analysis and Thresholds

Wildfire Prevention and Suppression
The **no-action alternative** which has been chosen as DEC's **preferred alternative** is the continuation of the Forest Rangers' traditional role of prevention education and active suppression. As mentioned above, suppression does not create excessive fuel loading in most State Forest settings.

An alternative for the suppression of wildfire would be a "let burn" policy. This cannot be implemented, considering the resource damage from an intense wildfire, threat to public safety and destruction of personal property.

No other viable alternatives have been identified.

Fuels Management and Prescribed Fire
The **no-action alternative** for use of prescribed fire has been adopted for all State Forest lands other than those listed in the preferred alternative. DEC's **preferred alternative** is to continue the use of prescribed fire on a limited acreage to maintain fire-dependent communities, grasslands and to treat forests in highly populated areas where excessive fuel loading could develop (i.e., Long Island Pine Barrens). The area of any single burn operation will be less than 100 acres.

SEQR Analysis Threshold: Compliance with the guidelines and strategies of this section will avoid and minimize potential impacts resulting from the use of prescribed fire. DEC will employ prescribed fire only if it is in conformance with the preferred alternative above and addressed in an approved fire plan. Any other prescribed fire will require additional site-specific environmental review under SEQRA.

CARBON SEQUESTRATION

Climate Change, Global Warming and Greenhouse Gases

One of the most important and highly-publicized environmental issues in the world today is climate change and the related concern of global warming. While there is a significant amount of debate and speculation on the rate of global warming, scientific studies from almost every nation have documented an increase in greenhouse gasses in the Earth's atmosphere. "As the largest source of greenhouse gas emissions, carbon dioxide (CO_2) from fossil fuel combustion has accounted for approximately 79 percent of global warming potential (GWP) weighted emissions since 1990…" (U.S. EPA 2009). "The global atmospheric concentration of carbon dioxide has increased from a pre-industrial value of about 280 ppm (parts per million) to 379 ppm in 2005. The atmospheric concentration of carbon dioxide in 2005 exceeds by far the natural range over the past 650,000 years (180-300 ppm) as determined from ice cores." (Intergovernmental Panel on Climate Change 2007).

The predicted consequences of global warming include species extinction, wider swings in weather patterns, melting of polar ice and glaciers, rising sea levels, shifting trade winds and the death of coral reefs, to name a few. Even though the future cannot be accurately predicted, all possible solutions to mitigate this problem must be considered, including the contributions that forests can supply.

In order to combat climate change, carbon needs to be pulled out of the atmosphere and put into long-term storage elsewhere. Trees and forests are one of the answers. Carbon sequestered "by US forest growth and harvested wood products currently offsets 12-19% of US fossil fuel emissions." (Ryan 2010). Through photosynthesis trees absorb CO_2 and use the carbon (C) to form wood fiber (growth) while releasing oxygen (O_2) into the atmosphere. Forests and urban trees presently absorb over ten percent of the overall CO_2 emissions in the United States annually. Carbon sequestration is also occurring in wetland habitats and is a great reason to protect wetlands as well as forests.

One half the dry weight of wood is carbon.

One means of combating climate change is adapted management of State Forests. Minor adverse impacts associated with carbon sequestration strategies (discussed below) may include slightly lower harvesting levels and reduced capacity to accommodate biodiversity objectives because of longer harvest intervals in some stands.

Afforestation has been a tremendous source of carbon sequestration over the past century. However, today much of that potential has already been realized. In the early 1900s about 25% of New York's land area was forested,

CO_2 CARBON SEQUESTRATION

today more than 61% is forested. Consequently there are relatively limited opportunities for new, large scale additions of forest cover. Active forest management now provides the primary potential for carbon sequestration in this state.

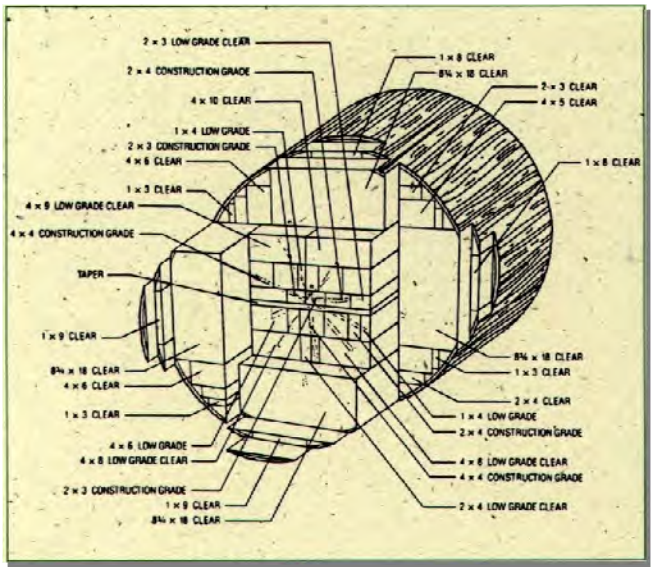
Active Forest Management

Active forest management involves the use of silvicultural systems to conduct timber stand improvements, timber harvests and various other treatments described in this plan that affect forest composition and vigor. Associated impacts are addressed in the forest products section of this plan.

Active forest management enhances a forest's carbon sequestration capacity by harvesting of future mortality and enhancing growth rates through thinning. Through active forest management, State Forest lands have an advantage in the ability to sequester carbon. Although forests do release some CO_2 from natural processes such as decay and respiration, a healthy forest typically stores carbon at a greater rate than it releases carbon. A forest's rate of growth is reminiscent of human growth for in its "teenage" years it has a large appetite for CO_2. The actual rate of carbon sequestration will vary with species, climate and site, but in general, younger and faster growing forests have higher annual sequestration rates. While older forests, such as those in New York's Adirondack and Catskill Forest Preserve and on many State Forests, have significant value as pristine water sources, undisturbed wildlife habitat, genetic repositories, and places of rare beauty and special value to society, these forests have a significantly lower potential for carbon sequestration.

Forest Soils

As a forest grows, carbon in the form of organic matter such as roots, leaves and twigs, collects in the soil. This is called soil organic carbon (SOC). SOC stock may decline sharply following harvesting due to soil mixing and exposure, leading to oxidation and increased susceptibility to erosion (Bouwman 1990) (Johnson 1992) (Davidson 1993). SOC stock can return to pre-harvest levels within 17 to 80 years, depending on site conditions. Harvesting on State Forests is conducted in a manner to minimize the disruption of natural processes and thereby maintain SOC stock.



Cross-section of a 38" diameter log, displaying its potential to produce lumber and thereby delay the release of carbon that occurs through natural decay

Forest Products

One half of the dry weight of wood is actually carbon. The use of wood in durable goods can bolster the effectiveness of

forests to sequester carbon. Trees in a forest gradually slow their carbon intake as they age. Eventually forests reach a point where harvesting and conversion of wood to durable goods enhances long term carbon storage and increases forest growth rate.

Use of forest products continues the sequestration (storage) of carbon until those products are eventually discarded and allowed to decay. Use of wood over other substitutes provides additional benefits through "avoided emissions." The manufacturing process for plastics can emit 40 to 75 times as much carbon than for similar wood products. Carbon emissions for manufacturing other substitutes are also substantially greater than for wood: 4 to 8 times more carbon emissions for concrete, 12 to 24 times more for steel, and up to 3 times as much additional carbon emissions for brick manufacturing (U.S. EPA 2006).

Forest products may also be used as a renewable energy source. Woody biomass is effectively consumed in large scale power plants as well as in smaller scale wood-energy heating systems. When harvested on a sustainable basis, biomass-derived energy is considered carbon-neutral because the carbon released in combustion originates from the natural above-ground carbon cycle, which includes natural sequestration, decomposition systems and atmospheric CO_2. Combustion of fossil fuels, on the other hand, adds carbon into the system.

"CS" OBJECTIVES, ACTIONS AND SEQR ANALYSIS

Carbon Sequestration (CS) Objective I – Keep forests as forests

CS Action 1 – Protect forests (and wetlands) through fee and easement acquisition. The state's land acquisition program will focus on purchases as outlined on page *147*. An indirect benefit of most acquisitions will be the protection of forests (and wetlands) from development.

CS Action 2 – Limit conversion of State Forests to non-forest habitat. Exceptions will be made to protect rare, threatened and endangered species and to fill habitat gaps which cannot reasonably be provided on private lands.

CS Objective II – Enhance carbon storage in existing stands

CS Action 3 – Lengthen rotation or harvest intervals in some stands, focusing on high-value timber species that have potential for longer term sequestration in durable goods

CS Action 4 – Control wildfires which cause large carbon emissions

CS Action 5 – Manage timber harvests to protect forest soils and to reduce SOC loss.

CS Objective III – Keep forests vigorous and healthy and improve forest growth rates.

CS Action 6 – Conduct thinning operations on young forests, to concentrate and enhance growth on crop trees. This action mimics natural events with enhanced results.

CARBON SEQUESTRATION

CS Action 7 – Stem the spread of invasive insects and diseases which can cause widespread mortality in a forest, resulting in large carbon emissions when those trees decay. Employ adequate resources for rapid detection and eradication of new introductions of non-native threats to native species.

CS Objective IV – Sequester carbon in forest products.

CS Action 8 – Conduct timber sales from State Forest lands on a sustainable basis, following sound silvicultural systems described within this plan.

CS SEQR Alternatives Analysis and Thresholds

The **no-action alternative**, or in other words, failure to adopt the actions listed above, would directly reduce the carbon sequestration potential of State Forests. This alternative will not be adopted in consideration of the important role that forests play in carbon sequestration. The other negative impacts of adopting the no-action alternative are: unchecked spread of forest pests, decreased economic contributions from State Forests, damage to soils and potential loss of land in forest cover.

The **preferred alternative** is the implementation of all actions listed above, which have been designed to mitigate the potential effects of increased atmospheric levels of CO_2. The only other alternatives would involve implementation of a selected group of these actions. These alternatives will not be adopted considering the need to maximize carbon sequestration and the serious consequences associated with climate change.

SEQR analysis thresholds have not been specifically formulated for carbon sequestration actions. Other relevant sections of this plan, which include actions that assist in carbon sequestration, include thresholds for those actions.

CHAPTER 7
BACKGROUND

LEGAL CONSIDERATIONS

NYS CONSTITUTION

Article XIV, Section 3 of the New York State Constitution provides that forest and wild life conservation are declared to be policies of the state, and authorizes the acquisition of lands outside the Adirondack and Catskill Parks for the practice of forest or wild life conservation.

STATUTES

Federal Statutes

Americans with Disabilities Act (ADA)

Title II of the ADA requires, in part, that the Department make reasonable modifications to its services and programs, so that when those services and programs are viewed in their entirety, they are readily accessible to and usable by people with disabilities. For a more detailed discussion of this topic, see Section 6.17.1 Universal Accessibility.

State Laws

Environmental Conservation Law (ECL)

Among other powers and duties, Article 9 of the ECL provides authorization for the DEC to do the following:

- exercise care, custody and control of state lands;
- acquire lands outside of the Adirondack and Catskill Parks "...which are adapted for reforestation and the establishment and maintenance thereon of forests for watershed protection, the production of timber and other forest products, and for recreation and kindred purposes;"
- create "reforestation areas which shall consist respectively of not less than five hundred acres of contiguous lands, which shall be forever devoted to the planting, growth and harvesting of...trees;"
- make necessary rules and regulations;
- enter into stewardship agreements with any person or persons for the purposes of preserving, maintaining, or enhancing a state-owned natural resource or portion thereof;
- sell the trees, timber and other products on State Forest lands outside the forest preserve;
- enter into leases for the purpose of aiding in discovering and removing oil or gas from, or for storage of gas or oil on State Forest lands outside the forest preserve;
- maintain a system of forest fire protection.

LEGAL CONSIDERATIONS

Further, the Park and Recreation Land Acquisition Act of 1960, and the Environmental Quality Bond Acts of 1972 and 1986 (as implemented through Articles 51 and 52 of the ECL, respectively) contained provisions for the acquisition of lands to be managed for multiple uses and added to the State Forest system.

Article 8 of the ECL, often referred to as the State Environmental Quality Review Act (SEQRA), requires all state agencies to "act and choose alternatives which...minimize or avoid adverse environmental effects," and to prepare...an environmental impact statement on any action they propose...which may have a significant effect on the environment."

Parks, Recreation & Historic Preservation Law (PRHPL)

Article 14 of the PRHPL requires the Department to include such cultural resources in the range of environmental values that are managed on public lands. For a more detailed discussion of this topic, see Section 6.7 Historic and Cultural Resources.

General Obligations Law (GOL)

The Department is subject to the provisions of the GOL, Article 9, Title 1 of which sets forth the duty of care owed by a landowner who allows specific uses of their property by others.

RULES & REGULATIONS

Public use of State Forests is regulated under 6 NYCRR Part 190, Chapter II. This includes general regulations that apply to all State Forests, as well as regulations that apply only to specific parcels of state land. The following is a brief summary of the sections of those regulations that pertain to the use and management of lands for which this plan is written.

- Section 190.1 Fire - no fires permitted except for cooking, warmth or smudge. Also prohibits depositing matches, etc. and using live trees for fuel;
- Section 190.2 Signs and structures - no person shall deface, mutilate or destroy, etc. This section also prohibits placing trash, garbage, etc. on state lands;
- Section 190.3 Camping sites - sites must be kept neat, 150 feet from trail, road, stream, pond, spring, etc. and includes emergency closure times and elevation restrictions;
- Section 190.4 Camping permits - camping at one site for four nights or more without a permit prohibited, length of stay specified, camping restricted to posted areas, group size specified and age of permittee;
- Section 190.5 Permissible structures - no permanent structures allowed, no transfer of existing structures, listing of reasons for cancellation of existing permits for lean-tos (open camps)
- Section 190.6 Open camps - specifies number of days a lean-to may be occupied, what constitutes an enclosure, etc;

- Section 190.8 General - list of prohibitions for the public use of state lands including gambling, use of snowmobiles, toboggans and sleds on ski trails, sale of alcohol, speed limits on truck trails, defacing, removing or destroying vegetation without a permit, etc. This section allows the use of horses except on intensively developed facilities (listed);
- Section 190.9 - Use of pesticides on state lands - none allowed except by written permission;
- Section 190.10 Unique Areas - special regulations listed by area;
- Section 190.11 Environmentally sensitive lands - lists the sections above that apply to people using sensitive lands (Sections 190.0 - 190.9);
- Section 190.24 Boat launch sites - specific rules of public use of launch sites;
- Section 190.25 - 190.33 Regulations for specific areas such as Zoar Valley, etc.

POLICY & GUIDELINES

The following policies and guidance documents are currently in effect and should be adhered to when making any decisions regarding the use and management of State Forest lands:

- Motor Vehicle Access to State Lands Under the Jurisdiction of DEC for People with Disabilities (CP-3);
- Standards and Procedures for Boundary Line Maintenance (NR-91-2; NR-95-1);
- Division Regulatory Policy (LF-90-2);
- Land Acquisition, Timber Cutting Reservations (NR-86-1);
- Adopt-A-Natural Resource (ONR-1);
- Policies and Procedures Manual Title 8400 - Public Land Management;
- State Land/Facility Naming (NR-90-2);
- Trail Construction and Maintenance Manual

Additional discussion of specific policies and guidance is provided where necessary in preceding sections of this plan.

AANRs & TRPs

Adopt-A-Natural Resource stewardship agreements (AANRs) are authorized by DEC policy, and allow interested parties to undertake care and maintenance of department facilities, while providing Worker's Compensation coverage for those working under the auspices of the AANRs. The AANRs set forth the activities allowed and the services to be provided by the Department to facilitate those activities.

Temporary Revocable Permits (TRPs) are authorized by DEC policy and Environmental Conservation Law and allow careful review of special events and proposed activity on State Forests. In general, TRPs are required for any activity that conforms to existing law but exceeds average levels of usage or access. TRP review allows the Department to avoid conflicting uses of state land and situations that could threaten public safety or integrity of natural resources. TRP authorization does not provide exemption to any existing state laws and regulations.

APPENDICES

For most supplemental information and resources, refer to
www.dec.ny.gov/lands/64567.html

GLOSSARY

Access trails
: temporary, unpaved roads which do not provide all weather access within the state land. They are not designed for long term and repeated use by heavy equipment. These corridors were originally constructed for the seasonal removal of forest products by skidding to log landings or other staging areas. Constructed according to best management practices, these trails may be used to support other management objectives such as recreational access corridors. Maintenance is limited to activities which minimally support seasonal access objectives.

Adaptive management
: a dynamic approach to forest management in which the effects of treatments and decisions are continually monitored and used, along with research results, to modify management on a continuing basis to ensure that objectives are being met

Afforestation
: The establishment of a forest or stand in an area where the preceding vegetation or land use was not forest

Age class(es)
: trees of a similar age originating from a single natural event or regeneration activity

All-aged
: a condition of a forest or stand that contains trees of all or almost all age classes.

Basal area
: the cross sectional area, measured in square feet, of a single stem, including the bark, measured at breast height (4.5 ft above the ground)

Best Management Practices (BMP's)
: a practice or a combination of practices that are designed for the protection of water quality of water bodies and riparian areas, and determined to be the most effective and practicable means of controlling water pollutants

Biodiversity
: **1.** the variety and abundance of life forms, processes, functions, and structures of plants, animals, and other living organisms, including the relative complexity of species, communities, gene pools, and ecosystems at spatial scales that range from local through regional to global —synonym biological diversity, diversity
2. an index of richness in a community, ecosystem, or landscape and the relative abundance of these species —note 1. there are commonly five levels of biodiversity: (a) genetic diversity, referring to the genetic variation within a species; (b) species diversity, referring to the variety of species in an area; (c) community or ecosystem diversity, referring to the variety of communities or ecosystems in an area; (d) landscape diversity, referring to the variety of ecosystems across a landscape; and (e) regional diversity, referring to the variety of species, communities, ecosystems, or landscapes within a specific geographic region —note 2. each level of biodiversity has three components: (a) compositional diversity or the number of parts or elements within a system, indicated by such measures as the number of species, genes, communities, or ecosystems; (b) structural diversity or the variety of patterns or organizations within a system, such as

habitat structure, population structure, or species morphology; and (c) functional diversity or the number of ecological processes within a system, such as disturbance regimes, roles played by species within a community, and nutrient cycling within a forest

Biological legacy
: an organism, living or dead, inherited from a previous ecosystem - note: biological legacies often include large trees, snags, and down logs left after timber harvesting

Blowdown
: tree or trees felled or broken off by wind

Browse
: portions of woody plants including twigs, shoots, and leaves consumed by animals such as deer

Buffer zone(s)/buffer strip
: a vegetation strip or management zone of varying size, shape, and character maintained along a stream, lake, road, recreation site, or other vegetative zone to mitigate the impacts of actions on adjacent lands, to enhance aesthetic values, or as a best management practice

Cavity tree/den tree
: a tree containing an excavation sufficiently large for nesting, dens or shelter; tree may be alive or dead

Clearcut
: the cutting of essentially all trees, producing a fully exposed microclimate for the development of a new age class —note 1. regeneration can be from natural seeding, direct seeding, planted seedlings, or advance reproduction —note 2. cutting may be done in groups or patches (group or patch clearcutting), or in strips (strip clearcutting) —note 3. the management unit or stand in which regeneration, growth, and yield are regulated consists of the individual clearcut stand —note 4. when the primary source of regeneration is advance reproduction, the preferred term is overstory removal

Climax forest
: an ecological community that represents the culminating stage of a natural forest succession for its locality / environment

Coarse filter approach
: a strategy for conserving biodiversity that involves maintaining a variety of native ecosystems within a landscape context. A coarse filter approach would ensure the availability of grasslands, shrublands, open wetlands, forest wetlands, riparian zones, northern hardwood forest and mixed northern hardwood/conifer forest in various stages of successional development. This approach assumes that a representative array of native ecosystems will contain the vast majority of species in a region

Coarse woody material
: any piece(s) of dead woody material on the ground in forest stands or in streams

Cohort
: a population of trees that originate after some type of disturbance

Community
: **1.** an assemblage of plants and animals interacting with one another, occupying a

GLOSSARY

habitat, and often modifying the habitat; a variable assemblage of plant and animal populations sharing a common environment and occurring repeatedly in the landscape.
2. a group of people living in a particular local area

Conversion
: a change from one silvicultural system to another or from one tree species to another

Corridor(s)
: a linear strip of land identified for the present or future location of a designed use within its boundaries. Examples: recreational trails, transportation or utility rights-of-way. When referring to wildlife, a corridor may be a defined tract of land connecting two or more areas of similar management or habitat type through which a species can travel from one area to another to fulfill any variety of life-sustaining needs

Cover type(s)
: the plant species forming a majority of composition across a given area

Crown class
: a category of tree based on its crown position relative to those of adjacent trees.
a) dominant: a tree whose crown extends above the general level of the main canopy and receives full light from above and partial to full light from the sides.
b) co-dominant: a tree whose crown helps to form the general level of the main canopy and receives full light from above and comparatively little from the sides.
c) intermediate: a tree whose crown extends into the lower portion of the main canopy and receives little direct light from above and none from the sides.
d) suppressed / overtopped: a tree whose crown is completely overtopped by the crowns of one or more neighboring trees and receives little or no direct sunlight

Cultural resources
: significant historical or archaeological assets on sites as a result of past human activity which are distinguishable from natural resources

Cutting interval
: the number of years between harvest or regeneration cuts in a stand

Designated recreational trail(s)
: a Department authorized recreational trail that is signed and/or mapped

Diameter (at) Breast Height (DBH)
: the diameter of the stem of a tree (outside bark) measured at breast height (4.5 ft) from the ground

Disturbance
: a natural or human-induced environmental change that alters one or more of the floral, faunal, and microbial communities within an ecosystem. Timber harvesting is the most common human disturbance. Wind or ice storms are examples of natural disturbance

Early successional habitat
: the earliest stage of development in a ecosystem. An example: vegetative habitat where early successional is seen as old fields, brushy shrubby type plants, with species that are shade intolerant

Ecosystem
: a spatially explicit, relatively homogeneous unit of the earth that includes all interacting organisms and components of the abiotic environment within its boundaries - note: an ecosystem can be of any size, e.g., a log, pond, field, forest or the earth's biosphere

Ecosystem management
: the appropriate integration of ecological, economic, and social factors in order to maintain and enhance the quality of the environment to best meet current and future needs. Involves management at the landscape level, prompting the biodiversity of natural communities of plants, animals, and seeking to maintain healthy and productive environments

Edge(s)
: the more or less well-defined boundary between two or more elements of the environment, e.g., a field adjacent to a woodland or the boundary of different silvicultural treatments

Endangered species
: any species of plant or animal defined through the Endangered Species Act of 1976 as being in danger of extinction throughout all or a significant portion of its range, and published in the Federal Register

Even-aged
: a class of forest or stand composed of trees of about the same age. The maximum age difference is generally 20 years

Even-aged (silviculture)
: a program of forest management directed to the establishment and maintenance of stands of trees having relatively little (10-20 yrs) variation in ages. The guidelines to be applied in using this system at all stages of tree development are uniquely different from the uneven-aged system

Flood plain(s)
: the level or nearly level land with alluvial soils on either or both sides of a stream or river that is subject to overflow flooding during periods of high water level

Forest fragmentation
: 1. the process by which a landscape is broken into small islands of forest within a mosaic of other forms of land use or ownership. Note- fragmentation is a concern because of the effect of noncontiguous forest cover on connectivity and the movement and dispersal of animals in the landscape
: 2. islands of a particular age class (e.g., old growth) that remain within areas of younger-aged forest

Forestry
: the profession embracing the science, art, and practice of creating, managing, using, and conserving forests and associated resources for human benefit and in a sustainable manner to meet desired goals, needs, and values

Fragipan
: a dense and brittle layer of soil. Its hardness results mainly from extreme density or compactness rather than from high clay content; the material may be dense enough to restrict root, nutrient, and water penetration

Gaps
: natural communities, habitats, successional stages, or organisms which have been identified as lacking in the landscape

GLOSSARY

Geocaching
: an outdoor activity in which the participants use a Global Positioning System (GPS) receiver or other navigational techniques to hide and seek containers

Geographic Information System (GIS)
: an organized collection of computer hardware, software, geographic and descriptive data, personnel, knowledge and procedures designed to efficiently capture, store, update, manipulate, analyze, report and display the forms of geographically referenced information and descriptive information

Group selection
: trees are removed and new age classes are established in small groups —note 1. the width of groups is commonly approximately twice the height of the mature trees with smaller openings providing microenvironments suitable for tolerant regeneration and larger openings providing conditions suitable for more intolerant regeneration —note 2. the management unit or stand in which regeneration, growth, and yield are regulated consists of an aggregation of groups

Habitat
: the geographically defined area where environmental conditions (e.g., climate, topography, etc.) meet the life needs (e.g., food, shelter, etc.) of an organism, population, or community

Hardwoods
: broad-leafed, deciduous trees belonging to the botanical group Angiospermae

Haul roads
: permanent, unpaved roads which are not designed for all-weather travel, but may have hardened or improved surfaces with artificial drainage; they are constructed according to best management practices primarily for the removal of forest products, providing limited access by log trucks and other heavy equipment; these roads may or may not be open for public motor vehicle use, depending on management priorities and objectives; they may serve as recreational access corridors, but are not maintained according to specific standards or schedules

Improvement thinning(s)
: the removal of less desirable trees of any species in a stand of poles or larger trees, primarily to improve composition and quality

Indicator species
: species with such specialized ecological needs that they can be used for assessing the quality, condition, or extent of an ecosystem on the basis of their presence and density, or the accumulation and effect of materials in their tissues

Invasive species
: species that have become established outside their natural range which spread prolifically, displacing other species, and sometimes causing environmental damage

Keystone species
: a plant or animal species that strongly influences that functioning of an entire ecosystem; for example, the way beaver influence wetlands

Landscape
: a spatial mosaic of several ecosystems, landforms, and plant communities across a

defined area irrespective of ownership or other artificial boundaries and repeated in similar form throughout

Landscape ecology
: the study of the distribution and abundance of elements within landscapes, the origins of these elements, and their impacts on organisms and processes.

Landscape matrix
: the most extensive and connected landscape element type present, which plays the dominant role in landscape functioning; for example, New York's South-Central Highlands (Central Appalachian) landscape is dominantly forest cover; thus, the landscape matrix is forest cover

Large poles
: trees that are 9 to 11 inches in diameter at breast height

Large sawtimber
: trees that are 24 inches or greater in diameter at breast height

Late successional habitat
: habitats predominated by forests with older and larger trees, having more structural complexity than mature forest, and being either in the process of developing or have developed old growth characteristics; they may exhibit evidence of past human or natural disturbances; these forests may exist as entire stands or as smaller patches within younger stands

Log landing(s)/(Log deck)
: a cleared area to which logs are skidded and are temporarily stored before being loaded onto trucks for transport

Mast
: all fruits of trees and shrubs used as food for wildlife; hard mast includes nut-like fruits such as acorns, beechnuts and chestnuts. Soft mast includes the fleshy fruits of black cherry, dogwood and serviceberry

Mature forest cover
: pertaining to an even-aged stand that has attained most of its potential height growth, or has reached merchantability standards. Within uneven-aged stands, individual trees may become mature but the stand itself consists of trees of diverse ages and stages of development

Medium sawtimber
: trees that are 18-23 inches in diameter at breast height

Mesic
: of sites or habitats characterized by intermediate moisture conditions; i.e., neither decidedly wet nor dry

Mid Successional
: forests that are pole-sized or larger, with relatively open understories

Multiple use
: a strategy of land management fulfilling two or more objectives, e.g. forest products removal and recreation

Natural area(s)
: an area allowed to develop naturally; intervention will be considered to protect forest

GLOSSARY

health (e.g. fire or invasive plant or animal invasive species), to enhance structural or species diversity, to protect, restore or enhance significant habitats or to exploit or create regeneration opportunities for desired plant species

Natural regeneration

the establishment of a forest stand from natural seeding, sprouting, suckering or layering

Neotropical migratory birds (migrants)

birds that breed in Canada and the United States and spend the winter in Mexico, Central America, South America or the Caribbean islands; these species represent more than 50% (340 of the 600 species) of North American birds

Niche

1. the ultimate unit of the habitat, i.e., the specific spot occupied by an individual organism

2. by extension, the more or less specialized relationships existing between an organism, individual or synusia, and its environment

3. the specific set of environmental and habitat conditions that permit the full development and completion of the life cycle of an organism —note the ecological niche of a species is the functional role of the species in a community; the fundamental niche is the totality of environmental variables and functional roles to which a species is adapted; the realized niche is the niche a species normally occupies

Northern hardwood forest

a forest type usually made up of sugar and red maple, American beech, yellow birch, and to a lesser extent black cherry and white ash. This type represents about 70 percent of all forests in New York State

Old growth

an abundance of late successional tree species, at least 180 - 200 years of age in a contiguous forested landscape that has evolved and reproduced itself naturally, with the capacity for self perpetuation, arranged in a stratified forest structure consisting of multiple growth layers throughout the canopy and forest floor, featuring canopy gaps formed by natural disturbances creating an uneven canopy, and a conspicuous absence of multiple stemmed trees. Old growth forest sites typically are characterized by an irregular forest floor containing an abundance of coarse woody materials which are often covered by mosses and lichens; show limited signs of artificial disturbance and have distinct soil horizons. The understory displays well developed and diverse surface herbaceous layers. Single, isolated trees may be considered as old growth if they meet some of the above criteria

Overstory

that portion of the trees in a forest forming the upper or uppermost canopy layer

Overstory removal

the cutting of trees constituting an upper canopy layer to release adequate desirable advanced regeneration in the understory

Parcelization

the subdivision of land into smaller ownership blocks. This intrudes new features and activities into the forest and changes its character, but does not necessarily fragment it in biophysical terms

Patch cut
: a type of clearcut where the cut area consists of a small part of a stand or forest —note 1. the minimum size of a patch depends primarily on (a) the creation of microclimate conducive to establishment of desired regeneration of particular tolerance, and (b) the area needed for safe felling and yarding of harvested trees

Pioneer Species
: a plant capable of invading bare sites (newly exposed soil) and persisting there or colonizing them until supplanted by later successional species

Plantation
: a stand composed primarily of trees established by planting or artificial seeding – a plantation may have tree or understory components that have resulted from natural regeneration

Poletimber
: trees that are generally 6-11 inches diameter at breast height

Prescribed fire
: fire that is deliberately ignited to burn wildland fuels in either their natural or modified state and under specific environmental conditions which allow the fire to be confined to a predetermined area and produces the fireline intensity and rate of spread required to attain planned resource management objectives.

Protection area
: land excluded from most active management to protect sensitive sites; exclusions include: timber harvesting, road construction, oil and gas exploration and development and some recreational activities. These sites most often include steep slopes, wet woodlands and riparian zones along stream corridors

Public Forest Access Roads (PFAR)
: permanent, unpaved roads which may be designed for allweather use depending upon their location, surfacing and drainage. These roads provide primary access for administration and public use within the Unit. The design standards for these roads are those of the Class A and Class B access roads as provided in the Unpaved Forest Road Handbook (8/74). As a general guideline, sufficient access is typically achieved when 1 mile of PFAR is developed for each 500 acres of state land, and no position within the Unit lies more than one half-mile from a PFAR or public highway

Pulpwood
: low grade or small diameter logs used to make paper products, wood chips

Regeneration
: seedlings or saplings of any origin

Release
: **1.** a treatment designed to free trees from undesirable, usually overtopping, competing vegetation
: **2.** a treatment designed to free young trees not past the sapling stage from undesirable competing vegetation that overtops or closely surrounds them

Riparian buffer (zone)
: areas of transition between terrestrial and aquatic ecological systems; they are

GLOSSARY

characterized as having soils and vegetation analogous to floodplains, or areas transitional to upland zones; these areas help protect the water by removing or buffering the effects of excessive nutrients, sediments, organic matter, pesticides, or pollutants

Rotation

the period of years between stand establishment and final harvest as designated by management decisions

Salvage cutting

the removal of dead trees or trees damaged or dying because of injurious agents other than competition, to recover economic value that would otherwise be lost

Sapling

a small tree, usually defined as being between 1 and 5 inches diameter at breast height

Sawtimber

trees that are 12 inches and larger diameter at breast height

Seed tree

1. a regeneration method consisting of cutting all trees except for a small number of widely dispersed trees retained for seed production and to produce a new age class in fully exposed microenvironment

2. a tree retained for seed production —note seed trees are usually removed after regeneration is established

Seedling

a young tree originating from seed that is less than one inch in diameter

Seedling(s)/sapling(s)

trees less than 6 inches diameter at breast height

Shade tolerance

the ability of a tree species to germinate and grow at various levels of shade;
a) shade tolerant: having the capacity to compete for survival under shaded conditions,
b) shade intolerant: having the capacity to compete for survival only under direct sunlight conditions; light demanding species

Shelterwood

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

Silviculture

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

Single tree selection
: individual trees of all size classes are removed more or less uniformly throughout the stand, to promote growth of remaining trees and to provide space for regeneration — synonym individual tree selection

Site
: the area in which a plant or forest stand grows, considered in terms of its environment, particularly as this determines the type and quality of the vegetation the area can support

Skid trail(s)
: a temporary or permanent trail used to skid or forward felled trees from the stumps to the log landing

Small poles
: trees 6-8 inches diameter at breast height

Small sawtimber
: trees 12-17 inches in diameter at breast height

Snags
: standing, dead trees, with or without cavities; function as perches, foraging sites and/or a source of cavities for dens, roosting and/or nesting for wildlife

Softwoods
: generally refers to needle and/or cone bearing trees (conifers) belonging to the botanical group Gymnospermae

Spatial analysis
: an examination of data in the context of where it occurs geographically or “on the ground;” This is usually accomplished by tying database information to GIS based maps

Species
: the main category of taxonomic classification into which genera are subdivided, comprising a group of similar interbreeding individuals sharing a common morphology, physiology and reproductive process

Species richness
: the number of different species present within a defined area

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

Stand structure
: the horizontal and vertical distribution of components of a forest stand including the height, diameter, crown layers and stems of trees, shrubs, herbaceous understory, snags and down woody materials

State Forest / State Reforestation Area
: lands owned by the State of New York, administered by the Department of Environmental Conservation Division of Lands & Forests, and authorized by

GLOSSARY

Environmental Conservation Law to be devoted to the establishment and maintenance of forests for watershed protection, the production of timber and other forest products, and for recreation and kindred purposes. These forests shall be forever devoted to the planting, growth, and harvesting of such trees (Title 3 Article 9-0303 ECL). (G)

Stocking

1. the amount of material on a given area – example: the stand is fully stocked
2. an indication of growing- space occupancy relative to a pre-established standard

Succession

the gradual supplanting of one community of plants by another —note 1. the sequence of communities is called a sere, or seral stage —note 2. a sere whose first stage is open water is termed a hydrosere, one whose first stage is dry ground, a xerosere —note 3. succession is primary (by pioneers) on sites that have not previously borne vegetation, secondary after the whole or part of the original vegetation has been supplanted, allogenic when the causes of succession are external to and independent of the community (e.g., accretion of soil by wind or water, or a change of climate), and autogenic when the developing vegetation is itself the cause

Suite

species similar in their habitat needs which may respond similarly to habitat changes

Sustainable forest management

management that maintains and enhances the long-term health of forest ecosystems for the benefit of all living things, while providing environmental, economic, social and cultural opportunities for present and future generations

Temporary revocable permit (TRP)

a Department permit which authorizes the use of state land for a specific purpose for a prescribed length of time

Thinning(s)

a silvicultural treatment made to reduce stand density of trees primarily to improve growth of remaining trees, enhance forest health, or recover potential mortality

Threatened species

a species likely to become endangered in the foreseeable future, throughout all or a significant portion of its range, unless protected

Timber Stand Improvement (TSI)

pre-commercial silvicultural treatments, intended to regulate stand density and species composition, while improving wood product quality and fostering individual tree health and vigor through the removal of undesirable trees

Understory

the smaller vegetation (shrubs, seedlings, herbaceous plants, small trees) within a forest stand, occupying the vertical zone between the overstory and the forest floor

Uneven-aged system

a planned sequence of treatments designed to maintain and regenerate a stand with three or more age classes

Uneven-aged stand/forest

a stand with trees of three or more distinct age classes, either intimately mixed or in small groups

Universal Design

Universal design is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

Variable patch retention (harvest system)

an approach to harvesting based on the retention of structural elements or biological legacies (trees, snags, logs, etc.) from the harvested stand for integration into the new stand to achieve various ecological objectives

Watershed

a region or area defined by a network of stream drainage. A watershed includes all the land from which a particular stream or river is supplied

Wetland(s)

a transitional area between aquatic and terrestrial ecosystems that is inundated or saturated for periods long enough to produce hydric soils and support hydrophytic vegetation

BIBLIOGRAPHY

Aldrich, R., and J. Wyerman. "National Land Trust Census Report." The Land Trust Alliance, Washington, DC., 2005.

Anderson, M. G. "Viability and spatial assessment of ecological communities in the Northern Appalachian ecoregion." Ph D, University of New Hampshire, Durham, NH, 1999.

Anderson, M. G., and S. L. Bernstein. "Planning methods for ecoregional targets: Matrix-forming ecosystems." Unpublished report, The Nature Conservancy, Conservation Science Support, Northeast & Caribbean Division, Boston, MA, 2003, 20.

Anderson, M.G. et al. "The North Atlantic Coast Ecoregional Assessment, Conservation Status Report, First Iteration, Edited." The Nature Conservancy, Northeast and Caribbean Division, Boston, MA, 2006.

Askins, R.A., and M.J. Philbrick. "Effect of changes in regional forest abundance on the decline and recovery of a forest bird community." *Wilson Bulletin* 99 (1987): 7-21.

Avery, T. E., and H. E. Burkhart. *Forest Measurements.* Fourth Edition. New York: McGraw-Hill, 1994.

Barbour et al., Henry. *Lower New England-Northern Piedmont Ecoregion Conservation Plan; First Iteration, Edited.* Boston, MA: The Nature Conservancy, Northeast and Caribbean Division, 2000 .

Bellemare, J., G. Motzkin, and D. Foster. "Legacies of the Agricultural Past in the Forested Present: An Assessment of Historical Land-Use Effects on Rich Mesic Forests." *Journal of Biogeography* 29 (2002): 401-1420.

Botkin, D.B. *Discordant Harmonies: a New Ecology for the 21st Century.* New York: Oxford University Press, 1990.

Bouwman, A.F., ed. *Soils and the Greenhouse Effect.* Chichester: J. Wiley & Sons, 1990.

Casey, D., and D. Hein. "Effects of heavy browsing on a bird community in deciduous forest." *Journal of Wildlife Management* 47 (1983): 829-836.

Caslick, J. W. *Measuring revegetation rates and patterns on abandoned agricultural lands.* Ithaca, NY: Cornell University Agricultural Experiment Station, New York State College of Agriculture and Life Sciences, 1975.

Chambers, R. E. *Integrating Timber and Wildlife Management Handbook.* State University of New York College of Environmental Science and Forestry, New York State Department of Environmental Conservation., 1983.

Cote, S.D., T.P. Rooney, and J. Tremblay. "Ecological impacts of deer overabundance." *Annual Review of Ecology, Evolution, and Systematics* 35 (2004): 113–147.

Davidson, E.A., Ackerman, I.L. "Changes in soil carbon inventories following cultivation of previously untilled soils." *Biogeochemistry* 20 (1993): 161–193.

deCalesta, D. S. "Effect of white-tailed deer on songbirds within managed forests in Pennsylvania." *Journal of Wildlife Management* 58 (1994): 711-718.

deCalesta, D. S., and T.G. Pierson. "Deer Density Estimation and Deer Browse Impact Survey Protocols 2005-06." Kinzua Quality Deer Cooperative, 2005.

DeGraff, R.M., and A.L. Shigo. "Managing Cavity Trees for Wildlife in the Northeast." General Technical Report NE-101, USDA Forest Service, 1985.

DeGraff, R.M., M. Yamasaki, W.B. Leak, and J.W. Lanier. "New England Wildlife: Management of Forested Habitats." Gen. Tech. Report NE-144, USDA Forest Service, NE Forest Experimental Station. , 1992.

Ecological Society of America (ESA); The Nature Conservancy; U.S. Geological Survey; U.S. Federal Geographic Data Committee. *Forming a partnership to further develop and implement the national vegetation classification standards.* Memorandum of Understanding, Washington DC: Ecological Society of America, 1999.

Edinger, G. J., D. J. Evans, S. Gebauer, and T. G. Howard. "Ecological Communities of New York State. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. (Draft for Review)." New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY, 2002.

Evans, K. E., and R. N. Conner. "Management of North Central and Northeastern Forests for NONGAME BIRDS (Snag Management)." General Technical Report NC-51, USDA Forest Service, 1979, 214-225.

Federal Geographic Data Committee. "FGDC vegetation classification and information standard, June 3, 1996 draft." Federal Geographic Data Committee, Vegetation Subcommittee (FGDC-VS), FGDC Secretariat, Reston, VA, 1997.

Fisher, R. F., and D. Binkley. *Ecology and Management of Forest Soils.* New York: Wiley, 2000.

Foster, D., and D. Orwig. "Preemptive and Salvage Harvesting of New England Forests: When Doing Nothing Is a Viable Alternative." *Conservation Biology* 20 (2006): 959-970.

Franklin, J.F., R.J. Mitchell, and B.J. Palik. "Natural Disturbance and Stand Development Principles for Ecological Forestry." Gen. Tech. Rep. NRS-19, USDA Forest Service , 2007.

Frumhoff, P.C., J.J. McCarthy, J.M. Melillo, S.C. Moser, and D.J. Wuebbles. *Confronting Climate Change in the U.S. Northeast:.* Cambridge, MA: UCS Publications, 2007.

Gibbs, James P. "Research Note: Wetland Loss and Biodiversity Conservation." *Conservation Biology* 14, no. 1 (2000): 314-317.

BIBLIOGRAPHY

Goetz, S. J., P. Jantz, and C. A. Jantz. "Connectivity of core habitat in the northeastern United States: parks and protected areas in a landscape context." *Remote Sensing of Environment* 113 (2009): 1421-1429.

Goodell, L., and D. Faber-Langendoen. "Development of stand structural stage indices to characterize forest condition in Upstate New York." *Forest Ecology and Management* 249 (2007): 158-170.

Grossman, D. H., et al. "International classification of ecological communities: terrestrial vegetation of the United States." In *Volume I, The National Vegetation Classification System: development, status, and applications*, by The Nature Conservancy. Arlington, VA, 1998.

Groves, C. R., et al. "Planning for biodiversity conservation: putting conservation science into practice." *Bioscience* 52 (2002): 499-512.

Harmon, M.E., et al. "Ecology of Coarse Woody Debris in Temperate Forest Ecosystems." *Advances in Ecological Research* 15 (1986): 133-302.

Hartley, M.J. "Rationale and Methods for Conserving Biodiversity in Plantation Forests." *Forest Ecology and Management* 155 (2002): 81-95.

Healy, W.M., R.T. Brooks, and R.M. DeGraaf. "Cavity Trees in Sawtimber-Sized Oak Stands in Central Massachusetts." *Northern Journal of Applied Forestry* 6: 61-65.

Helms, John A., ed. *The Dictionary of Forestry.* Society of American Foresters, 1998.

Hunter, M. L., Jr. *Wildlife, forests, and forestry: principles of managing forests for biological diversity.* Englewood Cliffs, NJ: Prentice Hall, 1990.

Ickes, R. "Yellow_billed Cuckoo." In *Atlas of breeding birds in Pennsylvania*, edited by D.W. Brauning, 152-153. Pittsburgh, PA: University of Pittsburgh Press, 1992.

Intergovernmental Panel on Climate Change. *Climate Change 2007: The Physical Science Basis.* Intergovernmental Panel on Climate Change, Working Group 1, 2007.

Johnson, D.W. "Effects of forest management on soil carbon storage." *Water, Air and Soil Pollution* 64 (1992): 83-120.

Karasin, L. N. "All-Terrain Vehicles in the Adirondacks: Issues and Options WCS Working Paper No. 21, April 2003." *Wildlife Conservation Society, Adirondack Program.* 2003. http://www.wcs.org/adirondacks/ (accessed 2010).

Keeton, W. S. "Managing for late-successional/old-growth characteristics in northern hardwood-conifer forests." *Forest Ecology and Management* 235 (2006): 129-142.

Kenefic, L.S., and R.D. Nyland. "Cavity Trees, Snags, and Selection Cutting: A Northern Hardwood Case Study." *Northern Journal of Applied Forestry* 24, no. 3 (2007): 192-196.

"Landscape Ecology." In *McGraw-Hill Encyclopedia of Science and Technology*. The McGraw-Hill Companies, Inc., 2005.

Lanier, J. *Who Lives Where?* Vermont Fish and Wildlife Department, 1988.

Latham, R. E., et al. "Managing White-tailed Deer in Forest Habitat from an Ecosystem Perspective: Pennsylvania Case Study." Audubon Pennsylvania and Pennsylvania Habitat Alliance, Deer Management Forum , Harrisburg, 2005.

Leimgruber, P., W. J. McShea, and J.H. Rappole. "Predation on artificial nests in large forest blocks." *Journal of Wildlife Management* 58 (1994): 254-260.

Lorimer, C.G., and A.S. White. "Scale and frequency of natural disturbances in the northeastern US: implications for early successional forest habitats and regional age distributions." *Forest Ecology and Management*, no. 185 (2003): 41-64.

Mace, R. *About Universal Design.* 2008. http://www.design.ncsu.edu/cud/about_ud/about_ud.htm (accessed 2009).

Marks, P. L., S. Cardescu, and F. Seischab. "Late Eighteenth Century Vegetation of Central New York State on the Basis of Original Land Survey Records." Bulletin No. 484, New York State Museum, Albany, NY, 1992.

Marquis, D. A., R. L. Ernst, and S. L. Stout. "Prescribing silvicultural treatments in hardwood stands of the Alleghenies (revised)." General Technical Report NE-96, US Department of Agriculture, Forest Service, Northeastern Forest Experimental Station, Radnor, PA, 1992, 43-44.

Marquis, R.J., and C.J. Whelan. "Insectivorous Birds Increase Growth of White Oak through Consumption of Leaf-Chewing Insects." *Ecology* 75, no. 7 (1994): 2007-2014.

McCabe, T. R., and R.E. McCabe. "Recounting whitetails past." In *The Science of Overabundance: Deer Ecology and Population Management*, edited by W.J. McShea, H.B. Underwood and J.H. J. H. Rappole, 11-26. Washington, DC: Smithsonian Institution Press, 1994.

McShea, W. J., and G. Schwede. "Variable acorn crops: responses of white-tailed deer and other mast consumers." *Journal of Mammology* 74 (1993): 999-1006.

McShea, W. J., and J.H. Rappole. "Herbivores and the ecology of forest understory birds." In *The Science of Overabundance: Deer Ecology and Population Management*, edited by W. J. McShea, H.B. Underwood and J.H. Rappole, 298-309. 1997.

McShea, W. J., and J.H. Rappole. "Managing the abundance and diversity of breeding bird populations through manipulation of deer populations." *Conservation Biology* 14 (2000): 161-170.

McShea, W.J., and J.H. Rappole. "White-tailed deer as keystone species within forested habitats of Virginia." *Virginia Journal of Science* 43 (1992): 177–186.

Minor, E. S., and D. L. Urban. "A graph-theory framework for evaluating landscape connectivity and conservation planning." *Conservation Biology* 22 (2008): 297-307.

Minor, E. S., and D. L. Urban. "Graph theory as a proxy for spatially explicit population models in conservation planning." *Ecological Applications* 17 (2007): 1771-1782.

BIBLIOGRAPHY

Moller, T. R., and C. P. Rordam. "Species of number of vascular plants in relation to area, isolation, and age of pond in Denmark." *Oikos*, no. 45 (1985): 8-16.

Multi-Resolution Land Characteristics Consortium (MLRC). 2001. http://www.mrlc.gov/.

Multi-Resolution Land Characteristics Consortium (MRLC). U.S. Department of the Interior, U.S. Geological Survey. April 22, 2008. http://www.mrlc.gov/about.php (accessed January 20, 2009).

"Natural Heritage Elements - Species Level." *Vermont Fish and Wildlife Dept.* 2003-04. http://www.vtfishandwildlife.com/cwp_elem_spec_esf.cfm (accessed 2010).

NatureServe. 2003. http://www.natureserve.org/ (accessed 2009).

Noss, R. F., E. T. LaRoe, and J. M. Scott. "Endangered ecosystems of the United States: a preliminary assessment of loss and degradation." Biological Report 28, U.S. Department of the Interior, National Biological Service, Washington, D.C., 1985.

Nowak, D.J., and J. T. Walton. "Projected urban growth (2000 – 2050) and its estimated impact on the U.S. forest resource." *Journal of Forestry* 103, no. 8 (2005): 383-389.

Nyland, R.D. *Silviculture Concepts and Applications.* New York: McGraw-Hill, 1996.

—. *Silviculture: Concepts and Applications;.* State University of New York College of Environmental Science and Forestry, 1996.

Nyland, Ralph D. "Even- to uneven-aged: the challenges of conversion." *Forest Ecology and Management*, 2003: 291-300.

NYS DEC. "2009 New York State Open Space Conservation Plan." *New York State Department of Environmental Conservation.* 2009. http://www.dec.ny.gov/lands/47990.html (accessed 2010).

—. "DEC Region 7 Draft Recreation Plan." unpublished, 2001.

NYSDEC. *NYS Forestry Best Management Practices for Water Quality: BMP Field Guide.* 2007.

O'Leary, J. T., F. A. McGquire, and F.D. Dottavio. *Using Nationwide Recreation Survey Data in Developing Recreation Policy and Planning Options - Review of Policy Research.* 1987.

OPRHP, NYS. "Statewide Comprehensive Outdoor Recreation Plan." Albany, NY, 2008.

Outdoor Industry Foundation. *The Active Outdoor Recreation Economy.* Boulder, CO, 2006.

Paine, R.T. "A Conversation on Refining the Concept of Keystone Species." *Conservation Biology* 9, no. 4 (1995): 962–964.

Pendleton, V. "Seismic exploration." In *Encyclopedia of Earth*, edited by C.J. Cleveland. Washington, DC: Environmental Information Coalition, National Council for Science and the Environment, 2008.

Perlman, D., and J. Midler. *Practical Ecology for planner, developers and citizens.* Washington, DC: Lincoln Institute of Land Policy, Island Press, 2005.

Pielou, E. C. *After the Ice Age: the return of life to glaciated North America .* Chicago: University of Chicago Press, 1991.

Quinby, P, et al. "Opportunities for Wildlife Habitat Connectivity between Algonquin Park, Ontario and the Adirondack Park, New York." online at http://www.ancientforest.org/a2a.html, The Greater Laurentian Wildlands Project, Burlington, VT, 1999.

Rawinski, T.J. "Impacts of Deer Overabundance in Forest Ecosystems: An Overview." USDA, USFS, NE Area, Newtown Square, PA, 2008.

Rellou, J. *Chestnut blight fungus Cryphonectria parasitica.* 2002. http://www.columbia.edu/itc/cerc/danoff-burg/invasion_bio/inv_spp_summ/Cryphonectria_parasitica.htm (accessed 2009).

Reschke, C. "Ecological Communities of New York State." *New York State Department of Environmental Conservation.* 1990. http://www.dec.ny.gov/animals/29389.html (accessed 2009).

Reschke, C. "Estimated numbers of element occurrences, acreage, trends, and threats for selected New York natural communities." unpublished report, New York State Department of Environmental Conservation, New York Natural Heritage Program, Latham, NY, 1993.

Robbins, C. S., D. K. Dawson, and B. A. Dowell. "Habitat area requirements of breeding forest birds of the Middle Atlantic States." *Wildlife Monographs* 103 (1989): 1-34.

Roe, J.H., and A. Ruesink. "Natural Dynamics Silviculture – A Discussion of Natural Community-Based Forestry Practices." Online at www.nature.org/wherewework/northamerica/states/vermont/files/pub_nds_doc.pdf, The Nature Conservancy Vermont, undated.

Ryan, M., Harmon, M., Birdsey, R., Giardina, C., et. al. *Synthesis of the Science on Forests and Carbon for U.S. Forests.* Issues in Ecology, Washington, D.C.: Ecological Society of America, 2010.

Schlesinger, M. D., and T. Howard. "Progress report October 2009 – March 2010: State Wildlife Grants Program - Planning for Wildlife Habitat Connectivity in the Hudson River Valley." New York Natural Heritage Program, Albany, NY, 2010.

Sjogren, J. "Extinction and isolation gradients in metapopulations; the case of the pool frog (Rana lessonae)." *Biological Journal of the Linnean Society*, no. 42 (1991): 135-147.

Smith, C. R., DeGloria, S.D., Richmond, M.E., et. al. "A Gap Analysis of New York NY-GAP." *Final Report and Data.* 2-disc CD set. University of Idaho. Moscow, ID: U.S. Geological Survey, Biological Resources, National Gap Analysis Office, October 2001.

Sneddon, L., M. Anderson, J. Lundgren, and et. al. "International classification of ecological communities: terrestrial vegetation of the Northeastern United States. July 1998 working draft." The Nature Conservancy and Natural Heritage Programs, Boston, MA, 1998.

BIBLIOGRAPHY

Stout, S. "Even-aged Silviculture as an Approach to Regeneration of Forests with High Deer Densities." A paper delivered at the Michigan Society of American Forester “Forests and Whitetails-Striving for Balance” Conference, June 9-10, St. Ignace, MI, 2005.

The Nature Conservancy. "Northern Appalachian – Acadian Ecoregional Assessment; Second Iteration, Edited." The Nature Conservancy, Northeast and Caribbean Division, Boston, MA.

The Nature Conservancy, Great Lakes Ecoregional Planning Team. "Great Lakes Ecoregional plan. First Iteration." The Nature Conservancy, Great Lakes Program, Chicago, IL, 1999.

Thompson, Elizabeth et al. "St. Lawrence – Champlain Valley Ecoregion Biodiversity Conservation Plan: Final Draft Report, First Iteration. Edited." The Nature Conservancy, Northeast and Caribbean Division, Boston, MA., 2002.

Tubbs, C.H., R.M. DeGraff, M. Yamasaki, and W.M. Healy. "Guide to Wildlife Tree Management in New England Northern Hardwoods." Gen. Tech. Rep. NE-118., USDA Forest Service, 1987.

U.S. Department of the Interior. *Adaptive Management.* July 30, 2007. http://www.doi.gov/initiatives/AdaptiveManagement/whatis.html (accessed August 3, 2010).

U.S. EPA. *Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2007.* Washington DC: U.S. EPA, 2009.

U.S. EPA. *Solid Waste Management and Greenhouse Gasses – A Life Cycle Assessment of Emissions and Sinks, 3rd Edition.* Washington, DC: U.S. EPA, 2006.

U.S. Fish and Wildlife Service. "New York Hunting & Fishing Survey." 2006.

Union of Concerned Scientists. *Climate Choices.* 2006. www.climatechoices.org (accessed 2010).

Urban, D. L., E. S. Minor, E. A. Treml, and R. S. Schick. "Graph models of habitat mosaics." *Ecology Letters* 12 (2009): 260-273.

Urban, D., and T. Keitt. "Landscape connectivity: a graph-theoretic perspective." *Ecology* 82 (2001): 1205-1218.

USBLM. *Ecosystem Management in the BLM: From Concept to Commitment.* Washington, DC: USBLM, 1994.

Van Driesche, Roy, Suzanne Lyon, Bernd Blossey, Mark Hoddle, and Richard Reardon. "Biological Control of Invasive Plants in the Eastern United States." *USDA Forest Service Publication FHTET-202-04* (USDA Forest Service Publication FHTET-2002-04), 2002: 413.

Vreeland, J. K. "Survival rates, cause-specific mortality, and habitat characteristics of white-tailed deer fawns in central Pennsylvania." Thesis, The Pennsylvania State University, University Park, PA, 2002.

Waller, D. M., and W.S. Alverson. "The white-tailed deer: a keystone herbivore." *Wildlife Society Bulletin* 25, no. 2 (1997): 217-226.

Wisconsin Dept. of Natural Resources. *PUB-FR-226 2003, Wisconsin Forest Management Guidelines.* 2003.

Wondolleck, J.M., and S.L. Yaffee. *Making Collaboration Work - Lessons from Innovation in Natural Resource Management.* Washington, DC: Island Press, 2000.

Yamasaki, M., R. DeGraff, and J. Lanier. "Wildlife Habitat Associations in Eastern Hemlock - Birds, Smaller Mammals and Forest Carnivores." *Proceedings from: Symposium on Sustainable Management of Hemlock Ecosystems in Eastern North America.* 1999.

Zaremba, R. E., and M. G. Anderson et. al. "High Allegheny Plateau Ecoregional Plan; First Iteration, Edited." The Nature Conservancy, Northeast and Caribbean Division, Boston, MA, 2003.

SUMMARY OF SUBSTANTIVE REVISIONS AND RESPONSE TO PUBLIC COMMENT

The following revisions were made based on internal DEC review of the draft plan:

- Conditions were added which would require additional site-specific environmental review under SEQRA in the Active Forest Management section of Chapter 2.
- Details regarding the information required to be included in Pesticide/Herbicide Application Plans was added to the Active Forest Management section of Chapter.
- Detailed information about the herbicides most commonly used on State Forests was added to the Active Forest Management section of Chapter 2.
- Proposed actions under Infrastructure were increased to include developing guidance for road, trail and utility corridor development, with the express intent of limiting forest fragmentation.
- A 100-acre threshold was added to prescribed burns on State Forests. Any single burning operation larger than 100 acres will require site-specific environmental review under SEQRA.

The following comments were received during the public comment period, by mail, email, telephone and at several public meetings conducted throughout the state. The Department's response follows directly after each comment. Comments are grouped according to the chapter of the plan which they address.

GENERAL

Numerous comments were received regarding proposed actions or regulations for specific State Forest properties. These will be addressed in the individual unit management plans for those State Forests.

Comment: The Department did not provide enough time for public comment.

Response: The comment period was twice as long as that which is required by state law. Comments were also accepted after the comment deadline had passed, over three months after the plan's release was announced.

Comment: The plan should include a detailed listing of state forest units, acreage, and acres by category.

Response: The plan includes a link to this information on the Department's website.

Comment: The plan should include detailed maps of state forests, by DEC region or by planning units.

Response: These are included in individual UMPs, and on the Department's website.

Comment: Writing the Strategic Plan as a GEIS will allow projects and UMPs to be implemented and adopted without a full SEQRA review, and with limited public comment.

Response: This is the concept of a generic EIS. If projects or UMPs are implemented or adopted outside of the provisions of this plan, additional SEQRA review will be conducted. There are numerous opportunities for public comment during the development of a UMP.

Comment: The SPSFM states the SEQRA "process is initiated by drafting an Environmental Assessment Form." This EAF must be included in full with the document, along with the legal determination of significance.

Response: An EAF does not need to be completed if the entity undertaking the action decides to complete an EIS, which the Department did in developing the plan.

Comment: The legal framework on which the plan is based should be included in the plan, either in the text or as an appendix.

Response: Legal considerations are included in Chapter 7.

Comment: The plan should report the planned and anticipated expenses listed in the specific UMP's of specific forests and statewide.

Response: This level of detail is addressed at the UMP level.

Comment: The plan is too big to be of use to land managers. It should be streamlined and include more direct guidance.

Response: As a strategic plan, the document's intent is to describe the large-scale, broad goals of the Department for management of State Forests. Direct guidance will come in the form of policies and guidelines, the development of which are actions proposed in the plan.

CHAPTER 1 – NEW YORK STATE FORESTS

Comment: Modify first paragraph under "State Forest History" more accurately describe conditions from the standpoint of European settlers.

Response: These modifications have been made.

CHAPTER 2 – ECOSYSTEM MANAGEMENT

Comment: The plan should recognize the negative impacts of closed canopy, late successional forest habitat on species requiring early successional habitat.

Response: Any management system will favor certain species over others. The plan recognizes that not all landscape deficiencies will be addressed on State Forests. The plan strives to create a balance of cover types, based on a number of considerations, including the surrounding landscape.

Comment: The plan should have targets for the creation of early successional habitat in each of the eco-regions.

Response: These targets will be developed in UMPs, based on the landscape surrounding the specific units.

Comment: The active forest management guidelines on page 90 should include limiting use of fencing and incorporating best practices for facilitating successful species movement across roads (e.g., improved culvert design).

Response: Text to this effect has been added to the plan.

Comment: The plan suggests Native American's where "former" occupants of New York at the time of European settlement. This is not the case. Please delete the word "former" from the section in Chapter 2 describing early successional forest and shrub habitat.

Response: "Former" has been deleted.

Comment: The plan should favor even aged management over uneven aged management for the majority of timber harvesting.

Response: As previously stated, the plan strives to create a balance of cover types. Late successional habitats are lacking in many parts of the state, and are therefore a priority on State Forests where there is such a deficiency. While even-aged management will be commonly practiced, the decision in any particular situation will be based on the existing conditions and the surrounding landscape.

Comment: The DEC should not shy away from clearcutting for political reasons if it is the right tool for the job.

Response: The plan does not propose to limit clearcutting.

Comment: Don't limit the size of clearcuts.

Response: The plan does not propose to limit the size of clearcuts.

Comment: The plan should prioritize environmental benefits over economic benefits.

Response: The plan already espouses an approach that does just that. For instance, the plan proposes to hire more staff to harvest more timber, but only within sustainable harvest levels, as well as being subject to the sustainability standards set by the Forest Stewardship Council and the Sustainable Forestry Initiative. These standards include such considerations as: protection of rare, threatened and endangered species and their habitats; protection of ecologically sensitive communities; protection of soil and water quality.

Comment: The plan should include wording to address protection and restoration of native fish populations.

Response: Please see the section on fishing in Chapter 5, which addresses the subject of native fish species, especially brook trout.

Comment: The plan focuses on landscape scale issues at the conceptual level, but the relation of the State Forests to the landscape is not as clear as it could be. For each state forest planning unit, the plan should show how the various State Forest planning units contribute to the landscape level goals, and how each unit affects nearby units.

Response: This information is provided in individual UMPs.

Comment: Pesticides should only be used to combat the spread of exotic invasive species, or perhaps in rare cases, the unnatural proliferation of a native species that has lost its natural control agents.

Response: Pesticides have multiple benefits beyond the control of exotic invasive species and may be used when applying Integrated Pest Management (IPM) and considering alternatives when controlling interfering vegetation.

CHAPTER 3 – RESOURCE PROTECTION

Comment: Request that DEC establish a reasonable timeframe for checking for endangered species.

Response: The presence of listed species may be detected at any time, by any person. The DEC welcomes any information that may be available about occurrences of rare, endangered or threatened species on State Forests lands.

Comment: Sensitive and wide-ranging species may need special protection from trapping and hunting on State lands.

Response: The role of wildlife management and protection is held by the DEC Division of Fish, Wildlife and Marine Resources and is outside the scope of this plan.

Comment: Do not allow construction of buildings within 500’ of state land boundaries.

Response: Construction of homes and other buildings on private lands is outside the scope of this plan.

Comment: An agreement on a set of indicators for species of concern would be beneficial long term.

Response: This set of indicators may be developed as a part of implementing this plan.

CHAPTER 4 – REAL PROPERTY AND INFRASTRUCTURE

Comment: The state should not expand the Forest Preserve.

Response: Acquisition of forest preserve property is outside the scope of this plan.

Comment: New York State should continue to acquire property and provide conservation easements to landowners to protect natural beauty and ensure public access to state lands.

Response: The Plan proposes to do this.

Comment: Parking areas should be constructed in more centralized locations on State Forests, instead of along boundaries.

Response: When opportunities arise, usually in conjunction with timber harvesting operations, parking areas are created in the interior areas of State Forests. However, building new roads and parking areas will be balanced with the stated goal of minimizing fragmentation of large forest areas.

Comment: DEC should eliminate wasteful practices and retire unneeded infrastructure.

Response: DEC considers the closing and elimination of unneeded infrastructure whenever possible. Usually these considerations are vetted with the public on a case-by-case basis through the UMP process with occasional exceptions.

Comment: Would like to have better signage indicating user is within 500’ of a residence or building.

Response: State Forests are natural areas. The plan specifically expresses a goal of minimizing “sign pollution.” In appropriate situations, signs indicating the proximity of private lands or buildings may be posted.

Comment: The Department should minimize forest fragmentation.

Response: Proposed actions under Infrastructure were increased to include developing guidance for road, trail and utility corridor development, with the express intent of limiting forest fragmentation.

Comment: Plans and timelines for completing boundary line maintenance and surveys need to be operationalized.

Response: These timelines are developed at the UMP level.

Comment: The DEC should give money to towns where it owns lands.

Response: The state pays town and county taxes in most counties.

Comment: DEC should keep the roads open except during the winter by using the local highway departments.

Response: There are many examples of cooperative agreements between towns and the state, whereby DEC roads are maintained. However, not all towns can afford to spend time and money on maintaining roads on State Forests within their town.

CHAPTER 5 – PUBLIC/PERMITTED USE

Comment: ATV usage should be considered on a case-by-case basis.

Response: The plan proposes to consider ATV use for certain purposes, under specific conditions.

Comment: Recreational use of ATVs on State Forests should be allowed.

Response: As the plan more fully articulates, many constraints limit the potential for the development of an ATV trail system on State Forests, including: 1) unique maintenance required; 2) conflicts with neighbors and other users; 3) significant environmental impacts; 4) air and noise pollution; 5) difficult enforcement

challenges; 6) high stewardship costs; and 7) necessary legislation for funding, enforcement and use.

Comment: Old railroad beds and utility lines could be used as ATV trail bases.

Response: Most former rail corridors remain in either private or municipal ownership, and are not owned by the state. Utility companies generally do not permit public use of their utility corridors.

Comment: There is an apparent contradiction in allowing four-wheel drive vehicles on truck trails, but not ATVs.

Response: Four-wheel drive vehicles may be legally registered for use on public roads; ATVs may not.

Comment: UTVs ("side-by-sides") should be allowed, since four-wheel drive vehicles are allowed.

Response: UTVs may not be registered under current New York State law, and therefore may not be used on public lands.

Comment: ATV use should be prohibited on State Forests.

Response: ATV use is appropriate in certain situations. Specifically, the plan proposes to continue to allow ATV use in designated locations to allow access by people with disabilities. The plan also proposes to consider creating short linkages between legal ATV trail systems adjacent to State Forests. The plan does not propose to create ATV trail systems on State Forests, nor does it propose to allow recreation use of ATVs by the general public on State Forests.

Comment: The proposal to allow connector trails for ATVs is inconsistent with the negative impacts clearly identified in the plan, and should be removed.

Response: Implementation of this proposal will depend in part on the ability to minimize and mitigate the negative impacts associated with ATV use.

RESPONSE TO COMMENTS

Comment: Public use of ATVs should be allowed on DEC roads where other motor vehicles are allowed.

Response: The Vehicle & Traffic Law allows this only under specific conditions.

Comment: The Department needs to remain open to the possibility of increasing State Forests open to snowmobile use.

Response: The plan allows for increasing the number and length of all types of trails on State Forests, subject to the Unit Management Planning process.

Comment: Hi-volume horizontal hydraulic fracturing (HVHHF) should not be allowed on State Forests.

Response: The decision whether or not to allow HVHHF on State Forests will be made after the DEC's Supplemental GEIS for Hydraulic Fracturing has been completed.

Comment: Natural gas is not a 'forest product' and its extraction is not sustainable.

Response: Natural gas is a natural resource, and the leasing of State Forests for its extraction is explicitly authorized under the Environmental Conservation Law. The sustainability standards and criteria used to assess sustainability of the Department's management of State Forests do permit mineral extraction, within certain specifications.

Comment: Plan should have a complete analysis of mineral extraction, including pipelines, roads, traffic, on State Forests.

Response: This analysis will be conducted during the leasing process.

Comment: The plan lacks analysis of how the DEC would address both the near-term and long-term environmental impacts associated with gas development within the State Forests.

Response: The environmental analysis regarding the use of high-volume hydraulic fracturing is being conducted under the Supplemental GEIS for Hydraulic

Fracturing. The Strategic Plan for State Forest Management is not intended to serve as the environmental review for this activity.

Comment: A no leasing alternative would be the most protective of the State Forests and the DEC must examine this alternative as a viable option in the Strategic Plan.

Response: The 'no lease' alternative is addressed. The plan states that "Another alternative would be to close State Forests to all future leasing," and then proceeds to explain why that alternative was not selected.

Comment: Individual SEQR review should be conducted for every well pad developed on State Forests.

Response: The Mineral Resources section of the plan (Chapter 5) outlines the tract assessment process that is conducted whenever State Forest lands are nominated for leasing. This process includes consideration of criteria for site selection, mitigation of potential impacts and land reclamation upon completion of drilling. If leasing of the property is approved, determinations made during the tract assessment process will be incorporated into the lease documents.

Comment: The statement indicating that mountain bike use is "acceptable only on trails that have been assessed and approved for such use" should be changed to more accurately reflect existing regulations, which allow mountain bike use on all trails that are not posted against it.

Response: This change has been made.

Comment: The trail construction guideline indicating that mountain bike trails should not be constructed at elevations over 2000 feet in elevation should be deleted.

Response: This change has been made.

Comment: The trail construction guideline indicating that skid berms or banked turns should be eliminated. These are proven methods of controlling erosion.

Response: This change has been made.

RESPONSE TO COMMENTS

Comment: There should be a discussion of long-distance bike trails.

Response: There has not been a demonstrated demand for long-distance bike trails on State Forests.

Comment: The statement that "trees are often cut or damaged when trails are established by users without authorization" should either be deleted or applied to all user groups, not just mountain bikers.

Response: Staff experience has been that while other user groups are no more or less likely to create unauthorized trails, they tend not to cut trees in so doing.

Comment: The Recreation section (Chapter 5) is largely biased toward hikers, and doesn't support shared use of trails.

Response: As stated in the plan, multiple-use of the many trail systems on State Forests has exacted a heavy toll on those systems through the sheer numbers of users, regardless of what type of recreation they are pursuing. Impacts and mitigation measures, as well as multiple-use conflicts are listed for hiking, biking, horseback riding, snowmobiling, cross-country skiing, fishing, hunting, trapping, swimming and boating.

Comment: Pedestrian users are the predominant users of State Forests. The amount of foot-only trails should be proportionally appropriate for the number of pedestrian users.

Response: While there has been no study quantifying the proportion of pedestrian users in relation to other users, pedestrian trails are by far the most common single-use trail type on State Forests.

Comment: Trail height clearance for foot trails should be increased from seven feet to eight or even ten feet to accommodate winter use.

Response: This change has been made.

Comment: All user groups should be allowed equal access to all state owned land.

Response: Not all uses create the same level of disturbance or environmental impact. To allow all uses the same access would be an abdication of the Department's duty to protect the natural resources found on State Forests. All user groups will be afforded as much access as is reasonable and responsible, commensurate with demand from other users, resources available to monitor and maintain the necessary facilities and the impacts that result from such use.

Comment: Add provisions for advanced level mountain bike trails and features.

Response: The plan does not prohibit such action. The decision to create such features will be made at the UMP level.

Comment: DEC should incorporate mores specific actions towards promoting recreation in our forests beyond basic hiking trails.

Response: The plan proposes to provide local governments with information about the recreational opportunities found on State Forests, and further recommends providing public information to potential users via signs, kiosks, outreach to user groups and online resources.

Comment: Adopt a Natural Resource Agreements with the sporting community should be explored, especially as they relate to maintaining trails to hunting and fishing areas.

Response: Any group is welcome to apply for an Adopt-a-Natural Resource stewardship agreement. Provided that the work the group wishes to accomplish is consistent with the goals of the plan, there is no reason why such applications will not be approved.

Comment: Would like to see the department develop more of an interactive website, perhaps using web 2.0 technology.

Response: The plan expresses the goal of improving public information dissemination, including the use of online resources. Implementation of this goal may well include web 2.0.

RESPONSE TO COMMENTS

Comment: DEC should develop literature and demonstration areas to educate the general public on the ecological benefits of silviculture.

Response: This action has been added to the plan.

Comment: Disagree with the statement that disposal by injection is "valid and viable option." New York specifically should not consider this practice a viable option.

Response: The referenced statement has been deleted. Additional information about this technology has been inserted, as well as a statement indicating that additional environmental review will be required if disposal by injection is proposed on State Forests.

Comment: The section regarding dog training is much shorter than many of the other sections about other types of recreation, and it inappropriately includes compaction of grass as an "impact."

Response: The plan does not refer to grass compaction; it includes compaction of soil from driving and parking vehicles as an impact of the activity. A sentence has been added to the section indicating that dog training and field trials are acceptable uses of State Forests.

Comment: Traffic noise should not be listed as a negative impact of dog training and field trials; these activities don't produce more traffic than other user groups. Dogs don't disturb wildlife groups any more than any other group. Language should be modified.

Response: Staff experience is not consistent with the above statement. Field trials usually involve large numbers of vehicles, and parking for the vehicles may not be available on the property. Dog owners and handlers express the need to park close to the actual training or trial site, as many of them bring multiple dogs and do not wish to have to walk long distances to bring each dog to the site individually. Field trials also typically are multiple-day events, involving intense use of a relatively small area as well as actual or simulated firearm discharge.

Comment: Expand land usage for canine events (dog trials and training).

Response: The plan does not discourage expansion of dog training or trial use on State Forests. Expansion of all recreational uses is subject to the Unit Management Planning process.

Comment: Create additional facilities for access and use by equestrian users.

Response: The plan does not encourage or discourage the creation of facilities for any single type of use. This decision is made at the unit level in UMPs.

Comment: "At this time" should be removed from the text on trapping.

Response: "At this time" has been removed.

Comment: Furbearers such as beaver, fisher and river otter are sought by trappers is too vague and almost misleading for this plan, especially since fisher and river otter trapping is not yet allowed in many DEC regions, and thus not yet allowed on many State Forests.

Response: Modifications have been made to the plan to clarify this issue.

Comment: People's dogs should be strictly controlled when on any State Lands. Dogs, except dogs being used for hunting or trained for hunting should not run free on State Forest Lands unless small areas, clearly marked, are set aside specifically for such use.

Response: Dog walking and exercising is an appropriate use of State Forest lands. Most State Forest users who bring their dogs keep them in control along use corridors such as roads or trails.

CHAPTER 6 – FOREST MANAGEMENT AND HEALTH

Comment: The DEC should increase revenues from sustainable logging and enhanced game harvesting.

Response: As stated in the plan, the Department has proposed to hire additional forestry staff to increase the harvest of timber from State Forests, within sustainable limits.

The level of game harvest in the state is outside the scope of this plan.

Comment: Commercial use of State Forests, particularly timber harvesting, is compatible with most other uses, and should be more strongly emphasized in the plan.

Response: The Active Management and Forest Products sections of the plan are already two of the more extensive sections.

Comment: The plan should include an overall target for timber harvest levels.

Response: The target will be developed as an action proposed in the plan. Further data collection is necessary before a responsible harvest level can be determined.

Comment: Timber harvests should not be "hidden" behind buffer strips of vegetation, as this perpetuates the idea that harvested areas are "ugly."

Response: SEQRA requires that visual impacts be one area of consideration, and that such impacts be minimized or mitigated.

Comment: Revenues from forest product sales should go back into State Forest management.

Response: Revenues from the sale of forest products are deposited in the Natural Resource Account. Changing the disposition of these funds would require legislation, which is beyond the scope of this plan.

Comment: Logging should generally be avoided near wetlands and water bodies, sites of rare or threatened or endangered (RTE) species or natural communities, key ecological linkages, and denning or birthing areas.

Response: Before logging is considered for a site, extensive review of that site is conducted through review of the Master Habitat Database, inventory and site inspection for RTE species, unique communities, nesting and denning with appropriate buffers and conditions to protect any ecological features of significance from logging impacts. Wetlands and other water bodies are protected through the application of the DEC Division of Lands and Forests Management Zone Rules for

Establishment of Special Management Zones on State Forests as discussed in Chapter 3.

Comment: Attempts to control invasive species through regulations of NYS residents after those species have demonstrated viability in the ecosystem are inappropriate. DEC should focus attention toward overseas freight at airports and ship yards.

Response: Preventing new introductions via international shipments is another avenue being pursued by the DEC and other agencies. However, it is also economically important to slow the spread of invasive species even after they have become established.

Comment: DEC makes no acknowledgment that Phragmites is harmful to wetlands.

Response: Phragmites has been added to list of examples of harmful invasive species.

Comment: The plan will likely have adverse effects on early successional habitat. Moving it more towards climax forests throughout the state.

Response: The plan expressly states that mid-stage forests (forests between 40 and 140 years old) are more than adequately represented on State Forests. The plan states that efforts will be made to create more late successional and early successional forests.

Comment: The section on Maple Tapping (Chapter 6) includes numerous inaccuracies about the economics of maple sap collection and the impacts that tubing systems would have on other users of State Forests.

Response: The plan has been revised to indicate that: financial return within five years (the longest contract term allowable under current law) could make sap collection on State Forests economically feasible; sap collection systems could be implemented in such a way that will not preclude use of State Forests by others.

Comment: DEC should adopt regulations to prevent overcutting from biomass harvesting for wood energy.

RESPONSE TO COMMENTS

Response: By implementing the rules, guidance and policies discussed within this plan, including but not limited to the Program Policy ONR-DLF-1/Plantation Management on State Forests, ONR-DLF-2/Retention on State Forests, and ONR-DLF-3/Clearcutting on State Forests, the Bureau already employs many practices to promote the sustainable management of State Forests and prevent overcutting.

Comment: Under “Fuels Management and prescribed Fire” add “Short term impacts associated with prescribed fire listed below should be considered in light of the long term benefits to forest health and reduced fire hazard” to the end of the first paragraph.

Response: Language added.

Comment: Under “Wildfire Prevention and Suppression” add “Methods of reducing impacts of wildfire suppression on the ecosystem should be incorporated into fire suppression activities, and low-impact methods should be deployed whenever possible (i.e. indirect attack methods).”

Response: Language added.

Comment: The plan should take a more aggressive approach, including the use of DMAP permits on State Forests, toward reducing deer impacts.

Response: A pilot DMAP program on State Forests in Region 7 has been started. The program may be expanded, depending on its success in reducing deer impacts on State Forests.