Resource Strategies

The strategies to be carried out by the Division of Forests in the upcoming five years are the key components of this Plan. Strategies selected for the Plan include those that continue programs with measured need and success; meet obligations under state statutes, rules and procedures; and new initiatives that will aid progress toward Desired Future Conditions.

The strategies are presented by Desired Future Condition - a broad statement that collectively leads to achieving the vision of Vermont's forests. Under each Desired Future Condition are goals and strategies which could, as a whole, direct the state towards a desired future.

As with previous Forest Resources Plans, this Plan builds on a foundation of partners. At the end of this section is a matrix summary that lists strategies followed by Division programs engaged in the activities, partner organizations that may be involved, financial resources needed to carry out each strategy, and its relationship to the national priorities.

Desired Future Condition 1: *Biological Diversity*

Conserve biological diversity across all landscapes

Overview

Connections between forest communities are important to fundamental ecological processes and the future of biological diversity associated with forests. Biological diversity is represented at many levels from genetic to species to ecosystems. It is critical that Vermont's forests contain healthy and sustainable populations of native plants and animals. The primary objective of the conservation of biological diversity is the survival of species and their genetic variability. Viable breeding populations of species and their natural genetic variation are part of interdependent physical and biological systems. By conserving biological diversity, forests should have the ability to function, reproduce and remain productive.

The breaking up of habitats into smaller, non-contiguous patches as a result of habitat conversion can render important habitats inaccessible, isolating populations and degrading remaining habitat patches through edge effects that favor edge-tolerant species such as raccoons and crows, as well as invasive exotic species that can out-compete native and rare species. The result of habitat fragmentation is often increased predation, increased mortality, reduced mobility and changes in habitat micro-climates (Vermont Department of Fish and Wildlife, 2005).

Base Indicators of Forest Sustainability

- Area and percent of forest land[1].
- Number and distribution of large forest blocks.
- Area and percent of conserved forest land.
- Area and percent of forest by forest type, and successional stage as indicated by size and age classes.
- Area of contiguous forest land lost to fragmentation.
- Acres and condition of unique or fragile sites under conservation protection.
- Bird population trends, including breeding bird survey.

Issues and Threats

[1] Forest land is land that is at least 10 percent stocked with trees of any size or that formerly had such tree cover and is not currently developed for a nonforest use. The minimum area for classification of forest land is one acre. The components that make up forest land are timberland and all noncommercial forest land (National Forest Inventory and Analysis Database, 2008).

Perhaps the single biggest threat to biological diversity is conversion of forests to other uses. Conversion may stem from parcelization, changing landowner objectives and development. Results of conversion include fragmentation of wildlife habitats, impact to the natural processes, increases in exotic invasive species and the loss of the integrity of natural communities. Spatial information on the location, ranking and value of forest ecosystems across the landscape is an important aid in effective conservation of biological diversity. Finally, we need more research to determine long-term impacts of acceptable management practices on biodiversity in maintaining balance between ecological and economic values and benefits.

Goals and Strategies

Desired Future Condition 1: *Biological Diversity*

Conserve biological diversity across all landscapes

Goal 1: Maintain a mix of forest structure and complexity across the landscape.

Strategy 1: Encourage management activities that sustain a diversity of forest conditions and ages.

Strategy 2: Maintain a mix of programs aimed at keeping forests in forests including UVA[2], Forest Legacy, local and regional planning and land acquisition.

Goal 2: Protect and conserve natural communities, genetic diversity, rare and endangered species, unique habitats, corridors and buffers.

Strategy 3: Work with partners to identify landscapes and support species of greatest conservation need.

Strategy 4: Conserve genetic diversity of species of concern.

Strategy 5: Support activities and leverage resources to protect and conserve landscapes and species of greatest conservation need.

[2] UVA stands for Use Value Appraisal Program.

Desired Future Condition 2: *Forest Health and Productivity*

Maintain and enhance forest ecosystem health and productivity

Overview

Ecosystem health depends upon the integration of all natural resource components and ecological functions. The health of the forest includes the productive capacity of the soil, water and air, and their interaction to support all biota. People have multiple effects on forest ecosystems; human impacts include land conversion, species and forest structure conversion through harvesting, suppression of natural fire cycles and floods, degradation through incompatible uses, acid deposition and the introduction of non-native species. These in turn, influence ecological processes and ultimately forest dependent plant and animal species (Stein, et al., 2005).

Our soil resource is a basic component of all terrestrial ecosystems and the loss of soil influences the vitality and species composition of forest ecosystems. Soil erosion and compaction can degrade aquatic ecosystems and associated forests, forest productivity, recreational opportunities and water supplies.

Monitoring the volume of wood products harvested annually relative to the amount which could be removed sustainably provides an indication of a forest's ability to provide a continuing supply of forest products, and economic and forest management opportunities. However, productivity should be viewed broadly, considering all the products produced from the forest such as water, air and carbon. Maintaining the health and productivity of our working forest landscape, truly a "forest that works for all" is critical to sustainability.

Base Indicators of Forest Sustainability

- Area of forest land at risk due to potentially damaging agents.
- Area of timberland[3].
- Annual removal of wood volume compared with net growth.
- Acres of public and private lands under forestry management plans.
- Trends in forest phenological measures favoring productivity.
- Acres and rate of change of dead and dying trees by species.
- Acres of forest land exceeding their critical load for acid deposition.

[3] Timberland is forest land not withdrawn from production that is capable of growing 20 "cubic feet" of industrial wood annually *(National Forest Inventory and Analysis Database, 2008)*.

Issues and Threats

There is the realization that the functions and benefits of forests are all interrelated and the maintenance of ecological productivity should include all values and services. There is much more to learn on forest systems and threats from human impacts. The role of forest management in maintaining forest health is often misunderstood by the public, as are the benefits of urban forests. A lack of quantitative information regarding natural and anthropogenic changes leads to uncertainty in developing management strategies.

Goals and Strategies

Desired Future Condition 2: *Forest Health and Productivity*

Maintain and enhance forest ecosystem health and productivity

Goal 1: Identify trends in forest ecosystem health and productivity.

Strategy 6: Work with partners to understand Vermont's forested ecosystem.

Strategy 7: Monitor and report current forest health and evaluate potential threats.

Goal 2: Maintain productive capacity of forests.

Strategy 8: Encourage appropriate forest management that maintains health and productivity.

Strategy 9: Maintain and enhance soil productivity.

Strategy 10: Rehabilitate degraded landscapes to restore ecosystem health.

Strategy 11: Support wildland fire preparedness planning and suppression activities.

Goal 3: Retain native flora and fauna across the landscape.

Strategy 12: Prevent the introduction and slow the spread of invasive exotic species.

Strategy 13: Support monitoring and programs that maintain Vermont's common flora and fauna.

Strategy 14: Encourage retention and planting of native plant species.

Desired Future Condition 3: *Forest Products and Ecosystem Services*

Maintain and enhance forest contribution to ecosystem services

Overview

Forests provide natural assets we call ecosystem services that are vital to human health and livelihood. The forests of Vermont have played a defining role in our treasured working landscape for more than three centuries. Maintenance and enhancement of traditional and emerging forest products sectors is critical to keeping forests as forests and supporting landowners who invest in this resource.

The accumulation of biomass as living vegetation, leaf litter and soil carbon (carbon pool) is an important forest function in regulating atmospheric carbon. The production rate of biomass is a measure of forest health and vitality. The ecological and sustainable management of productive forests and use of durable forest products can be a factor in controlling the amount of carbon entering the world's atmosphere.

Forests are an important part of the earth's hydrological cycles particularly in regulating surface and ground water flow. Changes in historic stream flow and the timing of flow can reflect on the health of aquatic ecosystems. Forests also play an integral role in protecting and enhancing water, as well as air quality.

Urban forests should not be ignored when describing benefits derived from forests. It is clear that the ecosystem services provided by trees and forests in the heart of our communities contribute not only to providing ecosystem functions, but to improved quality of life. Since urban forests are intermixed with a myriad of gray infrastructures such as roads and utilities, they should be looked at as 'green infrastructure,' a necessity towards sustainable communities.

Finally, Vermont's forests serve the needs of Vermonters and visitors for recreation and by supporting tourism. Recreational opportunities need to recognize the diverse personal needs and expectations for exercise, connection to nature, spiritual renewal, solitude and social interactions while balancing multiple recreational uses and the need for long-term maintenance.

Base Indicators of Forest Sustainability

- Area of forest land adjacent to surface waters.

- Percent of forest cover.
- Percent of tree canopy cover over urban areas.
- Status of forest ecosystem biomass and forest carbon pools.
- Wood and wood products production, consumption and trade.
- Miles of hiking, biking and other recreational trails.
- Federal, state and town facilities supporting forest recreation opportunities.
- Employment and wages in forest-related sectors.
- Property loss due to wildland fire.
- Percent of population living in communities developing or managing programs to plant, protect and maintain their urban and community trees and forests.

Issues and Threats

The lack of public understanding and valuing of ecosystem services is a threat to their management and protection. All too often, decisions on land use and management are short-term solutions, with long-term consequences. Keeping forest land intact may seem like a simplification of the problem, but the benefits of forested ecosystems that society has taken for granted are only now being realized. In all land based decisions, we need to account for the role that trees and forests have in providing ecosystem services, even in developed urban environments. Additionally, we need to recognize that differing management strategies may be necessary to meet the services and values we are seeking to maximize. For example, as potable drinking water continues to be a vulnerable commodity, we must consider the increased value of forests for its ability to produce clean water. With almost eighty percent of Vermont's forest in private ownership, it is critical that landowners can earn a return on their investment.

Goals and Strategies

Desired Future Condition 3: *Forest Products and Ecosystem Services*

Maintain and enhance forest contribution to ecosystem services

Goal 1: Maintain and enhance the production of forest products.

Strategy 15: Work with partners to assess Vermont's capacity to produce raw materials for forest products.

Strategy 16: Support the forest-based economy including maintaining and diversifying markets to encourage forest management activities and local production and use of forest products.

Strategy 17: Support research that improves the procurement and utilization of the full suite of forest products.

Strategy 18: Encourage stable solid wood and biomass supply to support forest industry.

Goal 2: Maintain and enhance water resources.

Strategy 19: Encourage inclusion of soil and water conservation considerations by foresters, forest landowners and loggers through appropriate forest planning and practices.

Strategy 20: Encourage trees and forests for flood mitigation and storm water management.

Strategy 21: Identify, conserve, restore and protect priority forested watersheds valued for water resources.

Goal 3: Maintain and enhance recreational opportunities.

Strategy 22: Build partnerships that enhance forest-based recreational opportunities.

Strategy 23: Work with partners to maintain forest access, land stewardship awareness and outreach, and well-maintained trail networks that support recreational opportunities.

Goal 4: Maintain and enhance forest carbon.

Strategy 24: Support research that improves the understanding of measuring, monitoring and trends in forest carbon, including applications for forest carbon marketing.

Strategy 25: Work with partners to enhance forest carbon market opportunities.

Goal 5: Maintain and enhance air resources.

Strategy 26: Support research and monitoring that improves the understanding of trends in air quality, weather, climate and how they affect forests.

Strategy 27: Work with partners to enhance opportunities for improving air resources.

Strategy 28: Monitor changes in forests in relation to air resources.

Desired Future Condition 4: *Land Ethic*

Maintain and enhance an ethic of respect for the land, sustainable use and exemplary management

Overview

To promote sustainable forest management, cooperation among forest landowners, practitioners, the public and government is critical in fostering ongoing and productive involvement. Educational opportunities enable the array of forest owners, industry professionals and users to understand and respect Vermont's forests. The Department must lead by example and set the standard for a land management ethic that respects the land and recognizes all appropriate uses.

Base Indicators of Forest Sustainability

- Investments in forest health and forest management research.
- Patterns and trends in forest ownership, land use and conservation easements.
- Acres enrolled in forest stewardship programs.
- Number of demonstration areas on Agency lands.
- Number of communities with conservation commissions and other related committees.
- Acres of federal, state and municipal forests.
- Local wood product production and consumption.
- Percent increase in urban forest canopy.
- Number of workshops and educational programs on forestry.
- Number of volunteer hours submitted annually related to natural resource management.

Issues and Threats

Because Vermonters use and value forests in many ways, debate over the future of our forests is often spirited. Issues including fragmentation of forest land, protection of wildlife and their habitat, unsustainable recreation activities, timber harvesting practices, taxation of forest land, status of forest health, acquisition and management of public land and the protection of private property rights are all common themes. There also exists an under appreciation of the forest products economy and urban forests in Vermont. It is in the public interest that private property owners hold a high stewardship ethic and practice sustainable forest management and public entities (town, state and federal) serve as stewardship leaders. Economic factors often create

obstacles to long-term stewardship and the quality of stewardship may vary greatly. Educating all residents on the values and benefits of trees and forests is critical to forest sustainability. However, affecting a change in ethics is not an easy task.

Goals and Strategies

Desired Future Condition 4: *Land Ethic*

Maintain and enhance an ethic of respect for the land, sustainable use and exemplary management

Goal 1: Encourage public understanding of forest systems.

Strategy 29: Encourage the understanding of different forest systems and how they interact.

Strategy 30: Enhance public education and outreach on forest health and productivity issues.

Goal 2: Increase public awareness of the critical role trees and forests play in sustaining Vermont communities and residents.

Strategy 31: Enhance public awareness and education of the components of functioning urban ecosystems.

Strategy 32: Strengthen public media outreach opportunities related to forest issues.

Strategy 33: Support forestry education activities and programs.

Strategy 34: Provide information to all stakeholders on ecosystem services and the importance of forests to all ownerships.

Strategy 35: Promote wildland fire prevention to protect forested communities.

Goal 3: Increase public understanding and the application of exemplary forest management, conservation and protection.

Strategy 36: Educate the public on the value of keeping forest land forested.

Strategy 37: Promote forest stewardship through educational efforts to all citizens.

Strategy 38: Encourage citizen involvement in forest health and protection.

Strategy 39: Support environmental literacy programs by forest professionals that improve natural resource management, conservation and protection.

Strategy 40: Educate natural resource professionals and promote management practices that maintain forest productivity and ecosystem services.

Strategy 41: Partner with State Parks, Green Mountain National Forest and other organizations to support forest-based recreational opportunities.

Goal 4: Maintain and enhance forest contribution to communities.

Strategy 42: Work with partners to encourage land use planning that maintains a working landscape.

Strategy 43: Promote and support the planning and management of urban forests at state, regional and local levels.

Strategy 44: Support local and regional efforts that encourage community forestry, economic development and strengthen land tenure.

Goal 5: Demonstrate exemplary forest management on state lands and encourage sustainable use across all landscapes.

Strategy 45: Implement forestry practices that demonstrate sustainable forest management.

Strategy 46: Expand educational opportunities on public lands.

Strategy 47: Utilize public lands as demonstration forests.

Desired Future Condition 5: *Legal, Institutional and Economic Framework*

Vermont has a legal, institutional and economic framework in place for forest conservation and sustainability

Overview

State policies must promote sustainability of Vermont's forests and reflect the needs of all forest owners while encouraging cooperation between all citizens of the state. Forestry statutes, rules and policies should provide for the sustainable management and protection of forest resources and provide the greatest environmental yield. To be successful, the Division of Forests is managed and operates in a sustainable manner that is respectful of the environment, its employees and the public. Within the Division, we will improve our understanding and monitor our actions in relationship with the principle of healthy forests.

Base Indicators of Forest Sustainability

- Level of adherence to forest management standards/guidelines.
- Number of Agency land management plans.
- Dollars spent on meeting our Desired Future Condition goals.
- Auditing of Division operations through survey of on job satisfaction.
- Number of violations of state forestry laws and regulations.
- Number of easement acres monitored annually.
- Acres enrolled in the UVA Program and third-party certification programs.

Issues and Threats

It is often difficult to promulgate state laws, policies and programs to promote sustainable forestry because of the perceived or real fears of erosion of property rights, loss of "traditional" uses or anticipated economic effects. State policies must promote the sustainability of Vermont's forests and reflect the needs of forest owners to meet their management objectives and public need. This is often a difficult balancing act between property rights and public welfare. Planning for state-owned and federal land should be comprehensive, interdisciplinary, and open to and representative of all Vermont citizens. Limited engagement of all citizens in the debate promotes imbalance and disinterest. A stable and equitable tax structure that encourages both retention and management of forests is necessary.

In light of the current economy, revenue streams are decreasing and shifting. This change has an impact on how the Division of Forests conducts business. The impacts will undoubtedly lead to changes in organizational structure and program delivery to focus on priorities while increasing efficiencies and effectiveness.

Goals and Strategies

Desired Future Condition 5 : *Legal, Institutional and Economic Framework*

Vermont has a legal, institutional and economic framework in place for forest conservation and sustainability

Goal 1: Maintain an organizational structure within the Division of Forests to support management, protection, conservation and enhancement of Vermont's forests.

Strategy 48: Ensure that all programs are consistent with its mission and our indicators are used to monitor progress towards maintaining healthy forests.

Strategy 49: Maintain infrastructure, staff and an organizational structure to achieve Desired Future Conditions.

Strategy 50: Enhance program management and program integration to improve efficiencies and effectiveness.

Strategy 51: Facilitate effective and enduring communications within the Division and with other state and federal agencies and organizations.

Strategy 52: Create and maintain an environment of professional development and continued learning.

Strategy 53: Encourage an organizational culture that rewards excellence, actively encourages teamwork and provides mentoring to achieve maximum job performance and job satisfaction.

Goal 2: Expand financial opportunities to support forest stewardship.

Strategy 54: Strengthen Division of Forests capacity to seek grant funding.

Strategy 55: Provide opportunities and incentives to accept private contributions.

Strategy 56: Support partners efforts to seek and maintain financial resources.

Strategy 57: Keep state legislature abreast of current financial status, program efforts, opportunities and challenges.

Strategy 58: Enhance financial collaboration with USDA Forest Service and Natural Resource Conservation Service, and others to fulfill Plan goals.

Goal 3: Strengthen, implement and enforce Vermont's forestry policies, rules and laws.

Strategy 59: Encourage a voluntary approach for attaining compliance.

Strategy 60: Support enforcement of Vermont's laws and regulations working within Vermont's legal system.

Strategy 61: Support an open, inclusive and deliberate process when assessing current and proposed legislation affecting forestry interests.

Goal 4: Encourage and support policies, programs and initiatives that assist private forest landowners in maintaining the working landscape.

Strategy 62: Continue to support and enhance participation in the Use Value Appraisal program as a stable tax equity program that promotes forest land retention and management.

Strategy 63: Encourage voluntary adoption and field application of best management practices for timber harvesting.

Strategy 64: Support forest landowners and the forest products industry on third-party certification and chain-of-custody marketing opportunities.

Strategy 65: Support and plan for cost-share and grant programs that assist forest landowners in management of the working forest.