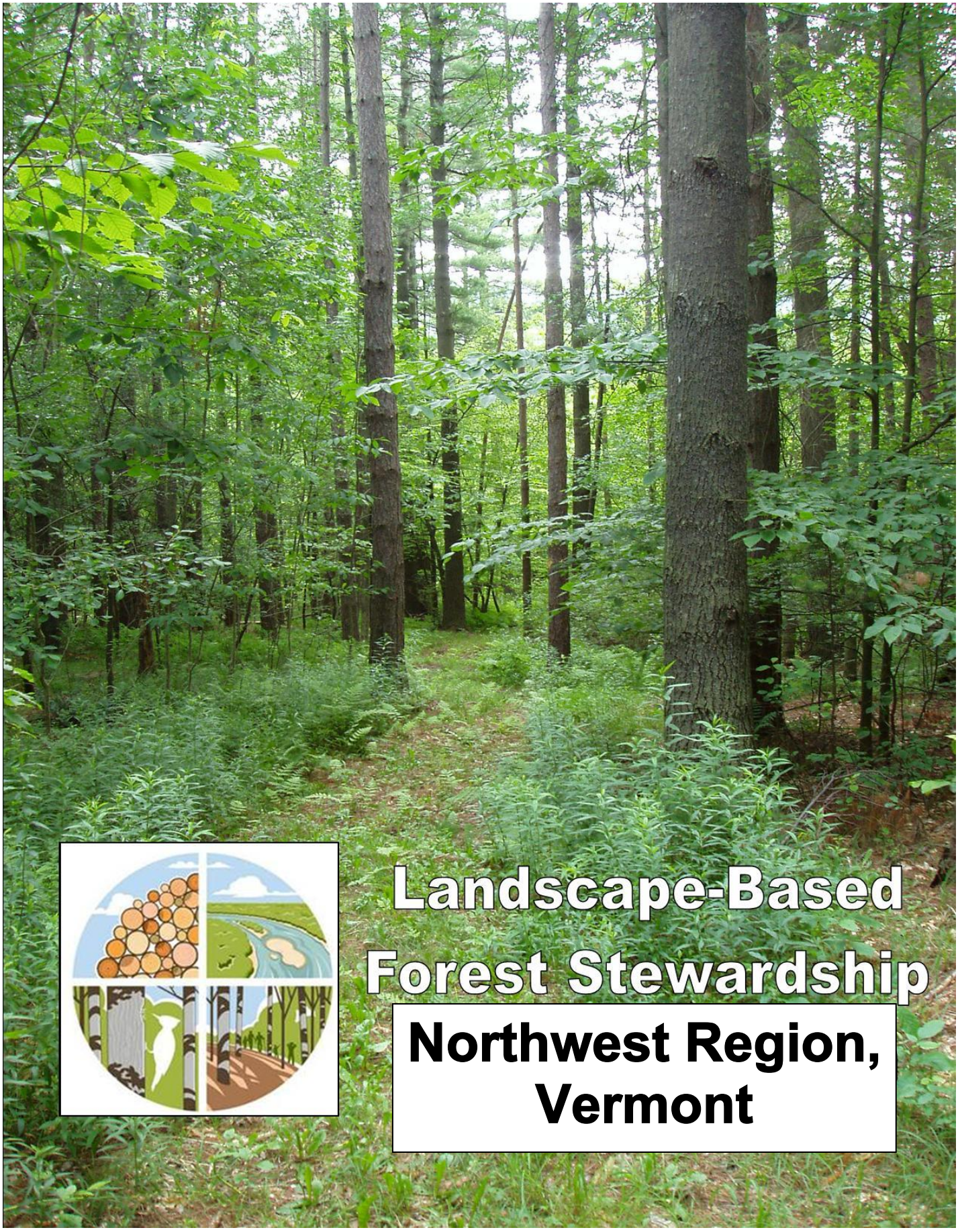

Landscape-Based Forest Stewardship

Northwest Region, Vermont

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Introduction

The Importance of Forests to the Northwest Region

Forests, in one form or another can be seen throughout the Northwest Region, whether as a town forest, timber stand, undeveloped mountain side, buffer along a stream, or a private sugarbush. They are a part of the Region's working landscape, provide essential resources, and are a critical asset in the development of a prosperous and sustainable future. In spite of this role, forests are often looked at as separate components of the landscape and not as a connected resource to forestland as a whole.

The purpose of this plan is to outline a landscape-level planning process that identifies how the forests are valued in the Region and what measures can be taken to ensure that the forests will be maintained in a healthy state in order to "keep forests as forest".

As a first step, Northwest Regional Planning Commission (NRPC) identified the potential interest groups and viewpoints that have a stake in the Region's forests. These stakeholders were invited to participate in this process to share their viewpoints and provide feedback on the topics being addressed. With the assistance of the stakeholders, NRPC identified the variety of ways the forests are utilized and valued. These stakeholders formed the Northwest Forest Stewardship Steering Committee to gather an understanding of the opportunities and challenges present in the Region for working towards good stewardship of this resource. This feedback component was a critical aspect of the process to ensure we are correctly capturing the different viewpoints of the Region and forestry sector.

The Northwest Forest Stewardship Steering Committee

The Northwest Regional Forest Stewardship Steering Committee was comprised of individuals from across the Region and represent different aspects of the forest such as forest landowners, municipal board representatives, forest industries, conservation interests and wildlife habitat organizations. The committee met several times between 2013 and 2014 to discuss what barriers our Region faces in maintaining forested lands and what kinds of strategies we will need to enhance and sustain their health. The committee was comprised of:

Table 1. Northwest Forest Stewardship Committee

Name	Entity	Role
Toby Alexander	Natural Resources Conservation Service	State Biologist/Acting Forester; Private Forest Landowner
Dorothy Allard	Bakersfield Conservation Commission	Municipal
Bridget Butler	Resident	Wildlife/Conservation
Annette Goyne	Richford Conservation Commission	Municipal
Charlie Hancock	North Woods Forestry; Montgomery Conservation Commission	Consulting Forester; Municipal
Kevin Hastings	Amoskeag Woodworking	Wood Products Manufacturer

Lawrence Howrigan	-	Maple Sugar Maker
Alex Hudak	-	Logger
Benjamin Lepesqueur	Lepesqueur Logging	Logger
Betsy Lesnikoski	Forester at Burlington Electric Department	Wildlife/Conservation
Gabe Parent	-	Logger
Nancy Patch	State of Vermont	County Forester
Mike Rainville	-	Logger
Tyler Riggs	LSF Forest Products, LLC	Saw mill operator; Maple Sugar Maker
Kyle Branon	Franklin County Sugarmakers Association, President	Maple Sugar Maker

NRPC and the Franklin County Forester were the lead partners working with the Steering Committee throughout the project. As the Committee list indicates, many of the members represented other organization or enterprises that have a significant concern for forest lands. Their views and contributions were invaluable to this project.

Goals & Objectives

Regional Meaning of "Keeping forestland as forestland"

"Keeping forests as forests" does not mean that forests and their various uses in the Region will not, or should not, change over time; a forested landscape is a dynamic system that is constantly changing. Rather, "keeping forests as forests" means proactively addressing the challenges and limitations to sound forest management so that the Region's forests may continue to support the very reasons that our communities value them. Our forests have the potential to provide us with an abundance of ecological, economic and social benefits. The sustainability of Vermont's forests depends upon keeping forests forested, which is one aspect of health and productivity.

Decisions and actions we make today will influence our forests for years to come. Maintenance and enhancement of traditional and emerging forest products sectors is critical to a sustainable forestland and supporting landowners who invest in this resource. Livable communities, functioning natural systems and our quality of life depend on healthy, sustainable forests. We must accept and embrace responsibility as stewards of this valuable resource.

Importance of Landscape-Based Planning for the "Forest Landscape"

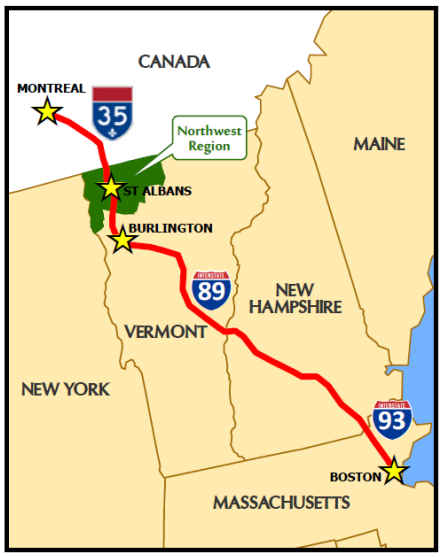
Vermont has a working forest landscape; one that provides goods and services through stewardship, management and conservation. One prevalent aspect of the forested landscape is that the majority of this resource is privately owned. According to the Vermont Forest Resource Fact Sheet, more than 70% of Vermont's 4.6 million acres of forest can be characterized as nonindustrial private forest land (NPIF). This land is divided among an estimated 88,000 landowners, independently managing their properties

with unique private interests. The fragmented nature of Vermont's NPIF ownership means that forest resource planning occurs parcel by parcel and to date no efforts have focused on looking at these individual forested parcels on a larger scale.

A planning approach that looks at the forest resource across parcel boundaries to the landscape or regional scale, would better address the State's objective of keeping forest land intact. This approach, termed a *landscape stewardship approach*, aims to consider habitat connectivity, forest health and productivity, ecosystem quality, and strong forest products based economic activities. A landscape stewardship approach, as employed for this report, has been identified as the most effective way to address these concerns and help communities and private landowners conserve forest resource values. Regional forest stewardship planning will help ensure Vermont's public and privately owned forests are managed in an environmentally responsible way.

Regional Characteristics of Northwestern Vermont

Location and Demographic Trends



The Northwest Region of Vermont is defined by the 23 municipalities (19 towns, 3 incorporated villages, and the City of St. Albans) which make up Franklin and Grand Isle Counties. The Region is bordered by the Province of Quebec to the north, New York State to the west, Chittenden and Lamoille Counties to the south and east, and Orleans County to the east.

Franklin County, with a land area of 637 sq. mi. and a 2010 population of approximately 47,746, is by far the larger of the two counties. The western portion of Franklin County, traversed by I-89, lies within the Champlain Valley and includes the shore land towns of Georgia, St. Albans, Swanton and Highgate. Access inland to the foothills and western flanks of the Green Mountains is provided via Route 105, following the Missisquoi River; Route 36 along the Black Creek drainage, which flows through the heart of the Region's hill country; and Route 104 which follows the Lamoille River. Only two roads, Route 105 out of Richford, and Route 242 out of Montgomery, provide year-round access eastward across the Green Mountains. Many Franklin County communities have an economic and cultural focus on agriculture and the working landscape.

Grand Isle County, also known as the "Champlain Islands" or simply "the Islands," is made up of three main islands the southernmost shared by the towns of South Hero and Grand Isle, two others comprising the Town of North Hero and Isle La Motte to the west, as well as the Alburgh peninsula which extends southward from the Canadian border. Surrounded by the waters of Lake Champlain (of which around 100 sq. mi. are within the county), the Islands are connected to the mainland and to each other by a series of causeways and bridges, and by a year-round ferry service operating between Grand

Isle and Plattsburgh, NY. With a land area of only 83 sq. mi., and a 2010 population of approximately 6,970, Grand Isle County is not much larger than many Vermont towns. Grand Isle County communities, however, share a unique character and identity that is intimately tied to the lake and island life.

The Northwest Region, represents approximately 8.7% of the State's population, with a combined year-round population in 2010 of just over 54,716 and an average density of around 76 people per square mile, it remains predominantly rural. Only 20% of the Region's residents live within "urban" areas, including St. Albans City (2010 pop: 6,818) the Region's primary government, commercial and employment center and the three incorporated villages of Alburgh, Enosburg Falls and Swanton.

A majority of the Region's population lives within easy commuting distance of Chittenden County, and benefits from the greater opportunities for jobs, goods, and services that this proximity affords. Growth has been fueled by the development of the greater Burlington metropolitan area to the south, and strengthened economic ties with Quebec to the north. This is evidenced in the transformation of rural farming communities into bedroom and recreational communities, the expansion of the St. Albans area, and the advent of forms of development including industrial and business parks, residential subdivisions, and commercial strip developments that typically define more suburban environments.

Land Use Trends

The Northwest Region contains a mix of the agrarian, working landscape and the natural systems of the Green Mountains and Lake Champlain. The built environment in the Region consists of compact village centers surrounded by open countryside. The Region has retained much of its traditional, small town rural character, however more recent forms of development including commercial strip development and suburban sprawl threaten the available working lands and open space.

The challenges of growth can have impacts on the economic resources, agriculture and forest lands of the Region. Although Franklin County was the most productive county agriculturally in the state in 2002, agricultural productivity has been trending down historically. In Franklin County the recent trend is that the amount of farmland has stayed relatively constant however the size of farms is growing but in Grand Isle County both the number and total amount of cropland is decreasing. Changes are also occurring to the area's forestland, as communities continue to grow, parcelization or the creating of smaller parcels for development leads to fragmentation of the forest resources.

Economic Characteristics and Trends

According to the 2007-2011 American Community Survey, the median family income for the Region was at $65,785 for Franklin County and $73,527 for Grand Isle County. Social and economic changes in recent decades have reshaped household dynamics in the Region; the majority of the households are classified as a married couple or family households, which can lead to higher median salaries if the household contains two-income workers (2007-2011 ACS). The Region's overall population is aging, following state and national trends. The education level of the Region's workforce has steadily increased since 2000. However, the percent of the population over 25 with a college degree or higher

falls behind that of the state.

The available employment opportunities provided in the Region has stayed relatively steady in the past ten years. Franklin County provided 24,850 positions in 2011, compared to Grand Isle County which employed 3,650 (2013 Vermont Economic and Demographic Profile). The major employment sectors in the Northwest Region in 2011 were *manufacturing* (15%), *retail trade* (13%), *health care and social assistance* (14%), and *government* (25%). These positions are largely located in the Region's employment centers: the City of St. Albans and the incorporated villages of Swanton and Enosburg Falls. This data does not capture the growing number of small businesses that are in the Region or the number of self-employed residents. Agriculture and forestry also play a central role in defining the character of the Region and have historically been, and continue to be, significant parts of the Region's economy.

In 2000, 60% of the Region's workforce stayed within the region to work and 37% traveled to Chittenden County. This trend has changed as of 2011, when 42% of the Region's workers worked within the region and 43% worked in Chittenden County. This trend reflects the expansion of Chittenden County workers into the Region.

Regional Forest Characteristics

Northwestern Vermont is considered part of the "Northern Forest", an area stretching across northern New York, Vermont, New Hampshire, Maine and also includes Quebec, New Brunswick and Nova Scotia north of the border. The Northern Forest encompasses 26 million acres of forestland within the U.S. The Upland Area of Northwestern Vermont contains the largest tracks of contiguous forest. This area is characterized by steeply sloping mature softwood and hardwood forests, and second and third order streams which flow into the Missisquoi and Lamoille Rivers, and eventually into Lake Champlain. Though predominantly in private ownership, these forests have been federally targeted to encourage sustainable forestry practices and compatible development that will maintain both the quality of the environment, and the health of rural communities.

The Region's uplands strongly correlate with preferred habitat for Vermont's black bear population, and are generally the most undeveloped lands in Franklin County. The Region's forests play an important role as a natural, cultural and economic asset to the local communities. A number of communities in the Region maintain Town Forests (see Map 12). These and other forests throughout the Region are used for recreational purposes and activities including hunting, hiking, snowmobiling, cross-country skiing, and many others.

Biophysical Context

A biophysical region characterizes the landscape into distinct units that share features of climate, geology, topography, soils, natural communities, and human history. The Northwest Region is divided between two biophysical regions: the Champlain Valley and the Green Mountains (see Map 1, Biophysical Regions with Land Cover).

The majority of the Region falls within the Champlain Valley region, this area is lower in elevation and warmer than the uplands of the Green Mountains. The soils are predominately clay with outcrops of limestone, dolomite and shale. Elevations range from 95 feet above sea level to less than 2,000 feet along the edges of the Green Mountain uplands. The natural forest vegetation of the valley is predominantly oak, hickory, maple, elm, ash, beech and white pine, a mix of some northern hardwoods with lower elevation clay plain forests. This area supports some of the Region's largest and most productive farms. Silt and clay loams, though poorly drained, are very fertile, and flatness of the land is better suited for mechanized agriculture.

In contrast, the Northern Green Mountains are characterized by high elevations from 2000 to over 4,000 feet, cool summers and acidic geology. The Green Mountains present a formidable barrier along Franklin County's eastern border. Exposed bedrock, boulders surfaces, steep slopes, and shallow soils are common. Thin soils and fractured bedrock allows for the infiltration of water and aquifer recharge. Northern Hardwoods dominate the slopes, and high elevations are forested with spruce and fir and alpine meadows. The mountainous uplands of the Region, because of their remoteness, elevation, steep slopes, shallow soils, and poor drainage, have not been heavily developed. Farming historically was confined to stream and river valleys. Upper slopes supported logging and timber industries, which formed the primary economic base for this part of Franklin County. Forestry remains the predominant commercial use of the land the Region.

Land Cover

As show on Map 1 (Biophysical Regions with Land Cover), the land cover in the Northwest Region is largely made up of a working landscape and forested lands. Today, nearly 75-80% of the Vermont landscape is forested. In the Northwest Region, forestland comprises a smaller part of the landscape at 43% and has a large agricultural land base at 26%. These two land cover categories are the most abundant in the Region and comprise 69% of the landscape followed by open water (19%), wetlands (6%) and developed (5%). Shrub/scrub (0.8%), grassland (0.2%), and barren (0.2%) each make up less than 1.5% of the total land cover in the Region.

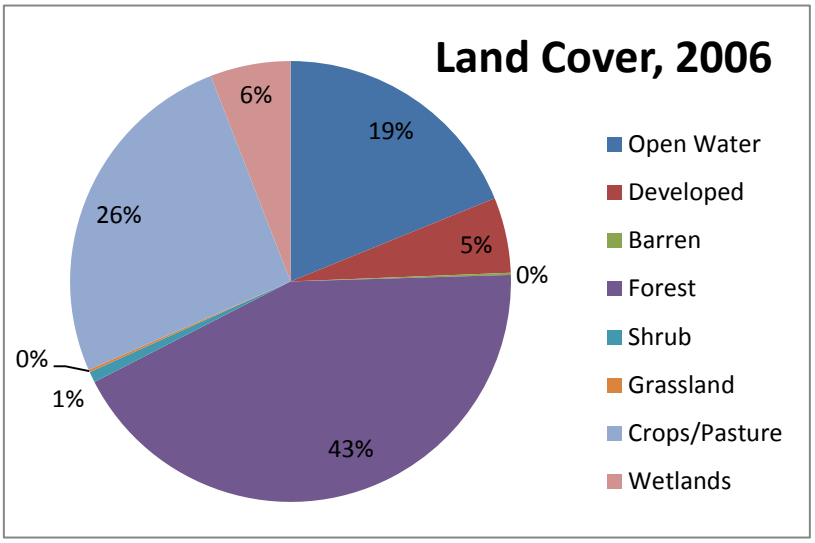
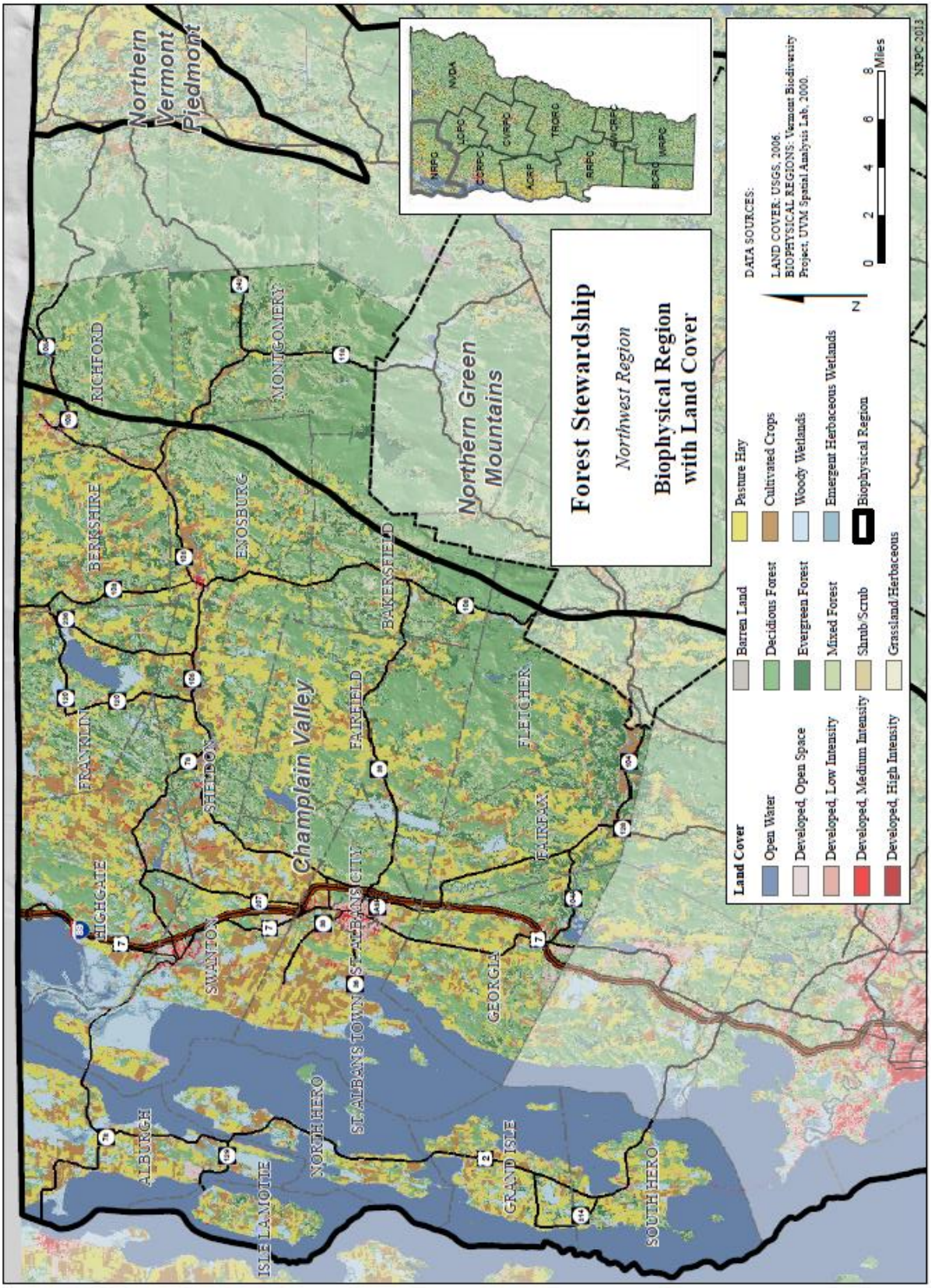


Figure 1. Land Cover for the Northwest Region, 2006 (USGS National Land Cover Data)



Map 1. Biophysical Region with Land Cover

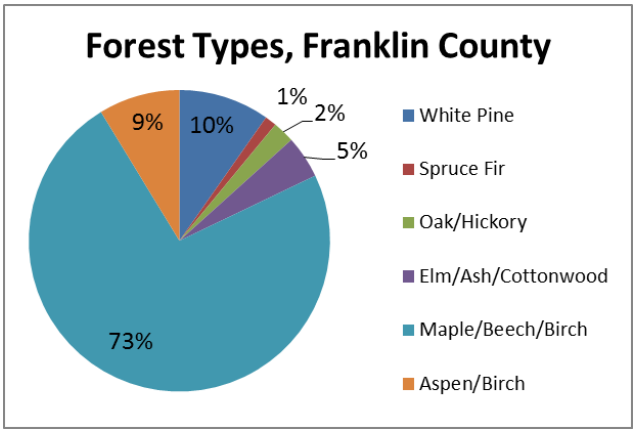


Figure 2. Forest species groups in Franklin County.

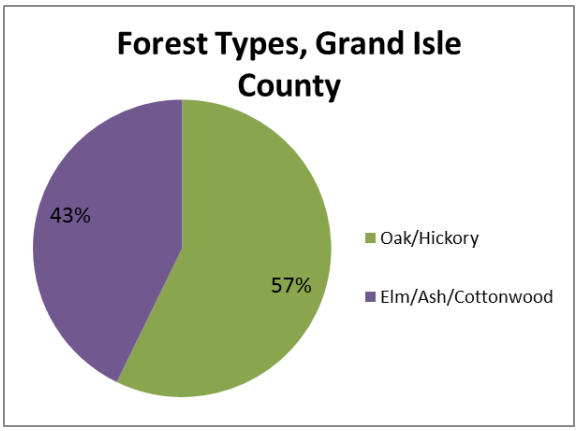
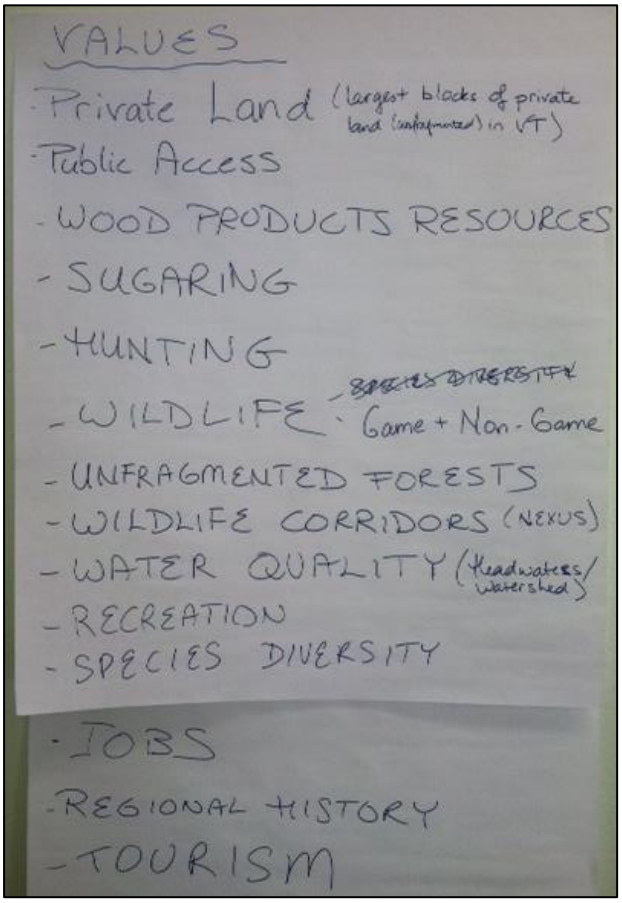


Figure 3. Forest species groups in Grand Isle County.

The Northwest Region contains 6.3% of the total forestland in Vermont. Northern hardwood forest is the dominant forest community in Franklin County, comprising 73% of the forested land area. It is followed by White Pine at 10%, Aspen/Birch at 9% and Elm/Ash/Cottonwood at 5% (USDA Forest Service, Forest Inventory and Analysis 2012). Grand Isle has very different dominant communities consisting of the Elm/Ash/Cottonwood being the dominant community type at 57% and Oak/Hickory at 43% (USDA Forest Service, Forest Inventory and Analysis 2012).

Forest Resource Values

The Region's forest lands provide services that play an economic, environmental and social role in the community. Forests are a source of raw materials that support traditional forest products industries, such as hardwood veneer, lumber, pulpwood, fuel wood, and maple syrup. Forests also provide ecological services that are not as easily quantifiable such as filtering the water and air, contributing to soil fertility through nutrient cycling, providing plant and wildlife habitat, and helping to sequester carbon. Forests also provide many social services such as providing recreational opportunities and scenic beauty, an educational resource, and a place to be able to connection to the Region's historic rural-based heritage.



List of Regional Values identified by the Forest Stewardship Committee.

Forest Productivity and Economic Values

In 2013, Vermont's forest product's industry provided employment for approximately 6,636 workers in the forest products, maple syrup, and Christmas tree sectors. The industry is estimated to have created over $861 million in annual sales (NESFA 2013). This number does not account for the multiplying effect that these sectors have on other aspects of the economy such as value-added products and recreational opportunities. The forestry sector also contributes greatly to the recreational economy, estimated to provide an additional 10,050 jobs and generates revenues of $1.9 billion annually; this sector includes revenues from all the various recreational opportunities in Vermont such as camping, hiking, hunting, downhill skiing, cross-country skiing, snowmobiling, fall foliage viewing, and wildlife viewing (NESFA 2013). The following sections will review the employment and productivity trends in the Region.

Employment

As noted in the economic profile of the Region, the majority of our residents are not primarily employed in the forestry sector and, for the population that is employed in the forestry sector, it may not be their primary form of employment. To characterize the Region, the Quarterly Workforce Indicators (QWI) from the US Census are used to provide a snapshot of employment and salary statistics. The forestry industry is represented as "Forestry and Logging" (FL) and "Wood Products Manufacturing" (WPM). The QWI is the best available data for obtaining information about employment sectors, however it may not correctly capture the forest industry given this indicator counts jobs, rather than employed workers, and does not include self-employed workers and independent contractor employment which make up a portion of this industry.

The following graphs show forestry based employment and wages in the Region as compared to statewide trends (Figures 4 and 5). Overall total employment in Franklin County is low in the Wood Products Manufacturing (**WPM**) sector compared to the rest of the state. No data was provided for the Forestry and Logging (**FL**) sector at the regional level given the low numbers, but statewide the sector is maintaining a base workforce.

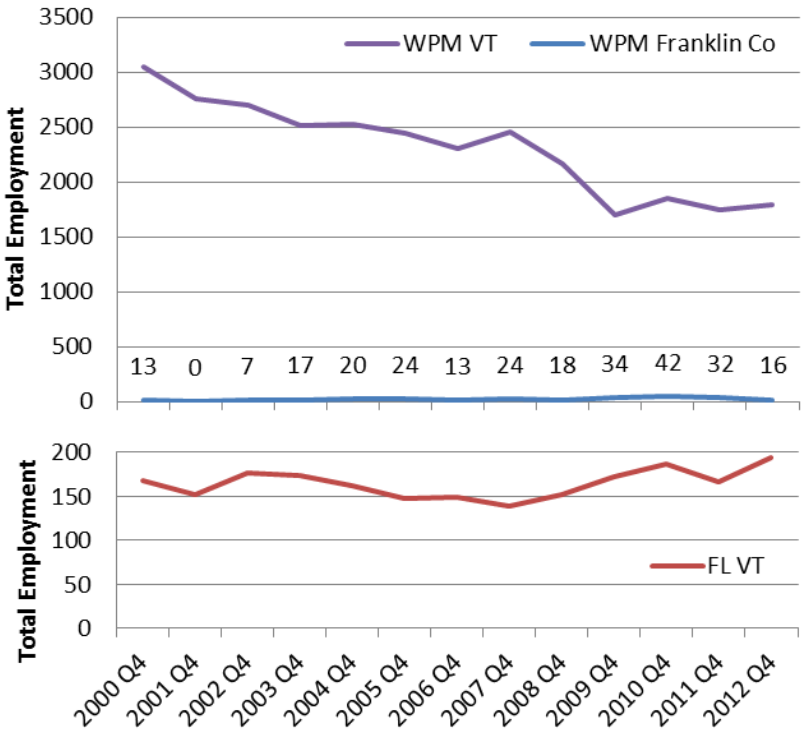


Figure 4. Forestry Industry Quarterly Employment 2000-2012

Wages were reported for the county in both sectors. In Figure 5, the top chart shows that the average monthly earnings in the Wood Products Manufacturing in the Region was lower than that state average in early 2000, however since 2010 wages are closer to the state average. For the Forestry and Logging sector, Franklin County previously had higher average monthly earnings than the state but as of 2006 the earnings have been about the same or lower than the state average.

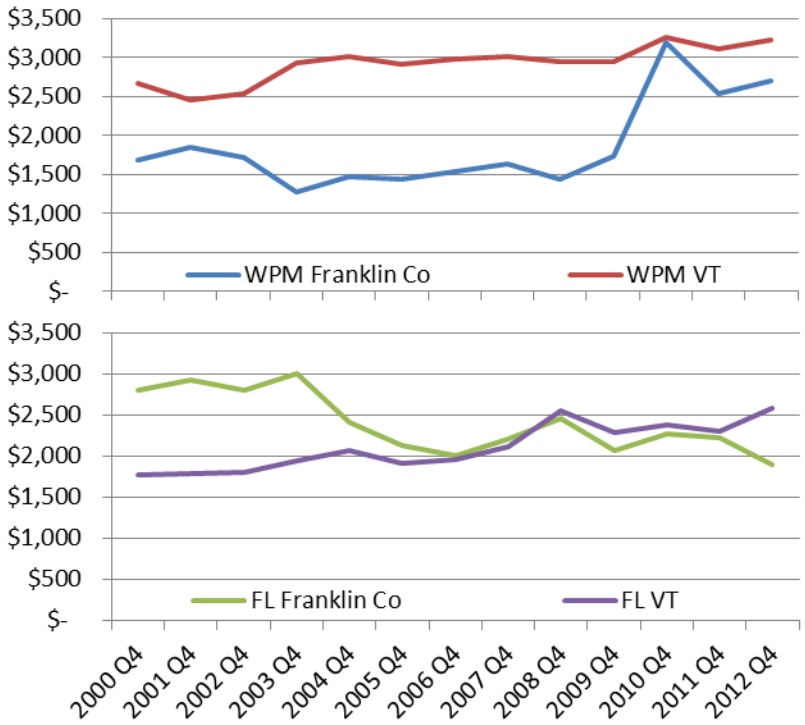


Figure 5. Forestry Industry Wages 2000-2012

Changing Market for Forest Products

The forest products created in the Region and industry as a whole serve a different market today than they did historically. A 1952 publication from the University of Vermont Agricultural Extension Service titled "Markets for Vermont Woodland Product: Franklin and Grand Isle Counties" was utilized to develop a snapshot of the woodland product buyers in the Region and surrounding area. In order to supplement the available data for the Region on employment and to compare the change in forest products produced, the Forest Stewardship Committee identified and mapped forestry sector entities and resources as of 2014 based on local knowledge. Table 2 below shows the range of known sectors in the Region; it should be noted that one entity may fall under multiple sectors. For example, loggers may also be truckers. Map 2 shows the regional distribution of woodland producers in 1952 and 2014.

Table 2. 2014 Forest Product Entities in the Northwest Region

Sector	Count
Loggers	40
Truckers	12
Wood Product Industries (lumber, pallets, shavings, chips, etc)	10
Portable sawmills (custom lumber)	4
Firewood Processors	14
Woodworking (cabinetry, furniture and artists)	16
Christmas Trees	2
Maple Sugar Producers	167 (as of 2003)

One of the larger changes in the wood products industry is the decline in the number of local saw mills from 15 in 1952 (represented as 'sawlogs') to four in 2014. This decline is a trend that was seen across Vermont particularly over the last 15 years; Figure 6 shows that in the Region the number of mills has stayed fairly constant since 2000 but declines statewide are still occurring. This decline in recent years is likely tied to the decline in the housing market and 2008 recession. As the number of sawmills is reduced, it increases the transportation distance sawlogs must travel to a mill and thereby increasing the cost of production and harvesting for that product. This relationship along with rising fuel costs decreases the profit margin of marginal species and grades as well as landowners with small quantities of wood.

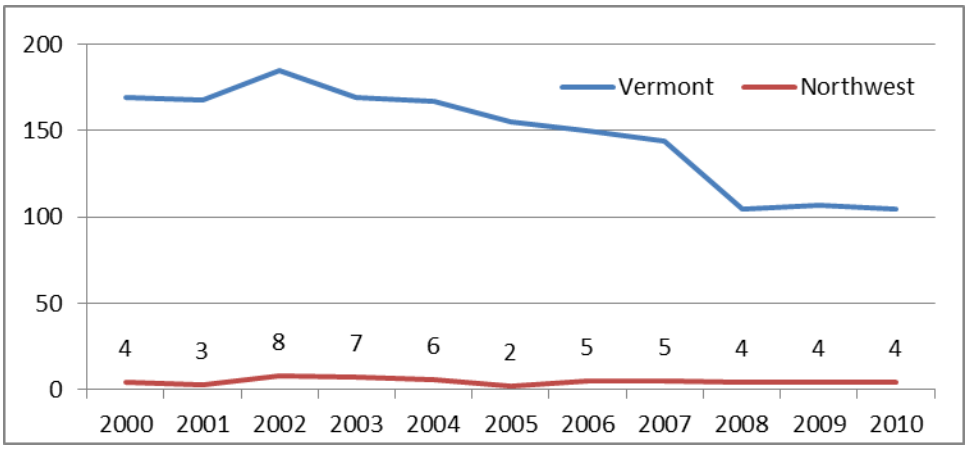
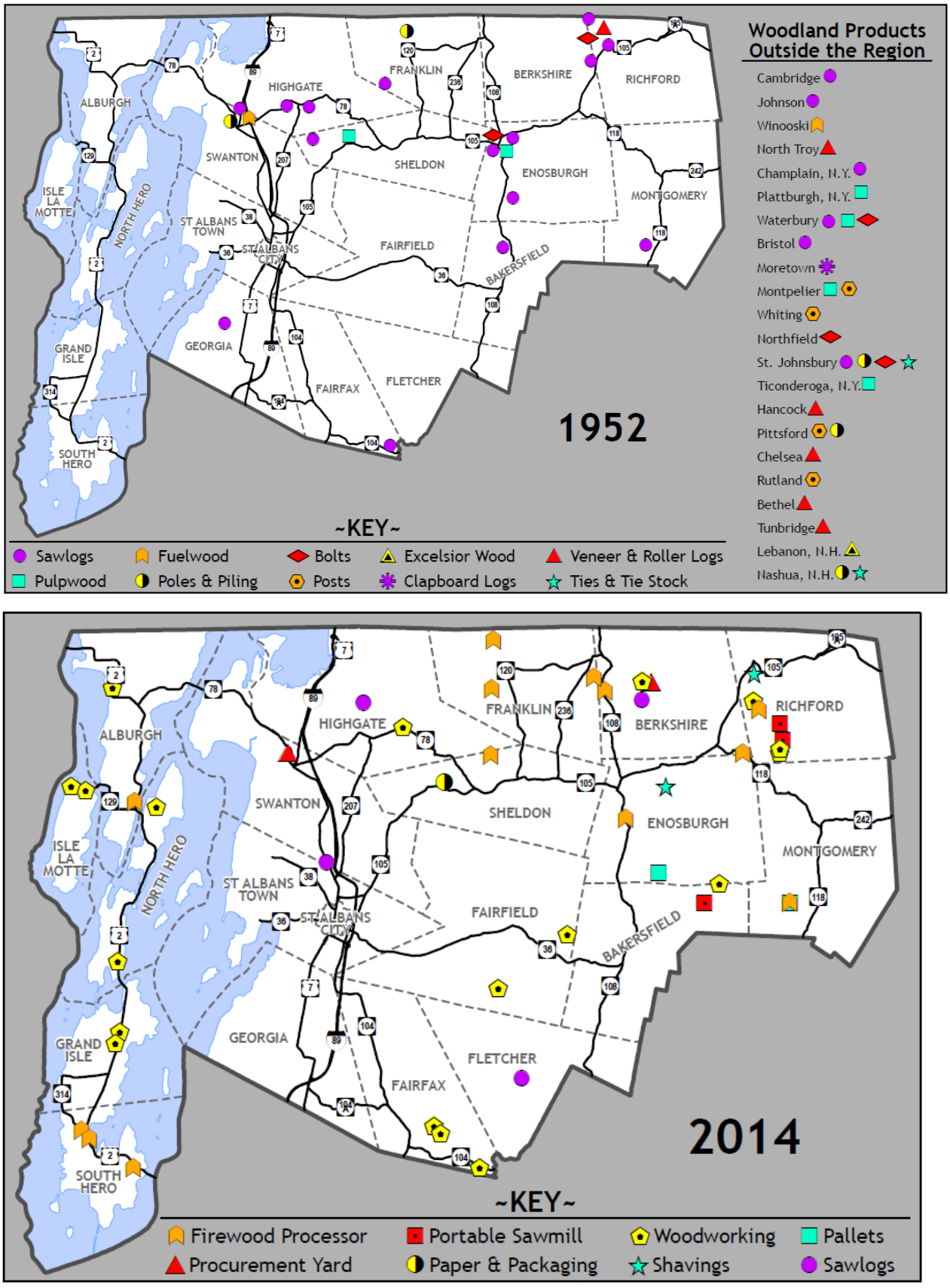


Figure 6. Number of sawmills in the Northwestern Region (Forest Harvest Reports)

Tied to the decline in the number of sawmills is the change in the types of products that are in demand and being produced. Many products made in 1952 are no longer necessary at the scale they once were such as 'poles and pilings' used for telephone and ship pilings, 'ties and tie stock' were low quality sawlogs used for the railroad, and 'posts' were often used for fencing. While we still utilize many of these products today, the market need that existed previously (such as the development of the railroad), does not exist today to support their production locally. A local example is this change is demonstrated by the adaption that has taken place at the Sheldon paper mill. The mill in existence in 1952 was primarily a pulp mill; by 1986 the mill was run by Boise Cascade and used a variety of inputs including virgin wood to product specialty paper grades and products. In the 1990s, Rock-Tenn purchased the company and the focus became the creation of paperboard from recycled materials that is used in packaging.

Firewood is a product that is in demand and processors are more prevalent today than historically perhaps given that changes in the way people procure their fuelwood. Pallets are a newer product that speaks to the market change and need to ship products to other markets.

In the 1950s, woodland product producers were largely distributed along transportation networks. However, in 2014 producers are more dispersed in the Region. This trend of locating further from the main transportation corridors is likely tied to the differences in the types of industry currently present with more self-employed and smaller employers versus more centralized facilities.



Map 2. Comparison of woodland products from 1952 to 2014.

Timber Harvesting

Timber harvesting is one of the traditional employment subsectors of the forest products industry. Forest Resource Harvest Summaries from the Vermont Division of Forestry provide a picture of how our forest resources are being utilized. This data enables us to track the relationship between forest productivity and the commercial demand for wood. Monitoring this information becomes more important with increasing economic pressures within the wood product industry. Harvest reports identify the volume of wood harvested each year by species and region; data for 2007 was unavailable. As show in Figure 7, the overall trend in Vermont is a decline in the amount of hardwood (HW) and softwood (SW) harvested since 2000 as measured in board feet. The volumes harvested in the Northwest Region are more variable but also have a declining trend. It should be noted that this data only represents reported harvest, actual harvest numbers may be greater.

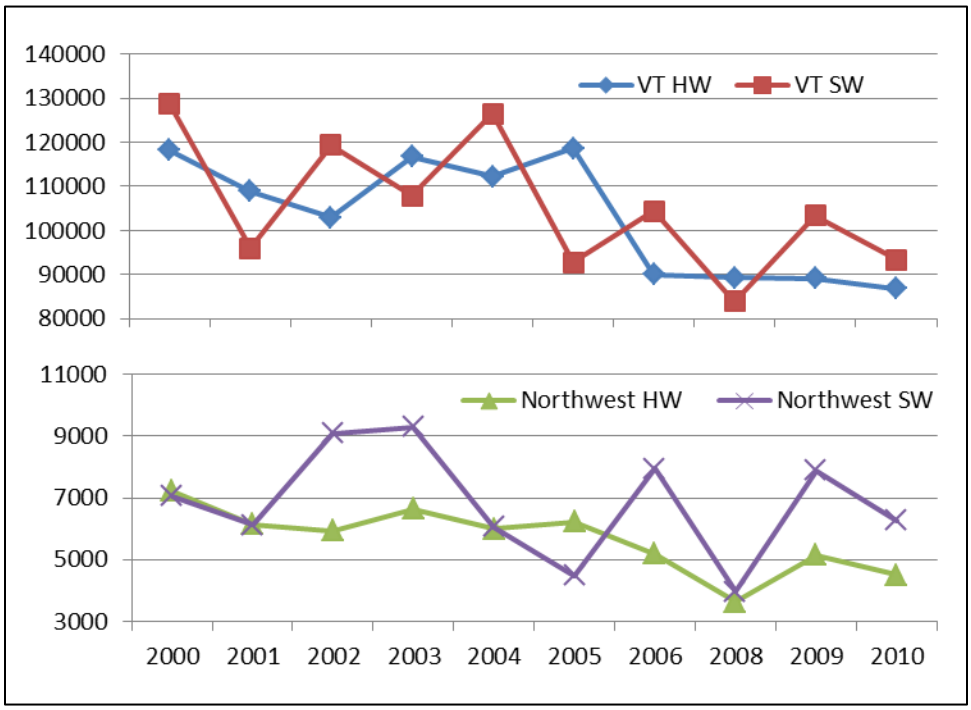


Figure 7. Sawlog and Veneer Harvest 2000-2010 (Mbf)

Historically, pulpwood and softwood harvests have declined considerably from the highs reached in the mid-1990's (Figure 8, Kessel 2008). Hardwood harvests shows only a very modest long-term positive trend, but year-to-year swings in output are more noticeable.

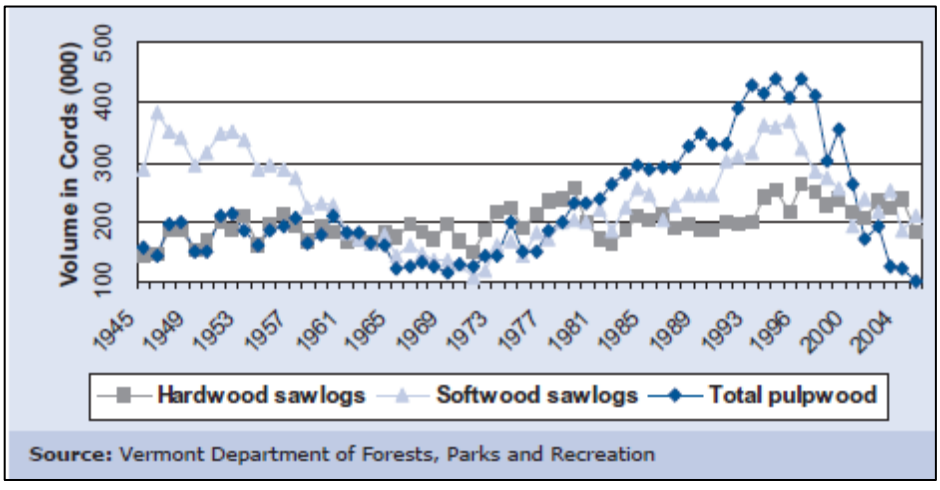


Figure 8. Vermont Forest Harvest in thousands of cords 1945 to 2005 (Kessel 2008).

Maple Sugar Production

Vermont is the largest producer of maple syrup in the United States, making up 40 percent of national production; Franklin County has the highest production of any county in the state according to the New England Agricultural Statistics (see Figure 9). Vermont has successfully marketed its many maple products. From maple syrup to maple butter, the sap from the sugar maple has been utilized for generations and has become an integral part of the cultural integrity of Vermont.

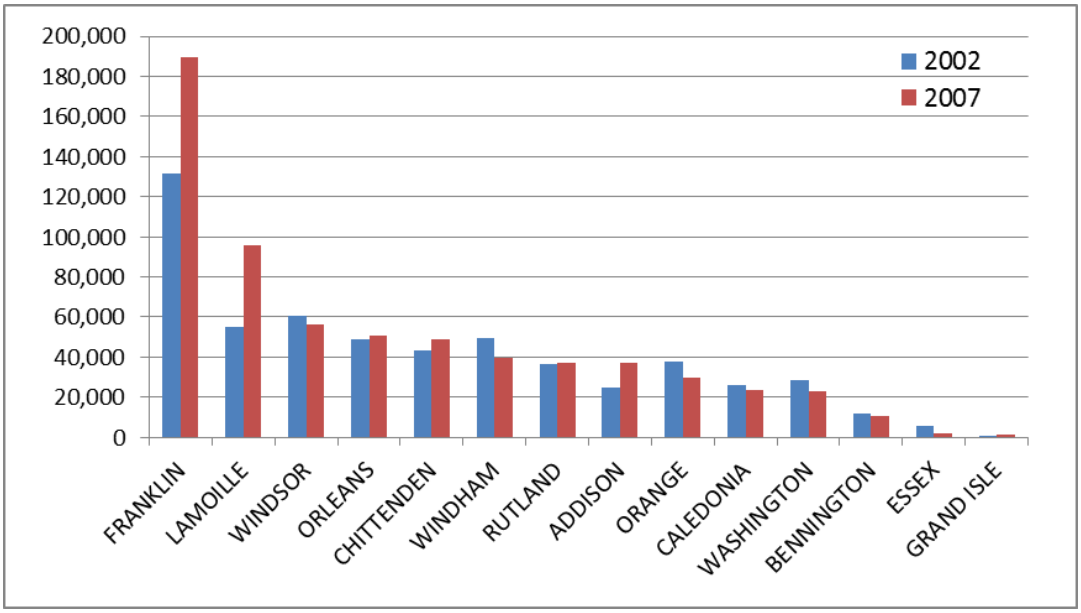


Figure 9. Maple Production in Gallons across Vermont's counties (New England Agricultural Statistics).

The Vermont maple crop in 2013 was the largest in seventy years. Following a mild winter maple syrup production was 1,320,000 gallons, a 43% increase from 2009. Maple products production in the Region is on the rise, as is the number of trees tapped and maple syrup produced. Both have been increasing since 2000 (Figure 10 and Figure 11). The producers in the Region range from small family businesses to large operations. Typically producers either produce syrup for retail or sell raw sap to larger sugarmakers. Vermont has several larger scale sugaring operations that purchase syrup from other Vermont sugarmakers; the four primary maple processors that buy bulk syrup are Highland Sugarworks, Maple Grove Farms of Vermont, Butternut Mountain Farm, and Coombs Family Farms. The majority of maple producers in Vermont are farmers that have diversified in order to earn extra income from tapping trees during sugaring season. As of 2003, there were 167 identified sugar makers in the Region. Map 3 shows the geographic distribution of timber resources and forest producers in the Region.

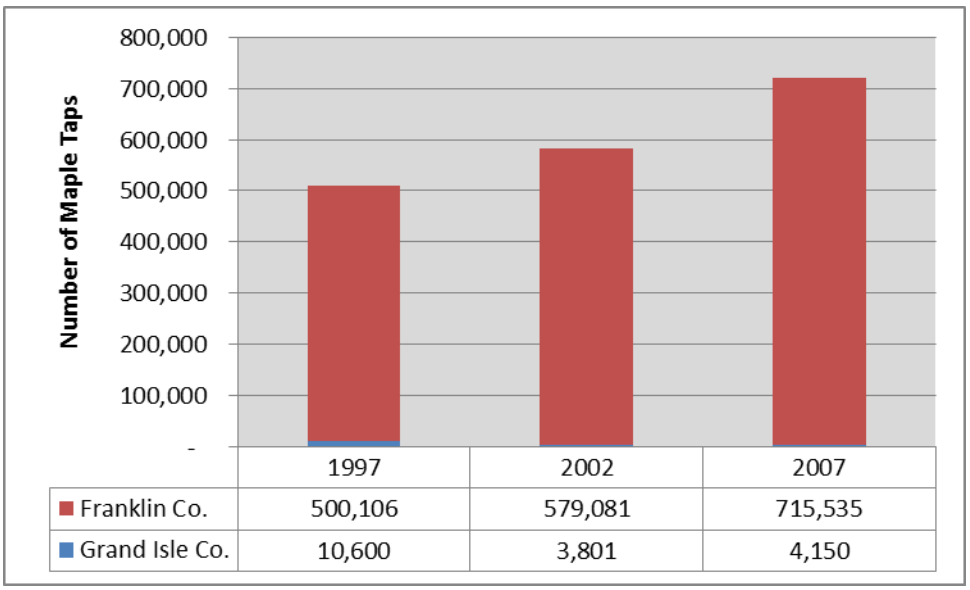


Figure 10. Number of Maple Taps in Region.

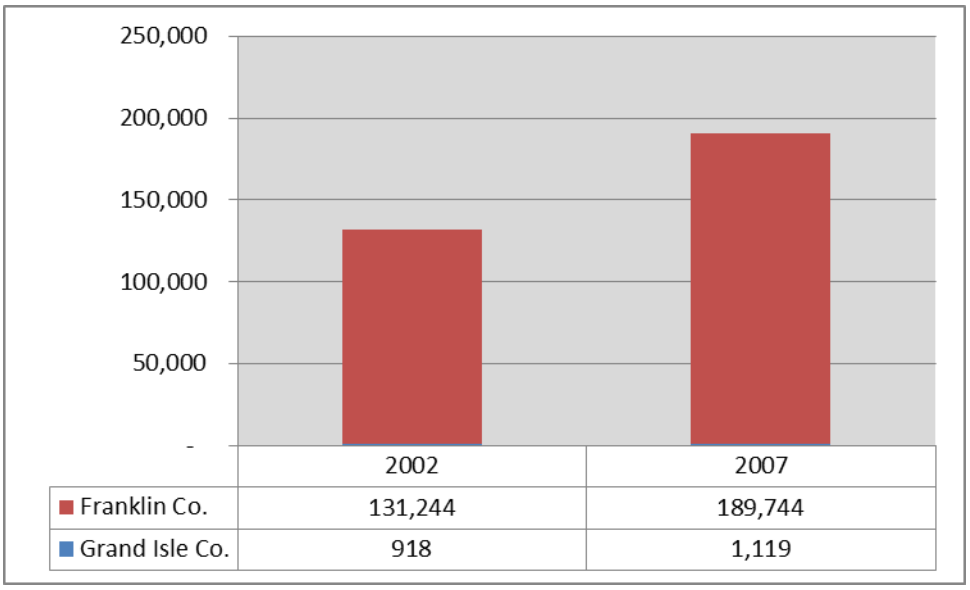
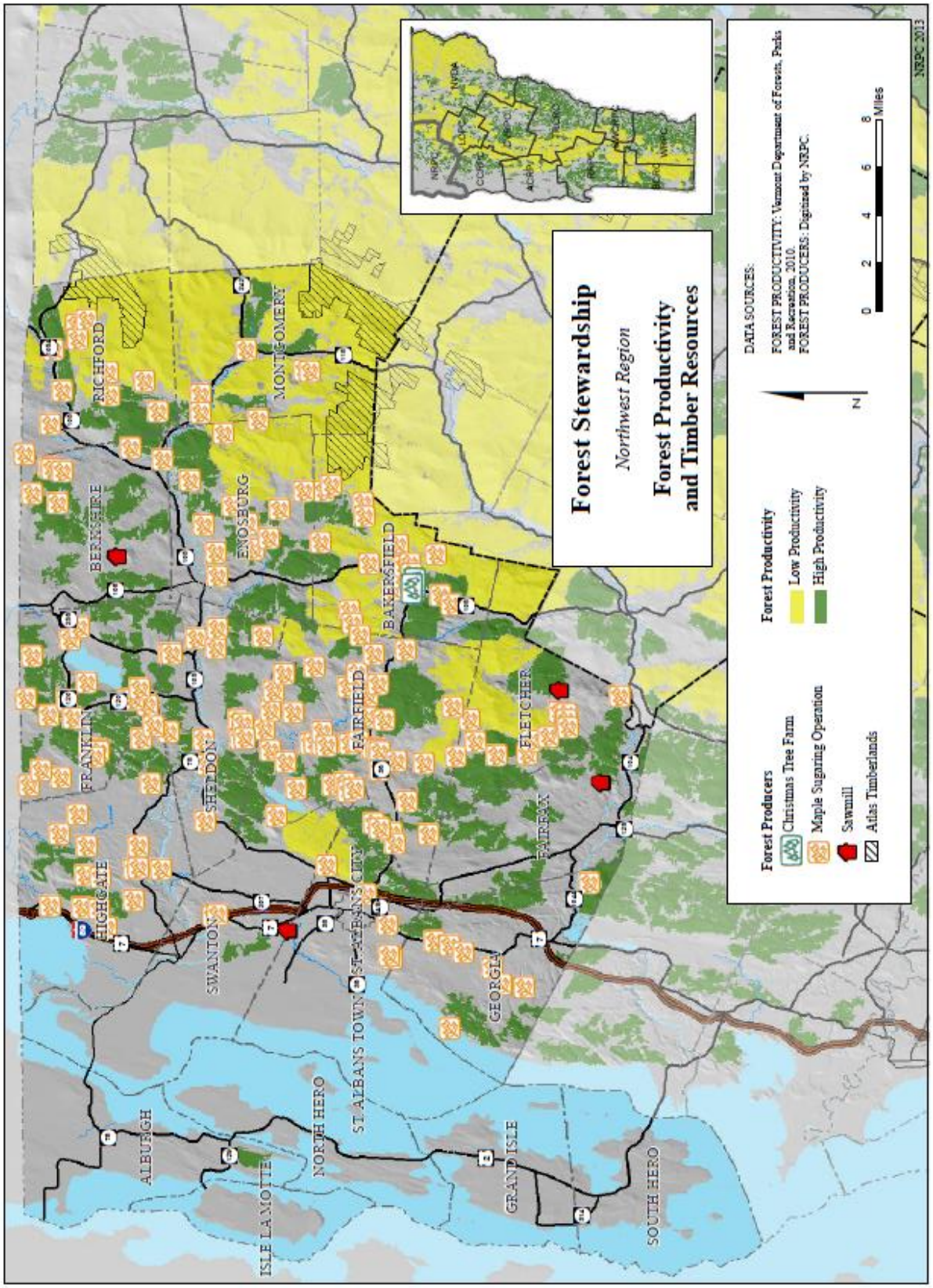


Figure 11. Gallons of Maple Syrup Produced in Region.



Map 3. Forest Productivity and Timber Resources.

Christmas Trees

Relative to the rest of the state, Northwest is less active in the Christmas tree harvest in both acres and production. Data from the New England Agricultural Statistics show that this value-added forest product is an important product of Vermont's forests is a less substantial part of the Region's forest economy.

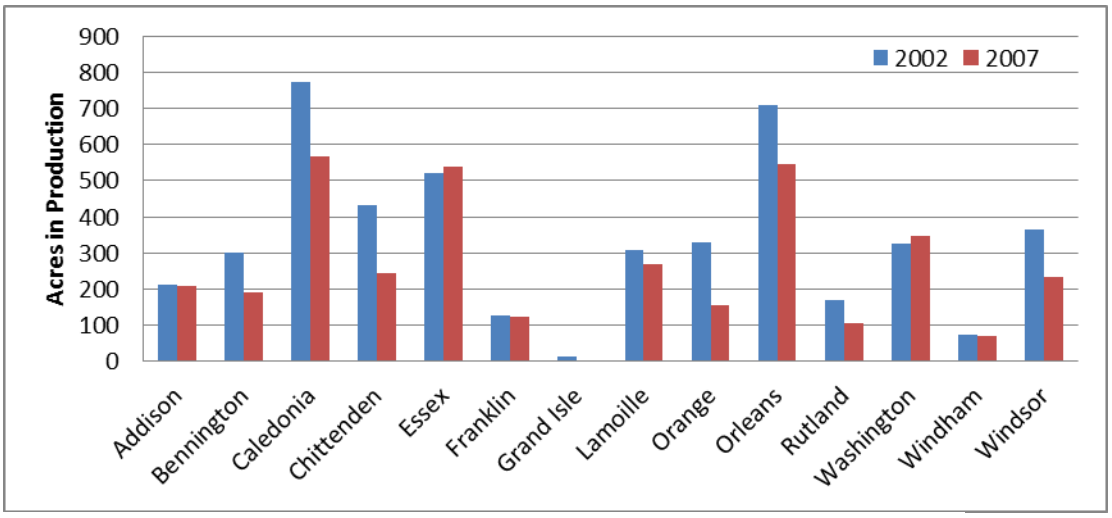


Figure 12. Vermont Christmas Tree Production by County.

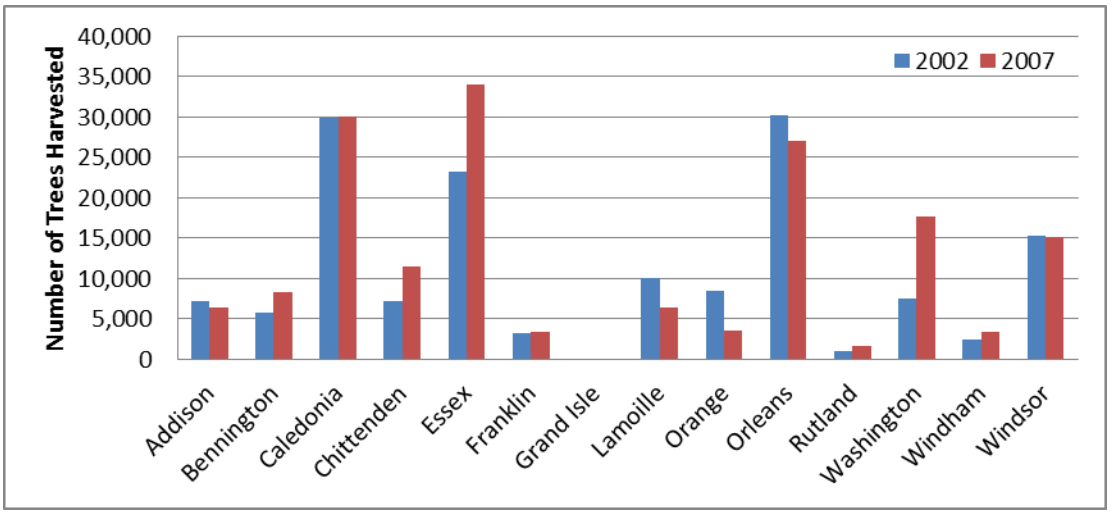


Figure 13. Vermont Christmas Tree Harvest by County.

Tourism

The forests provide year-round opportunities for appreciation for recreation and scenic values such as the changing of the leaves in fall. Figure 14 shows the variety of recreational activities that have been shown to be supported by the forested landscape as reported by the North East State Foresters Association. The draw of these activities is a part of the forestry industry and they also indirectly support establishments in the tourism industry such as hotels, restaurants, and shopping.

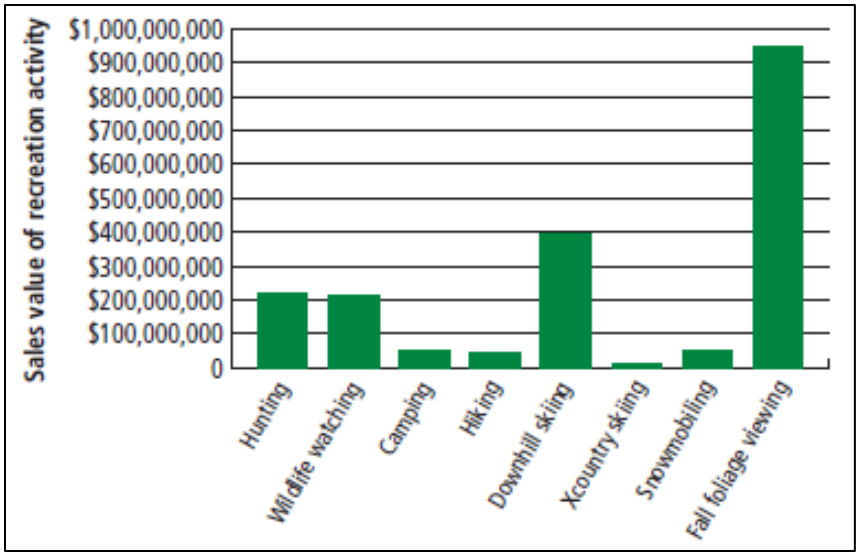


Figure 14. Economic Value of Forest-Based Recreation in Vermont, 2011 (NEFSA 2013).

Wood for Energy

Our forest woodlands also provide a source of energy; Vermont has a long history of using wood for heating and for electric energy generation. Many Vermont homes use cordwood as a primary or supplemental form of heating. Several commercial facilities in the Region are using wood or pellets to meet their energy needs (NESFA 2013). As shown in Figure 15, the annual wood usage by utility plants is also a large consumer of wood energy.

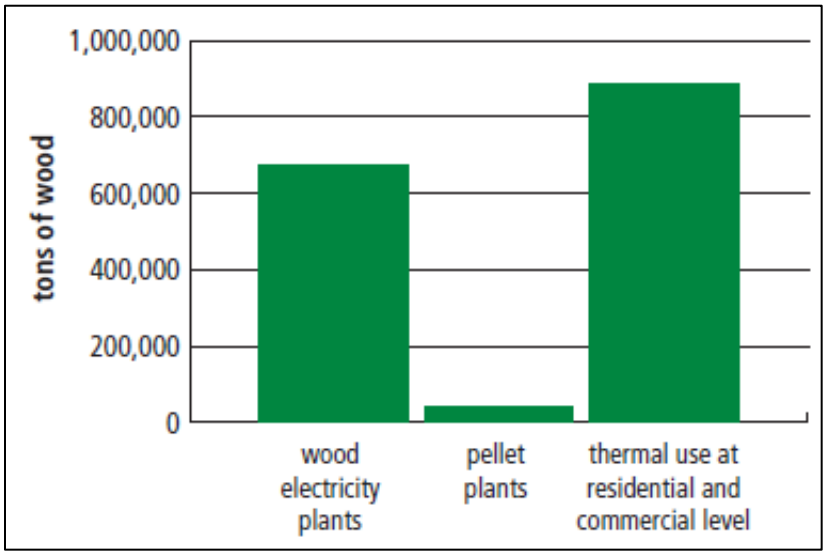


Figure 15. Annual wood energy use by sector in Vermont (NESFA 2013).

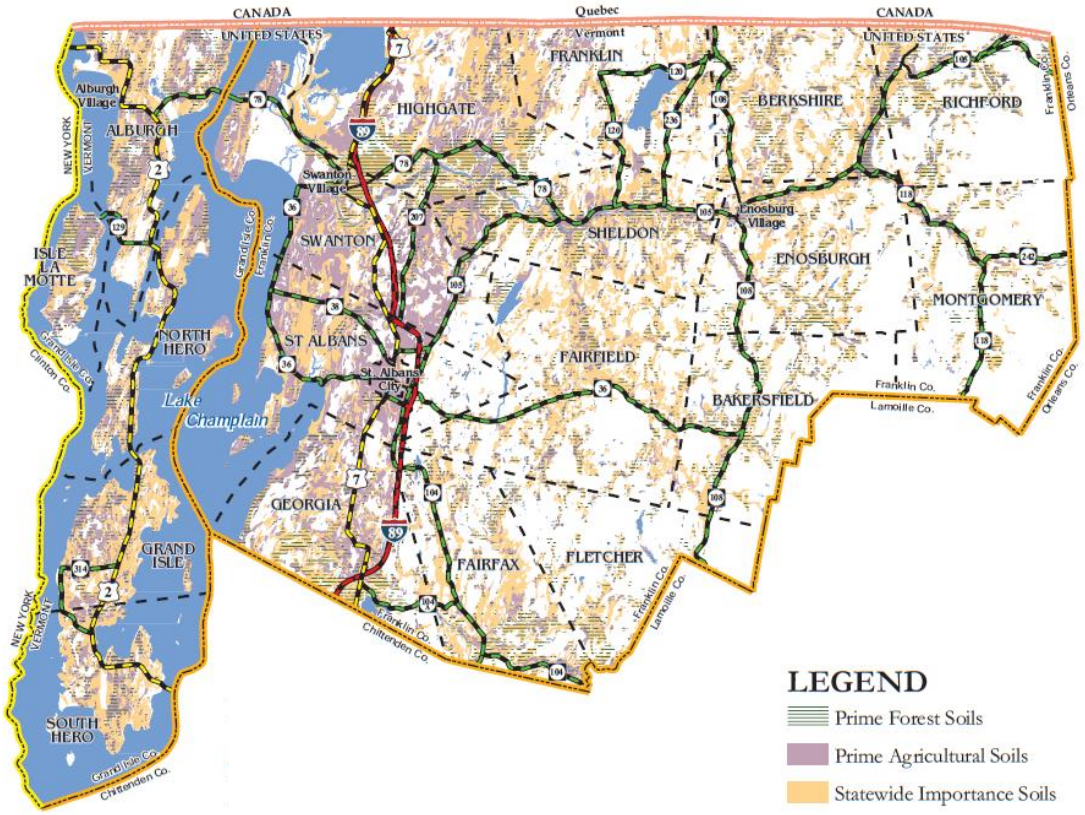
Ecological Values

Forests provide several ecological services that are of great value including contributing to air, water, and soil quality as well as providing habitat for wildlife species.

Soil Quality

Soils are the most important environmental factor in determining the use of land in rural areas. Good, fertile soils represent a 10,000 year investment – a valuable and limited resource. Soils are classified on the basis of structure, form, composition and suitability for various types of development. Within the context of land use planning, the characteristics that are of primary concern are bearing capacity, erodability, drainage, septic suitability and resource value.

NRCS has identified both "primary agricultural soils" and "primary forestry soils" in the state (Map 4). Primary forestry soils are areas tend to be widely distributed and are important to sustain commercial forestry operations in the Region, according to their relative productivity. Concerns exist regarding the development and fragmentation of these soils and the impacts it could have on maintaining viable commercial forestry operations. Even low density development, such as seasonal camps, may result in the fragmentation of productive forest land. Again, social and economic factors, as well as the sustainable management of the soils resource base (e.g. through accepted management practices (AMPs) for silviculture, as defined by the state) should be considered in determining which tracts of forest land should be maintained long-term for commercial use.



Map 4. Agricultural and Forestry Soils.

To determine where areas of higher forest productivity may occur, an analysis of landscape characteristics on forest blocks of greater than 500 acres was completed by the State. This analysis identified that the foothills of the Region between the Champlain Valley and the Green Mountains contained the most productive large forest blocks (Map 3, Osborne, VLT, 2009). Areas of higher forest productivity rates are generally characterized as having suitable access and located in the upland forest areas. Areas identified as potentially lower productivity correlate to areas of higher elevation where soil depth and quality may be lower. These conditions correspond to the more forested uplands of the Green Mountains. It should be noted that the Steering Committee felt that this analysis may be under representing the forest productivity in the Region, given the scale of analysis was only on forest blocks larger than 500 acres.

Air Quality

Forest canopies and urban trees significantly contribute to air quality through the sequestration of air-borne pollutants and the reduction in temperatures in developed areas from shade and evaporation. Vermont is currently within national standards for criteria pollutants, but it is important to note that the state is still affected by acid deposition on sensitive forests, poor visibility on warm days, ozone injury on sensitive plants, and increasing atmospheric carbon dioxide. Locally air quality concerns are low. However, Vermonters do create as much air pollution per capita as residents of other states. This is primarily due to air pollution tied to transportation. While there is industrial development along the interstate corridor in the Region, it exists at a low density and emits relatively low levels of pollutants. Other air quality concerns that impact the entire Region are limited to emissions from heating systems (e.g. woodstoves) and some agricultural practices.

Water Quality

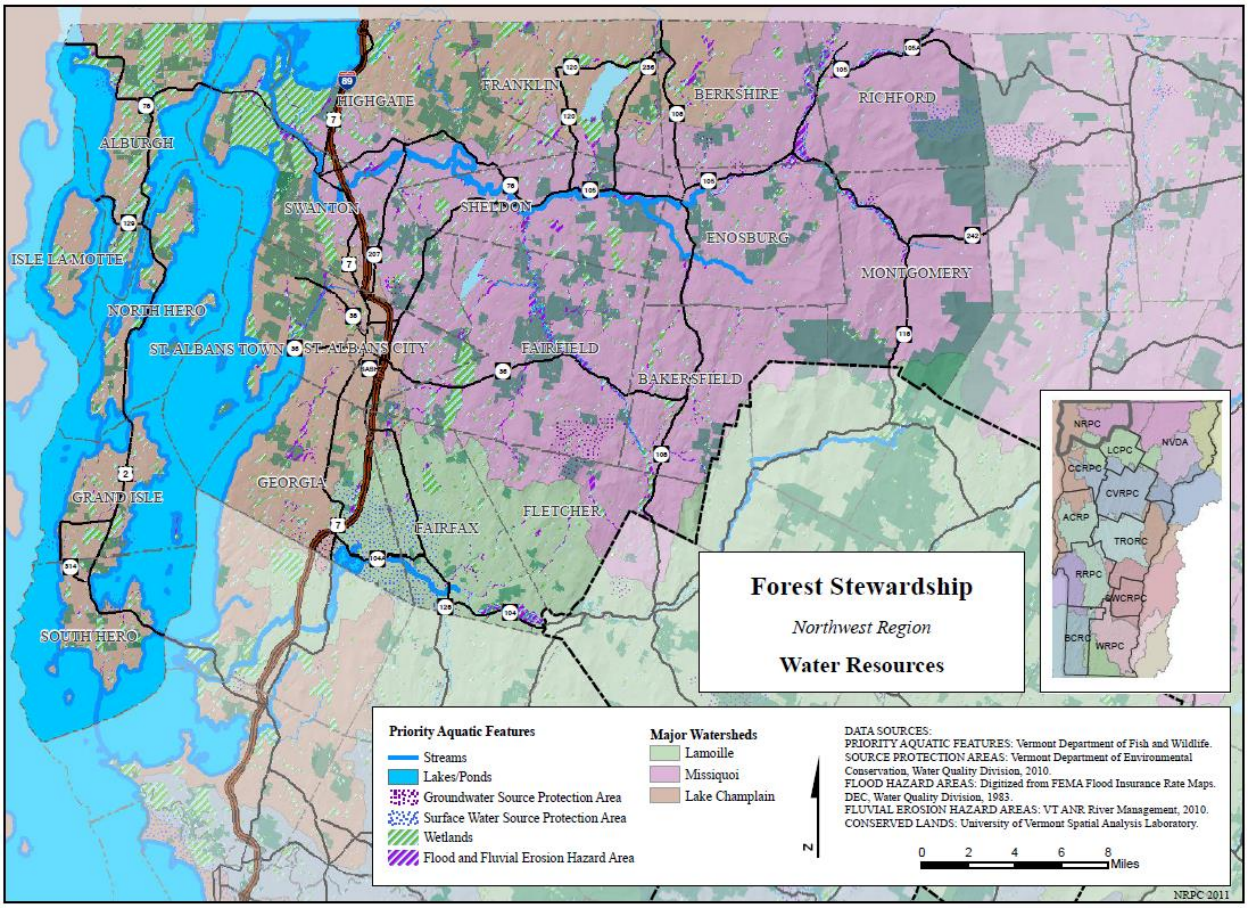
Lakes, rivers, and streams offer sustenance, scenic beauty, recreational opportunities, and heavily influence the cultural, social, economic and environmental landscape of northwestern Vermont. Waters in Franklin and Grand Isle Counties are encompassed by three major drainage basins, which empty into Lake Champlain (Map 5). Areas in the western part of the Region, including the Lake Champlain Islands and parts of Highgate and Franklin, drain directly into Lake Champlain. Once in the Lake, water flows north into the Richelieu River, the St Lawrence, and ultimately the Atlantic Ocean. The Region's lakes and rivers support a variety of game fish species and wildlife habitat. The quality of these populations is dependent on a number of interrelated factors that tie into tree cover such as increased water temperatures and sediment load to waterways with a reduced forest cover.

The communities and activities that occur within these watersheds are interconnected by a complex network of rivers, streams, wetlands, overland and subsurface flow. Changes in one of these areas impact other aspects of the landscape. For example, removal of riparian vegetation on the Tyler Branch of the Missisquoi in eastern Franklin County has resulted in increased stream bank erosion, which in turn has led to increased sediment loads being carried by the Missisquoi River. The increased sediment reduces water quality and the ability of the River to support certain species of game fish. As sediments continue to be transported downstream, additional wastes and nutrients are added from agricultural

and urban surface runoff and sewage treatment outfalls, along with more sediment from downstream erosion. At the Missisquoi Delta, the mouth of the river, the cumulative impacts of all upstream activities are present. As a result, the Delta - which provides critical habitat for several threatened and endangered species and is a regionally important area for recreation and tourism - is full of sediment, heavy metals, phosphorus and other nutrients. The accumulation of these materials, and their subsequent discharge into the lake, have a profound effect on accelerated eutrophication or filling in of the lake and water quality degradation in all of Missisquoi Bay.

The Upper Missisquoi and Trout Rivers are close to a designation as part of the National Wild and Scenic Rivers system. The National Wild and Scenic Rivers system was established in 1968 to recognize and preserve rivers with exceptional scenic and recreational value. Forty states have rivers listed in the Wild and Scenic Rivers system. The Missisquoi and Trout rivers would be Vermont's first. While this designation is focused on the river itself, the importance of the forest as a part of the system is noted throughout the Management Plan.

> "*Perhaps most importantly, the Committee found a strong desire among a wide diversity of folks to preserve the attributes that contribute to the character of the river valleys and the quality of life in the region including: the working landscape, healthy farms and forests, good water quality, vibrant communities, and recreational opportunities*" (Upper Missisquoi and Trout Rivers Management Plan 2013)



Map 5. Water Resources in Franklin and Grand Isle Counties.

Connected Forest and Wildlife Habitat

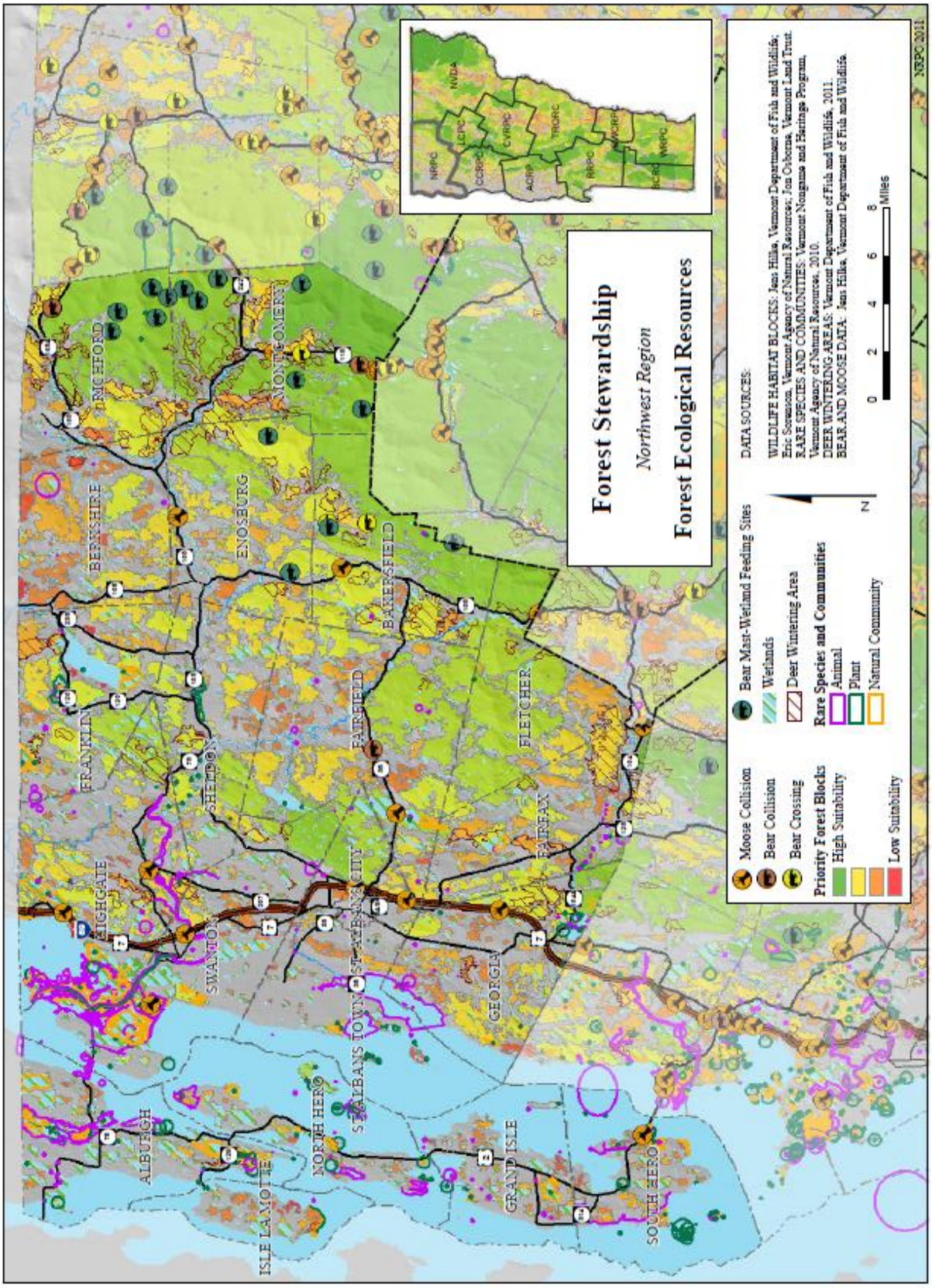
The extensive, relatively undeveloped tracts of forested upland in the Region have the potential, with proper management, to serve as areas of core wildlife habitat large enough to support viable populations of large mammals, such as moose, catamount, and black bear. Core habitat refers to large areas of interior forest which are not impacted by surrounding human uses. These more substantial undisturbed areas are particularly necessary for animals whose habitat requirements include large home ranges. Systems of core habitat, connected by smaller, more linear forested tracks which provide wildlife travel corridors between core areas, promote healthy animal populations by ensuring genetic mixing between animals from different core habitat areas.

Given the diversity of landscapes in the Region, wildlife habitat changes with the transition from the valley to the mountains. As shown in Map 6, deer wintering areas primarily occur in the heavily forested areas of eastern Franklin County. These areas, commonly called deer yards, provide critical habitat for white tail deer and other species of vertebrates and are typically associated with hemlock, spruce, fir, cedar, and pine species as they provide shelter from deep snow and permit easier winter travel. Black bears prefer mountainous and forested landscapes, on the wooded slopes of the Green Mountains. Thus there is a significant amount of regional bear habitat in eastern Franklin County. Map 6 also shows areas with natural communities and wetlands.

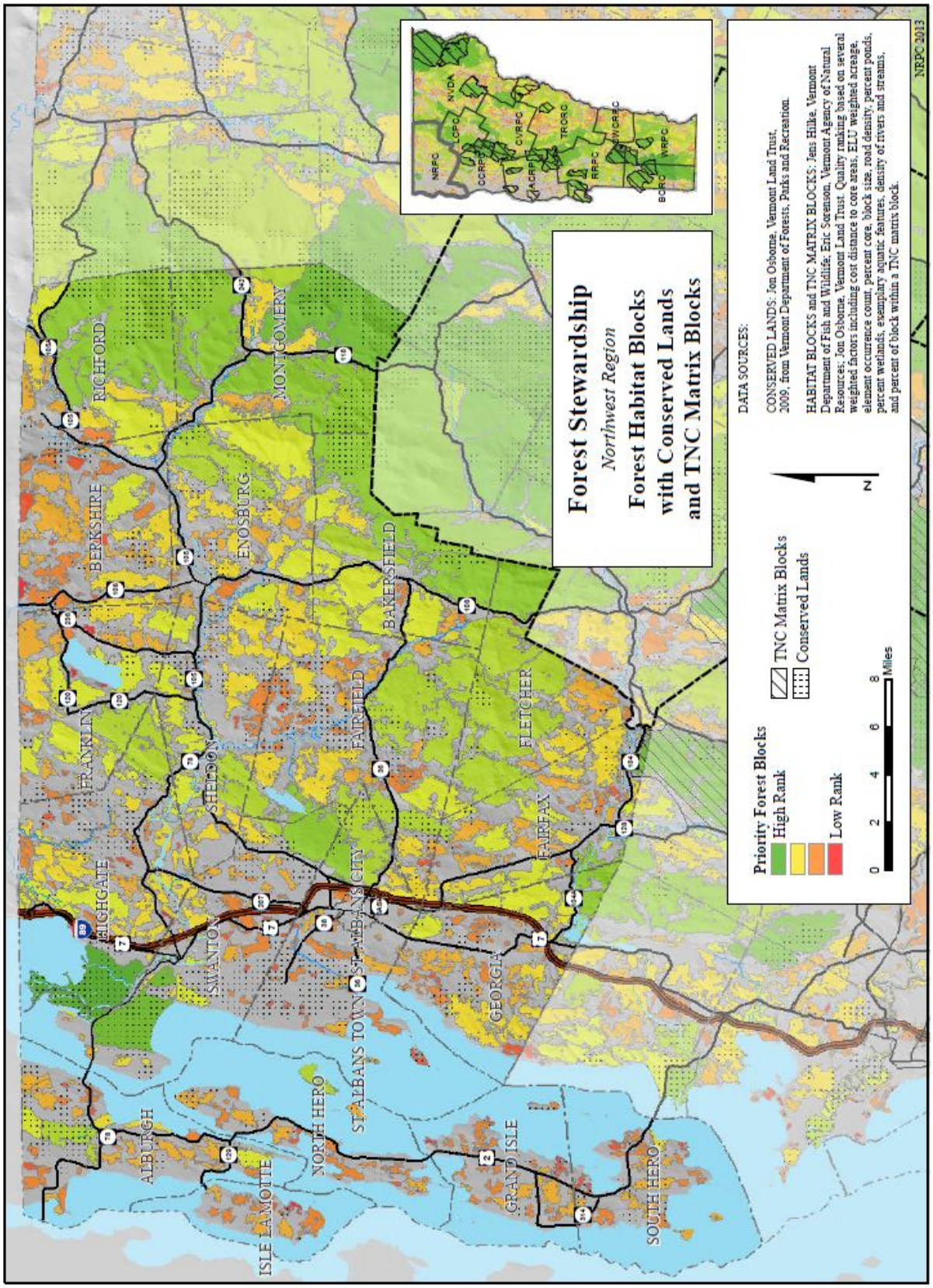
In an effort to detail these areas of importance for wildlife habitat, an analysis was done by VT Fish and Wildlife to identify the blocks or clusters of forestland that is of high value for wildlife habitat (Map 6 and 7). The “habitat potential” layer weights eleven ecological factors such as block size, road density, and presence of water resources. Blocks with high quality habitat are likely larger, less fragmented (more interior core habitat), and contain significant habitat communities. High quality blocks better support the needs of wide-ranging wildlife, and are most likely to include a diversity of physical and environmental conditions found in that biophysical region. Map 7 also shows lands that are currently conserved.

The results are important for forest stewardship at the regional and municipal level. While a picture of the landscape on the ground can provide an understanding of the forest extent, the assessment aims to quantify the ‘quality’ of the large blocks of forest land. Given that the presence of plant and animal communities are likely to cross political boundaries, municipalities should consider working with adjacent towns to manage and maintain appropriate habitat blocks and corridors species. Municipal plans should address quality habitat and large blocks of forest land in a consistent manner with adjoining towns.

One effort in the Region aimed at looking across municipal boundaries is the Cold Hollow to Canada initiative. This effort is a partnership of community members in Franklin and Lamoille Counties working together toward the common goal of land stewardship and wildlife habitat conservation through education, outreach, and conserving land and water resources (see the Advocacy Organizations and Associations section for more information).



Map 6. Forest Ecological Resources

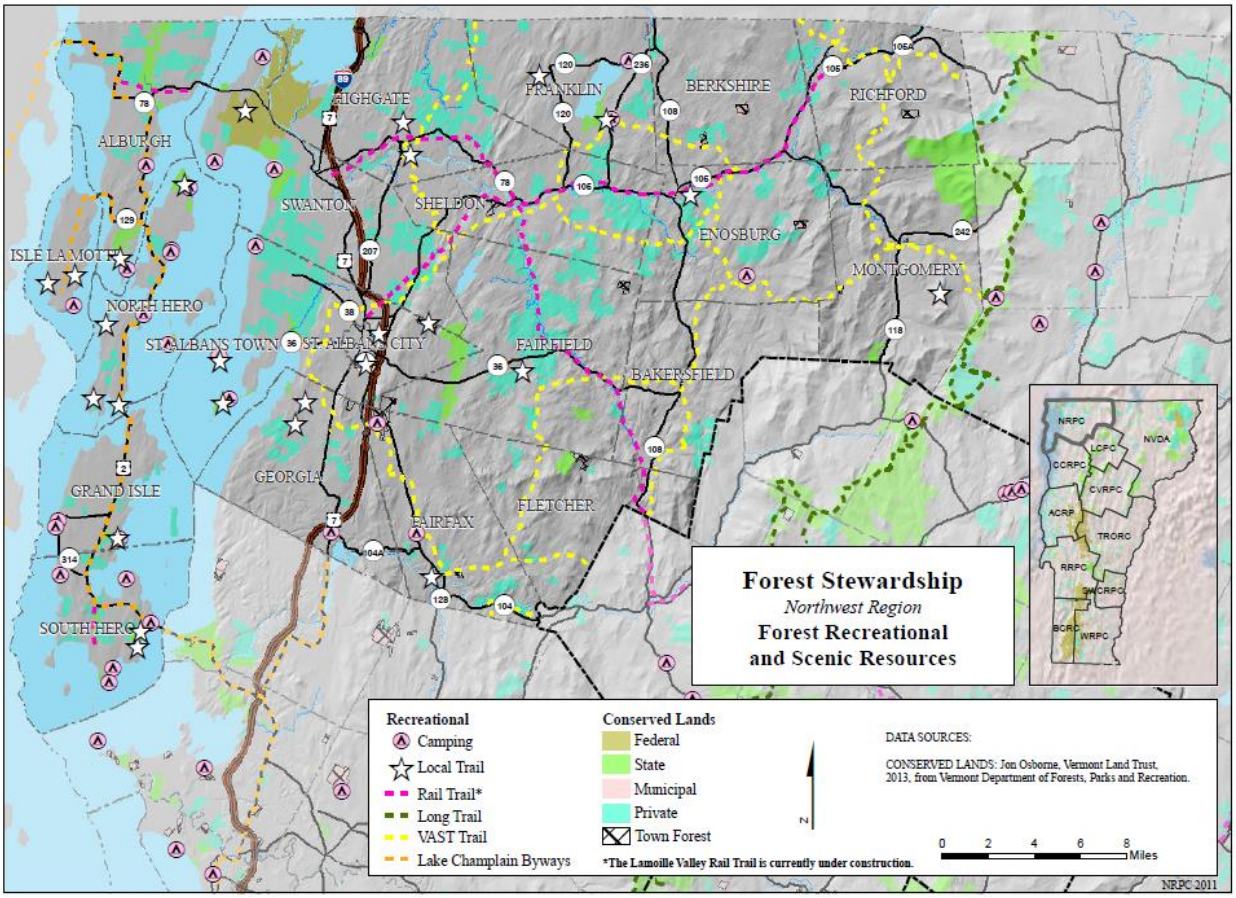


Map 7. Forest Habitat Blocks with Conserved Lands

The Region also has twelve natural areas that are noted in the Vermont Natural Areas Inventory that have state significance. These areas include several bogs and islands. The Missisquoi River Delta that comprises 1,500 acres of freshwater marsh and forest in the towns of Swanton and Highgate and is one of the areas identified as an important forested resource. This area is home to several rare birds and game fish and is also one of the state's largest Great Blue Heron rockeries. The Franklin Bog is a quarter mile north of Lake Carmi, in the Town of Franklin. This bog has high species and landscape richness with zones of conifer forest, open bog mat and streams.

Recreational & Scenic Values

A number of communities in the Region maintain Town Forests. These designated areas and other forests throughout the Region are used for recreational purposes and activities including hunting, hiking, snowmobiling, cross-country skiing and many other activities. Map 8 shows the variety of recreational resources in the Northwest Region; nearly every municipality offers some recreation sites open to the public in open land, wetlands or forested areas.



Map 8. Recreational and Scenic Resources

Education

Forests provide a place-based learning environment for both youth and adults to explore the sciences and the natural environment. The municipal recreation departments and school systems provide access to summer programing for youth that can provide opportunities for interaction with nature and the outdoors. There are also several watershed organizations in the Region that create volunteer opportunities for the public to get involved in restoring habitat or learning more about the forest resources around them.

Formal training in the forestry sector can be attained as a stand-alone program such as the Vermont Woodworking School in Fairfax or as part of a focus for high school students attending the Cold Hollow Career Center in Enosburgh. Some areas students also partake in the technical trainings through the Essex Technical Center educational program in Essex, Vermont.

Historic, Cultural and Spiritual Values

Forests have become an entrenched aspect of the landscape and part of Vermont's heritage and identity. While three-quarters of the state is currently forested, reforestation of the state started around the 1800s after heavy clearing for agriculture and pasturing. This patchwork of agricultural fields and forestland that make up the working landscape today are a prominent feature of Vermont's landscape in the Region. The tradition of the private landowner making a living off of their land is tied to the sustainability of forestry management practices and ecological maintenance of the land. While this tradition supports the livelihoods of those private landowners; it also provides recreational, wildlife, and timber resources and contributes to the health of watersheds. By maintaining healthy forestland, whether it is a working landscape or a protected forestland, we are also maintaining a resource for cultural and spiritual connection. The forested landscape provides a connection to the natural environment and, has the potential to provide a way of life that has been passed down through the generations.

Threats, Barriers and Limitations

Preservation of forest land is vital to the Region's future quality of life and economic prosperity. There are limitations, however, to the amount of forest land that can be expected to be maintained in the future. There also exist very real threats to the quantity and quality of the resource. Some of the limitations may stem from the external influences that are in conflict with local and regional needs and desires and some may be attributable to ineffective planning. Once these factors are identified and understood, it is possible to determine how to best respond to minimize the loss of important resource opportunities.

Threats, Barriers and Limitations were grouped into three categories: environmental threats, development and fragmentation, and economic conditions. Subsets of metrics representing each category were ranked by NRPC's Forest Stewardship Committee at their January 2014 meeting; the categories were ranked as they related to the perceived impact of the metric in the Northwest Region.

Environmental Threats

Air Quality

Air quality within the Region is good however impacts are felt by air pollutants that originate from sources beyond the state boundary. Acid rain, the pollutant with the greatest impact to forest health in the Region, can be linked with the sulfur emissions of Midwestern power plants. This is a threat that has been well documented for many years in the Northeast. Acid deposition can increase the leaching of valuable soil nutrients, such as calcium, thereby reducing the soil fertility and creating more acidic soils. An occurrence such as this has large impacts on the Region given that when soils become more acidic it impacts the growth and reproduction of sugar maples (Discoll et al. 2001).

As shown on Map 10 (Forest Resource Constraints) there are two bands of areas in Franklin County where forest health and productivity are threatened by acid deposition as mapped by VT Agency of Natural Resources. Higher sensitivity to acid deposition occurs along the ridgelines of the Green Mountain range along the eastern edge of the county from Fletcher up to Richford and in the western portion of the county where there is a band that comes up from Chittenden County east of the Interstate through the French Hill area in St Albans, and north towards Franklin. Mountain summits are more susceptible given the shallow soils and propensity for slightly acidic conditions, making them less able to withstand the loss of additional nutrients from acid rain.

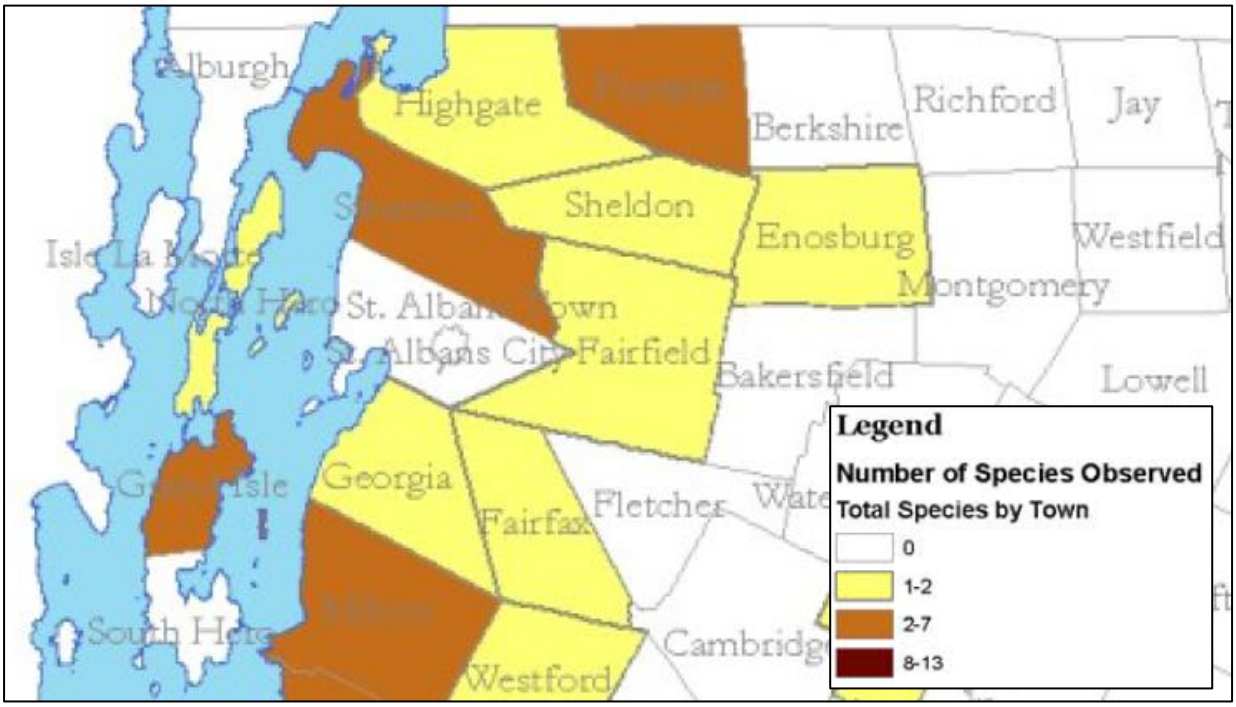
Water quality

Nonpoint source pollution, particularly phosphorus, is of high concern in the Region. Forestland can be a source of phosphorus pollution; this would typically be in the form of sediment loss from erosion after a disturbance to a site such as erosion and runoff that can occur from logging operations both during and post activity. To mediate these threats Vermont has developed Acceptable Management Practices and encourages proper buffers along river corridors and timing of operations.

Invasive species

Non-native plant and insect species can cause irreversible impacts to forest health and biodiversity. There are currently two insects, gypsy moth and hemlock wooly adelgid (has been identified in Windham County), that are established in Vermont that have an impact on the forest and several plan species (Forest Resource Plan 2010). There are also several species that are taking hold in neighboring states that could have large impacts on the ecosystem health in the Region. These species include the emerald ash borer and Asian longhorned beetle. Over half the trees in Vermont are a host species that these invasive pests would target (USDA UCF 2014). Forests are also impacted by exotic diseases such as beech bark disease and butternut canker (Forest Resource Plan 2010). Currently, the spread of invasive plants in the Region is low to moderate in the eastern section of the county but moderate to heavy in the Champlain Valley and the Islands (Map 9).

Invasive species tend to spread in areas of human impact which can be either passive by way of forest fragmentation creating areas along the edge of a forest patch for the invasive to be introduced to, being transported directly to the areas in the case of firewood or through nursery stock. Impacts from establishment of these invasive species can have devastating impacts on factors such as regeneration of native tree species thereby changing forest composition and genetic diversity. These impacts would also extend to the economic side of forestry; a quarantine that prevents wood from traveling across state borders would create a large barrier for the forest products industry to reach mills needed to process materials.



Map 9. Non-native invasive plant occurrence in Franklin and Grand Isle Counties (2010 Forest Resource Plan).

Climate Change

The climate in the Northeast is dealing with two trends: increased temperatures and precipitation In the last 50 years, Vermont's mean winter temperature has risen over 4.5°F and the mean summer temperature has risen about 2°F (Betts 2011). Warmer year-round temperatures impact the climate in many ways including the creation of a longer growing season, reduced snowpack, and increased heavy precipitation. For the forest, these changes in temperature can mean shifts in species compositions as well as changes to the distribution and spread of invasive species. While the warmer temperatures are enabling Northern hardwood species (sugar maple, yellow birch, American beech) to survive at higher elevations, this species group and spruce/fir forests are both vulnerable to warming climate. There is the potential for other species groups such as oak and pine to replace these species as they prefer warmer and drier environments (Wilmot 2011). While the impacts attributable to climate change are considered to be gradual, the outcome could create a noticeable change to our forest resources.

Logging and Forestry Practices

As noted under water quality, forests can be managed and harvested responsibly. A set of best practices (AMPs) has been developed to guide practitioners to have reduced impacts on the land. However, poor forestry practices such as high-grading and liquidation can have impacts that reach beyond what occurs on that parcel to impact more the forest health, water quality and wildlife of the watershed. High grading, the practice of removing the most marketable timber, can reduce long term forest health and increase fragmentation. Liquidation practices, also described as "heavy cutting" of more than 40 acres or 80 acres within 5 years and a 2-mi radius, are many times focused more on the merchantable wood and short-term gain than long-term productivity and regeneration; this differs from smaller clear cuts due to the scale of the operation. While the number of permits and amount of land harvest as a heavy cut has been reduced dramatically since Vermont enacted a law in 1997 establishing regulations around the practice, that has not stopped illegal cutting as was done in 2012 by 2 logging operations in Bloomfield, Vermont and one logging operation in 2013 in Albany, VT (Carpenter 2013, Schwartz and Duane 2012). These practices are not only a concern in regards to the environmental impacts they have but they may also lead to a greater risk of being converted to agricultural or residential development as the remaining fragmented forest provides less opportunity for the landowner to gain immediate income from timber and other forest products.

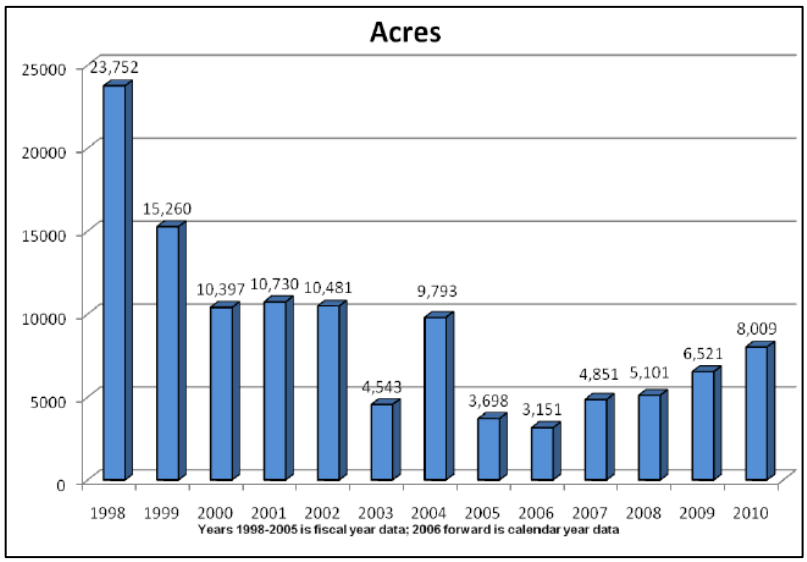
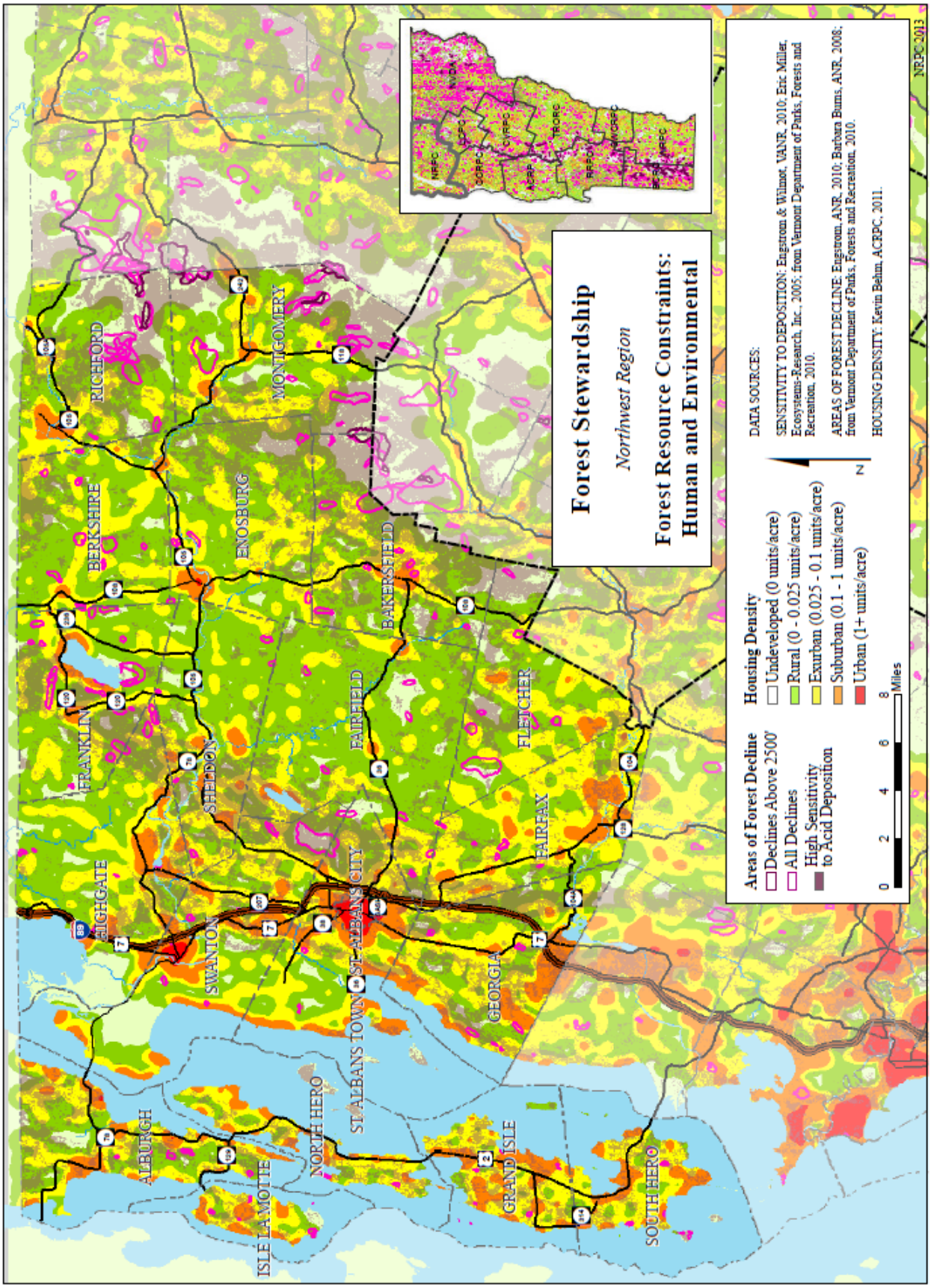


Figure 16. Acres harvested from a heavy cut statewide (Source: VT FPR).

Table 3. Ranking of environmental threats, as they relate to the Northwest Region.

	Level of Priority		
Action	Low	Medium	High
Water quality, specifically phosphorus loading	-	33%	67%
Fragmentation disrupts or prevents plant and animal species movement	-	70%	30%
Introduction of pests and invasive species (gypsy moth, beech bark disease, emerald ash borer)	-	40%	60%
Parcelization affects economic viability of land for timber harvesting	10%	30%	60%
Adverse forest practices such as liquidation, high-grading, unsustainable harvesting	-	60%	40%
Climate change (affecting forest health, species composition, logging operations and infrastructure)	11%	56%	33%
Air quality by way of chemical deposition (“acid rain” and similar pollution)	100%		



Map 10. Forest Resource Constraints.

Development and Fragmentation

Parcelization and Fragmentation of Forests

The continuity of large tracts of forestland are impacted by development when it infringes on the boundaries of the forest, cuts a path through it, and breaks it up into smaller parcels that may be managed differently. These processes are typically discussed as fragmentation (interruptions in otherwise intact forestlands due to infrastructure like roads or utility lines) and parcelization (the subdivision of a large parcel into several smaller ones). The causes and effects of fragmentation and parcelization of forestland are discussed in the 2007 report by the Vermont Natural Resources Council (VNRC) titled, "Roundtable on Parcelization and Forest Fragmentation"; they categorize these impacts into four areas: tax policy, conservation planning, valuation of ecosystem resources, and sustainability of the forest products industry.

VNRC identified that as of 2009, 71% of the land in Vermont was in parcels 50 acres or larger – a threshold assumed to be viable to support ecological and economic values (Brighton et al. 2010). Of this land in large parcels, about a quarter of it was classified as "woodland" or predominantly forested with no type of dwelling present (Brighton et al. 2010). VNRC did find evidence that this type of landscape is decreasing; a comparison of parcels from 2003 to 2009 found a 4% decrease in acreage classified as "woodland" as land was planned for development, subdivided into smaller parcels or other actions. While this decrease may be small, subdivision of properties and land conversion impact environmental and economic values on a larger scale.

On the environmental side there may be negative impacts on plant and animal species, water quality, wildlife habitat, and recreational use of the forestland from the parcelization of this resource. Land division also impacts the economics of forestland, as stated above once a parcel is less than 50 acres it is less viable to support many forest industries (Brighton et al. 2010). These may be further influenced by factors of the land division such as multiple landowners "owning" a portion of the forest that may result in differences in management and impacts to overall viability of the forest parcel to maintain the environmental services and economic viability.

Table 4: Loss of Acres in Parcels >50 ac 2003-2009 (VNRC 2007).

Percentage	Town
0%	Highgate, Sheldon, Enosburgh, Richford, Fletcher, South Hero, City of St Albans
1%	Alburgh, Bakersfield, Montgomery
2%	Franklin
>3%	Berkshire, Isle la Motte, North Hero, Grand Isle, Georgia, Town of St Albans

Note: Loss of acres in parcels refers to the subdivision and selling of acres from larger parcels.

Table 4 shows a that between 2003 and 2009, there were six municipalities in the Region that had a loss of 3% or more in the number of large private parcels (>50acs). These parcels could represent land used for dwelling (non-farm), farmland, woodland, or other and were either sold or subdivided in parcels of land less than 50 acres.

In order to address impacts that can happen as a result of the expansion of developed land, municipalities need to understand how their community could be developed based on their currently adopted policies and if it creates the intended development outcome.

Table 5. Ranking of barriers and limitations resulting from development practices and policies, as they relate to the Northwest Region.

	Level of Priority		
Action	Low	Medium	High
Large minimum lot size requirements in zoning result in a new home site that is accompanied by large amounts of land and the infrastructure needed to serve the new development - Creates additional clearing and land affected - Exurban development and perforation of the forest (for every house 35 acres are affected)	-	100%	-
Construction of buildings (largely residential) and supporting infrastructure in forested areas, ➢ Subdivision of large tracts of forest land pose challenges to long-term forest management and sustainability ➢ Parcelization of forests with development makes it harder to manage the forest resources	-	100%	-
Condition of existing infrastructure	-	90%	10%
Road policies that vary between towns (mud season, weight limits) and accessibility of roads	-	60%	40%

Economic Conditions

There are many economic barriers or limitations that impact the full viability of the Northwest Region's working forestland. These barriers include: gaps in processing facilities, distribution of wood supplies, and market development for the local forestry products.

Access to the Supply and Demand

There are many steps along the way to take wood from the forest and get it to a secondary manufacturer. Some of these steps can pose as a barrier, primarily for smaller forestry operations. The first of these barriers is the ability to locate a market for the type of wood that is ready to harvest from a forest stand. While there are a fair number of local furniture producers, artisans and custom millwork in the Region, there is not an existing network set-up to connect these users to the source of material they will use for their products.

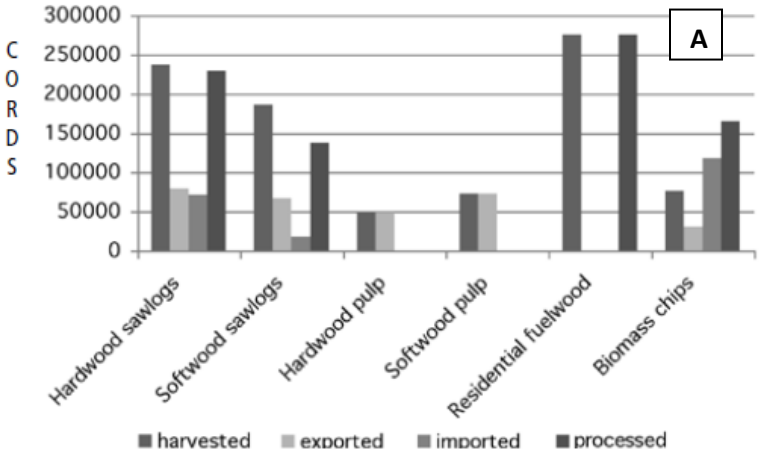
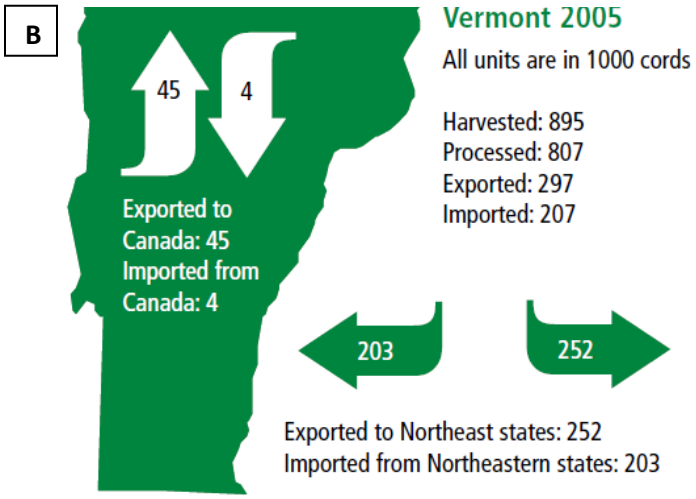


Figure 17. 2005 Wood flows in Vermont (Source: North East State Foresters Association 2007)



In addition to identifying a buyer for the wood, the cost of harvesting the wood from the forest is increasing due to another barrier: increased fuel costs. Therefore the trucking and operation of machinery used to remove the woody material is more expensive.

Finally, finding a processor for the wood harvested has been a limiting factor for several decades. Across Vermont there have been declines in mills as well as supporting infrastructure such as kilns to dry the wood and prepare it for the intended use. Since the 1980s, wood has been exported in significant quantities from of Vermont and to Canada or other states for processing at mills (Figure 17A and B, NESFA 2007). To meet the demands of the wood products industry, wood is then imported in a milled state ready for conversion into a product. As an example, the old paper mill in Sheldon purchases 100% recycled material from outside the state to produce paperboard that is then purchased by larger companies to create their product packaging.

Economies of Scale

Competition in the global marketplace represents certain challenges such as creating uneven playing fields for producing the same product. It has been found to cost 20 percent more to make a product in the US compared to nine other major industrial countries including China and Canada (Goergen et al. 2013). Aside from labor costs, much of this difference can be attributed to existing regulations (air, water, sensitive species, health care, etc) or access to wood from the crown land that impact the production costs in the manufacturing sector and contribute to inequities. While it is not intended by forest producers to want "a pass" on following regulations put in place to account for the sustainable and responsible use of the resource, reduced standards in other countries undervalues wood in the US (USFS 2014). Other countries such as China, have also introduced incentives and reduced taxes for wood products industries to encourage their growth and expansion and lead to a reduced reliance on imports to produce exports (American Forest and Paper Association, 2004).

Landowners that manage small forest lots and have less timber to manage may find that such conditions are a greater barrier to actively logging their land for a profit. There is a higher cost associated with getting a logger in to cut smaller lots. This issue can be associated with some of the smaller lots enrolled in the Current Use program; this program requires the need for a management plan but landowners may find this cost differential a barrier to carrying out the recommended management.

Buy local campaign

Vermont consumers are not as geared towards the "buy local" movement when purchasing wood products when compared to the support given to farmers and agricultural community statewide. An increased emphasis on buying local could enliven the regional forest products economy and help to retain jobs. The absence of a local movement means that local consumers as less likely to pay the premiums needed by the producers of these products (furniture, lumber, paper goods, etc) to make them viable locally and at a smaller scale. A buy local movement could also create a direct opportunity for jobs and promote good forest stewardship and high environmental standards are utilized in the manufacturing of the products. There have been some efforts towards such a campaign via several of the statewide trades organizations, but a wider promotion of "buy local" and value of certifications for timber products could potentially improve the markets for local producers.

Aging Workforce and Forest Landowners

An area of concern for the forestry industry in the state is the aging of the population. This demographic change will impact the forest resources and management by both the loss of skilled laborers and potential loss of managed forestland. Interviews with a few of the forest industry companies in the Region identified they have an issue with finding skilled labor to work for their companies. This can be tied to both not finding qualified applicants as well as the current low unemployment rate in the state. There are a growing number of vocational opportunities in Vermont that could be the start of a solution to this potential threat. Franklin County is home to the Vermont Woodworking School which has developed a degree offering through the Vermont Community College. Time will tell if this and other education programs create the workforce to fill the range of positions needed to work the land from

logging, trucking, forest managers to wood product producers. Cold hollow Career center also has a Natural Resources component that trains young people for the forest products industry.

The other concern regarding aging of forest landowners may be a harder issue to asses. A 2002-2006 survey conducted by the Forest Service on family forest owners found that 44% of family forestland was owned by landowners that are 65 years or older (Butler 2008). Fourteen percent of family forest owners plan to sell or transfer their land in the next five years (Butler 2008). For some landowners there is a plan to transfer the land to family members and maintain the working landscape but without this option, the fate of whether the land will be sold as a working forested landscape is unclear. A study conducted by VNRC (Brighton 2010) found that in 2009, 40% of parcels 50 acres or larger had different property owners than in 2003. This number does not include transfers that were not sales (such as transfer to family member) nor does it give a clear indication as to if this land will stay as forestland.

Economic Pressure of Maintaining Forestland

Costs of owning forestland can be high. This is a barrier to both maintaining land as forestland and for prospective purchasers of land. The operating and maintenance costs of landownership include those associated with maintaining an access road and its associated infrastructure (culverts, bridges), fuel, labor, property taxes, and equipment. Given that the market value of land is significantly higher than the use value of it as forestland, this can put more pressure on land to end up being sold and/or subdivided. This higher market value can also be a disincentive to the initial purchase of larger tracts of land.

Table 6. Ranking of barriers and limitations from changes in economic conditions, as they relate to the Northwest Region.

	Level of Priority		
Action	Low	Medium	High
Identification of markets to get raw material to user (networking)	-	-	100%
Increasing harvesting cost (fuel for trucking, insurance, etc.)	-	-	100%
Lack of local processing facilities, mills, kilns, etc.	-	10%	90%
Competition from global markets creates an uneven playing field – lower production costs elsewhere, subsidies/supports in other states/countries *[Noted that Region would like to aim for a sustainable local economy in Vermont]*	-	20%	80%
Absence of a "buy local" movement, slogans and certifications for timber products, has not yet caught on like the "eat local" movement	-	20%	80%
Smaller landowners with less timber to manage, larger barrier to get to market - Higher cost to get logger in to small lots *[Noted as an issue with small lots in Current Use program as need a plan for management but difficult to manage due to this concern]*	-	30%	70%

Workforce development – replacing existing skilled workforce	-	100%	-
Cost of maintaining forest land (taxes, maintain infrastructure, labor, equipment, fuel, etc.)	-	100%	-
Related economic pressure to convert forests to alternative uses (such as residential uses or potentially cleared for agricultural uses as those are further developed)	-	90%	10%
Aging landowners – uncertainty in what will happen to land	10%	80%	10%
Lack of economic opportunities for the use of forest resources (change in market preferences, price of timber, etc.)	-	40%	60%

Other

Another threat that does not fit into the previous categories is the human connection to the landscape and forest. Everyday people that do not have a connection to forestland or fall under the category of recreational and spiritual users may be less supportive of the activities that occur in a working landscape. This lack of a connection can serve as a barrier in the perceptions of activities such as harvesting and lack of support for the local producers when they are consumers (more interested in lower prices products than support local or environmental practices).

Table 7. Ranking of barriers and limitations for other factors, as they relate to the Northwest Region.

	Level of Priority		
Action	Low	Medium	High
Lack of personal and cultural connection to forests and forest services/products	-	-	100%

Tools for Sound Forest Stewardship and Conservation

The importance of maintaining the viability of forest resources has been recognized for many years and various complementary strategies have been developed and employed. This report identified strategies and actions to be employed in the Northwest Region, Forest Stewardship measures are grouped into the following categories:

- Conservation Planning to identify existing resources and how they should be managed;
- Investment in forestland, by a public entity or private conservation organization;
- Regulatory tools to address land use, transportation and environmental issues;
- Economic development assistance that supports continued forest resource uses of a property;
- Outreach and education on forest management as well as awareness of local resources; and
- Partnerships with existing forestry related organizations.

Conservation Planning

Conservation Planning can be a good first step for communities that have not yet taken stock of their natural resources. The main goals of conservation planning are to identify the location and extent of important resources, set priorities for resource protection, and recommend strategies for conserving forestlands that are needed to support the forestry working landscape, wildlife habitat, watershed protection, recreation and other public values (VNRC Community Strategies for VT's Forests and Wildlife, 2013).

Identifying Resources

To gain a base understanding of the community's natural resources, a map and/or inventory of resources should be conducted. This process could capture some of the following elements: location and extent of forest blocks, wildlife habitat, wildlife connectivity zones, significant forest stands, locations of conservation easements. Information should also be captured on the current forest products industry activities in the area such as the presence of a sawmill or kiln for processing lumber, firewood processors, sugarmakers, etc. Local volunteer groups and programs, such as UVM LAND program, could aid in providing natural resources inventories. These inventories can then be shared with landowners as an example of what can be found on their land and the community to build awareness of the area resources. This process would provide an overview of what the resources are and how they may be used in the area.

There are many readily available resources a community can use to start this process such as the Natural Resources Atlas and BioFinder, both of these tools are available on the state's website as free internet mapping tools (http://www.anr.state.vt.us/site/html/maps.htm). For more information on available data for asset mapping, contact the Northwest Regional Planning Commission.

Potential Forest Stewardship

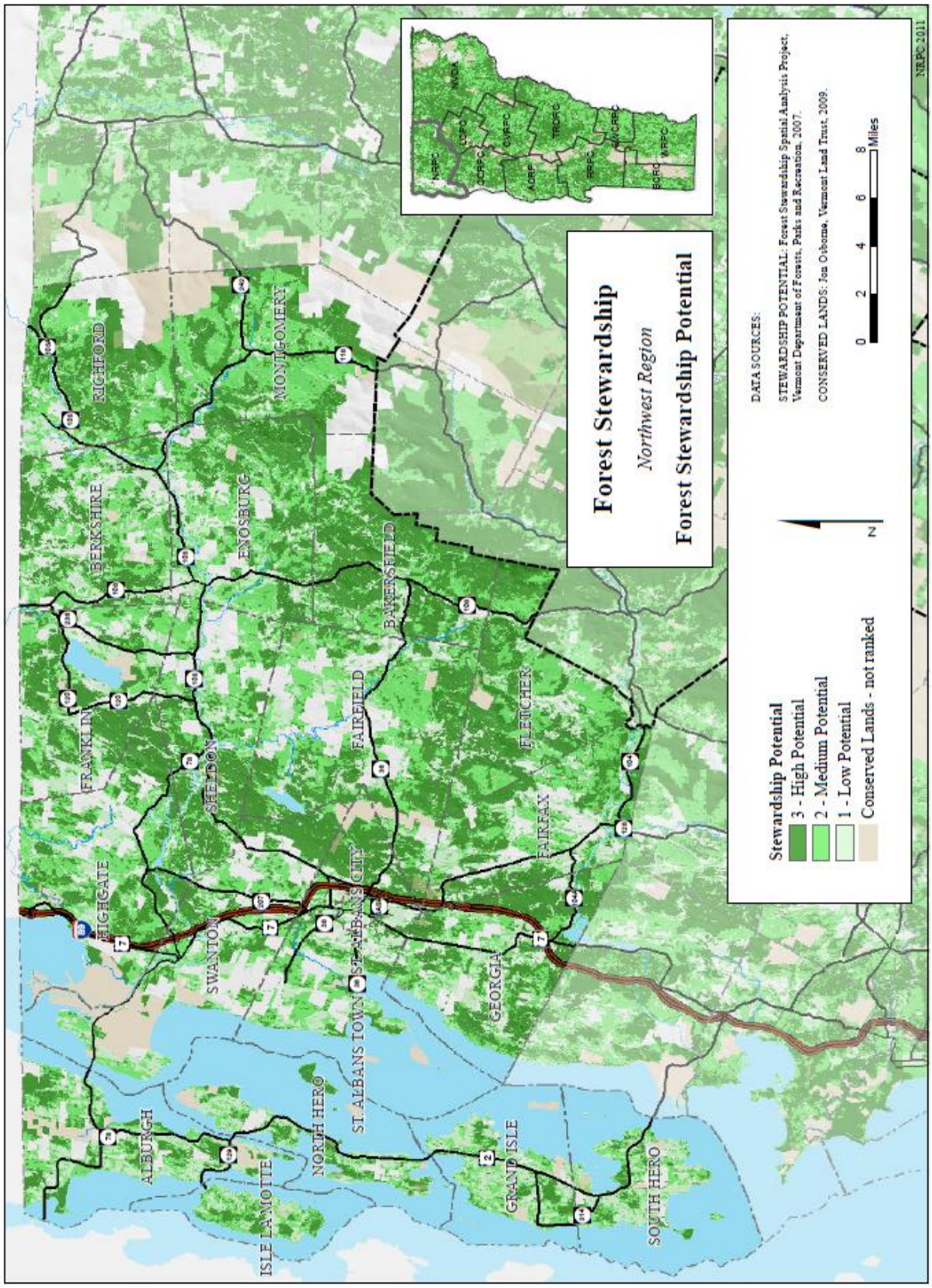
The Vermont Department of Forests, Parks, and Recreation, as part of its Forest Resources Plan, has developed a stewardship potential analysis that identifies areas where good stewardship practices should be encouraged. A component of that analysis, known as the Vermont Forest Stewardship Spatial Analysis Project (SAP), involved the creation of a map to be used in determining the private forest lands stewardship potential in Vermont.

Spatial data was used to indicate non-industrial private forest lands where stewardship could be encouraged or enhanced. The project identified ten factors that play a key role in influencing suitability for forest stewardship. Factors that threaten forest resources include development (conversion to non-forest uses) and forest health (risk and adaptability to change). Factors that support the potential of forest resources include forest patches, slope, wildlife, biodiversity, riparian corridors, wetlands, priority watersheds, and proximity to publicly owned lands. These ten factors were combined into an analysis and the importance of each of these factors was ranked as high, medium, or low. The final product is a single data layer which represents the suitability of the land for further stewardship efforts, scored from 3 (high potential for forest stewardship) to 1 (low potential) (Forest Resources Plan 2010).

The results of the effort are provided on Map 11 (Forest Stewardship Potential). Results correlate to areas where there are larger blocks of forestland as shown in the *Forest Ecological Resources* (Map 6) (north-south band east of the interstate, along the Green Mountains, and around the boundary of Fairfax/Fletcher/Fairfield).

Strategy: Asset Mapping of natural community and resources related to forestry to aid in developing conservation and management objectives by landowners and in the community.

> *Action*: Utilizing readily available data and collect missing information to create a map and/or inventory of forest related resources.



Map 11. Forest Stewardship Potential.

Setting Priorities with Plans

Once the forestry and natural resources are known, policies can be developed to set priorities to ensure these resources will be responsibly managed and protected.

Regional Plan – Related Forestry and Natural Resource Policies

The 2007 NRPC Regional Plan discussed forests as a landscape component in several elements of the Regional Plan including the Natural and Cultural Resources, Housing, and Land Use. In these sections of the plan the value of forestland is discussed as it pertains to wildlife habitat, scenic part of our landscape, and a part of the working landscape livelihood. The plan identifies several policies that relate to the importance and protection of our forest landscape and working lands.

- Impacts of development will be considered from a watershed perspective, including incremental and cumulative impacts, and impacts between watersheds.
- Acquisition of natural and fragile areas by local, state or federal conservation agencies whose goal is protection of the areas is encouraged.
- Degradation and fragmentation of habitat for wildlife and threatened or endangered species should be discouraged.
- Residential developments are encouraged to be located within locally and regionally designated growth centers with appropriate infrastructure, and should be located outside of identified resource and conservation lands.
- Public investments in infrastructure should encourage growth in designated growth centers and should not encourage the development and/or fragmentation of farmlands or other resource areas.
- Clustered developments should be designed to work with the landscape in terms of energy efficiency, protection of ecologically sensitive areas, and conservation of farmland.
- Development in these areas should not diminish the viability of agricultural operations or fragment large contiguous tracts of woodland.
- Development is encouraged to be built outside of farms and along the edges of forests, preferably with buffers between such development and agricultural uses or environmentally sensitive areas.

NRPC is currently updating the Regional Plan and will be provide more of an emphasis on forest lands and their importance as outlined in the values section of this report both as an important natural resource to be conserved and as a component of our working landscape. Currently, draft policies will specifically address parcelization and fragmentation issues. The 2007 Regional Plan did not have an economic development section; the importance of the forest products industry as part of the Region's working landscape will be incorporated into the updated plan. Information from the development of this plan will be utilized to incorporate policies on the use of forest resources, their protection and stewardship.

Strategy: Incorporate policies that support sound forest stewardship as identified in this effort into the NRPC Regional Plan.

Action: Incorporate information on the importance of the forest product industry as part of the Region's economy and natural resource.

Action: Recommend outreach to municipal officials on forestry issues during technical assistance opportunities.

Local Municipal Plans – Related Forestry and Natural Resource Policies

Below are some examples of how municipalities in the Region and state are incorporating language into their planning documents to address forest stewardship in their town plans.

Enosburgh Town Plan (2013) - Existing Supporting Policies

- Prepare a multiple use forest management plan for the town forest.
- Encourage the development of a conservation commission or local land trust, and collaboration with state and federal land trusts.
- Promote the Current Use Program to better manage and conserve forest and agricultural lands.
- Encourage landowners to donate or sell development rights in order to preserve Enosburgh's rural character.

Montgomery Town Plan (2010) – Existing Supporting Policies

- Avoid fragmentation of large forest blocks of contiguous forests that provide both economic opportunities for landowners as well as ecological and cultural benefits to the community, including wildlife habitat, water quality maintenance and recreation.
- Promote anti-sprawl initiatives as a measure to maintain the appropriate use of our land Resources.
- Promote the enrollment of productive farm and forestland in the current use value appraisal program.
- Limit the loss of local wildlife habitat by maintaining significant features, including areas of existing contiguous forest habitat, wildlife corridors, and unique sensitive areas, and protecting such areas from development that would demonstrably reduce the ecological function of habitat on a particular parcel or on the landscape scale.

Berkshire Town Plan (2010) – Existing Supporting Policies

- Development within agricultural and forested areas should be discouraged on primary agricultural or forestry soils.
- The use of Best Management Practices (BMPs) in agriculture and Acceptable Management Practices (AMPs) in forestry and logging operations will be encouraged whenever possible.
- Places of outstanding historical or educational value should be protected from development that unreasonably impairs their character or quality.

Berkshire Town Plan (2010) – Existing Supporting Policies cont.

- Strip development shall be discouraged. Clustered development, including Planned Unit Developments (PUDs), shall be encouraged where feasible and appropriate in order to protect and maintain important farmland, forestland, and open space.
- The town encourages agricultural and forestland be maintained for viable economic use, encourages value added businesses, promotes locally grown products, and encourages the implementation of agricultural/forestry best management practices.

The following strategies are items the Region should utilize in long-range planning to continue to support language that conserves the Region's forestland.

Strategy: Encourage open space planning exercises to inform town planning documents and areas that should be conserved.

Action: Develop a stand-alone plan or language for the municipal plan that outlines actions for open space lands identified as important or special.

Action: Utilize the information from the planning to inform areas that should be considered for conservation easements or town forests.

Strategy: Incorporate language in municipal plans that promote best practices of land development to reduce impacts from forestland fragmentation.

Action: Update plans with clear policies to promote land development that reduces or minimizes forestland fragmentation and impacts to wildlife habitat.

Strategy: Ensure that local plan policies support working forests.

Action: Review plan language to identify if the forest products industry is supported in the plan.

Strategy: Utilize available data to relate the importance of the working forested landscape and environmental services into local plans.

Action: Integrate natural resource data layers that relate to keeping forest and wildlife intact (i.e. habitat blocks, forest productivity, and areas of wildlife connectivity) into the development of plan maps and policies.

Strategy: Municipal plans should address quality habitat and large blocks of forest land in a consistent manner with adjoining towns.

Action: Wildlife Habitat Block data from the USFWS should be evaluated to determine if there are important corridors areas of forestland within a community and shared with an adjacent community.

Forestry Conservation Measures

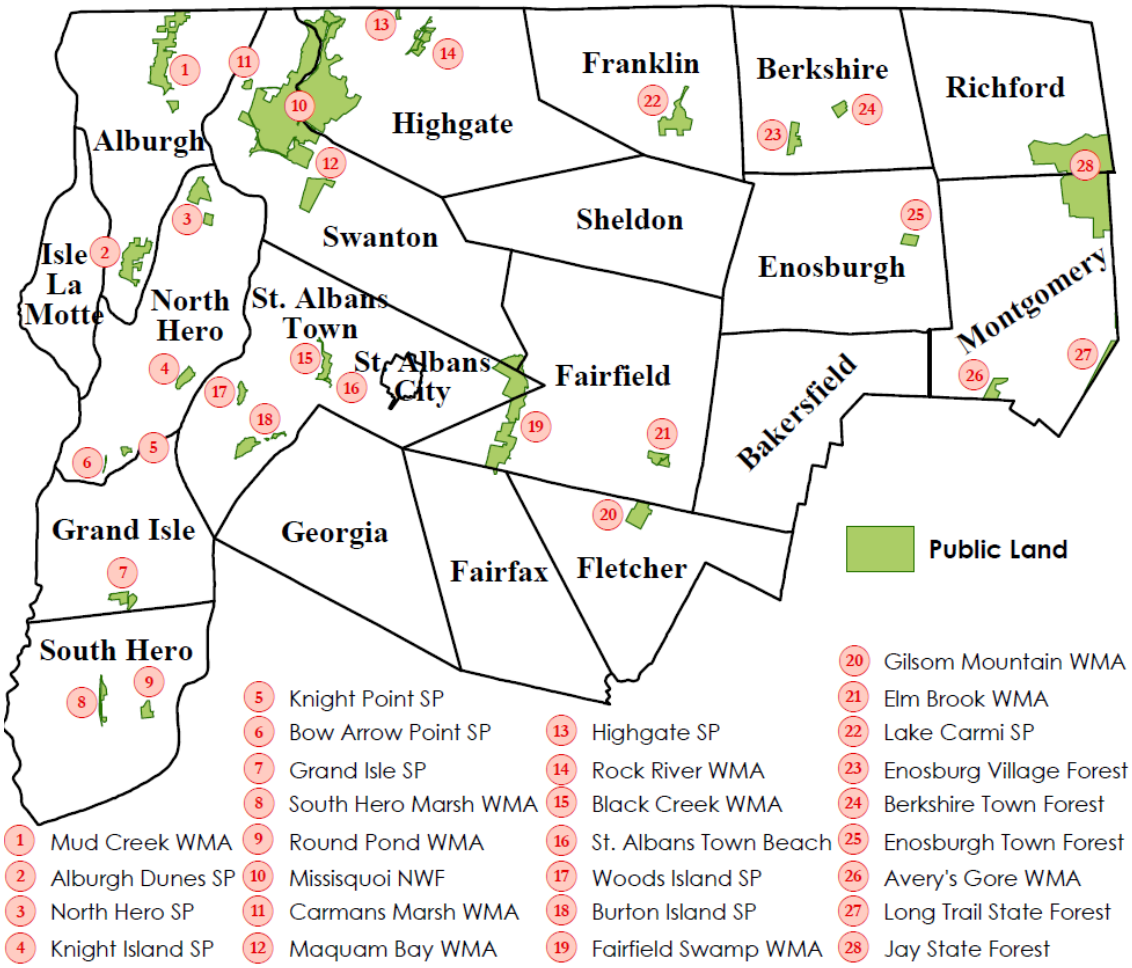
There are several types of conserved land in the Northwest Region shown on Map 13; public lands cover more than 18,530 acres in Franklin and Grand Isle Counties. The State owns more than half of this area, managing over 47 parcels ranging in size from the 1,766 acre Fairfield Swamp Wildlife Management Area to small access areas of 1-2 acres each. The federally owned Missisquoi National Wildlife Area, covering 6,470 acres represents a very significant portion of the remaining public lands and is the only federally owned property in the Region. Table 8 summarizes this information.

The Regional distribution of public lands and recreational facilities is shown in Map 12 below. The majority of municipalities have close access to public land.

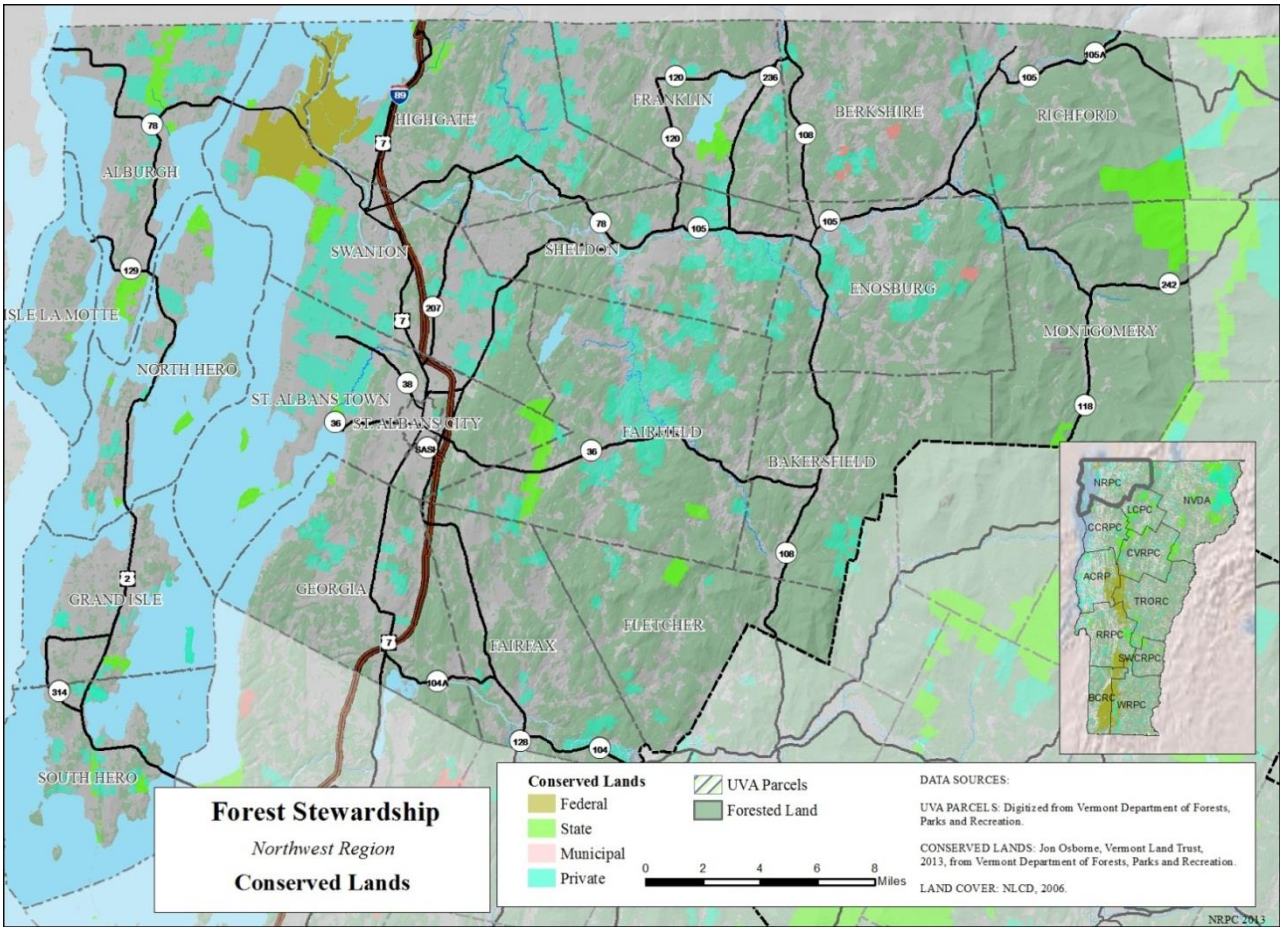
Table 8. Northwest Regional Public Lands

	Federal	State	Municipal*	Total
Acreage	6,119	12,411	440	18,970

CONSERVED LANDS: Jon Osborne, Vermont Land Trust, 2013, from Vermont Department of Forests, Parks and Recreation.
**Note there are additional public lands not included in this data.*



Map 12. Forest Stewardship Potential.



Map 13. Conserved Lands.

Municipal-level Conserved Land

Municipal Forests or forest land owned and managed by a municipality, conserve forest land while providing recreational benefits, wildlife habitat, and in some cases, revenue for Town governments. Town Forests were originally developed as part of a statewide effort to reforest the State and promote good forest management practices.

Many towns in the Region have a municipal forest, see Table 9. Management of municipal forests varies from community to community and often reflects the goals and vision of the local community. Some communities may use their forests primarily for recreation, others may emphasize wildlife conservation and another option may be to manage the Town Forests primarily for revenues from

Table 9. Northwest Region Town Forests.

Name	Acres
Berkshire Town Forest	130.84
Enosburgh Town Forest	140.37
Enosburg Village Forest (2 Parcels)	168.40
Fairfax Town Forest (2 Parcels)	157.40
Fairfield Town Forest	130.16
Fletcher Town Forest	134.71
Georgia Town Forest	68.13
Montgomery Town Forest	48.87
North Hero Town Forest (2 Parcels)	77.58
Richford Town Forest	144.53
Sheldon School Forest	85.17
Saint Albans City Forest	49.16
Saint Albans Town Forest	221.86

logging. A municipal forest in another region are managed to provide affordable fire wood for low income residents. Given the different goals of management, there may be times when potential uses of Municipal Forests may conflict; for example, providing revenues through timber sales may conflict with promoting recreation.

Strategy: Each town should identify a management goal and develop policies for their Municipal Forest to address potential conflicts for use of resources.

> *Action:* Identify the desired uses for the Municipal Forest and develop a management plan to maintain the resource(s).

Conservation Easements

A conservation easement is a legally binding agreement between a landowner and a government agency or land protection organization (land trust) that ensures a parcel will be protected indefinitely from certain types of development. Conservation easements are typically created to conserve farm or forest lands, to protect ecologically sensitive areas, or to protect land that has particular importance to an individual, family, or community. Easements are sometimes donated but can also be purchased. The terms of the easement and activities allowed to occur on the property is set with the landowner; the landowner will usually be allowed and often encouraged, to use the land for farming, forestry, recreation, or educational purposes.

Three Land Trusts are active within the Northwest Region. Their existing easements are shown as "private" land on Map 13. The **South Hero Land Trust** is an active local land trust in the Town of South Hero. Since its creation in 1997, the organization has completed numerous conservation projects, several of their projects have been completed in partnership with the other two land trusts.

The **Lake Champlain Land Trust** conserves a variety of landscapes on both sides of the Lake Champlain.

The **Vermont Land Trust** is a statewide organization that facilitates the implementation of permanent conservation easements to preserve farms, forests, wetlands, and other open space. The Vermont Land Trust has conserved more than 360,000 acres of productive forest lands across the State of Vermont. Vermont Land Trust has been very successful and has worked with partners to conserve land in almost every municipality in the Region. In 2002, the South Hero Land Trust partnered with the Vermont Land Trust to conserve 60 acres of woodland, known as the Jackson's Point conservation project in South Hero. This project was an effort of seven families who jointly own the property and donated an easement.

Communities can also engage in the development of conservation easements on parcels of land by creating a **conservation fund** that can be used for conservation projects. These funds could be raised in response to a specific project or allowed to build up for when an opportunity may arise. This should be set up as a reserve fund as defined by 24 V.S.A. 2804. Funds can be raised either through a direct

appropriation or to a specific increase in the tax rate (e.g. $0.01). Communities do not need to purchase the property but can work with a land trust or private landowner to develop the easement.

Strategy: Encourage use of conservation easements to conserve working forests and protect sensitive areas.

Action: Bring awareness to private landowners, municipal boards, and general public of the benefits of conservation easements for forestland.

Action: Reach out to landowners of non-conserved properties to educate them about conservation programs and funding opportunities.

Action: Explore the creation of a Town Conservation fund to assist in compensating landowners for conservation efforts.

Enosburgh Conservation Fund

The Town of Enosburgh has a conservation fund that sets aside ½ cent of the tax rate to be put towards conservation efforts. This amounts to approximately $10,000/year and is rolled over if not used. The first year it was instituted, the funded was used to contribute to the purchase of what is now Island View Park making fishing and canoe access permanent for the public and allowing the Village of Enosburg Falls to transfer two affordable housing lots to Habitat for Humanity. This contribution was a small part of the total purchase price but showed the granting organizations, fundraisers and other donators that this was important for the village. This project shows that a small contribution can go a long way in leveraging a project.

Cooperative Management

Forest Cooperatives allow for adjacent landowners to work together to share the costs of managing their property and foster conservation and stewardship goals. This strategy addresses the previously identified barrier of the high cost to actively manage a woodlot for a private landowner compared to the potential return for the harvest. Cooperation among landowners and forest products businesses can reduce costs and gain efficiencies; these opportunities should be investigated and encouraged.

Landowner cooperatives can help reduce each individual's land management costs and to facilitate joint marketing of forest products. Landowners who coordinate activities through a cooperative or association can share road and other infrastructure costs, develop comprehensive management plans, and jointly apply for State or Federal assistance. Cooperative management can also be instrumental in landowners securing better per acre pricing from loggers, obtaining favorable long-term contracts, and identifying markets for their products. Another added benefit for the landowner is working with others to develop the management plan for the land; this opportunity can provide landowners that may lack the technical skills for ensuring appropriate forest management practices are occurring and getting fair prices for harvesting.

Landowner cooperatives have the added benefit for the community and region of creating a mechanism for managing forests on the larger scale necessary for effective timber management, while allowing individuals to maintain ownership of lands that have been previously parcelized.

Strategy: Promote landowner cooperatives to foster cross-boundary management of continuous, multi-owner forestland for good stewardship and to market forest products.

Action: Provide materials to interested landowners on existing forest landowner cooperatives such as Vermont Family Forests and the local example in Enosburgh.

Action: Landowners could be encouraged through incentives to begin cooperatively managing forestland that is owned by multiple property owners.

Regional Example of Landowner Cooperative – Enosburgh, VT

In Enosburgh, 12 landowners are combining around 2,000 acres into a landowner cooperative. Three of the landowners in this group with land totaling approximately 500 acres have donated conservation easements to the Vermont Land Trust. Every landowner has an individual management plan which they can implement, but there are also opportunities for group management. In this case, the group is in the process of coordinating some activities such as wildlife habitat management which includes a forest bird assessment is being conducted for each property by Audubon VT. Also the Cooperative is working on a climate change adaptation assessment for each property and a consolidation of the entire landscape of climate change resiliency strategies.

Estate Planning

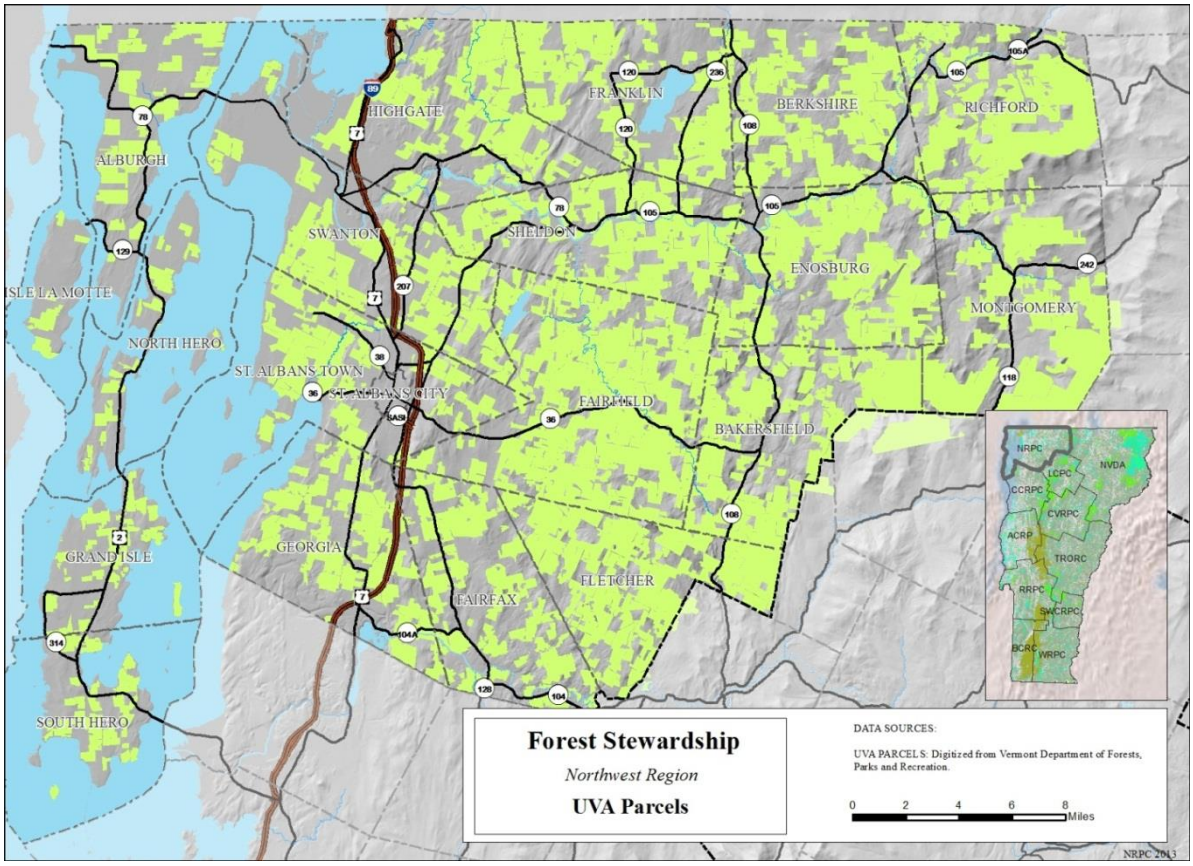
Estate Planning provides a plan for how land ownership will be transferred. As noted earlier in the report, our forest landowners are aging and without a plan in place there is a greater potential for forest fragmentation and parcelization.

Strategy: Promote estate planning to foster long-term forestland conservation.

Action: Conduct workshops for landowners with estate planning professionals.

Current Use - Use Value Appraisal Program

The Use Value Appraisal Program (UVA or Current Use) provides an incentive for private landowners to keep forestland (and farmland) productive and undeveloped. This program has been very important for maintaining the working landscape in the Northwest Region. The spatial distribution of parcels enrolled in the UVA program is shown on the Map 14; fifty-one percent of landscape in the Region is enrolled in the UVA program.



Map 14. UVA Parcels in the Region.

The Current Use program enables landowners who practice long-term forest management to have their enrolled land appraised for property taxes based on its value for forestry, rather than its fair market (development) value. This tax incentive is important as without this program the annual property taxes on forest land for some landowners may exceed the annualized income from forest management. When land is enrolled in the UVA program, the State attaches a permanent lien to the deed. Productive forest land appraised under this program receives this assessment until it is no longer actively managed, developed, or withdrawn from the program by the landowner. UVA enrolled parcels, managed according to approved management standards, are appraised at their use value. Towns are reimbursed for local shortfalls in tax revenues by the State. Qualifying nonprofit organizations can enroll land in the Current Use program if there is an approved conservation management plan.

The primary goals of the Use Value Appraisal program are to maintain the State's productive agricultural and forest land; to encourage and assist in conservation and preservation, to prevent accelerated conversion of these lands to more intensive use, and to achieve more equitable taxation for undeveloped lands. The following are strategies and actions to further these goals:

Strategy: Continue public education about the importance of the UVA program for the working landscape in the Region and Vermont.

Action: Educate the public about the public benefits associated with maintaining working forest land, including protection of water quality, maintenance of wildlife habitat, flood and erosion control, and air quality.

Action: Education on the tax benefits of maintaining working lands, particularly amongst decision makers such as Selectboards, Trustees and Legislators.

Strategy: Increase the acreage of land protected from development through conservation easements or enrollment in the UVA Program.

Action: Reach out to forest landowners in priority forest areas by examining parcel records at municipal offices and targeting outreach (for example, mailings on forest stewardship regional priorities, welcome buckets, etc.).

Strategy: Periodically provide outreach and education to landowners currently enrolled in the UVA program on available resources and best practices.

Action: Distribute information to landowners about responsible forest management, their rights and responsibilities as landowners as it relates to logging jobs, State water quality laws, how to ensure they receive a fair price for timber harvested from their land, and how to find and select a reputable logger, such as hiring loggers who have completed the Logger Education to Advance Professionalism (LEAP) program

Strategy: Provide information to landowners to inform their management plan development on local, regional and/or statewide management objectives.

Action: Create a public framework that allows for easy access to regional and/or statewide management objectives. For example, critical wildlife corridor or the recharge area of a public water supply.

Strategy: Highlight model Forest Management Plans and/or Case Studies demonstrating best practices.

Action: Develop model UVA Forest Management Plans or Case Studies that forest landowners could consult. Such documents should be varied in their approach to management objectives given that landowners have diverse interests, such as wildlife habitat, maple syrup production, or timber harvesting.

A Local Tax Stabilization program is another tool that a municipality could set-up to allow for a lower tax assessment for owners of forestland and open space. Thirty-three towns have created with own tax stabilization program with similar tax goals as the UVA program. Currently no communities in the

Northwest Region are utilizing this option instead or in addition to the UVA program. This option creates a contract between the municipality and the landowner with a fixed tax rate or the amount of annual tax assessed. For landowners, this option creates an opportunity for those with smaller parcels as there is not a minimum acreage. However this option does not provide funding to make up the tax loss resulting from the tax stabilization, although the conserved land will be requiring fewer services.

Regulatory Tools

Local Zoning and Subdivision Regulations with Forestry and Natural Resource Implications

Standards for Development Review

It is important for resource protection provisions in local bylaws to be clear and consistent in their language. The following are a few examples of how standards should be written to ensure that the intent of the community will be supported through the adopted bylaws.

Incorporate Specific Language

Currently, many communities that consider forest resources in their local bylaws use fairly vague terms and often call for "minimizing fragmentation" or placing development on areas with least impact. These are vague terms which provide little guidance for both applicants and reviewers. The Vermont Supreme Court, in the recent case *In re Appeal of JAM Golf, LLC*, struck down a South Burlington zoning ordinance designed to "protect important natural resources including streams, wetlands, scenic views, wildlife habitats and special features such as mature maple groves or unique geologic features." The Supreme Court found the regulation did not provide sufficient standards to be enforceable.

Municipalities should be sure to write specific standards that define what important or significant features are and how they should be protected. Communities could consider requiring developers to submit stand-level mapping by a professional forester (or use existing stand-level data from UVA plans) or obtain and submit an evaluation by a certified wildlife biologist/ecologist. Development could then be required to be clustered in stands or areas that have low forestry potential and limited wildlife habitat values. While this would still allow development in forest areas, it would leave the most productive stands intact.

> **Enosburgh** worked to outline how they are defining their valuable natural resources in their Natural Resources Overlay. The district includes areas which have significant geologic features, unusual or important plant and animal qualities of scientific, ecological or educational interest, steep slopes, waterways and significant wildlife habitat including connectivity areas mapped by VT Fish and Wildlife. The Zoning states that the basis for the Overlay district is the "GIS data provided by the Northwest Regional Planning Commission in the Town of Enosburgh's Land Use Map and the Critical Areas Map, as presented in the Town Plan" and land above 15% elevation. The note that this provides information that can be used in conjunction with more specific data about wildlife habitat, steep slopes, and surface waters, including information published in the Open Space and Natural Resource Assessment, Enosburgh, Vermont. They also state it "also

establishes an information base and a process of protecting areas from significant adverse effects of development, and to evaluate the impact of specific land use and development proposals with environmental constraints." The bylaws also limit development of roads greater than 800 feet through prohibition in certain zones and conditional review in others.

The information included in this overlay district provides additional detail that outlines what the community means and or is using as data to define what their valuable natural resource are. Clear definitions should also be used to define forest related terms and what uses or activities are included in "forestry".

DEFINITION EXAMPLES

FOREST FRAGMENTATION: The division or conversion of large tracts of contiguous forest or formerly contiguous forest into smaller pieces leaving remnant patches of forest that vary in size and isolation separated by non-forested lands or other vegetation and land use types. The reduction in size of forest patches as a result of forest fragmentation can reduce the productive capacity of forestland for forestry and disrupt wildlife corridors and render the forest and other habitats unsuitable for certain species of plants and animals.

FORESTRY: The use of an area of land for the raising and the harvesting of trees for commercial purposes, including accessory uses, temporary structures, and facilities such as logging roads, and portable sawmills.

Receive Adequate Information for Development Decisions

Municipalities should ensure that they are requesting enough information from an applicant during the permitting process. The sketch plans should convey enough information to allow the Authorizing Official to make an informed decision. For example, Enosburgh has requested the following information on existing resource be provided on sketch plans, *"natural features (i.e. non-portable features of the landscape) – Streams, ponds, and wetlands; forest boundaries, fields, large trees, and rock outcroppings; ridge lines; prime agricultural soils; watershed boundaries; geological formations including rock outcroppings, cliffs and sinkholes; slopes between 15-25%; slopes greater than 25%; meadow, pasture and hedgerows; and any other existing features."* The inclusion of this information provides the reviewer information to be able to understand impacts and have a discussion with the permittee on potential mitigation or avoidance of impacts.

Provide Guidance of Best Practices to be employed

Other ways municipalities can ensure good forest stewardship is to provide guidance in zoning and development regulations that identify best practices that should be employed during the layout of the site. The following excerpt is from Enosburgh's Planning and Design Standards of their Development Bylaw:

Section 8.16 Forest Fragmentation

Lot boundaries and development (building) envelopes shall be located and configured to avoid the fragmentation of forestland in parcels greater than 50 acres. Methods for avoiding fragmentation include but may not be limited to the following:

A) Buildings and associated building envelopes shall be located in a fashion that reduces penetration into large forest blocks and building lots should be clustered to avoid the fragmentation of forestland parcels greater than 50 acres.

B) Roads, driveways and utility corridors shall be shared to the extent feasible and designed to avoid or limit forest fragmentation; and, where sites include linear features such as existing roads, tree lines, stone walls, and/or fence lines, shall follow these to minimize the fragmentation of forestland parcels.

C) The subdivision of forestland shall, to the extent feasible, be configured to allow for ongoing forest management of the parcel after subdivision. Lot boundaries and development envelopes should be laid out to avoid the unnecessary fragmentation of productive timber stands, and provision for forest management access should be a consideration of the final plan if active management is taking place.

Strategy: Clearly define all terms in the local plan and bylaw that describe the important or significant resources of interest.

Action: Ensure that the Plan and Regulations identify the intent of language to allow for the adherence to that intent.

Strategy: Ensure that the Authorizing Official has all the information necessary to understand impacts to existing site features during the permitting process.

Action: Review the information required on the sketch plan and consider requesting additional features be provided.

Strategy: Regulations should provide clear guidance on how to avoid or mitigate impacts to forest lands.

Action: Incorporate specific design standards that identify options for the development of a parcel while considering the impact to forestland such as fragmentation.

Forestry and Conservation Districts

If a community wants to guide development in areas that may contain sensitive forestland or other natural features, one strategy they can take is to develop a district around these areas. Several communities in the Region have utilized Conservation Districts to limit residential development above certain elevations. These districts may require additional review and standards for residential development (such as conditional use review), contain large minimum lot sizes (25 acres or more), or prohibit residential development altogether. The following are some examples of how communities are utilizing this strategy.

Town of Montgomery - Regulations outline two conservation districts. The Conservation District above 1600ft elevation prohibits all uses except forestry, agriculture, wildlife refuge, and water/storage and reservoirs; camps are allowed as a conditional use. The other Conservation District is denoted below 1600ft and has the same provisions as the other district but also allows single-family dwellings as a conditional use.

Town of Highgate – A Forest Reserve District is defined by lands which are "essentially undeveloped, lack direct access to public roads, are important for wildlife and wildlife habitat, have potential for commercial forestry use or have one or more physical limitations to development." Compatible residential and recreational development is allowed within the district however other limited uses are allowed in the district.

Strategy: Ensure that each zoning district has a clear purpose statement.

Action: Review zoning district descriptions and ensure that the goals of the district are clearly stated.

Strategy: Establish guidelines for how development will occur in forestland and sensitive areas.

Action: Define a zoning district or overlay that outlines how development will occur in these resource areas and set specific standards.

Cluster or Planned Unit Development

Planned unit development is a type of development review that allows for additional flexibility in site planning and subdivision design for larger subdivisions. This tool can be used in several ways. Most commonly it is used to cluster allotted density of housing on to smaller lots than is typically allowed in the district in order to allow for larger undeveloped areas of forestland or open space. Another option could be to use conservation subdivision design which uses the location of natural resources to guide where the building lots should go. These tools are important for keeping large forest blocks intact when developing on a forested landscape. Incentives such as density bonuses can be incorporated into the bylaws to encourage the implementation of the practice by developers.

Strategy: Encourage municipalities to consider Planned Unit Development provisions in their bylaws and enhance the standards of existing bylaws.

Action: For municipalities without PUD language: discuss the purpose of the language with the municipality and how it could be incorporated to reduce forest fragmentation.

Action: For municipalities with PUD language: identify how it has been used to date and determine if modifications could be made such as requiring a minimum amount of open space.

Shoreline and Stream Buffer Protections

Vermont contains numerous lakes and ponds that are an important forest resource for wildlife, recreation, and aesthetics. However, these areas are also prime locations for development. Limiting development close to shorelines and preserving shoreline vegetation is often necessary to preserve these resources. With the recent signing of the Shoreline Protection Act, new state regulations will take effect starting July 1, 2014 that set standards for activities within 250ft of the mean water level of all lakes greater than 10 acres in size. The intent of the act is to "prevent degradation of water quality in lakes, preserve habitat and natural stability of shorelines, and maintain the economic benefits of lakes and their shorelands by defining standards for the creation of buildings, driveways, and cleared areas in shorelands." While some communities had previously adopted shoreline ordinances or standards in their regulations; regulation now lies with the state unless the municipality has a more restrictive regulation and receives approval from the state.

Similarly maintaining forested stream buffers provide important benefits such as flood control, wildlife habitat, and improved water quality. To protect buffer areas towns can adopt overlay districts or setbacks from stream banks to prevent development encroachment. These so-called "river corridors" limit development and land clearing within these areas.

Enosburgh requires that an undisturbed naturally vegetated buffer strip be maintained from the shores of lakes and ponds and from each bank of streams and rivers. The following is a table outlining the application and width of buffers that the community adopted.

Type of Waterway	Required Buffer
Seasonal (intermittent) streams and permanent streams < 10 ft in average channel width	25 feet
Unnamed rivers and streams > 10 feet in average channel width	50 feet
Named rivers and streams	110 feet
Lakes and ponds	50 feet

Enosburgh also provides detail within their zoning as to the benefits of buffers related to water quality, habitat, bank stability, etc.

Strategy: Maintain and enhance stream buffers and shoreline stability.

Action: Evaluate how planning and regulatory documents are currently supporting stream and shoreline buffers.

Action: Incorporate policies and standards into planning and regulatory documents.

Provisions for Forestry Based Industries

Active forest stewardship is more likely to occur when there is a market for forest products. A working forestry economy requires support industries such as equipment and vehicle servicers and providers, sawmills and other processing facilities such as woodchoppers, pellet manufactures, and other value added manufacturing facilities. Larger facilities may be appropriately located in *industrial parks and commercial districts*.

However, there are a growing number of small scale forest related operations in Vermont, including portable and backyard sawmills, small fire wood providers, cottage furniture makers, and other craft industries. In many cases, these small industries are likely run out of someone's home and are too small to afford space in a commercial or industrial park. In addition to providing sufficient space for large industries, it is important that communities ensure that their provisions for *home businesses* allow these types of activities and that onsite processing of materials is included in the definition of forestry found in *local regulations*.

Strategy: Ensure Forest Products Industries are allowed and can perform necessary activities for working in the landscape.

Action: Review development regulations to identify if home occupation provisions for forest based industries are allowed in districts; ensuring the scale of the business is appropriate for the district.

Action: Review Use Table and Definitions to identify if forest based industries are defined as a permitted use and if there are districts that would support that intensity of use.

Action: Identify if standards protect access to the forest parcels, such as logging roads and landing areas, for forestry and resource management.

Road and Trail Policies

Properly placed roads and trails can maintain the conservation of the forestland as well as still providing for access for timber management and recreational access. However, poorly sited roads and standards can cause problems such as stormwater management, fragment habitat, and open up more land for development. Policies and regulations should aid in guiding how roads and trails are developed and managed. Communities should also identify if their policies unfairly restrict or prohibit access to forestland by forest sectors (logging or maple syrup trucks) but allow access for similarly sized commercial truck traffic.

Strategy: Determine if there are links in the transportation system that would prohibit the flow of product for producers.

Action: Review municipal road ordinances to identify if policies would prohibit forest producers from accessing materials or delivering product.

Action: Identify if there are regional constrictions to movement of materials along the transportation system.

Education & Outreach

Education and outreach are essential for promoting good forest management practices. Target audiences include: private landowners, surveying and harvesting professionals (such as consulting foresters, loggers), municipal officials, and the community (especially youth).

Strategy: Promote the awareness and participation in existing forestry based educational programs.

Action: Conduct outreach on available training programs for the public and forestry sector employees. List of current training programs:

Program	Description	Partner
Stewardship of the Urban landscape (SOUL)	Focus on urban forestry techniques	UVM Extension, VT Dept of Forest, Parks and Recreation
Natural Resources management Academy	Clearinghouse of educational material	UVM Extension
Forestry & Natural Resources Program	2-year high school program on land use and management	Cold Hollow Career Center
Short courses and workshops on woodworking	small woodworking and furniture-making school	VT Woodworking School

Action: Develop additional community based training programs specifically focused on forest management and small woodlot ownership. Example – Hogback Community College in Bristol provides workshops on forestry related topics.

Strategy: Educate landowners on how their property fits into the larger forested landscape.

Action: Promote the use available clearinghouses of information and training materials like the Forest Stewardship mapping application from this effort, along with other efforts currently under development such as the Natural Resources Management Academy.

Strategy: Promote best management practices of forest stewardship to private landowners

Action: Distribute brochures containing practical advice for landowners regarding responsible forest management, their rights and responsibilities as landowners as it relates to forest management, the benefits of working with a forester and LEAP certified loggers, and the importance of obtaining bids/estimates from loggers. A sample statewide brochure has been developed by the Vermont Woodlands Association that could be modified to reflect regionally specific issues.

Strategy: Utilize Town Forests as places to promote sound Forest Stewardship practices.

Actions: Town Forests can be used as a teaching ground for showing positive and negative impacts of forestry practices without commenting on the condition of any individual's property or quality of stewardship. These events can also be used to provide information on the availability of programs for assistance and promote the work of organizations.

Supporting Local Economy - Forest Resources Based Businesses

Forest land plays a large role in the regional and statewide economy. Another side to ensuring the existence of forest lands is through maintaining a healthy economy that supports forest resource jobs and their products. Opportunities to support the forest economy can happen at both ends of the product cycle for both consumers and producers. For the consumers, the need to promote a culture of thinking locally first for everything from toilet paper and cutting boards to furniture and construction materials. For producers, we need to ensure that there is enough and the right kind of infrastructure to support a vibrant local forest-products economy.

*Strategy***:** Educate and inspire consumers to shop locally for forest products.

Actions: Promote a buy local campaign such as "Local Wood for Local Good" that showcases the range of wood related products in Vermont and educate consumers on the environmental and local economic impact of their purchases.

Actions: Emphasize the economics of forestry and the working lands to landowners and the public at large.

Strategy: Identify and support ways to encourage or incentivize local infrastructure processing for timber.

*Actions***:** Encourage the development of new markets for lower quality timber. Current market example is wood chips to Burlington Electric Department.

Actions: Investigate the reason why some local concentration yards are inactive and find ways to revitalize them.

Actions: Create incentives for loggers to process lumber locally. For example, setting up additional cooperative wholesale log yards in the area.

Actions: Allow landowners to choose to have their lumber milled locally, even though this might increase the price.

Strategy: Identify the regional distribution of forestry sectors (wood products manufacturing, furniture makers, mills, etc) to gain a full understanding of the regional and state make-up.

Actions: Utilize regional stakeholder groups to identify the regional distribution of the various forestry sectors.

Actions: Determine the infrastructure gaps that encourage or even force the industry to process wood outside of Vermont.

Other Strategies for Forest Stewardship

There are many additional strategies that could also be employed. Appendix A provides the Vermont Natural Resources Council (VNRC) summary matrix, "Strategies Guide for Forestland and Wildlife Conservation" that lists information on several of the regulatory and non-regulatory tactics for the conservation of forest land. More recently, VNRC published a more extensive guide for town officials who wish to explore and implement policies aimed at keeping forests as forests in 2013 titled "Community Strategies for Vermont's Forests and Wildlife: A Guide for Local Action". This report is

available on VNRC's website at www.vnrc.org. These resources are a good starting point for exploring additional options for the promotion of best forest stewardship practices that apply to municipalities, landowners, businesses, and other interest groups to advance forest stewardship objectives.

Existing Forestry Related Organizations

The following are a listing of existing conservation and forestry related organizations that can be potential partners and resources for action to accomplish the strategies identified in this plan.

Conservation Commissions/Organizations

Conservation Commissions play an important role in maintaining and enhancing natural resources in the Region. Currently there are 5 municipalities with commissions: Georgia, Bakersfield, Montgomery, Enosburgh and Richford. The goals and activities of these commissions vary by town. The Enosburgh Conservation Commission was very involved in incorporating the concepts of forest habitat block and information from the Staying Connected Initiative during the Town's zoning update; this work resulted in an updated Natural Resource Overlay district.

Vermont Coverts: Vermont Coverts works to enhance wildlife habitat and promote healthy forest stewardship practices among private landowners in Vermont. The group educates forest owners on how to draft and implement a sound management plan. Part of this work involves hosting workshops on forest management and working with landowners through personal contacts. Vermont Coverts also represents its constituency among State agencies and other forest and wildlife related groups.

Staying Connected Initiative: Staying Connected is an initiative to help safeguard wide-ranging and forest-dwelling wildlife such as bear, moose, lynx, marten, and bobcat from the impacts of habitat fragmentation and climate change by maintaining and restoring landscape connections across the Northern Appalachians region. The Initiative focuses on seven priority areas across the Northern Appalachians, including three areas in Northern Vermont – the Northern Green Mountains (VT-Canada), Worcester Range to the Northeast Kingdom (VT), and the Northeast Kingdom to Northern New Hampshire to the Western Maine mountains (VT-NH-ME). The Northwest Region is a connecting point for the southern intersection of these ranges to Canada and eastern New England states.

Forest Products Associations

Vermont Wood Products Marketing Council: The Vermont Wood Products Marketing Council works to promote the quality and craftsmanship of Vermont wood products so that residents and nonresidents may increase their awareness of the outstanding design of the products, the environmental sensitivity of the manufacturers, and their commitment to customer satisfaction. The Wood Products Marketing Council has developed the "Vermont Quality Wood Products" brand and logo. The Council has also created the *Essential Buyers Guide for Vermont Wood Products*, which allows readers to view furniture, wooden ware, toys and games, building supplies, carvings, and architectural wood products. The

Cornerstone Resource Manual connects architects, designers, and purchasers with Vermont producers and crafts people. Several regionally based companies are listed in these manuals.

Vermont WoodNet: Vermont WoodNet, Inc. is a non-profit organization established to address the needs of small scale Vermont wood product businesses that produce "Vermont Made" products by creating opportunities for education, joint manufacturing, joint marketing, and increased access to materials and services. Vermont WoodNet provides an online directory which connects wood product businesses with other Vermont businesses which provide services they may need (for example kiln drying and tool and equipment suppliers). Vermont WoodNet also provides a list of Vermont companies that produce and sell Forest Stewardship Council Certified products.

Advocacy Organizations and Associations

Two Countries, One Forest: 2C1Forest is a Canadian-US collaborative dedicated to using landscape conservation to protect and maintain the Northern Appalachian/Acadian ecoregion. One of their 5 regions of concern is in the Region, the Green-Sutton Mountains (connecting Vermont to Quebec).

Cold Hollow to Canada Forest Link Project (CHC): CHC is a partnership of community members working together toward the common goal of land stewardship and wildlife habitat conservation through education and outreach. The CHC project area includes seven towns on the western side of the Green Mountain ridgeline that are part of The Northern Forest from the southern portion of the Cold Hollow Mountains to the Canadian border. These towns include Bakersfield, Belvidere, Enosburgh, Fletcher, Montgomery, Richford, and Waterville.

Vermont Natural Resources Council (VNRC): VNRC is a non-profit environmental advocacy organization and the Vermont-based wing of the National Wildlife Foundation. While the group works to address several environmental issues (including energy, water, air, etc.), VNRC's Healthy Forests Program is especially strong. "Recovery of threatened and endangered species, wilderness, ecological reserves, and sustainable forestry are key conservation components in VNRC's forest program." Most notably, VNRC coordinates the Vermont Forest Roundtable with stakeholders from across the state to discuss threats to forests and brainstorm recommendations to ensure a sustainable future.

Vermont Council on Rural Development (VCRD): VCRD is a non-profit organization dedicated to the support of the locally-defined progress of Vermont's rural communities. Currently, the Vermont Working Landscapes Partnership is a major initiative of the VCRD. The Working Landscapes Partnership is a non-partisan and broad-based effort to support local agriculture and forestry, grow and attract farm and forest entrepreneurs, and conserve Vermont's working landscape far into the future.

Action Plan

Given there are many stakeholders and aspects that make-up our forested landscape, this report identifies strategies and actions that need to be taken on by a variety of stakeholders to ensure successful forest stewardship. Below is a table listing the combined strategies and actions identified as being important for action in the Northwest Region to support Forest Stewardship.

Conservation Planning

Strategy	*Action*	*Potential Partner(s)*
Asset Mapping of natural communities and resources related to forestry to aid conservation and management objectives by landowners and the community.	Create a map and/or inventory of forest related resources utilizing readily available data and collect missing information to.	*UVM LANDS program, Conservation Commission, Municipal Planning Commission.*
Incorporate policies that support sound forest stewardship as identified in this effort into the NRPC Regional Plan.	Incorporate information on the importance of the forest product industry as part of the Region's economy and natural resource base.	*Regional Planning Commission.*
	Recommend outreach to municipal officials on forestry issues during technical assistance opportunities.	*Regional Planning Commission, Conservation Commission*
Encourage open space planning exercises to inform town planning and areas that should be conserved.	Develop a stand-alone plan or language for the municipal plan that outlines actions for open space lands identified as important or special.	*Municipal Planning Commission, Conservation Commission, Regional Planning Commission.*
	Utilize open space planning to inform areas that should be considered for conservation easements or town forests.	*Municipal Planning Commission, Conservation Commission, Regional Planning Commission.*
Incorporate language in municipal plans that promote best practices of land development to reduce impacts from forestland fragmentation.	Integrate information on importance of large contiguous forest (i.e. habitat blocks, forest productivity, and areas of wildlife connectivity) into the development of plan.	*Municipal Planning Commission, Conservation Commission, Regional Planning Commission.*
	Update plan with clear policies to promote land development that reduces or minimizes forestland fragmentation and impacts to wildlife habitat.	*Municipal Planning Commission, Regional Planning Commission.*

Strategy	*Action*	*Potential Partner(s)*
Municipal plans should address habitat and large blocks of forest land in a consistent manner with adjoining towns.	Wildlife Habitat Block data from the USFWS and other data should be evaluated to determine if there are important corridor areas within a community and how to manage them if shared with adjacent communities.	*Municipal Planning Commission, USFWS, Regional Planning Commission.*
Ensure that local plan policies support working forests.	Review plan language to identify if the forest products industry is supported in the plan.	*Municipal Planning Commission, Regional Planning Commission.*

Forestry Conservation Measures

Strategy	*Action*	*Potential Partner(s)*
Each town should identify a management goal and develop policies for their Town Forest to address potential conflicts for use of resources.	Identify the desired uses for the Municipal Forest and develop a management plan to maintain the resource(s).	*Conservation Commission, County Forester*.
Encourage use of conservation easements to conserve working forests and protect sensitive areas.	Bring awareness to private landowners, municipal boards, and general public of the benefits of conservation easements for forestland.	*Land trust organization, Conservation Commission, Regional Conservation Partnerships.*
	Reach out to landowners of non-conserved properties to educate them about conservation programs and funding opportunities.	*Land trust organizations, Conservation Commission, Regional Conservation Partnerships.*
	Explore the creation of a Town Conservation Fund to assist in compensating landowners for conservation efforts.	*Conservation Commission, Municipal Planning Commission.*
Promote landowner cooperatives to foster cross-boundary management of continuous, multi-owner forestland for good stewardship and to market forest products.	Provide materials to interested landowners on existing forest landowner cooperatives such as Vermont Family Forests and the local example in Enosburgh.	*Vermont Family Forests, County Forester.*
	Encourage landowners through incentives to begin cooperatively managing forestland that is owned by multiple property owners.	*Vermont Dept of FPR.*

Strategy	***Action***	***Potential Partner(s)***
Promote estate planning to foster long-term forestland conservation.	Conduct workshops for landowners with estate planning professionals.	*Conservation Commission, Coverts, Vermont Woodland Owners Association.*
Continue public education about the importance of the UVA program for the working landscape in the Region and Vermont.	Educate the public about the public benefits associated with maintaining working forest land, including protection of water quality, maintenance of wildlife habitat, flood and erosion control, and air quality.	*Conservation Commission, Conservation organizations, Advocacy organizations, County Forester.*
	Educate on the tax benefits of maintaining working lands, particularly amongst decision makers such as Selectboards, Trustees, and Legislators.	*Conservation Commission, Conservation organizations.*
Increase the acreage of land protected from development through conservation easements or enrollment in the UVA Program.	Reach out to forest landowners in priority forest areas by examining parcel records at municipal offices and targeting outreach (for example, mailings on forest stewardship regional priorities, welcome buckets, etc.).	*Municipal Planning Commission, Conservation Commission, Local forestry organizations.*
Highlight model Forest Management Plans and/or Case Studies demonstrating best practices.	Develop model UVA Forest Management Plans or Case Studies that forest landowners could consult. Such documents should be varied in their approach to management objectives given that landowners have diverse interests, such as wildlife habitat, maple syrup production, or timber harvesting.	*Consulting foresters, County foresters, Local forestry organizations.*
Periodically provide outreach and education to landowners currently enrolled in the UVA program on available resources and best practices.	Distribute information to landowners about responsible forest management, their rights and responsibilities as landowners as it relates to logging jobs, State water quality laws, how to ensure they receive a fair price for timber harvested from their land, and how to find and select a reputable logger, such as hiring loggers who have completed the Logger Education to Advance Professionalism (LEAP) program.	*Consulting foresters, County foresters, Local forestry organizations.*

Strategy	*Action*	*Potential Partner(s)*
Provide information to landowners to inform their management plan development on local, regional and/or statewide management objectives.	Create a public framework that allows for easy access to regional and/or statewide management objectives. For example, critical wildlife corridors or the recharge area of public water supplies.	*Vermont Dept of FPR, County forester, Consulting foresters.*

Regulatory Tools

Strategy	*Action*	*Potential Partner(s)*
Clearly define all terms in local plans and bylaws that describe important or significant resources of interest.	Ensure that the Plan and Regulations identify the intent of language to allow for the adherence to that intent.	*Municipal Planning Commission, Regional Planning Commission, Conservation Commission.*
Ensure that the Authorizing Official has all the information necessary to understand impacts to existing site features during the permitting process	Review the information required on the sketch plan and consider requesting additional features be provided.	*Municipal Planning Commission, Regional Planning Commission.*
Regulations should provide clear guidance on how to avoid or mitigate impacts to forest lands.	Incorporate specific design standards that identify options for the development of a parcel while considering the impact to forestland such as fragmentation.	*Municipal Planning Commission, Regional Planning Commission, Conservation Commission.*
Ensure that each zoning district has a clear purpose statement.	Review zoning district descriptions and ensure that the goals of the district are clearly stated.	*Municipal Planning Commission, Regional Planning Commission.*
Establish guidelines for how development will occur in forestland and sensitive areas.	Define a zoning district or overlay that outlines how development will occur in these resource areas and set specific standards.	*Municipal Planning Commission, Regional Planning Commission.*
Encourage municipalities to consider Planned Unit Development (PUD) provisions in their bylaws and enhance the standards	For municipalities without PUD language: discuss the purpose of the language with the municipality and how it could be incorporated to reduce forest fragmentation.	*Municipal Planning Commission, Regional Planning Commission*

Strategy	*Action*	*Potential Partner(s)*
of existing bylaws.	For municipalities with PUD language: identify how it has been used to date and determine if modifications could be made such as requiring a minimum amount of open space.	*Municipal Planning Commission, Regional Planning Commission*
Maintain and enhance stream buffers and shoreline stability.	Evaluate how planning and regulatory documents are currently supporting stream and shoreline buffers.	*Municipal Planning Commission, Regional Planning Commission, Conservation Commission.*
	Incorporate policies and standards into planning and regulatory documents	*Municipal Planning Commission, Regional Planning Commission, Conservation Commission.*
Ensure Forest Products Industries are allowed and can perform necessary activities for working in the landscape.	Review development regulations to identify if home occupation provisions for forest based industries are allowed in districts; ensuring the scale of the business is appropriate for the district.	*Municipal Planning Commission, Regional Planning Commission.*
	Review Use Table and Definitions to identify if forest based industries are defined as a permitted use and if there are districts that would support that intensity of use.	*Municipal Planning Commission, Regional Planning Commission.*
	Identify if standards protect access to the forest parcels, such as logging roads and landing areas, for forestry and resource management.	*Municipal Planning Commission, Regional Planning Commission*
Determine if there are links in the transportation system that would prohibit the flow of product for producers.	Review municipal road ordinances to identify if policies would prohibit forest producers from accessing materials or delivering product.	*Forest producers, Regional Planning Commission*
	Identify if there are regional constrictions to movement of materials along the transportation system.	*Forest producers, Regional Planning Commission, County Forester*

Education & Outreach

Strategy	*Action*	*Potential Partner(s)*
Promote the awareness and participation in existing forestry based educational programs.	Conduct outreach on available training programs for the public and forestry sector employees. *See list of current training programs in section text.*	*UVM Extension, Cold Hollow Career Center, VT Woodworking School.*
	Develop additional community based training programs specifically focused on forest management and small woodlot ownership. Example – Hogback Community College in Bristol provides workshops on forestry related topics.	*UVM Extension, Cold Hollow Career Center, VT Woodworking School.*
Educate landowners on how their property fits into the larger forested landscape.	Promote the use available clearinghouses of information and training materials like the Forest Stewardship mapping application from this effort, along with other efforts currently under development such as the Natural Resources Management Academy.	*Vermont Dept of FPR, County forester, Consulting foresters, Regional Planning Commission.*
Promote best management practices of forest stewardship to private landowners	Distribute brochures containing practical advice for landowners regarding responsible forest management, their rights and responsibilities as landowners as it relates to forest management, the benefits of working with a forester and LEAP certified loggers, and the importance of obtaining bids/estimates from loggers. A sample statewide brochure has been developed by the Vermont Woodlands Association that could be modified to reflect regionally specific issues.	*Vermont Woodlands Association, County Forester.*
Utilize Town Forests as places to promote sound Forest Stewardship practices.	Town Forests can be used as a teaching ground for showing positive and negative impacts of forestry practices without commenting on the condition of any individual's property or quality of stewardship. These events can also be used to provide information on the availability of programs for assistance and promote the work of organizations.	*State of Vermont, Vermont Coverts, Vermont Woodlands Association.*

Supporting Local Economy - Forest Resources Based Businesses

Strategy	*Action*	*Potential Partner(s)*
Educate and inspire consumers to shop locally for forest products.	Promote a buy local campaign such as "Local Wood for Local Good" that showcases the range of wood related products in Vermont and educate consumers on the environmental and local economic impact of their purchases.	*Chambers of Commerce, Forestry organizations, Vermont Wood Manufacturer's Association (VWMA), Vermont Wood Products Marketing Council (VWPMC).*
	Emphasize the economics of forestry and the working lands to landowners and the public at large.	*Chambers of Commerce, Forestry organizations, Vermont Wood Manufacturer's Association (VWMA), Vermont Wood Products Marketing Council (VWPMC).*
Identify and support ways to encourage or incentivize local infrastructure processing for timber.	Encourage the development of new markets for lower quality timber. Current market example is wood chips to Burlington Electric Department.	*Forestry organizations, Vermont Wood Manufacturer's Association (VWMA).*
	Investigate the reason why some local concentration yards are inactive and find ways to revitalize them.	*Chambers of Commerce, Forestry organizations*
	Create incentives for loggers to process lumber locally. For example, setting up additional cooperative wholesale log yards in the area.	*State of Vermont, local sawmills, Vermont Wood Products Marketing Council (VWPMC).*
	Allow landowners to choose to have their lumber milled locally, even though this might increase the price.	*State of Vermont, local sawmills, Vermont Wood Manufacturer's Association (VWMA), Vermont Wood Products Marketing Council (VWPMC).*
Identify the regional distribution of forestry sectors to gain a full understanding of the regional and state make-up.	Utilize regional stakeholder groups to identify the regional distribution of the various forestry sectors.	*County Foresters, Forest Stewardship Steering Committees, Working Lands Enterprise Board*
	Determine the infrastructure gaps that encourage or even force industry to process wood outside of Vermont.	*Chambers of Commerce, Forestry organizations, Vermont Wood Manufacturer's Association (VWMA).*

Conclusions

The forestland that covers much of the Region's landscape represents an important part of the area's history, contributes to the unique character of our communities, and represents a significant economic development asset. While there are areas of our Region with large intact forest blocks, many people interact most directly with the smaller isolated wooded areas that exist in and adjacent to town and village centers. All of these forest landscapes are important, and the conservation and wise use of the resources they contain present challenges that differ according to physical and political geographies. The overriding objective of planning for forest landscape stewardship in the Region is to identify key resources, understand and address threats and constraints to the use of those resources, and to provide effective strategies to ensure that those areas provide maximum benefits to our communities.

A number of strategies have been employed in the Region to help "keep forests as forests" and to retain and enhance forestland values such as conservation easements and the option to participate in the Use Value Appraisal program. The Region has also benefited from comprehensive local land use regulations that have been coordinated through effective municipal and regional planning; as a result communities are working to keep working landscapes intact. Historical markets for forest products and emerging markets for use of forest lands have provided economic benefits that help landowners maintain their forests.

A variety of new strategies also can support forest stewardship objectives. Regulatory tools such as planned unit developments, and clearly defined forest resource based land uses as permitted uses in local plans and bylaws all can be very effective. Education at various levels also has a key role to play. Forest landowners should be educated about existing programs designed to assist with forest management, students need to be exposed to forest science and forestry in their curriculum and appropriate training programs set up and supported, and the general public needs to be better informed about the benefits for forest land conservation and resource management. Landowner cooperatives can reduce costs and open up new opportunities for marketing products. Finally, there is tremendous potential for gaining economic benefit from the Region's forests, particularly in the area of developing a strong market for sustainably produced biomass from local forests.