

ROUNDTABLE ON PARCELIZATION AND FOREST FRAGMENTATION

FINAL REPORT



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Recommendations from a roundtable of diverse participants.

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ROLE OF THE FOREST ROUNDTABLE

The Roundtable on Parcelization and Forest Fragmentation (hereinafter Forest Roundtable) was convened in August of 2006 by Vermont Natural Resources Council (VNRC) to identify the causes of parcelization and forest fragmentation and help reduce their effects in Vermont. Over one hundred people representing a broad array of public and private interests participated in the Forest Roundtable. Participants included consulting foresters, professional planners, government officials, landowners, sportsmen, representatives from the forest products industry, conservation groups, biomass energy organizations, and public and private universities and colleges.



The **goals** of the Forest Roundtable are to:

- Share information and educate roundtable participants and the public on the effects of parcelization and forest fragmentation and forestland loss.
- Define the terms “fragmentation” and “parcelization”.
- Identify gaps in information related to the trends of parcelization and forest fragmentation.
- Bring in experts to inform the roundtable participants and the public.
- Ground truth the effectiveness of existing programs designed to curtail the rate of parcelization and forest fragmentation in the state.
- Craft new policies, strategies and ideas for curtailing the rate of parcelization and forest fragmentation in the state.
- Mitigate the effects of parcelization.
- Develop new partnerships to address the issues discussed in the roundtable.

PROBLEM STATEMENT:
WHAT IS PARCELIZATION AND FOREST FRAGMENTATION?

The term ‘parcelization’ is used to describe changes in ownership patterns whereby large tracts are divided into smaller parcels. The act of parcelization is mostly a legal exercise where large tracts of land are divided into smaller ownerships or land holdings. The result of parcelization may simply be an increase in the number of people who own a specific parcel of land. However, when larger parcels are divided and sold or transferred into multiple parcels, often through the process of subdivision, the result can be disjointed land ownership patterns that promote new housing and infrastructure development (roads, septic, utility lines, etc.). When this development occurs, it can fragment the landscape and negatively affect plant and animal species, wildlife habitat (called habitat fragmentation), and water quality. It can also affect the viability of large tracts of forestland to contribute to Vermont’s rural economy. Forest fragmentation and habitat fragmentation are often the result of parcelization and its associated development.¹

EFFECTS OF PARCELIZATION AND FOREST FRAGMENTATION

Parcelization and forest fragmentation have numerous ramifications to the ecology and traditional economy of forestland in Vermont. According to U.S.D.A. Forest Service publication *Forests on the Edge: Housing Development on America’s Private Forests*, parcelization and forest fragmentation can be associated with:

- **Decreases in native wildlife populations owing to decreased wildlife habitat quantity and quality, increased predation and mortality, and other consequences of human activity that change the relationships many wildlife species have with their environments.**²

For example, land clearing and road construction can result in the loss of evergreen/conifer trees used by deer for cover and protection during winter cold and snow. Land clearing and road construction can also disrupt wildlife travel corridors, which negatively affects species such as black bear.

- **Alterations in forest structure and function that can adversely affect ecological processes on which forests and forest dwellers depend, resulting in less biodiversity and more opportunities for invasions of nonnative species, insects, and diseases.**³

For example, housing development may result in road construction, conversion of forest resources, planting of nonnative species, and “woodscaping” - the practice of removing

¹ Forest fragmentation occurs when large, contiguous forests are divided into smaller blocks either by roads, clearing for agriculture, urbanization, or other human development. Cornell Lab of Ornithology at http://www.birds.cornell.edu/bfl/gen_instructions/fragmentation.html.

² Stein, Susan M.; McRoberts, Ronald E.; Alig, Ralph J.; Nelson, Mark D.; Theobald, David M.; Eley, Mike; Dechter, Mike; Carr, Mary. 2005. Forests on the edge; housing development on America’s private forests. Gen. Tech. Rep. PNW-GTR-636. Portland, OR: US Department of Agriculture, Forest Service, Pacific Northwest Research Station, at p. 11 citing Engels and Sexton 1994; Harris 1984; Theobald et al. 1997; Vogel 1989; Wear and Gries 2002a, 2002b.

³ Id. citing Ferreira and Laurence 1997, Meekings and McCarthy 2002.

forest understory (vegetation under eight to ten feet in height), so as to create a park-like appearance. This can result in a loss of protective native habitat for ground-nesting birds and the introduction of potentially invasive, i.e. non-native, species of plants, insects and diseases.

- **Long-term modifications and reductions in water quality and aquatic diversity when forests can no longer regulate the movement of storm water across the landscape. This leads to changes in streamflows, increases in sediment, reshaped stream bottoms and banks. It adversely impacts water quality and aquatic species such as fish and mussels.**⁴

For example, water runoff from roofs, paved driveways, fertilized lawns and new roads channeled into culverts and new ditches can alter natural flow patterns and the composition of soil and water.

- **Decreases in timber production and active forest management when population densities increase.**⁵

For example, many landowners are unlikely to harvest timber in the immediate vicinity of their homes.

- **Changes in scenic quality and recreational opportunities owing to loss of open space, decreased parcel size, and fragmentation, all of which can degrade the recreational experience and lead to increased likelihood of land use conflicts.**⁶

For example, land clearing and home construction on ridgelines and hilltops can impair scenic resources. Old logging roads formerly used by the public for recreational pursuits may be converted to private driveways.

- **Shifts in price levels and economic benefits for forest-based products – including fewer options for timber management, recreation, and other uses whose economic benefits rely on large forested areas.**⁷

For example, fragmentation of large forest parcels in a single ownership to several smaller parcels in different ownerships can lead to access issues, higher maintenance costs, higher property taxes and reduced timber value available per entry. These factors can increase costs and reduce revenue, to the point that active forest management is no longer practical.

⁴ Id. citing Booth and Henshaw 2001, Bryan 1972, Fisher et al. 2000, Jones and Holmes 1985, Paul and Meyer 2001.

⁵ Id. citing Gobster and Rickenbach 2004, Kline et al, 2004, Wear et al. 1999.

⁶ Id. citing Gobster and Rickenbach 2004, Patterson et al. 2003.

⁷ Id. citing Ellis et al., in press; Tyrvaainen 1997; Tyrvaainen and Vaananen 1998; Weeks 1990).

CAUSES OF PARCELIZATION

There are many causes of parcelization. Perhaps the greatest driver may simply be escalating property values and land prices in Vermont. As land valuation and development opportunities increase in Vermont, market conditions prompt an increased desire to subdivide and develop property for economic gain. Other factors that foster forest parcelization include:

- Population growth,
- Changing demographics,
- Shifts in cultural values regarding land management,
- Inadequate land-use planning and regulation, and
- Lack of planning within families to ensure consistent forestland ownership through multiple generations.

Increasing Land Prices

Over the past couple of decades, unprecedented real estate activity has occurred in Vermont and the Northern Forest Region. On a regional scale, between 1980 and 2005, approximately 23.8 million acres changed hands in the 26 million acre Northern Forest region.⁸ Of significant interest, nearly one-half (45%) of the land transactions that occurred during this 25-year period occurred in the last five years.⁹ While many of these transactions may have involved the same parcel of land, these transactions indicate a recent trend in real estate activity that has helped to drive an increase in land values in the region.

In Vermont, the real estate market has seen a noticeable increase in value in the last five or six years.¹⁰ According to the Office of Federal Housing Enterprise Oversight (OFHEO), Vermont homes recently experienced very strong appreciation, having on average climbed sixty-six percent in the last five years.¹¹ While the housing market may be starting to cool, Vermont in 2006 was still showing the greatest appreciation in New England, posting rates that were higher than New York State and the national average.¹² Since 1980, Vermont values on average appreciated 351%; --higher than the national average of 299%.¹³

Information from Vermont's property transfer tax data provides useful trend data for Vermont's real estate market. From 2001 to 2005, the average sale price for primary homes and condominiums rose 56.8 percent, from \$126,000 to \$185,000.¹⁴ Similarly, the median price of vacation homes and condominiums rose significantly from \$110,000 to 200,000, an increase of

⁸ Hagan, J.M., L.C. Irland, and A.A. Whitman. 2005. Changing timberland ownership in the Northern Forest and implication for biodiversity. Manomet Center for Conservation Sciences, report #MCCS0FCP-2005-1, Brunswick, Maine, at p. iii.

⁹ Id. at p. 4.

¹⁰ Vermont's Housing Market – Trends and Perspectives, Handout by Phil Dodd for Forest Roundtable, Oct. 18, 2006. Available at <http://svr3.acornhost.com/~vnrcorg/frt/presentations.htm>

¹¹ Id.

¹² Id. (In the second quarter of 2006, Vermont experienced 11.25% appreciation compared to the same time a year earlier).

¹³ Id.

¹⁴ Id.

81.8%.¹⁵ During the same time period, the median price per acre of open land and forestland parcels of twenty-five acres or more rose 62%, from \$974 per acre in 2001 to \$1,580 in 2005. However, the median price per acre of open land and forestland parcels of between one and twenty-five acres experienced the highest growth rate, rising 117%, from \$4,505 per acre in 2001 to \$10,000 in 2005.¹⁶

According to Phil Dodd of the Vermont Property Owners Report, “the last figure, showing very strong demand for smaller parcels of land, suggests why owners and developers and speculators may have been tempted to subdivide and sell smaller parcels of Vermont land: this has been a very profitable business to be in.” As highlighted by Dodd in a presentation to the Forest Roundtable, “all you need to do is buy a commodity (larger land parcels) that is going up in value at a rate of 62% every five years and then split it up and sell it as a commodity (smaller parcels) that is going up in price at the rate of 117% every five years.”¹⁷

Increasing Property Taxes

Increasing land and property valuations, along with higher school and municipal spending, have led to rising property tax rates. In some areas of Vermont, property tax rates have increased significantly.¹⁸ This puts additional pressure on landowners to divide and sell a portion of their land. Not surprisingly, the National Woodland Owner Survey conducted by the U.S.D.A. Forest Service lists property taxes as the number one concern among landowners.¹⁹

The state offsets property taxes by providing income sensitive payments to lower income residents, but landowners that own large tracts of forested open space are not eligible for this payment.²⁰ Landowners who are land rich and cash poor feel the pressure of rising property taxes, unless they have taken measures to reduce their property tax burden by enrolling in Vermont’s Use Value Appraisal (UVA) Program (commonly called “Current Use”). Approximately 38% of all eligible forestland is enrolled in the UVA Program.²¹ This is a significant accomplishment, yet it indicates that there is still a large percentage of forestland that remains vulnerable to property tax driven development pressures.

Population Growth and Land Use

Population growth and changing land use contribute to forestland parcelization. Between 1982 and 1992, the human population in Vermont grew by about 10 percent, but the amount of

¹⁵ Id.

¹⁶ Id.

¹⁷ Id.

¹⁸ Tom Mitchell, *Shifting Burden: School Spending Pinches State’s Property Owners*, Rutland Herald, July 17, 2006, at A1, A6.

¹⁹ Brett J. Butler, Presentation at the Forest Roundtable (Sept. 18, 2006). Available at <http://svr3.acornhost.com/~vnrorg/frt/presentations.htm>

²⁰ Id. at A1.

²¹ As of the 2006 tax year, 38.4% of potentially eligible forestland was enrolled in the UVA Program. A total of 1,517,226 acres out of 3,948,100 acres were enrolled as of the 2006 tax year. Phone conversation with Bill Snow, Vermont Department of Property Valuation and Review.

developed land increased by about 25 percent.²² Since population growth is occurring in mostly rural areas (defined as fewer than 2,500 people), forestland and important rural resource lands have experienced growth pressures that have led to parcelization.²³

Tracking parcelization rates in Vermont is tricky, but survey work that was repeated in the 1980s and 1990s demonstrates increasing parcelization in the state. For example, the number of non-industrial private landowners in Vermont has increased from an estimated 61,900 in 1983, to approximately 80,000 in 1993.²⁴ This corresponds with a decrease in the average size of a parcel of land.²⁵ Data specific to forestland shows in 1983, 19,000 individuals owned forest parcels 1-9 acres in size. By 1993, there were 40,900 owners of 1-9 acre parcels – an indication of increasing parcelization and landscape fragmentation.²⁶ This reflects a national trend of more people owning smaller pieces of forestland, with the current average parcel size of 24 acres projected to decrease to 17 acres in 2010.²⁷

In 1970, there were 165,063 housing units in Vermont.²⁸ In 2000, this number had increased to 294,382 units.²⁹ Between 2000 and 2005, years with high real estate appreciation rates, 17,673 building permits were issued in Vermont.³⁰ While the number of building permits does not necessarily give an accurate picture of the degree to which parcelization has occurred on the land, it does highlight the level of housing growth that has occurred in Vermont.

The Forest Service estimates that by the year 2030, housing densities on private forests in Vermont are projected to increase between 5 and 40 percent across the majority of the watersheds, with the highest projected development expected to occur along the Connecticut River.³¹ This level of increased housing across the majority of the watersheds will contribute to a moderate to high level of parcelization of privately owned forestland.³²

²² Kim Royar, Vermont Fish and Wildlife Department. See also Vermont Fish and Wildlife Service, *Conserving Vermont's Natural Heritage: A Guide to Community-Based Planning for the Conservation of Vermont's Fish, Wildlife, and Biological Diversity*, (2004), at p. 18.

²³ Id. In 1960, Vermont's rural population was around 240,000; in 1990 it was around 382,000.

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²⁵ Widmann, R.; Birch, T. 1988. Forest-land owners of Vermont-1983. Res. Bul. NE-102. Broomall, PA. USDA-FS, Northeastern Forest Experiment Sta. 89 p.

²⁶ Birch, T. 1996. Private forest-land owners of the Northern United States. 1994. Res. Bul. NE-136. Radnor, PA. USDA-FS, Northeastern Forest Experiment Sta. 293 p.

²⁷ LaPierre S. and Germain R.H. Forestland parcelization in the New York City watershed. 2005. *Journal of Forestry* 103 (3) : 139 - 145.

²⁸ Vermont Housing Data website. Available at

<http://www.housingdata.org/profile/profileMainResult.php?submitted=stateProfile>

²⁹ Id.

³⁰ Id. Statistics on housing units authorized by building permits include housing units issued in local permit-issuing jurisdictions by a building or zoning permit. Not all areas of the state require a building or zoning permit. The statistics only represent those areas that require a permit.

³¹ Stein, Susan M.; McRoberts, Ronald E.; Alig, Ralph J.; Nelson, Mark D.; Theobald, David M.; Eley, Mike; Dechter, Mike; Carr, Mary. 2005. Forests on the edge; housing development on America's private forests. Gen. Tech. Rep. PNW-GTR-636. Portland, OR: US Department of Agriculture, Forest Service, Pacific Northwest Research Station, at pp. 8-9.

³² Id.

Cultural and Demographic Shifts

The aging population of forestland owners also leads to parcelization. According to a recent report, 25 percent of all privately owned forestland in the United States is owned by people who are 65 or older.³³ While estate planning can provide ways to keep forestland intact among successive generations of forest owners, the will of a deceased landowner often divides the ownership of land into smaller parcels for purposes of bequeathing the land to multiple children. This leads to the parcelization of forestland unless the landowner has provided a way to keep the land intact.

Another driver of forest parcelization is urban dwellers' desire to either relocate or purchase second homes in rural settings where land is relatively cheap compared to urban real estate markets. This trend, labeled 'exurbanization', is defined as the migration of urban residents to rural environments.³⁴ Rather than buying rural land for traditional uses such as timber and agriculture, private residences are typically built a long distance from towns and services in order to maximize privacy and views. The demand for high-end homes in Vermont is contributing to the increasing parcelization of forestland, especially in resort areas.

VERMONT VALUES AFFECTED BY PARCELIZATION AND FOREST FRAGMENTATION

Participants in the Forest Roundtable were asked to identify Vermont forest values and attribute a score for their importance and vulnerability. A diverse group of participants identified the environmental, social, and economic values of greatest importance to them, and the values most threatened by parcelization and forest fragmentation.

The group was most interested in maintaining forest ecosystem function, forest-related jobs, flow of forest-based materials (wood and clean water), habitat connectivity, and values held by individuals (sense of place, sense of stewardship, and valuing outdoor activities). All of these values were considered to be highly vulnerable to the impacts of parcelization and forest fragmentation. The recommendations in the following section were developed as a way to maintain this set of environmental, social, and economic values. Results of this exercise are presented in Appendix A.

³³ Crim, S, et al. Forest Fragmentation Extension Programming: A National Initiative., 2002. 8.

Tyrell, M. and G. Dunning (2000). "Forestland Conversion, Fragmentation, and Parcelization." Yale Forest Forum Series 3(6): 6.

³⁴ Crim, S, et al. Forest Fragmentation Extension Programming: A National Initiative., 2002. 8.

Egan, A. and A. E. Luloff (2000). "The exurbanization of America's forests- research in rural social science." Journal of Forestry 88(3): 26-30.

ROUNDTABLE RECOMMENDATIONS

The Forest Roundtable held seven meetings to discuss the causes of parcelization and forest fragmentation in the state, and to develop draft recommendations to curtail the rate and mitigate the effects of parcelization and forest fragmentation.

Roundtable meetings addressed multiple topics, including trends in the real estate market, forestland valuation, property tax policy, land use and conservation planning, estate planning, landowner incentive programs such as the Current-Use Program, and the long-term sustainability of the forest products industry. These topics are condensed into the following four major focus areas of recommendations for addressing parcelization and forest fragmentation.

RECOMMENDATIONS REGARDING TAX POLICY

The following recommendations focus on tax policies that influence the way forestland is managed and conserved in Vermont.

1. The Forest Roundtable strongly endorses Vermont’s Use Value Appraisal Program (UVA) including continued funding.

Vermont’s UVA Program, commonly referred to as Current Use, is a vitally important program for keeping land in an undeveloped condition. As long as land is enrolled in the program, it is maintained for productive agriculture and forestry uses and is taxed at the value of these uses rather than “highest and best use”, which usually equates to housing or commercial development. The UVA Program has been a very successful tool for reducing the effects of parcelization and forest fragmentation and should continue to be fully funded and supported by the Legislature.

2. Educate municipal officials regarding the lack of impact of the UVA Program on municipal tax rates.

Towns are reimbursed for lost property tax revenue at the municipal level from land that is enrolled in the UVA Program. Since Act 60 and Act 68 were established, towns are reimbursed by the state for any municipal property tax revenue that would have been realized if enrolled parcels were taxed at highest and best use. These reimbursements are usually referred to as Current Use Hold Harmless Payments. As long as these payments continue to be mandated by state law, local tax rates are not directly affected by enrollment in the UVA Program.

3. Provide the UVA Program with adequate resources to administer the program. The Agency of Natural Resources, The Department of Taxes, and the Legislature should study ways to improve the overall efficiency and administration of the Program.

County foresters are overburdened with the responsibility of monitoring parcels of land enrolled in the UVA Program. Some members of the Roundtable feel that additional county foresters and staff at Property Valuation and Review are needed to help with monitoring,

enforcement, and landowner technical assistance; and that options for funding new staff should be explored. Other members believe that this may not be feasible, and that improvements to the overall efficiency and administration of the Program should be explored instead. For example, options for improving administrative efficiency include removing the statutory requirement to inspect each parcel every 5 years, and improving and/or lengthening landowner reporting requirements.

- 4. Conduct an independent legislative study of the UVA Program which examines the statutory goals of the program and assesses the program's effectiveness with respect to the original goals. For example, is the goal of conserving natural ecological systems adequately addressed? This study should also assess ways to expand landowner enrollment in the program, and assess the effectiveness of the land use change tax.**

According to 32 V.S.A. § 3751, the purpose of the UVA Program is to maintain and conserve Vermont's productive agricultural and forest land; protect Vermont's natural ecological systems; prevent the accelerated conversion of these lands to more intensive use by the pressure of property taxation; achieve more equitable taxation for undeveloped lands; preserve and enhance Vermont's scenic natural resources; and enable the citizens of Vermont to plan for orderly growth in the face of increasing development pressures. The Legislature should examine whether the Program is effectively meeting all of the established goals.

In addition, the Legislature should assess ways to expand landowner enrollment as a way to decrease parcelization and forest fragmentation. Some Roundtable members believe implementing a tiered approach like the New Hampshire Current Use Program, which has different use value categories such as wildlife habitat and open space, could improve overall enrollment in the Program. Other Roundtable members believe this would detract from the focus of use value appraisal on the contribution of working forests to Vermont's economy.

Due to increasing rates of development of land that is withdrawn from the Program, the Legislature should also analyze the effectiveness of the land use change tax, which is the penalty landowners pay for developing their property after enrolling in the Program.

Finally, the Legislature should study the effectiveness of the program for conserving natural ecological systems and non-timber resources, and make improvements if necessary. Some members of the Roundtable believe that certain ecological systems, such as riparian and wetland buffers and rare or significant forest communities, should be allowed to be enrolled in the program without being subject to timber harvesting. Other Roundtable participants believe the program is already adequately providing for the conservation of natural ecological systems.

- 5. Assess property with perpetual conservation easements at a lower value.**

Landowners who place conservation easements on their property typically give up development rights on the property forever. Conservation easements, however, may not reduce the value at which property is assessed in Vermont. There is little guidance in the

state for appraisers in assessing the value of land with conservation easements, which leads to inconsistency in practice among towns. Because land with perpetual conservation easements can never be developed, Roundtable participants believe land with such easements should be assessed at a value that accounts for the loss of development rights. Such a policy would make easements more attractive to landowners, thus increasing the potential to mitigate the effects of parcelization and forest fragmentation.

Some Roundtable members believe land with conservation easements should be assessed at a rate comparable to use value appraisal in the Current Use Program. Other members believe such a rate would reduce the incentive for landowners to enroll in the UVA Program and actively manage their land. In addition, some members believe it would not be fair to assess easements at use-value, which is derived from the productive capacity of the land for timber or agricultural products.

6. Disburse property transfer tax revenue according to the formula set in statute.

Revenue that is collected from the property transfer tax on the sale of real estate in Vermont is supposed to be disbursed according to a formula established in state statute. The disbursement formula is: 1% to the Tax Department; 33% to the General Fund; 50% to the Housing and Conservation Trust Fund; and 17% to the Municipal and Regional Planning Fund. The goal of the Housing and Conservation Trust Fund is to create affordable housing and preserve the state's agricultural land, historic properties, important natural areas and recreational lands. The goal of the Municipal and Regional Planning Fund is to fund the Regional Planning Commissions, municipal planning grants, and the Vermont Center for Geographic Information.

In recent years, the disbursement of property transfer tax revenue has been skewed in favor of the General Fund. In Fiscal Year 2005, the General Fund received approximately double the amount it was supposed to according to the statutory formula, while the other categories received approximately one-half of statutorily approved funding.³⁵ The Legislature should disburse the property transfer tax revenue according to the statutory formula. This would significantly strengthen the ability of the Housing and Conservation Trust Fund to conserve forestland. It would also strengthen the ability of the Regional Planning Commissions to mitigate the effects of parcelization and forest fragmentation.

7. Strengthen the collection of the land gains tax on timber sales on land subject to the land gains tax, and develop better mechanisms to track timber sales and assess taxes from these sales.

Vermont's land gains tax is imposed on gains realized through sales of land within six years of purchase. Revenue from timber sales during this period should be included in the calculation of the gain.

Strengthening the land gains tax may help prevent forestland from being purchased, its timber liquidated, and then resold. Collection of proper taxes could reduce the profitability

³⁵ Hausauer, Brenda. *Tax Reform that Agrees With Vermont*, Nov. 2005 at p. 43. Available at www.vnrc.org.

of liquidating our timber resources, and thus reduce the byproducts of fragmentation, parcelization and residential development. In addition, it would help level the playing field so that “stewardship” minded buyers could better compete in the market with liquidation minded buyers.

RECOMMENDATIONS REGARDING CONSERVATION PLANNING

The following recommendations focus on conservation planning as a broad theme encompassing state, regional, municipal, and estate planning mechanisms to reduce the rate of parcelization and forest fragmentation in Vermont.

1. Educate landowners about programs for keeping forestland intact across multiple generations.

Parcelization can occur when there is a lack of planning within families to maintain the long-term viability of forestland. Landowners should be educated about programs that provide opportunities for conserving forestland across multiple generations while still providing for the various goals of family members.

2. Track annual rates of parcelization in Vermont.

It is difficult to quantify the rate at which parcelization is occurring in Vermont. Anecdotal information suggests that parcelization is a problem in certain locations and may be contributing to decreased forest viability in the state. Data collection on parcelization is currently scattered among various government agencies, academic institutions, non-government organizations, and local municipalities. The Legislature should develop and fund a program to quantify the locations and rates of parcelization to better inform decision makers, planners, and forestland conservation efforts. In order to quantify forestland parcelization, towns should be encouraged to prepare and continually update town tax parcel maps and gather information on subdivision developments in large tracts of forestland.

3. Utilize existing data and develop maps to identify and prioritize forest blocks for conservation.

There is a need to coordinate the efforts of state and non-government organizations with expertise in forest block landscape analysis to develop maps to identify and prioritize forest blocks for conservation. Forest blocks are easily mapped using GIS and satellite imagery, and their relative importance should be assessed using current information and additional field evaluations. Mapping should be developed within two years, and should be revised periodically in order to examine the degree of change over time.

It is further recommended to examine the full range of innovative approaches on how priority forest blocks and wildlife corridors can be identified and conserved for all their associated values. Forestland conservation efforts, and particularly those that are supported by local

community input, should protect ecologically significant features, wildlife habitat, watershed functions, and promote forest reserves and sustainable forest management for a full range of uses and management options.

4. Track and analyze rates and degree of forest fragmentation in Vermont.

Forest fragmentation is measured in a different way from quantifying the rate of parcelization. In order to track and analyze the degree of forest fragmentation in Vermont, it is necessary to look at the integrity of forest blocks for wildlife habitat, watershed maintenance and other ecological factors. This type of analysis differs from quantifying the rate at which parcels are divided into multiple ownerships. The Agency of Natural Resources and other interested parties should undertake a statewide analysis of forest fragmentation and determine methods for measuring changes in the rate and degree of forest fragmentation in the state.

5. Integrate existing planning efforts at the local, regional and state level to better address parcelization and forest fragmentation.

Local, regional, and statewide planning strategies to address parcelization and forest fragmentation are being instituted in a piecemeal fashion across the state. All local, regional, and state level planning efforts should be integrated to address parcelization and forest fragmentation on a uniform basis. Successful planning strategies should be shared among state planners and regional planning commissions, and should be implemented at the local planning level. For instance, there should be goals for local planning, such as encouraging that each town has a conservation commission, a town forest, and a town plan that speaks to the values of contiguous forest/connectivity, forest economies, and traditional uses of the land.

6. Identify and correct gaps in Act 250 and other land use regulations to attenuate the rate of parcelization and forest fragmentation in Vermont.

A significant amount in the state is not subject to Act 250.³⁶ Exemptions in Act 250 may reduce the ability of the Agency of Natural Resources and the Act 250 District Commissions to review potentially harmful development in important forestland resources. For example, long driveways and the associated impacts of utility lines are currently exempt from environmental review in Act 250. The Natural Resources Board recently completed a report on the utility line exemption. The Legislature should review this report and consider improving Act 250 to address forest fragmentation. The local development review process and associated regulations should be improved to address forest fragmentation due to development and its associated impacts.

³⁶ Act 250 may only apply to only about forty percent of all the development undertaken in the state. Vermont Natural Resources Council. *Act 250: A Positive Economic Force for Vermont*. Dec. 1993 at p. 5.

7. Implement planning efforts that reflect the public values of forests.

Regional and town plans offer excellent opportunities to educate the public about the importance of forests for ecological, social, and economic values. It is recommended to implement planning that provides an opportunity for the public to inform decision makers about the public values of forests. For instance, a community can map or chart the values of forestland in their town. Woodland organizations, state and municipal government, and non-government organizations should take full advantage of planning workshops to collect information and make the public more aware of the values of forests.

RECOMMENDATIONS REGARDING THE CONSERVATION, STEWARDSHIP, AND VALUATION OF ECOSYSTEM SERVICES

The following recommendations focus on conservation, stewardship, and in particular, the recognition of the value of healthy functioning forested ecosystems in Vermont.

1. Develop a system to consistently quantify, recognize, and compensate landowners for the value of ecosystem services provided by forestland in Vermont.

Ecosystem services are the goods and services nature provides. Some of the many services that ecosystems provide are: water filtration, climate regulation, nutrient cycling, pollination, pest control, disease regulation and flood control.³⁷ The development of mechanisms to quantify these benefits is still in its early stages due to the difficult nature of quantifying them, and the vast range of the benefits to recognize, from wildlife habitat and watershed functions to carbon storage in forests. In one of the first studies to put a price tag on nature's services, it was estimated that ecological services worldwide are worth nearly \$33 trillion per year.

As private land is developed, we are losing valuable ecosystem services that forests provide. Quantifying the value of ecosystem services provided by forestland in Vermont may better justify investments in conservation efforts and lead to increased compensation to landowners for fostering these services.

2. Communicate the value of forests to the public in everyday terms, including the ecological benefits that the public is receiving for free from healthy functioning forests.

Services produced by ecosystems are generally free of charge. The costs of providing these services are generally borne by private landowners. For example, a service such as water filtration is performed by the root structures of trees and plants without a cost to society. According to the U.S. Forest Service, "when our forests are undervalued they are increasingly susceptible to development pressures and conversion."³⁸ Recognizing forest

³⁷ USDA, <http://www.fs.fed.us/ecosystemservices/faq.shtml>

³⁸ USDA, <http://www.fs.fed.us/ecosystemservices/>

*ecosystems as natural assets with economic and social values can promote conservation and more responsible decision-making.*³⁹

- 3. Convene a forum on how to manage for ecosystem services at the regional scale, paying attention to property rights, alternative models of ownership and management, and to required policies and distribution of costs and benefits.**

Managing for ecosystem services in an effective manner implies adopting a landscape (or watershed or regional) planning approach, because that is the scale at which most ecosystem services are provided. Conservation planning at the regional scale, for example, is a way to manage for ecosystem services. Similarly, managing for recreation could mean implementing a management plan that is coordinated at the regional scale. A forum should be convened to develop strategies to manage for ecosystem services at the landscape or regional scale, taking into consideration the distribution of costs and benefits between providers and beneficiaries of ecosystem services, and devising proper ways to compensate providers.

- 4. Create an annual award for ecosystem service stewardship to increase awareness and showcase forest ethics role models in the state.**

Showcasing exemplary ecosystem service stewardship can increase awareness and provide role models for forest ethics and sound management in the state. An annual award could recognize and promote leadership in ecosystem service stewardship.

- 5. Fund the development of build-out models and case studies to show projected impacts on ecosystem services in order to assist planning, conservation, and stewardship activities.**

Developing build-out models and case studies could assist planning efforts and conservation and stewardship activities by highlighting important ecosystem services that should be maintained. Visual models and case studies are good tools for weighing management decisions that could impact ecosystem services.

- 6. Create a model for community based Timberland Investment Management Organizations (TIMO's) that can buy and manage forestland collectively.**

Timberland Investment Management Organizations (TIMOs) are single organizations or a collection of individuals and organizations that purchase timberland as a financial investment.⁴⁰ Creating community based TIMOs could leverage the ability of landowners to buy and manage forestland collectively. Such an arrangement could help individual landowners pool their resources and share the costs of ownership and management.

³⁹ USDA, <http://www.fs.fed.us/ecosystemservices/>

⁴⁰ Hagan, J.M., L.C. Irland, and A.A. Whitman. 2005. Changing timberland ownership in the Northern Forest and implication for biodiversity, at p. 3.

7. Support the establishment of landowner cooperatives that foster conservation, forest stewardship, ecosystem services and forest product marketing efficiencies.

Potential exists to create landowner cooperatives to foster conservation, stewardship and market forest products. The agricultural sector has been successful in providing a stable market for raw materials while increasing member buying power and providing a larger presence in the market place. Existing forest landowner cooperatives such as Vermont Family Forests have been successful and should be explored as a means of addressing parcelization.

RECOMMENDATIONS REGARDING THE LONG-TERM SUSTAINABILITY OF THE FOREST PRODUCTS INDUSTRY

The following recommendations focus on supporting the forest products industry as a way to strengthen the viability of working forestland, which makes up a considerable percentage of the Vermont landscape.

1. Bolster development of strong, effective, cooperative statewide organizations that bring together forest products industry representatives, landowners and manufacturers to promote the forest products economy.

The entities that promote the forest products economy in Vermont generally are specialized, and represent particular aspects of the forest products economy. Various woodland owners organizations exist to represent landowners who manage their property for forest products. Other organizations exist to represent the forest products industry and forestry interests, whether it is primary manufacturing (mills, lumber yards, paper manufacturing, etc.), secondary manufacturing (drying, planing, cutting, and assembly of lumber into parts or finished products), or biomass energy production. Separate organizations exist to represent professional loggers in the state. There is a need to bolster the development of organizations that can represent these various interests cooperatively on behalf of all aspects of Vermont's forest products economy.

2. Increase the visibility of the contribution of a working forest to the state, including the economic, ecological and social benefits of forestland.

Forest-based manufacturing and forest-related tourism and recreation contribute over 1.4 billion dollars to Vermont's economy on an annual basis.⁴¹ Other benefits of working forests include the 13,800 jobs that forest-based manufacturing and forest-related tourism and recreation provide⁴², not to mention the products that are used and enjoyed by Vermonters and people around the country and the world. The myriad ecological benefits of forestland are beyond calculation and provide vitally important functions for humans and wildlife. The visibility of these contributions should be increased to inform the public about the economic, ecological, and social benefits of keeping working forestland intact in Vermont.

⁴¹ North East State Foresters Association, *The Economic Importance of Vermont's Forests*, December 2004, at p. 2.

⁴² Id.

- 3. Increase the professionalism of logging. Invest in programs to support youth who are interested in becoming loggers. Develop loan programs, a worker's compensation pool, and better access to health insurance. Promote the use of low-impact equipment and natural resource management programs.**

It is becoming harder to retain jobs in the logging industry. Loggers as a group are aging and there is a need to support youth who are interested in being professional loggers. A comprehensive package of programs is needed to enhance the professionalism of logging, including addressing worker's compensation and health insurance rates. Vocational programs should be promoted to train loggers in the use of new technology and the use of logging techniques that reflect today's economic and social demands and trends.

- 4. Continue and strengthen state promotion for the forest products manufacturing sector.**

Desirable state promotional efforts are well articulated in the Vermont Forest Products Council Blueprint for Action. This report, sponsored by the Vermont Council on Rural Development, articulates several strategies for promoting the forest products manufacturing sector including better branding of Vermont wood products⁴³. Some of the Council's recommendations have already seen a good deal of progress, yet additional work is needed to accomplish the report's goals and build on others outside of the report's recommendations.

- 5. Promote the use of Vermont wood in Vermont and in Vermont-sponsored development. Support buying local as a concept and encourage architects and builders to support the use of local wood.**

A broad umbrella of programs could be created that stimulates interest in utilizing local products for as many applications as possible. One option is to encourage architects and builders to specify and use local wood in manufacturing and design standards.

- 6. Increase weight limits on Vermont Interstates to make Vermont competitive in the region.**

Weight limits on Vermont's Interstate restrict the movement of heavy logging trucks within the state and beyond. This limitation is a federal requirement and poses a barrier to the industry because New Hampshire has relaxed this restriction through federal legislation. Reducing the travel costs of timber would improve the overall competitiveness of the forest products industry and help to keep the working landscape viable in Vermont. Legislation should be introduced by Vermont's Congressional Delegation to make weight requirements on log trucks on Vermont's Interstate as favorable as in other New England states.

⁴³Vermont Forest Products Council Blueprint for Action, at p.8. Available at www.vtrural.org/reports-councils.php.

APPENDIX A:

VERMONT VALUES AFFECTED BY PARCELIZATION AND FOREST FRAGMENTATION

Participants in the Forest Roundtable were asked to identify Vermont forest values and attribute a score for the importance and vulnerability. This was accomplished by conducting two exercises. In the first exercise, participants identified the environmental, social, and economic values of greatest importance to them. In the second exercise, participants identified the environmental, social, and economic values they determined were most threatened by forest parcelization and fragmentation. Approximately 25 people participated in the values exercises.

The charts on the following page highlight the most popular answers provided by the roundtable participants.⁴⁴ The charts provide the views and values of a diverse group of interests. The columns with the highest-ranking scores indicate where participants found common ground in identifying forest values of greatest importance to them, and the forest values most threatened by parcelization and forest fragmentation in Vermont.

ABBREVIATED RESULTS

The charts indicate that the group was most interested in maintaining forest ecosystem function, forest-related jobs, and flow of forest-based materials (wood and clean water), landscape configuration, and values held by individuals (sense of place, sense of stewardship, and valuing outdoor activities). All of these values were considered to be highly vulnerable to the impacts of forest parcelization and fragmentation.

⁴⁴ The methodology and complete list of answers is at <http://svr3.acornhost.com/~vnrcorg/fit/values.htm>

Consolidated List of Environmental Values

Theme	Value	Importance	Vulnerability
Ecological processes	Long-term ecological functioning (including ecological processes that maintain water, air, and soil productivity and quality; forest health; and forest productivity)	19	19
Structure	Habitat connectivity (including the maintenance of gene flow)	13	17
Composition	Maintain plant, fish, wildlife, and natural heritage (diverse native species)	12	9
Other	Environmental amenities (aesthetics, recreation, etc.)	6	2
Ecological processes	Carbon storage (to affect global climate change)	4	3

Consolidated List of Social Values

Theme	Value	Importance	Vulnerability
Values held by individuals	Forest ethics and sense of stewardship for diverse forest values	11	7
Sense of place	Rural remote sense of Vermont (including diverse habitat for wildlife and large remote tracts)	10	10
Values held by individuals	Diverse and wholesome recreational opportunities	8	2
Values for society	Intergenerational connection to forests	6	8
Values for society	Forest-based economy supporting a community and diverse society	4	5
Values for society	Traditional uses (hunting, fishing, etc.)	4	5

Consolidated List of Economic Values

Theme	Value	Importance	Vulnerability
Jobs	Primary forest-based jobs (industrial – logging, manufacturing, etc.)	15	16
Forest materials	Water (e.g., clean water)	11	10
Jobs	Secondary forest-based jobs (e.g., tourism, recreation, etc.)	8	7
Economic opportunities	Economic opportunities supported by forested landscape (including amenity dependent jobs)	6	2
Forest materials	Energy source	6	3
Forest materials	Sustainable resource flow (long-term)	5	9

RELATED VERMONT FOREST POLICY DOCUMENTS

Northern Forest Lands Council (2005), 10th Anniversary Forum Final Report: Recommendations for the Conservation of the Northern Forest, North East State Foresters Association

Northern Forest Lands Council (1994), Finding Common Ground: The Recommendations of the Northern Forest Lands Council, North East State Foresters Association

Vermont Department of Forests, Parks and Recreation (1999), Vermont Forest Resources Plan 1999 - 2008, VT Agency of Natural Resources

Vermont Department of Fish and Wildlife (2005), Vermont's Wildlife Action Plan, VT Agency of Natural Resources

Vermont Forest Products Council (2003), Blueprint for Action, Vermont Council on Rural Development

Vermont Forest Resources Advisory Council (1997), Final Report, Vermont Agency of Natural Resources

LIST OF ORGANIZATIONS AND INDIVIDUALS THAT PARTICIPATED IN THE FOREST ROUNDTABLE

The following organizations and individuals participated in the Forest Roundtable. This list reflects the diversity of roundtable participants. The Roundtable strived to develop consensus recommendations, although some organizations and individuals may not necessarily endorse every recommendation in the final report.

- Amos Baehr, Gund Institute for Ecological Economics, UVM
- Todd Barker, Meridian Insitute
- Virginia Barlow, Redstart Forestry and Northern Woodlands Magazine
- Jayson Benoit, Northwoods Stewardship Center
- David Birdsall, Forester and Portable Sawmill Owner
- Put Blodgett, Vermont Woodlands Association
- Michelle Boomhower, Lamoille County Planning Commission
- Darby Bradley, Vermont Land Trust
- Deb Brighton, Vermont Family Forests
- Greta Brunswick, Northwest Regional Planning Commission
- Bob Burt, Green Mountain National Forest, United States Forest Service
- Brett Butler, Northeastern Research Station, United States Forest Service
- David Brynn, Green Forestry Education Initiative, Rubenstein School of Environment & Natural Resources, UVM
- Farley Brown, Sterling College and Vermont Coverts
- Greg Brown, Chittenden County Regional Planning Commission
- Richard Carbonetti, Land Vest
- Marta Ceroni, Gund Institute for Ecological Economics, UVM
- Cindy Cook, Adamant Accord
- Paul Costello, Vermont Council on Rural Development
- Jad Daley, Northern Forest Alliance
- Ed Delhagen, Cornerstone Project, Vermont Sustainable Jobs Fund
- Don Dennis, Northeastern Research Station, United States Forest Service
- Catherine Dimitruk, Northwest Regional Planning Commission
- Phil Dodd, Vermont Property Owners Report
- Jamey Fidel, Vermont Natural Resources Council
- Erhrard Frost, Full Circle Forestry and Forest Guild
- Ken Gagnon, Gagnon Lumber, Inc.
- George Gay, Northern Forest Alliance
- Bob Hawk, Woodland Owner and Logger
- Jens Hilke, Vermont Department of Fish and Wildlife
- Matthew Hoffman, Woodland Owner
- Karen Horn, Vermont League of Cities and Towns
- Bill Johnson, Property Valuation and Review Division, Department of Taxes
- Jon Kart, Vermont Department of Fish and Wildlife
- William Keeton, Rubenstein School of Environment & Natural Resources, UVM
- Melanie Kehne, Vermont Natural Resources Board
- Tom Kennedy, Southern Windsor County Regional Planning Commission

- Leo Laferriere, Consulting Forester and Society of American Foresters
- Ed Larson, Vermont Forest Products Association
- Jane Lazorchak, Vermont Department of Fish and Wildlife
- Lynn Levine, Forest* Care
- Hugo Liepmann, Woodland Owner & Vermont Coverts
- Stephen Long, Northern Woodlands Magazine
- Mark Lorenzo, National Wildlife Federation
- Katie Manaras, Graduate Student, Rubenstein School of Environment & Natural Resources, UVM
- Jessica Massanari, Graduate Student, Rubenstein School of Environment & Natural Resources, UVM
- Thom McEvoy, Rubenstein School of Environment & Natural Resources, UVM
- Janet Milne, Vermont Law School
- John Meyer, Bardill Land & Lumber Co.
- Meg Mitchell, Forest Supervisor, Green Mountain National Forest, United States Forest Service
- David Paganelli, Vermont Department of Forests, Parks & Recreation
- Ethan Parke, Vermont Housing and Conservation Board
- Carl Powden, Vermont Land Trust
- Mike Rainville, Vermont Wood Manufacturers Association
- Ethan Ready, Senator Sanders Office
- Melissa Reichart, Green Mountain National Forest, United States Forest Service
- John Roe, The Nature Conservancy of Vermont
- Lisa Sausville, Vermont Coverts
- Bill Schmidt, Woodland Owners Association
- Jim Shallow, Audubon Vermont
- Adam Sherman, Biomass Energy Resource Center
- Brian Shupe, Vermont Forum on Sprawl
- Steven Sinclair, Director of Forests, Vermont Department of Forests, Parks & Recreation
- Jeffrey Smith, Meadowsend Timberlands, Ltd.
- Steve Springer, Woodland Owner and Water First
- Eric Sorenson, Vermont Department of Fish and Wildlife
- Brian Stone, Vermont Department of Forests, Parks & Recreation
- Peter Upton, Woodland Owner and Hunter
- George Weir, Consulting Forester and Consulting Foresters Association of Vermont
- Andrew Whitman, Manomet Center for Conservation Sciences
- Jonathan Wood, Commissioner, Vermont Department of Forests, Parks & Recreation

CONTACT INFORMATION

For further information on the Forest Roundtable, please contact Jamey Fidel, Forest and Biodiversity Program Director, Vermont Natural Resources Council at 802-223-2328 ext. 117 or jfidel@vnrc.org. Forest Roundtable materials including meeting minutes and presentations are available at vnrc.org.

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