

YFFReview

Forestland
Conversion,
Fragmentation,
and Parcelization

A summary of a forum
exploring the loss of
forestland and the future
of working family forests

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Executive Summary



It is increasingly evident that fragmentation is one of the most critical issues facing our forests today. Development and economic pressures on private lands are driving conversion of forest land to other uses, resulting in fewer large, intact, forested landscapes and increasing fragmentation of forestlands, especially those close to expanding population centers. Private forestlands, especially working family forests, are particularly threatened by these trends. The causes are varied and complex, calling for creative solutions which can only be developed through collaboration on many levels of both private and public sectors. Solutions need to be developed at the regional level, because the complexity of factors influencing fragmentation—for example, historic land use planning policies and forestland ownership patterns—have a distinct regional basis.

On April 13th and 14th, 2000, the Yale Forest Forum and the Southern New England Forest Consortium hosted a public forum and workshop titled "A Fragmented End? How Parcelization and Land Use Conversion May Mark the End of Working Family Forests" at the Yale School of Forestry and Environmental Studies in New Haven, Connecticut, USA. The purpose of the forum was to discuss the potential risk of forest fragmentation, parcelization, and land use conversion on the viability of working family forests—specifically to address the scope, impact, possible solutions, policy implications, and research priorities. The workshop was devoted to the southern New England regional perspective on these same issues.

Dr. John Gordon, Pinchot Professor of Forestry at the Yale School of Forestry and Environmental Studies, moderated the forum. In his opening remarks, he asked the provocative question of whether or not forest fragmentation is inevitable. In his words, "Are we trying to hold back the tide?" The discussions over the two days indicate that we are searching for ways to both accommodate the rising tide and shorten its reach. And that both are necessary.

Neil Sampson, President, The Sampson Group, Inc., argued that parcelization is the most ominous trend, with development pushing changes in ownership patterns and rapid land-use conversion. One of the implications of these mega-trends is that there are more owners of smaller parcels who are harder to reach with traditional forestry extension programs and much less likely to actively manage their lands. There are 150,000 new land owners each year acquiring some of the most productive working forests on the landscape. If we write off these small ownerships, then we are writing off a significant portion of our available timber land. If we're not ready to do this, then he argues that the search for workable solutions needs to be aggressive and soon.

Sara Leiman, forestland owner and vice president of the Oregon Small Woodland Association, provided the perspective of a working family forest owner/manager. She discussed the continued pressures to develop private lands in Oregon for recreational, residential, and commercial uses. The strategic location of most of Oregon's working family forests, on the urban fringes and lower valley floors, make these lands of immense environmental and economic value across the landscape. She argued that small working forests are being fragmented by regulations which increasingly reduce the effective size of the managed forest. Rather than being rewarded for doing a good conservation job, small owners are being penalized by losing their working lands to increased buffers and wildlife refuge circles.

Sarah Thorne, Research Director, Society for the Protection of New Hampshire Forests (SPNHF), indicated that loss of forest cover and fragmentation are big concerns in New Hampshire, particularly in the southeastern portion of the state. As the fastest growing state in New England, New Hampshire is experiencing both overall loss of forest cover, from 87% in the 1980s to 83% in 2000, and parcelization as evidenced by a drop in average parcel size from 47 acres in 1983 to 37.5 acres in 1997. She presented the preliminary results of a survey of loggers, foresters, the forest products industry, and forestland

investors, which indicate that there is a very real relationship between parcel size and the economic return of forest management activities. She discussed various strategies for addressing the fragmentation trend, including property tax policies, zoning policies, and land conservation.

Richard Cooksey, Forest Resource Planner, USDA Forest Service Northeastern Area State and Private Forestry, spoke about the Chesapeake Bay Program, a partnership between the Bay states, Washington DC, and many federal agencies. He indicated that forest fragmentation is one of the most important issues facing forest management in the watershed, with both ecological and economic consequences. Significant loss of forest cover is affecting water quality and aquatic habitat in the bay, which is a very stressed ecosystem due to nutrient pollution and habitat loss. He argued that large-scale statistics, such as state-wide percentage forest loss can mask substantial regional loss such as is occurring around the large population centers of the Chesapeake watershed.

On April 14, a diverse group of regional stakeholders joined the panellists to participate in a workshop about the issues of forest fragmentation in southern New England. They brought varying perspectives, including those of forest management, land conservation, forestland investment, and the forest products industry. There was general agreement among all participants that fragmentation is a serious issue in the region. The overarching theme of the discussion was that the new mega-trends of "dot com" wealth and urban/suburban sprawl into rural areas are severe threats to working forests. It was apparent from the discussion that saving working forests will require a 'market basket' of solutions, including state- or region-wide land use planning, alliances with the development community, tax reform, healthier urban environments, and programs to help people become better informed about working forests. It was generally felt that the discussion should be carried forward to a regional workshop, dealing with some of the tools and techniques which can be used to assess and address problems on a regional basis.

Issue Introduction

Protection of private forestland and preservation of the rapidly vanishing American landscape are immediate and urgent challenges. According to preliminary information from the National Resources Inventory, the United States lost over 2 million acres of forest each year between 1992 and 1997 (USDA NRCS 1999). At the same time, the number of forestland owners is increasing rapidly. As these trends continue, more forestland will be taken out of production and ultimately converted to other uses, causing continued pressure on rural economies and resulting in a loss of timber supply, environmental services, recreation, and aesthetics. Fragmentation is of concern to environmentalists because of its effect on biodiversity, and to industry because of lost production potential. It is a concern to society overall because it represents a loss of some of the country's most productive land with minimum planning and forethought.



Forum panelists (l-r) Sarah Thorne, Sara Leiman and Neil Sampson

Forest fragmentation, parcelization, and land use conversion are complex phenomena resulting from dynamic interactions between the natural landscape and society's ever-increasing demands on the land. 'Fragmentation' occurs when large expanses of forests are converted into smaller tracts of forest surrounded by other land uses, causing a disruption in continuity of the natural landscape. The term 'parcelization' is used to describe changes in ownership patterns whereby large forested tracts are divided into smaller parcels, which

may or may not remain contiguous forest. 'Land use conversion' in this context means the conversion by human activity of forestland to other uses. The term 'fragmentation' is often used broadly to encompass all three phenomena.

Clearly fragmentation has ecological implications. When large forested landscapes are broken up into smaller tracts surrounded by agriculture or development, there can be a significant effect on biodiversity and forest health. Habitat for certain wide-ranging species, such as large mammals and neotropical migrant birds, can be permanently destroyed. Edge environments create pathways for invasive nuisance species, domestic predators, and disease vectors. Forests become much more difficult to manage when there are problems with disease or invasive species. And with fewer trees to filter air pollutants, loss of forestland only exacerbates the problems of global climate change and air pollution.

Given the prevailing ownership patterns, sustainable management of privately owned forestland is crucial for maintaining US forests economically, socially, and environmentally. With the right mix of incentives, private landowners have proven to be stable, thoughtful, and motivated stewards of our nation's forests. However, there are a number of strong pressures, challenges, and perverse incentives acting on these owners. If working family forests are to survive in this environment, then owners must be able to manage their lands at a profit.

It is within this context that the Yale Forest Forum hosted an open public forum and workshop to address the risk of fragmentation, parcelization, and land use conversion on the viability of working family forests. "A Fragmented End? How Parcelization and Land Use Conversion May Mark the End of Working Family Forests" was held on April 13th and 14th, 2000, in New Haven, Connecticut, USA

Presenter Summaries

IMPLICATIONS FOR SUSTAINABLE PRIVATE FORESTS

By Neil Sampson, The Sampson Group

Private forestlands are largely an eastern issue; public lands a western issue. Throughout the whole eastern United States, fast growing counties coincide with a lot of forest in private ownership. In Georgia, for example, Atlanta is eating its forest – and it's the same in other areas such as the Chesapeake. It's happening everywhere. New Jersey was 40% developed in 1997. That's not a terrible shock to anyone who's trooped around New Jersey. However, the shock is that a third of the development has happened since 1982. The curve on land use conversion is going up very, very rapidly.

Forest fragmentation is a very real thing, coming out of what biology and ecology are saying about habitats. But quite frankly I am most worried about parcelization, when looking at the economics. I did some analysis of National Resource Inventory data versus population change data which shows that on the national average, between 1987 and 1992 we developed eight-tenths of an acre for every net new person in population. Between 1992 and 1997, we developed 1.7 acres per net new person. We doubled our developed land per person. That's just reflective of the fact that all the money in the world cannot be in dot com stock. A lot of it is chasing land and they are driving land prices up very, very high. For rural landowners, their family's wealth is often in their land—they are land rich and cash poor. Their land is getting more valuable all the time while they are getting closer to retirement, and they face some extremely significant challenges.

In 1995 there were almost ten million forestland owners in the United States, and most of them owned small parcels, one to nine acres. Through parcelization, many larger parcels of forest area are being broken up and sold as ten to forty-nine acre pieces. These small forests are often difficult if not impossible to manage. The priority audience for USDA programs is owners in the 10-500 acre parcel size.



"We've got to figure out how to keep the private ownership functional on a working landscape because we can't put it all in the public domain"

—Neil Sampson

The number of owners in this category doubled from two million to four million from 1978 to 1994 and the growth was in the smaller sizes, the 10-40 acre category. Projections are that by 2010 there will be 6 million owners in this category with an average private ownership size of 17 acres. Where I grew up you called that too big to trim, too small to log.

The type of owners has also changed. There are more retired people and white collar professionals. The numbers of blue collar workers and farmers are down. The age of forestland owners has shifted to the 65+ category—they now own 90 million acres of private forestland. With more owners and smaller parcel sizes, the problem is how to reach these land owners. We have to try and figure out the drivers. Newer owners are less market driven, but they may be increasingly conservation driven. Many surveys have been conducted and they all show that there are a lot of reasons for owning forestland, but investment and timber income is always down in 6th or 7th place. It will change by region, but not much. Time after time, survey results indicate that the top values for owning forestland are:

1. appreciating nature, scenic beauty, green space;
2. residence value;
3. heritage for family and future;
4. viewing/hosting wildlife;
5. recreation, hunting, fishing, enjoyment;
6. land value, investment; and
7. timber harvesting income.

The next step is to figure out how to do things differently from a working forest standpoint. And by working, I mean environmentally working as well as economically working. Landscape level cooperative management is not easy with multiple owners of small lots. On working lands, smaller forests mean increased costs of management activities, taxes, and certification. Zoning patterns are affecting the way the land is managed. For example, fragmentation is being created by the

Oregon land use law. With Oregon's '20 acre minimum parcel in forest - 10 acre for farm' zoning, you end up with many owners and it's not likely to be a working forest. Well-intentioned land use laws are doing some things that we may not like—not just in Oregon, but everywhere.

The fragmentation trend looks powerful, you're not going to stop it, so what are you going to do? What should our strategy be? Write off small ownerships and don't worry about them? There are 150,000 new owners a year. We could be writing off 150 million acres of productive forestland by 2010. This represents 35% of our available timberland on some of the best producing working land on the landscape. If we're not ready to write off the small ownerships, then the search for workable solutions needs to be aggressive and soon. It's a lot easier to raise the questions than find the answers.

OREGON WORKING FAMILY FORESTS:

ISSUES AND PERSPECTIVES

By Sarah Leiman, Forestland Owner

I've been asked to provide the perspective of a private non-industrial landowner and to give you the Oregon slant. We're a three-generation family company—some of our land has been in the family since the 1920's. We have six non-contiguous parcels in western Oregon, managed as a family—we are a working family forest. Our hope is to continue that for many decades through careful management.

What does it take to keep a working family forest together, to keep it going? Those of us in it for the long run have a connection to and a passion for the land. We have an optimism for the future that the investments we make today will be gains for the family down the road. A tremendous long-term commitment in money and honest sweat equity is necessary to support the more-than-life-time cycles of our forests.



"Many times we can't even cover our expenses... that's the opposite of an incentive to invest for prudence"

—Sara Leiman

In Oregon, most of the people and our most productive forestland are on the west side of the Cascade Range. Forest covers 45% of the land in Oregon, and about 40% is privately owned. There are 51,000 non-industrial private forest owners in the 10 to 5,000 acre category—another 114,000 own between 1 and 9 acres. Non-industrial private forestland represents 16% of total forestlands and 43% of the private forestland base.

As a result of early settlement patterns, working family forests typically occupy lower stream reaches, lower elevations, near expanding urban and suburban areas—some of the most important landscapes in the state. This strategic location—mostly on the urban fringes and lower valley floors—and management diversity make family forestlands of immense environmental and economic value across the landscape. Private forestlands are in diverse conditions due to a complex pattern of mixed ownership and management. We don't follow 'one size fits all' management schemes. We buffer the extremes of public and industrial forest management.

The rate of conversion of forestlands to other uses has slowed dramatically from a 5% decline in forest cover from 1973 to 1982 to a 2% decline from 1982 to 1994. This is most likely due to land use planning restrictions. However, Oregon is facing major demographic changes—rapid population growth, increasing urbanization, and changes in the state's citizenry. Population is expected to increase by 38% from 1995 to 2025. This growth will likely increase the demands on private forests to produce products, services, amenities and values, with added pressures from a decrease in timber harvest on public lands. We will experience continued pressures to develop our lands for recreational, residential, and commercial uses.

Of great concern is fragmentation and the shrinkage of our family forestlands by law, regulation, and government controls. Beginning with the nation's first forest practices act in 1971, Oregon has gone the route of government regulations rather than voluntary best management practices. Three major bodies of law affect our forest

management capabilities: Oregon's Land Use Zoning, the Oregon Forest Practices Act and the federal Endangered Species Act. Most landowners agree with baseline conservation measures, but now regulations have gone beyond baseline responsibility of forestland owners. An owner's property can be reduced in effective size, without sale or subdivision, but by mandating non-working, no-touch conservation zones such as extensive riparian buffers and wildlife protection areas.

Forest practices regulations erode our ability and commitment to keep a working tree farm afloat. Land use laws limit conversion of forestlands to a certain extent; however, they have also affected the economic resilience of working family forests by limiting opportunities in a changing landscape. Small land owners are now being required to shoulder a financial burden that should be shared by all Americans. It can be particularly devastating for landowners who have an extensive network of streams or endangered species on their lands. Rather than being rewarded for doing a good conservation job, we are being penalized by losing our lands to increased buffers and wildlife refuge circles. Set-asides can take 20%, 50%, or 90 % of family forests out of the working category—this can doom a small operation.

The financial burden on family forests of providing public values has gone way past individual landowner responsibility. Compensation would help restore landowner optimism and would encourage long-term investment in the land. Shall we sell out, cash in our chips, and open up one more mini-mall? Does that contribute more to our communities than a working family forest? I can't believe it does.

In the words of Oregon Governor John Kitzhaber: "As we formulate policies and ask landowners to do their part, we must understand that securing a healthy environment for our children and grandchildren depends on economically viable land management. Our challenge is to find a balance that is fair to those affected and still achieves environmental goals."



"When it comes to parcelization...we want to try to quantify just what the relationship is between parcel size and the economics of management"

—Sarah Thorne

NEW HAMPSHIRE'S CHANGING LANDSCAPE

By Sarah Thorne, Society for the Protection of New Hampshire Forests

Our goals are to protect large parcels of forestlands, linked when possible to enhance the ecological values of those lands; to protect productive and operable lands as well as ecologically significant lands; and to protect lands throughout the state, not just up north, not just where it's easy, so that we can sustain a working forest economy for the future. SPNHF owns 123 forest reservations and holds conservation easements in 490 locations—we've protected about two percent of the state, but have a long way to go.

Forest fragmentation and parcelization, being driven by development, are very serious issues for us in New Hampshire. We're concerned about several dimensions of the fragmentation issue. The first is total loss in forest cover. New Hampshire is still the second most forested state in the nation, after Maine, but the trend is a real cause for concern. Forest cover peaked in the 1980s at 87% and has begun declining again to 83% right now and is heading downward for the foreseeable future. Using predictive modeling, looking at population rates relative to forest cover, it is estimated that by 2020 forest cover will drop to 80%. So the overall loss in forested acreage is a very real concern for us. The fragmentation of forest blocks is also a concern. When you overlay ownerships on the forest, the picture looks much more grim. New Hampshire's average forest parcel size in 1983 was 47 Acres—in 1997 it dropped to 37.5 acres.

We have been doing some work recently to understand what is happening to New Hampshire's forestland base (*New Hampshire's Changing Landscape*, SPNHF and TNC 1999). Our results show that New Hampshire is the fastest growing state in New England at 1.1 % per year. Population doubled between 1950 and 1998. From 1980 to the present there has been a 55% increase in housing stock—a lot of these are second homes. The state has undergone a tremendous transformation. It is estimated that our population will be tripled by 2020 from 1950 levels. Population density in the southeast is by far

the highest in the state—85% of the growth in the state is occurring on only 33% of the land area. Forest fragmentation is most severe in the southeast, which has become a suburb of the Boston metropolitan area.

What does all of this mean for forest management? SPNHF is conducting a survey of loggers, foresters, forest products industry, and forest land investors to try to get at just that question. The results are not all in yet, but we do have some preliminary insights.

- > Foresters are saying that there is a very strong relationship between stumpage price and parcel size. For example, for a white pine sale, when all other factors are equal, many are seeing a 20% increase in stumpage price when parcel size increases.
- > Loggers indicate that they pay higher stumpage on larger parcels. We know there are economies of scale; we're trying to quantify exactly what those are.
- > The forest products industry also reports that they're very concerned about loss of forestland. Approximately 10% of the harvests that are going on right now in the state are liquidation cuts, paving the way for development. Most of our mills are very concerned about their wood supply ten and twenty years out. The majority of mill owners are holding back on investments because of concern about future wood supply.
- > Forest investors who buy land primarily to manage it for forest products are looking for unfragmented forest parcels in the 5,000 acre range, which are very few and far between. They don't want to buy fragmented forestland. They know what their costs are and they want those economies of scale. They receive a higher stumpage price, a 10% - 20% premium, with larger parcel sizes and larger scales.

What strategies can we employ to try to stem fragmentation and parcelization? New Hampshire has a very effective current use property tax. The problem is that it has a 10 acre minimum, which has become the de facto minimum lot size for zoning in the state. Larger

parcels are being chopped up into 12 acre lots so they can have the house plus the 10 acres—house plus land. Open space/cluster zoning is another strategy. Local planning boards need to be able to require this kind of zoning and need to require that there are manageable tracts left, more than small ribbons and remnants of open space. There is a place for 50 acre minimum zoning for forestry districts in areas where the highest and best use of the land is forestry.

A major strategy in New Hampshire is the acquisition of land and conservation easements. Twenty-two percent of the land base is permanently protected, half of which is in the White Mountain National Forest. Most of the protected land is up north, only a very small amount is down south where most of the people live. Fifty percent of New Hampshire towns have less than 10% of their land protected, which is probably not enough to sustain a forest products economy in an area over the long haul. Only 26% of large blocks (over 500 acres) of forest are protected. Two exciting new programs that we hope will enable us to acquire more land and conservation easements are New Hampshire's Land and Community Heritage Investment Program and the federal Forest Legacy Program.



An all too familiar scene in southern New England

THE CHESAPEAKE BAY PROGRAM:**SAVING FORESTS TO SAVE THE BAY**

By Richard Cooksey, USDA Forest Service

The Chesapeake Bay is the nation's largest estuary and one of the most productive ecosystems in the world. The watershed encompasses 41 million acres—64,000 square miles—in portions of six states and the District of Columbia. Eighty-five percent is private land. The forests, covering 59% of the watershed, are exciting and diverse—spanning the range from southern pine to oak-hickory to northern hardwood. With the changing dynamics of population growth and ownership patterns, and sprawling suburban development, the forested area across our landscape has continued to decline and become increasingly fragmented. We're experiencing significant regional loss of forest—our greatest concern is long-term permanent conversion to non-forest uses.

The Forest Service is one of largest land managers in the watershed. We work with the Chesapeake Bay Program (CBP), a partnership between the Bay states, Washington DC, and many federal agencies. CBP's mission is to clean up the Bay and to promote restoration and conservation of the watershed. A primary goal is to understand the important roles of trees and forests in the maintenance of the Bay's watershed health, demonstrating how forests are part of the solution to the problems that are affecting the Bay, primarily nutrient pollution and habitat loss. The Forest Service's goal, as a CBP partner, is to educate and bring forth policies and programs that clearly show the linkage between land and water and the health of both. We are using the foundation of basic watershed management and forest stewardship principles, and the flexibility of incentive-based cooperative stewardship programs.

The trends are alarming. We are losing forests, primarily to suburban development, at a rate of about 100 acres per day. Riparian forests are extremely critical landscape features, especially as they relate to water



"We think that forest fragmentation is one of the most important issues facing forest management today with both ecological and economic consequences"

—Richard Cooksey

quality, and we've lost about 40% of that resource. If estimates are correct, regional projections show population increasing by anywhere from 3 to 18 million people by 2020 and an estimated 1.7 million new homes will be built in that time frame—which could result in a loss of 630,000 acres of forest.

Numbers can be deceptive. The watershed overall lost about 2% forest in the last ten to twelve years, which doesn't seem like that much. But we need to look closer—there has been substantial regional loss. The suburbanizing areas have experienced the greatest declines. In southern Pennsylvania, there was a 5% loss of forest from 1985 to 1995; but if you look at the state as a whole, there was a net gain during the same period. Around Richmond there was a 7.5% decline, while overall for Virginia the decline was 4.2%. The story is the same in Maryland—around Baltimore, an 8.5% decline, Maryland overall declined by 4.2%. The take-home message is that gross statistics fail to tell the whole story. If we're going to talk about policy options and approaches, we cannot take a 'this is the same everywhere' approach. That will clearly fail in an area as large as the Chesapeake watershed.

The Bay's forests have economic importance. Forestry is in the top five industries in state domestic products in all the Bay states: hundreds of thousands of jobs are related to forestry. A study conducted in Virginia of the effects of growth on state timberlands showed that when population densities increased to just 150 people per square mile, the opportunity for commercial forestry operations dropped to zero. At 45 people per square mile, it was about 50-50 (Liu and Scrivani, 1997). This is the shadow effect of development. People are moving into an area where working lands and working landscapes are prevalent, but because of the very low tolerance for forestry activity, they enact ordinances to exclude it. This has been quite an eye opener for the department of forestry, to see their forest resource becoming less effective even with an industry that has that degree of economic strength in the region.

In an analysis by American Forests of an 11 million acre area of the Chesapeake Bay watershed, it was estimated that forest land cover declined from 55% to 37% between 1973 and 1997 (American Forests 1999). This loss of forest is occurring in a large concentric circle around the major population centers. In an economic analysis of the impact of tree loss since 1973, it was estimated that the 32% decrease in forest cover caused a 19% increase in runoff (5.4 million cubic feet of water), cost an additional \$51 billion in stormwater services, produced an additional 34 million pounds of pollutants, and represented \$588 million in lost air quality benefits. There is a relationship between economic performance and ecological function – trees do many of things for free that we'd have to pay a lot of money for otherwise.

The objectives of the Forest Service program in the Chesapeake Bay are:

1. to build a scientific foundation to define and characterize forest fragmentation in the watershed, to help get data and analysis to better understand the problem and issues;
2. to facilitate collaboration and consensus building among disparate interests so that we can get a better idea on how to deal with these issues; and
3. to develop sensible solutions within a framework of recommendations, approaches and strategies that can actually address parts of this problem. This is a complex issue; there are many related parts when it comes to development practices, transportation policy, land use policy and issues related to property taxation, pricing and access to markets. We need to select some of them and make advances.

Through our program, the Forest Service has been building a scientific foundation. We've facilitated collaboration and consensus by conducting roundtables and workshops across the watershed to talk about the issue in relation to growth and development. We're now moving into looking at policy options.

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Workshop Summary

The objective of the April 14 workshop was to generate interest in and understanding of the scope and socio-economic implications of fragmentation on private forestlands in southern New England. General themes that emerged from the discussion revolve around development pressures, the connection between urban/suburban populations and the future of rural forests, public perceptions of forest management, the value of conservation tools, the value of alliances and partnerships, and the need for state/regional landscape-level planning. Although not all participants concurred on all the details, they were generally in agreement on the basic causes and potential solutions to the problem of forest conversion and fragmentation.

CAUSES OF FOREST LOSS IN SOUTHERN NEW ENGLAND

Development pressure in southern New England, including the southern tiers of Maine, New Hampshire and Vermont, is a severe threat to both forestland in general and working forests in particular. The urban/suburban fringe is migrating outward as more and more people want to live in rural areas. In many parts of the region, forests and other forms of open space are becoming islands in a mosaic of sub-divisions. The new "dot com" wealth and changes in how people work are pushing this trend even harder as both companies and individuals are driving up land prices. Ironically, the establishment of conservation land tends to raise the value of adjacent properties, putting even more economic pressure on private forest landowners.

Pressures are strongest at the urban fringes and there was some sense that people's desire to sprawl out into the landscape is tied to urban livability. In order to slow sprawl, the conservation community should support programs which improve urban and ex-urban environments, including education and crime deterrence as well as urban forests and parks. At the same time, concern was expressed that an urban focus on the part of government forestry programs would come at the expense of the rural areas—somehow we have to do it all.

New England has a strong tradition of local control at the town level. Some participants thought that this could be a positive force since municipalities are empowered to do something about the problems of land-use conversion. There is increasing awareness that development is not an economic benefit to towns when long-term costs of providing support services are considered. However, there was also a very strong sentiment that because of such powerful local government, there is a notable lack of land-use planning, especially at a landscape level. Local officials tend to be notoriously short-sighted. It was generally agreed that state or regional land-use planning is a necessary and powerful tool for saving forests and that the traditional forms of government in New England do not easily lend themselves to collaborative planning across political boundaries.

CHALLENGES FOR WORKING FORESTS

The challenges of forest management are coming from both economic pressure and public perception. Not only is it increasingly difficult to keep the family forest afloat economically, but forest managers are facing conflicts with new rural landowners who have no ties to the land and often do not want to see (or hear) forestry operations in their neighborhood. Differences in basic values and life styles between traditional rural communities and new landowners can lead to dramatic changes such as zoning restrictions against forestry operations, which would constitute the final deathblow to working forests and a local forest-based economy.

The future of "keeping forest forest" is tied to the viability of both working forests and a regional forest products industry. There is a tremendous need for education about the benefits of having active,

managed forests, especially for urban/suburban populations.

Demonstration forests in the urban fringe, programs for kids, getting people out in the woods and talking about and showing what good forestry looks like, are all ways to gradually change people's thinking about their relationship to the land and the value of working forests, both environmentally and economically.

On the economic side, taxes and land prices dominated the debate, although some concern was also expressed about the economics of managing small parcels. Federal estate taxes are forcing land sales and regressive tax policies at the state and local level are forcing private land owners to make very difficult decisions. It was noted that no one can buy land in Connecticut for investment in the resources—prices are just too high. The private sector owns the bulk of the land in the region, therefore it is essential to develop programs that encourage and make it economically viable for the private sector to retain its land.



Neil Sampson leading workshop participants in the discussion



"Money is chasing land..there is no piece of land in southern New England that anyone can buy as an investment in the forest resources—and that is a problem for working forests"

—Star Childs

GETTING TO SOLUTIONS

Land Conservation and the Role of Easements

There was general agreement that land conservation is an important part of the overall strategy. Public financing of direct land conservation should be increased. Programs to purchase development rights for forestland should be established in all states in the region. Funding for land or easement purchases is limited, however, and there is a need to be strategic with conservation dollars, to take more of a landscape scale approach rather than the traditional opportunistic approach to targeting land for conservation.

The discussion about conservation easements was lively, with differing viewpoints, particularly about permanent vs. term easements. Some participants had conceptual difficulty with permanent easements—with the whole notion of perpetuity, without flexibility for future generations. It was noted that it is almost impossible to draft a document that's going to work forever—ecosystems change, institutions change, societal values change. Easements are not necessarily well thought out, which can cause problems with restrictions and reserved rights when land changes hands. On the other side was the argument that resources are too limited to justify term easements which have to be re-negotiated every twenty or thirty years. Individuals and organizations that finance easements want to know that their investment is for the long run. Perpetuity can be thought of as meaning 'doing our best for the foreseeable future.' If societal values change significantly enough in the future, anything would be up for re-evaluation.

Public Education

Concerns about public perception of forest management came up repeatedly - and the overriding sentiment was that most people, especially urban and suburban dwellers, just do not have an

opportunity to connect with the land in ways that increase their understanding of a working landscape. It was felt that we can start to address the problem with programs that bring people into the working forest, that use the forest as a teaching tool to get people, especially children, involved with the land. The Society for the Protection of New Hampshire Forests, Land's Sake in Weston, Massachusetts, and state extension foresters all have programs which have demonstration components, showing people what good forestry is all about.

In addition to the traditional extension programs, there is a need for a strong 'inreach' program where people can get information about forestry and forest management when they need it. With the dramatic changes in land ownership, there are more and more owners, and no outreach program, however good it is, is going to be able to reach them all.

Strategic Land Use Planning

Growth in southern New England appears to be inevitable; the challenge is how to accommodate it with the least impact on the region's forests. Accommodating both growth and land protection requires more than local decision making. It requires strategic, landscape level planning, a large scale strategy focusing on what we want our state or region to look like. A shift in thinking is vital at the local level. The one or two acre minimum zoning that is so popular in New England suburbs contributes to sprawl and fragmentation. Zoning changes are needed to allow for cluster development. Studies consistently show that people are willing to live on smaller lots if they have access to open space. Good development benefits everyone; however, developers often find that zoning ordinances are working against them. Urban growth boundaries, increased funding for township planning, and incentives for regional planning are all tools that can be used to control and channel development in ways that preserve open space.



"I think we have to ask: Are we and should we be preparing to accommodate fragmentation or are we trying to hold back the tide?"

—John Gordon

Alliances and Partnerships

The complexity of saving a working forest landscape requires partnerships and alliances on many levels. Some of these will be 'unexpected' coalitions, such as those between the development, conservation, and forestry communities to fight for smart growth, with clustered development, working forest zones, and conservation zones. Tying forest conservation to improvements in urban livability will require partnerships and collaborations with people who are working on solving the problems of the cities. Alternative conservation models can be developed by partnering with private industry to sustainably manage the forest. Educational and demonstration forests can be managed jointly by conservation organizations, educational institutions, and the forestry industry. Reaching out to urban and suburban populations for both education and support will require more than the traditional extension programs—it will require creating linkages with urban and suburban audiences that have become disconnected from, or have never understood, the value of forestland and the importance of a viable forest-based economy to 'keeping forest forest.'



Hans Bergey, Rena Price, Roger Monthey, and Brian Donahue during the workshop discussion

At the same time as new partnerships are developed, traditional alliances ought to be strengthened. Agreement is needed between the forestry community and the environmental and conservation community on the goal to keep forestland managed and operating and to team up politically to accomplish it. It was noted that the conservation community in southern New England is actively supportive of working forests, perhaps because it is a little older and a bit more forward thinking than in other parts of the country. And finally, continued support from the educational sector is needed for educational programs, scientific research, and publications.

Future Directions

There was considerable enthusiasm for continuing the dialog. The proposed next step is to hold a regional workshop, including the public sector, particularly elected officials. It is intended to encourage more formal thinking on fragmentation in this geographical context. It was suggested that the regional scope be extended to include southern Maine, New Hampshire and Vermont, since they are grappling with the same problems. A useful workshop would be one that dealt with some of the tools and techniques used to assess and address the problems of parcelization, fragmentation, and land use conversion on a regional basis.

At the national level, the Yale Forest Forum is developing a new initiative on forest fragmentation in order to contribute substantively to a commitment to preserve intact forest ecosystems. The initiative will employ a three pronged approach: national coalition building, education/outreach, and research.

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References

American Forests. 1999. *Regional Ecosystem Analysis: Chesapeake Bay Region and the Baltimore-Washington Corridor.*

Azuma, D.L. et. al. 1999. *Forests, Farms and People: Land Use Change on Non-Federal Land in Western Oregon 1973-1994.* Oregon Department of Forestry. Salem, Oregon.

Birch, T. W. 1996. *Private Forest-land Owners of the United States, 1994.* Research Bulletin NE-134, Radnor, Pa. USDA Forest Service, Northeastern Forest Experiment Station.

Bliss, J. 1999. *Of What Value are Small Woodlands?* Presentation at annual meeting of Oregon Small Woodlands Association. Oregon State University.

Liu, R., and J.A. Scrivani. 1997. *Virginia Forest Land Assessment.* Virginia Department of Forestry, Charlottesville, Virginia.

Oregon Forest Resources Institute. 1999. *Toward Sustainable forestry: A Look at Oregon's Forests at the Millennium.* Portland, Oregon.

Oregon Forest Resources Institute and The Evergreen Foundation. 1997. *Oregon Forest Fact Book.* Medford, Oregon.

Sampson, R.N., and L.A. DeCoster. 1997. *Public Programs for Private Forestry: A Reader on Programs and Options.* Washington, D.C. American Forests.

The Society for the Protection of New Hampshire Forests and The New Hampshire Chapter of The Nature Conservancy. 1999. *New Hampshire's Changing Landscape: Population Growth, Land Use Conversion and Resource Fragmentation in the Granite State.*

USDA Natural Resource Conservation Service. 1999. *Summary Report: 1997 National Resources Inventory.* Washington, D.C. US Department of Agriculture.

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OTHER RESOURCES

American Farmland Trust, Keep America Growing Conference
<http://www.farmland.org/kag.html>

American Forests
<http://www.americanforests.org/>

Community Stewardship Exchange
<http://www.sonoran.org/>

Environmental Protection Agency Mid Atlantic Integrated Assessment
<http://www.epa.gov/maia/>

Fragmentation 2000 Conference
<http://www.fragmentation2000.org/>

Lincoln Institute of Land Policy
<http://www.lincolninst.edu/main.html>

Michigan State University, Department of Geography,
Basic Science and Remote Sensing Initiative
<http://www.bsrsi.msu.edu/wfw>

National Center for Policy Analysis: The Truth about Urban Sprawl
<http://www.ncpa.org/ba/ba287.html>

National Governors Association: Growth and Quality of Life
<http://www.nga.org/CBP/Activities/SmartGrowth.asp>

North Carolina State University and USDA Cooperative State Research
Education and Extension Service
People in Forested Landscapes
<http://courses.ncsu.edu/classes/for512001/>

Planning Commissioners Journal Planners Web: Sprawl Guide
<http://www.plannersweb.com/sprawl/home.html>

Policy.com: Is The Urban Sprawl Destroying The Environment?
<http://www.policy.com/issuemk/98/0420/>

Reason Magazine: Sprawl Brawl
<http://www.reason.com/bisprawl.html>

Rutgers University, Center for Remote Sensing & Spatial Analysis
Sterling Forest: A Landscape Ecological Analysis
<http://www.crssa.rutgers.edu/projects/sterling/sterling.html>

Sierra Club: Challenge to Sprawl Campaign
<http://www.sierraclub.org/sprawl/>

Smart Growth Network
<http://www.smartgrowth.org/>

Sprawl Busters
<http://www.sprawl-busters.com/index2.html>

Sprawl Watch Clearinghouse
<http://www.sprawlwatch.org/>

Sustainable Ecosystem Institute, Forest Ecosystems Program
<http://www.sei.org/forest.html>

University of Connecticut, NASA Regional Earth Science Application Center
<http://resac.uconn.edu/>

USDA Forest Service, Forest Inventory and Analysis National Program Office
<http://www.srsfia.usfs.msstate.edu/wo/wofia.htm>

USDA Forest Service, Northeastern Research Experiment Station, Forest Inventory and Analysis
<http://www.fs.fed.us/ne/fia/>
\
USDA Forest Service Southern Research Station:
Processes Driving Forest Fragmentation in the Southeast
http://www.rtp.srs.fs.fed.us:80/econ/research/std33_5.htm

USDA Forest Service: Fragmentation of Forest Ecosystems
<http://willow.ncfes.umn.edu:80/fhm/pubs/96frag.htm>

US Geological Survey, Forest Fragmentation Index Map of North America
<http://www.nationalatlas.gov/forestm.html>

US Geological Survey, National GAP Analysis Program
<http://www.gap.uidaho.edu/>

Additional Readings

- Dale, V.H., S. Brown, R.A. Haeuber, N.T. Hobbs, N. Huntley, R. J. Naiman, W.E. Riebsame, M.G. Turner, and T.J. Valone. 2000. Ecological Principles and Guidelines for Managing the Use of Land. *Ecological Applications*, 10(3), pp. 639-670.
- Gaddis, D.A., B.D. New, F. W. Cubbage, R.C. Abt, and R. J. Moulton. 1995. *Accomplishments and Economic Evaluations of the Forestry Incentives Program: A Review*. Southeastern Center for Forest Economics Research Working Paper No. 78. 52p. + append.
- New, Barry D., F.W. Cubbage, and R.J. Moulton. 1997. *The Stewardship Incentive Program, 1992-1994: An Accomplishment and Program Review*. Southeastern Center for Forest Economics Research Working Paper No. 83. 32p. + append.
- Sampson, N., and L. DeCoster. 2000. Forest Fragmentation: Implications for Sustainable Private Forests. *Journal of Forestry* 98:3 pp. 4-8.
- USDA Forest Service and Society of American Foresters. 1998. *Forest Fragmentation in the Chesapeake Bay Watershed*. A Professional Roundtable Series, January 12-16, 1998, Society of American Foresters National Office, Bethesda, Maryland.
- Vogelmann, J. E. 1995. Assessment of Forest Fragmentation in Southern New England Using Remote Sensing and Geographic Information Systems Technology. *Conservation Biology* 9 (2):439-449.