



Large-tract Forestland Ownership Change:

**Land Use, Conservation,
and Prosperity in
Michigan's Upper Peninsula**

Large-tract Forestland Ownership Change: Land Use, Conservation, and Prosperity in Michigan's Upper Peninsula

December 2007

Co-authors and Project Research Team:

Robert Froese, PhD, Mike Hyslop, and Chris Miller
Michigan Technological University

Brad Garmon, Hugh McDiarmid, Jr., and Ariel Shaw
Michigan Environmental Council

Larry Leefers, PhD
Michigan State University

Mark Lorenzo and Stacy Brown
National Wildlife Federation

Marilyn Shy
Upper Peninsula RC&D Council

Acknowledgements

The research team gratefully acknowledges the generous support of People and Land, a project of the W.K. Kellogg Foundation administered by Public Sector Consultants Inc. and the Land Policy Institute at Michigan State University. The project research team extends its sincere gratitude to all involved in this program for their ongoing support of land use education, outreach and research.

The project research team also thanks the members of the project advisory team for their generous dedication of time, expertise and support:

- George H. Berghorn and Kevin Korpi (Michigan Forest Products Council)
- Charles Eshbach (Michigan Nature Association)
- Becky Lentz (National Wildlife Federation)
- Evan McDonald (Keweenaw Land Trust)
- Gina Nicholas and Sue Haralson (Houghton/Keweenaw Conservation District)
- Lisa Niemi (The Nature Conservancy)
- Jim Okraszewski (NewPage Corporation)
- Alan Steege (Keweenaw Land Association, Ltd.)
- Jack Thomas (Plum Creek Timber Co.)
- Nathalie Winans (Public Policy Associates, Inc.)
- Darcy Rutkowski (Upper Peninsula RC&D Council)

The National Wildlife Federation wishes to recognize the contributions of Eric Firstenberg for proposing and securing funding for this project and Sara E. Jackson for report design and layout.

Cover Photo: ISTOCK

Copyright 2007 National Wildlife Federation.

School of Forest Resources & Environmental Science - Michigan Technological University

1400 Townsend Drive
Houghton, MI 49931
906-487-2308
www.forest.mtu.edu

Michigan Environmental Council

119 Pere Marquette Drive, Suite 2A
Lansing, MI 48912
517-487-9539
www.mecprotects.org

Department of Forestry - Michigan State University

126 Natural Resources Building
East Lansing, MI 48824-1222
517-355-0097
www.for.msu.edu

National Wildlife Federation

213 W. Liberty St., Suite 200
Ann Arbor, MI 48104
734-769-3351
www.nwf.org

Upper Peninsula Resource Conservation & Development Council

780 Commerce St., Suite C
Marquette, MI 49855
906-226-8871
www.uprcd.org

People and Land

600 W. St. Joseph, Suite 10
Lansing, MI 48933
517-371-7467
www.peopleandland.org

Land Policy Institute - Michigan State University

317 Manly Miles Bldg.
East Lansing, MI 48823
517-432-8800
www.landpolicy.msu.edu

Table of Contents

Executive Summary	3
Introduction	7
Part 1. UP Forests, Forestlands and Large-Tract Forestland Owners	13
Part 2. The Role of the Forest Products and Tourism Industries in the UP Economy	23
Part 3. Strategies and Capacity to Conserve and Protect UP Forestland	31
Part 4. Recommendations for a Sustainable Forest-Based Economy	40
References and List of Acronyms	48

Case Studies

A History of Changing Forestland Ownership	18
Development Coming to UP Power Co. Waterfront Lands	22
Downeast Lakes Forest Project Shows Value of Public Engagement	24
Snow Sports See Change in Public Access	27
Protecting Working Forests: The Northern Great Lakes Forest Project	35
Large-tract Owner and DNR Partner for Wildlife Habitat	39

List of Figures

Figure 1. UP Land Use and Land Cover	13
Figure 2. UP Forestlands	14
Figure 3. Current Large-tract Corporate Ownership in the UP by owner type	16
Figure 4. Large-tract Corporate Ownership in the UP	19
Figure 5. Corporate Forestland of Potential Higher Alternative Economic Use Value	21
Figure 6. Pulpwood Production in the UP, 1980 to 2004	25
Figure 7. Forest Product Output/Sales and Employment, 2003	26
Figure 8. Sources of Inputs for Production	28
Figure 9. Distribution of Major CF Land Owners	33
Figure 10. Planning and Zoning Data for the Upper Peninsula, 2003	37

List of Tables

Table 1. UP Land Use/Land Cover	13
Table 2. Forest Land Area (acres) By Major Owner Class	14
Table 3. Leading UP CF Land Owners as of August 2006	15
Table 4. Corporate Forestlands of Potential Higher and Better Use	20
Table 5. Ownership Distribution of UP Registered CF Lands	32
Table 6. Contents of Planning and Zoning Documents in the UP	38



Photo: ISTOCK

Executive Summary



Photo: Robert Froese, MTU

THERE IS NO PLACE ON EARTH LIKE MICHIGAN'S UPPER PENINSULA.

Steeped in history, infused with a rugged individualistic spirit, and blessed with abundant natural resources, the UP has carved its unique identity on the American social and physical landscape.

Central to all that is the UP are its forests: vast tracts of forestlands that are the linchpins of the region's economy, natural resources and rugged identity.

Powerful changes have marked UP forestlands during the last 150 years, from the near-complete harvesting of old-growth trees during the 1800s to the increasingly sustainable management regimes enlisted by many forestland owners in recent decades.

There have been remarkable constants throughout these changes: Public access to much privately- owned forestlands has been largely maintained;

fragmentation of those lands has been minimal; and the resulting identity of the UP as a “place without fences” has sustained a culture grounded in outdoor recreation and freedom to roam.

Major and fast-moving changes in forest property ownership patterns during the past two years signal significant changes for the UP forests, the public’s access to them, and the natural resources that depend on them. This project aims to provide information relevant to local and state planning processes and to inform the public debate about the menu of public policies, investments and incentives that might be appropriate to address the changes and forces impacting the UP. The debate under way now will determine the future of the UP’s economy, nature and legacy.

It all starts with forests, which make up the majority of land cover in the UP, representing approximately 8.5 million acres or 79 percent of the total land base. More than half of the employee compensation in the UP’s manufacturing sector comes directly from forest products industries. Forest owners traditionally have been timber product companies with vested interests in managing the land for use in their own company mills. But as forestland ownership becomes decoupled from the mills, the goals of the new owners replace those of the old.

More than one million acres of UP corporate forestland changed ownership in 2005 and 2006, moving from land owners directly tied to forest products industries (vertically integrated timber

product companies, or VITPC) to large-tract forestland investors—timber investment management organizations (TIMO) and real estate investment trusts (REIT). The TIMO owner-type category now represents the largest holder of UP

private forestland; REITs are the second largest holder. REITs and TIMOs raise questions about whether so-called economic “higher and better use” forestlands, particularly those in proximity to assets such as lakes, rivers and roads, might become more prone to parcelization than under previous owners.

“Parcelization” is defined as “the subdivision of land under a single ownership into smaller parcels under a diverse ownership” (Drzyzga and Brown 2002). Fragmentation refers to physical landscape changes in the size and shape of forestlands. As parcelization increases and large-tract ownership is reduced, public access and wildlife habitat typically decline. The associated infrastructure (roads, buildings, etc.) that often follows parcelization leads to forest fragmentation that jeopardizes recreation, habitat, and local infrastructure budgets.

Our research shows that the vast forest tracts are already getting smaller. In general, contiguous corporate holdings in the UP have been decreasing in maximum area. Great Lakes shoreline

lands, arguably the most valuable and lucrative, are becoming increasingly owned by small private land holders, and therefore less accessible to the public. Forestland adjacent to inland lakes also is being divested by large corporate holders.

As parcelization increases and large-tract ownership is reduced, public access and wildlife habitat typically decline. The associated infrastructure (roads, buildings, etc.) that often follow parcelization leads to forest fragmentation that jeopardizes recreation, habitat, and local infrastructure budgets.



Photo: ISTOCK

New ownership patterns and global economic forces also have tremendous potential to impact the men and women who call the UP home. More than one-quarter of the manufacturing establishments in the UP are in wood products manufacturing and paper and paperboard manufacturing. Almost half of the manufacturing jobs in the UP were associated with the forest products industries in 2003. Almost 20 percent of total UP output was directly associated with forest products industries, along with approximately six percent of employment. The forest products industry had statewide sales of \$11.2 billion in 2003 with \$2.5 billion of those sales in the UP, comprising about 22 percent of the state's total.

Tourism spending in Michigan totaled \$9.5 billion in 2000 (adjusted to 2003 dollars). Of this, \$750 million was associated with counties in the UP, or about 8 percent of the state's total. Forest-based industries face continuing threats from lower-cost international competition and other tourism options.

Michigan's citizens are not helpless in the face of ownership changes and world economic events. Rather, there are several tools that can help maintain the most beneficial forest management practices that protect and conserve forestland:

- Supporting private landowners with state incentive programs. The Commercial Forest program, which gives tax breaks for owners who keep their land open for recreation, is a robust program that can be a win-win for owners and users.
- Sustainable forest certification designations can help shape markets and sustain best forestry practices.
- Conservation easements use private donations to buy and protect development rights or other values on strategic lands.
- Local planning and zoning helps communities define and invest in their future economic,

recreational and environmental assets. Research shows that the UP is behind in access to information, tools and technical support for local planners and elected officials.

As a starting point for action, four strategies and 22 recommendations were developed from this project to better promote the stable, sustainable ownership and management of the UP's large-tract commercial forestlands. They include fostering stewardship of private land, protecting exceptional resources, strengthening the economies of rural communities and promoting informed decisions.

Input on these recommendations was solicited from more than 150 local residents, forest industry representatives and local elected leaders at a series of

community forums held in Newberry, Marquette and Houghton in the UP during June, 2007. The tools most popular among all community members who participated were those that support the state's existing Commercial Forest program, offer new programs to diversify and market regional wood products, and provide additional education for local leaders and citizens about forest issues.

A new era of UP forest ownership patterns and agendas requires a new set of public policy tools to ensure sustainability of both the resources and the region's quality of life. Our hope is that this project provides an overview of the job at hand and explores tools that might be used to undertake that job.



Photo: Brad Garmon, MEC

Introduction



Photo: ISTOCK

Motivations for this Project

FORESTED AREAS MAKE UP THE MAJORITY OF LAND COVER IN MICHIGAN'S UPPER PENINSULA (UP), representing approximately 8.5 million acres or 79 percent of the total land base. Over half of the employee compensation in the manufacturing sector in the UP comes directly from forest products industries, which rely on these forestlands.

However, Michigan's UP forestlands are undergoing a transformation in land ownership and economic makeup. More than one million acres of UP corporate forestland changed ownership in 2005 and 2006, moving primarily from traditional land owners directly tied to forest products industries (VITPC) to large-tract forestland investors.

Two recent large-scale land sales underscore this change. In 2005, Plum Creek Timber Company, Inc. purchased 650,000 acres in the UP from Escanaba Timber LLC, formerly Mead Paper and MeadWestvaco. The purchase made Plum Creek, headquartered in Seattle, WA, the largest private landowner in Michigan.

The second major land sale was in 2006 when International Paper (IP) sold 440,000 acres in the UP to the consortium of GMO Renewable Resources, LLC.

These two sales, moving large-tracts of forestland out of VITPC and into ownership by REITs and TIMOs respectively, essentially completed the transition of large-tract forestland ownership in the UP. The sales left Vulcan Timberlands as the last large-tract (greater than 10,000 acres) VITPC in the UP, and their registered commercial forest holdings of 13,871 acres are quite small by comparison to other large-tract owners.

Other recent notable sales activities include the purchase of 6,275 acres of land on the Keweenaw Peninsula by the State of Michigan with assistance from The Nature Conservancy; The Forestland Group, LLC's purchase of 390,000 acres from the Kamehameha Schools Trust of Hawaii; and We Energies' announcement of the potential sale of 11,000 acres in the Western UP. The Forestland

Group, LLC purchase provided the opportunity for the Northern Great Lakes Project, in which The Nature Conservancy and the State of Michigan entered into an agreement with them to protect more than 271,000 acres.

Michigan is not alone. Nationwide, in the ten years up to 2006, the forest industry—including familiar companies like International Paper Co., MeadWestvaco Corp., and Boise Cascade—have sold more than 31 million acres of forestland. According to Laura Madarno of *Marketwatch*, “about 25 million of the sold acres, or 80 percent, ended up in the hands of financial investors [that include insurance companies and specialized asset managers]. The nation's 504 million acres of forestland, home to wildlife and the source of everything from deck frames to copy paper, have been the focus of a massive multi-year auction, the outcome of which is set to change the rules for wood companies and conservationists alike” (Madarno 2007).



Photo: Brad Garmon, MEC

The New Forestland Owners

VITPCs such as International Paper and Mead Paper owned both land and processing facilities, like pulp and paper mills. They often viewed forestland as a strategic contribution to the mill rather than an investment in its own right (Mendelsohn 2002). VITPCs are typically publicly traded corporations whose primary financial concerns are after-tax earnings per share, cash flow and return on investment (Browne 2000). Timber harvest and management practices of VITPC generally reflected a long-term perspective.

The new owners are TIMOs and REITs, which place a larger emphasis on forestland as a real estate investment. This is not to say the new owners are not in the business of timber production. In addition to open-market sales, in many cases the new owners have log supply agreements with the previous owners' mills (such as the 10-year fiber supply agreement with the Verso Paper mill as part of the purchase agreement in the International Paper sale). Rather, the producers and the consumers of logs are not the same companies, and the connection between the two is based on agreements and market transactions.

A Real Estate Investment Trust (REIT) is a kind of company or trust that invests almost exclusively in real estate and is structured to change the way income is effectively taxed. By distributing at least 90 percent of income as dividends, income is taxed at the shareholder and not the corporate level (Matheson 2005), and effectively at a lower rate than it would have been if earned by a VITPC (Hickman 2007). Financially, REITs emphasize growth in funds from operations and stock prices and typically seek to minimize volatility in harvest levels (Block and Sample 2001).

Nearly all publicly-traded REITs in the United States (U.S.) invest in industrial, retail or residential

property and the emergence of the large-tract forestland REIT is a very recent phenomenon (NAREIT 2007). In 1999, the REIT Modernization Act permitted the establishment of Taxable REIT Subsidiaries (TRS), which permitted the parent REIT to operate as a real estate investment company while controlling traditional business units, such as processing facilities or real-estate development ventures, as subsidiary units (Matheson 2005). In 1999, Plum Creek converted from a VITPC to become the first large-tract timberland REIT structured in this way.

The "Investopedia Dictionary" defines a TIMO as a "management group that aids institutional investors [such as pension plans and endowments] in managing their timberland investments." (Invest 2007). A TIMO doesn't actually own land; they package and broker a timberland investment for their institutional clients. Thus, TIMOs seek to find, analyze and acquire investment properties that would best suit their clients' goals. Once an investment property is chosen, the TIMO is given the responsibility of actively managing the timberland to achieve adequate returns for the investors.

Tax and accounting issues are less important for TIMOs because taxes apply to the revenue and capital gain realized by the investor, not to the ongoing forestland operations. Thus, from a financial perspective TIMOs emphasize cash flow, timing of cash flow, and total returns on investment, and they apply modern portfolio theory to their decision-making (Hickman 2007; Block and Sample 2001). Many TIMO investments are closed-end funds with a 10–15 year time span for holding the asset. Some funds may be re-evaluated at the end of their cycle for hold/sell decisions (Browne 2005). A TIMO might see only about one third of the net present value return from an investment come from operations while the rest comes from value at exit, when the investment is sold (Greger 2002).

Motivations for Ownership Change

Hickman (2007) suggests that the reasons for these changes in forestland ownership may be viewed from three perspectives: why some VITPCs sold their lands, why TIMOs bought forestlands, and why some VITPCs converted to REITs and placed mills in a TRS. Concise summaries of many of the issues and motivations that may have driven large-tract forestland ownership change to TIMO and REIT types are offered by Hickman (2007), Clutter et al. (2005), Ravenel et al. (2002) and Block and Sample (2001).

It may be easy to overlook the reality that ownership change would not have occurred if VITPCs were not motivated to sell. Taxation and accounting issues have not been favorable for traditional VITPCs, and rising land value combined with the perception that open log markets could provide a reliable supply have eroded traditional arguments for the VITPC structure.

Restructuring as a REIT captures tax and accounting advantages, and through TRS allows a REIT to function like both a real estate and a forest products enterprise. Thusly structured, REITs and TIMOs as real estate investments are appealing to institutional investors because of strong historical risk-adjusted returns, opportunities for portfolio diversification and as hedges against inflation.

In the UP, the convergence of many factors, from global to local, is driving ownership change. Advances in technology, communications and

transportation infrastructure have made the UP less “remote.” Land use trends, population changes and demographics also play important roles.

Additionally, the region is affected by powerful dynamics in the national and global economy, as resource supply and demand respond to the increasingly “flat” world marketplace.

Issues, Threats and Concerns

It is not surprising that forestland ownership changes have been driven by financial motivations. After all, the lands in question are and have for

many decades been held in institutional ownership. For many stakeholders, however, ownership changes are threatening because of the uncertainty in the attitudes of the new owners towards their new lands. In the UP, economic prosperity, wildlife habitat, recreational opportunities and public access all depend on attitudes and activities of large-tract forestland owners.

One of the primary concerns expressed about the transition to primary ownership by REITs and TIMOs is whether

forestlands with a so-called “higher and better use” economically might be more prone to parcelization than under previous VITPC management. For example, Plum Creek has an active real estate development business through a TRS that contributes a sizeable portion of operating income (Plum Creek Timber Co. 2007). As parcelization increases and large-tract ownership is reduced, public access and wildlife habitat decline (Rinkus and Markham 2006, Nelson 2001, and Radeloff et al., 2005). This concern has prompted increasing

In the UP, the convergence of many factors, from global to local is driving ownership change. Advances in technology, communications and transportation infrastructure have made the UP less “remote”. Land use trends, population changes and demographics also play important roles.



interest in the future of the UP's economic makeup and its traditionally resource-based rural communities.

The increased emphasis on portfolio theory among institutional investors may produce more frequent or more dramatic ownership changes in the future (Block and Sample 2001). Portfolio evaluation may be significant at the end of a closed-end fund. Laura Madarno of *Marketwatch* writes, "While these types of investors continue to log, their growing role in the industry has cast a long shadow over what happens to these forestlands 10 or 15 years from now" (Madarno 2007). As Bob Izlar, director of the University of Georgia's Center for Forest Business, told the magazine, "There's an uncertainty in the general conservation community about the long-term predictability that [these lands] will stay in timberland and won't go into a golf course."

Such outcomes, if realized, could impact the long-term economic outlook of the forest products and tourism industries in the UP, with far-reaching implications for the social, cultural and environmental character of the region. However, it is too early to tell definitively when or if such changes might occur under the new ownership regimes. Many factors, including land values, demographics, markets, and forest products profitability, will determine the future land use patterns of the UP. All are reasons for stakeholders to take an active role in learning about and planning for future UP forest management.

Care should be taken to view issues in the larger context of threats to northern forests. For example, while the impact of parcelization on wildlife habitat is real, the likely rate of development in even the worst case is likely far smaller than many other conceivable threats. In contrast, in about a decade

the emerald ash borer has killed more than 20 million trees in the Midwest, mostly in Michigan.

Kathryn Fernholz, of the non-profit forestry research group, Dovetail Partners, Inc. sums up the issue as follows:

“The sale of large tracts of forestland by forest products companies to financial interests both creates opportunities and raises concerns. The concerns rest in the unclear commitment of ownership groups to long-term sustainable forest management and the role these groups might play in parcelization of forestland and associated development. The opportunities lie in the potential for increased investment in forest management and productivity, and in the access of new ownership groups, e.g. environmental organization, socially responsible mutual funds and other concerned groups, to these properties and the control and influence that could entail. In reality, TIMOs and REITs are market-based tools that will impact forests primarily based on the goals of those organizations that choose to participate in them” (Fernholz 2007).

Project Goals and Objectives

This People and Land (PAL) project focuses on a central question of land use in Michigan's UP: How will such changes in ownership of large-tract forestland affect wildlife habitat, public access and the economy? The answers have significant importance for residents, businesses, the forest products industry and seasonal visitors to the UP, where outdoor pursuits and access to large tracts of forestland are linchpins of the lifestyle and economy.

This report collects and presents a range of relevant ownership change data, scenario analysis, economic

information, state and local tools, and recommendations to inform future debate, discussion and action. It is not intended to be the final word on the issue, but rather an entry point to a conversation through education, information and analysis that might point the way to future tools, research needs and information gaps.

The first section of this report examines ownership changes and presents scenarios for possible landscape fragmentation based on these trends. Part 2 focuses on the economy of Michigan's UP with a special emphasis on the role of forest products and tourism industries. Part 3 explains the range of existing tools and strategies currently available to help support the sustainability of contiguous, large-tract forestland ownership, including state incentives and local planning capacity. Finally, recommendations at the conclusion of the report suggest ongoing programs and various changes communities and leaders can implement to help protect the traditional access and economic drivers the forests provide while adjusting to the shift in ownership patterns.

The goal of the project is to provide information to be used in community planning and to inform the public debate about the menu of public policies, investments and incentives that might be appropriate for addressing the changes and forces impacting the UP.



Photo: Robert Froese, MTU

Part 1. UP Forests, Forestlands and Large-Tract Forestland Owners

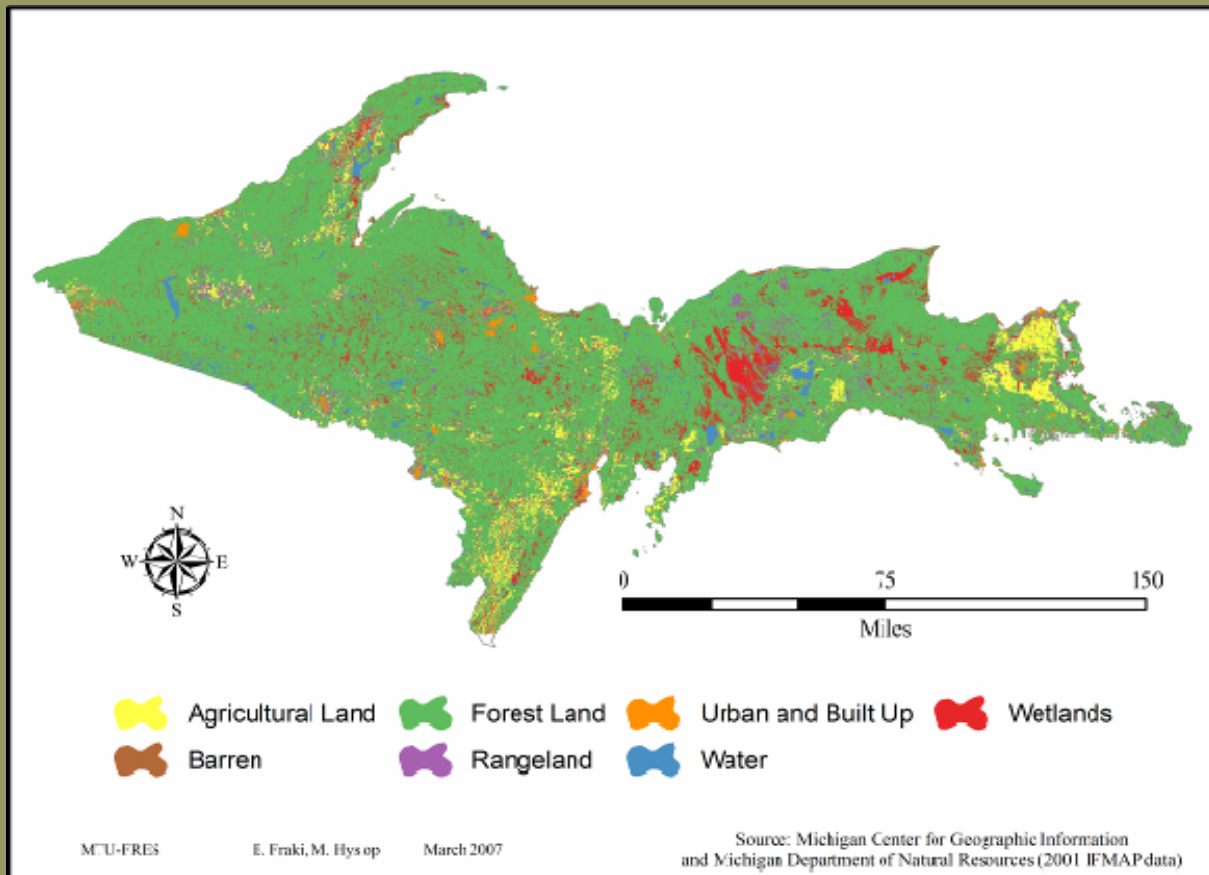


Figure 1. UP Land Use and Land Cover

Table 1. UP Land Use/Land Cover

Use/Cover	Area (million acres)
Forest Land	8.423
Wetlands	0.861
Agricultural Land	0.486
Rangeland	0.409
Water	0.242
Urban/Developed	0.171
Barren	0.017
Total	10.609

Current Land Cover and Forestland Ownership

THE UP LAND BASE IS APPROXIMATELY 10.6 MILLION ACRES. The distribution of these lands among cover types is shown in Figure 1 and detailed in Table 1.

Forested areas make up the majority of land cover in the UP, representing 79 percent of the total land base. Public lands, represented by federal and state ownerships or rights (excluding mineral rights) constitute the approximately 4.2 million acres shown in Figure 2 on the following page. The remaining approximate 4.2 million acres of UP forestland are owned by a

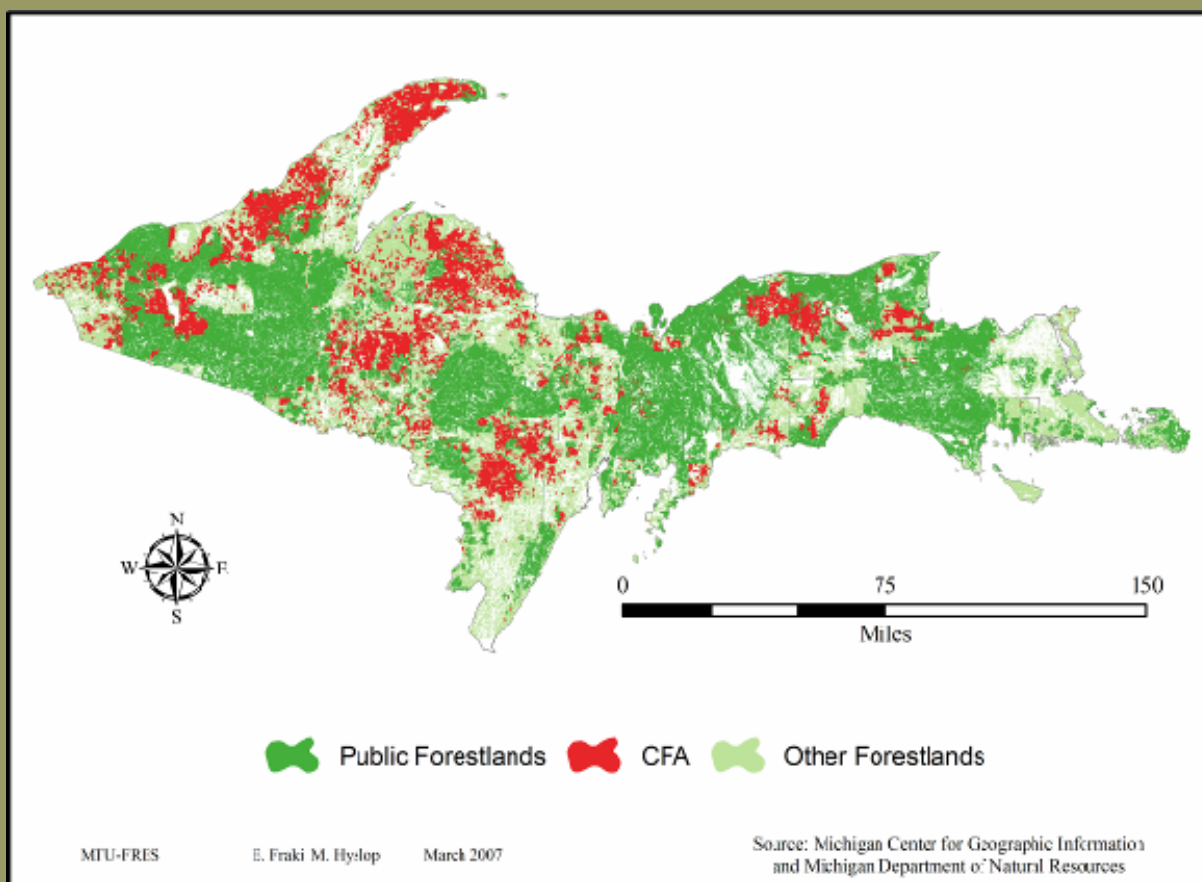


Figure 2. UP Forestlands

Forestlands are almost entirely comprised of national and state forests. Both CF and Other Forestlands are held by a mix of corporations, trusts and private individuals.

Table 2. Forest Land Area (acres) By Major Owner Class

County	Owner Class			Leading Corporate Owner
	Corporate	State	Federal	
Alger	169,159	99,485	158,599	The Forestland Group
Baraga	234,117	80,244	44,673	Plum Creek
Chippewa	46,861	225,977	242,762	Plum Creek
Delta	62,527	71,564	244,397	Plum Creek
Dickinson	48,602	228,916	0	GMO Renewable Resources
Gogebic ¹	166,442	21,116	305,714	Keweenaw Land Association
Houghton	144,615	63,252	155,839	The Forestland Group
Iron	166,728	99,255	176,496	The Forestland Group
Keweenaw ²	144,634	4,948	0	GMO Renewable Resources
Luce	111,226	298,061	0	The Forestland Group
Mackinac	19,679	209,397	152,150	Plum Creek
Marquette	358,462	270,692	18,147	Plum Creek
Menominee	115,970	100,299	0	Plum Creek
Ontonagon	179,079	77,578	284,062	Plum Creek
Schoolcraft	64,141	297,949	215,347	Plum Creek

¹Gogebic County also has 50,290 acres of county forest in public ownership.

²Keweenaw County areas exclude Isle Royale.

mixture of entities such as private individuals, corporations, various organizations including conservation groups, and local governments. A county-by-county summary of the acres of forestland ownership by class (corporate, state and federal) is shown in Table 2 on the previous page.

Large corporate land owners, which are the focus of this study, have had most of their lands enrolled in the Michigan Commercial Forest (CF) program. The CF program provides a property tax incentive for landowners to encourage long-term commercial forestry management in exchange for public access for hunting and fishing. A summary of these owners and the total CF enrolled acreages are shown in Table 3 below.

In Michigan, the transition from VITPC ownership to large-tract forestland investors is essentially complete. The 2005 announcement of International Paper's transfer of land holdings to GMO Renewable Resources, a TIMO, leaves Vulcan Timberlands as the only remaining large-tract VITPC (greater than 10,000 CF acres) in the Michigan UP, and their registered CF land holdings



of 13,871 acres are quite small by comparison to other large-tract owners.

Vulcan has been a long-term holder of UP forestland, active in timber sales with production facilities through a partnership of Vulcan Bowling Pin Co. and Brunswick, Inc. (Vulcan 2005). Vulcan has holdings in Houghton and Ontonagon counties, with the majority in Ontonagon County. In both counties, Vulcan's holdings have shown slightly increasing but relatively stable ownership.

Ownership of UP forestland by TIMOs is increasing at a higher rate than ownership in other owner types. With the transfer of International Paper land to GMO, the TIMO owner-type category represents the largest holder of UP private forestland. The Forestland Group has holdings in all counties except Delta, Dickinson, Mackinac and Menominee, with the largest ownership in Alger County (See Appendix A).

By owner-type, REITs are the second largest holder of UP forestland. The REIT owner-type is represented in large-tract holdings in

Table 3. Leading UP Corporate Forest Land Owners as of August 2006

Entity	Owner Type	CF Acres
Plum Creek Timber Company, Inc.	REIT	633,900
The Forestland Group, LLC	TIMO	518,050
GMO Renewable Resources, LLC ¹	TIMO	419,930
Keweenaw Land Association, Ltd.	LAND	144,900
Longyear holdings	LAND	65,351
Nature Conservancy	CONSERVE	23,076
Cleveland Cliffs Iron Company, Inc.	MINERAL	15,540
Vulcan Timberlands, Inc.	VITPC	13,871
Group Total		1,834,618

¹ Note: The actual owner of the reported CF Acres as of August 2006 was International Paper, Inc. Precise acreage retained in CF after the transfer to GMO Renewable Resources, LLC is not known.

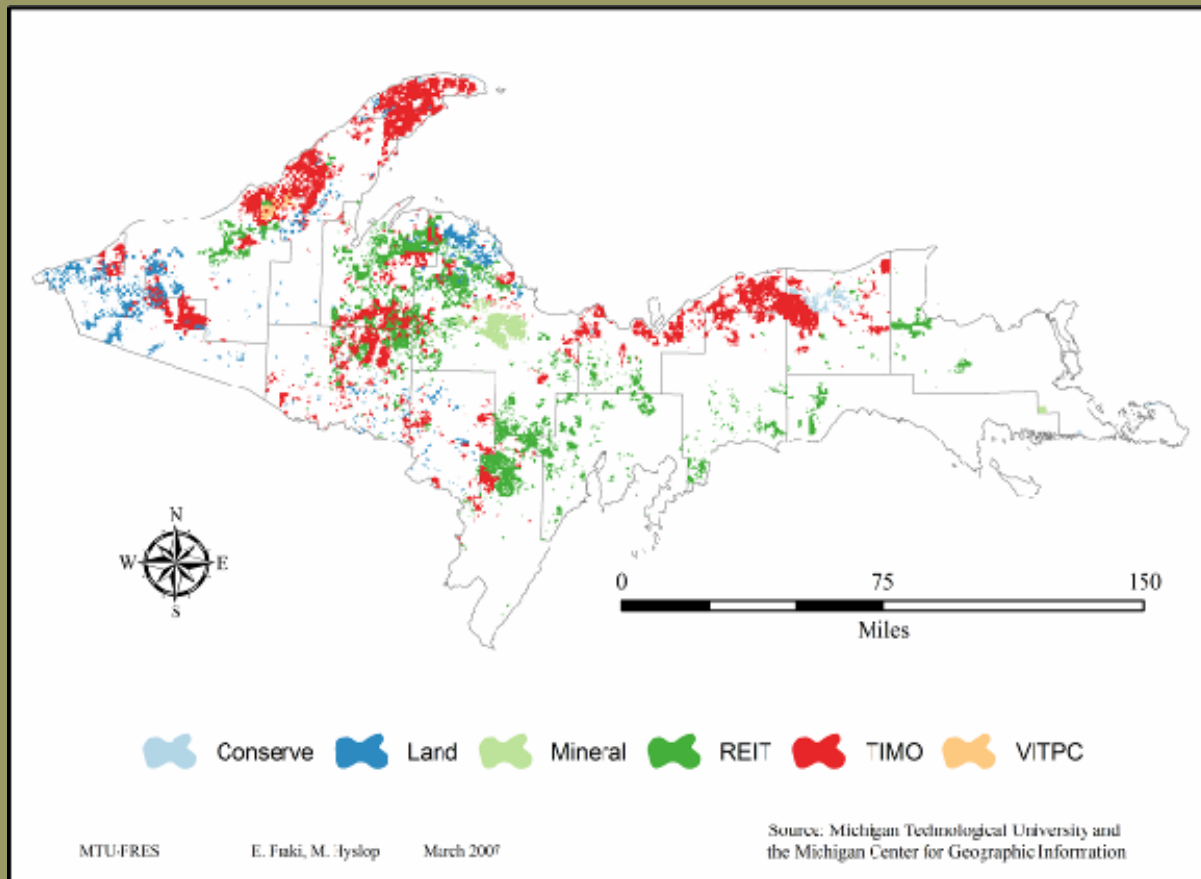


Figure 3. Current Large-Tract Corporate Ownership in the UP by Owner Type

Sampling date varies by county and only indicates general patterns.

the UP by Plum Creek Timber Co., the largest single forestland owner. Plum Creek was the first REIT and is the largest private owner of forestland in the US, with the majority of its UP holdings obtained from Escanaba Timber Co. in 2005 (Plum Creek 2006).

The distribution of the present large-tract corporate forest owners by owner-type is shown in Figure 3 above. This figure is a generalized representation of current large-tract UP forestland holdings because the most recent inventory year varies by county (2003 - 2006). Thus, the figure does not reflect actual ownerships at any specific point in time, but is indicative of the general pattern.

Risks and Implications of Forestland Parcelization

The nearly two million acres of investor holdings in the UP approximate a quarter of total forestland, with public holdings accounting for another 50 percent. The remaining 25 percent constitute a significant land use complexity. However, the reasons for owning most family forests in the northern U.S. are for the enjoyment of beauty and scenery, privacy, and protection of nature and biological diversity (Butler and Leatherberry 2004). Other reasons for ownership include recreation, land investment, family legacy and timber production.

Large-tract forestland investors expect a reasonable return on their investments. The returns can come from several sources: sale of timber, sale of other services (e.g., easement for environmental protection), sale of land for so-called “higher and better” economic uses, and property value appreciation. The majority of large-tract corporate forestland owners currently hold third-party certification for sustainable forestry practice, such as Sustainable Forestry Initiative, Forest Stewardship Council or both. Most lands are also enrolled in Michigan’s CF program, allowing certain levels of oversight and disclosure of management actions. The amount and location of land enrolled in the CF program is significant to understanding overall UP forestland trends.

One of the primary questions arising from the recent corporate forestland sales is that contiguous forested lands might become more fragmented as a result of “parcelization,” defined as “the subdivision of land under a single ownership into smaller parcels under a diverse ownership” (Drzyzga and Brown 2002). Fragmentation refers more to physical landscape changes in the size and shape of forestlands. Parcelization has been shown to be a frequent precursor to fragmentation (Radeloff et al. 2005, Rinkus and Markham 2006).

PARCELIZATION HAS IMPLICATIONS FOR FOREST MANAGEMENT, PUBLIC ACCESS AND WILDLIFE HABITAT.

Forest Management

Parcelization affects the availability of timber. More owners of smaller tracts mean more effort is needed to acquire a company’s wood supply. This, in turn, increases the cost of doing business. Moreover, as parcel size declines to less than 100 acres, the likelihood of timber harvesting decreases considerably (Butler and Leatherberry 2004). Parcelization could lead to a greater range of management principles and objectives per

management unit, adding uncertainty to the nature and status of forest management and condition (Drzyzga and Brown 2002).

Public Access

Public access to large-tract corporate lands for activities such as hunting, fishing, trapping and hiking is a tradition in the UP, and has been provided through the CF program and the permissions granted by individual companies. De-listing and removal of CF lands from the program

would impact this access.

Public access to large-tract corporate lands for activities such as hunting, fishing, trapping and hiking is a tradition in the UP.

From a recreational standpoint, parcelization likely adds more “No Trespassing” to the landscape and can disrupt existing travel corridors. While total land enrolled in and

being withdrawn from the CF program is important, the location of parcels is also of interest. The loss of key parcels may inhibit public access to other CF land. Byron Sailor, a UP resident who retired from the MDNR, explains that he “used to drive the Tracey CK road from south of Covington all the way through to Nestoria. One landowner bought a piece of CF, removed it from the program, put up a gate and now you can no longer drive through that road. You go in 16 miles turn around and come out, or drive in about the same distance from the other way and turn around.” Another example was given in Baraga County, where “the Celotex road through to Big Bay or Nestoria” is now gated, requiring travelers to take other routes (Sailor 2007).

In the case of hunting (Nelson 2001), it has been shown that restrictions placed on the discharge of

Case Study

A History of Changing Forestland Ownership

Today, more than 1,300 people work at the NewPage plant in Escanaba; the company is the largest employer in Escanaba, and easily the largest pulp and paper facility in Michigan. Until recently, the mill had extensive timberland holdings. Those lands are now owned by Plum Creek Timber Company, Inc., a timberland real estate investment trust.

It's a story that began in 1912, when pulp-making first came to Escanaba. By 1920, under the direction of George Mead, a paper mill was added, newsprint production was underway, and the Escanaba Paper Company was born.

Over time, Mead expanded the operation by acquiring and managing forestland as well as the plant. With his 1945 purchase of 20,000 acres, Mead began 60 years of company-based forest acquisition and management, purchasing forestland from Cleveland-Cliff Iron Company, Cadillac Soo Lumber Company, Copper Range Company, Ford Motor Company, Champion International, and many others. Mead became the largest private landowner in the UP when the company purchased 87,000 acres from Ford River Timber Company (formerly Sawyer-Stoll Company) in 1975.

Along with pulp and paper processing, forestland ownership remained a significant part of the Mead legacy until 2005, when Escanaba Timber LLC, (formerly Mead Paper and MeadWestvaco) sold its 625,000 acres to Plum Creek.

Many UP companies have bought and sold UP forestland over the years. Every purchase and sale brought questions about the future, as Plum Creek's acquisition does today. For at least the next decade, Plum Creek will continue to supply wood to the NewPage mill, but the era of forest products companies owning forestland appears to be over.

firearms in proximity to structures limited access. Typically, a safety zone of 450 feet is required around buildings. Using a new 30 x 30 foot structure as an example, Nelson calculated nearly 16 acres of land becomes unavailable for hunting. Further loss of public access to public land may occur by parcelization of fringe areas isolating or "land locking" landscape features.

Wildlife Habitat

As parcelization increases and large-tract ownership is reduced, it has been shown wildlife habitats decline (Rinkus and Markham 2006, Nelson 2001, and Radeloff, et al. 2005). Habitat loss and fragmentation are two of the most direct impacts of development on previously undeveloped land. Fragmentation negatively affects wildlife in a number of ways, including interfering with wildlife travel, decreasing habitat size, and reducing interaction with other wildlife communities. Fragmentation produces declines in both the number of species (diversity) and populations (abundance). Studies suggest that habitat destruction is the main factor threatening 80 percent or more of the species listed under the federal Endangered Species Act. According to research, more than 95 percent of listed species are endangered to some extent by habitat loss or alteration (EPA 2001).

The associated infrastructure (roads, buildings, etc.) that often follows parcelization leads to forest fragmentation that jeopardizes large mammal and bird habitats (Radeloff, et al. 2005). These habitats are disrupted by factors such as human activity, destruction of connecting pathways between areas of forest cover and decreased area of interior forest and forest edge environments (Bryan 2004).

Potential for Parcelization

Large-tract corporate lands divested into smaller-tract ownership during the past 20 years are indicated in Figure 4 on the opposite page. Because

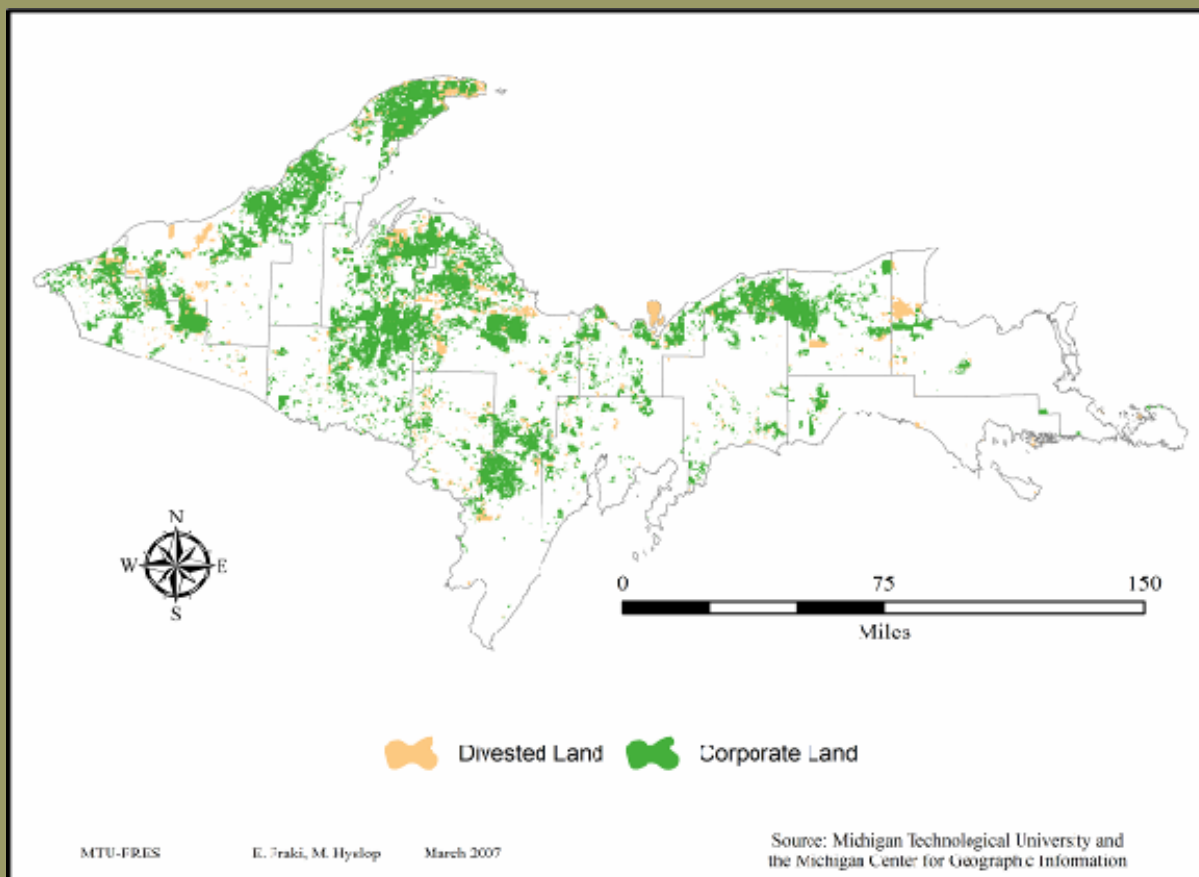


Figure 4. Large-Tract Corporate Ownership in the UP

The date varies by county, from 2002-2006.

the two points in time used to determine ownership change vary by county, this representation is very simplified and should be interpreted with caution.

The nature of corporate forestland holdings is changing as a result of such transfers. For example, in Keweenaw County total large-tract holdings declined from nearly 167,000 acres to 145,000 acres. Many measures of parcelization indicate an increasingly fragmented corporate land base. In the county, between 1994 and 2006, the number of parcels less than 40 acres in size nearly doubled, and mean parcel area declined from more than 10,000 acres to about 5,000 acres. In other UP counties, mean parcel size has increased over time, but this can be due to divestiture of smaller parcels or strategic acquisitions designed to make holdings contiguous to decrease the cost of forest operations.

In general, contiguous corporate holdings have been decreasing in maximum area, with the exception of Iron, Baraga, Chippewa, Luce and Mackinac counties. Of these five counties Baraga showed the largest increase in maximum contiguous area with over 25,000 acres gained. Marquette, Keweenaw, and Ontonagon Counties had the largest declines in contiguous area.

To highlight corporate lands that might have a relatively higher or greater potential for alternative uses, buffers were created around landscape features that might affect this value, including lakes, rivers, shoreline, roads and urban areas. In the case of roads, those included were state and federal highways, major and minor arterials, general non-certified roads, and U.S. Forest Service roads. For lakes, those bodies of water greater than or equal to 10 acres in size were buffered. With few exceptions,

the 10-acre minimum area included all named lakes, based on Michigan Geographic Framework data. Rivers, including creeks and streams, are those bodies that may be intermittently dry, but are large enough to be identifiable, without vegetation covering the water body from bank-to-bank (Michigan Geographic Framework, definitions 2007).

Buffers were compared with corporate holdings to measure the amount of corporate land that fell within the buffered regions. Regions were defined as lands that fell within 5 miles of urban areas and 0.25 miles of other features. While the most recent sampling dates vary across counties from 2003 to 2006, the percentage of corporate land falling within the buffered regions is quite pronounced, ranging

from 38 percent in Mackinac County to 76 percent in Marquette County (Table 4 below). A map of the total area falling within all buffers is shown in Figure 5 on the opposite page

Based on these buffers, changes in ownership within specific land categories were examined in more detail. Lands in these buffers indicate lands being divested out of large-tract corporate ownership into smaller-tract ownership, and thus reflect acreages more likely to be subject to forest management trends associated with parcelization:

- Land Adjacent to Great Lakes Shoreline**
 Corporate-owned lands adjacent to Great Lakes shoreline in the UP generally decreased over all sampling periods. Of the thirteen counties with

Table 4. Corporate Forestlands of Potential Higher and Better Use.

County	Sampling Date	Corporate Land Area within Buffered Feature (acres)			Percent of Total Corporate Land Area within Buffers
		Rivers and Lakes Only	Shoreline Only	All Features Together	
Alger	2004	60,346	525	108,080	64
Baraga	2006	116,393	188	149,404	64
Chippewa	2003	12,976	495	22,379	48
Delta	2004	19,690	38	28,325	45
Dickinson	2006	9,782	0	24,167	50
Gogebic	2005	62,588	1,693	94,947	57
Houghton	2006	47,612	1,656	92,915	64
Iron	2006	61,455	0	95,971	58
Keweenaw	2006	55,900	2,735	87,218	60
Luce	2005	34,533	83	48,615	44
Mackinac	2006	4,608	413	7,455	38
Marquette	2006	162,594	503	271,290	76
Menominee	2003	32,711	0	54,074	47
Ontonagon	2004	76,711	34	91,063	51
Schoolcraft	2005	21,431	220	31,853	50

shoreline, two began and ended their respective sampling intervals with zero frontages – Delta and Menominee, Luce, Ontonagon, and Baraga Counties showed 100 percent divestiture of these types of corporate lands. Chippewa, Houghton, and Marquette Counties saw slight increases in shoreline area over their respective sample periods (9 to 11 years), with Houghton County leading with 994 acres of shoreline adjacent land while Chippewa and Marquette Counties each had less than 200 acres. Keweenaw had the largest holdings of shoreline area, approximately 1,500 acres based on the current sample date of 2006, representing a decline of approximately 51 percent over a twelve-year period. The least amount of

remaining corporate shoreline area was found in Schoolcraft County (145 acres) from 2005 data.

- **Land Adjacent to Urban Areas**

No increases in corporate land adjacent to urban areas were found across the counties. Seven counties were constant at zero adjacent area for their respective sampling intervals. Marquette County has the largest area of adjacency with 6,623 acres from its current sampling date of 2006, an approximate 37 percent decline in area over an eleven-year period. Keweenaw County ended its sampling period 100 percent divested of such lands. Delta County, sampled in 2004, showed the least remaining adjacent area (18 acres), an

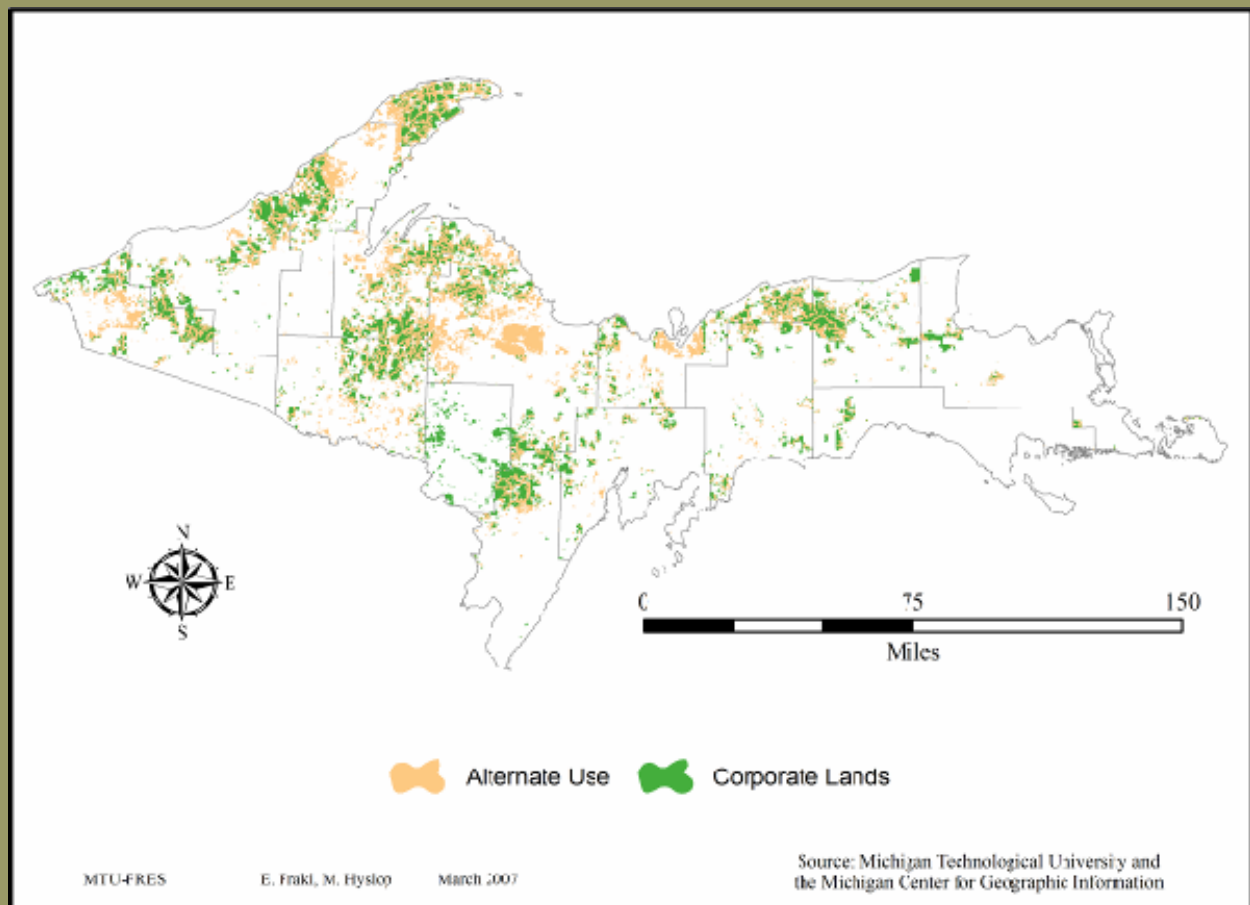


Figure 5. Corporate Forestland of Potential Higher Alternative Economic Use Value

approximate 94 percent decline over a fourteen year interval.

- **Land Adjacent to Lakes**

All counties contain corporate land adjacent to inland lakes, with the exception of Mackinac, which was 100 percent divested at the time of the 2006 sampling date. Marquette County showed the largest area of adjacent corporate lands with 22,229 acres from its current sampling date of 2006, a 26 percent decline over an eleven year period. Delta County had the least area (402 acres) based on a 2004 sampling date, following an approximate 33 percent decline over fourteen years.

- **Land Adjacent to Rivers and Roads**

Large corporations hold forestland adjacent to rivers and roads in all counties. Declines in these areas were found over the various sampling periods in all counties.



Photo: Robert Froese, MTU

Case Study

Development Coming to UP Power Co. Waterfront Lands

In late 2005, the Upper Peninsula Power Company (UPPCO) sold land around several of its hydroelectric dams to Naterra Land, a company that buys and sells waterfront and wooded property for housing construction.

The property sales included 960 acres near Bond Falls in Ontonagon County, 150 acres near Boney Falls in Marquette and Delta counties and 250 acres near the Cataract Basin in Marquette County.

The prospective developments, which could include as many as 424 homes near Bond and nearby Victoria Falls, have raised concerns about forest fragmentation and loss of public access to traditionally open areas.

At Bond Falls, proposed paths and stairways leading from residences to private docks on the water have generated vehement opposition from locals, who see it as private appropriation of a public resource.

Similarly, according to the Milwaukee Sentinel newspaper, We Energies of Milwaukee, WI, sold about 7,400 acres, mostly in the UP, in July, 2007. The lands are near the utility's hydroelectric dams, and the deal was closed with Wild River Properties LLC of Marquette, Mich. Some land will be used by the timber industry and other parcels will be resold, according to We Energies (Content 2007).

It's clear that Naterra, Wild River, and others see potential in the UP for land sales and possible development. Conflict stemming from isolated developments in areas traditionally open to the public may become more frequent in the coming years.

Part 2. The Role of the Forest Products and Tourism Industries in the UP Economy



Photo: ISTOCK

THE ECONOMY OF THE UPPER PENINSULA IS TIED CLOSELY TO THE FOREST PRODUCTS INDUSTRY AND TOURISM.

Access to forestlands for land-based tourism and forest management help maintain these industries, and widespread parcelization of large forestland tracts would adversely affect them. However, forestland acquisition and divestiture have long been a part of the UP culture, so re-sale of UP forestlands is expected in the future (see Case Study, p 24); a concern is the extent and rate of parcelization, which naturally occurs as industries/firms expand and contract.

Land-use changes can affect the vitality of forest products and tourism industries, and these industries have connections to many other industries in the region. These industries cover an array of economic sectors (see Appendix B). Each of these

Case Study

Downeast Lakes Forest Project Shows Value of Public Engagement

When 446,000 acres of Maine timberland were sold to a timber management investment organization and harvesting was intensified, community fears of development became palpable.

Potential threats to the region's tourism economy were addressed with a three-part conservation project including 500-foot riparian buffers on 50 miles of waterways, a 27,000-acre purchase and a 312,000-acre conservation easement.

To build support and rationale for the project, the groups invested in studies cataloging the natural resources on the forest lands. They also conducted outreach to teach the public and policy makers that the resources are key to an economy built largely on recreational pursuits and attendant businesses.

The Friends group also evolved into a community leader, marshalling public support for a deal it bills as “the first northern Maine forest conservation project that is community incubated, community supported, community led and designed to sustain a natural resource based, rural economy and lifestyle.”

The protections were engineered by three core partners: The New England Forestry Foundation, Friends of the Downeast Lakes and the Woodie Wheaton Land Trust. The cost was \$31.5 million. The deal closed in 2005.

The Downeast example illustrates how community-based initiatives can be successful in securing and maintaining land protections that wouldn't otherwise occur. (See Appendix D for more information.)

sectors has its own unique linkages to other parts of the UP economy, and to the state and regional economies.

In 2003, the UP accounted for 3.2 percent of the Michigan population, 3.7 percent of the state's establishments, 2.0 percent of the state's employee compensation, 2.7 percent of the state's employment, and 1.9 percent of the state's industry output/sales. With 15 of 83 counties, it contributes a fairly small portion of the overall economic activity. It is relatively worse off economically on average than many parts of the state. For example, average employee compensation in the UP is 73.6 percent of the state's average, and unemployment rates are generally higher in the UP than in the state as a whole.

Unlike other regions of Michigan, the UP population level has been fairly stable since early in the 20th century, and the western UP has actually experienced a population decline in recent decades. The UP is not a region that can rely on population growth as a major economic driver. Hence, maintaining and expanding economic activity in the UP through private and government investment is important.

Forest Products Employment and Production

To provide context for assessing potential effects of land use change on the economy of the UP, and especially on the forest products industries, it is useful to examine forest production and employment. More detailed tables, figures and discussion are available in the Social and Economic Assessment for Michigan's State Forests (Tessa Systems, LLC 2006).

Forest products industries are often classified as producers—logging and trucking firms that extract trees from the forest, primary manufacturers—

firms that convert those trees directly into products, and secondary manufacturers—firms that take primary products and add value to create further-processed, “value-added” products. Sawmills, for example, would be primary manufacturers, whereas firms making wood windows and doors would be secondary manufacturers.

Some firms are vertically integrated; for example, they may harvest logs, produce lumber and manufacture wood products.

More than one-quarter of the manufacturing establishments in the UP are in wood products manufacturing and paper and paperboard manufacturing. Almost half of the manufacturing jobs in the UP were associated with the forest products industries in 2003. Forestry and logging and agriculture and forestry support services were also significant employers in the UP. Average weekly employee compensation in forest products industries for the UP exceeded averages for the state as a whole for forestry and logging, wood products manufacturing, paper and paperboard manufacturing and wood furniture manufacturing.

Statewide, pulpwood production has increased slightly since 2000, but current levels are still close to those of the late 1980s (Figure 6 above). Statewide pulpwood production was 2.7 million cords in 2004,

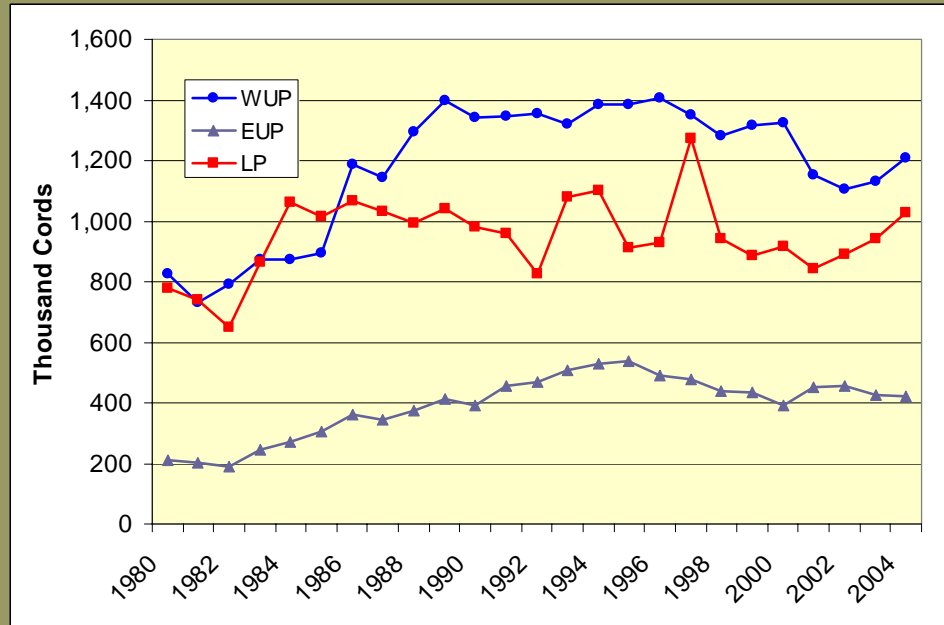


Figure 6. Pulpwood production in the UP, 1980 to 2004

Data from for the western UP (WUP), eastern UP (EUP) and Lower Peninsula (LP)

Data Source: USDA-Forest Service Pulpwood production and Timber Product Output reports.

the most recent year for which data are available. The trend in the eastern UP production in recent years has been fairly flat, but the western UP and Lower Peninsula showed harvest increases. The western UP produced more pulpwood than the Lower Peninsula or the eastern UP. Recent data on sawlog production are not available.

Based on Michigan Department of Natural Resources data, there are more than 12,000 jobs associated with forest products industries in the UP. Most of these jobs are located in the western UP. Likewise, most logging/trucking, primary manufacturing and secondary manufacturing firms are located in the western UP.

Forest Products Dependency

Concentration of economic activity based on forest products industries provides a measure of the importance of the industries within the state, regional and county economies. Though forest

products industries' output and sales were over \$11 billion in 2003, they only accounted for 1.6 percent of the state's total output (Appendix B, Table A1, Figure 6). The percentage of jobs attributed to the industries accounted for 1.1 percent of Michigan's employment. The UP regional role was significantly higher. Almost 20 percent of total UP output was directly associated with forest products industries, along with approximately 6 percent of employment (Figure 7 below).

There are other sources of economic activity directly related to the forest products economy in the UP. For example, the Michigan Department of Natural Resources and the USDA Forest Service make payments in lieu of taxes and other payments to local governments annually that are associated with forestland ownership and timber production (Leefers et al. 2003, Tessa Systems, LLC 2006). These payments total over \$6 million annually.

In addition, many of the agencies' employees work on preparing and administering timber sales. These activities are captured under government sectors

rather than the forest products industries. Finally, employees' and agencies' expenditures in these government sectors provide additional economic inputs into the regional economy.

Tourism

Tourism is an important industry in Michigan, though it is not defined by the federal government (i.e., NAICS) in the same manner as forest products industries. This is due to the nature of tourism; it is linked to many sectors—accommodations, food services, drinking places, and so on. Stynes (2002) estimated that tourism spending in Michigan totaled \$9.5 billion in 2000 (adjusted to 2003 dollars). Of this, \$750 million was associated with counties in the UP, or about 8 percent of the state's total.

In comparison, the forest products industry had statewide sales of \$11.2 billion in 2003 (Appendix B, Table A1, from IMPLAN) with \$2.5 billion of those sales in the UP, comprising about 22 percent of the state's total.

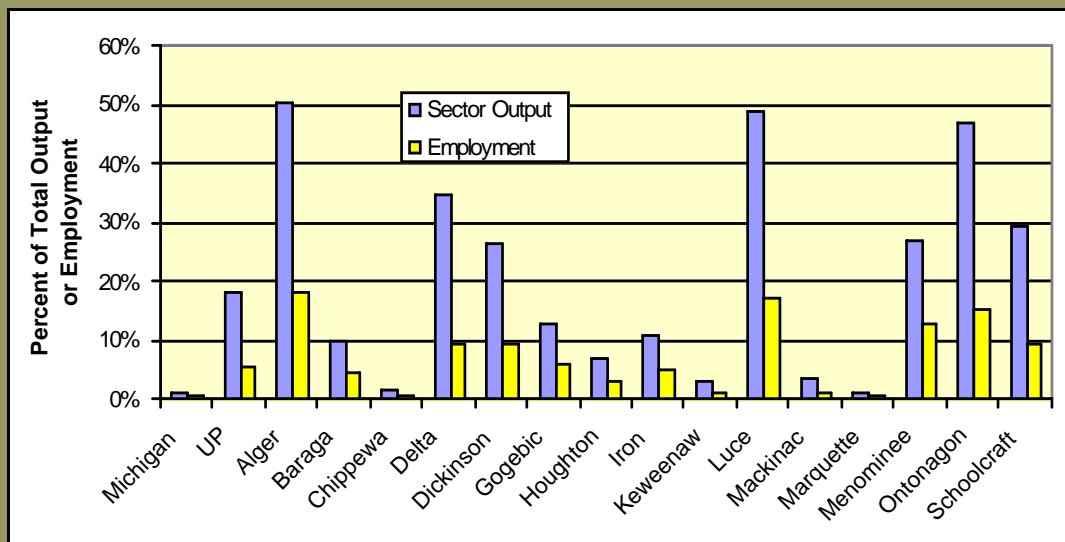


Figure 7. Forest Product Output/Sales and Employment, 2003

Data include Michigan and UP by county (dependency measure).

Source: IMPLAN Professional™, 2003 Michigan data.

Case Study

Snow Sports See Change in Public Access

Ed Stielstra, owner of Nature's Kennel Sled Dog Racing in McMillan, Michigan, sees more forestland than most - conducting sled dog tours for customers and training his teams throughout the eastern UP.

His recent experience parallels other anecdotes of gates appearing across trails and hunters lamenting an increase in "No Trespassing" postings on the edges of woodlots. Together, they suggest that new land ownership patterns in the UP are changing traditional public access to large tracts of forest.

"It's a two-track that might cross somebody's 40 (acres)," Stielstra said. "And one day it's blocked off. Oh my, you hear stories like that all the time."

Stielstra suggests the problem is two-fold: Compared to traditional large-tract forestland owners, smaller-tract landowners appear more likely to restrict access for privacy; and landowners of all tract sizes, and also the State of Michigan, appear to be enforcing the CF's access provisions (which allow only hunting and fishing access by foot travel) more stringently.

In Stielstra's personal experience, large-tract landowners like The Forestland Group, LLC have granted him permission to run sled dog teams through their land, but only if he provides proof of liability insurance. Casual hikers or hunters on a motorized vehicle don't have such insurance.

Forestland Group and other owners are only abiding by the law and protecting themselves from liability, he said. "The problem isn't the big land owners," he said. "The problem is in our laws."

Tourism tends to have a strong association with seasons; employment tends to be highest during the summer and fall months in Michigan, and unemployment is high during the winter and spring months. Tourism is often associated with lower wages (see Appendix B). Nonetheless, according to a recent U.S. Department of Agriculture Economic Research Service (ERS) study, development of recreation and tourism in rural counties yields many positive results (Reeder and Brown 2005). The study included 311 non-metro recreation counties, sometimes called recreation-dependent counties. All Eastern UP counties and four Western UP counties were included in the study.

Reeder and Brown (2005) found that the overall effects of tourism development were positive. Recreation and tourism development was associated with increased employment rates, earnings and educational attainment, and decreased poverty rates. Notably, the average population growth in recreation-dependent counties was 20 percent from 1990 to 2000, whereas the UP population increased by only 1.2 percent over the same period.

Linkages Between the Forest Products Industries and Other Sectors

Linkages between the forest products industries and other sectors of the economy are numerous. Establishments purchase goods and services directly from other establishments. The other establishments purchase goods and services from others. These additional purchases "ripple" through the economy, creating indirect effects, and the effects of changes in household expenditures (from compensation) are called induced effects.

The combination of direct, indirect and induced effects measures the total economic impact of a

change in economic activity, such as the opening or closing of a mill. The total economic impacts differ by sector, but are often twice as large as the direct impacts. Substantial changes may exceed estimated impacts because they can create structural changes in the economy.

Central to this project is the linkage between changing land ownership in the UP and its consequences. Though the potential ramifications of the change have not been enumerated, two aspects of linkages are presented. First, forest products industries purchase goods and services from other sectors of the economy. If those sectors are influenced by the change in forestland ownership, the forest products sectors are potentially affected. Second, and more explicitly, if the change leads to some direct economic decisions or activities, then those impacts can be estimated.

The relationship or linkage between the industry sector of interest and other sectors has been quantified by tracing the cost components of production. These linkages show the dollar inputs (or actually cents) required to produce one dollar of output in the sector (Figure 8). The linkages are based on nationwide relationships, but can be modified locally.

Economic structure within a region, however, is based on survey data from the region. A major part of most production functions is Value Added—employee compensation, proprietary income, other property type income (including profit), and indirect

business taxes used to produce outputs (MIG, Inc. 2004). Therefore, the price of the value-added product reflects labor, private business owners' income, rents, profits and sales and excise taxes used in the production process.

The composition of the production function varies by industry (Figure 8 below). The production functions highlight the many linkages between sectors. Each of those sectors is, in turn, linked to others. Linkages are often called backward linkages or forward linkages. One backward linkage for the sawmill sector is forestry and logging, the source of

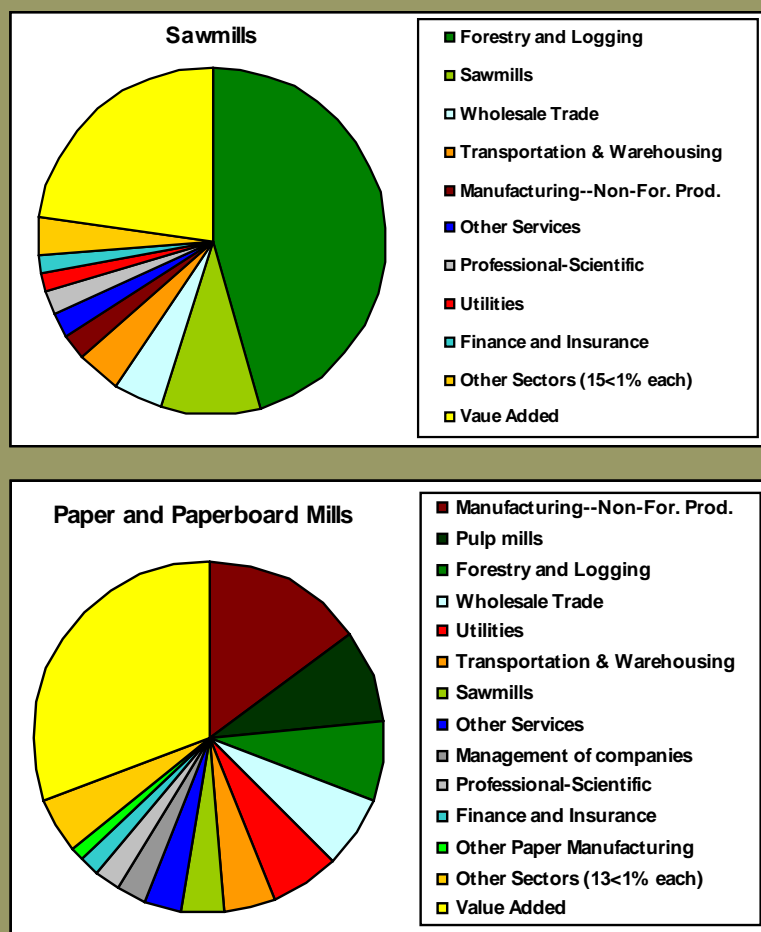


Figure 8. Sources of Inputs for Production

Data includes logging, sawmill, and paper and paperboard mill industry sectors by percent for one dollar of output, 2003.

Source: IMPLAN Professional™, 2003 Michigan data.



Photo: Larry Leefers, MSU

logs. For the forestry and logging sector, sawmills and paper and paperboard mills are forward linkages; that is, they purchase commodities sold by the logging and forestry sector.

Forest Products Industries Outlook

Several government and private sources provide projections and economic outlooks for the U.S. economy and various economic sectors. These projections are often tied to a set of assumptions. For example, the Bureau of Labor Statistics' (BLS) Monthly Labor Review (Saunders 2005) provided industry output and employment projections with some of the following standard disclaimers: no major wars, no natural catastrophes and no other unanticipated factors that could upset the behavior of the projection models. While these factors do not currently hold given recent hurricanes and ongoing wars, the overall U.S. economy is still on a growth trajectory. BLS projections provide a long-range

(10-year) estimate of employment and output by major industry sectors.

Berman (2005) reported a mixed picture in BLS' projected forest products industries employment and output in the U.S. for 2014. Projected gains in employment in wood products manufacturing (sector 321) offset losses in forestry and logging (sectors 1131 and 1132), paper manufacturing (sector 322) and furniture and related product manufacturing (sector 337). In total, employment in forest products industries nationwide was projected to be relatively unchanged. Projected increases in output were expected in all sectors except forestry, which was projected to remain unchanged.

The overall picture for forest products industries is one of continuing threats from lower-cost international competition. As part of this situation, softwood logs and lumber exports have declined in recent years, whereas hardwood logs and lumber

exports have increased. For example, softwood lumber imports from Canada have a significant part of the U.S. market. In the case of some hardwoods, the logs or lumber are exported, transformed to end products such as furniture, and then shipped back to the U.S. for sale.

Three other forces will have unknown impacts on forest products industries: biofuels, forest certification and carbon markets. Each of these areas has the potential to positively affect forest products industries in Michigan.

Tourism Outlook

Several factors influence domestic and international travel: currency exchange rates, interest rates on various loans, gasoline prices, unemployment levels, stock market performance, housing prices, type of employment, consumer confidence, economic conditions, and inflation (Holecek et al. 2007). All of these factors can influence disposable income and affect decisions to spend money on travel and tourism.

Tourism employment and sales are sometimes touted as a substitute for forest products industries. Both are important to the UP economy and culture, however. The forest products industries and the tourism industries have their own cycles. A few recent trends illustrate the importance of having a diversified economy. The highway traffic counts in Michigan have generally declined since 2004. Visits to welcome centers and traffic counts for the UP declined from 2005 to 2006. This trend was also

reflected by fewer Mackinac Bridge crossings—2006 crossings declined from 2005 (fifth straight annual decline) and were at a level similar to those in the early 1990's.

Holecek and others (2007) noted several negative indicators for Michigan tourism: high and rising energy costs, the “housing bubble” burst, high Michigan unemployment, government reductions, more road construction, a declining state image as a tourism destination, and continuing employment reductions by the Big Three. These indicators translate to less money consumers have to spend than in the past and more uncertainty about the future, leading to reluctance to spend money on travel and tourism. However, there are also some positive indicators for Michigan tourism: a robust U.S. economy, less air travel may lead to more auto travel (Michigan residents likely to spend more in Michigan), a growing population of retired baby boomers with demand for tourist activities, more school districts opening their schools after Labor Day, and growing employment in the service sector.

As with the forest products industries, other factors can influence short-term or long-term travel and tourism. On the positive side, there are efforts to promote the state as a tourism destination, including the “Pure Michigan” advertising campaign aimed at increasing tourism in the state. Three factors could also greatly influence tourism in the future: acts of domestic terrorism, even higher gasoline prices, and weather. If gasoline prices moderate, and winter and summer weather are favorable, tourism can grow.



Photo: Brad Garmon, MEC

Part 3. Strategies and Capacity to Conserve and Protect UP Forestland



Photo: Eric Kelly

IN A SURVEY OF 404 REGISTERED VOTERS IN THE UP (EPIC-MRA 2002), RESPONDENTS RANKED FOREST HABITAT DESTRUCTION AND OVER-DEVELOPMENT OF LANDS ADJACENT TO RIVERS, LAKES AND GREAT LAKES SHORELINE AS THE MOST SIGNIFICANT CHALLENGES TO CONSERVATION AND RECREATION.

Natural amenities, such as lake and river frontage, and infrastructure proximities such as roads and urban areas, have a clear influence on population and development distributions (Gustafson et al. 2005). Studies have shown that value and tendency for parcelization of forestland increases in proximity to these features (Benson 2006, NFLC 1994).

A variety of proactive tools are available to help Michigan policy makers and UP communities support large-tract ownership of forestlands, and to encourage sustainable management practices. These include market-based strategies, purchase agreements, conservation easements, and local planning and zoning approaches. Each provides opportunity, with appropriate dedication of resources and access to information, to help reduce potential fragmentation and derive continued value from contiguous UP forestlands.

Market-Based Strategies

With 19.3 million acres of forestland, covering 53 percent of the state, several incentive programs have been created to address forestry practices in Michigan. All programs are voluntary, at the discretion of the forestland owner. Among them are the Commercial Forest Program, Community Forestry Grants, Forest Stewardship Program and the Forest Legacy Program. These programs are designed to complement one another and also to complement other federal programs.

- ### Commercial Forest (CF) Program

The principal policy associated with private forestlands in Michigan is the Commercial Forest program (Natural Resources and Environmental Protection Act 451 of 1994, Part 511). The CF program provides an incentive for forestland owners to retain and manage forestland for long-term timber production by providing a property tax reduction on the land in exchange for allowing access by hunters, anglers and trappers. Landowners who enroll a minimum of 40 acres in this program pay a reduced

property tax of \$1.20 per acre annually to each county where land is listed in the program, and the State of Michigan also contributes \$1.20 per acre. An additional 15 cents per acre tax reduction is available for properties with a “working forest” conservation easement. Once enrolled, penalties for program withdrawal are based on local assessments, and funds help support long-term management objectives.

Approximately 2.2 million acres are enrolled in the CF program. The continuation of this program is a key element in maintaining accessible, working private forests in Michigan. Many of the lands recently sold or transferred in the UP are enrolled in the CF program.

85 percent of the more than 2 million acres of CF enrolled forestlands are owned by eight entities, with over half of the total enrolled land owned by just two corporate entities (Table 5 below). This study focuses on the holdings of those eight major corporate entities. A depiction

Table 5. Ownership Distribution of UP Registered CF Lands.

Area (acres)	Corporate and Organizational Ownership		
	Number of Owners	Represented Area (acres)	Percent of Total
500,000 or more	2	1,151,950	53.4
100,000 -499,999	2	564,829	26.2
50,000 - 99,999	1	65,351	3.0
10,000 - 49,999	3	52,486	2.4
1000 - 9,999	33	107,443	5.0
less than 1,000	133	37,351	1.7
Total	175	1,979,410	91.8
	Private Individual Ownership		
1000 -9,999	22	42,214	2.0
less than 1000	951	135,713	6.3
Total	973	177,927	8.2
Total Upper Peninsula CF lands		2,157,337	100
Total Upper Peninsula CF land owners		1,148	-

Source: MDNR Hunter List 2006

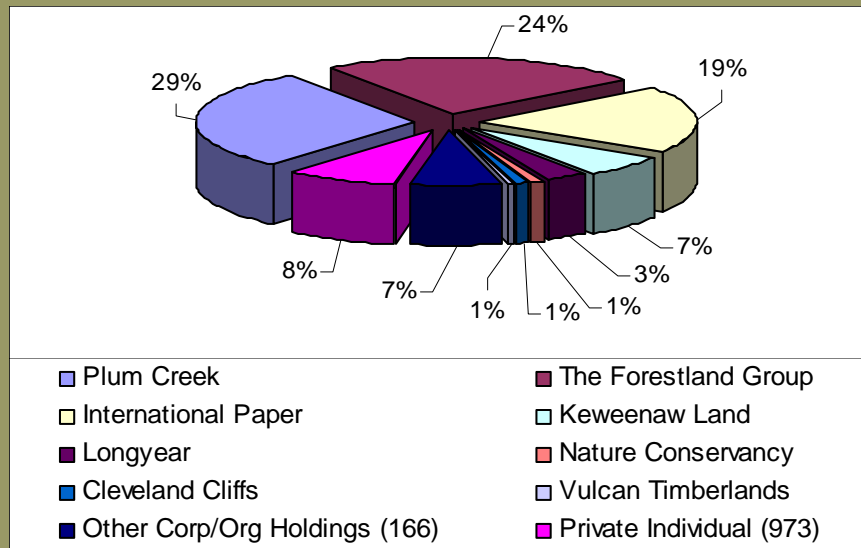


Figure 9. Distribution of Major CF Land Owners.

Source: Michigan Department of Natural Resources

of the leading CF forestland owners in relation to total CF enrolled lands in the UP is shown in Figure 9 above.

Other state and federal programs supporting the forest products industry include:

- **Community Forest Grants (CFG)**

Community Forestry Grants (CFG) are available through the Department of Natural Resource's Urban and Community Forestry Program and are funded by the U.S. Department of Agricultural Forest Service's State and Private Forestry Program. The purpose of the grants is to help communities understand and properly manage valuable natural resources. Grants are given for projects such as management and planning, training and education, tree planting and library resource purchases. These projects must be performed on non-federal public land.

- **Forest Stewardship Program (FSP)**

Forest Stewardship Program (FSP) has the

populations; provide additional quality outdoor recreational experiences; result in stable production of wood products; ensure soil productivity; protect water quality and quantity; protect wetlands and cultural/historical sites; and enhance the biological diversity and aesthetic qualities of our landscape.

- **Commercial Qualified Forest Property (QFP)**

This program is oriented to non-industrial forest owners and provides property tax exemption for similar purposes as the CF program, providing a tax exemption as a method to encourage private landowners to manage their land for forestry. Unlike the CF program, participating landowners are not required to allow public access on their land. Enrollment exempts landowners from some school operating taxes (18 mills). Purchasers of QFP-enrolled property may apply to their local government to prevent the property valuation from being "uncapped," which would normally occur at the time of transfer of property. Landowners must enroll between 20 acres

general goal to significantly increase the amount of non-industrial private forestlands (NIPF) managed and the quality of that management, enabling individual landowners to increase the benefits derived from their land while conserving it for the future. More specifically, the practices encouraged by the program aim to maintain, enhance and sustain forest ecosystems and their species; improve fish, game and non-game wildlife and plant



Photo: USDA Forest Service

(minimum) and 320 contiguous acres, with at least 80 percent productive forests, no structures and updated forest management plans.

- **Michigan Right to Forest Act**

Michigan Right to Forest Act (2002 PA 676), outlines a set of "generally accepted forestry management practices" (GAFMP), and compliance with these GAFMPs provides a defense for forest operations against many nuisance allegations. GAFMPs were approved in November 2006, based on recommendations from the Forest Management Advisory Committee and the Natural Resources Commission, and they apply to both public and private forestlands in Michigan. The GAFMPs outline management practices that address four general categories of potential nuisance complaints: visual changes, noise, removal of vegetation from neighboring land, and the use of chemicals normally used in forest operations.

- **Michigan Forest Finance Authority (MFFA)**

The MFFA is an independent nine-member board created within the Department of Natural Resources. The MFFA Board of Directors is responsible for implementing a system of forest management, financing forest management operations, issuing bonds or notes, and contracting for timber cutting rights. It also oversees a portion of the 21st Century Jobs Fund and "is charged with investing in projects that will create jobs and spur economic development in Michigan." Activities are limited to State Forests and are intended to "improve forest management, protect forest resources, create jobs and promote local and state economic activity."

Private Purchase Agreements

In addition to government-sponsored approaches, agreements between buyers and sellers can also play an important role in securing a more predictable future for UP forestlands. For example, a 10-year fiber supply agreement with the Verso Paper mill in Quinnesec (previously Champion International and then International Paper) was part of the purchase agreement in the IP sale. A long-term fiber supply agreement with the NewPage paper mill in Escanaba was part of the Plum Creek purchase agreement.

Forest Certification

Non-governmental forest certification programs of note are the Sustainable Forestry Initiative (SFI) and the Forest Stewardship Council (FSC), a consortium of international interests such as non-governmental social and environmental organizations and forest product interests. These programs, developed in the early 1990s, are similar in their overall goals of sustainable forestry practices (Meridian Institute, 2001).

Once these programs certify a forest management practice, monitoring continues through timely audits or complaint resolution. Failure to comply with program standards may culminate in de-certification. While Michigan's CF program imposes a financial penalty for program withdrawal, FSC and SFI do not, relying mainly on market pressures to maintain certification. Most CH lands are certified.

Conservation Easements

Easements are typically restrictions placed on a property's deed regarding such issues as property development, forest management and public access. Easements are acquired through both donation and purchase. Data regarding conservation easements in place on certain lands in the UP were not gathered for this study; however, their existence greatly influences land use planning efforts. Identification of those lands bound by deed restriction and the nature of such restrictions would greatly enhance interpretation of ownership data.

A good example of Conservation Easements for the UP is The Nature Conservancy's "Northern Great Lakes Forest Project," which reached agreement with The Forestland Group on 271,000 acres of UP forestland (TNC 2006) for the protection of public access, sustainable forestry practices and resource conservation of sensitive areas (Case Study on right).

Many states also offer robust voluntary conservation easement programs. Michigan operates the Forest Legacy Program (FLP) in partnership with the USDA Forest Service in order to protect privately owned and environmentally significant forestlands from being converted to non-forest uses. FLP is a voluntary program that helps pay for the acquisition of development rights through conservation easements. These legally binding agreements help relieve financial pressure to develop forestland, while maintaining the property in private

Case Study

Protecting Working Forests: The Northern Great Lakes Forest Project

The Northern Great Lakes Forest Project establishes a working forest conservation easement on 248,000 acres of UP forestland owned by The Forestland Group, LLC, which purchased the land in 2002. The easement agreement was brokered by The Nature Conservancy, with help from the State of Michigan and financial support from numerous private foundations, other individual contributors and public programs.

The land was already enrolled in Michigan's Commercial Forest Program (CF), a voluntary initiative for privately owned forestlands that requires management for timber harvests and public access for hunting and fishing in exchange for greatly reduced property taxes.

The easement augments the CF goals and public benefits by keeping the land - and its many lakes, streams and wetlands - permanently open to the public for expanded recreational opportunities, including hiking, cross-country skiing and snowmobiling, in addition to hunting and fishing. The Forestland Group continues to own and manage the property to maintain a stable and sustainable wood harvest, retaining the right to sell this property to future owners that would have to abide by the easement agreement now in place.

The Northern Great Lakes Forest Project is a tremendous example of how the marshalling of organizations and incentives designed to promote sustainable timber management and land protection can work together. It also uses multiple tools already available in Michigan—easements, incentives and the state's Natural Resources Trust Fund, which pledged \$16 million—to execute the deal.

The project cost \$58 million, which includes the outright purchase of an additional 23,318 acres by The Nature Conservancy.

ownership. To qualify, landowners are required to prepare a multiple resource management plan as part of the conservation easement acquisition. The federal government may fund up to 75 percent of program costs, with at least 25 percent coming from private, state or local sources.

Planning and Zoning

In addition to market-based and private approaches, state and local planning and development policies provide additional strategies that can help ensure the sustainable availability and responsible use of valuable resources. As the global economy, state and UP continue to undergo dramatic transformations, communities can become more proactive and strategic in addressing the allocation of land, people and resources. Also, planning and zoning tools can help communities craft a vision that will invite business, keep and attract young people and foster entrepreneurialism and a high quality of life for the UP by explicitly linking land use, environmental and economic development goals.

In Michigan, land use regulation occurs through a variety of local, county, state and federal statutes. According to a report prepared for the Tri-County Regional Planning Commission (TCRPC 2002), the most common types of land use and development regulation in Michigan involve:

- Land use planning and development laws (e.g., local and county planning and zoning enabling laws);
- Natural resources and environmental protection laws (e.g., wetland and floodplain laws);
- Infrastructure programs (e.g., water supply and sewer system laws); and
- Housing and economic development tools (e.g., brownfield redevelopment law).

Each of these packages plays a significant role in shaping the future land uses, municipal growth and

overall destiny and character of communities. The State of Michigan has articulated the role of state and local governments in each of these areas through state laws and guidance documents, and each area of emphasis provides specific tools and strategies for influencing land use in the future. The area of particular interest to this project is planning and zoning capacity focused on maintaining the integrity of the forestland base in Michigan's Upper Peninsula.

Local Capacity for Planning and Zoning

A general assessment of the planning and zoning capacity of local and state government provides a look at the UP's potential future because "the comprehensive plan provides 'a tangible representation of what a community wants to be in the future.'" (Kelly and Becker 2000). While infrastructure decisions, economic development tools and housing strategies play critical roles in shaping the future of the UP, they are largely outside the scope of this project. Additionally, the implications of different land use scenarios on the infrastructure needs, associated costs and affordable housing allocations are well documented (www.landpolicy.msu.edu).

Currently in Michigan, approximately 1,857 local units of government (272 cities, 261 villages, 1,241 townships and 83 counties) have direct land use planning and zoning authority, though a myriad of local issues, powers and strategies make the land use arena a complicated one to grasp. In addition, each level of government (villages and cities, townships, counties) is governed under slightly different local structure: planning commission, zoning boards of appeal, etc.

A recent mail survey completed by Michigan State University suggests that 72 percent of all townships and 76 percent of all county governments in

Michigan have adopted a basic land use plan or Master Plan, while zoning ordinances have been adopted in 76 percent of townships and 37 percent of counties (Olson 2007).

The UP is comprised of 206 different local governments. Overall, a lower percentage of local governments have plans and ordinances in the UP compared to other regions of the state. According to MSU's 2003/2004 Institute for Public Policy and Social Research (IPPSR) survey, 117 of the 206 UP local governments (56.7 percent) have their own zoning ordinances, including villages/cities, townships and counties. An additional 28 governments without their own zoning ordinance are subject to county zoning (for a total of 70 percent) (Figure 10 below).

Most roles within this structure are undertaken by volunteers elected or appointed to offices. Rarely is a professional background in planning or zoning a prerequisite for appointment. Many of these volunteers are supported by paid professional staff, but this is rarely the case in rural areas.

As a "home-rule" state, development and implementation of land use regulations are housed in the smallest unit of government with applicable authority, meaning that land use planning and zoning is close to the people and capable of great innovation and responsiveness, but also limited by lack of resources and an inability to effectively coordinate decision-making across narrowly defined municipal boundaries.

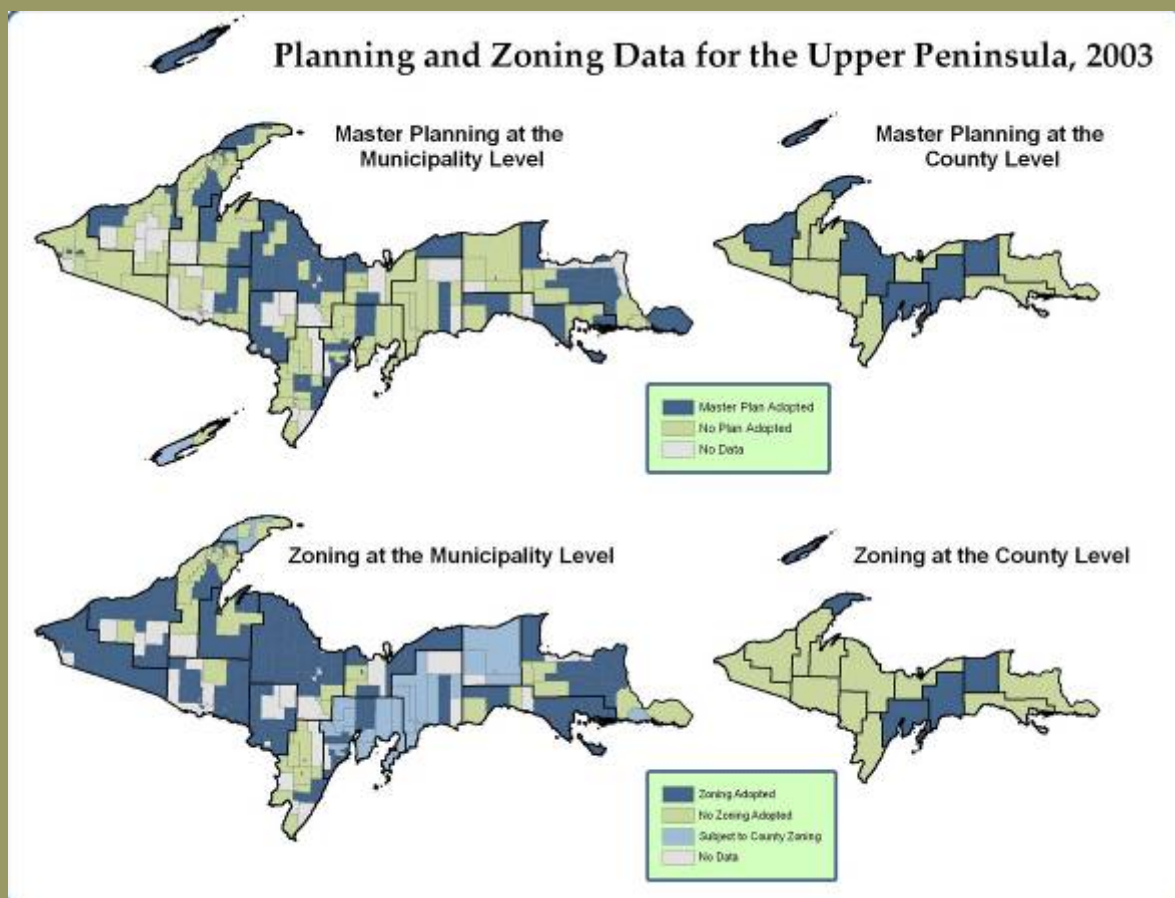


Figure 10. Planning and Zoning Data for the Upper Peninsula, 2003

Source: McGrain, Brian. "To Plan or Not to Plan: Current Activity within Michigan's Local Governments." Institute for Public Policy and Social Research. Policy Brief, Volume 8, January 2004.

The large number of local governments in the state (1,857) and in the UP (206) makes collecting and analyzing information about planning and zoning capacity very difficult. Additionally, procedures and communication systems within local government are not consistent, leading to further complications in data collection. According to research undertaken by Michigan State University's IPPSR, "Quite often communities were not aware of who was in charge of planning and zoning, or even whether or not the community had zoning in place. This led to some miscommunications. For instance, in a number of cases, several surveys were returned by different people from the same community, but with different information provided" (Suvedi and Taylor 2002).

It is clear that level of experience and knowledge with regard to planning duties and responsibilities varies widely across Michigan, but is often lower in rural areas. Researchers for this project encountered substantial difficulty in locating the appropriate representative of each local government entity. Some were not aware if they had planning or zoning documents, and the level of relevant knowledge varied widely. Very few of the representatives of each municipality knew if the ordinances were available at a local library or where they could be reviewed by the public.

Table 6. Contents of Planning and Zoning Documents in the UP

IPPSR Question	UP Municipalities	Total Michigan Municipalities
Does your zoning ordinance include Shoreline Protection?	31 (15.0%)	192 (14.1%)
Does your zoning ordinance include Access Regulations?	19 (9.2%)	374 (27.5%)
Does your zoning ordinance include Environmental Area Regs.?	8 (3.9%)	136 (10.0%)
Does your zoning ordinance include Cluster Development regulations (at least 50% open space)?	21 (10.2%)	493 (36.2%)
Does your zoning ordinance include Wetland Regulations?	20 (9.7%)	255 (18.7%)
Does your zoning ordinance include Woodlands Regulations?	19 (9.2%)	125 (9.2%)
Does your zoning ordinance include Lot Splits Regulations?	52 (25.2%)	786 (57.8%)
Does your zoning ordinance include Private Road Regulations?	20 (9.7%)	597 (43.9%)
Does your zoning ordinance include Purchase of Development Rights?	1 (0.04%)	47 (3.5%)
Does your zoning ordinance include Transfer of Development Rights?	2 (0.1%)	38 (2.8%)
Does your community charge applicants for the full cost of review of development proposals?	27 (13.1%)	635 (51.3%)
Does your zoning ordinance include Traditional Neighborhood Development/Form-Based Zoning?	19 (9.2%)	295 (21.7%)
Does your zoning ordinance include Farm Land Protection Regulations?	18 (8.7%)	221 (16.2%)
Does your zoning ordinance include Growth Management Ordinances?	2 (0.1%)	80 (5.9%)

Source: McGrain, Brian. "To Plan or Not to Plan: Current Activity within Michigan's Local Governments." Institute for Public Policy and Social Research. Policy Brief, Volume 8, January 2004.

Content of Local UP Plans and Ordinances

The IPPSR study also reveals a clear difference in the complexity and specificity of planning and zoning documents in the UP compared to those in the rest of the state. This is true of nearly every category of zoning ordinance addressed by the IPPSR study (Table 6). For example, specific environmental and resource production ordinances that could be very prominent in the UP, such as woodland production, wetland protection and shoreline development ordinances, show up far less frequently on a percentage basis in the UP, suggesting that UP municipalities use these ordinances much less often than their downstate counterparts, despite their clear relevance to the region.

Of the relatively small number of municipalities using zoning ordinances in the UP, an even smaller number utilized growth management or resource protection strategies.

The examples in Appendix C highlight the different strategies UP municipalities have taken. Samples are taken from a variety of ordinances throughout the UP and contain provisions that may appear redundant or contradictory at first glance; they offer a broad overview of the types of zoning ordinances in use. The full summary of ordinances with their associated township affiliation is available in Appendix C.



Photo: Judy Bearup, MEC

Case Study Large-Tract Owner and DNR Partner for Wildlife Habitat

According to Michigan's recently completed Wildlife Action Plan, parcelization of large, contiguous acreages of undeveloped land is one of the emerging threats to the UP's bountiful wildlife habitat.

A recent public-private partnership was established that will have a positive impact on the future of wildlife-based recreation in the central UP.

In July 2007, the Michigan Department of Natural Resources (DNR) announced the tentative purchase of 1,840 acres of land in the central UP as part of the Winter Deer Range Improvement Program (DRIP). The parcel will be purchased from Plum Creek Timber Company, which had acquired the parcel in their purchase of 650,000 acres of forestlands from Escanaba Timber, LLC.

This parcel is adjacent to existing state-managed lands, and helps conserve unique habitat conditions favorable to deer during the harsh UP winters, such as cedar for thermal cover. In addition, the acquisition protects frontage along the Ford River west of Escanaba.

Sustainable forestry practices will be needed to maintain the required biodiversity component of such high quality wildlife habitats. Working with the DNR, Plum Creek modified its scheduled timber harvest plan for the area prior to the state purchase, to allow limited hardwood and aspen to be removed while retaining the integrity of the thermal cover.

The DNR's Natural Resources Commission tentatively approved another DRIP acquisition of 640 acres from Plum Creek northwest of Manistique. Like all large-tract owners, Plum Creek will continue to pursue management strategies that reflect its owners' goals, including sales, conservation transactions, easements and land exchanges

Part 4. Recommendations for a Sustainable Forest-Based Economy



THE FOLLOWING STRATEGIES AND RECOMMENDATIONS WERE DEVELOPED TO PROMOTE STABLE, SUSTAINABLE OWNERSHIP AND MANAGEMENT OF THE UP'S LARGE-TRACT CORPORATE AND OTHER FOREST LANDS, WHILE FOSTERING LOCAL ECONOMIC, RECREATIONAL AND CONSERVATION OPPORTUNITIES.

The primary strategies use a framework developed by the Northern Forest Lands Council for the Northeast forested region of the United States. Specific recommendations within each strategy were initially drawn from various national, state and local sources, including:

- Studies of land use, forest management trends and the role of the forest products industry in the economy of the UP;
- Similar studies done for the Northern Forest region of New England and New York;
- A current assessment of local regulatory capacity in the UP;
- Surveys of state-based regulatory and market-based incentive programs;
- A case study of a recent large-scale forest land transfer in Maine; and
- Deliberations and recommendations by the Michigan Land Use Leadership Council and the Michigan Forest Products Council.

Input on draft strategies and recommendations was solicited from more than 150 UP residents, forest industry representatives and local elected leaders at a series of community forums held in Houghton, Marquette, and Newberry during June, 2007. Input from these forums assisted in developing priorities and gauging the

feasibility, relevance and potential benefits or drawbacks of the various proposals. The tools most popular among all community members who participated were those that support the state's existing Commercial Forest program (recommendation 1 below), offer new programs to diversify and market regional wood products (rec. 12), and provide additional education for local leaders and citizens about forest issues (rec. 19).

Some of the recommendations are long-term in nature, while others can be undertaken in the short term with the expectation of more immediate impact.

The recommendations do not necessarily reconcile tradeoffs among sometimes competing community values. For example, the forest processing and products industry is a major contributor to the UP economy. One way to strengthen this sector is to ensure a reliable, affordable supply of raw materials. However, activities that work towards this objective likely have the effect of reducing the value of forestland for timber production, and accelerating land use change towards other uses targeting higher immediate economic returns.

Instead, these recommendations incorporate both market-based and regulatory tools, such as comprehensive planning and zoning, intended to help communities manage resource use tradeoffs more effectively. Together, they provide a range of tools to help assure a viable and sustainable future for the forests, people and forest-based businesses of the UP.

Strategy 1:

Foster Stewardship of Private Land

A common theme expressed during the UP community sessions was the need to protect and enhance the UP's forestland base by fostering and promoting good management practices on land held

in private ownership, whether large-tract commercial forests or smaller wood lots. This included recognition of the regional importance of maintaining viable wildlife corridors and large, contiguous tracts of forestland to benefit wildlife—both game and non-game species—and recreation, and using best management practices to maintain the overall health of the forest ecosystem. Recommendations to foster stewardship of private land include:

1. Maintain and fully fund the administration of the Commercial Forest (CF) and Qualified Forest Property (QFP) programs, including current county payment levels.

The CF program provides a property tax reduction to private landowners who agree to develop, maintain and manage the land as commercial forest through planting, natural reproduction or other silvicultural practices. Lands listed in this program are required to be open to the public for hunting, trapping and fishing. The new QFP program is oriented to smaller, non-industrial forest owners and provides a property tax exemption for similar purposes as the CF program, but does not have public access requirements. Both the CF and QFP programs are administered by the Michigan Department of Natural Resources.



Photo: Robert Froese, MTU

2. Staff and fund state conservation easement programs to maintain working forest land.

Many states offer voluntary programs that pay landowners for development rights through conservation easements. Michigan operates the voluntary Forest Legacy Program (FLP) in partnership with the USDA Forest Service to protect privately owned and environmentally significant forest lands from being converted to non-forest uses. These legally binding agreements help relieve financial pressure to develop forest land, while maintaining the property in private ownership.

3. Maintain landowner education, outreach and technical assistance programs.

For example, the Forest Stewardship Outreach and Education Grant Program is designed to encourage private forest land owners to actively manage their forestlands and to develop long-term management plans that will enhance the understanding of forest ecosystems. The program also provides outreach and education to all citizens about stewardship of our natural resources. Grant projects can include management plans for school and municipal forests, outreach and education projects, demonstration areas and ecosystem projects. All proposals need to involve non-industrial private forests.

4. Develop a Community Forest awareness, acquisition and management program.

Municipal, town and community forests can provide local opportunities for forest education and exposure to sustainable forest management for private landowners and other local stakeholders, often in cooperation with local K-12 and vocational schools. Community forests can provide opportunities for forestry events that demonstrate model forestry techniques and technology as well as showcase value-adding

processes. They can also help provide and link outdoor recreational opportunities. Exposure to working, well-managed local forests can help stimulate interest in forestry professions for youth.

Strategy 2: Protect Exceptional Resources

Community members expressed a desire to protect and enhance the region's natural resources, and improve the capacity of local leaders and residents to plan for the sustainable development and management of forest assets. In addition to concerns about fragmentation and development issues, access to high-quality forest-based recreation was a major issue for local community members. Many recognized that the use of off-road vehicles (ORV) and all-terrain vehicles (ATV) is increasing, bringing with it the need for new educational programs and enforcement tools to address negative impacts to public and private lands, and to reduce conflicts between landowners and recreational users. Recommendations to protect exceptional resources include:

5. Support private forest conservation acquisition and easement programs.

Land trusts can use funds from private donors to help conserve forestland. After acquiring land threatened by development, land trusts will typically place a conservation easement on the land, preventing future conversion or development and frequently allowing or requiring protection or sustainable forest management plans for much of the property. In most cases, land trusts will sell the land back to a public land management agency at below-market value as permanent additions to public forest holdings. The Trust for Public Land's Northwoods Land Protection Fund and The

Nature Conservancy's Northern Great Lakes Forest Project as outlined earlier in this report are good examples.

6. Encourage and support community “visioning” and master planning processes.

Communities in the UP have substantially fewer master planning processes and plans than the rest of the state. As the rate of development increases, this may lead to haphazard development that could affect critical forest and water resources and diminish recreational opportunities. Master planning and visioning processes allow local communities to decide how they would like to see their area develop, while reducing conflict that otherwise could result from more ad-hoc responses to ownership changes.

7. Fund training and continuous educational opportunities for municipal planning and zoning administrators.

Well-trained and experienced planners and administrators can more efficiently and effectively address complicated land use issues. Local staff and elected officials in the UP are very interested in training opportunities, but have fewer options on average than elsewhere in the state. Options for group orientation and training, on-line tutorials and use of “circuit rider” trainers or mentors should be studied. For example, the Citizen Planner Program through Michigan State University provides training modules in classroom and online versions that can provide local planning officials with tools, strategies and skills to support better planning in the Upper Peninsula. Michigan State University's forestry extension service, if funded, can be a very effective delivery mechanism.

8. Fully fund and staff MDNR for all land management and related activities.

The duties and expectations of state land management departments have increased substantially in recent decades. In particular, activities associated with administration of tax adjustment programs, cost-share and technical assistance to private landowners, easement appraisals and administration, and state forest ecological management and certification require professional staff, often beyond the traditional purview of natural resource managers. Appropriate staff levels and funding can ensure that legislative and executive mandates passed on to the MDNR are implemented effectively.

9. Increase support and education for local land conservation finance ballot measures.

Local land conservation financing mechanisms can include “pay as you go” initiatives such as property tax levies to pay for recreational corridors or community forests, and capital improvement general obligation bonds to protect and restore natural infrastructure. These measures can help enact community desires for forest conservation as identified in planning processes. Such ballots require local voter approval, so their use measures citizen sentiment regarding conserved lands as assets to local communities.

10. Maintain the Michigan Natural Resources Trust Fund (MNRTF) for intended purposes and seek additional opportunities specifically in the UP.

The MNRTF was established in 1976 to provide a source of funding for public acquisition of lands for resource protection and public outdoor recreation. Funding is provided from royalties on the sale and lease of state-owned mineral rights. During its 30-year history, the fund has supported state and local land acquisition and natural resource

development projects in every county in Michigan. In 2006, 61 recreation, land acquisition and working forest easement projects totaling \$36,076,075 were funded. A total of 162 applications were submitted with total demand for project funding exceeding \$63 million. As industrial land owners review their land holding portfolios in the UP, many opportunities for long-term forest conservation, working forest maintenance, and growing recreational demands can be served by application to the MNRTF.

11. Provide technical assistance to communities to update existing planning and zoning documents and make available online model forest land zoning ordinances and templates.

Many existing local planning and zoning documents and codes are out of date. As interest

in developing UP forest land continues and community concerns are expressed, it would be timely to update these local documents to better manage forest conversion rates and protect valuable natural resources. State technical assistance to communities would assure more consistent and timely updating of policies and procedures. UP communities overall have significantly lower use of zoning ordinances than those in the Lower Peninsula. As rates of forest land sales and conversion increase, the availability of model ordinances and zoning templates can help to efficiently develop zoning codes.

**Strategy 3:
Strengthen Economies of
Rural Communities**

Community members expressed an interest in supporting existing forest industries while expanding initiatives to diversify forest products markets and develop value-added wood products and manufacturing operations. Citizens, industry representatives and community leaders suggested that the UP needs to diversify its forest products industry to ensure the long-term sustainability and resiliency of the forestland base. They also expressed strong interest in additional information and research into the opportunities and risks associated with the use of the UP's abundant woody biomass as an alternative to fossil fuels. Recommendations to strengthen economies of rural communities include:

12. Develop forest product marketing and regional branding support programs in cooperation with USDA Rural Development offices, the US Small Business Administration and state economic development programs.

The rapidly globalizing forest products marketplace means that offshore production



Photo: Brad Garmon, MEC

often enjoys cost advantages (e.g., in labor, energy and health care) over domestic producers. In this climate, differentiated marketing and regional branding strategies for domestic wood products can be based on non-price attributes, such as product quality, support for local economies, certified forest management practices, customization potential and speed of delivery. Group and cooperative marketing opportunities are also useful for smaller-scale producers. Forest product businesses are generally under-represented in the farm-oriented programs of USDA Rural Development and the more urban orientation of many SBA and state economic development programs. With modest targeted outreach and technical assistance, new and revitalized value-adding forest-based businesses can emerge.

13. Promote public policy to support forest-based recreation.

Outdoor recreation is the most rapidly increasing public demand on state and national forests. Access to private lands for hunting and fishing is also a public concern as large forest ownerships change hands. With recreation as a major economic driver in the UP, policies that help maintain and sustainably manage forest-based recreation are critical. Community members suggested that comprehensive trail systems are needed for both motorized and non-motorized users, and that strategic efforts to plan, fund, develop and maintain such trails are important.

14. The MDNR Forest, Mineral, and Fire Management Division should develop a transparent, science-based process for determining harvest levels from state forests while managing for long-term sustainability and consistent timber harvest levels.

The state forest system by virtue of its size and extent is a dominant influence on the supply of wildlife habitat, recreation opportunities and

timber resources in the UP. However, timber harvest levels from state forests in the UP vary considerably from year to year and have been declining. Harvest levels are not well-linked to a transparent calculation and management planning process with a long-term perspective. A more predictable stream of third-party certified timber sales from state forests would assist value-added industries in scheduling investments in production capacity and labor as well as obtaining an affordable supply of raw materials. A clear, science-based process for determining the intensity and extent of management activity would increase confidence among stakeholders and ensure that the steps necessary to reach desired goals are clearly identified.

15. Target access to state grant and loan funds for infrastructure improvements to those local units with comprehensive growth management plans.

State grants and loans for infrastructure improvement can be used more effectively by prioritizing projects that are embedded in long-range community planning processes. Infrastructure development and improvement should serve the needs of existing and desired patterns of development, rather than stimulating wasteful and costly sprawl-type development that imposes long-term fiscal burdens on local communities. This can be encouraged by requiring municipal or county applicants to submit planning documents that account for the impact and long-term consequences of the proposed investments.

16. Maintain and expand third-party certification of public forest land management.

Stable supplies of certified wood from public lands can provide economic opportunities for value-adding and marketing through product differentiation. The State of Michigan has obtained third-party certification of its state

forest management under two systems, the Forest Stewardship Council and the Sustainable Forestry Initiative. Forest certification verifies that forest management activities are practiced in consideration of wildlife, water quality, long-term productivity and, to varying degrees, local communities. The state should include other managed forest lands, such as State Game areas and State Parks, and consider means to involve other managed public forest lands such as community forests.

17. Maintain capitalization and expand the activities of the Michigan Forest Finance Authority (MFFA).

The MFFA is an independent finance authority within MDNR created to finance forest management investments on productive sites in state forests by issuing direct revenue bonds to be repaid by future revenues from timber sales. Board members include loggers, conservationists, the directors of three state departments and others. Funded activities are designed to improve forest management, protect forest resources, create jobs and promote local and state economic conditions. Michigan appropriated \$26 million to launch the MFFA, but funds were later reduced to \$6 million. Initial projects include an inventory and management effort for the many mature red pine stands in state forests, some dating back to the work of the Civilian Conservation Corps in the 1930s, resulting in local wood harvests for local uses.

Strategy 4:

Promote Informed Decisions

Finally, community members saw a strong need for more educational programs for elected leaders and citizens about forest issues, and better strategic integration of the education and outreach programs that are already available. This included a desire for

more training and education specifically for those responsible for planning and zoning decisions in local communities. The need to educate the public at large about the forest industry, including its impact on the UP economy and environment, and the industry's role in forestland management was also noted. Recommendations to promote informed decisions include:

18. Continue to track, analyze and report forest land, economic and social trends periodically.

Rates of change in forest ownership are accelerating, variability in environmental conditions is increasing, and outbreaks of forest pests and pathogens are more frequent. Ten year (decennial) forest surveys and reports by the USDA Forest Service are important tools to assess rates of change, but more frequent sampling of areas most affected by these changes, conducted by state natural resource departments, should be supported. In 2003, the Michigan Land Use Leadership Council recommended that the state prepare a "State of Michigan Land Use and Environment" report every five years, tracking a variety of key land use information such as the amount of forestland in active production, new and second-home construction, and change in land cover over time.

19. Promote natural resource education for the public in education curricula and through agency and non-profit educational outreach and demonstration activities.

Forest land ownership is turning over more frequently, and large holdings are breaking up. A new generation of forest owners looms on the horizon without much experience in, or exposure to, forest ecology or management. Youth interest in outdoor recreation is also in decline with the massive expansion of electronic media and the internet. A restoration of natural resources and ecological education in public

curricula, expanded application of outdoor experiential and service learning opportunities, placement of forest interpretive exhibits and staff in public forests, and reinforcement of forest agency and non-profit educational outreach are vital in order to slow or reverse these trends.

20. Support cooperative efforts among state universities, state agencies and conservation groups for eco-regional planning on state lands, maintain the annual state-wide assessments and reports from the Michigan Natural Features Inventory and implement the “Biodiversity Conservation Planning Proposal” of the MDNR Biodiversity Conservation Committee (BCC).

Tracking ecosystem health and changes over time in reaction to management practices and climate change requires the development and use of new criteria and indicators. Biodiversity and adaptation of forest ecosystems and species can be improved by identifying and using appropriate management techniques for biologically important and/or scarce forest types and habitats. Focus area identification and mapping can greatly aid land managers in site-specific management approaches, as well as help the public celebrate and protect their natural heritage. Eco-regional planning is best pursued through multi-party cooperation, due to the large amount of data in a wide variety of scientific specialties. Cooperative efforts on state lands also leverage limited agency resources to

conduct field work, development databases and generate reports.

21. Support the operation and activities of the Michigan Invasive Plant Council and other efforts to manage forest pests and pathogens.

With the emerald ash borer, Asian longhorned beetle, beech bark disease, oak wilt and other forest health threats increasingly afflicting UP forests, more frequent and comprehensive surveys of forest pest and invasive species are necessary. The State, Invasive Plant Council and forest landowners and managers should cooperate to develop and apply best practices for quarantine and control activities.

22. Improve local access to GIS technology and data and provide training in its use, possibly through a regional consortium of universities, MDNR and other state agencies.

Adequate funding should be provided to MDNR to implement a state-of-the-art GIS-based forest ecosystem inventory system, in cooperation with existing service providers, forest conservation groups and universities with existing GIS capacity. Forest industry, land use planners, conservation interests and other state agencies including transportation departments and utility regulators need a centralized repository of quality, up-to-date GIS data. A longer-term funding commitment to data collection, including remote sensing and data ground-truthing is also necessary to expand and keep existing data sets up to date.



Photo: ISTOCK

References

Executive Summary and Introduction

- Block, N.E. and V.A. Sample. 2001. *Industrial Timberland Divestitures and Investments: Opportunities and Challenges in Forestland Conservation*. Pinchot Institute for Conservation, Milford, PA.
- Browne, M. 2000. *Changing Ownership Patterns: An Overview Of Institutional Ownership And Resulting Opportunities*. Pinchot Institute for Conservation and USDA Forest Service Symposium, May 22, 2000. Resources and Convention Center, Washington, D.C.
- Clutter, M., B. Mendell, D. Newmand, D. Wear and J. Greis. 2005. *Strategic factors driving timberland ownership change in the U.S. south*. USDA-FS and SGSF, Asheville, NC. Available at: <http://www.srs.fs.usda.gov/econ/pubs/southernmarkets/strategic-factors-and-ownership-v1.pdf>
- Drzyzga, S.A. and D.G. Brown. 2002. *Spatial and Temporal Dynamics of Ownership Parcels and Forest Cover in Three Counties of Northern Lower Michigan USA, ca. 1970 to 1990*. In S.J. Walsh and K.A. Crews-Meyer, Eds., *Remote Sensing and GIS Applications for Linking People, Place, and Policy*, Dordrecht: Kluwer, p. 155-185. Available at www.personal.umich.edu/~danbrown/papers/drzyzga03, accessed in September 2006.
- Fernholz, Kathryn, Jim Bowyer and Jeff Howe. 2007. "TIMOs and REITs: What, Why, and How They Might Impact Sustainable Forestry." Dovetail Partners, Inc., Minneapolis, MN. May 23, 2007. www.dovetailinc.org
- Greger, E. 2002. Presentation summary, pp. 14-18 in: Ravenel, R. et al. (eds.) *Institutional Timberland Investment: A summary of a forum exploring changing ownership patterns and the implications for conservation of environmental values*. School of Forestry and Environmental Studies, Yale University, New Haven CT. Available from: www.yale.edu/gisf.
- Hickman, C. 2007. *TIMOs and REITs*. USDA Forest Service, Washington D.C.
- Invest (Investopedia Online Financial Dictionary). www.investopedia.com. Accessed April 20, 2007.
- Mandaró, Laura, *MarketWatch*. Mar 31, 2007. "For-sale signs pop up on U.S. timberlands." Available at www.marketwatch.com, accessed in April, 2007.
- Matheson, T. 2005. "Taxable REIT subsidiaries: analysis of the first year's returns, tax year 2001." US Department of the Treasury, Internal Revenue Service, Statistics of Income Division. Available from: <http://www.irs.gov/pub/irs-soi/01reit.pdf>.
- Mendelsohn, R. 2002. Presentation summary, pp. 11-13 in: Ravenel, R., et al. (eds.) "Institutional Timberland Investment: A summary of a forum exploring changing ownership patterns and the implications for conservation of environmental values." School of Forestry and Environmental Studies, Yale University, New Haven CT. Available from: www.yale.edu/gisf.
- National Association of Real Estate Investment Trusts (NAREIT). 2007. "Constituent Companies in the FTSE NAREIT All REIT Index." April 2007. Available from: <http://nareit.org/library/performance/FNUSIC2007.xls>.
- Nelson, C.M. 2001. "Economic Implications of Land Use Patterns for Natural Resource Recreation and Tourism." Prepared for the Michigan Economic and Environmental Roundtable. Public Sector Consultants, Inc., Lansing, MI.
- Plum Creek (Plum Creek Timber Co.). 2007. Form 10-K - Annual Operations. Available from: http://media.corporate-ir.net/media_files/irol/68/68740/financials/PCL_200610K.pdf.
- Ravenel, R., M. Tyrrell and R. Mendelsohn (eds). 2002. *Institutional Timberland Investment: A summary of a forum exploring changing ownership patterns and the implications for conservation of environmental values*. School of Forestry and Environmental Studies, Yale University, New Haven CT. Available from: www.yale.edu/gisf.
- Rinkus, M.A. and V.D. Markham. 2006. *U.S. State Reports on Population and the Environment, Michigan*. Center for Environment and Population and The National Wildlife Federation, Ann Arbor, MI.
- Sailor, Byron. Email correspondence with Marilyn Shy and Gina Nicholas. June 27, 2007.
- Traverse City Record Eagle*. 2005. "Company to buy U.P. forest-Outdoor lovers are worried about access." October 5, 2005.
- Forest Management." *Journal of Forestry*, September 1996.
- Brewer, Cynthia A., 2007. <http://www.colorbrewer.org/>, accessed March, 2007
- Browne, M. 2000. *Changing Ownership Patterns: An Overview Of Institutional Ownership And Resulting Opportunities*. Pinchot Institute for Conservation and USDA Forest Service Symposium, May 22, 2000. Resources and Convention Center, Washington, D.C.
- Bryan, G. 2004. "How Much Habitat is Enough?" Environment Canada, Canadian Wildlife Service, Downsview, Ontario. Available at www.on.ec.gc.ca/wildlife, accessed on July 15, 2006.
- Butler, B.J. and E.C. Leatherberry. 2004. "America's family forest owners." *Journal of Forestry*, 102(7): 4-9.
- CCI (Cleveland Cliffs Iron Co.) 2007. Company History. Available at www.cleveland-cliffs.com/general/history, accessed on January 10, 2007.
- Crowell, Alan. 2007. "'Wilderness sprawl' in unorganized territories." *Kennebec Journal*. March 12, 2007.
- EPA. 2001. *Our Built and Natural Environments: A Technical Review of the Interactions between Land Use, Transportation and Environmental Quality*. January, 2001. EPA 231-R-01-002.
- Gustafson, E.J., R.B. Hammer, V.C. Radeloff and R.S. Potts. 2005. "The relationship between environmental amenities and changing human settlement patterns between 1980 and 2000 in the Midwestern USA." *Landscape Ecology* 20:773-789.
- Hagan, J.M., L.C. Irland, and A.A. Whitman. 2005. *Changing timberland ownership in the Northern Forest and implications for biodiversity*. Manomet Center for Conservation Sciences, Report # MCCS-FCP-2005-1, Brunswick, Maine, 25 pp.
- Hickman, C. 2007. TIMOs and REITs. USDA Forest Service, Washington D.C.
- IP (International Paper Co.), 2006. News Release available at <http://investor.internationalpaper.com>, accessed on September 25, 2006
- KLA (Keweenaw Land Association, Ltd.). 2006. Company Profile and History. Available at www.keweenaw.com/profile, accessed on January 7, 2007.
- Mandaró, Laura, *MarketWatch*. Mar 31, 2007. "For-sale signs pop up on U.S. timberlands." Available at www.marketwatch.com, accessed in April, 2007.
- Matheson, T. 2005. Taxable REIT subsidiaries:

Part 1 and Appendix A

- Benson, S. 2006. 3Q06: *Get the Latest Rural Land Price Trends!* Available at www.landandfarm.com, accessed in November, 2006.
- Binckley, C.S., C.F. Raper, and C.L. Washburn. 1996. "Institutional Ownership of US Timberland; History, Rationale, and Implications for

- analysis of the first year's returns, tax year 2001. US Department of the Treasury, Internal Revenue Service, Statistics of Income Division. Available from: <http://www.irs.gov/pub/irs-soi/01reit.pdf>.
- Michigan Geographic Framework. 2007. Definitions. Available at: <http://www.michigan.gov/cgi/0,1607,7-158--50182--00.html>
- MDNR (Michigan Department of Natural Resources). 2003. Michigan Forest Legacy Program, Assessment of Need. A Report From the Michigan Department of Resources.
- Meridian Institute. 2001. Comparative Analysis of the Forest Stewardship Council and Sustainable Forestry Initiative Certification Programs. American Lands, Washington, D.C. Available at <http://www2.merid.org/comparison/pressrelease>, accessed in December, 2006.
- Longyear (J.M.Longyear, LLC.). 2001. The Longyears. Available at www.longyear.org/mbi, accessed on January 7, 2007.
- Nelson, C.M. 2001. Economic Implications of Land Use Patterns for Natural Resource Recreation and Tourism. Prepared for the Michigan Economic and Environmental Roundtable. Public Sector Consultants, Inc., Lansing, MI.
- NFLC (Northern Forest Lands Council). 1994. Recommendations of the Northern forest Lands Council. Governor's Task Force on Northern Forest Lands, Concord, NH.
- Plum Creek (Plum Creek Timber Co.). 2006. News Release, Plum Creek Updates Assessment of High Value Timberlands. Available at www.phx.corporate-ir.net, accessed on August 25, 2006.
- Plum Creek (Plum Creek Timber Co.). 2007. Form 10-K - Annual Operations. Available from: http://media.corporate-ir.net/media_files/irol/68/68740/financials/PCL_200610K.pdf.
- Potts, Robert, Eric Gustafson, Susan I. Stewart, Frank R. Thompson, Kathleen Bergen; Daniel G. Brown, Roger, Hammer, Volker Radeloff, David Bengston, John Sauer, and Brian Sturtevant. *The Changing Midwest Assessment: land cover, natural resources, and people*. Gen. Tech. Rep. NC-250. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Research Station. 87 p. 2004.
- Radeloff, V.C., R.B. Hammer, and S.I. Stewart. 2005. Rural and suburban Sprawl in the U.S. Midwest from 1940 to 2000 and Its Relation to Forest Fragmentation. *Conservation Biology* 19:3, pp 793-805.
- Rinkus, M.A. and V.D. Markham. 2006. U.S. State Reports on Population and the Environment, Michigan. Center for Environment and Population and The National Wildlife Federation, Ann Arbor, MI.
- Sabor, A.A.; Radeloff, V.C.; Hammer, R.B.; Stewart, S.I. 2003. Relationships between housing density and timber harvest in the Upper Lake States. In: Buse, L.J.; Perera, A.H., comps. "Meeting emerging ecological, economic, and social challenges in the Great Lakes region: popular summaries." For. Res. Inf. Pap. 155. Sault Ste. Marie, ON: Ontario Ministry of Natural Resources, Ontario Forest Research Institute: 80-82.
- Sailor, Byron. Personal e-mail correspondence (Marilyn Shy). June 27, 2007.
- TNC (The Nature Conservancy). 2006. Northern Great Lakes Forest Project. Available at www.nature.org/wherework/northamerica/states/michigan, accessed on January 7, 2007.
- Vulcan (Vulcan Timberlands, Inc.). 2005. Company Profile and History. Available at www.vulcorp.com, accessed on January 7, 2007.
- Wear, D. 2005. Rapid Changes in Forest Ownership Increase Fragmentation. Southern Research Station Headquarters, Asheville, NC. Available at www.srs.fs.usda.gov/staff/636, accessed in July, 2006.
- W.U.P.P.D.R. (Western Upper Peninsula Planning and Development Region). 2006. Spatial Ownership Datasets, Ontonagon, Gogebic, Iron, and Baraga Counties

Part 2 and Appendix B

- Berghorn, G.H. 2005. Trends in Michigan's forest products industry, 2000-2004. Lansing, MI: Michigan Forests Products Council. 9 p.
- Berman, J.M. 2005. Industry output and employment projections to 2014. *Monthly Labor Review* 128(11): 45-69.
- Botti, W.B. and M.D. Moore. 2006. Michigan's state forests. East Lansing, MI: Michigan State University Press. 201 p.
- Burchell, R.W., G. Lowenstein, W.R. Dolphin, C.C. Galley, A. Downs, S. Seskin, K.G. Still, and T. Moore. 2002. Costs of sprawl-2000. TCRP Report 74. Transit Cooperative Research Program. Washington, DC: National Academy Press. 605 p.
- Center for Technology Transfer, Inc. 2004. Wisconsin's forest products industry business climate status report, 2004. Madison, WI: Center for Technology Transfer, Inc. 69 p.
- Chappelle, D.E., S.E. Heinen, L.M. James, K.M. Kittleson, and D.D. Olson. 1986. Economic impacts of Michigan forest industries: a partially survey-based input-output study. *Nat. Resour. Res. Pap.* 472. East Lansing, MI: Michigan State University Agricultural Experiment Station. 17 p.
- Colbert, C. 2006. Home furniture. Hoovers™, a Dun & Bradstreet Company. Downloaded from Hoovers™ on 12/5/06: <http://premium.hoovers.com/subscribe/ind/overview.html>. 2 p.
- Comings, P. 2006. 210 lose jobs at plant. *Gaylord Herald Times*. March 8, 2006.
- George Banzhaf & Company. 2005. Timber supply and demand in Michigan: Executive summary. Milwaukee, WI: George Banzhaf & Company. 19 p.
- Hansen, M.H. and G.J. Brand. 2006. Michigan's Forest Resources in 2004. St. Paul, MN: USDA Forest Service, North Central Research Station. RB NC-255. 41 p.
- Haugen, D.E. and A. Weatherspoon. 2003. Michigan Timber Industry—An Assessment of Timber Product Output and Use, 1998. St. Paul, MN: USDA Forest Service, North Central Research Station. RB NC-212. 83 p.
- Haugen, D.E. and J. Pilon. 2002. Michigan timber industry—an assessment of timber product output and use, 1996. St. Paul, MN: USDA Forest Service, North Central Research Station. RB-NC -203. 85 p.
- Holecek, D.F., T. Herowicz, and C. Shih. 2007. Michigan tourism 2007: past performance and future expectations. PowerPoint presentation made to the Michigan Lodging and Tourism Conference, Traverse City, MI, March 26-7, 2007. East Lansing, MI: Travel, Tourism, and Recreation Resource Center, Michigan State University. 70 slides.
- Grushecky, S.T., U. Buehlmann, A. Schuler, W. Luppold, E. Cesa. 2006. Decline in the U.S. furniture industry: a case study of the impacts to the hardwood lumber supply chain. *Wood and Fiber Science* 38(2):365-376.
- IMPLAN News. 2002. Diversity Index in the IMPLAN General Information Report (SA090). January 2002. Stillwater, MN: MIG, Inc. pp. 2-3.
- Lawser, S. 2004. "How wood component manufacturers are adjusting and competing in the global marketplace." Forest Products Society: PowerPoint Presentations in PDF from *Manufacturing Competitiveness of the Forest Products Industry: Competing in Today's Global Manufacturing and Consumer Marketplace*, November 3-5, 2004, New Orleans, LA. Downloaded on 12/5/06 from: <http://www.forestprod.org/>.
- Leatherberry, E.C.; and J.S. Spencer, Jr. 1996. Michigan forest statistics, 1993. RB- NC-170. St. Paul, MN: USDA Forest Service, North Central Research Station.
- Leefers, L., K. Potter-Witter, and M. McDonough. 2003. Social and economic assessment for the Michigan national forests. 244 p. Report submitted to Robert Brenner, James DiMaio, David Maercklein, and Fred P. Clark for the Michigan national forests on July 25, 2003.
- MIG, Inc. 2004. IMPLAN Pro™: User's guide, analysis guide, and data guide. Stillwater, MN: The Minnesota IMPLAN Group, Inc. 414 p.
- Minnesota Governor's Advisory Task Force. 2003. Governor's advisory task force report on competitiveness of Minnesota's primary forest products industry. Minneapolis, MN: Governor's Office. 34 p.
- Minnesota Governor's Advisory Task Force. 2003. Governor's advisory task force report on competitiveness of Minnesota's primary forest products industry. Minneapolis, MN: Governor's Office. 34 p.
- Pearce, M. 1957. History of the Standard Industrial Classification. Washington, DC: US Bureau of the Budget, Office of Statistical Standards. 3 p.

- Piva, R.J. 1999. Pulpwood production in the North-Central Region, 1997. St. Paul, MN: USDA Forest Service, North Central Research Station. RB-NC-195 37 p.
- Piva, R.J. 2002. Pulpwood Production in the North-Central Region, 1998. St. Paul, MN: USDA Forest Service, North Central Research Station. RB NC-217. 59 p.
- Piva, R.J. 2003. Pulpwood Production in the North-Central Region, 1999. St. Paul, MN: USDA Forest Service, North Central Research Station. RB NC-214. 58 p.
- Piva, R.J. 2003. Pulpwood Production in the North-Central Region, 2000. St. Paul, MN: USDA Forest Service, North Central Research Station. RB NC-221. 58 p.
- Piva, R.J. 2003. Pulpwood Production in the North-Central Region, 2001. St. Paul, MN: USDA Forest Service, North Central Research Station. RB NC-227. 56 p.
- Piva, R.J. 2005. Pulpwood Production in the North-Central Region, 2003. St. Paul, MN: USDA Forest Service, North Central Research Station. RB NC-251. 56 p.
- Piva, R.J. 2005. Pulpwood Production in the North-Central Region, 2002. St. Paul, MN: USDA Forest Service, North Central Research Station. RB NC-239. 56 p.
- Piva, R.J. 2006. Pulpwood Production in the North-Central Region, 2004. St. Paul, MN: USDA Forest Service, North Central Research Station. RB NC-265. 51 p.
- Raile, G.K.; and W.B. Smith. 1980. Michigan Forest Statistics, 1983. Resource Bulletin NC-67. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 101 p.
- Reeder, R.J. and D.M. Brown. 2005. Recreation, tourism, and rural well-being. Economic Research Report Number 7. Washington, DC: USDA Economic Research Service. 33 p.
- Rickenbach, M., T.W. Steele, and M. Schira. 2005. Status of the logging sector in Wisconsin and Michigan's Upper Peninsula, 2003. Madison, WI: University of Wisconsin Extension. 40 p.
- Rinkus, M.A. 2006. U.S. state reports on population and the environment: Michigan. New Canaan, CT: Center for Environment and Population. 33 p.
- Sarath, P. 2006. Lumber, wood production & timber operations. Hoovers™, a Dun & Bradstreet Company. Downloaded from Hoovers™ on 12/5/06: <http://premium.hoovers.com/subscribe/ind/overview.xhtml>. 2 p.
- Saunders, N.C. 2005. A summary of BLS projections to 2014. Monthly Labor Review 128(11): 3-9.
- Schuler, A., C. Adair, and P. Winistorfer. Challenge and response: strategies for survival in a rapidly changing forest products industry. *Engineered Wood Journal* 2005(Fall): 23-25.
- Stynes, D. 2002. Michigan Tourism Spending by County, 2000 - Update. Downloaded on 12/5/06 from: <http://www.msu.edu/~stynes/>.
- Stynes, D.J., J. Zheng, and S.I. Stewart. 1997. Seasonal homes and natural resources: patterns of use and impacts on Michigan. General Technical Report NC-194. St. Paul, MN: USDA Forest Service, North Central Research Station.
- Tessa Systems, LLC. 2006. Social and Economic Assessment for Michigan's State Forests. A report prepared for the Michigan Department of Natural Resources, Forest, Mineral, and Fire Management Division, Lansing, Michigan. East Lansing, MI: Tessa Systems, LLC. 153 p. Internet site for downloading: www.michigan.gov/dnr/0,1607,7-153-30301_39170-152806--,00.html
- Traverse City Record Eagle. 2005. Company to buy U.P. forest-Outdoor lovers are worried about access. October 5, 2005.
- Walker, T. 2006. Paper & paper product manufacturing. Hoovers™, a Dun & Bradstreet Company. Downloaded from Hoovers™ on 12/5/06: <http://premium.hoovers.com/subscribe/ind/overview.xhtml>. 2 p.
- Ward, B.C., D.J. Mladenoff, and R.M. Scheller. 2005. Simulating landscape-level effects of constraints to public forest regeneration harvests due to adjacent residential development in northern Wisconsin. *Forest Science* 51(6): 616-632.
- McGrain, Brian. 2004. "To Plan or Not to Plan: Current Activity within Michigan's Local Governments." Institute for Public Policy and Social Research. Policy Brief, Volume 8. www.ippsr.msu.edu/ppie/policybrief.htm
- Meridian Institute, 2001. Comparative Analysis of the Forest Stewardship Council and Sustainable Forestry Initiative Certification Programs. American Lands, Washington, D.C. Available at <http://www2.merid.org/comparison/pressrelease>, accessed in December, 2006.
- NFLC (Northern Forest Lands Council). 1994. Recommendations of the Northern Forest Lands Council. Governor's Task Force on Northern Forest Lands, Concord, NH.
- Olson, Jennifer A, John J. Paskus and Gerhardus Schultink. 2007. "Public Preferences on the Integration of Natural Resources Information in Land Use Planning and Zoning: A Survey of Local and Regional Planning Officials." The MSU Land Policy Institute Report Series, Report 2007-04.
- Suvedi, Murari, Ph.D., Gary Taylor, J.D. and Phillip Davis, Ph.D. 2002. "Perspectives on Land Use: A Statewide Survey of Land Use Decision Makers in Michigan." Michigan Agricultural Experiment Station Report Research Report 582.

Part 3 and Appendix C

- Benson, S. 2006. 3Q06: Get the Latest Rural Land Price Trends! Available at www.landandfarm.com, accessed in November, 2006.
- Cullen, Anne, Patricia E. Norris, Wayne R. Beyea, Christine Geith, and Gerald Rhead. 2006. "Expanding Education and Training Opportunities for Michigan Local Government Land Use Planning Officials." Michigan Agricultural Experiment Station Report 574.
- Drzyzga, S.A. and D.G. Brown. 2002. Spatial and Temporal Dynamics of Ownership Parcels and Forest Cover in Three Counties of Northern Lower Michigan USA, ca. 1970 to 1990. In S.J. Walsh and K.A. Crews-Meyer, Eds., *Remote Sensing and GIS Applications for Linking People, Place, and Policy*, Dordrecht: Kluwer, p. 155-185. Available at www.personal.umich.edu/~danbrown/papers/drzyzga03, accessed in September 2006.
- EPIC-MRA. 2002. Survey on the Economy and Natural Resources in the Upper Peninsula. Executive Summary and Demographic Analysis. EPIC-MRA, Lansing, Michigan.
- Gustafson, E.J., R.B. Hammer, V.C. Radeloff and R.S. Potts. 2005. The relationship between environmental amenities and changing human settlement patterns between 1980 and 2000 in the Midwestern USA. *Landscape Ecology* 20:773-789.
- Kelly, E.D., and B. Becker. 2000. Community Planning: An Introduction to the Comprehensive Plan. Washington, D.C.: Island Press.

Part 4

- 1000 Friends of Minnesota. *Fact Sheet #2: The Land Protection Toolbox*, 2006. Available at <http://www.1000fom.org/ictools2.htm>.
- Berghorn, G.H. 2005. *Trends in Michigan's Forest Products Industry, 2000-2004*, Michigan Forests Products Council.
- Biodiversity Conservation Committee. 2005. *Biodiversity Conservation Planning Proposal*, Michigan Department of Natural Resources.
- Brown, Stacy. 2006. "Downeast Lakes Forestry Partnership: One Community's Response to Landowner Transition." National Wildlife Federation. Montpelier, Vermont.
- Garmon, Brad and Ariel Shaw. 2006. "Upper Peninsula Forestry Changes: Overview of Local Regulatory Capacity." Michigan Environmental Council.
- McGrain, Brian. 2004. "To Plan or Not to Plan: Current Activity within Michigan's Local Governments." Institute for Public Policy and Social Research. Policy Brief, Volume 8. www.ippsr.msu.edu/ppie/policybrief.htm
- Leefers, Larry. 2007. *The U.P. Economy and the Role of Forest Products Industries*. Department of Forestry, Michigan State University, East Lansing, MI.
- Lorenzo, Mark. 2006. "Different is Good: Benefits of Differentiated Wood Products." Northeastern States Research Cooperative, University of Vermont.
- Michigan Department of Natural Resources. 2006. *Forest Management and Planning (Program Descriptions)*, Available at: http://www.michigan.gov/dnr/0,1607,7-153-30301_30505---,00.html

- Michigan Land Use Leadership Council. 2003. *Michigan's Land, Michigan's Future: Final Report of the Michigan Land Use Leadership Council*, Available at: http://www.michiganlanduse.org/MLULC_FINAL_REPORT_0803.pdf
- Norris, Patricia E., and Judy Soule. 2003. *Managing Land Use Change and Michigan's Future*, Michigan State University. Available at: <http://web1.msue.msu.edu/iac/transition/papers/ManLandUse.pdf>
- Northern Forest Lands Council. 2005. *10th Anniversary Forum Final Report. Recommendations for the Conservation of the Northern Forest*, North East State Foresters Association
- People and Land. 2006. *Unaddressed MLULC Recommendations*, Available at: http://www.peopleandland.org/MLULC_Recommendations/index.cfm
- 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, USDA Forest Service.

Case Studies

- Content, Thomas. 2007. "We Energies' land in U.P. goes to firm for unknown sum." *Milwaukee Journal Sentinel* July 24, 2007. Online at: www.jsonline.com/story/index.aspx?id=637540
- Mech, L. David and Luigi Boitani. 2003. *Wolves: Behavior, Ecology, and Conservation*. University of Chicago Press, Chicago, IL.
- Wydeven, A.P., D.J. Mladenoff, T.A. Sickley, B.E. Kohn, R.P. Thiel, and J.L. Hansen. 2001. "Road Density as a Factor in Habitat Selection by Wolves and Other Carnivores in the Great Lakes Region." *Endangered Species UPDATE*. 18:110-114.

Additional Online Appendices:

This report, as well as appendices of full research reports, data and other project information, is available online at <http://forestlands.mtu.edu>.

- Appendix A: *The Role of Corporate Timberland Ownership Change in Land Use, Conservation, and Local Prosperity in Michigan's Upper Peninsula*. Chris A. Miller, Robert E. Froese and Michael Hyslop. School of Forest Resources and Environmental Science, Michigan Technological University.
- Appendix B: *The U.P. Economy and the Role of Forest Products Industries*. Larry Leefers. Department of Forestry, Michigan State University, East Lansing, MI. Land Policy Institute Report 2007-07. 49 p.
- Appendix C: *Upper Peninsula Forestry Changes: Overview of Local Regulatory Capacity*. Brad Garmon and Ariel Shaw. Michigan Environmental Council. December 26, 2006.
- Appendix D: "Downeast Lakes Forestry Partnership: One Community's Response to Landowner Transition." Stacy Brown, National Wildlife Federation. Montpelier, Vermont. December 28, 2006

Citation for this report:

Froese, R., M. Hyslop, C. Miller, B. Garmon, H. McDiarmid, Jr., A. Shaw, L. Leefers, M. Lorenzo, S. Brown and M. Shy. 2007. *Large-tract Forestland Ownership Change: Land Use, Conservation, and Prosperity in Michigan's Upper Peninsula*. Ann Arbor, MI: National Wildlife Federation. 54 p.

List of Acronyms

ATV	All-terrain Vehicle
BCC	Biodiversity Conservation Committee (MDNR)
BLS	Bureau of Labor Statistics (U.S.)
CCI	Cleveland Cliffs Iron Co.
CF	Commercial Forest Program
CFG	Community Forest Grant
EUP	Eastern Upper Peninsula, MI
FLP	Forest Legacy Program
FSC	Forest Stewardship Council
FSP	Forest Stewardship Program
GAFMP	Generally Accepted Forestry Management Practice
GIS	Geographic Information System
GMO	GMO Renewable Resources, Inc.
IP	International Paper Co.
IPPSR	Institute for Public Policy and Social Research (Michigan State University)
MFFA	Michigan Forest Finance Authority
MDNR	Michigan Department of Natural Resources
MNFI	Michigan Natural Features Inventory
MNRTC	Michigan Natural Resources Trust Fund
MSU	Michigan State University, East Lansing, MI
ORV	Off-road Vehicle
PAL	People and Land, a project of the W. K. Kellogg Foundation
QFP	Qualified Forest Property (Program)
REIT	Real Estate Investment Trust
SBA	Small Business Administration (U.S.)
SFI	Sustainable Forestry Initiative
TIMO	Timber Investment Management Organization
TNC	The Nature Conservancy
TRS	Taxable REIT Subsidiary
UP	Upper Peninsula, MI
USDA	United State Department of Agriculture
USFS	United States Forest Service
VITPC	Vertically Integrated Timber Products Company
WUP	Western Upper Peninsula, MI

