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Changes in Wisconsin's Large Private Forests, 1999–2015: Land Ownership, Conservation, and Recreational Access

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ABSTRACT

Forestland divestment by vertically integrated forest products companies (VIFPCs) has spurred significant forest ownership change. To illuminate these dynamics, we examined land sales after VIFPC divestment, subsequent acquisitions of conserved land, and trends in recreational access in Wisconsin. We documented changes from 1999 to 2015 with analysis of tax program records and profiles of the state's largest investor owners, Plum Creek and The Forestland Group. Nearly all VIFPC land was sold to investors, public agencies, or smaller corporate and private owners. State tax and land acquisition programs buffered these changes: 70% of large private ownership land was retained in the forest tax program and another 16% was acquired by public and nonprofit owners. More than one-quarter of divested forestland was placed in conservation easements. Nonetheless, large private forestland open to public recreation declined by almost one-third. Investor strategies and conservation programs shaped the provision of forest benefits during ownership transitions.

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As forest production is increasingly globalized (Cashore, Pohnan, and Stone 2014), many forested lands around the world have shifted to ownership by corporations and institutional investors (Cubbage et al. 2014). Historically in the United States, vertically integrated forest product companies (VIFPCs) owned substantial forestland to supply their pulp, paper and lumber mills; this arrangement simultaneously provided wildlife habitat and areas for recreation (Best and Wayburn 2001). Beginning in the 1980s, due to changes in industry structure, tax regulations, and desire for debt reduction, many VIFPCs began to sell their forestland (Clutter et al. 2005). From 2001 to 2007, VIFPCs sold more than 25 million acres of forestland in the United States, prompting questions about future land ownership, conservation, and access (Bliss et al. 2010).

New forestland owners often have management objectives significantly different from those of their predecessors. Most VIFPC forestland was initially purchased by two types of “investment owners” that buy, sell, and manage land on behalf of investors: timber real estate investment trusts (REITs) and funds managed by timberland investment management organizations (TIMOs). Like VIFPCs, both TIMO and REIT firms are structured to deliver the greatest possible returns to their investors (Gunnoe 2014). However, investment owners can legally hold only limited production assets like mills, making them more

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likely to maximize returns from forest land sales, intensive timber production, or the capitalization of other forest components (Gunnoe and Gellert 2011).

The differing structures and investment time frames of REITs and TIMOs affect their continued land ownership and use decisions (Hickman 2007). Timber REITs are publicly traded corporations that were spun off or converted from VIFPCs. They maintain a hierarchical corporate structure to manage forestland and limited processing facilities (Ellefson and Kilgore 2010). All REITs must derive at least 75% of their gross income from real estate, and they distribute a high proportion of earnings as dividends to shareholding investors (Fernholz, Bowyer, and Howe 2007). Since stockholding investors generally require relatively high and consistent returns on a quarterly basis (Zinkhan and Cabbage 2003), there is substantial pressure for REITs to increase returns through regular land sales when timber prices are depressed. In contrast, TIMOs do not own land; they purchase and manage land on behalf of investors, either in “separate accounts” for discrete entities over an indefinite term, or in “commingled accounts” for multiple investors over a set period of 10 to 15 years (Fernholz, Bowyer, and Howe 2007). These firms also sell smaller properties on behalf of their investors, but due to greater capital availability they have greater flexibility to wait for higher land prices (Hickman 2007). TIMOs may have regional offices with a small number of forestry staff or may contract to local firms for implementing land management (Daigle et al. 2012). They charge a fee per acre to investors, which may create an incentive to retain as much land as possible under management (Mendell 2011). These organizational differences between the REIT and TIMO investment owner types may produce variation in land management objectives and different levels of engagement with the needs of local communities (Bliss et al. 2010).

Conservationists and industry stakeholders seeking to maintain the multiple benefits of VIFPC lands have deployed a suite of public policy instruments, including property tax programs, conservation easements (CEs), and public acquisition (Bengston, Fletcher, and Nelson 2004). Every state administers preferential tax treatment programs to forestland owners, usually emphasizing commercial timber production objectives, with some providing additional incentives for public access (Butler et al. 2012). Tax programs with specific management plan requirements, withdrawal penalties, and strong financial incentives, including those of California, Maine, and states of the upper Midwest, are considered to be most effective in protecting forestland in areas highly susceptible to development (Ma et al. 2014). Tax policies alone are often not enough to stave off development of private forestland, however (Butler et al. 2012), so public agencies and nonprofit conservation organizations (NCOs) have also purchased private forestland for more than a century (Fairfax 2005). In recent decades there has been a shift from fee simple land purchases toward the purchase of CEs (Merenlender et al. 2004). CEs are a form of partial title transfer between a landowner and a nonprofit land trust or government agency to restrict some land uses in perpetuity to protect conservation values (Rissman et al. 2013). CEs are less expensive for public agencies than outright land acquisition and are increasingly used to ensure continued forest production and recreational access from large private forestlands (Owley and Rissman 2016). Some owners may prefer CEs because they provide an accelerated return on their initial land investment with few significant demands for management changes (Rissman et al. 2013). New investment owners may differentially engage with these conservation programs, with important implications for land management and public access outcomes.

Conservationists and policymakers are concerned that forestland divestment will negatively affect a number of forest qualities, including timber supply, recreational access, and healthy ecosystems. Public access to former industrial forestland may be greatly altered, either by hastened parcelization (Rickenbach and Gobster 2003) or through closure by investment owners that consider access rights to be profitable assets (Gunnoe and Gellert 2011). While the primary purpose of land ownership by VIFPCs was to supply their mills, these lands were historically accessible to the public (Hickman 2007). New investment owners may sell off parts of their land with higher real estate value for residences and development, which are more likely to be closed to the public (Dennis 1993). Larger properties owned for economic returns are generally more likely to permit public access (Snyder and Butler 2012), but investment owners may view recreational activities as a potential hindrance to management priorities or as an additional opportunity for profit via sale of leases (Daigle et al. 2012). While leasing of properties for exclusive recreation may limit problems for landowners, recreationists often use multiple forestlands for different activities (Marcouiller and Mace 1999), so closures are not necessarily offset by reduced pressure on other public and open private land.

Questions and Hypotheses

This study focuses on changes in ownership and recreational access on former VIFPC forestland in the state of Wisconsin. Wisconsin is a state with a large amount of private forestland, a variety of forest conservation programs, and a long tradition of recreational access to industrial forestland. To understand the extent and significance of forestland changes, we asked: (1) How have the types of owners and the amount of land they control changed following divestment by VIFPCs of their forestlands? (2) To what extent did VIFPC divestment lead to changes in conserved forestland, either through CEs or fee simple land sales, and how did this vary by landowner type? (3) To what extent did VIFPC divestment lead to changes in the availability of public access to forestland, and how did this vary by landowner type? We approached these questions through a mixed-methods approach, including a quantitative analysis of land ownership records from 1999 to 2015 and organizational profiles of the REIT and TIMO controlling the greatest amount of forestland in the state.

Study Context

Wisconsin contains more than 16 million acres of forestland, predominantly in its northern and central regions. These forests support the highest number of forest industry employees and total value of industrial forest product shipments of any state in the United States (American Forest and Paper Association [AFPA] 2015). More than two-thirds of the forests in Wisconsin are privately owned (Best and Wayburn 2001), and ownership by VIFPCs has made up about 10% of this area since the 1940s (Stearns 1997). The parcelization of private forestlands is perceived as a threat to the economies of scale necessary for timber harvesting and recreational activities (Rickenbach and Gobster 2003). Increasing demand for forestland was reflected in rising per-acre costs in forestland sales from the late 1990s until 2007 (National Agricultural Statistics Service [NASS] 2015), but following the national recession that began in late 2007, the total number, acreage, and prices of forestland sales dropped significantly. Land sales for continued forest use returned to nearly prerecession

levels by 2012, but transaction rates and values of forestland for other uses have remained much lower than previous levels (NASS 2015).

Conservation organizations have encouraged sustainable timber production and forest recreational access to private forestlands in Wisconsin through several programs. The most extensive of these are the Managed Forest Law and the Forest Crop Law tax programs (MFL/FCL), which together enrolled more than 3 million acres of private forestland in 2015. Participation in MFL/FCL reduced property taxes to a per-acre rate for all private landowners, and if landowners designated their land as “open” to public access for specified recreational activities they receive additional reductions to a lower per-acre rate. Through the end of 2015, properties in MFL/FCL legally could not be subject to recreational leases that permitted exclusive use to individuals or groups, whether or not they were enrolled as open. The programs were estimated to lower property taxes by an average of 80% (Nielson and Bergman 2004), but owners who withdrew before the end of the 25- and 50-year enrollment terms incurred significant financial penalties, including requirements to repay prior year taxes and pay additional withdrawal fees.

Public agencies and NCOs are able to purchase private forestland in Wisconsin, both in fee simple and CEs, predominantly with financial support from the state’s Knowles–Nelson Stewardship Fund. The funding requires that most purchased properties be open to the public for the recreational activities allowed on open MFL/FCL properties, in addition to access for game trapping. The federal Forest Legacy Program (FLP), which has provided matching grants for several large CEs in the state, also gives preference to projects that increase and permanently guarantee public access. Between 1999 and 2014, the state and federal governments have provided more than \$156 million for the acquisition of former VIFPC land, including \$70 million to purchase this land in fee simple and \$64 million for conservation easements from Wisconsin’s Knowles–Nelson stewardship funding, as well as \$22 million for acquiring CEs through FLP and other federal grants.

Methods

This article examines trends in land ownership, conservation transactions, and public access following divestment by VIFPCs in Wisconsin. We present quantitative trends supplemented by organizational profiles of the largest REIT and TIMO in the state to suggest rationales behind their land decisions.

Land Ownership Transitions

We tracked ownership transitions beginning with a database from Wisconsin’s forestland tax program. An overwhelming percentage of all VIFPC and investor owned forestlands in Wisconsin are enrolled in MFL/FCL, primarily due to the significant per-acre tax reductions and financial penalties for withdrawal. Enrollment remains in place for forested properties even as they go through ownership change, so many of the properties that were previously owned by VIFPCs have remained enrolled in the programs, even as the land was sold to new private owners. We confirmed with Department of Natural Resources (DNR) stakeholders that large VIFPC and investor landowners have enrolled nearly the entirety of their properties in MFL/FCL due to substantial property tax benefits, so we considered acreage enrollments by landowners in the programs as equivalent to their total land ownership.

We identified all private forestland held in large MFL/FCL enrollments of more than 1000 acres in 1999 and examined the ownership dynamics of these lands using program enrollment data acquired from the Wisconsin Department of Natural Resources (WDNR) at 4-year intervals from 1999 to the beginning of 2015. Enrollments by most private owners with more than 1000 acres of land are designated in a “large” (previously “industrial”) category, with slightly different management requirements but the same per-acre tax rates as small owners in the program. After consulting with forestland owners, managers, and state agency professionals, we classified all large private forestland owners throughout the study period, as well as the acquirers of lands that left those ownerships, into 11 owner types in four groups (Table 1), building on previous classifications in other regions of the United

Table 1. Typology of large forestland property owners and purchasers.

Group	Type	Description	Largest landowners during period
Vertically integrated forest product companies			
	Paper mill	A corporation that owns one or more paper mills, usually in addition to pulp mills, and holds forestland primarily to supply these facilities.	Consolidated Papers, Inc. Stora Enso North America The Timber Co. (Georgia Pacific)
	Lumber mill	A corporation that owns one or more lumber mills and holds forestland primarily to supply these facilities.	Tigerton Lumber Co. Connor Timber Associates Kretz Lumber Co., Inc.
Investment owners			
	REIT	A publicly traded real estate investment trust that purchases timberland in order to pass earnings directly to shareholders.	Plum Creek Timberlands LP Potlatch Forest Holdings, LLC
	TIMO investor	Investors in funds managed by timberland investment management organizations.	Heartwood Forestland Fund VII (The Forestland Group LLC) Lyme St. Croix Forest Co., LLC (The Lyme Timber Co. LP) Northwoods ATP LP (Regions/RMK/BTG-Pactual)
	Other investors	Corporations, families, and individuals that invest in large forestland properties.	Tomahawk Timberlands LLC FutureWood Corp. Richard M Connor Jr.
Other private owners			
	Mining corporation	A corporation that owns land and mineral rights for underground resource extraction.	US Steel Corp. RGGG Land & Minerals LTD LP LaPointe Iron Co.
	Other company	Corporate landowners that have a primary interest in land for uses other than forest-production.	Northeast Asphalt, Inc. Wildlife for Tomorrow Wisconsin River Power Co.
	Small private buyer*	Corporations, families, and individuals with less than 1000 acres of land.	
Public, tribal, and nonprofit			
	Native American tribe*	One of the federally recognized tribes in Wisconsin.	Bad River Band of Lake Superior Chippewa Indians Lac du Flambeau Band of Lake Superior Chippewa Indians
	NCO*	Nonprofit conservation organizations with an environmental focus that are neither a part of a government nor a conventional for-profit business.	The Conservation Fund The Nature Conservancy The Trust for Public Land
	Public*	Government agencies at the federal, state, and county level.	Wisconsin DNR County Forests Wisconsin BCPL

*Those with land owned in large private ownerships in 1999.

States (Hagan, Irland, and Whitman 2005; Froese et al. 2007). We calculated total landownership by owner and owner type at each 4-year interval. We also assembled a database of land transactions from media reports, corporate sales announcements, and U.S. Securities and Exchange (SEC) annual filings, and communicated with state agency staff to corroborate the area, date, and owner identities of all reported transactions of forestland originally controlled by VIFPCs and other large private owners enrolled in MFL/FCL. In cases where reported acreages did not align, we used the more conservative numbers and were able to account for the transfers of more than 98% of large ownership acreage.

Conservation Transactions

We defined conservation transactions as purchases by public agencies, Native American tribes, and NCO owners, since they typically place a high priority on sustainable forest production and maintaining recreational access for the public (see Locke and Rissman 2012). We included fee simple land acquisitions as well as CEs that permanently restrict land development and division. In order to determine the extent of large private forestland owner participation in conservation transactions, we assembled a database of all state agency land purchases and CEs (by WDNR and the Wisconsin Board of Commissioners of Public Lands [BCPL]), in addition to land acquisition records from the U.S. Forest Service and County Forests. Sales to Native American tribes and NCOs were identified through media reports, parcel records, and information requests to land trusts. From these records we coded all fee simple and CE transactions by large private forest owners between 1999 and the end of 2014.

Access

All land enrolled in the original FCL program was required to be available to public access for hunting and fishing, while landowners enrolled in MFL have a choice of enrolling their land at different tax rates as “closed” or “open,” which requires access to the public for hunting and fishing, as well as hiking, sightseeing, and cross-country skiing. For the years 1999 and 2015 we calculated the total amount of forestland open to public recreational access by large owner type. Access to forestland purchased by Native American tribes was calculated according to its MFL/FCL status at the end of the time period. We also determined the amount of forestland purchased by federal, state, and county agencies that remained open to public access.

Organizational Profiles

In order to gain a better understanding of the conservation transactions and public access decisions by landowners following industrial land divestment, we developed two profiles of the REIT and TIMO controlling the greatest acreage of forestland in Wisconsin. We analyzed company records and conducted interviews with a company land manager for each profile. We conducted additional interviews with present and former public employees of the largest public agencies involved with purchasing former VIFPC lands. Interviews were semistructured and lasted about an hour each. They were recorded and key ideas and quotes were transcribed. The organizational profiles allowed us to explore the organizational motivations for the patterns we observed in the quantitative data.

Findings

Distribution of Land Ownership

The total amount of forestland in large private ownerships declined steadily after 1999 (Figure 1a), and only 69.9% of the original 1,078,800 acres of large ownerships remained in MFL/FCL by the beginning of 2015. Of the land remaining in large private ownership, there was a substantial decrease in the amount controlled by VIFPCs. In 1999, nearly 930,000 acres (86.2%) of private forestland in large ownerships was controlled by VIFPCs, including eight pulp and paper producers and five lumber producers. By 2015, the total amount of forestland remaining under the control of any paper and lumber-producing VIFPCs had declined to less than 61,000 acres (8.1%). Lumber companies controlled just over half of their original acreage, and the two remaining paper producers controlled less than 0.3% of their original land holdings. This divestment led directly to the rise in ownership by TIMO investors and REITs. From 2003 to 2007, REITs controlled more than 50% of all forestland in large private ownerships, though they later sold most of this land. At the end of the study period more than three-quarters (76.3%) of the original VIFPC forestland acreage had been sold to TIMO investors. Five TIMOs managed 575,000 acres for 18 different ownership funds, the two largest of which controlled more than 80,000 acres each.

The volume and timing of forestland transactions by large private forest owners varied over the study period (Figure 1b). The pulp and paper mill VIFPCs with the largest initial ownerships sold off nearly the entirety of their holdings, often in single deals. Two REITs (Potlatch Corporation and Plum Creek Timber Company) acquired half the total VIFPC

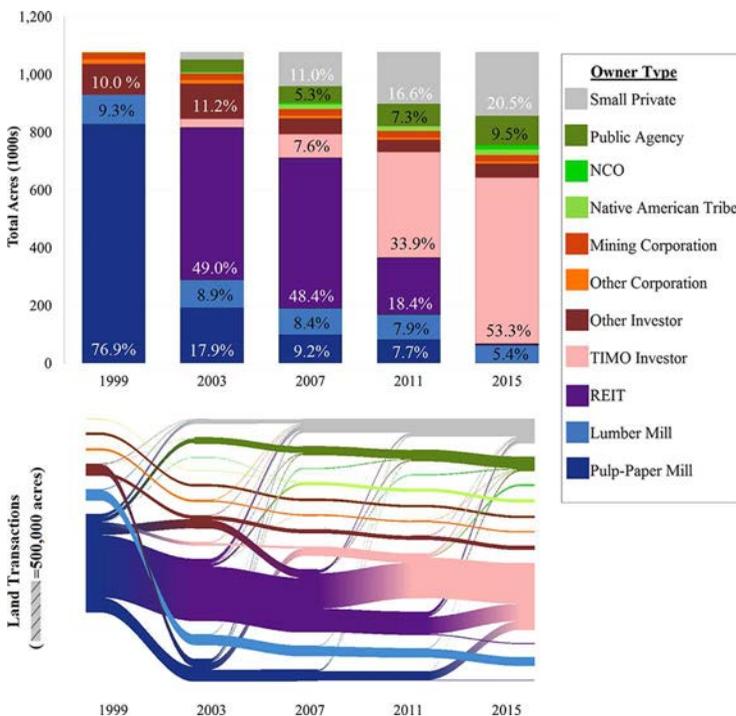


Figure 1. (a) Total large ownership forest area by owner type, 1999–2015. (b) Large ownership forest transactions between owner types, 1999–2015.

acreage with three large purchases between 2001 and 2007 and then sold it to public and private buyers over the remaining years. Some of the largest buyers were TIMO investors, which, in contrast to REITs, continued acquiring rather than selling land in Wisconsin through 2015. Some VIFPCs were very active in rural land sales and real estate development themselves, advertising and marketing small properties to purchasers for recreation and development. Wausau-Mosinee Paper Corporation, the last paper producer with large landholdings, sold about one-third of its land in small units over the decade prior to late 2011, when it sold the remainder of its land directly to two investment funds managed by TIMOs, the Lyme St. Croix Timber Company and The Forestland Group. Investors purchased lands through other TIMOs, including Forest Investment Associates (FIA), Timberland Investment Resources, and RMK/Regions (later BTG Pactual). As a WDNR representative observed, “The industrial forest owners are pretty much out of the land-owning business now.” However, lumber-producing VIFPCs still owned 58.4% of their original acreage at the end of the period. Altogether, the greatest transitions occurred in the ownership of pulp and paper mill VIFPCs, and most of this land went to investors and other private owners.

Conservation Transactions

The divestment of paper company land allowed public agencies, Native American tribes, and NCOs to place large amounts of forestland into more permanent conservation status (Figure 2). Former VIFPC land was acquired by two state agencies (WDNR and BCPL), 11 county forests, and the Chequamegon–Nicolet National Forest. In three counties in

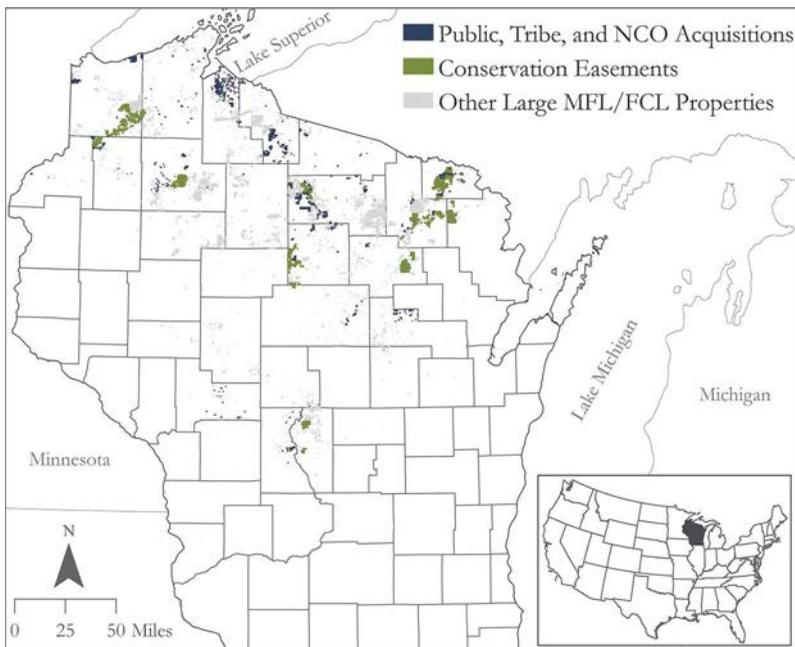


Figure 2. Map of conservation transactions on large private forestland enrolled in MFL/FCL, 1999–2014.

northern Wisconsin (Lincoln, Florence, and Forest), more than 90% of the county forest acres acquired over the period were from large private forest owners. There were 23 separate conservation easement transactions, originating from each type of VIFPC and investment owner.

The amount of land in conservation transactions varied greatly among owner types (Table 2). In fee simple land sales, VIFPCs and REITs each sold more than 44,000 acres of forestland to public agencies and NCOs. Lumber-producing VIFPCs and other forest investors sold a much smaller amount and percentage of their forestland in conservation transactions, but they enrolled a similar percentage of their landholdings in conservation easements (more than 16.5% each). TIMO investors sold a relatively small percentage of their lands (less than 3%) outright to conservation owners, but they sold two large CEs in areas of high ecological priority for the state and purchased several large properties that had been previously enrolled in CEs. NCOs were often involved in state working forestland purchases and conservation easements. They were frequently involved in transaction negotiations, and in several instances they have purchased land or CEs directly from VIFPCs and TIMOs.

Changes in Public Access

The area of large private lands enrolled in MFL/FCL that was open to public recreation access declined by 352,000 acres over the study period (Table 3). In 1999, more than 99% of the total area enrolled in the large ownership category was open to public recreational access. In 2015, the remaining large ownerships were still 96.8% open to the public, but because so much land had moved out of the large ownership category, total open access land enrolled in large ownerships in MFL declined by more than one-third. However, not all ownership types kept such a high percentage of their land open to public access. The major outliers were lumber companies and other corporations. These two groups reduced the portion of their land open to public access from nearly 100% to approximately 70% during the study period.

While the amount of large private forestland open to public access through the MFL/FCL program decreased considerably as land in large ownerships left the tax program, this did not mean that all of this land was closed to the public. We found that more than 96,000

Table 2. Conservation easements and fee simple sales of former VIFPC land, 1999–2014.

Forest owner type	Conservation easements to state or NCOs (1999–2014)		Fee simple sales to public agencies, tribes, or NCOs (1999–2014)	
	total acres	(number of transactions)	total acres	(number of transactions)
Vertically integrated producer				
Paper mill	44,618	(3)	49,778	(51)
Lumber mill	18,648	(3)	1,249	(6)
Investment owner				
REIT	45,785	(7)	49,342	(43)
TIMO investor	59,255	(2)	17,858	(6)
Other investor	35,120	(4)	6,478	(9)
Other private owner				
Mining corporation	0	(0)	0	(0)
Other corporation	0	(0)	6,556	(10)
Tribal and nonprofit				
Native American tribe	0	(0)	0	(0)
NCO	30,421	(4)	20,119	(10)
Totals	233,847	(23)	151,648	136

Table 3. Large private forestland open to public access under MFL/FCL by owner type, 1999–2015.

	Open public access 1999		Open public access 2015	
	Acres	Percent of MFL/FCL holdings	Acres	Percent of MFL/FCL holdings
Vertically integrated producer				
Paper mill	827,483.7	99.7%	2,315.6	100.0%
Lumber mill	98,472.7	98.1%	38,989.1	69.8%
Financial investor				
REIT	0.0	—	17,849.6	99.1%
TIMO investor	0.0	—	563,808.3	99.8%
Other investor	99,375.9	99.7%	29,783.5	96.6%
Other private owners				
Mining corporation	21,928.4	100.0%	20,805.7	94.1%
Other corporation	22,869.2	97.7%	15,220.3	72.0%
Tribal and nonprofit				
Native American tribe	3,722.2	100.0%	19,129.1	99.0%
NCO	0.0	—	13,756.1	100.0%
Totals	1,073,852.1	99.6%	721,657.2	96.3%

acres were sold to public agencies and nearly all of these remain open to public access though no longer enrolled in MFL/FCL. Furthermore, recreational opportunities were often a focus of CE funding and negotiations. In some instances, CEs guaranteed additional recreational activities beyond those already included under MFL/FCL. For example, some CEs permanently allowed the right to trap game animals, harvest berries, or use motorized vehicles like snowmobiles and ATVs, none of which were required by the tax program. In 2014, the state and an NCO landowner established a road fund endowment under a working forest CE to pay for the maintenance and repair of private roads on which the public is granted access for recreational purposes.

The Largest REIT Landowner: Plum Creek Timber Company

The corporation that controlled the greatest total amount of Wisconsin's private forestland during the study period was also one of the largest private landowners in the country. Plum Creek Timber Company (Plum Creek) was a timber REIT that owned 244,000 acres in Wisconsin through a 2001 merger with The Timber Company, an operating company of Georgia-Pacific Corporation. In 2002, Plum Creek acquired another 307,000 acres from a Finnish company, Stora Enso. As a publicly traded company, Plum Creek had to report quarterly returns from its landholdings of more than 8 million acres in 20 states. In Wisconsin it derived returns from the approximately 550,000 acres it purchased primarily through its timberlands and real estate segments. According to a Plum Creek representative, "We regularly review our timberlands to identify properties that may have higher values other than as commercial timberlands. These are lands that we may choose to sell or exchange for conservation, recreation or residential purposes." These properties might be considered nonstrategic for a variety of reasons, including lower than average forest productivity, prices that exceed the value of holding and operating as commercial timberland, or simply location in areas where the company would like to reduce its presence. These pressures help explain the greater rate and size range of property sales by Plum Creek than any other large private forest owner during the study period. Plum Creek sold land to a variety of private owners, including individuals, development companies, farming corporations, hunting clubs, and several TIMO investors, in transactions from less than 10 acres up to 99,800 acres.

As one of the country's largest landowners, Plum Creek has been critiqued for intensive harvest and land subdivision (Bell 2007), but it has also contributed to numerous land conservation projects. In Wisconsin, it sold just over 42,000 acres in fee simple to conservation agencies and organizations, and placed another 45,465 acres of land under conservation easement, primarily through three large CEs for which it received over \$22 million in public funding. Together this represents more than 16% of the REIT's original land purchased in the state. An employee of Plum Creek observed that "Conservation easements in Wisconsin are a very useful tool to protect what the state values and protect the timberland value as well, and to keep large blocks of land in working forest."

Plum Creek allowed public access to nearly all of the land it owned in Wisconsin, even though leasing land for recreation is a revenue source for the company in many other states. A company representative noted, "We bought in Wisconsin knowing the requirements of MFL... it was not a viable business decision for Plum Creek to go into leasing." Plum Creek did sell several properties to hunting and shooting clubs, indicating the demand for more restricted recreational properties. However, the company also noted on its nationwide recreational leasing website that all of its property in Wisconsin was open to the general public for recreation because of enrollment in MFL/FCL (Plum Creek Timber Co. 2015). These actions demonstrate both the willingness of Plum Creek to allow continued recreational access and the effects of the state's incentive programs to support it.

The Largest TIMO: The Forestland Group

By 2015, much of the Wisconsin forestland originally owned by VIFPCs had been sold to institutional investors under the management of TIMOs; The Forestland Group (TFG), a TIMO based in Chapel Hill, NC, controlled more than 212,000 acres. TFG manages this land for four comingled investment funds, two of which were the largest private landowners in the state. The organization purchased these lands in transactions ranging from 40 acres to 99,800 acres from several different private owners, including one VIFPC paper producer, local forestland investors, and several purchases from the Plum Creek REIT. A representative of the company noted that the funds were structured to allow the purchase of small in-holdings to allow greater control and facilitate timber management. These purchases have allowed TFG investors to accumulate properties from different owners across northern Wisconsin to create more consolidated holdings.

By 2015, TFG had sold very little of its investors' land in Wisconsin, though this is expected to change as investor funds reach the end of their fixed terms between 2017 and 2025. Although other TIMOs in the state have enrolled their investors' forestland in CEs, TFG had not enrolled any land in CEs or sold any land to the state, counties, tribes, or NCOs by the end of the study period. However, a TFG representative indicated that it is open to this possibility, and TFG has purchased over 30,000 acres of land enrolled in two separate CEs by previous REIT owners. This may reflect the incentives TIMOs have as asset managers to retain and increase land under their own control.

Like other investment managers, TFG has kept nearly all of its investors' land in Wisconsin enrolled in MFL/FCL and open to public access, even though it leases land in other states. One company representative noted, "What's driving the lack of these [leasing] programs in Wisconsin is the fact that we've got the Managed Forest Law which is providing us with great tax breaks to keep the land open for the public for hunting and fishing and

other recreational uses.” Many TFG properties are posted with informational signs about allowed activities. However, the TIMO has been criticized for reducing vehicular access to the roads on one of its investors’ properties with a preexisting CE. A company representative described its response: “We open gates and worked with the DNR with regards to when those gates will be opened and closed, but in order to restrict access and protect the resource and our investment ... we’ll open and close gates [on other road systems] based upon our need and our decision as to when it should be appropriate for the public to access the property.” These sentiments demonstrate the increasing challenges TIMO land managers face in balancing the requirements of conservation programs, maintaining community relations, and the desire to minimize costs to their investors’ assets.

Discussion

Forestland divestment by VIFPCs has led to major changes in land ownership and public access to large private forestlands in Wisconsin. As we expected, VIFPC divestment led to a substantial decrease in the total amount of land in large private ownerships. At least 30% of this was due to the sale of portions of the original VIFPC land to public ownerships, but the majority was from sales to smaller private ownerships. This latter portion represents the greatest danger of parcelization and the greatest concern with respect to promoting conservation and maintaining public access. While CEs limiting future property divisions should ensure that some investment owner forestlands will remain in large ownerships, sale and parcelization of their remaining forestlands are likely to continue. Changes in forest ownership in Wisconsin are broadly similar to patterns in other regions where most VIFPC land was purchased by large investment owners, while significant portions of these forestlands were also sold to small private owners, public agencies, and conservation nonprofits (Jin and Sader 2006; Zhang, Butler, and Nagubadi 2012).

Much of the land remaining in large private ownerships has been sold to investment owners that differ from VIFPCs in their approaches to profiting from forestland. In addition to timber values, the new investment owners have an increased focus on real estate and development values. Thus far they have operated in a manner similar to the original large VIFPCs with respect to allowing public access on their land. We suggest that Wisconsin’s Managed Forest Law deserves a great deal of credit for maintaining public access and buffering losses due to changes in ownership. The MFL program is one of the largest state property tax programs for sustainable forest management on private forestland, with relatively long fixed enrollment periods and substantially lower tax rates for providing recreational access. Several aspects of the program were changed by state law in early 2016 (2015 Wisconsin Act 358; State of Wisconsin 2016), including new provisions to allow landowners to voluntarily withdraw forestland from the program without penalty, permitting the leasing of enrolled land designated as closed to public access, and requiring signed access to land open to public access. Future research on the interactions between recreational access and the divestment and conservation of private forestland is needed, especially in states like neighboring Michigan and Minnesota that incorporate access requirements into tax programs, as well as areas of the northeastern United States, where there has been a shift away from an open private land tradition (Ginger et al. 2012) toward fees for hunting access (Daigle et al. 2012), and Southern states with more developed recreational land leasing systems (Zhang, Butler, and Nagubadi 2012). Financial incentive programs may have only

limited effects on family forest owners (Kilgore et al. 2007; Butler et al. 2012), but they are a significant motivating factor for corporate landowners with extensive landholdings and strong profit motivations.

Investment owners have engaged a higher fraction of their total holdings in conservation transactions than the original VIFPCs, though TIMOs and REITs have differed in their patterns of conservation transactions. TIMOs have sold much less land in fee simple and have tended to favor large CEs, often quickly following initial land purchases. REITs have participated in both types of transactions, but have placed CEs in smaller increments at regular intervals. The time frames and financial requirements of these organizations may help explain differences in their length of land ownership and manner of engaging in conservation transactions. The need for REITs to generate consistent returns creates pressure for the companies to sell forestland to both private and public owners. In contrast, many TIMO investors have a set time frame of a decade or more, which allows managers to wait for favorable land prices and reduce the total number of land transactions. The preference for CEs over complete sales may stem from managers' desire to keep forestland under their control and maintain their total assets under management. These strategies vary within the TIMO and REIT types; a subset of investment owners is responsible for the majority of CEs and sales, while other investment owners have participated in few sales or conservation transactions.

Conservation opportunities arise in periods of land ownership change turnover if public agencies and NCOs have the funding and authority to react (Fairfax 2005). The purchases by public agencies following this cycle of VIFPC divestment echo previous periods of forest ownership change in Wisconsin when cleared and abandoned forestland was incorporated into state, county, and national forests following the "cutover period" of the early 20th century and land abandonment during the Great Depression (Stearns 1997). A century later, the amount of former VIFPC land that has been protected through CEs has exceeded fee simple purchases. While investment-oriented landowners in some parts of the country may be resistant to CEs if they result in a lower resale value (Gosnell, Haggerty, and Travis 2006), many investment owners of forestland in Wisconsin intending to keep land in timber production have welcomed the sale of CEs for the full value of development rights. Funding from the Knowles–Nelson Stewardship Fund has been essential in facilitating the public acquisition of former VIFPC forestland as well as for the purchase of CEs, especially in providing matching funds for FLP. Wisconsin is one of 33 states with devoted conservation funding for land acquisition (Trust for Public Land [TPL] 2015), but how it compares to other states in the acquisition of former VIFPC lands is unknown.

Ensuring public access has been an increasingly important driver of recent forestland protection efforts. Compared to public acquisition, CEs on private lands provide fewer public rights to forests, with more limited recreational opportunities and less public oversight of timber and wildlife habitat management. On the other hand, CEs provide a greater degree of public access than enrollment in the MFL/FCL tax program alone and have added guarantees of additional types of access in perpetuity with requirements from Knowles–Nelson and FLP funding. Thus, though VIFPC land divestment has led to a decline of about 352,000 acres of publicly accessible private land, conservation programs have increased access on 96,000 acres through purchase by public agencies and on 230,000 acres placed in CEs, and maintained access to at least 721,000 acres through MFL/FCL. Providing the infrastructure to allow access to these acres may be the next challenge. While investment owners currently maintain nearly all of their land in the "open access" designation for

recreationists on foot, they have increasing concern about allowing use of their internal roads, which are financial assets of the companies.

Privately owned forestlands are critical for biodiversity and ecosystem services (Kamal, Grodzińska-Jurczak, and Brown 2014). Following divestment of forestland by VIFPCs and subsequent purchase by investment owners, the decision-making structures of publicly traded companies and investment managers are increasingly shaping the trajectories of private forestland ownership and use. Wisconsin's strong tax incentives and land conservation funds have been instrumental in maintaining public access and buffering fragmentation during this dynamic transition period. Forestland ownership and management objectives are now more closely tied to investment decisions and will continue to evolve, especially in response to programs providing financial incentives. The implications for conservation and public recreation will remain important areas of study during the next decade as ownership transitions continue.

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