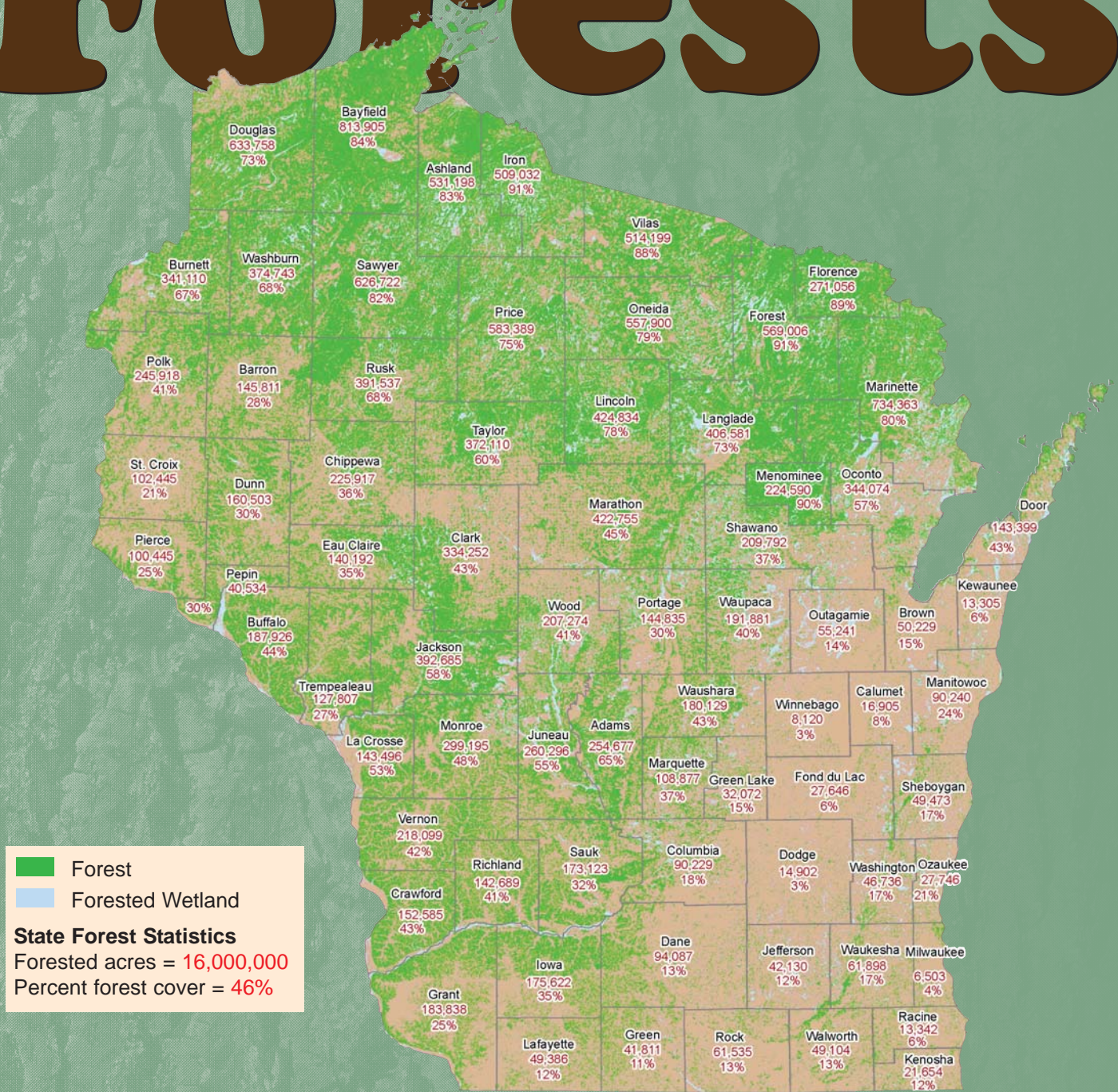


WISCONSIN LAND USE MEGATRENDS:

Forests



Map 1: Wisconsin Forest Cover
 This map displays forest and forested wetland land cover in Wisconsin using WISCLAND data developed in 1992. Forest statistics from the 2002 USDA Forest Service Inventory show that over 46 percent of Wisconsin or approximately 16,000,000 acres are forested.¹⁴

Introduction

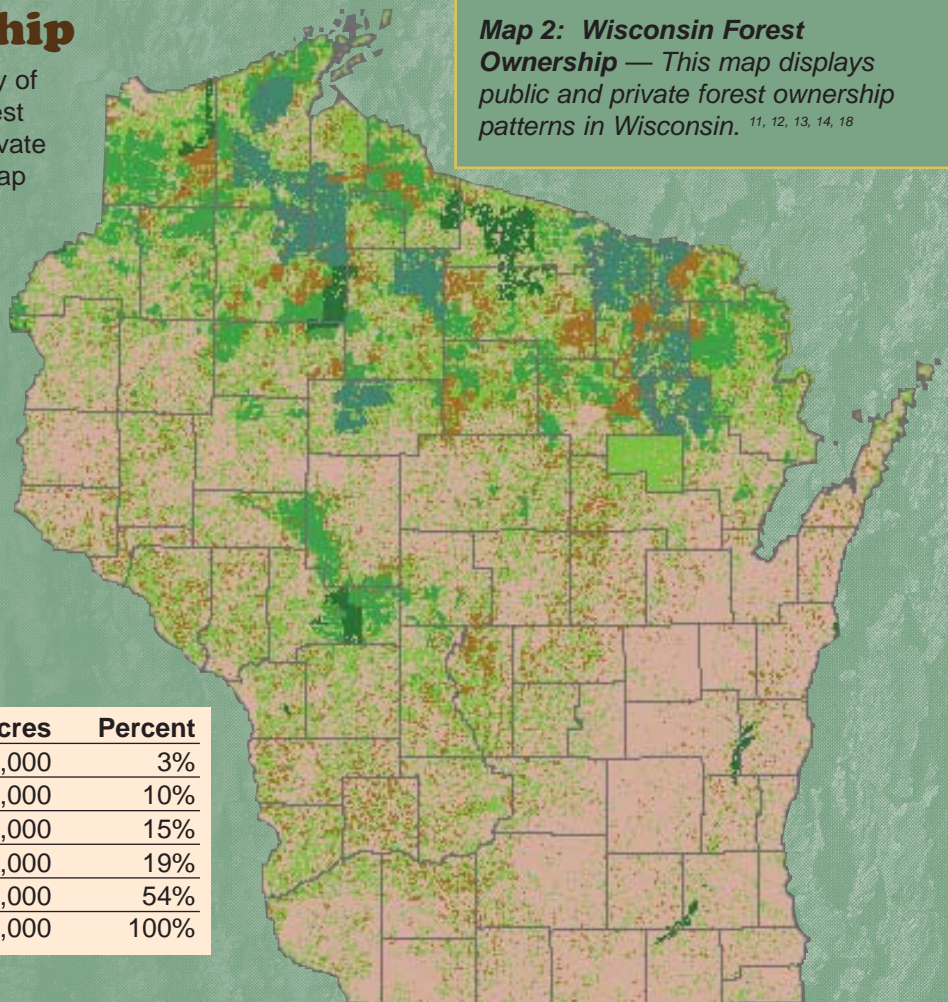
The goal of this brochure is to illustrate statewide land use trends related to Wisconsin's forested lands. Throughout history, forests have played an integral role in the physical and economic development of the state and helped shape the state's proud conservation ethic. Today, forests contribute to the state's economy and environment by providing financial, recreational, aesthetic, ecological and other benefits. By increasing awareness and understanding of the importance of forests, we hope to engage local communities, government officials, planning professionals, and individual landowners in a dialogue about the importance of Wisconsin's forests. We encourage Wisconsin communities to develop local land use strategies that will enhance conservation and management of the state's forest resources.



Forest Ownership

To ensure the sustainability of Wisconsin's forests, active forest management by public and private landowners is essential. As Map 2 depicts, individuals own the majority of Wisconsin's forestland and will play a critical role in shaping the future of these lands. Significant technical, financial and educational support is needed as current and future generations of landowners deal with rising land prices, difficulty obtaining financing options and mounting development pressures.

Map 2: Wisconsin Forest Ownership — This map displays public and private forest ownership patterns in Wisconsin. ^{11, 12, 13, 14, 18}



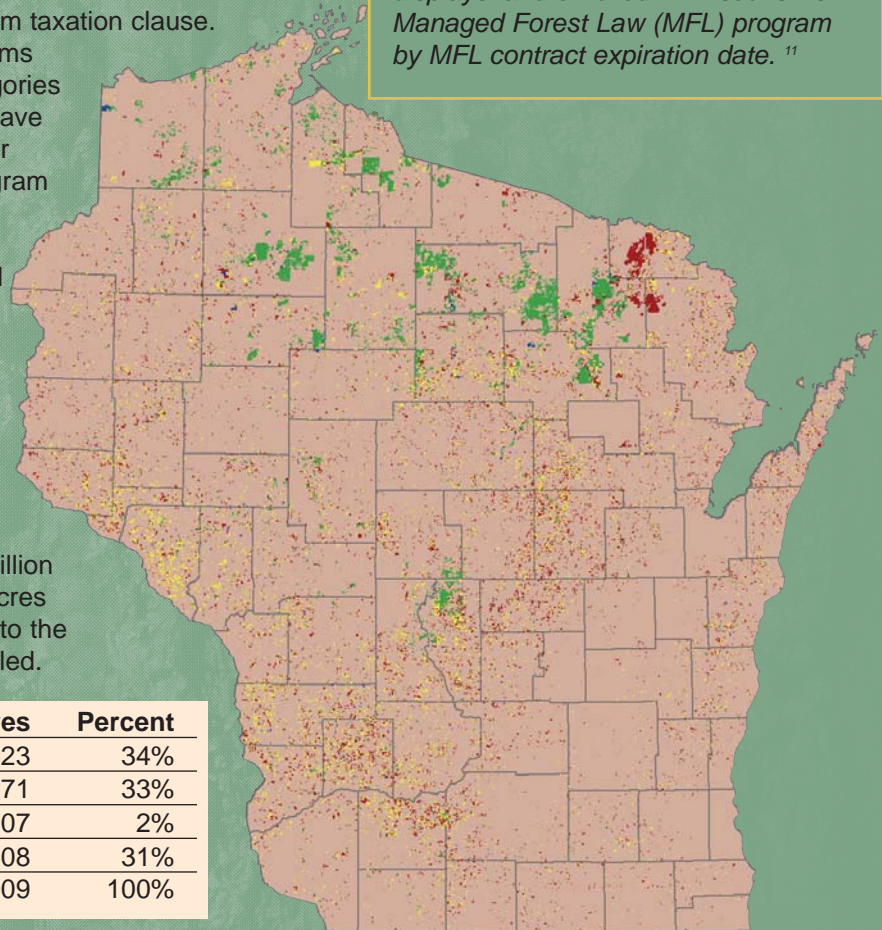
Forest Ownership	Acres	Percent
State Forests	505,000	3%
National Forests	1,500,000	10%
County Forests	2,328,000	15%
MFL/FCL	3,121,000	19%
Other Forest Ownership	8,546,000	54%
	16,000,000	100%

Managed Forest Law Trends

Wisconsin's Managed Forest Law (MFL) program is an outgrowth of forestry promotion and taxation policies dating back to 1927. Recognizing that productive forests were long-term investments with only periodic income, the citizens of Wisconsin amended the State Constitution in the 1920's to permit exceptions from the uniform taxation clause. As a result, forest land enrolled in state programs could be taxed at a lower rate than other categories of land. Over time the state's forest tax laws have expanded to increase participation from smaller private holdings of forest lands. The MFL program began in 1986 and was significantly revised in 2004.

Growth in rural land values and associated real estate taxes along with a maturing timber resource have contributed to a steady growth in the number of acres enrolled in MFL. In recent years, enrollment has increased dramatically, fueled by rapid land value growth and tax shifts associated with agricultural use value assessment. According to records maintained by the DNR, new entries to MFL between 1999 and 2004, totaled almost one million acres – representing almost 40% of the total acres enrolled. The number of landowners applying to the program during that same period roughly doubled.

Map 3: Land Enrolled in Wisconsin's Managed Forest Law — This map displays land enrolled in Wisconsin's Managed Forest Law (MFL) program by MFL contract expiration date.¹¹

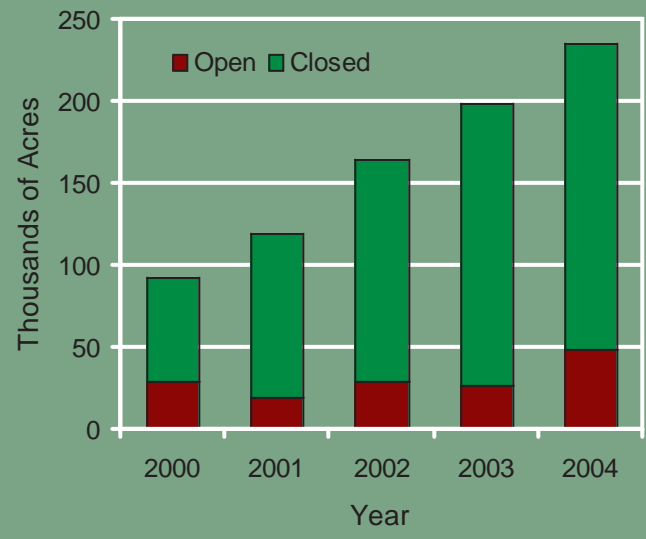


MFL Contract Expiration	Acres	Percent
2011 - 2020	828,823	34%
2021 - 2030	798,571	33%
2031 - 2040	41,107	2%
2041 and after	751,508	31%
	2,420,009	100%

Growing involvement in the MFL program has positive impacts for local communities, the environment and the state's forest industry. Landowners in the program are required to develop and follow active management plans that incorporate environmental protections. MFL lands open to public access are only a portion of annual enrollment but the acreage is increasing overall. Yield taxes paid on harvested timber are returned to communities to pay for public services. DNR records show that since the mid-1990s, the yield tax revenue has increased 700% from about \$100,000 per year in 1994 to over \$700,000 in 2004. The yield tax is roughly equal to 5% of total MFL harvests, suggesting a 2004 harvest worth over \$14 million.

Recent changes in the law may have effects on future rates of enrollment growth. Among other things, the law now requires a higher enrollment fee and higher annual payments from landowners, yielding a smaller tax benefit to the landowner. In addition, the portion of timber revenue yield tax historically provided to the state is now returned directly to local governments, effectively increasing their revenue from MFL lands. Coupled with growing yield tax revenue, these trends suggest the MFL program will be more revenue neutral for local governments in the future.

Figure 1: New Acres Enrolled in Wisconsin's Managed Forest Law



Economic Value of Forests

The economic health of rural Wisconsin depends on agriculture, forestry, and tourism. Forest industries and forest-based recreation, in particular, contribute significantly to Wisconsin's economy.

- Wisconsin has been the #1 paper-making state in the nation for 50 years. The state also ranks very high in fine papers, sanitary paper products, millwork, hardwood veneers, forest product manufacturing capital expenditures, annual payroll, and total forest products employment.
- The forest products industry is Wisconsin's second largest manufacturing employer, providing 1 in every 6 manufacturing jobs in the state. Direct employment translates into 15% of the state's total manufacturing wage and salary income, for a total of almost \$3.2 billion annually. In addition, 1.6 support jobs are created for every job in the industry.
- Wisconsin manufacturers depend on Wisconsin forestry. Over 90% of the state's timber harvest is utilized directly by Wisconsin manufacturers.¹⁶

Trends in the Forest Industries*

Due in part to a soft domestic economy and strong foreign competition, the growth of Wisconsin's forest industries has begun to slow over the past few years. After increasing steadily through the mid-1990's, the value of forest industry shipments leveled off near \$20 billion (see Figure 2). Beginning in the same time period, the number of Wisconsin companies in the forest industries began to decline slightly (see Figure 3). This trend is mirrored by declining numbers of jobs in the wood product and paper manufacturing industries where increased mechanization has been an additional factor (see Figure 4, next page).

* Forest industries refer to wood product manufacturing, paper manufacturing and wood furniture

Map 4: Wisconsin Wood Products Industry, 2002
 This map displays the number of primary and secondary wood product industries by zip code. Primary wood product industries consist of firms that manufacture logs and pulpwood into value added wood products. Secondary wood products industries consist of firms that manufacture dimensional and reconstituted wood products into value added wood products.¹⁵

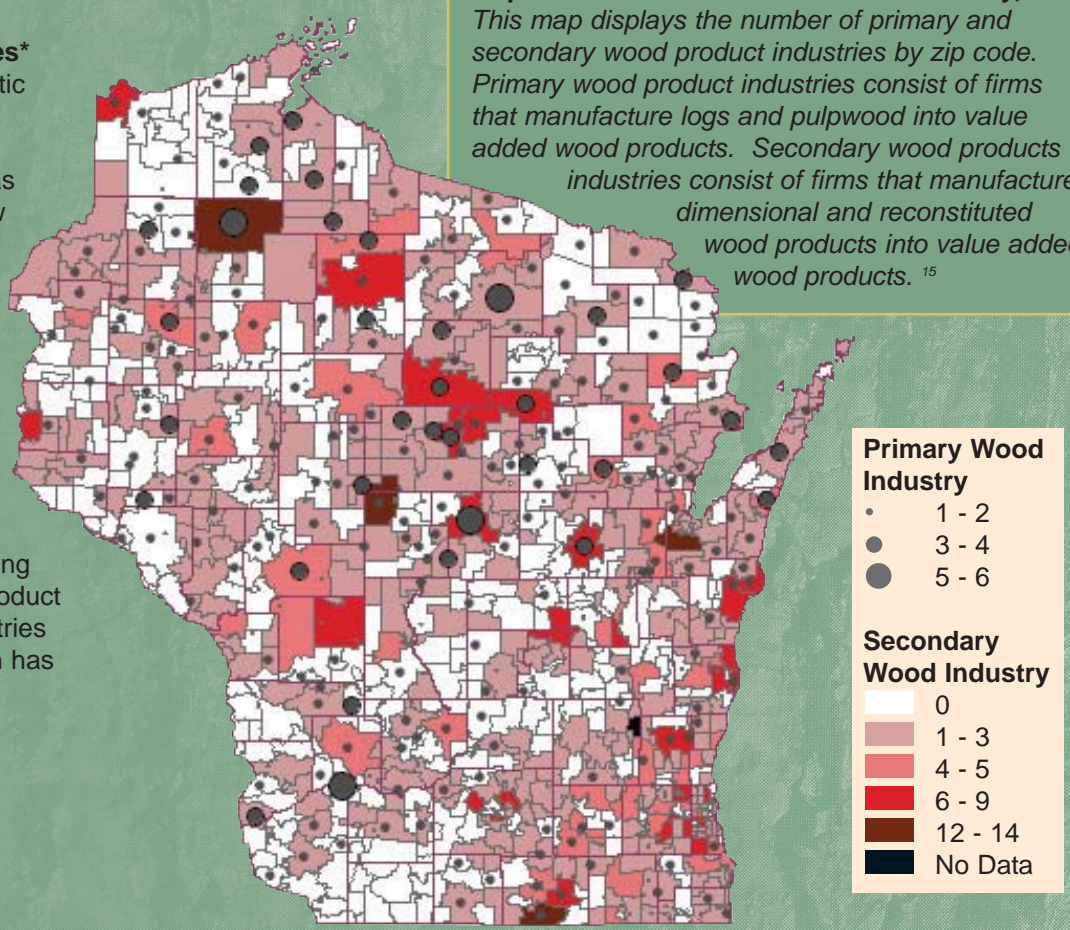


Figure 2: Value of Forest Industry* Shipments¹⁶

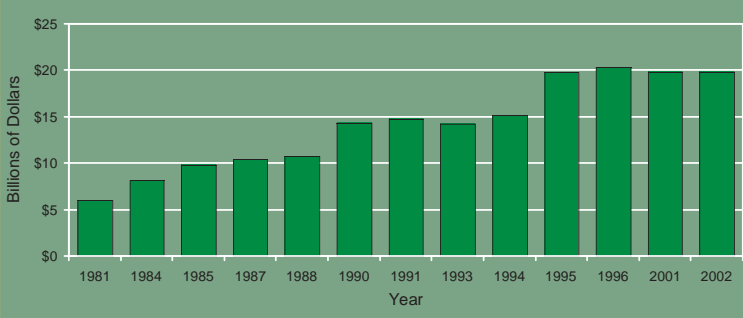
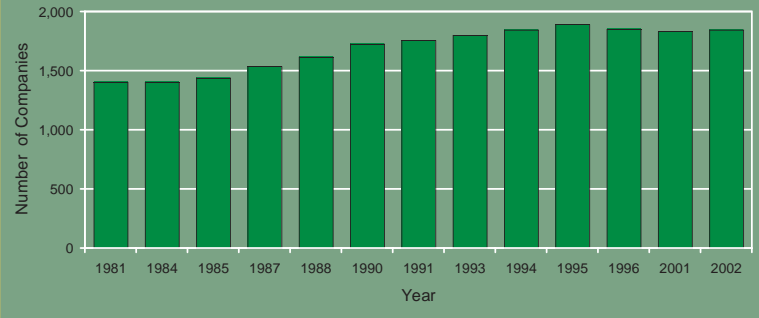


Figure 3: Number of Forest Industry* Companies¹⁶



Recreational Value of Forests

The impact of forest-based recreation on Wisconsin's economy is significant, generating approximately \$5.5 billion annually. When tourists travel to a region for forest-based recreation, they consume local goods and services and enhance the livelihood of local restaurants, hotels, gas stations, grocery stores and other small businesses.

Recreational opportunities exist on both public and private lands throughout Wisconsin. The level of access and types of recreational uses that are appropriate for these lands are determined in large part by ownership. Figure 5 displays user preferences by land ownership type. While quiet recreationists overwhelmingly utilize public lands, hunters tend to favor private lands. Motorized recreationists, on the other hand, utilize a mix of private and public lands, but tend to use more public lands.

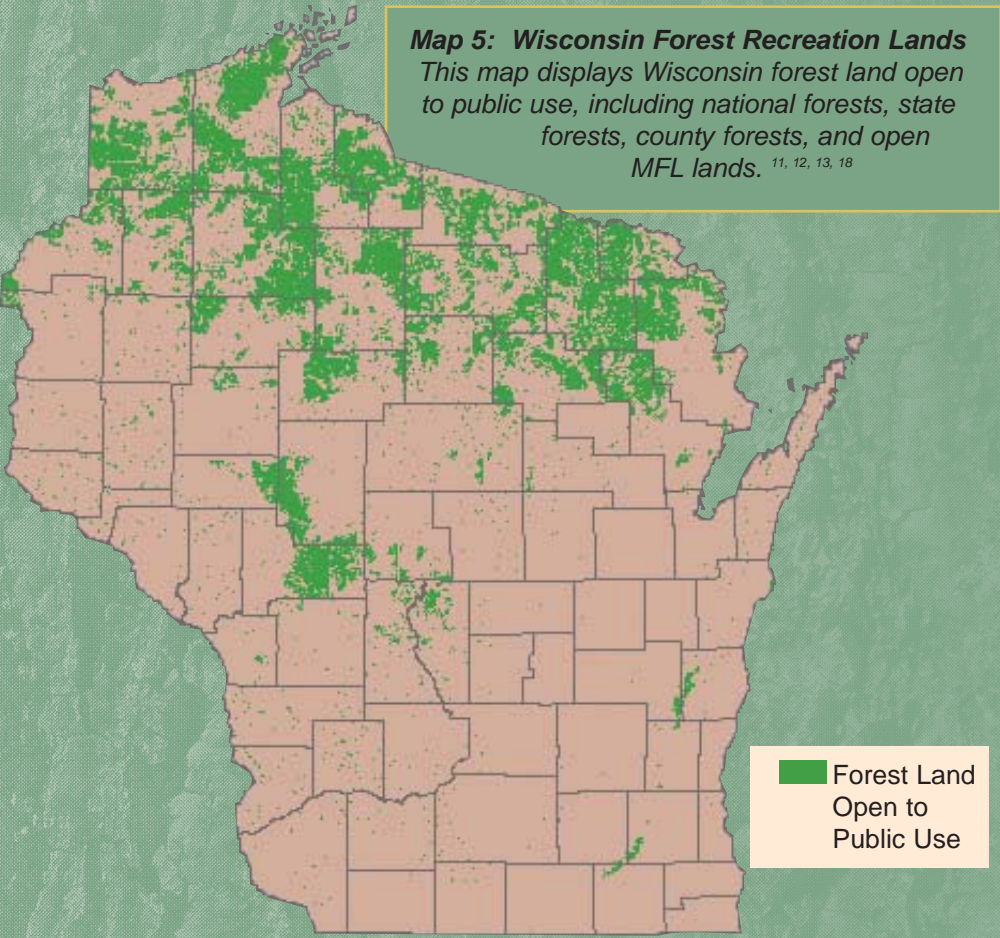


Figure 5: Type of Land Used by Forest Recreationists ⁴

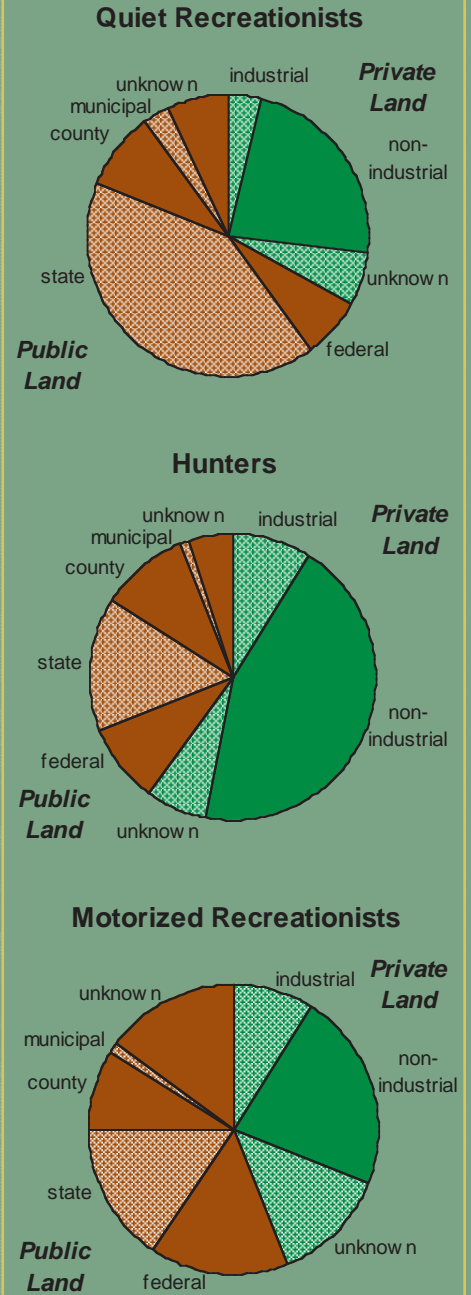


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Water and Forests

The Forest-Groundwater Link

Over 95% of Wisconsin's communities and about 75% of Wisconsin residents obtain their water from groundwater sources.² Groundwater from forested or wooded areas is less likely to contain fertilizers, pesticides and petroleum products because such chemicals aren't typically applied to forested land. In addition, forests act as a natural filter removing chemicals and other contaminants that pass through it. Consequently, many municipalities in Wisconsin have sited their wells in forested areas or are converting well recharge areas into woods.

Nitrate is a common groundwater contaminant in Wisconsin that can cause blue baby syndrome, a condition that can be fatal in infants. In most cases, the amount of nitrate corresponds to local land uses. Nitrates may come from fertilizer and animal wastes on agricultural lands, human waste from septic systems, and lawn fertilizers. An analysis of over 35,000 Wisconsin private well samples found that drinking water is three times more likely to be unsafe to drink due to high nitrates in agricultural areas compared to forested areas (see Figure 6). High nitrate levels are also more common in sandy areas where the soil is more permeable. Drinking water samples with high nitrate levels from agricultural lands are more likely to contain pesticides than drinking water with low nitrate levels.⁹ Because the water in a well drains from large areas of land, nitrate levels often reflect a mixture of land uses around the well.

The Forest-Lake Link

Forests enhance the natural beauty of shorelines and provide food and shelter important for wildlife. In addition, forests serve as buffers to protect lakes from runoff. The trees, shrubs and ground cover in a forest allow water to soak into the ground, thereby decreasing stormwater runoff carrying fertilizers, pesticides and other pollutants to lakes and streams.

Phosphorus is the key nutrient causing plant and algae growth in most lakes. In more than 80% of Wisconsin's lakes, adding phosphorus increases the amount of algae and aquatic plant growth.⁷ On average, forest land delivers significantly less phosphorus to lakes than other land uses. As shown in Figure 7, the amount of phosphorus delivered to lakes per square mile of land is five times higher for residential land and ten times higher for agricultural land.⁵ These ranges reflect differences in soils, topography and management practices. In northern Wisconsin, lawn sites were found to contribute seven times more phosphorus to the lake than forested sites, due to substantial increases in runoff volume.¹

Figure 6: Percentage of drinking water samples with nitrate levels over the health standard

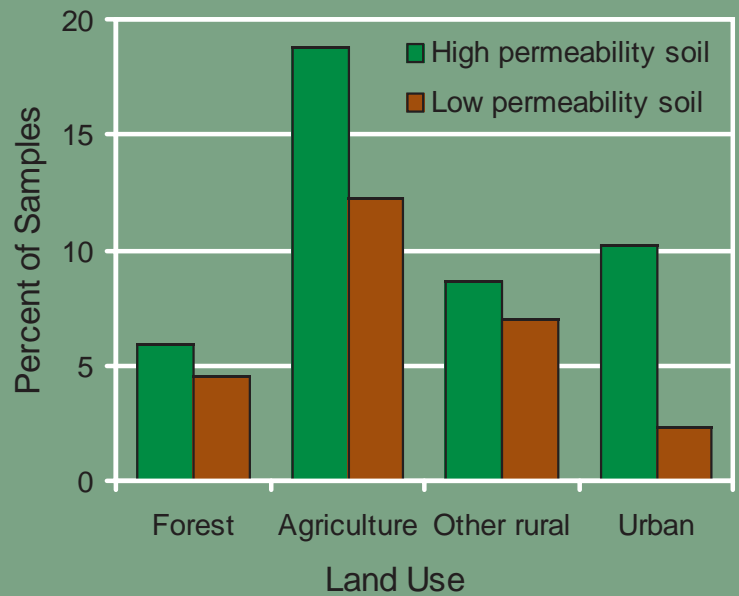
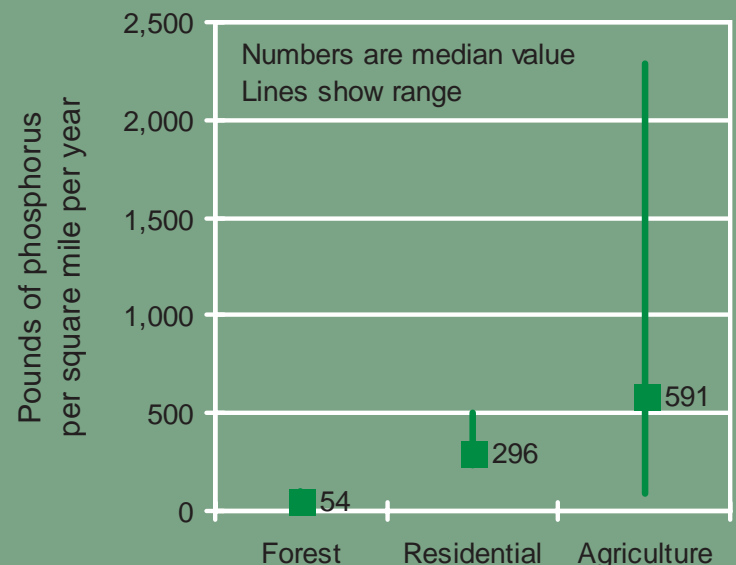


Figure 6 is based on the results of over 35,000 Wisconsin private well samples compiled by David Mechenich at the Central Wisconsin Groundwater Center. Other rural land is composed of grassland, water, wetlands, barren land and shrub land. High permeability soils are defined as having infiltration rates greater than 6 inches per hour, while low permeability soils have infiltration rates less than 6 inches per hour.

Figure 7: Phosphorous Loading from Land Uses⁵



Humans and Forests

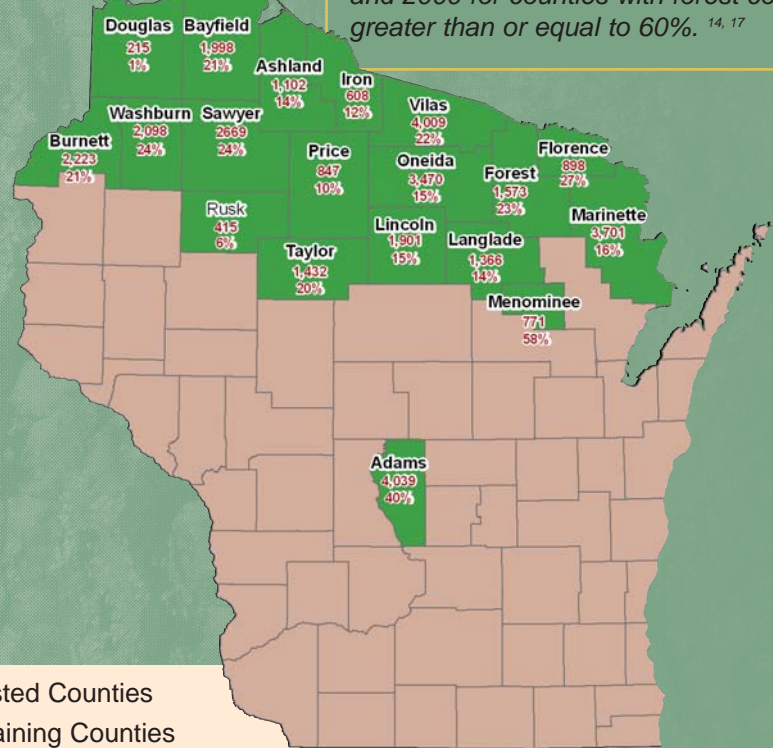
Housing in Wisconsin's Forested Areas

Housing growth in rural and remote areas of Northern Wisconsin is increasing due to attractive recreational and aesthetic amenities such as forests and lakeshores, increasing levels of second home development, and smaller household sizes.³ The influx of residential and recreational development may have profound effects on the ecological structure and management of Wisconsin's forested lands.

Development in or near forested areas may reduce the amount of contiguous or undisturbed forest habitat, alter the structure of native vegetation, and potentially exacerbate the invasion of exotic species. Timber harvests may be limited if housing development creates parcels that are too small for commercially viable harvests. Proximity to residential areas can also limit the range of management practices available in a forest, particularly limiting the use of controlled burns.

Modifications in timber harvests will likely be followed by changes in forest age structure, wildlife and tree species composition, coarse woody debris and fire management strategies, among other things.⁶

Map 6: Housing in Wisconsin's Forested Counties, 1980-2000 — This map displays the number and percent increase in housing units between 1980 and 2000 for counties with forest cover greater than or equal to 60%.^{14, 17}



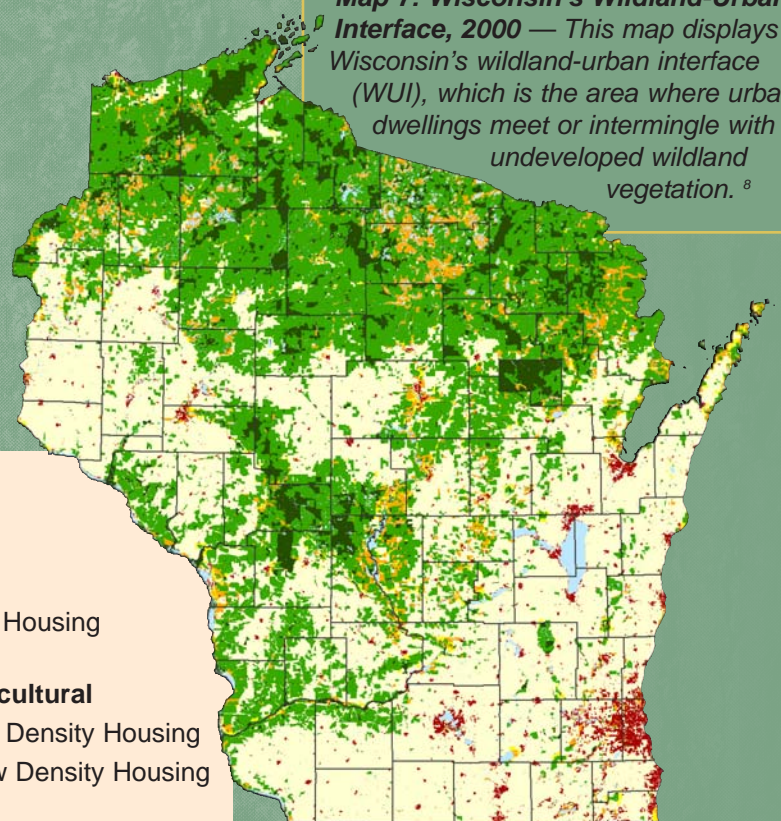
■ Forested Counties
■ Remaining Counties
Housing in Forested Counties, 1980-2000
 Increase in housing units = **35,335**
 Percent change = **17%**

The Wildland-Urban Interface

The wildland-urban interface (WUI) includes those areas where housing meets or intermingles with undeveloped wildland vegetation. Areas are delineated based on U.S. Census tracts. To be considered part of the WUI, housing must be at a density of at least one-house-per-forty-acres. Wildland vegetation includes forests, native grasslands, shrubs, wetlands, and transitional lands, but excludes orchards, farmland, and pasture. The WUI constitutes focal areas for human-environment conflicts such as wildland fires, habitat fragmentation, invasive species, and biodiversity decline.

The WUI contains both "interface" and "intermix" communities. The interface includes housing areas that are not predominantly wildland but are within 1.5 miles of large tracts of wildland vegetation. The intermix component of the WUI includes areas where housing is scattered within large tracts of wildland.

Map 7: Wisconsin's Wildland-Urban Interface, 2000 — This map displays Wisconsin's wildland-urban interface (WUI), which is the area where urban dwellings meet or intermingle with undeveloped wildland vegetation.⁸



WUI
■ Intermix
■ Interface
Non-WUI Vegetated
■ Very Low Density Housing
■ No Housing
Non-Vegetated or Agricultural
■ Medium and High Density Housing
■ Low and Very Low Density Housing
■ Water

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Center for Land Use Education

