





Forest Socioeconomics



Wisconsin's forests are vital to the state's economy by providing raw material to paper and lumber mills, recreational opportunities for tourism, and ecosystem functions such as water filtration and erosion control. The forestry sector produces a range of timber products including paper, wood veneer, particleboard, and furniture, as well as several non-timber products such as maple syrup and wild ginseng. Sustainable forestry practices, which are also influenced by certification and fragmentation/parcelization, help ensure a consistent supply of raw material for the forestry sector, as well as an ecologically diverse and aesthetically pleasing landscape that can be enjoyed by all Wisconsinites.

The Forest Socioeconomics section focuses on the current state of Wisconsin's forest social and economic needs, how they have changed over time, and what that might mean for the future. The purpose of this portion of the assessment is to provide a source of succinct, comprehensive, and scientifically based information and data that supports and informs the goals and strategies for sustainability.

ASSESSMENT

FOREST ECONOMIC CONTRIBUTIONS

Wisconsin has a very strong forest products industry. In 2016, the Wisconsin's forestry sector generated an output of \$24.1 billion, an increase from \$22.9 billion in 2012. The forestry sector consists of 1,200 establishments, which are businesses including paper mills, wood product manufacturers, wood furniture manufacturers, and paper manufacturers (Haugen, 2017). In 2016, the forestry sector produced a value-added economic impact (value added beyond the raw materials) of \$17.4 billion and contributed \$156 million in taxes. At the same time, the forest products industry faces major challenges, such as resource availability/accessibility and an aging workforce.

Wisconsin leads the nation in paper production. Pulp, paper, and allied products account for approximately 70 percent of the forest product output in the state. Paper mills alone accounted for an output of \$8.3 billion (Table 6). Paperboard container manufacturing and paper bag and coated and treated paper manufacturing each had outputs of \$3.0 billion, while sanitary paper product manufacturing had an output of \$2.8 billion. Wood window and door manufacturing was the next biggest contributor with an output of \$1.2 billion.



Industry Description	Output
Paper mills	\$8,337,404,000
Paperboard container manufacturing	\$2,993,953,000
Paper bag and coated and treated paper manufacturing	\$2,957,992,000
Sanitary paper product manufacturing	\$2,843,920,000
Wood windows and door manufacturing	\$1,166,980,000
All other converted paper product manufacturing	\$635,169,800
Paperboard mills	\$579,547,900
Sawmills	\$569,068,900
Other millwork, including flooring	\$461,618,000
Wood container and pallet manufacturing	\$453,084,700
Wood kitchen cabinet and countertop manufacturing	\$424,842,300
Commercial logging	\$388,983,600
Veneer and plywood manufacturing	\$368,848,400
Stationery product manufacturing	\$353,070,800
All other miscellaneous wood product manufacturing	\$326,730,600
Reconstituted wood product manufacturing	\$273,388,800
Engineered wood member and truss manufacturing	\$241,093,100
Prefabricated wood building manufacturing	\$202,894,500
Wood preservation	\$102,605,900
Nonupholstered wood household furniture manufacturing	\$93,943,190
Custom architectural woodwork and millwork	\$86,667,960
Cut stock, resawing lumber, and planing	\$73,628,150
Support activities for agriculture and forestry	\$55,908,150
Wood office furniture manufacturing	\$38,848,790
Manufactured home (mobile home) manufacturing	\$34,818,810
Pulp mills	\$34,217,630
Forestry, forest products, and timber tract production	\$4,506,339
Total	\$24,103,735,319

Table 6: WI Economic output by industry for 2016

Since the late 1990s, globalization has led to an increase in hardwood lumber and log exports from Wisconsin, most notably for oak and ash species destined for markets in China. This increase in exports enabled many Wisconsin firms to diversify their markets following the decline in domestic manufacturing. Shipping costs, trade policy, and global demand will impact the long-term stability and growth for these exports.

The forest industry experienced an increase of 11 mills between 2008 and 2013 primarily due to a rise in the number of mid to large sized sawmills, while also experiencing a decline in the number of pulp mills, cabin log mills and veneer mills (Table 7).

Mill type	1996	1999	2003	2008	2013
Sawmill	355	299	227	179	205
Veneer mill	15	10	9	8	4
Pulp mill	16	15	13	12	9
Particleboard mill	6	6	5	4	4
Cabin log mill	15	16	11	17	8
Other mill	15	12	10	7	8
All mills	422	358	275	227	238

Table 7: Number of mills by product type in Wisconsin from 1996 to 2013

Forest Industry: CONDITIONS & TRENDS

- Although Wisconsin’s forests yield a wide range of products, the forestry sector relies heavily on paper and pulp manufacturing. ^{1, 2}
- Logging firms play a key role in implementing sound forestry practices while also supplying timber to markets. These firms often require significant capital investments while facing uncertainty with operability, market fluctuations, labor availability, and accessing capital. ^{1, 3}
- A safe and efficient transportation infrastructure is key to maintaining and growing forest industries. ¹
- Although the number of mills increased between 2008 and 2013, mills are still far fewer in number than two decades ago. Veneer mills and cabin log mills experienced a particularly sharp decline of roughly 50 percent between 2008 and 2013. ²
- Increased international demand for timber over the last decade is creating a stronger export market for the forest industry. ¹

FOREST PRODUCTS

Wisconsin’s forests are an important contributor to the economy, particularly in rural parts of the state. Demand for Wisconsin’s forest products has been high since Euro-American settlement. Since the end of the cutover period in the late 19th and early 20th centuries, and conversion of forest land to agricultural usage, Wisconsin’s forests have expanded and aged: trees have gotten bigger and shade-tolerant species have replaced more intolerant species. In addition, introduced pests and diseases have caused some tree species to decline in number. Forest products markets are volatile and can change quickly. This assessment has relied on data that was current as of the time of writing but may not reflect current conditions.

Growing Stock Volume and Quantity

Growing stock trees are live trees of commercial species that meet specified merchantability standards. The total volume of growing stock on Wisconsin timberland has increased steadily since 1938 and currently stands at 22 billion cubic feet. The volume of softwood (mostly coniferous, evergreen trees) has increased in each inventory since 1983. Hardwood (mostly deciduous, broadleaf trees) volume has increased since the 1983 inventory but that growth has slowed since 1996 (Figure 15).

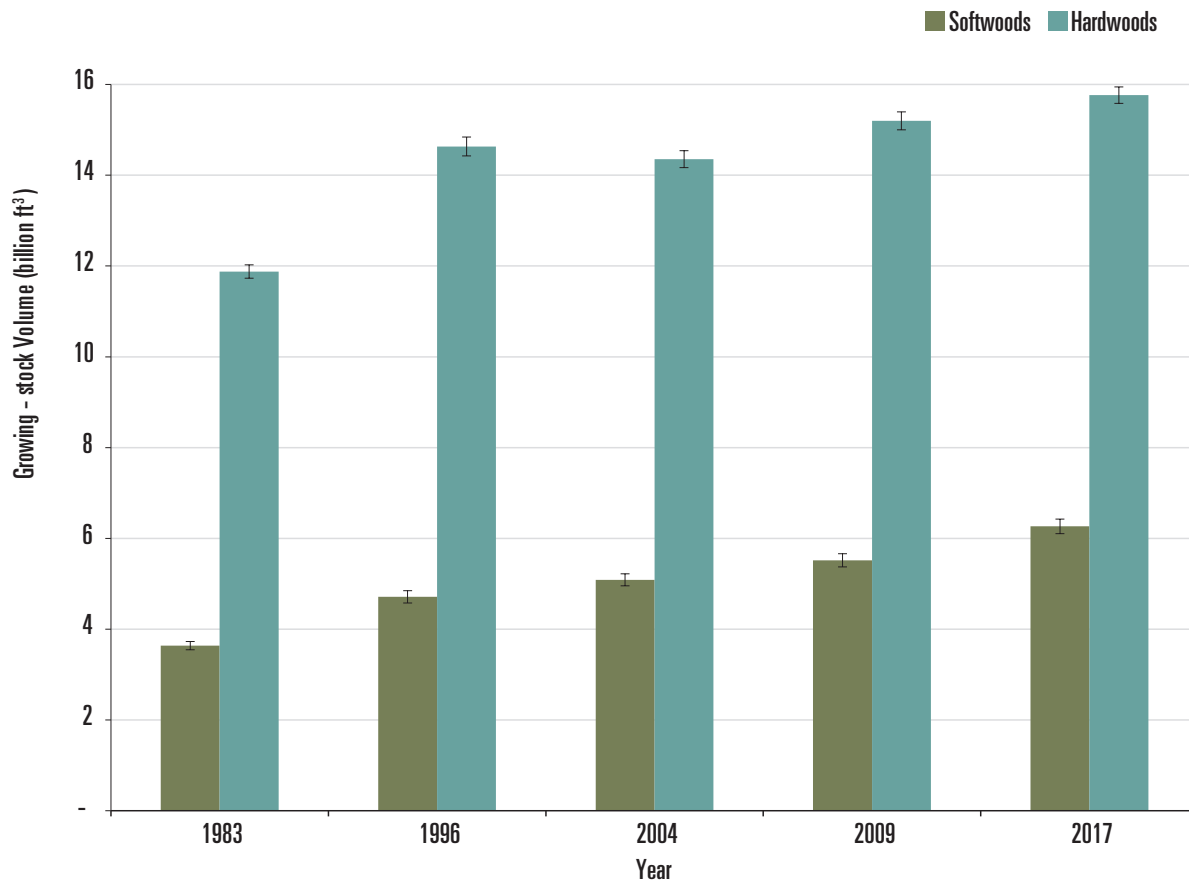


Figure 15: Volume of growing stock by species group and year, in Wisconsin. Error bars estimate the 68 percent confidence interval. Source: U.S. Forest Service, 2017

Within total growing stock, sawtimber volume and quality are important indicators of the present and future economic value of Wisconsin’s forests. Sawtimber trees are older, large-diameter trees that can be sawn into lumber. This resource not only provides direct economic benefit through sawtimber and veneer sales but also supports wood-using secondary industries such as furniture and millwork manufacturing. As Wisconsin’s forests mature, trees increase in diameter and volume.

Sawtimber volume, estimated to be 69 billion board feet in 2017, has increased steadily since 1956 (Figure 16). The

sawtimber volume of most economically valuable species groups increased between 1996 and 2017: 34 percent for hardwoods and 63 percent for softwoods. Several species, including northern pin oak, red pine, white ash, eastern white pine, and silver maple increased in sawtimber volume by more than 70 percent since 1996. Jack pine, paper birch, and aspen, which are early successional species, have declined substantially in the last two decades. Jack pine sawtimber volume has decreased 40 percent since 1996 (Figure 17).

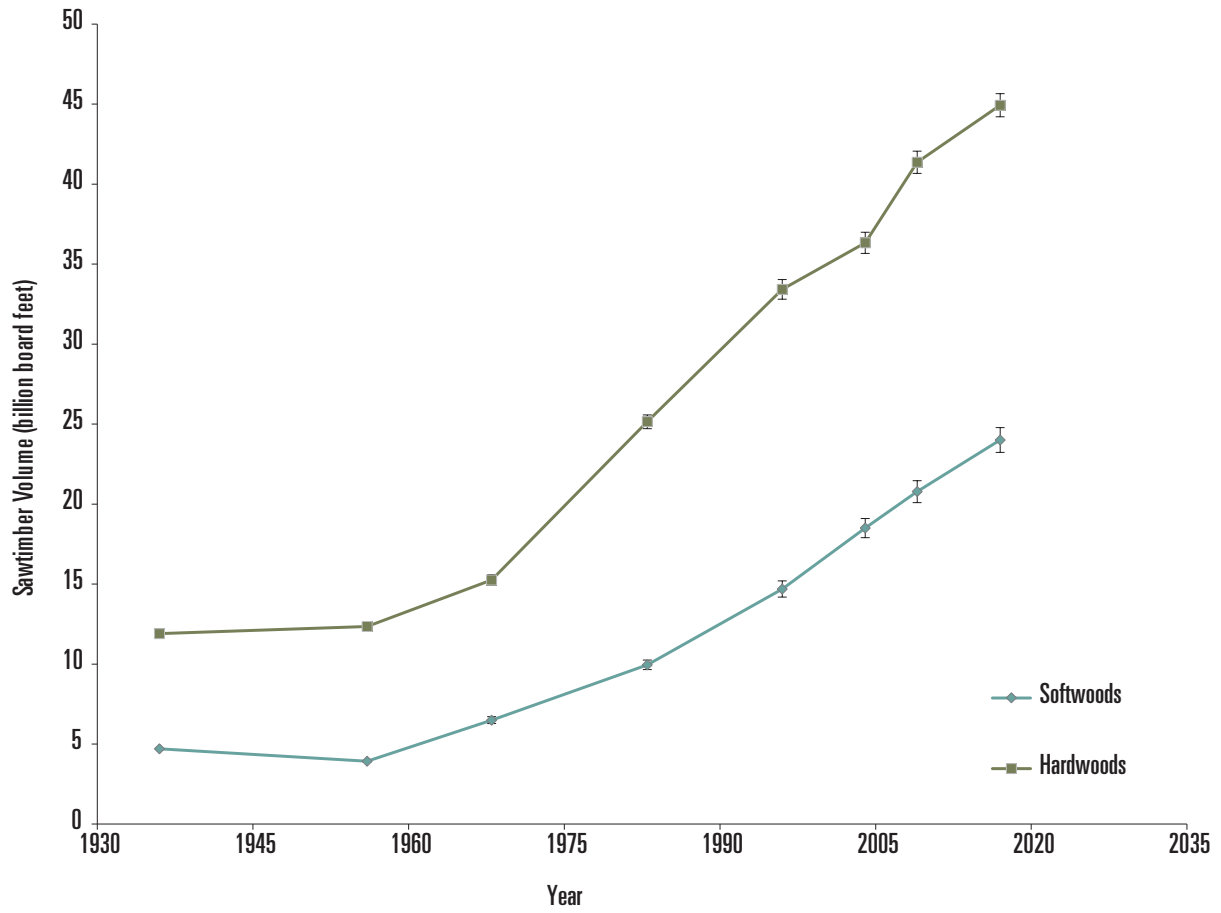


Figure 16: Volume of sawtimber on timberland by year for softwoods and hardwoods, Wisconsin. Error bars represent the 68 percent confidence interval. Source: U.S. Forest Service, 2017

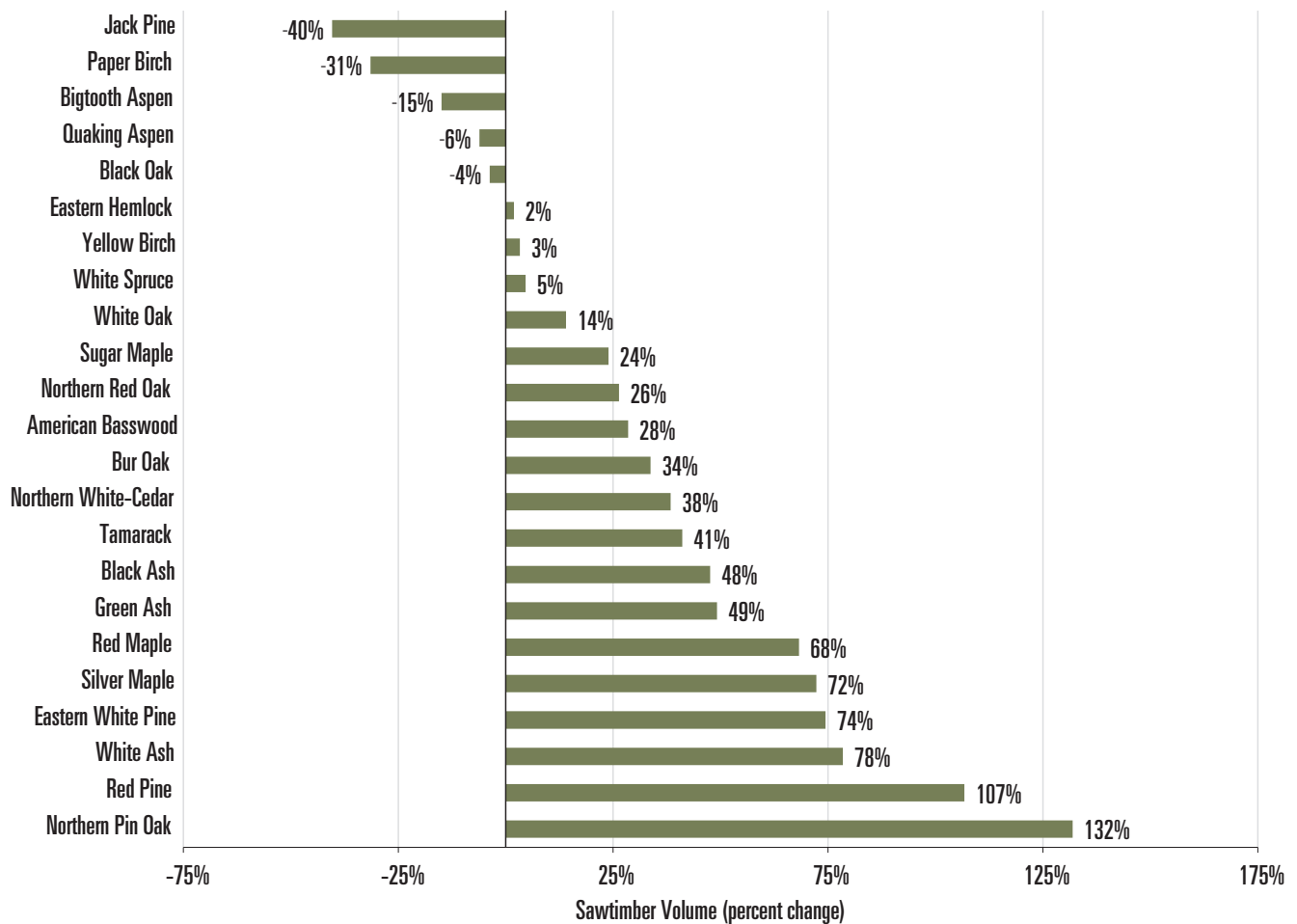


Figure 17: Change in sawtimber volume on timberland by species, Wisconsin, 1996 to 2017. Source: U.S. Forest Service, 2017

In 2016, 62.4 percent of Wisconsin’s non-federal forest acres and 64 percent of volume was considered “available” (VTCNR, 2016). The growth to removals ratio calculated on available timberland by the study is 1.38, which is markedly lower than the 1.84 growth to removals ratio calculated for all timberland in the state using FIA data. Hardwood and softwood sawtimber are readily available throughout the state, but the supply of pulpwood has been under increasing demand for the last several years except in southern Wisconsin. Pulpwood is generally smaller diameter trees that are primarily used for papermaking. Hardwood pulpwood had a growth to removals ratio of 0.9 and softwood pulpwood wasn’t much higher at 1.0. Sawtimber-sized material has typically been utilized to its highest value but has also been used to supplement the limited pulpwood supply. Wisconsin pulp and paper mills will continue to compete for the supply of raw materials.

Certain size classes and/or species of trees are under-utilized in Wisconsin. More recently, many mills no longer have the equipment or business model to handle very large logs (>30 or 36 inches in diameter). However, much of the growth in sawtimber volume has also occurred in the largest size classes of trees.

Timber Product Outputs

An important indicator of a sustainable forest is the level of actual timber harvested. This information is an important measure of whether the current timber cutting levels can be sustained. Production levels are also a good indication of the health of the forest products industry.

Roundwood is the unit of measure for products and refers to the volume being harvested for industrial and nonindustrial products such as softwoods; hardwoods; sawlogs; veneer logs; pulpwood and fiber byproducts; composite products; fuelwood and fuel byproducts; posts, poles and piling; and miscellaneous product and byproducts.

Roundwood production decreased by 1.5 percent between 2008 and 2013, from 313 to 308 million ft³. Softwood species accounted for approximately 25 percent of the total volume in 2013. Pulp mills consumed 164 million ft³ of roundwood, and the rest was split between saw logs, veneer logs, particleboard, and other products (Figure 18).

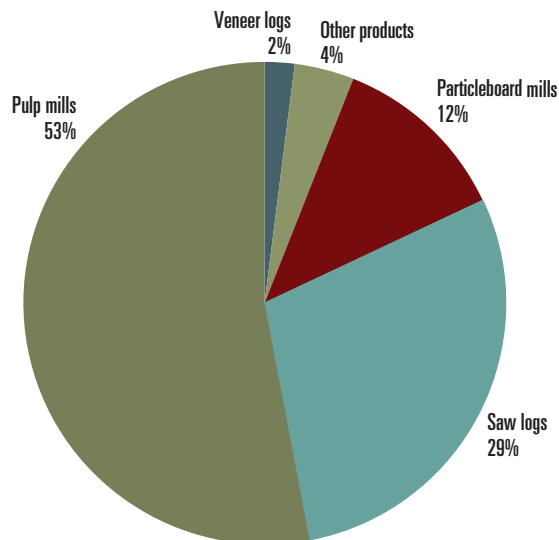


Figure 18: Proportion of roundwood production by product use (million cubic feet) in 2013. Note: “Other products” includes wood energy use. Source: U.S. Forest Service, 2017

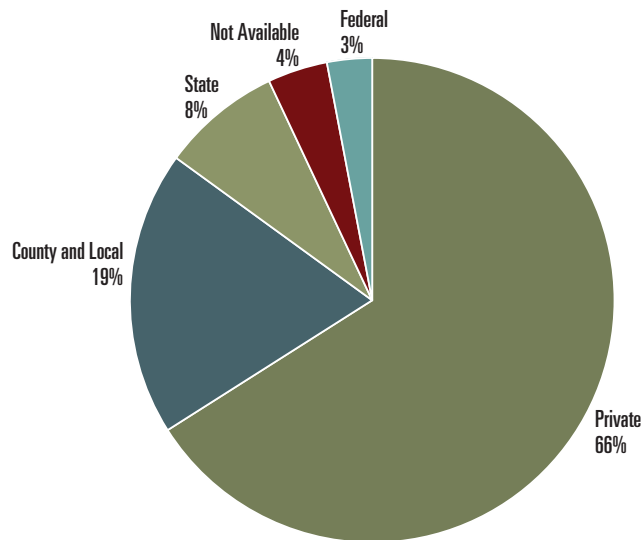


Figure 19: Proportion of harvest removals by forest land ownership in 2018. Note: “Not Available” is unclassified due to FIA accounting methodologies. Source: U.S. Forest Service, 2017

Due to changes in mill operations the demand for large timber has decreased. There is also limited demand for several species of trees with available volume (e.g., box elder or silver maple) due to a lack of demand for finished products made from those species. Also, in southwestern Wisconsin (roughly the Western Coulees and Ridges Ecological Landscape) pulpwood volume is available, but there are limited markets for pulpwood as most of the industry using pulpwood is in the north. Transportation costs limit the feasibility of moving southern pulpwood north. In addition, the varied, steep topography of timberland in this region can limit the access and operability of sales.

Both private and public forest ownerships contribute to timber production in Wisconsin, providing landowners, local governments, tribes, and agencies opportunities for economic returns while also realizing many social and ecological benefits. Private forest lands generate the largest share of timber for Wisconsin’s mills, accounting for 66% of the state’s annual timber harvest removals, followed by county and local governments that contribute nearly 20% of the state’s total harvest volume annually (Figure 19).

Non-Timber Forest Products

Non-timber forest products (NTFP) are items harvested or gathered from forests that are not traditional wood products. Non-timber forest products are important components of the economic value of forests and their collection and processing makes an important contribution to economic activity. Many of these products also are important to indigenous people and others for their contribution to cultural values and subsistence activities (Robertson, Gaulke, McWilliams, LaPlante, & Guldin, 2011). One example of this is the use of paper birch bark from large paper birch trees for traditional canoes. The various types, uses, and growing locations of these products make tracking the amount of removal challenging. Since there is not a long-term database with information on the removals of NTFP, there is also no specific database for the value of those products. Typically, if a NTFP is sold, the value of that commodity can be tracked. Some important NTFPs in Wisconsin include Christmas trees, maple syrup, wreaths, decorative logs, nuts, essential oils, and baskets and other crafts.

Another general management strategy that produces NTFPs is agroforestry. There are many different types of agroforestry and the cost-benefits have yet to be fully evaluated. The change to agroforestry is less likely to come from forested land, but for agricultural land shifting to forestry practices. Further research is needed to understand appropriate applications (Mayerfeld, Rickenbach, & Rissman, 2016).

Wood Energy

Between 2010 and 2015, non-residential wood energy consumption increased by 63 percent, reversing a 20-year decreasing trend (Figure 20). This increase can mostly be attributed to industrial consumption. Industrial consumers use wood to produce thermal energy and electricity. Wood fired boilers can take the place of fuel oil or natural gas at industrial facilities. Many companies in the forest product sector, for example, use wood waste for their energy needs. Electric utility consumption remained mostly unchanged and commercial consumption is still very low, though possibly growing.

Despite the recent uptick in use, non-residential wood energy consumption is still lower than it was in the late

1980s and early 1990s. A major factor limiting expansion of wood energy markets is the current low price for natural gas that has been sustained since late 2008 – wood energy is simply not a competitive option at current gas prices. It is likely that when fossil fuel prices rise, the demand for wood energy will also rise as it will be a more economical option for consumers. Residential wood energy use statistics used to be reported by the Public Service Commission but have not been updated since 2012. Residential wood energy use has been highly variable, but between 2000 and 2012 regularly outpaced non-residential use by anywhere between 50 and 250 percent. The picture of wood energy use in Wisconsin is not truly complete without residential wood energy use statistics, and unfortunately, there hasn't been a residential wood energy survey conducted since 2012.

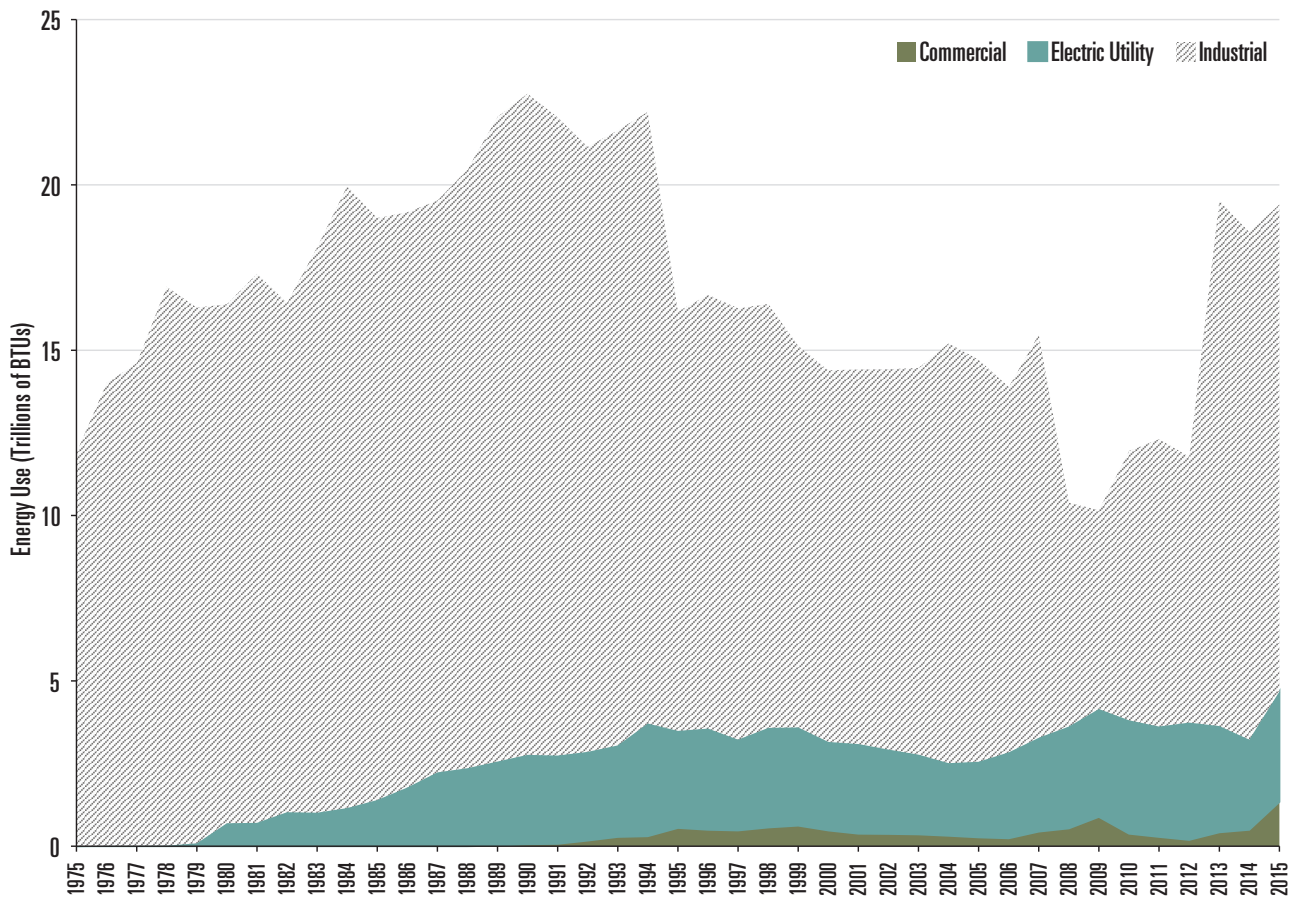


Figure 20: Non-residential wood energy consumption, Wisconsin, 1975-2015. Source: Durant et al., 2018

Forest Products: CONDITIONS & TRENDS

- Both hardwoods and softwoods are continuing to experience growth in growing-stock volume throughout Wisconsin.¹
- The demand for both hardwood and softwood pulpwood supply fluctuates over time, but the overall trend is positive (increasing).¹
- Availability of sawtimber continues to increase across the state.¹
- Many species have experienced large increases in sawtimber volume over the last two decades. This provides the forest products industry with better opportunities to capitalize on species that may be in high demand.¹
- Several species of trees and/or size classes of trees are underutilized.^{1,2}
- Changes in forest composition may require the forest products industry to adapt to which species and sizes are more available and economical to use.^{1,3}
- Industrial wood energy consumption is very inconsistent, which makes predicting future consumption trends challenging. If fossil fuels increase in price, there is likely to be greater demand for wood energy.²
- Understanding wood energy use is difficult without updated residential use statistics.^{1,2}

WORKFORCE NEEDS & PATHWAYS

Forestry related employment adds significantly to Wisconsin's economic and social well-being. Careers in forestry are diverse, encompassing positions across both rural and urban forest management, logging, wood and paper manufacturing, forestry research and academia. Wisconsin's forestry sector employed over 60,000 workers in 2016. Although employment numbers have been relatively steady since 2012, workforce recruitment, retention, training, and diversity are growing challenges across the sector.

Forest Management, Production and Manufacturing
Jobs in forest management, logging, and wood and paper manufacturing are at the backbone of Wisconsin's forest products economy. Forest managers in both public and private sectors, plan, manage and evaluate forestry practices for a wide range of economic, ecological, and social goals. Professional loggers play an integral role in sustainable forest management while also contributing to the economy by supplying necessary raw materials for the manufacture of forest products. In addition, tens of thousands of mill workers in Wisconsin produce hundreds of wood and paper products our society uses daily.

Forest industry employment has experienced some recovery since the Great Recession (2007-2009). However, employment has remained relatively flat since 2012 apart from wood manufacturing, which experienced some decline between 2014 and 2016. Wisconsin's pulp and paper industry employed approximately 30,000 workers which was around 50% of the total jobs in the forest industry.

The average salary in forest products industries has increased from 2014 and the actual figures, not considering inflation, have rebounded since the 2008 economic recession, although wages in 2016 still did not exceed pre-recession wages in 2006. One exception is wages in wood product manufacturing, which have increased from an average of \$42,626 in 2006 to \$48,037 in 2016. Paper mills remain the highest-paying industry within the forestry sector. The average annual wage in paper mills in 2016 was \$70,473.

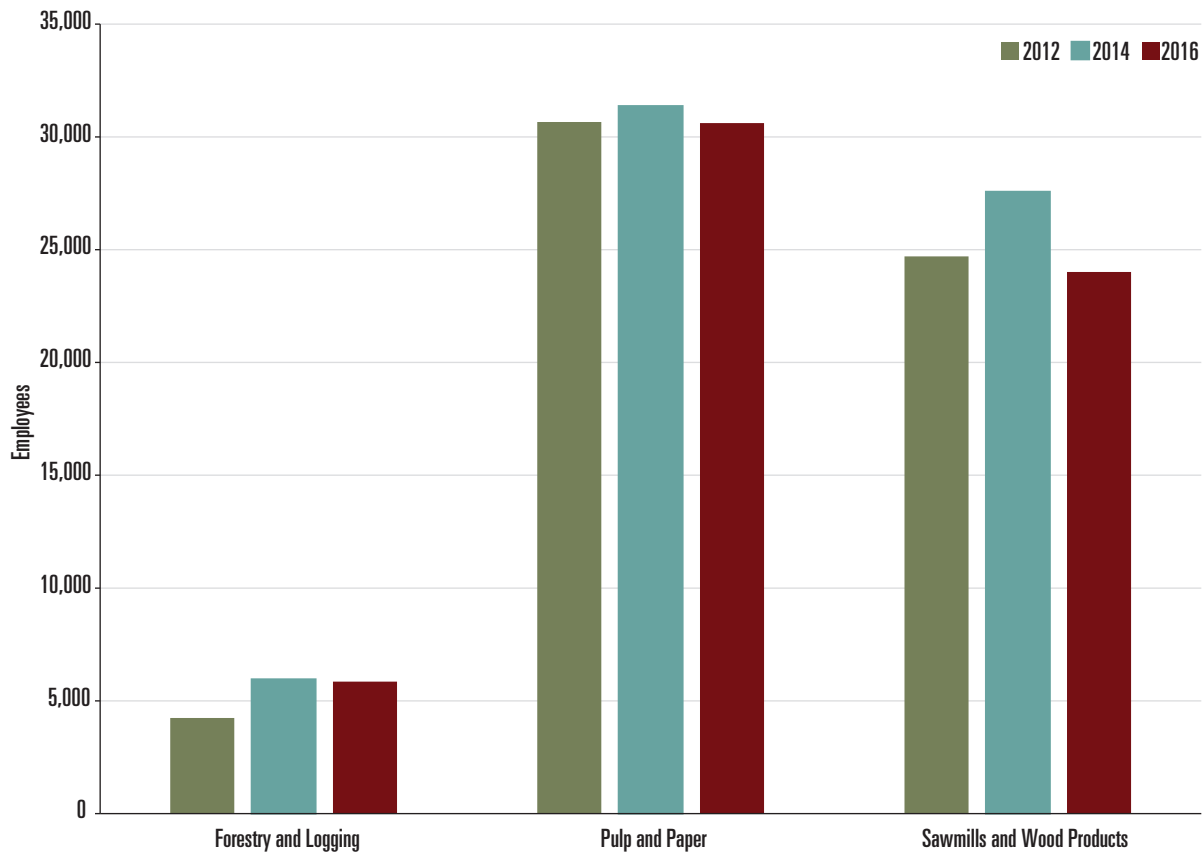


Figure 21: Number of people employed in different sectors of Wisconsin's forest industry from 2012 to 2016.

Wisconsin's logging industry is dominated by companies that have been in business for over 25 years. However, only a small percentage of new businesses have entered the workforce (Rickenbach, 2018). In 2016, the median age of logging business owners was 56 years, a steadily increase from 46 in 2003. Succession planning and additional recruitment and training efforts will be needed to maintain the state's logging workforce (Rickenbach, 2018).

The overall production of timber has shifted from many small to medium-sized logging firms to larger logging businesses (Rickenbach, Vokoun, & Saunders, 2015). One reason is the increase in the adoption of mechanized, cut-to-length equipment over chainsaws and other mechanized equipment. With these trends, logging firms will need reliable access to capital for investments in addition to stable markets for harvested forest products. Another reason for the decrease in small logging firms is the extremely high cost of workers compensation insurance, specifically for hand cutters. Timber is increasing in size and unless harvesting equipment gets much larger to handle these larger trees, hand cutters will be needed for forest management well into the future.

An opportunity exists for forest businesses, industry organizations, agencies, and economic development to foster greater awareness of technical training and job opportunities in the sector, as well as enhancing workforce diversity. Data indicates that many federal and state government natural

resource agencies and undergraduate forestry programs are underrepresented in female and ethnic minorities. According to the Society of American Foresters "A focus on diversity and inclusion practices, closely linked with specific actions such as employee recruitment and retention strategies, helps every aspect of the profession and drives continuous improvement. These strategies for welcoming and mentoring diverse employees will build a diverse and talented workforce equipped to help the profession better fulfill its mission to serve society".

Urban Forestry

Arboriculture and urban forestry employers in Wisconsin have identified a shortage of qualified workers to fill vacancies in this growing field. To help meet the demand for and retain qualified workers, industry professionals in Wisconsin have developed new career pathways for the arboriculture profession.

Wisconsin was the first in the nation to develop and implement the Arborist Apprenticeship program, a hybrid program consisting of on the job training and classroom instruction. Apprenticeship is creating a new training model for the industry, helping to increase recruits, retain existing workers, and legitimize the arborist as a skilled worker. The Wisconsin program is being adopted nationally through the Tree Care Industry Association to create a standardized model for the industry. Additionally, work is on-going in Milwaukee to

develop a pre-apprenticeship program to further attract and ready potential candidates.

There are urban forestry and arboriculture degree, diploma and certificate offerings available at multiple education institutions in Wisconsin including the University of Wisconsin Stevens Point, Milwaukee Area Technical College, Mid-State Technical College, and Gateway Technical College. Madison

College launched a new Urban Forestry Technician program in fall of 2019.

Industry professionals have been engaging in career outreach through school career fairs, radio interviews, arbor day celebrations, and staffing informational booths at community events, among other efforts.

Workforce Needs & Career Pathways: CONDITIONS & TRENDS

- Forest industry employment declined significantly in the last decade but appears to have stabilized. ^{1,2}
- The forestry sector would benefit from efforts to enhance workforce recruitment, training and diversity. ^{1,3}
- Workforce retention, training and diversity are ongoing challenges across the forestry sector. ^{1,2,3}
- Difficulties exist in entering the logging workforce due to extensive capital investments and the knowledge required in understanding financial principles, forest management requirements, contracts, equipment operation/maintenance, and forest product utilization. ^{1,2}
- There is a lack of understanding related to employment data and market information for the urban forestry workforce, including real or perceived barriers to entry into the arboriculture and urban forestry fields. ^{1,2}

FOREST CERTIFICATION

Wisconsin leads the nation with implementing third-party forest certification standards including the Sustainable Forestry Initiative® (SFI®), Forest Stewardship Council® (FSC®), and the American Tree Farm System® (ATFS) a program of the American Forest Foundation. In response to forest industry requests for a supply of certified fiber, in 2003, Governor Doyle charged the Wisconsin Council on Forestry of exploring the prospects for sustainable forest certification (Wisconsin Council on Forestry, 2005). The Council on Forestry, together with the Wisconsin DNR Division of Forestry explored the feasibility of certification and successfully attained forest management certification for state land, the County Forest Program and the Managed Forest Law (MFL) program. This collaboration resulted in obtaining certification to almost 5 million acres of forestland in less than two years, which was unprecedented and allowed Wisconsin to become the Lake States leader in certification.

Since 2005, forest industry, tribes, NIPF landowners, MFL owners, Wisconsin DNR and county forests have expanded certification to nearly 7.5 million acres or almost 50 percent of the commercial forests in Wisconsin (Council on Forestry Steering Committee, 2013). The total number of certified forest acres has been flat or declined between 2013 and 2019. For 2019, total certified acres are as follows:

- Wisconsin DNR forested lands (fee and leased) – 1,543,120 acres
- Wisconsin County Forests – 2,339,907 acres
- Managed Forest Law – 2,588,326 acres under 46,748 orders with 37,443 private landowners

Wisconsin's independent, third-party certified forests meet strict standards for ecological, social and economic sustainability. The benefits of forest certification in Wisconsin include helping the forest industry remain competitive in global markets that increasingly demand certified raw materials, assurance of high standards of sustainable forestry practice as validated by independent third-party audits, and continuous improvement.

Third-party certification is based on the premise that consumers are seeking assurances that their wood products come from sustainably managed forests. Between the three primary certifying programs, there are over 118 million acres certified in the United States. Roughly 7.5 million acres (44 percent of Wisconsin forest acres; and approximately 6.4 percent of the total U.S. certified land and 19 percent of FSC-U.S. certified land) are certified in Wisconsin.

The market demand for certified wood has been mixed. Large pulp and paper producers have increased their demand for certified fiber, particularly for Forest Stewardship Council® (FSC®) certified fiber. Not all the demand for increased certified volumes for Wisconsin mills is met with wood from Wisconsin. Imported fiber, particularly FSC certified fiber from Canada, helps meet the demand for FSC credits for one major pulp and paper mill. For small to medium producers of a variety of solid wood and other products, some producers have become certified and others have let their certifications lapse. The decision to pursue certification is typically based on perceived market demand. Regional demand can also impact Wisconsin markets. A new fiber board plant in lower Michigan may increase

demand in Wisconsin for FSC certified softwood fiber when it goes online in 2020.

Establishing and maintaining certification has a cost throughout the forestry sector. Wisconsin DNR has made a commitment to continue to invest in the maintenance of certification on private, county and state lands. In order for products to be fully certified, the entire chain of custody must also be certified. Gaps in chain of custody affect the ability of companies to capture certification credits. Growth in market demand may be insufficient to drive value to mills and landowners; if that occurs, mills and/or landowners

could drop certification. For example, Minnesota has lost 50 percent of its demand for certified wood and some Minnesota counties have decided to drop their certifications.

At the same time, SFI has announced a partnership with ATFS to bring certification to small forest landowners. This may result in stronger growth in certification of small landowners. FSC, SFI and ATFS standards will be revised over the next two years. Potential increased cost and complexity of standards may influence certificate holder's decisions about whether to remain certified.

Forest Certification: CONDITIONS & TRENDS

- Forest certification supplies validation that entities under certification are managing their resources sustainably. ^{1,3}
- Certification is critical to the pulp/paper industry as it keeps Wisconsin's forests competitive and in global markets. ^{1,3}
- The large land base of certified wood in the state could be used to attract new forest industry. ^{1,3}
- Markets for certified products are mixed:
 - If market demand is insufficient to drive value to mills and landowners, mills and landowners could drop certification because the costs of maintaining certification may outweigh the benefits. ²
 - If new markets drive increased demand for certified wood, this could result in price enhancement for certified wood, and increase the incentive for new landowners and mills to become certified. ^{1,3}

FOREST RECREATION

Wisconsin's forest lands provide a range of recreational opportunities, from developed camping and motorized use to wilderness back packing, hunting, and paddling. Public forest lands offer unique recreational opportunities for those pursuits that require large blocks or long linear ownerships. The unique land base provides opportunities for extensive motorized recreational uses and linear trail systems often connecting to other public road and trails systems. Interest in motorized access for recreation uses, including hunting access and trail and route riding has increased over time.

Wisconsin's Statewide Comprehensive Outdoor Recreation Plan (SCORP) identifies current recreation offerings and demands by recreation type and geographic location. Recreation planning to determine current and future use is an open and transparent process using the "forest plan" as the public process. Stakeholders interests, statewide and locally, are relatively high for recreation on public lands. According to SCORP, "outdoor recreation influences many aspects of our lives and the larger communities in which we live....Thus participation in nature-based activities is likely to be increasingly important in the public's level of support for protecting air and water quality, open spaces and wildlife" (WI DNR, 2019). The entire SCORP can be found by visiting dnr.wi.gov and search: SCORP.

While the data analysis used in SCORP covers recreation on all lands, not just forested lands, certain inferences can

be made. The figure below describes types of recreation activity and associated participation rates. Popularity of activity group will vary with different recreation areas (Figure 22). Within forested areas, camping, hiking, lake and river use, hunting and trapping, snowmobile and ATV/UTV use tend to be the most popular forest-based recreation activities.

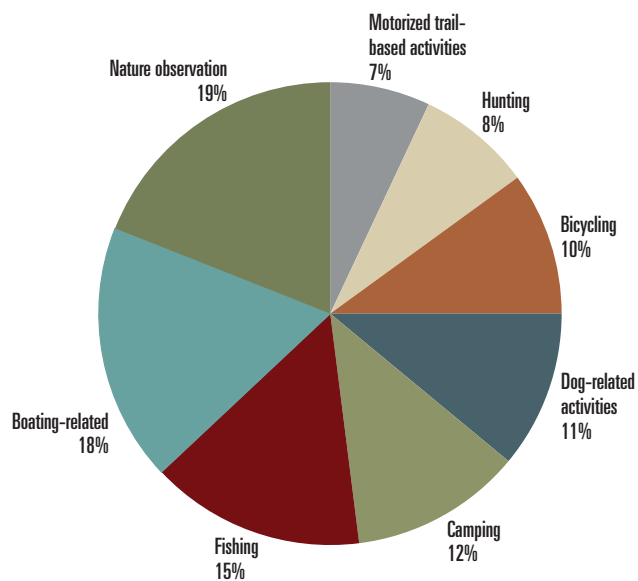


Figure 22: Wisconsin resident participation rates of grouped nature-based recreation activities. Percentages indicate proportion of WI residents that participated at least once in the last 12 months. Source: WI DNR, 2019

Additional acres are available for public use through multiple tools (e.g., Volunteer Public Access and Habitat Incentive Program, MFL open lands and Conservation easements). Easements retain the forests in private ownership for forest management but secure a permanent public use ownership

for nature based outdoor recreation. State acquired forest legacy easements has provided additional public recreational access on large blocks of working forests in northern Wisconsin.

Recreation: CONDITIONS & TRENDS

- Recreation on public lands provide local and statewide social and economic benefits. ^{1,3}
- Public forest recreation provides the full spectrum of recreational uses from remote to developed and non-motorized to motorized. ^{1,3}
- Role of public forests is a public debate with often conflicting recreational interests and use from diverse and engaged stakeholders. ^{1,2,3}
- Demand for motorized forest-based recreation is increasing, particularly for ATV/UTV access and must be balanced with water quality, invasives management and social and economic impacts, both positive and negative. ^{1,2,3}
- Previously allowed public motorized recreational use on large blocks of private forest lands is more limited and unpredictable with ownership changes. ^{1,2,3}

CULTURAL RESOURCES AND VALUES

Wisconsin's forests are home to many cultural resources that represent parts of an inheritance shared by all people. This heritage is of fundamental value to modern-day societies. Cultural resources often possess spiritual, scientific and other values that are weighed differently by different cultures. Today the management of cultural resources is a necessary component of land stewardship. Additionally, such resources may be protected by federal, state and local laws.

Cultural resources include historic structures, archaeological sites, cemeteries, and traditional-use areas, among others. Together, they represent roughly 13,000 years of human occupation in Wisconsin – from the end of the last ice age to the present day. Prehistoric cultural resources reflect the activities of Indian people prior to initial French contact in 1634. Since the first written records of Wisconsin began at that time, 1634 marks the beginning of the historic period. To be considered historic, a cultural resource usually has to be at least 50 years old or older.

More information on cultural resources and forest management in Wisconsin can be found in the Forest Management Guidelines (dnr.wi.gov and search: *Forest Management Guidelines*)

Scenic and Aesthetic Values

Woodland owners prize their property for its wildlife habitat and natural beauty as much as for its timber value. Concern

about the aesthetic quality of forested lands throughout the state is a great source of pride for Wisconsin citizens. Scenic beauty – or “visual quality” – is one of the primary reasons people choose to spend their recreation and vacation time in or near forested areas. They are also attracted by the peace and quiet of the outdoors – the serenity, the solitude, and a host of other emotional, spiritual and sensory responses that make up the richly aesthetic and deeply personal experience that is so closely tied to time spent in or near our forests.

Scenic quality is one important aspect of the broad, multi-faceted concept of integrated forest resource management. Travel routes and areas where significant public use occurs, and where visual quality is of high concern to typical users are important considerations for landowners, resource managers and loggers. Examples of such routes may include public highways, local roads, recreational lakes and rivers, and designated recreational trails and areas that provide a high level of scenic quality.

More information about scenic values and forest management in Wisconsin can be found in the Forest Management Guidelines (dnr.wi.gov and search: *Forest Management Guidelines*)

Cultural Resources and Values: CONDITIONS & TRENDS

- Cultural resources are scarce and nonrenewable. ^{1,2,3}
- Good forestland management is compatible with the protection of cultural resources. ^{1,3}

GOALS AND STRATEGIES

Goals and strategies are captured in subject areas throughout the plan. Many goals highlighted in one section of this document are pertinent to other sections. A list of all goals and strategies, including other goals related to Forest Socioeconomics, is included in the Summary of Goals and Strategies section.

GOAL L: WISCONSIN IS A HUB FOR DIVERSIFIED FOREST MARKETS AND NON-MARKET FOREST BENEFITS.

Strategies

1. Promote and support research on existing and emerging forest markets and the forest products industry.
2. Promote forest industry manufacturing diversity and certification.
3. Develop markets for under-utilized forest materials.
4. Improve the connection between private landowners and timber markets.
5. Identify and remove barriers to the sustainable use of biomass for wood energy.
6. Improve consumer knowledge of ecosystems services benefits of forests and wood products.
7. Develop and promote education and outreach to landowners on benefits of active forest management.
8. Explore viability of ecosystem service markets.
9. Promote production of non-timber forest products that are compatible with sustainable forest management.
10. Promote and facilitate access to recreational opportunities.

GOAL M: THE FOREST PRODUCTS INDUSTRY REMAINS

COMPETITIVE IN BOTH DOMESTIC AND GLOBAL/ INTERNATIONAL MARKETS.

Strategies

1. Explore, share and promote information with local governments on the impact to the forest industry of local policies regarding transportation.
2. Advocate for improvements in transportation infrastructure, including rail, bridge replacements and upgrades, and roads to increase operational efficiency.
3. Work across state lines to increase capacity to process timber products.
4. Improve forest operations efficiencies to reflect current and future needs.
5. Maintain and increase access to forest products.
6. Maintain and increase the acreage of forests that are certified.
7. Reduce barriers to in-forest logging operations, while maintaining water, soil and other ecological qualities.

GOAL N: THE FORESTRY WORKFORCE, INCLUDING RURAL & URBAN SECTORS, ARE THRIVING WITH HIGH LEVELS OF COMPENSATION, TRAINING, SAFETY, QUALITY OF LIFE & DIVERSITY.

Strategies

1. Invest in and expand forestry workforce recruitment, retention and training.
2. Explore, identify, and reduce economic barriers to entering the forestry workforce.
3. Grow interest and promote greater workforce diversity of those considering a career in forestry.
4. Promote and support all career pathways into the forestry workforce, including a continuum of existing and new education efforts and initiatives for students to learn about forests and forest-related careers.

GOAL O: FORESTS PROVIDE A BALANCE OF SOCIAL, ECOLOGICAL, ECONOMIC & PUBLIC HEALTH BENEFITS

ACROSS ALL OWNERSHIPS FOR CURRENT & FUTURE GENERATIONS.

Strategies

1. Promote sustainable forestry management on Wisconsin's private and public forest lands.
2. Build public understanding about the benefits provided by investing in forest conservation.
3. Develop and support opportunities for collaboration and partnerships within the forest community.
4. Invest in the development of new and improve existing tools and resources to actively address amenity-based markets, forest health issues, threats, and climate change impacts.
5. Promote and maintain desired landscape conditions through planning and implementing habitat management and sustainable timber harvests.
6. Identify, develop and offer relevant programming, training, and professional development opportunities for service providers working with private landowners so they can develop and maintain a depth of knowledge on risk analysis, adaptation strategies and applicable management tactics.
7. Identify, designate, and manage special management areas to conserve unique ecological, geological, cultural, and social values.

GOAL P: WISCONSIN'S PUBLIC FOREST LANDS PROVIDE A BROAD RANGE OF FOREST-BASED RECREATION & TOURISM OPPORTUNITIES TO MEET GROWING & CHANGING DEMANDS.

Strategies

1. Plan for a range of recreation opportunities at a state-wide level suitable to the capability of the land and with minimal long-term impacts.
2. Continue to evaluate regional and statewide forest-based recreational trends, issues and opportunities.
3. Develop and promote effective partnerships in managing recreation opportunities and experiences.
4. Promote and provide information and assistance to the public, local chambers of commerce, and tourism entities.

