

# **Regional Economic Impacts of the Menominee Tribal Enterprises Forestry and Mill Operations**

Extension Report 08-2  
August, 2008

Joshua Clements and Dave Marcouiller

University of Wisconsin – Madison/Extension  
Department of Urban and Regional Planning  
Old Music Hall, 925 Bascom Mall  
Madison, WI 53706

## Executive Summary

In this report, we present an assessment of the extent to which the Menominee Tribal Enterprises (MTE) contributes to the economy of Menominee County and the surrounding region. We focus on income generation and its consumption impacts. Further, we present several opportunities that exist for expansion of the MTE into other value added wood processing sectors.

The objective of this study was to investigate the economic impact of Menominee Tribal Enterprises operations on the economies of Menominee County and its surrounding North Central Wisconsin region. This was accomplished through an assessment of MTE's occupational and annual wage structure, results of which were applied to an input-output model constructed for Menominee County and the surrounding region (including Langlade, Oconto, and Shawano Counties) to develop estimates of the broader economic impacts associated with the forestry and mill activities undertaken by the Menominee Tribal Enterprises, Inc..

Results of the analysis suggest:

- In 2007, MTE represented roughly 20 percent of the jobs generated in the County and 18 percent of direct worker compensation.
- MTE had a total economic output of just over \$96 million.
- The indirect and induced effects of MTE activity in Menominee County represented \$12 million in additional economic output, bringing total impact of MTE operations to \$108 million.
- MTE represented over 45 percent of total economic output of Menominee County, and when induced and indirect impacts are added, this figure increased to roughly 51 percent.
- The above figures represent roughly equivalent losses to Menominee County were the MTE mill to cease operations.
- MTE accounted for almost 14 percent of the sawmilling output of Northern Wisconsin.
- The mean wage of an MTE employee is \$14.50 per hour, or \$30,039.39 per year.
- Only 8.4 percent of employees earned greater than 20 percent above the MTE median wage of \$14.29, while only 1.1 percent earned 20 percent below the median.
- The four-county region of Langlade, Menominee, Oconto, and Shawano Counties are specialized in sawmill, millwork, cabinetry and countertop, and wood furniture industries.
- Its unique history and renowned forest management program position MTE to take advantage of growing "sustainable forestry" and "green" wood products markets.

## **Acknowledgements**

This assessment resulted from a 2007 request from the Menominee Tribal Enterprises for assistance from the University of Wisconsin – Extension, Community, Natural Resources, and Economic Development Program Area. An earlier version of the assessment and report was submitted as a research note for a UW-Madison graduate course in Regional Economic Problem Analysis (URPL/Econ/LAF 734).

## **Author Affiliations**

Clements is a Master of Science Candidate in Urban and Regional Planning at the University of Wisconsin – Madison. Marcouiller is a Professor of Urban and Regional Planning, University of Wisconsin – Madison and State Extension Resource Economist with the University of Wisconsin – Extension.

# Regional Economic Impact of Menominee Tribal Enterprises Forestry and Mill Operations

## Table of Contents

Section:	Page:
Executive Summary	ii
Acknowledgements	iii
Author Affiliations	iii
Table of Contents	iv
1. Introduction	1
1.1 A Brief Historical Account	1
1.2 MTE as an economic asset	6
1.3 Forestry and forest products in the Lake States	7
1.4 Objectives of this research and specific research questions addressed	10
2. Methods	12
3. Results	15
4. Summary	24
References	26

## List of Tables

<b>Table 1</b>	Hourly wages paid to MTE employees by county of residence, 2007.	15
<b>Table 2</b>	Employment and Annual Wages Paid.	16
<b>Table 3</b>	Economic characteristics of the sawmill sector in various regions.	17
<b>Table 4</b>	Economic impacts of the Menominee Tribal Enterprises to Menominee County	19
<b>Table 5.</b>	Overall Household Consumption Demands of Menominee 4-County Region	20
<b>Table 6.</b>	Impact of MTE Workers Household Consumption Demand on Menominee 4-County Regional Economic Structure	21
<b>Table 7</b>	Location quotient matrix of three wood product sectors with reference regions: Northern Wisconsin, State of Wisconsin, and the U.S.	22

# Regional Economic Impacts of the Menominee Tribal Enterprises Forestry and Mill Operations

Joshua Clements and Dave Marcouiller

## 1. INTRODUCTION

The members of the Menominee Tribe of Native Americans in Northern Wisconsin hold values that intertwine natural resources within their own livelihood and cultural structure. Changes in the natural resource base, global demands for forest products, and transitions in the development of family income structures place the past, current, and future of resource utilization and management on the Menominee reservation in focus. The research reported in this document addresses the role of the Menominee Tribal Enterprises (MTE) forestry and mill operations in supporting the regional economy of North Central Wisconsin and improving the livelihoods and living standards of tribal members. Further, the unique attributes associated with culturally sensitive forestry will be forwarded as an important non-market attribute that explains the why and how of MTE activities.

### 1.1 A brief historical account

Since the formal establishment of the Menominee Reservation in 1855, it has undergone a unique evolution of circumstances with respect to its natural resource base. Treaty stipulations permitted only nominal control of resources to tribes, vesting major decision making ability to the U.S. Office of Indian Affairs within the Department of the Interior. Early decisions had implicit goals of commercial management of timber and converting the Native American populace into farmers (Thomsen *et al.*, 1999). The tribe was allowed subsistence logging to support local needs, and after initial denial of commercial harvesting

in 1863, agreements with local timbermen were approved to allow salvage of dead and down timber; the proceeds to be placed in a tribal trust fund (Herzberg, 1977). Throughout the rest of the 1800s there were a number of conflicts between the tribe, private commercial logging corporations, and the Office of Indian Affairs over logging rights; including the suspension of previously successful tribal timber operations between 1876 and 1882 (Thomsen *et al.*, 1999).

With the passage of a special act of Congress (26 Stat., 146) in 1890, the Menominee Reservation became the first government-managed land in the U.S. to be placed under a federally regulated logging management plan. The LaFollette Act in 1908, written and championed by Wisconsin Senator Robert LaFollette, removed harvest limited on dead and downed timber, and “placed the care of the forests... ultimately in the hands of the Indians upon these reservations” stipulating that the U.S. Forest Service provide management oversight and expertise, rather than the Office of Indian Affairs<sup>1</sup> (LaFollette, 1908; Thomsen *et al.*, 1999).

The period between 1908 and 1929 saw a great deal of financial and operational investigations by federal agencies, it also saw the construction of rail lines into the reservation in 1908 and 1912, which facilitated the increase of hardwoods harvested by orders of magnitude (Thomsen *et al.*, 1999). Even though this period saw clear-cutting practiced (advocated by some U.S. Forest

---

<sup>1</sup> The LaFollette Act also reinforced existing policy requiring the preferential hiring of tribal peoples for timber activities to preserve a local employment base. The construction of Mill 1 and the Town of Neopit began in 1908 under the direction and planning of the Forest Service (Thomsen *et al.*, 1999). The LaFollette Act dictated that all timber cut on the reservation must be processed at the tribal mill for sale as timber, which the Forest Service argued did not result in maximum sale value of timber and thus losses to the tribe. Part of the Indian Appropriation Act of 1917 authorized the sale of timber as logs if the wood could not be milled economically. It has been argued that this resulted in loss of reservation jobs, but resulted in sales to new markets, and higher timber sale prices (Thomsen *et al.*, 1999).

Service supervisors), the Menominee worked to improve their silvicultural applications and forest regeneration practices<sup>2</sup>.

Menominee Forester L.O. Grapp prepared the reservation's first forest management plan in 1930 (Thomsen *et al.*, 1999). Menominee Forest Supervisor Richard Delaney wrote "Working Basis for Permanent Management Plan" in 1939, which was a formal compilation of Grapp's plan with Timber Stand Improvement innovations. Delaney's plan has been seen as a "silvicultural coming of age" for its analysis of sustainable yield and emphasis on intensive management through cyclical selective cutting to maximize annual regeneration yet maintain quality (Delaney, 1939; Thomsen *et al.*, 1999). Delaney's plan evolved into the Continuous Forest Inventory System which monitored the health and vigor of the entire forest, while also the volume and condition of the lumber at the local scale<sup>3</sup> (Thomson *et al.*, 1999).

A number of congressional actions during the 1930s and 1940s collectively known as the "Indian New Deal" aimed to give Native American tribes greater autonomy. This package included the Indian Reorganization Act, which ended land allotment and protected the right of tribes to sue or bring claims against the United States.

In 1934 and 1935, after initial tribal opposition, the General Council voted to approve a Civilian Conservation Core camp on the reservation, which brought over \$460,000 in federal funding. One resulting program entailed research and experimentation into new silvicultural techniques collectively called Timber Stand Improvement (or TSI) activities, which included pruning of individual trees to produce straight clear lumber and release cutting to thin less desirable species (Rushfeldt, 1939; Ridlington and Waukchon, 1940; Thomson *et al.*, 1999).

---

<sup>2</sup> New techniques included nursery development, planting programs, and the application of selective harvesting. Although these programs were considered "unproven, unscientific, and untested" at the time, foresters moved forward with experimentation of these regenerative management techniques.

<sup>3</sup> This plan also focused on the critical economic importance for both employment of tribal people as well as economic activity of the reservation.

The 1950s brought great change to the Menominee Tribe. Following World War II, there was a growing movement to decrease Federal Government spending, and special interests pushed for opening reservations to private development (Thomsen *et al.*, 1999). The 1953 passage of House Concurrent Resolution 108 set the stage for the eventual 1961 termination of Federal Government trust responsibility for the Menominee Reservation<sup>4</sup>. The 1961 termination of trust status caused major economic fallout<sup>5</sup> associated with loss of financial support from the Bureau of Indian Management and new costs associated with running a County government.

Termination created Menominee Enterprises Inc (MEI), a public corporation which held and managed former trust properties, including the forestry operations. As such, MEI served as the sole, major employer in the county and largest source of tax revenue. The Termination Act dictated that all enrolled Menominee Tribal members (3,270) receive a \$3,000, 4 percent income bond, which created a heavy debt load for MEI and limited MEI's ability to secure further debt to purchase equipment (Thomson *et al.*, 1999).

Public Law 339, entitled "Valuation and Assessment of Sustained-Yield Forest Lands" passed in 1954 enabling the Wisconsin Department of Natural Resources (DNR) to regulate timber in Menominee County using sustainable yield forestry principles (Pecore, 1997a; Thomson *et al.*, 1999). The DNR worked with MEI to develop forest management plans, as well as provide oversight and operational assistance. From this marriage produced the 1961 plan, which deployed the Continuous Forest Inventory (CFI) to provide more accurate

---

<sup>4</sup> In 1951 the Menominee received a settlement of the "Mismanagement Case", choosing to receive the settlement in per capita payments to tribal members - which the U.S. Senate would agree to if the Menominee would agree to terminate their trustee status" (Thomson *et al.*, 1999). The Senate enacted the Menominee Termination Act in 1954 (Thomson *et al.*, 1999) and appropriated the settlement money. Reservation land was given ownership to the Menominee Enterprises Inc, and logging revenues were no longer tax-free.

<sup>5</sup> Termination resulted in the closure of the Tribe's electric utility, schools, hospitals, and clinic because they either did not have funding or did not meet state regulatory codes; resulting in a significant decline in standard of living (Thomson *et al.*, 1999).

assessments of resource stock and condition, and assisted in regulating sustained yield harvests. The plan did this by calling for a cutting system based on small, discrete parcels with tailored management goals rather than on large harvest blocks.

The 1968 Plan<sup>6</sup> continued to develop CFI procedures by creating a grid-like system of plots throughout the reservation and intensively gathered data pertaining to 84 categories on individual trees to monitor changing forest conditions (MEI, 1964; Thomson *et al.*, 1999). Two new innovations in this period included use of computers to analyze and store data, and flyovers to assist in determining forest condition; both pioneered at the Menominee Reservation.

The Federal Government re-established trust responsibility for the Menominee Reservation in 1973 with the Menominee Restoration Act. Ownership in trust of tribal lands was transferred to the Secretary of the Interior, but did not mandate that the Menominee surrender autonomy to the federal government as Congress did not impose federal micromanagement on the Menominee People or Tribal Government (Thomson *et al.*, 1999).

Once forestlands were placed in trust, all other forestry assets transferred to a new entity, Menominee Tribal Enterprises (MTE), which assumed management control of assets formerly controlled by MEI, but under the authority of the new tribal government body, the Menominee Restoration Committee. After the passage of a Tribal Constitution in 1976, the Constitution granted MTE “all powers necessary to manage and operate” the Tribe’s property, as the Tribal Legislature did not assume authority (MRC, 1977; Thomson *et al.*, 1999). Subsequently, MTE was no longer responsible to provide for all tribal needs as it had during Termination and could focus on forestry operations.

---

<sup>6</sup> During Termination (1961-1973) many forest management programs were either cut back or suspended due to lack of funds, even though the forest condition was considered “the most outstanding in the Lake States” (Thomson *et al.*, 1999). After restoration, monies were once again available from the Bureau of Indian Management and the forestry program returned to being one of forest management rather than harvest management (Thomson *et al.*, 1999).

In 1984 the MTE forestry program initiated a habitat classification project developed by Dr. John Kotar at the University of Wisconsin to determine what tree species might grow best on which sites for the application of future forest management techniques and goals (MTE, 1997).

In 1993 the Tribe established the Menominee Sustained Development Institute in the College of the Menominee Nation for education and outreach to maintain Menominee forests in a sustainable state and expand product markets. Many health and long-term productivity concerns loomed over MTE and the reservation after restoration. Slowly relationships with BIA were re-formed and greater cooperation was realized. The Tribe was able to continue to implement sustainable forest management techniques and improve profitability through greater utilization, efficiency, value-added programs, and certification of products (Thomson *et al.*, 1999).

The Menominee Tribal Enterprises Seventh Generation sustainable harvest management program has been lauded for both environmental and economic health. In 1995 MTE received the United Nations' Award on Sustainable Development and in 1996 the Award for Sustainable Development from President Bill Clinton (Wood and Dewhurst, 1998; Burgess, 1998; Landis, 1992). Forest products were certified under the Scientific Certification Systems as sustainably harvested. This recognition has created greater awareness for MTE products (Thomson *et al.*, 1999).

## **1.2 MTE as an economic asset**

With the resumption of logging in 1881, proceeds in the form of stumpage fees evolved into an established mechanism to support the tribe's social programs. The LaFollette Act of 1908 stated that all net sales revenues in the Treasury Department account with four percent annual interest which was available to support the Menominee as the Secretary of the Interior saw fit, including per-capita payments to tribal members. Proceeds from tribal forestry

operations and associated employment have been the primary economic activity for the tribe since the authorization of native logging (Thomsen *et al.*, 1999).

After the Great Depression, increased production demand of World War II served to create a rebound in reservation forestry activity. However, the reservation faced labor shortages, and had to hire nearby farmers with horse teams to skid logs from the forests at a fixed rate.

Despite innovations in sustainable forestry and management techniques, and logistical assistance by the Wisconsin Department of Natural Resources, Menominee Enterprises, Inc failed to produce a consistent profit during the Termination Era between 1961 and 1972 (Thomsen *et al.*, 1999). This was partially due to an aging and technologically outdated mill, over which the Tribe initiated several lawsuits in 1967 charging the federal government with neglect. Yet, experience gained during this period and deliberate management strategies to maintain the sustainability of reservation forest resources would prove fruitful in the ensuing decades. Removal of less ideal species, reforestation and planting, fire suppression, insect and disease prevention, and evolutions in the Continuous Forest Inventory all contributed to long-term management strategies that improved forest operations and the value of the forest growing stock over time (Thomsen *et al.*, 1999).

In 1994 MTE established a revitalization and value-added program, which focused on continuing the modernization of the mill and exploring production of new products from secondary wood processing.

### **1.3 Forestry and forest products in the Lake States**

Change is occurring in the timber industry both domestically and internationally. Domestic production and consumption of roundwood and wood products per capita is increasing. Per capita consumption of roundwood equivalent has decreased since form 83ft<sup>3</sup> to 71ft<sup>3</sup> between 1987 and 2003, but

increased to 72 ft<sup>3</sup> in 2005. This decrease is attributed primarily to increased paper recycling and increasing production efficiency (Howard, 2007).

Increasing globalization and international competition has placed great pressure on domestic production of timber to reduce cost, consolidate, and restrain growth (Ince *et al.*, 2007). By 2002, total domestic forest harvest had decreased ten percent from 1992, and imports had become the fastest growing component of softwood lumber and structural panel supply to the U.S. The import share of all U.S. wood products consumption rose in every sector, especially labor intensive sectors such as sawmills and furniture (Ince *et al.*, 2007).

After years of decline, the forest products industry appears to be in a state of rebound. Economic activity throughout most major forest products increased between 2004 and early 2006, with a 4.1% increase in total industrial index (Howard, 2007). However, a declining housing market, which accounts for one-third of softwood and structural lumber demand and substantial portions of other soft and hardwood products, is in decline from 2006 through 2008.

Due to increased competition for wood products and decreasing per capita consumption, it is more important than ever for MTE to distinguish itself from its competitors, seek efficiency increasing techniques, and explore value-added product options.

In 2004, 22 percent (\$33 Billion) of national value-added forest production was lumber and wood product manufacturing, such as millwork (27%); veneer, plywood, and engineered wood products (25%); and sawmills and wood preservation (25%). An additional 22 percent (\$32 Billion) for value-added forest production included furniture and related products, such as household and institutional furniture (44%); kitchen cabinetry and countertops (24%); and office furniture (19%) (Howard, 2007).

Through globalization, international competition has caused U.S. wood products industries to lose competitive advantage (Freudenburg, 1992; Weber,

1995; Pulver, 1995; Galston and Baehler, 1995). Further, the U.S. economy has been evolving toward a post-industrial structure, one dominated by service industries and reduced reliance on domestic resource extraction and refining activities<sup>7</sup> (Bluestone and Harrison, 1982; Chevan and Stokes, 2000). This has led to a decline in extractive activities across the U.S., and communities have shifted their focus toward a landscape of aesthetic and recreational amenities over extraction (Galston and Baehler, 1995; Isserman, 2000; Green, 2001; Kim et al., 2005). This has led public policy makers to favor reduction in timber harvests on public land in favor of non-timber, amenity-based uses (Kennedy *et al.*, 2001; Wear and Murray, 2004).

In many forested areas, such as Northern Wisconsin, joint use of natural resources for extractive and amenity-based industry is increasingly seen as a method for economic development (Webster *et al.*, 1997; Green et al., 2005; Bove and Marcouiller, 2007). Forest resources are increasingly utilized as critical elements in a number of amenity based sectors including tourism, recreation, second home ownership, and retirement development (Fredrick, 1993; Keith and Fawson, 1995; Jakus et al., 1995; Keith et al., 1996; Marcouiller *et al.*, 1996; Marcouiller, 1997; Marcouiller, 1998; Klase and Guries, 1999; McDonough et al., 1999; Nelson, 2001; Hall and Müller, 2004; Krannich and Petrzalka, 2004; Schnaiberg *et al.*, 2004; RSS, 2006; Bove and Marcouiller, 2007). Explanatory models display important links between tourism and natural amenities such as forests (Marcouiller, 2004; Kim *et al.*, 2005; RSS, 2006).

Large scale dependency on resources extraction can lead to community economic instability (Gunton, 2003), and it is generally accepted that diverse economic structures benefit not only stability, but also long term economic growth (Webster *et al.*, 1997; Wagner and Deller, 1998; Dissart, 2003). However, economic theory places great emphasis on comparative advantage through

---

<sup>7</sup> The decline in wood product production can also be attributed to increased process efficiency and recycling; although a recent increase in wood for energy use may result in increased future

specialization. Although there is risk, natural resources have the potential to provide significant comparative advantage relative to other economic sectors by creating resource rents greater than returns to other factors of production (Gunton, 2003). Recent studies by Bowe and Marcouiller (2004, 2007) show that counties with high levels of forest extraction activities are typically located in rural-remote regions with low population densities, while forested counties with high levels of tourism development have population densities two or three times higher, perhaps suggesting difficulty in having high levels of each activity simultaneously. Indeed, results of these studies suggest that counties with both high timber and tourism activity did not exhibit higher socio-economic indexes.

Research suggests that small economies organized around locally controlled economic enterprises are “associated with a more balanced economic life and high levels of social welfare” (RSS, 2006). MTE represents unique local ownership structure and is an example of a local, rural enterprise that provides economic return to the community (Thomsen *et al.*, 1999; MTE, 2006; Trospen, 2007).

#### **1.4 Objectives of this research and specific research questions addressed**

As 100<sup>th</sup> anniversary of the creation of Menominee Tribal Enterprises (MTE) approaches, we step back to view its place in the regional economy. This report outlines how Menominee Tribal Enterprises is not only an important part of both the economy of Menominee County and the greater region, a sustainable source of income to the Menominee people, but also that opportunities exist for a prosperous future.

The objective of this study was to investigate the economic impact of Menominee Tribal Enterprises operations on the economies of Menominee County and its surrounding North Central Wisconsin region. This will be accomplished through an assessment of MTE’s occupational and annual wage

---

consumption (Howard, 2007).

structure, results of which will then be applied to an input-output model constructed for Menominee County and the surrounding region (including Langlade, Oconto, and Shawano Counties) to develop estimates of the broader economic impacts associated with the Menominee Tribal Enterprises, Inc. Key questions that will be addressed include the following. To what extent is income generated by the MTE and to where does income flow? What are the multiplier effects of MTE activity? What portion of the regional economy is made up by the MTE and its related activities? And a specific question related to resource dependency, how does economic specialization in Menominee County and its surrounding region compare with other reference regions? These are the questions that will be answered by the research outlined in this report.

This report is organized into three additional sections. First, we outline methods used to conduct both the occupation/wage assessment and the input-output analysis. We then outline results of a robust input-output model to estimate the regional economic impact of MTE activities. Finally, we summarize the work and provide suggested areas where MTE can seek to expand its activities to increase profitability.

## 2. METHODS

Occupational structure of the forestry and mill activities undertaken by the Menominee Tribal Enterprises was assessed using a comprehensive dataset of 2007 MTE employees. Job titles, hourly wage rates, and county of residence data was acquired from MTE offices and organized into tables roughly sorted by job type. This data provided the basis of both descriptive assessment and its use in regional economic modeling.

The MTE employs people from a fairly broad labor market that extends outward from the mill; in some cases up to 50 miles. While most of the workers are from Menominee County (over 56 percent), many workers commute from the surrounding counties of Shawano, Langlade, and Oconto. Of the roughly 450 MTE employees, just over 90 workers had missing hourly wage data. Using broad categories that included office, mill work, and forestry activity, further sorting of the data allowed these workers with missing data to be sorted into job type which allowed average wage rates by category to be applied. Most of the missing wages were for skidder and woods machine workers (85 employees). To fill in, we used the average wage for an “engine boss”; which was \$14.75/hour. Two missing clerks used a “c scale office” average of \$14.78/hour. Six specialist/mid--management workers used a “b scale office” average wage of \$20.59/hour. One missing manager wage rate used an “a office scale” average of \$30.54 per hour. Once done, this complete dataset was then used to expand hourly wages to annual payroll.

Annual payroll was calculated for three separate regional delineations based on residence. These included Menominee County, the three surrounding counties of Shawano, Langlade, and Oconto, and those workers who resided outside of the four county region of Menominee, Shawano, Langlade, and Oconto Counties.

MicroIMPLAN<sup>8</sup> was used to develop input-output (sometimes also referred to as “inter-industry”) tables and a modeling structure that allowed estimates of regional economic impact resulting from MTE activities. The 2006 Menominee County file used for this work required editing of the base data to more accurately reflect the actual MTE activity taking place within the county. This was accomplished using results of the occupational structure assessment described above as control for data on the sawmill sector (NAICS 3211) from the surrounding counties of Langlade, Oconto, and Shawano. Specifically, this was required because of the need to estimate other forms of value added (proprietor’s income, other property type income, and indirect business taxes) and total sectoral output for use in the complete edited file for Menominee County. Using employment and employee compensation as a base, ratios of these other characteristics were applied to calculate these estimates.

Once adjusted, the file was used to develop a Menominee County input-output model which was used to assess the impact of the MTE on regional economic characteristics. This was done using a standard MicroIMPLAN scenario without further adjustment. Estimates of economic impact as reported in the Results section reflect regional economic characteristics for the 2006 calendar year.

In an effort to better understand how income paid to MTE workers translated into an economic stimulus for the broader North Central Wisconsin economy, MicroIMPLAN was again used to develop ratios of household consumption demands. This was done within the income categories relevant to the wage structure of MTE occupations. Namely, the ranges of household income included \$15,000 to \$75,000. Grouped ratios were then applied to the

---

<sup>8</sup> MicroIMPLAN is an economic modeling system that includes both software and county level datasets used to perform regional input-output analysis. Both input-output and MicroIMPLAN are topics beyond the scope of this report. The reader interested in these topics is referred to a recent text on Community Economics by Shaffer et al. (2004); specifically, these topics (and their place amongst other regional economic analysis tools) are dealt with in Chapters 14 and 15.

number of workers by place of residence. These amounts of household consumption demand were then applied to the four-county model built using the datafiles for Langlade, Menominee, Oconto, and Shawano Counties.

Our assessment focused on three primary economic characteristics of interest. These included “output” or the total amount of regional activity (sometimes referred to as “gross regional product”) that takes place by industry. “Value Added” is a complete reporting of income (included in output) to include employee compensation, proprietor’s income, other property-type income, and indirect business taxes. Finally, “employment” tracks the number of jobs by industry. For this assessment, industries were aggregated into one-digit SIC representations.

In an effort to better understand both the primary (sawmills) and secondary (millwork, cabinetry, and wood furniture manufacturing) wood products sectors, a location quotient (LQ) assessment was also done.<sup>9</sup> These LQs of value-added timber sectors for select counties were calculated using reference regions that included Northern Wisconsin, the State of Wisconsin, and the United States for comparison. Individual counties were selected due to their relationship between tourism aggregate location quotients and timber aggregate location quotients, and their classification relative to Menominee County using a method put forward by Bowe & Marcouiller (2007). Data for this LQ assessment was developed using county-level data files which allowed a comparison of relative production, employment, and income levels.

---

<sup>9</sup> Like input-output analysis, a full description of the location quotient as a regional economic analysis tool is beyond the scope of this report but the interested reader can again gain further insight by reading the Shaffer et al. (2004) text on Community Economics.

### 3. RESULTS

The wage structure of MTE, as shown in Table 1, outlines mean wage, median wage, and percentage of total by location of residence. The total mean wage is very similar to the median wage, with only a \$0.21 (1.5%) difference. This suggests a relatively even wage structure around the median and/or a wage structure in which most employees earn very near the median. The wage rate table of MTE suggests both are true. Only 8.4% of employees earn greater than 20% above the median while only 1.1% earn 20% below the median.

**Table 1.** Hourly wages paid to MTE employees by county of residence, 2007.

County of Residence	Number of Employees	Percentage of Total	Mean Hourly Wage	Median Hourly Wage
Brown	3	0.66%	\$14.29	\$14.29
Calumet	2	0.44%	\$23.01	
Douglas	1	0.22%		
Forest	27	5.93%	\$13.74	\$14.29
Langlade	50	10.99%	\$13.74	\$14.29
Marathon	8	1.76%	\$13.89	\$14.29
Marinette	6	1.32%	\$14.29	\$14.29
Menominee	256	56.26%	\$14.26	\$13.09
Oconto	25	5.49%	\$13.99	\$14.29
Shawano	73	16.04%	\$16.36	\$14.29
Waupaca	2	0.44%		
Wood	1	0.22%	\$14.29	
Unassigned	1		\$11.62	
Total	455	100%	\$14.50	\$14.29

Employees who resided off-reservation constituted almost 44% of employment and had a very similar wage structure when compared to the 56% who resided on reservation, with mean wages of \$14.88 to \$14.26, and identical medians of \$14.29.

The analysis of the MTE wage structure was incomplete because it only included employees for which a wage rate was listed. While included in the employment but not wage data in Table 1, thirteen (13) employees had no wage rate listed and eighty five (85) were listed only as loggers without a reported wage rate; together representing 21.5% of total employment.

Using the full occupational structure data, estimates of total annual wages paid by aggregated county of residence is outlined in Table 2. Note from this Table that, according to our estimate, roughly \$14 million was paid as either employee compensation or payment for contractual labor rendered.

**Table 2.** Employment and Annual Wages Paid (2007)

Region	Total Annual Wages Paid	Number of Employees	Average Annual Wages per Worker
Menominee	\$7,750,163	257	\$30,039.39
Three Adjacent Counties	\$4,653,064	149	\$31,228.62
Out-of-Region	\$1,532,045	51	\$30,040.09
Total	\$13,935,272	457	
Menominee Region	\$12,403,227	406	

A summary of economic characteristics of the sawmill sector by various regional delineations is outlined in Table 3. The relative extent of sawmilling in Menominee County is placed in context by noting that just over 50 percent of the sawmilling output of the four county region is contributed by the MTE. Further, the MTE accounts for almost 14 percent of the sawmilling output of Northern Wisconsin.

An accounting for “income” is also summarized in Table 3. While the MTE occupational structure assessment resulted in almost \$14 million of employee compensation (roughly \$7,750,000 to residents of Menominee County), ratios from other secondary data were used to estimate a total amount of “Value Added” of \$25,678,000 as a result of MTE activity. Employee compensation

combines with proprietor’s income, other property income, and indirect business taxes to sum to Total Value Added. Results of the estimation suggest that these latter three categories of income total roughly \$11.7 million.

**Table 3.** Economic characteristics of the sawmill sector (NAICS 32111, MI sector 112) in various regions (MicroIMPLAN 2008)

	Output	Total Value Added	Employment	Employee Compensation
U.S. Nationwide	\$32,419,516,000	\$9,439,389,000	121,636	\$4,868,224,000
Northern Wisconsin*	\$726,249,000	\$179,627,000	2935	\$95,714,000
4 county region**	\$191,865,722	\$50,689,694	829	\$27,509,272
Menominee County	\$97,192,722	\$25,677,694	457	\$13,935,272

\* includes Ashland, Bayfield, Burnett, Florence, Forest, Iron, Langlade, Lincoln, Marinette, Menominee, Oconto, Oneida, Price, Rusk, Sawyer, Taylor, Vilas, and Washburn Counties

\*\* includes Langlade, Menominee, Oconto, and Shawano Counties

The economic impact of MTE activities in Menominee County can now be estimated using the MicroIMPLAN software. This software generates input-output results that allow for an estimation of multiplier effects. Key to these economic multiplier effects are inter-industry transactions that track the round by round spending that results from an initial economic stimulus. In these input-output models, the initial economic stimulus is represented by the forestry and milling operations of the MTE. These are referred to as “direct” economic impacts. The round-by-round inter-industry transactions resulting from direct impacts are referred to as “indirect” economic impacts. Further, multiplier effects can include the increased consumption resulting from increased incomes (resulting from both “direct” and “indirect” impacts) within the region. These income effects are referred to as “induced” economic impacts. Given that each type of impact is unique, the sum of “direct”, “indirect”, and “induced” impacts is referred to as “total” economic impact.

The importance of MTE activity to Menominee County is outlined in Table 4. Note from this table that the direct impact associated with MTE activity

represents the amount of output for Menominee County previously described in Table 3 (roughly \$96 million). This was used as the initial stimulus of the model results reported in Table 4. This translated into a total amount of value added income of just over \$25 million and is represented as 457 total jobs (note that this coincides with the amount of MTE employees who reside in Menominee County shown in Table 2).

With multiplier effects, the direct output impact of \$96 million associated with MTE operations results in a total impact on output of just over \$108 million, generating more than \$12 million in indirect and induced output. The output multiplier for Menominee County specific to the MTE activity is roughly 1.13; a number that reflects the generally non-diverse and rural nature of the Menominee County economy.

This also results in 67 additional jobs created for a total of 524 jobs attributed to the impact of MTE activities. The majority of this additional economic activity is in non-MTE manufacturing, forestry, and service sector activities.

It is important to note that while the impacts tied to MTE workers are created (supplied) within Menominee County, a large portion of these employees reside outside the county. While this supply side view helps in providing insight into the income generation abilities of the MTE that originates in Menominee County, it falls short in providing insight into how income stimulates regional consumption demands. Indeed, many of the impacts associated with the MTE occur due to the consumption patterns of MTE workers in Shawano, Oconto, and Langlade Counties. This is due to the combined facts that many of the workers do not reside in Menominee County and that there is only limited availability of household consumption items found within the Menominee County retail and service sector.

To account for this broader regional consumptions, a second model of the four-county region was constructed and used. An understanding of household

**Table 4.** Economic impacts of the Menominee Tribal Enterprises to Menominee County (using data on MTE occupational structure and Micro-IMPLAN aggregated to top-level economic sectors).

Industry (Aggregated)	Direct*	Indirect*	Induced*	Total*
<b>Output Impact (2007 \$)</b>				
Agriculture	\$0	\$3,048,782	\$3,902	\$3,052,684
Mining	\$0	\$0	\$0	\$0
Construction	\$0	\$0	\$2	\$2
Manufacturing	\$96,119,368	\$6,672,804	\$254,932	\$103,047,104
TCPU *	\$0	\$27,084	\$2,030	\$29,114
Trade	\$0	\$6,459	\$373	\$6,832
FIRE ^	\$0	\$1,741	\$33,960	\$35,701
Services	\$0	\$344,709	\$1,669,037	\$2,013,745
Total	\$96,119,368	\$10,101,577	\$1,964,236	\$108,185,181
<b>Total Value Added Impact (2007 \$)</b>				
Agriculture	\$0	\$588,199	\$391	\$588,589
Mining	\$0	\$0	\$0	\$0
Construction	\$0	\$0	\$0	\$0
Manufacturing	\$25,410,622	\$1,790,513	\$170,325	\$27,371,460
TCPU *	\$0	\$11,620	\$871	\$12,491
Trade	\$0	\$3,423	\$198	\$3,621
FIRE ^	\$0	\$985	\$19,222	\$20,207
Services	\$0	\$133,032	\$1,253,649	\$1,386,682
Total	\$25,410,622	\$2,527,772	\$1,444,655	\$29,383,049
<b>Employment Impact (total jobs)</b>				
Agriculture	0	14	0	14.1
Mining	0	0	0	0
Construction	0	0	0	0
Manufacturing	457	32.4	5.1	494.5
TCPU *	0	0.4	0	0.4
Trade	0	0.2	0	0.2
FIRE ^	0	0	0.6	0.6
Services	0	6.1	8.2	14.3
Total	457	53.1	13.9	524

\* TCPU = Transport, communications, and public utilities

^ FIRE = Finance, insurance, and real estate

consumption demands can be found in Table 5. Note from this table that MTE workers who reside in the four county region earned just over \$12 million and this is then spent among sectors as identified using household consumption

demands for the income groups between \$15,000 and \$75,000 (first column). These income groups account for roughly two-thirds of all households in the four county region (third column). Sectoral distribution of household consumption applied ratios (fourth column) to the amount of income generated by the MTE to residents of the four-county region to develop dollar estimates of demand attributed to MTE workers (fifth column).

**Table 5.** Overall Household Consumption Demands of Menominee 4-County Region (2006 IMPLAN data)

	Household demand from MTE income group	Total household demand all income groups	% MTE group of all income groups	% of MTE income groups by sector)	Demand Attributed to MTE workers
Agriculture	\$11,048,000	\$16,098,000	68.6%	0.6%	\$74,567
Mining	\$55,362,000	\$79,153,000	69.9%	3.0%	\$373,657
Construction	\$4,997,000	\$7,042,000	71.0%	0.3%	\$33,726
Manufacturing	\$995,033,000	\$1,439,821,000	69.1%	54.1%	\$6,715,824
TCPU	\$20,643,000	\$30,348,000	68.0%	1.1%	\$139,327
Trade	\$6,694,000	\$10,427,000	64.2%	0.4%	\$45,180
FIRE	\$35,122,000	\$61,003,000	57.6%	1.9%	\$237,051
Services	\$708,760,000	\$1,092,392,000	64.9%	38.6%	\$4,783,668
Totals	\$1,837,659,000	\$2,736,283,000	67.2%	99.4%	\$12,403,000

These demands were then applied to the four-county model to develop estimates of the impact MTE workers and their household consumption demand has on the surrounding region. These estimates are presented in Table 6. Note, once again, that the initial levels found in Table 5 are (roughly given rounding errors) those found in the first column of Output Impact found in Table 6. Given this \$12.4 million stimulus, a total amount of \$17.9 million is generated as an impact on output. This reflects a four-county output multiplier of 1.44; again, a reasonable multiplier effect given the generally more diverse regional economy.

**Table 6.** Impact of MTE Workers Household Consumption Demand on Menominee 4-County Regional Economic Structure (2006 IMPLAN model results).

Industry	Direct*	Indirect*	Induced*	Total*
<b>Output impact (2006 \$)</b>				
Agriculture	\$438,213	\$1,320,901	\$40,436	\$1,799,549
Mining	\$33,700	\$117,951	\$47,185	\$198,836
Construction	\$0	\$5	\$2	\$6
Manufacturing	\$7,083,469	\$1,449,580	\$864,311	\$9,397,360
TCPU *	\$0	\$74,355	\$28,031	\$102,386
Trade	\$0	\$35,203	\$18,779	\$53,982
FIRE^	\$0	\$77,037	\$24,898	\$101,934
Services	\$4,798,205	\$305,807	\$1,107,440	\$6,211,452
Institutions	\$4,413	\$0	\$0	\$4,413
Total	\$12,358,000	\$3,380,838	\$2,131,080	\$17,869,918
<b>Total Value Added Impact (2007 \$)</b>				
Agriculture	\$234,232	\$307,764	\$12,779	\$554,775
Mining	\$9,779	\$63,813	\$28,724	\$102,316
Construction	\$0	\$0	\$0	\$0
Manufacturing	\$1,983,685	\$633,945	\$484,921	\$3,102,551
TCPU *	\$0	\$35,088	\$13,170	\$48,258
Trade	\$0	\$18,032	\$7,788	\$25,820
FIRE^	\$0	\$32,275	\$10,406	\$42,681
Services	\$2,876,926	\$122,960	\$714,875	\$3,714,761
Institutions	\$0	\$0	\$0	\$0
Total	\$5,104,622	\$1,213,876	\$1,272,663	\$7,591,162
<b>Employment Impact (total number of jobs)</b>				
Agriculture	4.2	9.3	0.6	14.1
Mining	0.2	0.7	0.2	1.2
Construction	0	0	0	0
Manufacturing	31.6	10.9	11.4	53.9
TCPU *	0	0.9	0.4	1.3
Trade	0	0.5	0.2	0.8
FIRE^	0	1.3	0.4	1.7
Services	114.5	5.9	12.3	132.8
Institutions	0	0	0	0
Total	150.6	29.6	25.6	205.8

To gain insight into the opportunities for value added activities within both the primary and secondary wood products sector, a regional comparison

was done to assess the presence of specialization. This was done using location quotients for select industry which were calculated using data from MicroIMPLAN. These location quotients for select secondary wood products processing sectors are outlined in Table 7. By calculating the location quotients, we can identify a comparative level of sectoral specialization for the MTE operations in Menominee County, its four county region, and in Northern Wisconsin with respect to Northern Wisconsin, the State of Wisconsin, and the United States. A location quotient greater than one suggests that there is a greater specialization in this sector compared to the reference region, and a location quotient greater than five suggests generally high levels of specialization (Shaffer *et al.*, 2004).

**Table 7.** Location Quotient matrix of three wood product sectors with reference regions: Northern Wisconsin, State of Wisconsin, and the U. S.

Reference	Location Quotient		
	N. WI	WI	U.S.
Region	<b>Sawmills</b>		
Menominee County	17.6	120.2	143.7
Menominee Region	3.2	21.9	26.1
Northern Wisconsin	x	6.8	8.2
	<b>Other Millwork</b>		
Menominee County	0.0	0.0	0.0
Menominee Region	0.6	2.6	5.5
Northern Wisconsin	x	4.4	9.3
	<b>Cabinetry</b>		
Menominee County	0.0	0.0	0.0
Menominee Region	1.3	1.2	1.3
Northern Wisconsin	x	0.9	1.0
	<b>Wood Furniture</b>		
Menominee County	0.0	0.0	0.0
Menominee Region	4.9	2.0	4.5
Northern Wisconsin	x	0.4	0.9

Location quotients were calculated for three value-added sectors present in the region, other millwork, kitchen cabinetry, and wood furniture. The presence and specialization of select value-added industries is important for two reasons: (1) the relative lack of these industries would suggest that there is potential for development, and (2) the presence and specialization of these industries would suggest that there is a strong export component to which MTE could market its products. Results suggest that both the Region and Northern Wisconsin are highly specialized in sawmill operations and specialized in millwork, but the Region is specialized in cabinetry and furniture while Northern Wisconsin is not.

Although Table 5 displays location quotients of zero for Menominee County, MTE reported both planing (3.6 Mbf) and milling (0.34 Mbf) operations internal to the firm with unknown economic metrics that are included in aggregated sawmill operations (MTE, 2007). Wood siding and flooring are examples of products that may result from planing and milling operations, included in the “other millwork” industry sector.

Results suggest that there exists millwork production operations in the immediate region to demand MTE output for production of flooring and molding, as well as cabinetry and furniture operations. These industries would likely consume higher quality wood for use in these value-added finished products. These are also products which typically in the highest demand, greater price premiums, and increased attention paid to sustainable harvest certification (Perry, 2006).

Throughout the MTE literature, the desire to expand value-added product lines in order to grow tribal employment and further economic development is expressed (MTE, 2007). Analysis of the location quotient table for value-added forest products suggests that the Regional specialization exists and that there should be a market for MTE products, both high quality raw timber and value-added finished goods.

With the rapid rise of the green building movement throughout the county, significant demand has been created for certified sustainable products, especially value-added lines as flooring, molding, cabinetry, and furniture. Due to this demand, and the value placed upon it due to its sustainable nature, there may be price premium for certified products (Clay, 2003; Perry, 2006). These premiums tend to be realized at the production or retail of value-added products rather than in the harvest and management of forests (Nausbaum & Simula, 2005).

#### **4. SUMMARY**

Representing \$96 million in direct economic activity, MTE represents a large portion of total economic output of Menominee County. When induced and indirect impacts are added, this total amount of economic impact on output rises to \$108 million. Further, MTE represents a large workforce in the County (457 jobs; 257 of whom reside in Menominee County). Clearly, MTE is a significant part of Menominee County economy.

With increasing volumes of forest products entering the market, especially imports, and overall decreasing demand due to the recent housing downturn, it is important for MTE to distinguish itself as a leader in sustainably harvested wood (Clay, 2003; Perry, 2006), explore new production efficiencies (Reynolds, 2006; Pickens *et al.*, 2005), and seek value-added product opportunities (Nausbaum & Simula, 2005).

Menominee Tribal Enterprises is respected as a leader in sustainable forestry and is distinct in its rich history and experience in forest management. The strong vertical integration between the woods and the mill presents a unique aspect of the MTE management approach. Indeed, the MTE works within a management structure where the forest drives the mill, rather than the mill driving the forest. This reflects the Menominee's philosophy of placing great

value on forest health and ecosystem vitality; a keystone of sustainable forest management.

With a 150-year history of sustainable forest management (Burgess, 1998; Pecore, 1997b; Pecore, 1993, Landis, 1992) and as the first forest in North America certified by Scientific Certification Systems (SCS, 2001) MTE should seek to further market its products as sustainability harvested (SmartWood, etc), and to take advantage of demand in this area and command the corresponding price premium (Clay, 2003; Nausbaum & Simula, 2005; Perry, 2006).

## REFERENCES

- Bluestone, B., Harrison, B., 1982. *Deindustrialization of America: Plant Closings, Community Abandonment, and the Dismantling of Basic Industry*. Basic Books, New York.
- Bowe, Scott A. and Dave W. Marcouiller. 2007. "Alternative tourism-timber dependencies and the development of forested rural regions." *Forest Policy and Economics* 9: 653-670.
- Burgess, D. 1998. Forests of the Menominee- A Commitment to Sustainable Forestry." *The Forest Chronicle* 72(3): 268-75.
- Chevan, A., Stokes, R. 2000. Growth in family income inequality. 1970-1990: industrial restructuring and demographic change. *Demography* 37 (3), 365-380.
- Clay, Jason. 2003. "Borrowed from the Future: Challenges and Guidelines for Community-Based Natural Resource Management." Ford Foundation.
- Delaney, Richard. 1939. Working Basis for A Permanent Forest Management Plan, Menominee Indian Reservation. 1-2/8-9.
- Delaney, Richard. 1941. Narrative Supplement to Annual Forestry Report, Fiscal Year 1941, Menominee Indian Reservation.
- Deller, Steven; Tsung-Hsiu, Tsai; Marcouiller, David; English, Donald. 2001. "The Role of Amenities and Quality of Life in Rural Economic Growth." *American Journal of Agricultural Economics* 83:2 pp 352-365.
- Deller, Steven; Sumathi, N.R.; Marcouiller, Dave. 1993. "Regional Economic Models for the State of Wisconsin: An Application of the Micro-IMPAN Modeling System." Staff Paper 93.6, University of Wisconsin-Extension, Madison WI.
- Depro, B.M., Murray, B.C., Alig, R.J., and Shanks, A. 2008. Public Land, Timber Harvests, and Climate Mitigation: Quantifying Carbon Sequestration Potential on U.S. Public Timberlands. *Forest Ecology and Management* 255, 1122-1134.
- Dissart, J.C. 2003. Regional Economic Diversity and Regional Economic Stability: Research Results and Agenda. *International Regional Science Review*, 26: 4, 423-446.
- Fredrick, Martha, 1993. Rural tourism and economic development. *Economic Development Quarterly* 7 (2), 215-224.
- Freudenburg, William R., 1992. Addictive economies: extractive industries and vulnerable localities in changing world economy. *Rural Sociology* 57 (3), 305-332.
- Galston, William A., Baehler, Karen J., 1995. *Rural Development in the United States: Connecting Theory, Practice, and Possibilities*. Island Press, Washington, DC.
- Grapp, L.O. 1930. Preliminary Forest Management Plan for Menominee Indian Reservation, Wisconsin, 1930.
- Green, Gary P., 2001. Amenities and community economic development: strategies for sustainability. *Journal of Regional Analysis and Policy* 31 (2), 61-76.
- Green, Gary P., Deller, Steven C., Marcouiller, David W. (Eds.), 2005. *Amenities and Rural Development: Theory, Methods, and Public Policy*. Edward Elgar, Cheltenham, UK.
- Gunton, Thomas, 2003. Natural resources and regional development: an assessment of dependency and comparative advantage paradigms. *Economic Geography* 79 (1), 67-94.
- Hall C.M and Müller, D.K. 2004. *Tourism, Mobility & Second Homes: Between Elite Landscape and Common Ground*. Multilingual Matters Limited.
- Herzberg, Stephen J. 1977. "The Menominee Indians: From Treaty to Termination." *Wisconsin Magazine of History* 60(1977): 277.
- Howard, James L. 2007. "U.S. Timber Production, Trade, Consumption and Price Statistics 1965 to 2005." U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. Madison WI.
- Huff, Paula and Marshall Pecore. 1995. "Case Study: Menominee Tribal Enterprises." Nelson Institute for Environmental Studies, Land Tenure Center. Madison WI.

- Ince, Peter; Schuler, Albert; Spelter, Henry; Luppold, William. 2007. "Globalization and structural change in the U.S. forest sector: an evolving context for sustainable forest management." General Technical Report FPL-GTR-170. U.S. Department of Agriculture, Forest Service, Forest Products Laboratory, Madison, WI.
- Isserman, Andrew M., 2000. The competitive advantages of rural America in the next century. *International Regional Science Review* 24 (1), 35-58.
- Jakus, Paul M., Siegel, Paul B., White, Richard L., 1995. Tourism as a rural development strategy: finding consensus in residents' attitudes. *Tennessee Agri Science* 22-29 (Fall 1995).
- Keith, John, Fawson, Christopher, 1995. Economic development in rural Utah: is wilderness recreation the answer? *Annals of Regional Science* 29 (3), 303-313.
- Keith, John, Fawson, Christopher, Chang, Tsangyao, 1996. Recreation as an economic development strategy: some evidence from Utah. *Journal of Leisure Research* 28 (2), 96-107.
- Kennedy, J.J; Thomas, J.W.; Glueck, P. 2001. Evolving Forestry and Rural Development Beliefs at Midpoint and Close of the 20<sup>th</sup> Century. *Forest Policy and Economics* 3:1 pp 81-95.
- Kim, Kwang Koo, Marcouiller, David W., Deller, Steven C., 2005. Natural amenities and rural development: understanding spatial and distributional attributes. *Growth and Change* 36 (2), 273-297.
- Klase W.M., and Guries R.P. 1999. Forestland ownership in Oneida and Vilas Counties, Wisconsin, 1975-1994. Land Tenure Center, University of Wisconsin-Madison.
- Krannich, R., Petrzela, P. 2004. "Tourism and Natural Amenity Development: Real Opportunities?" in: *Challenges for Rural America in the Twenty-First Century*. David L. Brown and Louis E. Swanson, editors, University Park, PA: Pennsylvania State University Press, 2003.
- LaFollette, Robert. 1908. Committee on Indian Affairs, United State Senate, Report no. 110 to accompany Senate bill 4046, January 23, 1908, "Cutting of Timber, Etc., on Indian Reservations in Wisconsin," pp 2-3; Wisconsin State Historical Society, Jay P. Kinney Papers, MSS360, Box 1, Folder 1.
- Landis, S. 1992. "Seventh Generation Forestry." *Harrowsmith County Life* 7(42): 26-28, 30-33.
- Leatherman, J. C. and D. W. Marcouiller. 1996. "Persistent Poverty and Natural Resource Dependence: Rural Development Policy Analysis That Incorporates Income Distribution." *Journal of Regional Analysis and Policy* 26(2):73-93.
- Leatherman, J. C. and D. W. Marcouiller. 1996. "Income Distribution Characteristics of Rural Economic Sectors: Implications for Local Development Policy." *Growth and Change* 27(4):434-459.
- Marcouiller, D.W., D. F. Schreiner and D. K. Lewis. 1993. "Constructing a Social Accounting Matrix to Address Distributive Economics Impacts of Forest Management." *Regional Science Perspectives* 23(2):60-90.
- Marcouiller, D.W.; Schriener D.F.; Lewis D.K. 1995. "Distributive Economic Impacts of Intensive Timber Production." *For. Sci.* Vol. 41, n1, pp. 122-139.
- Marcouiller, D.W., Green G.P., Deller S.C., Sumathi N.R. 1996. *Recreational Homes and Regional Development*. University of Wisconsin Extension.
- Marcouiller, D. W. and J. C. Stier. 1996. *Forest Management Alternatives and Income Distribution in the Lake States*. Staff Paper Series # 48. Madison, WI: Department of Forestry, University of Wisconsin-Madison.
- Marcouiller, David W., 1998. Environmental resources as latent primary factors of production in tourism: the case of forest based commercial recreation. *Tourism Economics* 4 (2), 131-145.
- Marcouiller, D.W., Kim, K.K., Deller, S.C., 2004a. Natural amenities, tourism, and income distribution. *Annals of Tourism Research* 31, 1031-1050.
- Mater, Catherine. 1999. "The Business of Sustainable Forestry Case Study: Menominee Tribal Enterprises: Sustainable Forestry to Improve Forest Health and Create Jobs." Island Press.

- McDonough, M., Fried, J., Potter-Witter, K., Stevens, J., Stynes, D. 1999. The role of natural resources in community and regional economic stability in the eastern upper peninsula. Research Report 568. Michigan Agricultural Experiment Station. Michigan State University.
- Menominee Enterprises, Inc. 1964. "Annual Report."
- Menominee Tribal Enterprises. 2007. "Annual Report 2006."
- Menominee Tribal Enterprises. 2006. "Annual Report 2005."
- Menominee Tribal Enterprises. 2005. "Annual Report 2004."
- Menominee Tribal Enterprises. 2004. "Annual Report 2003."
- Menominee Tribal Enterprises. 2003. "Annual Report 2002."
- Menominee Tribal Enterprises. 1997. "The Menominee Forest Tradition: History, Principles and Practices."
- Menominee Restoration Committee. 1977. Article XII, Constitution and Bylaws of the Menominee Indian Tribe of Wisconsin.
- Naussbaum, Ruth and Simula, Markku. 2005. The Forest Certification Handbook. Second Edition. Earthscan.
- Nelson, C.M. 2001. Economic Implications of Land Use Patterns for Natural Resource Recreation and Tourism. Michigan State University.
- Perry, Alyx. 2006. "Market Opportunities for FSC Certified Wood Products in the Southern Appalachians." Rainforest Alliance, Southern Forests Network.
- Pecore, Marshall. 1997a. "Menominee Woodland."
- Pecore, Marshall, John Koss, Doug Cox, Paula Huff, Keith Milner, Gary Mejchar. 1997b. "The Forest Keepers: The Menominee Forest-Based Sustainable Development Tradition." The Menominee Indian Tribe of Wisconsin, Neopit, WI.
- Pecore, Marshall. 1992. "Menominee sustained yield management: A successful land ethic in practice." *Journal of Forestry*. 90(7):12-16
- Pickens, Jim, Aaron Everett, Scott Noble, John Baumgras, Philip Araman, Conrad Waniger, Al Steele. 2005. "Improving Intensive Hardwood Log Bucker Training Using HW Buck Dramatically Improves Value Recovery." Michigan Technological University, Houghton MI.
- Pulver, Glen C., 1995. Economic forces shaping the future of rural America. In: Beaulieu, Lionel J., Mulkey, David (Eds.), *Investing in People: The Human Capital Needs of Rural America*. Westview Press, Boulder, CO, pp. 49-63.
- Reynolds, Keith M., ed 2006. Sustainable forestry in theory and practice: recent advances in inventory and monitoring, statistics and modeling, information and knowledge management, and policy science Gen. Tech. Rep. PNW-GTR-688. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Ridlington, Walter and Lee Waukechon. 1940. Timber Stand Improvement, Menominee Reservation, 1940. National Archives I, Record Group 75, Entry 1000, CCC, General Records, Box 123 Keshena, Folder 64982-1939.
- Rural Sociological Society (RSS). 2006. Tourism and Amenity-Based Development in Rural Communities. Issue Brief 3, 2006.
- Rushfeldt, Victor L. 1939. Report, September 15, 1939, Timber Stand Improvement, Menominee Reservation, Wisconsin. National Archives I, Record Group 75, Entry 1000, CCC, General Records, Box 123, Kshena, Folder 64892-1939.
- Scientific Certification Systems (SCS). 2001. Certification Public Summary Reports. 27 June 2001. [www.scs1.com/publicsummary.shtml](http://www.scs1.com/publicsummary.shtml)
- Shaffer, Ron; Deller, Steve; Marcoullier, Dave. 2004. *Community Economics: Linking Theory and Practice*. Second Edition. Blackwell Publishing, Ames IA.
- Schnaiberg, J., Riera, J., Turner, M.G., Voss, P.R. 2004. Explaining Human Settlement Patterns in a Recreational Lake District: Vilas County, Wisconsin, USA. *Environmental Management*, 30(1): 24-34.
- Thomsen, Cristina; Hal Neumann; and John Schuttler. 1999. *The Forests of the Menominee*. Heritage Research Center, Ltd. Missoula, Montana.

- Trosper, Ronald. 2007. Indigenous Influence on Forest Management on the Menominee Indian Reservation. *Forest Ecology Management* 249(1): 134-139.
- United States Senate. 1956. Senate Report No. 2413, 84<sup>th</sup> Congress, 2<sup>nd</sup> Session, 1956, National Archives, Record Group 75, Entry 121, Central Classified Files, 1948-1952, Menominee 339-350, Box 84, File 8297, 5.
- Wagner, J.E., and Deller, S.C. 1998. Measuring the Effects of Economic Diversity on Growth and Stability. *Land Economics*, 74(4): 541-556.
- Wear, D.N., Murray, B.C., 2004. Federal timber restrictions, interregional spillovers, and the impact on U.S. softwood markets. *J. Environ. Econ. Manage.* 47 (2), 307-330.
- Weber, Bruce A., 1995. Extractive industries and rural-urban economic interdependence. In: Castle, Emery N. (Ed.), *The Changing American Countryside: Rural People and Places*. University Press of Kansas, Lawrence, KS, pp. 155-179.
- Webster, HH, Chappelle, DE, Andrews, SC. 1997. *Tourism and Forest Products: Twin Resource Sectors for Effective Community Development in the Lake States*. University of Minnesota.
- Wood, Brent and Stephan Dewhurst. 1998. "A Decision Support System for the Menominee Legacy Forest." *Journal of Forestry*. 96(11): 26-32