

Michigan timber available to harvest
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Use of the tables

These tables have been developed to allow users to refer to information on previous harvest trends and planned timber removals from public forests, and for nonindustrial private forest the percentage of owners that have harvested in the past and are willing to do so in the future. This information may be used to adjust forest inventory, i.e. the amount of wood in standing trees, to the amount that might be available for harvest.

Users are cautioned that the planned or projected harvest, i.e. the volumes presented as those that timber owners may make available to the market are under the condition that state and federal policy will not change significantly and that timber market conditions will remain essentially the same as they have been over the analysis period.

Definitions of terms used in these tables are taken from the USDA Forest Service Forest Inventory and Analysis Unit and are available in Appendix A along with the timber volume conversion factors used in this report.

Statewide growth and removals

To provide background information, composite tables of average annual timber growth (Table 1) and average annual removals (Table 2) for the state by region and ownership class are summarized from USDA Forest Service inventory information (FIA 2010). The user can refer to these tables to develop a sense of what the growth and removal trends have been for each region and ownership. Next, similar information is presented in more detail for each ownership class, by region and species group (hardwoods or softwoods).

For **State Forest** timber harvests, the historical harvest level for the period 2000--2009 is displayed for each region by hardwood or softwoods (Table 3). This is an indication both of the current capacity in the State Forest System to make timber available for sale as well as the demand for state forest timber over the period. The Department of Natural Resources, Forest Management Division has a State Forest Management Plan which, among other things, sets a target for annual harvests from State Forest lands. This target level is not yet available by individual state forest or region. Lacking this forest level information, the planned harvest is allocated to each region and species group based upon historic harvest levels. This results in a case where the estimate of allocated harvest is greater than the average annual growth (Table 3, EUP hardwoods).

Users of course can use a greater amount, total state forest growth, for example, as the amount available for harvest if they would like to examine a scenario in which more of the state forest timber would be put up for sale.

For **National Forest** timber harvests, the historical harvest level for the period 2000 to 2009 is displayed for each region by hardwood or softwoods (Table 4). This is an indication of the recent levels of timber

volume made available for sale by each national forest as well as the volume of timber that has been purchased and harvested over the period. Information on the planned harvest levels for each of the four National Forests¹ in Michigan is also displayed. This is the level of harvest as planned from the respective National Forest Plan for each of the forests. Users of course can use a greater amount, total national forest growth, for example, as the amount available for harvest if they would like to examine a scenario in which more of the national forest timber would be put up for sale.

For **Non-industrial Private Forests** (NIPF) the historical harvest level for the period 2000 to 2009 is displayed for each region by hardwood or softwoods (Table 5). Since these forests are owned and managed by individuals, families or non-timber industry organizations, there is no centralized planning of timber harvest levels for the ownership class. The historic levels of timber harvests from NIPF lands are more a result of market demand and supply, i.e. at a given price how much owners are willing to sell and how much users are willing to buy. Next indications of what percentage of forestland owners have harvested timber or are willing to harvest timber is listed. These percentages were developed from 2003 and 2010 surveys of private non-industrial owners in Michigan (Mueller et al. 2010 and GC et al. 2010). Note that these figures are the percentage of landowners that say they have done or will do timber harvesting and that the respondents' answers are based upon many factors such as their experience and perceptions of current or future markets. Their actual behavior may be different than what they say they will do and their intentions and behavior may change if timber prices rise or fall appreciably.

Data on historical **timber investment organization** timber harvests are not available for Michigan. Forest Land Group, GMO and Plum Creek are the three investment forest owners with the greatest acreage in Michigan. Two of the ownerships currently have long-term contracts to specific wood-using mills in Michigan to supply raw material. These contracts will run out by 2015. One of the ownerships makes its timber sales available to the open market. Users are advised to determine how much of the timberland in their analysis is owned by these companies, if any, and adjust timber availability as they see fit.

¹ The Huron-Manistee National Forests are administered as one unit but are still two national forests

Table 1. Average annual net growth of live trees (thousand ft³/year) in MI timberlands by region, species group and owner class. (FIA 2000-2004 to 2005-2009).

Region	Species group	Ownership									
		Unknown	National Forest ²	Fish & Wildlife Service	Department of Defense or Energy	Other Federal	State ³	Local (county, municipal, etc.)	Other non federal lands	Undifferentiated private	Total
EUP	Softwood	122	17,740	288		35	16,014	-64		31,777	65,912
	Hardwood	64	8,701	176		925	5,780	-39		34,073	49,680
	Total	186	26,440	464		960	21,793	-103		65,851	115,591
WUP	Softwood	166	7,654		20	8	8,097	586	-31	30,398	46,898
	Hardwood	180	13,340		0	136	8,772	1,897	94	58,358	82,778
	Total	345	20,995		20	144	16,869	2,483	63	88,756	129,675
NLP	Softwood	240	17,435	-5	111	0	29,732	1,527	51	56,777	105,867
	Hardwood	-48	19,509	21	501	-8	37,590	3,373	150	153,569	214,656
	Total	191	36,943	16	612	-8	67,322	4,900	201	210,346	320,523
SLP	Softwood	92	135	0	0	0	719	776	0	10,831	12,553
	Hardwood	1,586	224	842	143	59	17,137	6,782	152	157,931	184,855
	Total	1,678	359	842	143	59	17,856	7,558	152	168,762	197,409
Statewide	Softwood	619	42,963	282	131	43	54,562	2,825	20	129,784	231,230
	Hardwood	1,781	41,774	1,039	644	1,111	69,279	12,014	396	403,931	531,969
	Total	2,400	84,737	1,321	775	1,154	123,841	14,839	417	533,714	763,198

National Park Service average annual growth = 0

² This column denotes average annual net growth of live trees in all timberlands on Michigan's national forests and not only those lands that are identified as suitable for timber management according to National forest plans.

³ This column denotes average annual net growth of live trees in all timberlands on Michigan's state owned forests.

Table 2. Average annual removals of live trees (in thousand ft³/year) in MI timberlands by region, species group and owner class. (FIA 2000-2004 to 2005-2009)

Region	Species group	Ownership					Total
		Unknown	National Forest	State	Local (county, municipal, etc.)	Undifferentiated private	
EUP	Softwood	1,480	6,484	5,636		14,154	27,754
	Hardwood	1,065	899	9,051		38,830	49,846
	Total	2,545	7,383	14,688		52,984	77,600
WUP	Softwood	1,815	5,090	1,669	1,963	14,735	25,273
	Hardwood	2,937	3,716	9,875	2,702	63,644	82,874
	Total	4,751	8,807	11,544	4,666	78,379	108,147
NLP	Softwood	2,921	1,170	13,614	411	17,859	35,976
	Hardwood	8,004	1,764	19,495	1,051	67,279	97,593
	Total	10,926	2,934	33,109	1,462	85,139	133,569
SLP	Softwood	1,448		76		511	2,036
	Hardwood	16,329		1,959		38,716	57,004
	Total	17,777		2,036		39,227	59,039
Statewide	Softwood	7,664	12,744	20,996	2,375	47,259	91,039
	Hardwood	28,334	6,379	40,380	3,753	208,470	287,317
	Total	35,999	19,124	61,377	6,128	255,729	378,356

National park service = 0, Fish and Wildlife Service = 0, Department of Defense or Energy = 0, Other Federal = 0, Other Non-federal = 0

Table 3. Growth and removals of live trees in MI state owned forests in the Upper Peninsula and Northern Lower Peninsula by region and species group (Source: FIA 2000-2004 to 2005-2009) ⁴

Region	Species Group	Average annual net growth of live trees in MI state owned forests (thousand ft ³ /yr)	Average annual removals of live trees in MI state owned forests (thousand ft ³ /yr)	Growth to removals ratio	Avg. annual removals to net growth ratio ⁵	Percent of harvests on state owned forest in northern 2/3 of MI	Example distribution of planned harvest level for State Forests in thousand ft ³ ⁶	Planned Harvest /Net Growth ³
EUP	Softwood	16,014	5,636	2.8	0.352	9.50%	5,252	0.33
	Hardwood	5,780	9,051	0.6	1.566	15.25%	8,435	1.46 ⁷ⁱ
	Total	21,793	14,688	1.5	0.674	24.75%	13,688	0.63
WUP	Softwood	8,097	1,669	4.9	0.206	2.81%	1,555	0.19
	Hardwood	8,772	9,875	0.9	1.126	16.64%	9,203	1.05
	Total	16,869	11,544	1.5	0.684	19.45%	10,758	0.6
NLP	Softwood	29,732	13,614	2.2	0.458	22.94%	12,687	0.43
	Hardwood	37,590	19,495	1.9	0.519	32.85%	18,167	0.48
	Total	67,322	33,109	2.0	0.492	55.79%	30,854	0.46
N 2/3 MI	Total State Owned	105,985	59,341	1.8	0.560	100.00%	55,300 ⁸	0.52

⁴ The southern 1/3rd of Michigan is not included in this table since there are no State Forests in the region. The state land in the SLP is largely managed for recreation or wildlife habitat.

⁵ Average Annual Growth divided by net growth is the measure of historical performance.

⁶ Distribution is 55,300,000 cubic feet X percent of harvests on state owned forest for the region and species group.

⁷ Note that the state of Michigan DOES NOT plan a harvest level greater than growth. This number is a result of allocating the statewide harvest level to the regions. Additionally, this estimate does not take into account harvesting patterns due to stand type, species group or age class distribution which affect harvesting patterns.

⁸ Planned Harvest Level is based upon planned sales of 53,000 acres of timber with 13 cords per acre average. Additionally the 20 year average is 700,000 cords per year or 55.3 million cubic feet using 79 cubic feet per cord.

Table 4. Growth and removals of live trees on National Forests in the Upper Peninsula and Northern Lower Peninsula by region and species group (Source: FIA 2000-2004 to 2005-2009) ⁹

Region	Species group	Net volume of live trees on MI timberland (thousand ft ³)	Average annual net growth of live trees in national forests (thousand ft ³ /yr)	Growth to removals ratio	Removals to growth ratio	Species type percent of removals on each national forest	Planned allowable harvest		Allocated allowable harvest	Allocation of Planned Harvest/Net Growth
							MBF/year	thousand ft ³ /yr		
EUP = Hiawatha National Forest	Softwood	3,035,402	17,740	2.7	0.37	87.82%			15,057	0.85
	Hardwood	2,925,397	8701	9.7	0.10	12.18%			2,088	0.24
	Total	5,960,799	26,440	3.6	0.28	100.00%	108,516	17,146	17,146	0.65
WUP = Ottawa National Forest ¹⁰	Softwood	2,507,125	7,654	1.5	0.67	57.80%			8,228	1.07
	Hardwood	5,228,585	13,340	3.6	0.28	42.20%			6,008	0.45
	Total	7,735,710	20,995	2.4	0.42	100.00%	90,100	14,236	14,236	0.68
NLP = Huron-Manistee National Forests ¹¹	Softwood	3,521,995	17,435	14.9	0.07	39.89%			5,735	0.33
	Hardwood	7,790,898	19,509	11.1	0.09	60.11%			8,643	0.44
	Total	11,312,893	36,943	12.6	0.08	100.00%	91,000	14,378	14,378	0.39

⁹ The southern 1/3rd of Michigan is not included in this table since there are no State Forests in the region. The state land in the SLP is largely managed for recreation or wildlife habitat.

¹⁰ For the Ottawa National Forest, the planned allowable harvest is 90.1 million board feet/year for the first decade (2006-2015) of 2006 National Plan implementation and is 134.5 million board feet/year for the second decade.

¹¹ For the Huron-Manistee National Forests, the planned allowable harvest is 91 million board feet/year for the first decade (2006-2015) of 2006 National Plan implementation and is 100.2 million board feet/year for the second decade.

Table 5. Growth and removals of live trees in MI private forests by region and species group (Source: FIA 2000-2004 to 2005-2009)

Region	Species Group	Net volume of live trees in MI timberlands (thousand ft ³)	Average annual net growth of live trees in MI private forests (thousand ft ³ /yr)	Average annual removals of live trees in MI private forests (thousand ft ³ /yr)	Growth to removals ratio	Removals to growth to ratio	Percent of landowners willing to harvest based upon 2003 survey of MI NIPF owners ¹²
EUP	Softwood	3,035,402	31,777	14,154	2.2	0.5	
	Hardwood	2,925,397	34,073	38,830	0.9	1.1	
	Total	5,960,799	65,851	52,984	1.2	0.8	73.2 %
WUP	Softwood	2,507,125	30,398	14,735	2.1	0.5	
	Hardwood	5,228,585	58,358	63,644	0.9	1.1	
	Total	7,735,710	88,756	78,379	1.1	0.9	52.6%
NLP	Softwood	3,521,995	56,777	17,859	3.2	0.3	
	Hardwood	7,790,898	153,569	67,279	2.3	0.4	
	Total	11,312,893	210,346	85,139	2.5	0.4	49.6%
SLP	Softwood	432,113	10,831	511	21.2	0.0	
	Hardwood	5,545,791	157,931	38,716	4.1	0.2	
	Total	5,977,905	168,762	39,227	4.3	0.2	37.7%
Statewide	Softwood	9,496,635	129,784	47,259	2.7	0.4	
	Hardwood	21,490,671	403,931	208,470	1.9	0.5	
	Total	30,987,306	533,714	255,729	2.1	0.5	

¹² 46% in NE MI have harvested in the past 10 years and 36% plan to harvest in the next 10 years 35% are unsure about harvesting in the next 10 years (2010 survey). 41% in NE MI say they would be willing to produce and sell timber for converting it to alternative energy (2010 survey). In the short range these percentages could be influenced by changes in timber prices or procurement activity.

Table 6. Growth to removals ratio of all live trees in MI timberlands by region, species group and ownership (Source: FIA 2000-2004 to 2005-2009)

Region	Species group	Ownership							Current removals/ growth ratio
		Unknown	National Forest	Other Federal	State	Local (county, municipal, etc.)	Undifferentiated private	Total	
		Growth/Removals							
EUP	Softwood	0.1	2.7		2.8		2.2	2.4	0.42
	Hardwood	0.1	9.7		0.6		0.9	1	1.00
	Total	0.1	3.6		1.5		1.2	1.5	0.67
WUP	Softwood	0.1	1.5		4.9	0.3	2.1	1.9	0.53
	Hardwood	0.1	3.6		0.9	0.7	0.9	1	1.00
	Total	0.1	2.4		1.5	0.5	1.1	1.2	0.83
NLP	Softwood	0.1	14.9		2.2	3.7	3.2	2.9	0.34
	Hardwood	0	11.1		1.9	3.2	2.3	2.2	0.45
	Total	0	12.6		2	3.4	2.5	2.4	0.42
SLP	Softwood	0.1			9.4		21.2	6.2	0.16
	Hardwood	0.1			8.7		4.1	3.2	0.31
	Total	0.1			8.8		4.3	3.3	0.30
Statewide	Softwood	0.1	3.4		2.6	1.2	2.7	2.5	0.40
	Hardwood	0.1	6.5		1.7	3.2	1.9	1.9	0.53
	Total	0.1	4.4		2	2.4	2.1	2	0.50

Removals to growth ratio = average annual removals / average annual net growth

Appendix A. Definitions from USDA Forest Service Forest Inventory and Analysis

Average annual removals from growing stock.--

The average net growing-stock volume in growing-stock trees removed annually for roundwood forest products, in addition to the volume of logging residues, and the volume of other removals. Average annual removals of growing stock are the average for the years between inventories and are based on information obtained from remeasurement plots (see Survey Procedures in USDA Forest Service, Forest Inventory and Analysis User's Manual, 2010).

Average net annual growth of growing stock._

The annual change in cubic foot volume of sound wood in live sawtimber and poletimber trees, and the total volume of trees entering these classes through in- growth, less volume losses resulting from natural causes. Average net annual growing stock is the average of the years between inventories.

Growing-stock volume.-

Net volume in cubic feet of growing-stock trees 5.0 inches dbh. and over, from 1 foot above the ground to a minimum 4.0-inch top diameter outside bark of the central stem or to the point where the central stem breaks into limbs.

Net volume.-

Gross volume less deductions for rot, sweep, or other defect affecting use for timber products.

Live trees. -Growing-stock, rough, and rotten trees 1.0 inch dbh, and larger.

Volume Conversion Factors Used¹³:

1 Cord = 79 cubic feet
1 MBF = 158 cubic feet

¹³ Leatherberry, E.C. and J.S. Spencer. 1996. Michigan Forest Statistics, 1993. Resource Bulletin NC-170. St. Paul, MN: U.S. Dept. of Agriculture, Forest Service, North Central Forest Experiment Station.

Citations

1. Hiawatha National Forest Land and Resource Management Plan. 2006. Appendix A-1. United States Department of Agriculture, Forest Service. Escanaba, MI, 4p.
2. Huron-Manistee National Forests Land and Resource Management Plan. 2006. Appendix D-1. United States Department of Agriculture, Forest Service. Cadillac, MI, 23p.
3. Mueller, L. and K. Potter-Witter. 2010. Regional variation of non-industrial private forest owners in Michigan. Poster presented at the Society of American Foresters National convention held in Albuquerque, NM October 27-30, 2010.
<http://www.michiganforestbiofuels.org/sites/default/files/regional-variations-of-forest-owners.pdf>
4. Mueller, L. 2011. Nonindustrial private forest owners in Michigan: examination at a finer scale. MS Thesis, Michigan State University, East Lansing, MI, 61p.
5. Michigan State Forest Management Plan. 2008. Michigan Department of Natural Resources, Forest Management Division. Lansing, MI, 276p.
6. Ottawa National Forest Land and Resource Management Plan. 2006. Appendix E-1. United States Department of Agriculture, Forest Service. Ironwood, MI, 4p.
7. Potter-Witter, K., S. GC, and B. Kuipers. 2011. Assessment of Michigan non-industrial private forest owners' willingness to supply biomass for bioenergy. Poster presented at Poster presented at Agricultural and Natural Resources Week, March 8, Kellogg Center.
<http://www.michiganforestbiofuels.org/sites/default/files/NIPF%202010%20Poster.pdf>
8. USDA Forest Service, Forest Inventory and Analysis. Forest Inventory Data Online (FIDO)
<http://apps.fs.fed.us/fido/>
9. Woudenberg, Sharon W.; Conkling, Barbara L.; O'Connell, Barbara M.; LaPoint, Elizabeth B.; Turner, Jeffery A.; Waddell, Karen L.T 2010. The Forest Inventory and Analysis Database: Database description and users manual version 4.0 for Phase 2. Gen. Tech. Rep. RMRS-GTR- 245. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 336 p.

ⁱ Note that the state of Michigan DOES NOT plan a harvest level greater than growth. This number is a result of allocating the statewide harvest level to the regions.