FOREST MANAGEMENT PLAN
For the
PURDUE-MILLER MEMORIAL WOODLANDS

Prepared by Don Carlson-Purdue University Forester
DECEMBER 2003 (Updated 12-2006)

1. Legal Description and Location

The Purdue University Miller Woodland is located approximately 2 miles east of Upland, Indiana. More specifically, it is composed of 180.085 acres in four separate compartments located in Sections 1 and 2, T23N, R9E, of Jefferson Township in Grant County, IN.

To get to the property from the intersection of I-69 and SR 22, take SR 22 east nearly three miles to point where SR 22 turns south. At this point, continue going east onto CR 500 South for approximately two miles to the northern edge of compartments 1 and 2.

2. Physical Description

- Soils: (Glynwood-Blount-Pewano)
  Glynwood silty clay consists of deep, moderately well drained, slowly permeable soils with slopes ranging from 2-6%. These soils occupy the highest positions in the landscape and have few limitations. Site indexes (tree height at 50 years) are: Red, White, and Black oak- 80.

  Blount silty clay loams soils are deep and relatively poorly drained. Slopes range from 0-3%. Windthrow is a concern on these soils. Site indexes are: Red and White oak- 65.

  Pewano silty clay loam soils are deep, nearly level soils that occupy the lowest sites and drain poorly to the degree that water can accumulate during wet periods, especially in the spring. Due to the poor drainage, there will be equipment limitations and some windthrow potential. Site indexes are: Pin oak- 90, Red maple and white ash- 71, cottonwood- 98.

- Topography: The land is relatively flat with a few slightly rolling areas and some wet pockets. The maximum elevation change is roughly 30 feet.

- Acreage: The Miller Woodlands is divided into four, noncontiguous compartments. The total property contains 180 acres of which approximately 155 is established natural hardwood forest while the majority of the remaining 25 acres are old agricultural fields which were mostly planted to trees in 1991 or 2003.

MILLER PURDUE WOODLANDS

COMPARTMENT	TOTAL ACRES	NATURAL HARDWOODS ACRES	TREE PLANTING ACRES (PLANTING YEAR)	OTHER ACRES
1	45.5	36.9	8.6 (2000 & 2003)	0
2	51.5	38.3	9.5 (1991)	3.7*
3	33.0	30.5	0	2.5
4	50.1	47.1	0	3***

*This area is in heavy grass / perennial weed cover. A portion of the area contains a functioning underground field tile that drains the agricultural field to the south.
**This is a 100 foot wide strip running along the west edge of the SE ¼, SE ¼, of Sec. 2 providing access from the road to the southwest corner of Compartment 3.
***This area was last farmed in 2002. In 2003 the area was planted to red oak and wildlife shrubs. The red oak planting failed leaving the field available for a future planting / research project. It was replanted to a demonstration tree planting with deer fence in the spring of 2006. See Installation of Research Plots below.

- Property lines: The property is bounded on the north by CR 500 South and on the south by CR 600 South. A railroad track forms the south boundary of Compartment 1 and the north boundary of Compartments 3 and 4. The western edge of Compartment 2 is CR 1150 East. The remaining property lines are bordered by agricultural lands. See attached map.

3. Forest Description

- Stand Characteristics: The majority of the forest has an even aged history and composition. Throughout much of the minimally disturbed forest, there is only a limited subcanopy as a result of heavy shade from the dominant trees and past fires and grazing which have killed many of the original shade tolerant species. The areas that have been disturbed through individual tree selection have begun to develop a more uneven age structure. Finally, the areas heavily harvested in the 1970-80s, have regenerated with pockets of even age stands of 3-8 inch diameter at breast height (dbh) trees, except in the excessively wet areas. These wet areas are intermixed with very dense, excessive moisture tolerant grass and forb species with an under stocking of trees.
  The 1991 tree planting of 10 acres in Compartment 2 has developed a closed canopy over much of the stand and has already undergone a light thinning to release the crowns of higher quality individuals. The understory is herbaceous at this time.
  The 2000 & 2003 tree plantings of approximately 8 acres in Compartment 1 appear to be well established but have roughly 5-7 years before canopy closure occurs.

- Species Composition: The minimally disturbed areas of Compartments 1, 2, and 4 have primarily an oak overstory with a sugar maple / elm understory. The oak is very heavy to white oak with a lesser amount of bur, swamp white, and red with a few shumard, pin, and chinkapin. As disturbance increases, mainly from past harvesting, the large diameter oak

component has been reduced and replaced with sugar maple and elm with a mixture of other species including ash, silver maple, cherry, basswood, red oak, hickory, and ironwood. Very little if any oak besides red oak are naturally regenerating.

Compartment 3 was heavily cut in 1977 using single tree selection. This cutting resulted in the present overstory mix of hickory, sugar maple, ash, and oak (red, white, bur, pin, and shingle). The understory contains primarily sugar maple and elm.

The 1991 tree planting in Compartment 2 contains a mix of oak including white, red, bur, swamp white, and swamp chestnut. A few cottonwoods have volunteered in the planting.

The 2000 / 2003 tree planting on the north end of Compartment 1 contains a nice mix of red, white, and bur oak with walnut and cherry mixed in. Some ash and dogwood are regenerating naturally.

- General Size Classes: The overstory trees of the areas not heavily cut in the 70's are in the large saw timber size class ranging from 20"-40" dbh. In these relatively undisturbed stands, there is little if any other size class besides the 1-10" sugar maple and elm..

  The areas that were cut during the 1970's, are missing many of the large diameter oaks but still contain saw log size trees in the overstory ranging from 8-30" dbh. Several areas where the entire overstory was removed in 1977, have regenerated to an even-age stand of 6-10" trees, mainly elm, soft maple, ash, sugar maple, cherry, and a few walnut, hickory, and red oak.

  In 1981 and 1987, a regeneration study was conducted on the southern half of Compartment 2. In this study a 1.78 acre area in the southwest corner was clearcut in 1981. In 1987, the adjacent 1.78 acre area to the east of the 1981 clearcut was clearcut. Both of these clearcut areas contain 3-8" dbh trees, including a nice mix of red oak, ash, hickory, cherry, elm, and sugar maple. Also in 1987, the six acre area to the west of the clearcuts was harvested to create a shelterwood. The understory at that time was controlled and some oaks were planted. Now, the area contains a broken overstory of 24-30" dbh trees and an understory of 2-8" dbh maple, basswood, elm, cherry, red oak, and hickory.

  Compartment 1 was cut in 1991. This cut selectively removed some of the mature overstory trees throughout the northern 3/4th of the stand. The southern ¼ was clearcut in an effort to naturally regenerate the stand, hopefully to oak. However, much of this area is poorly drained. Therefore, in areas where the regeneration was successful, there are multiple 1-4" dbh trees with scattered culls that were not deadened following the harvest. The remaining areas have scattered regeneration with few new trees greater than 1" dbh

- Stocking: To keep the crop trees vigorously growing while maintaining quality, the BA should remain between 70-110.
  Compartment 1 has an overall stocking of 78.6 square feet of basal area (BA). However, since the 1991 harvest created a significant clearcut area with minimal BA, the remaining stand has a stocking closer to 90 BA.
  Compartment 2 has the highest BA of all the compartments at 142.4 BA. This is an extremely high stocking for an oak dominated forest. In order for the present trees to

continue to grow, others will need to be removed via natural mortality or management in the form of a timber harvest or tsi. Mortality and declining health of many of the mature trees is already evident, especially with the red oak group.
Compartment 3 is now approaching its maximum preferred stocking level at 96.3 BA.
Compartment 4 can be essentially divided into two stands. The northern approximately 10 acres (north of the access road that transects the compartment) shows little sign of past harvesting and is well over stocked with large, over mature trees. This area has experienced increased mortality in the last several years. South of the access road, the forest has undergone several harvests between 1956-77. Here, the forest is vigorously growing with a stocking in the range of 85-95 BA.

- Inventory Data: The analysis of the 2001 CFI data is summarized by the attached Appendices B1-B4.

4. Unique Features

- Physical: There are two legal easements for accessing Compartments 4 and 3. Each easement is 20 feet wide. The first runs along the gravel access lane connecting 1150 E. to Comp. 4. The second connects the northeast corner of Compartment 3 to the lane bisecting Compartment 4. Compartment 3 also contains a 100' wide strip of land (not an easement) connecting 600 S. to the southwest corner of Compartment 3.

  There is an old pipeline that ran through the property years ago. It has been determined that the pipeline is no longer actively used and can be disregarded.
  In Compartment 2, between the existing natural forest and the 9.5 acre tree planting is an underground tile that drains the crop field to the south of the compartment. The tile is broken in several places as evidenced by large holes in the old field on Purdue's property.
- Biological: The northern portion of Compartment 4 has not been disturbed by human activity for many years. It is a forest undergoing transition as the over mature trees continue to decline and younger trees take their place.
  All things considered, this forest provides good wildlife habitat for a variety of species, none of which are known to be endangered or threatened.
- Cultural: none

5. History

- Acquisition Date: 1938
- Fire: It is noted that Compartment 2 burned over in the spring of 1942 while Compartment 1 burned on March 29, 1945. No other fires have been noted since that time. Compartments 1, 2, and the northern portion of 4 show evidence of past fire. Numerous trees in these areas, especially sugar maple, red oak, and some ash, are hollow to some extent probably due in part to fire and/or grazing. Most of the white and bur oak appear to be undamaged by the fires. Many of the old white oak stumps in Compartment 1 and 2 show little fire damage.
- Grazing: The majority of the forest land was probably grazed until the early to mid 1930s'. When Purdue University acquired possession of the land in 1938, all cattle were excluded
- Inventory: Several inventories have been completed as listed: 1949 (20% inventory), 1957 (100% of 6.5"+ trees, Compartment 1), 1961 (variable plot, all Compartments), 1975 (permanent 1/5 acre CFI plots installed), 1979 (100 % of 14"+ trees, Compartment 4), 1986 and 2001 (CFI plots remeasured).

- Installation of Research Plots: In 1981, Compartment 2 was divided into 11 blocks (60 X 120 meters, approximately 1.78 acres) to examine regeneration responses to various cultural treatments. Block 1 in the southwest corner of the woods was clearcut in 1981. In 1986, crop trees were selected on a 5 X 5 meter grid in 12 subplots. Crop trees were then subjected to one of four crop tree release treatments. Note: This 1.78 acre area looks great with a nice mix of species and has recently been thinned.

  In 1987, Block 2 was clearcut to duplicate the 1981 study. Also, Blocks 3, 4, and 5 were shelterwood cut to examine the effects of subcanopy treatments on natural and planted oak regeneration. Note: Today there is very little oak regeneration in this area due to intense shading by larger sugar maple, basswood, and elm trees that were more competitive in the understory.

  In 1939, 1-1.5 acre blocks were cleared in Compartments 2 and 3 and were planted to various strains of Asiatic chestnut. Regrettably, the Compartment 2 plot burned in 1942 and the trees were lost. Note: This area now is nicely stocked with 10-18" dbh red oak with a mix of equal size cherry, walnut, hickory, and sugar maple. The plot in Compartment 3 also failed with the last chestnut tree dying in 1978.

  In the spring of 2006, demonstration tree plantings were established on Compartments 2 and 4 as part of educational outreach efforts. The plantings were established in the agriculture field on the west side of Compartment 4 and in a natural regeneration opening in Compartment 2. Each planting is intended to demonstrate the effects of deer on plantation establishment and natural regeneration by excluding the deer from ½ of each planting using 7 ½ foot deer fence. In addition, each planting is composed of rows containing proportional numbers of white and red oak, yellow poplar, and black walnut. To add potential value to the demonstration, two stock types of black walnut were planted. The two types are standard Vallonia State Tree Nursery stock (includes ~10% stock from DNR select seed orchards) and HTIRC select walnuts. Every other row contains only Vallonia stock while the opposite rows contain only HTIRC select stock.

- Harvests: The Purdue-Miller Woodlands has a long history of sustainable timber harvests. To summarize, since Purdue University acquired ownership in 1938, a total of at least 13 timber harvests have been completed yielding over 808,000 board feet. A timber harvest history table (Appendix A) is attached to provide a break down of harvests by compartments.

  As far as can be determined from harvest records and the present condition of the woodlands, most of the harvests have been conducted on an individual tree or small group selection basis. However, several regeneration cuts have been made since 1977. In 1977, two strips were cleared in the southern portion of Compartment 4 north of the drainage ditch. Each strip was approximately 2 chains wide and 10 chains long (a chain is 66 feet). The strips were completed (everything greater than 1" dbh was cut) following the harvest. Today the strips contain 4-14" dbh trees, mainly soft maple and elm with scattered other species. Compartment 2 has two adjacent areas of 1.78 acres each that were clearcut in 1981 or 1987. This area now contains an excellent mix of high quality 3-8" dbh trees. Also in 1987, the 6 acres adjacent to the clearcuts were harvested to create a shelterwood. Finally, the south end of Compartment 1 was clearcut in 1991. This area has regenerated

poorly due to poorly drained soils, heavy herbaceous competition and a lack of thorough post-harvest tsi.

On December 16, 2003, the 14th timber harvest was initiated by the sale of 71 trees containing 24,715 BF in Compartment 1 and 167 trees containing 50,511 BF in Compartment 2. This harvest created several small openings in both compartments along with removing scattered individual crop trees where needed. In order to maintain a diversity of stand structure, species composition, and its aesthetic appeal to the community, large areas in each compartment were not be affected by this harvest that was completed in 2004.

- Specific Management Activities: The details of past management become more clearly defined in recent years compared to the early years of Purdue's 45 years of management. Early accounts seem to be vague or not present at all. Below is a list of recorded management (not including timber harvests or research projects) since 1938. Other management has undoubtedly been completed which was not recorded or records have not been found to date.
  - 1955- 2000 white pine and 2000 red oak seedlings were planted in Compartments 2 & 4.
  - 1961- Some tsi took place following the 1959 timber sale.
  - 1977- Post-harvest tsi in the clearcut strips.
  - 1978- 50 black walnuts planted in opening in Compartment 3.
  - 1981- 68 black walnuts planted in Compartment 2 in an opening by the county road.
  - 1987- Limited post-harvest tsi completed in Compartment 2.
  - 1991- 10 acre tree planting established on west side of Compartment 2.
  - 1992- Limited post-harvest tsi completed in Compartment 1.
  - 2000-3- Eight acre tree planting established on north side of Compartment 1.
  - 2001- Grape vines controlled on all compartments.
  - 2003- First thinning of 1991 tree planting in Compartment 2.
  - 2003- Crop tree release in 1981-6 clearcut area in Compartment 2.
  - 2006- Post harvest timber stand improvement completed on Compartments 1 & 2.
  - 2006- Demonstration tree plantings established on Compartments 2 and 4.

6. Forest Management Concerns

Purdue University's long ownership history brings with it a big responsibility to demonstrate sound management that is conscientious to the concerns of the local community. An important concern would be to maintain a visible management presence while not detracting from the forest's aesthetic appeal.

7. Management Objectives

The major goals for this forest are to determine appropriate management strategies to maintain the long history of sustainable timber harvesting while improving the quality and health of the forest and providing the opportunity for quality, natural regeneration (especially white oak) to occur. In addition, providing the opportunity for forest and wildlife research must remain a high priority. Finally, the Miller-Purdue Woodlands needs more programs to demonstrate good stewardship to forestry professionals and the public.

8. Implementation Plan

In order to meet the long term goals while addressing the concerns will require a commitment to the implementation of this management plan.

Timber in Compartments 1 & 2 were sold in December 2003 and harvested in 2004. Post-harvest TSI was completed in 2006. There is significant acreage in both compartments that was not harvested to allow additional research and demonstration opportunities. Other areas were lightly cut while some isolated locations were regenerated. Opportunities exist for using prescribed fire to manage both the wildlife habitat and the regeneration of the forest.

Compartment 3 and the southern half of Compartment 4 are in need of timber stand improvement to release crop trees from excessive competition.

The timber in the north portion of Compartment 4 is degrading due to over maturity and wet soil conditions. It could use a timber harvest. However, the harvest should be implemented with the stand's over mature status and lack of quality, advanced regeneration in mind.

The southern portion of Compartment 4 should be allowed to grow for at least another 12 years before another harvest. The small area adjacent to the road and south of the ditch is highly visible and could be reasonably left to grow naturally with limited harvesting taking place.

Compartment 3 can be harvested in 5-7 years while Compartments 1 & 2 can be harvested again in 10-12 years or when deemed necessary for research purposes.

The 1991 and 2000-3 tree plantings should be maintained in a productive and effective fashion. Canada thistle, prevalent in the younger tree planting and old field area of Compartment 2, must be controlled.

Realizing the value of this forest for its research potential, re-measuring the CFI plots should be a priority. All of the CFI plots need to be re-measured by 2011 with a follow-up analysis of the data. The woodlands management forester, Don Carlson, should see to the completion of the data inventory and its analysis. Following this inventory, additional re-measurements and analysis should occur every five-ten years.

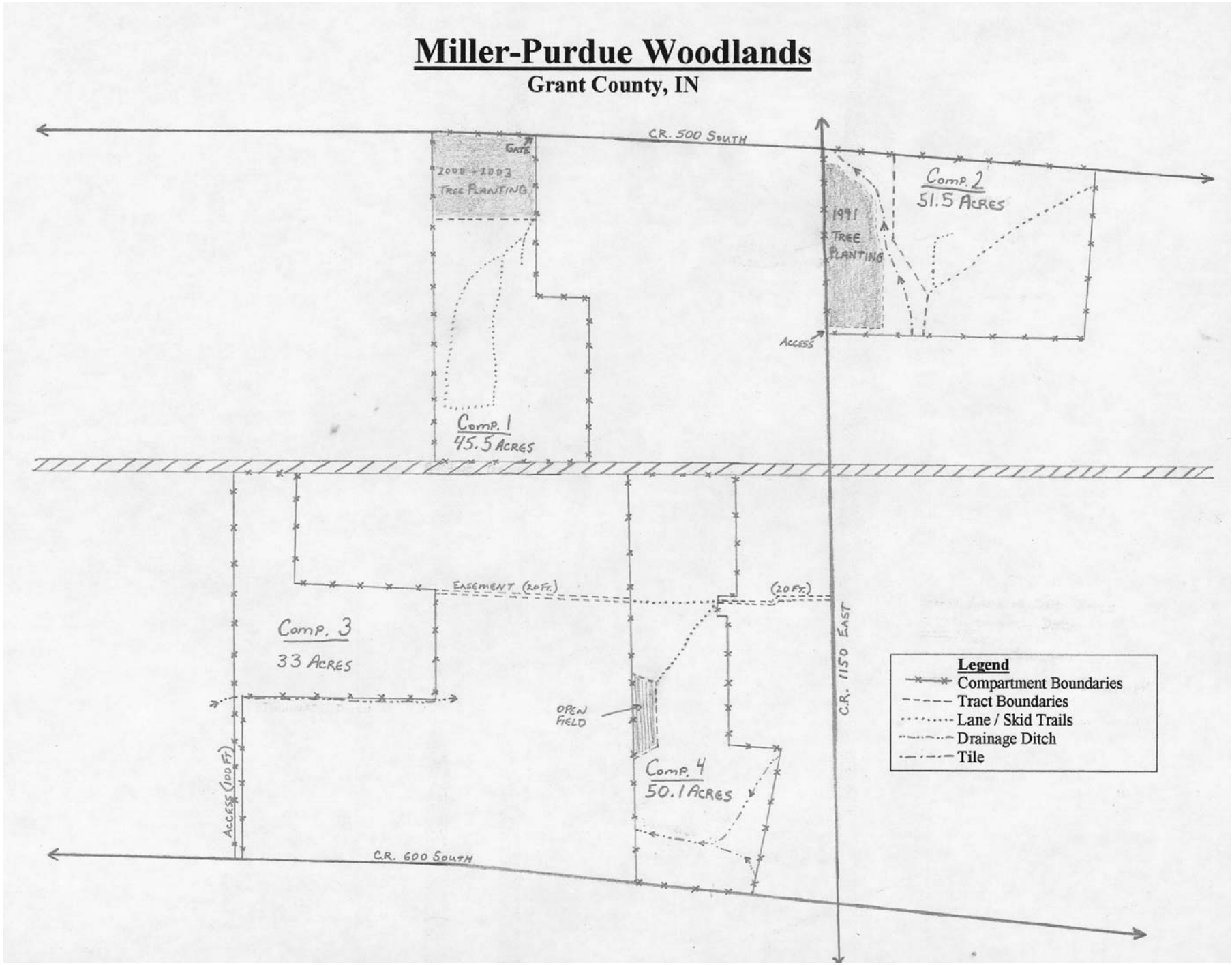
Finally, efforts should be made to improve the forest's accessibility and use for management / demonstration purposes. 1) Access roads and/or skid yards should be maintained to allow vehicles to park and turn around. 2) Gates or cables should be installed to control unwanted access. 3) Plans should be made to establish small, managed, wildlife areas / wetlands in the drainage ways west of the natural woods in Compartment 2 and in the drainage within the 2000-3 planting of Compartment 1. 4) As timber harvests are completed, some skid trails should be maintained through periodic clearing and mowing to allow easy access.

9. Summary

Year	Task to be completed
2007	Complete tsi on Compartments 3-4. Improve accessibility and parking. Install gates or cables as needed. Create plans for managed wildlife / wetland areas in Compartments 1 & 4 Establish harvest plan for the north part of Compartment 4.
2010-11	Remeasure CFI plots.
2008-2010	Conduct timber sale on Compartment 3.
2011-2014	Conduct timber sale on Compartments 1 & 2. Date can be adjusted as needed.

Miller-Purdue Woodlands

Grant County, IN



Purdue-Miller Memorial Woodlands Timber Harvest Records

December 3, 2003

Year	Compartment	Type of Harvest	Board Feet (Doyle)	Income Generated
1939	2	-	5200	?
1939	3	-	13,500	?
1946	1	Salvage (fire killed trees)	9600	?
1955	4a,b	Farm use	6,800	0
1956	4a,b	Farm use	7,410	0
1959	4b	-	14,600	?
1959	4b	-	5,900	?
1959-60	1	Individual tree selection	27,236	?
1971	1-4	Walnut Sale	8,849 (Comp 1) 5,008 (Comp 2 6,540 (Comp 3) 16,084 (Comp 4)	91,900
1976	1	Individual tree selection	163,120	37,398
1976	4	Clearcut Strips	50,398	7,567
1977	3 and 4c	Individual tree selection	143,000 (Comp 3) 64,484 (Comp 4c)	86,136
1979	4b	Farm use	6,435	0
1981	2	Clearcut	107,645	10,800
1987	2	Clearcut / shelterwood	49,900	8,243
1992	1	Individual tree selection	101,370	27,660
2003	1 & 2	Individual tree selection and group openings	24,715 (Comp. 1) 50,511 (Comp. 2)	Sale on Dec. 16, 2003

SUMMARY AND ANALYSIS OF *FOREST INVENTORY 2000*
SUMMING ALL TREES

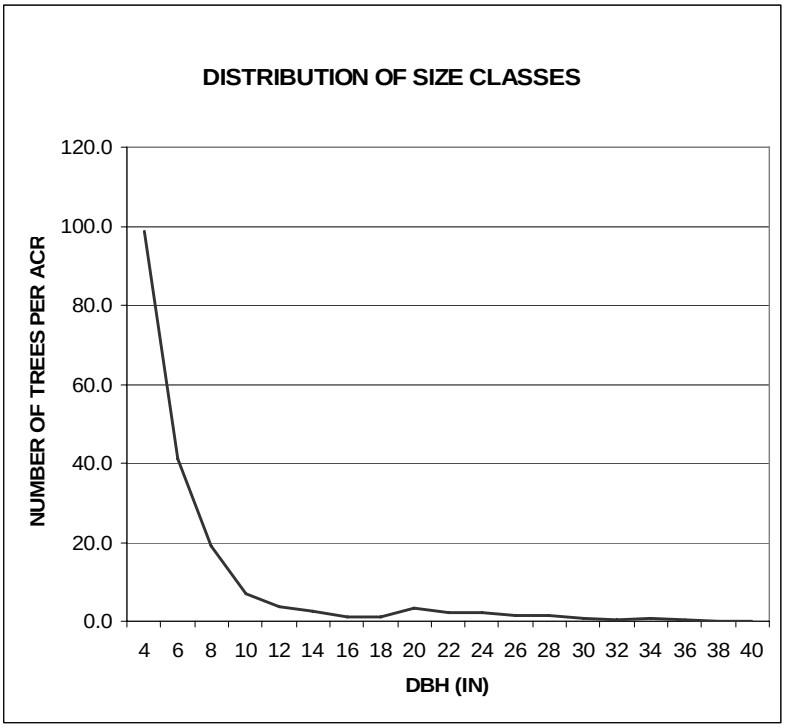
OWNER: Purdue University
TRACT: Miller- Comp. 1
ACRES: 35.30

DATE: June 2001
FORESTER: Don Carlson

This inventory was accomplished by measuring all trees greater than 3" within 1/5 acre plots over 16 sample points.
All figures for volume are in board-feet (bd-ft) Doyle, all figures for basal area (BA) are in feet^2, and all figures for diameter at breast height (dbh) are in inches.

SUMMARY BY SIZE CLASS

DBH	VOL. PER ACRE	TREES PER ACRE	BASAL AREA / ACRE
4		98.8	8.6
6		41.3	8.1
8		19.1	6.7
10		6.9	3.7
12	9	3.8	2.9
14	79	2.5	2.7
16	88	0.9	1.3
18	170	0.9	1.7
20	779	3.1	6.8
22	797	2.2	5.8
24	947	2.2	6.9
26	867	1.6	5.8
28	954	1.6	6.7
30	561	0.6	3.1
32	334	0.3	1.7
34	665	0.6	3.9
36	323	0.3	2.2
38			
40			
TOTAL	6575	186.6	78.6



SUMMARY BY SPECIES

SPECIES	VOL. PER ACRE	PCT. OF PER ACRE VOL.	TREES PER ACRE	PCT. OF PER ACRE TREES	BASAL AREA/ ACRE	PCT. OF PER ACRE BA	AVG. DBH		**TOTAL STAND VOLUME**
White Oak	5313	80.8%	12.8	6.9%	38.7	49.3%	23.5		187,553
Bur / Swamp White Oak	1104	16.8%	2.2	1.2%	7.0	9.0%	24.3		38,962
Black Walnut	70	1.1%	0.3	0.2%	0.7	0.9%	20.0		2,482
Hickory	43	0.7%	6.9	3.7%	3.7	4.7%	9.9		1,533
Red / Shumard Oak	29	0.4%	6.9	3.7%	1.5	1.8%	6.2		1,037
Sugar Maple	15	0.2%	75.0	40.2%	13.8	17.6%	5.8		530
Micellaneous			66.3	35.5%	10.3	13.0%	5.3		-
Ash			10.0	5.4%	1.6	2.0%	5.4		-
Red Maple			0.3	0.2%	0.2	0.3%	12.0		-
Black Cherry			5.9	3.2%	1.1	1.4%	5.9		-
PER ACRE TOTALS	6575	100.0%	186.6	100.0%	78.6	100.0%	8.8		**232,098**

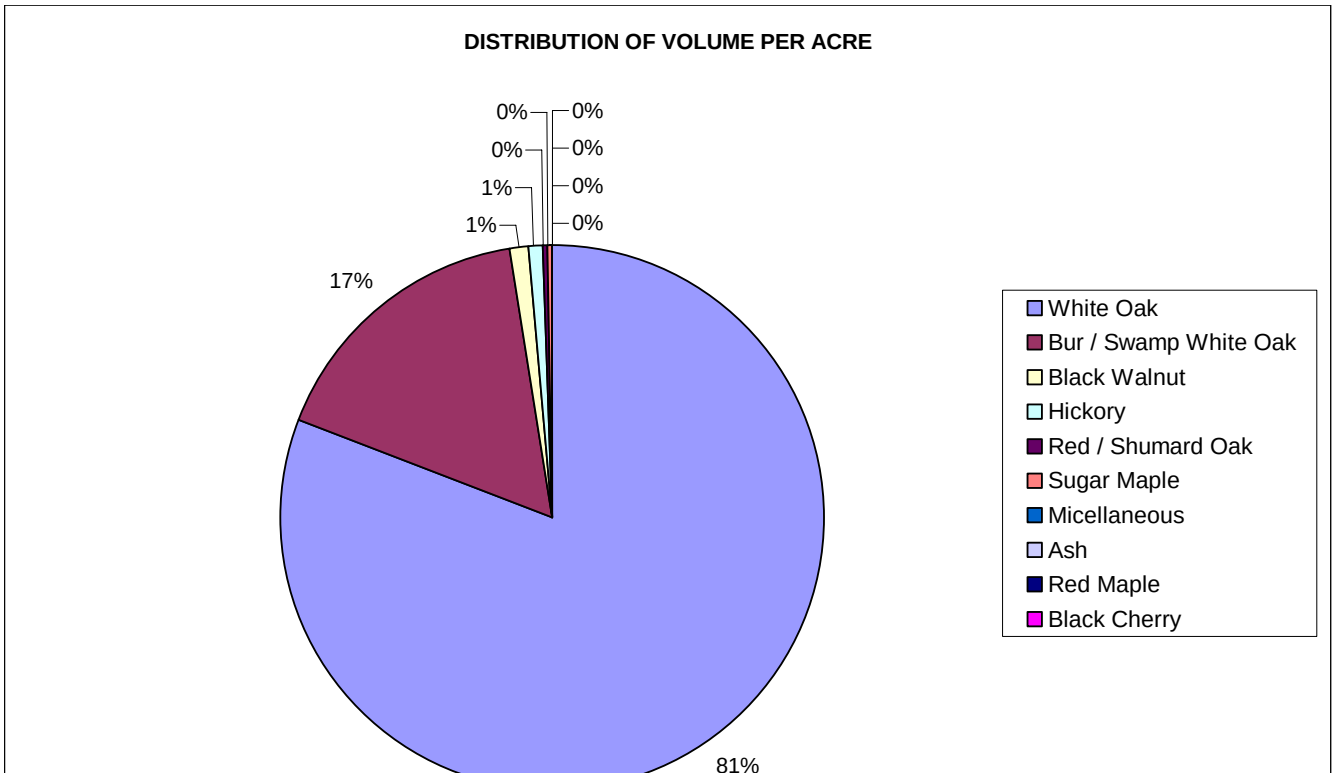
acre

OWNER: Purdue University
TRACT: Miller- Comp. 1
ACRES: 35.30

DATE: June 2001
FORESTER: Don Carlson

SUMMARY OF VOLUME PER ACRE BY SPECIES AND SIZE CLASS

DBH	*** SPECIES LISTING ***										VOL. PER ACRE
	White Oak	Bur / Swamp White Oak	Black Walnut	Hickory	Red / Shumard Oak	Sugar Maple	Micellaneous	Ash	Red Maple	Black Cherry	
12				9							9
14	15	15		34		15					79
16	59				29						88
18	170										170
20	627	82	70								779
22	797										797
24	947										947
26	699	168									867
28	782	172									954
30	281	281									561
32	334										334
34	279	386									665
36	323										323
38											
40											
VOL./ACRE	5313	1104	70	43	29	15					6575



SUMMARY AND ANALYSIS OF *FOREST INVENTORY 2000*
SUMMING ALL TREES

OWNER: Purdue University
TRACT: Miller- Comp. 2
ACRES: 32.88

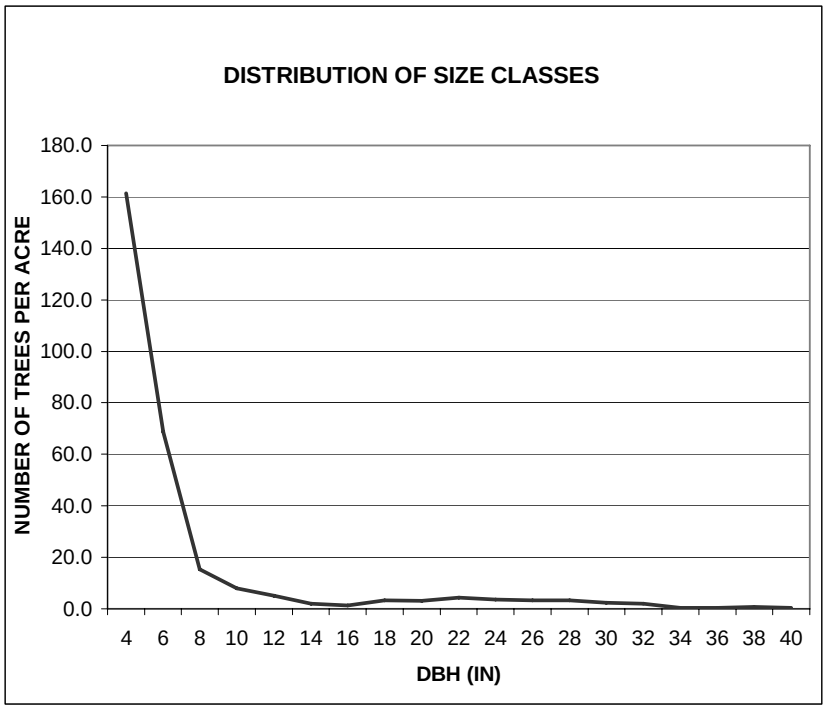
DATE: June 2001
FORESTER: Don Carlson

This inventory was accomplished by measuring all trees greater than 3" within 1/5 acre plots over 15 sample points.

All figures for volume are in board-feet (bd-ft) Doyle, all figures for basal area (BA) are in feet^2, and all figures for diameter at breast height (dbh) are in inches.

SUMMARY BY SIZE CLASS

DBH	VOL. PER ACRE	TREES PER ACRE	BASAL AREA / ACRE
4		161.3	14.1
6		68.7	13.5
8		15.3	5.4
10		8.0	4.4
12	29	5.0	3.9
14	32	2.0	2.1
16	140	1.3	1.9
18	607	3.3	5.9
20	668	3.0	6.5
22	1486	4.3	11.4
24	1557	3.7	11.5
26	1604	3.3	12.3
28	2030	3.3	14.3
30	1568	2.3	11.5
32	972	2.0	11.2
34	355	0.3	2.1
36	194	0.3	2.4
38	608	0.7	5.3
40	345	0.3	2.9
TOTAL	12194	288.7	142.4



SUMMARY BY SPECIES

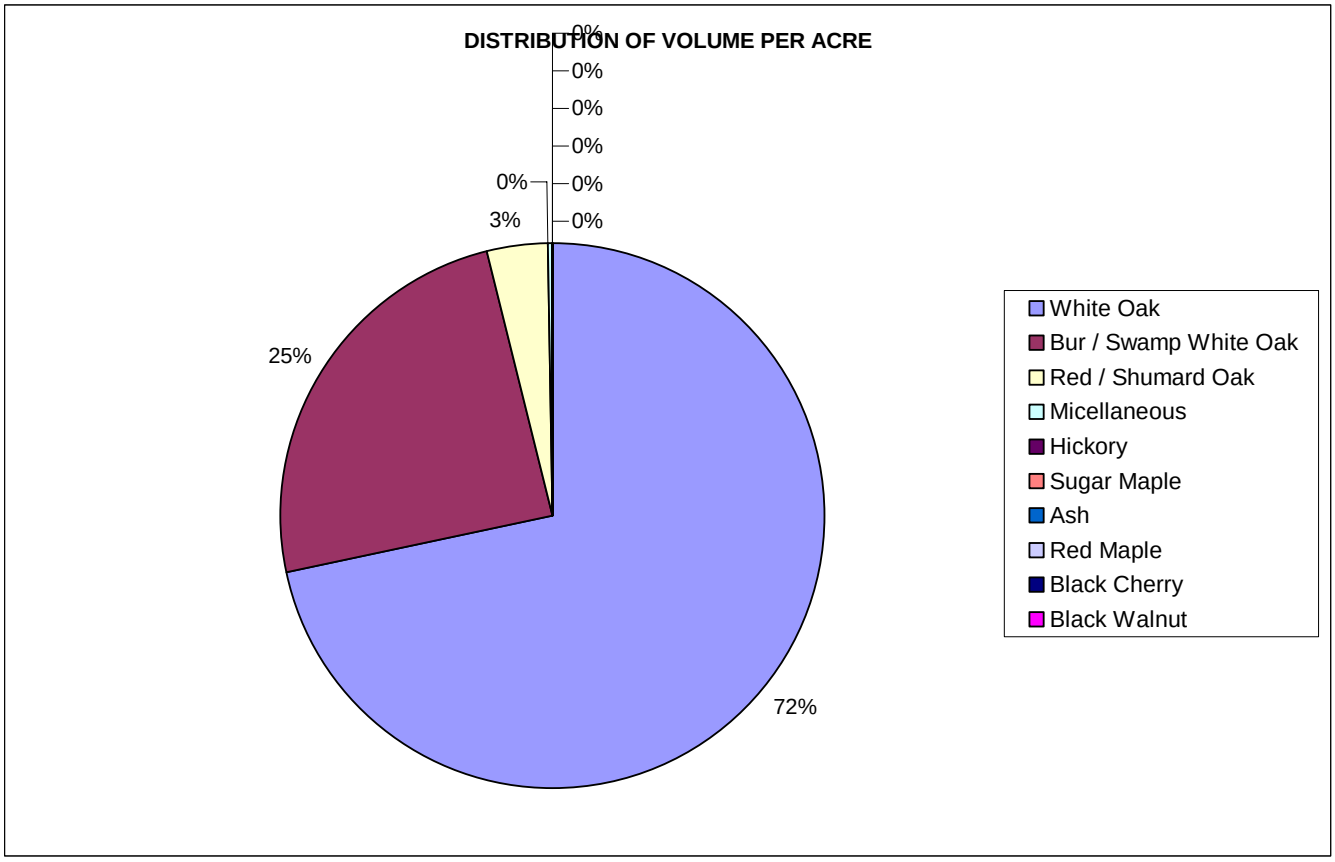
SPECIES	VOL. PER ACRE	PCT. OF PER ACRE VOL.	TREES PER ACRE	PCT. OF PER ACRE TREES	BASAL AREA/ ACRE	PCT. OF PER ACRE BA	AVG. DBH		**TOTAL STAND VOLUME**
White Oak	8736	71.6%	21.7	7.5%	66.9	47.0%	23.8		287,251
Bur / Swamp White Oak	2990	24.5%	6.3	2.2%	26.8	18.8%	27.8		98,322
Red / Shumard Oak	426	3.5%	14.3	5.0%	7.5	5.3%	9.8		14,007
Micellaneous	26	0.2%	111.7	38.7%	17.3	12.2%	5.3		844
Hickory	16	0.1%	26.0	9.0%	7.9	5.5%	7.4		526
Sugar Maple			43.7	15.1%	6.0	4.2%	5.0		-
Ash			29.0	10.0%	4.5	3.2%	5.4		-
Red Maple			5.7	2.0%	0.8	0.6%	5.1		-
Black Cherry			29.0	10.0%	4.0	2.8%	5.0		-
Black Walnut			1.3	0.5%	0.6	0.4%	9.1		-
PER ACRE TOTALS	12194	100.0%	288.7	100.0%	142.4	100.0%	9.5		**400,950**

OWNER: Purdue University
TRACT: Miller- Comp. 2
ACRES: 32.88

DATE: June 2001
FORESTER: Don Carlson

SUMMARY OF VOLUME PER ACRE BY SPECIES AND SIZE CLASS

DBH	*** SPECIES LISTING ***										VOL. PER ACRE
	White Oak	Bur / Swamp White Oak	Red / Shumard Oak	Micellaneous	Hickory	Sugar Maple	Ash	Red Maple	Black Cherry	Black Walnut	
12			19	10							29
14				16	16						32
16	70		70								140
18	489	118									607
20	668										668
22	1273	213									1486
24	1485	72									1557
26	1298	153	153								1604
28	1518	328	184								2030
30	1130	439									1568
32	147	825									972
34	355										355
36		194									194
38	304	304									608
40		345									345
VOL./ACRE	8736	2990	426	26	16						12194



SUMMARY AND ANALYSIS OF *FOREST INVENTORY 2000*
SUMMING ALL TREES

OWNER: Purdue University
TRACT: Miller- Comp. 3
ACRES: 21.00

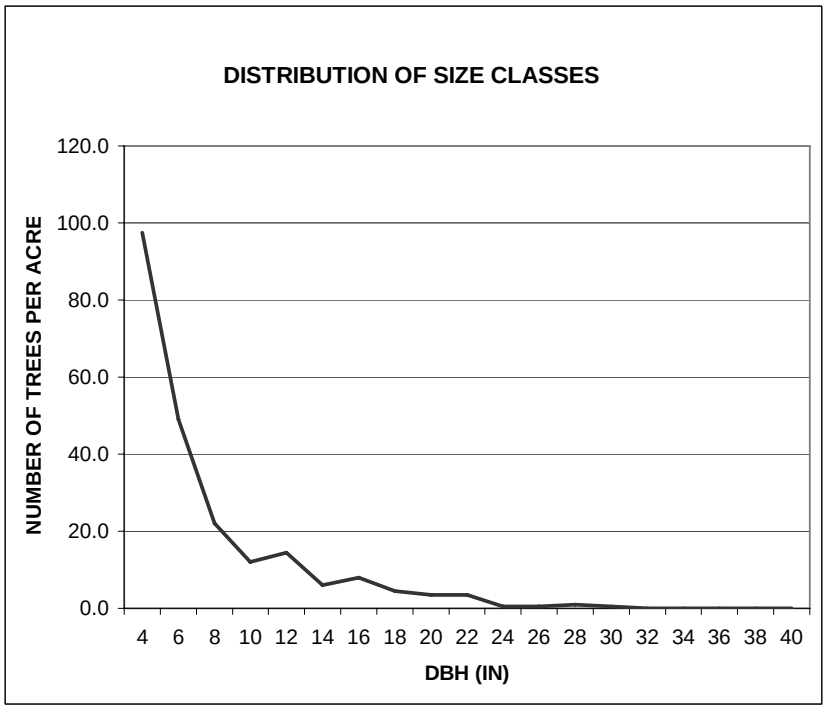
DATE: June 2001
FORESTER: Don Carlson

This inventory was accomplished by measuring all trees greater than 3" within 1/5 acre plots over 10 sample points.

All figures for volume are in board-feet (bd-ft) Doyle, all figures for basal area (BA) are in feet^2, and all figures for diameter at breast height (dbh) are in inches.

SUMMARY BY SIZE CLASS

DBH	VOL. PER ACRE	TREES PER ACRE	BASAL AREA / ACRE
4		97.5	8.5
6		49.0	9.6
8		22.0	7.7
10		12.0	6.5
12	44	14.5	11.4
14	96	6.0	6.4
16	586	8.0	11.2
18	774	4.5	8.0
20	554	3.5	7.6
22	1039	3.5	9.2
24	147	0.5	1.6
26	230	0.5	1.8
28	551	1.0	4.3
30	329	0.5	2.5
32			
34			
36			
38			
40			
TOTAL	4348	223.0	96.3



SUMMARY BY SPECIES

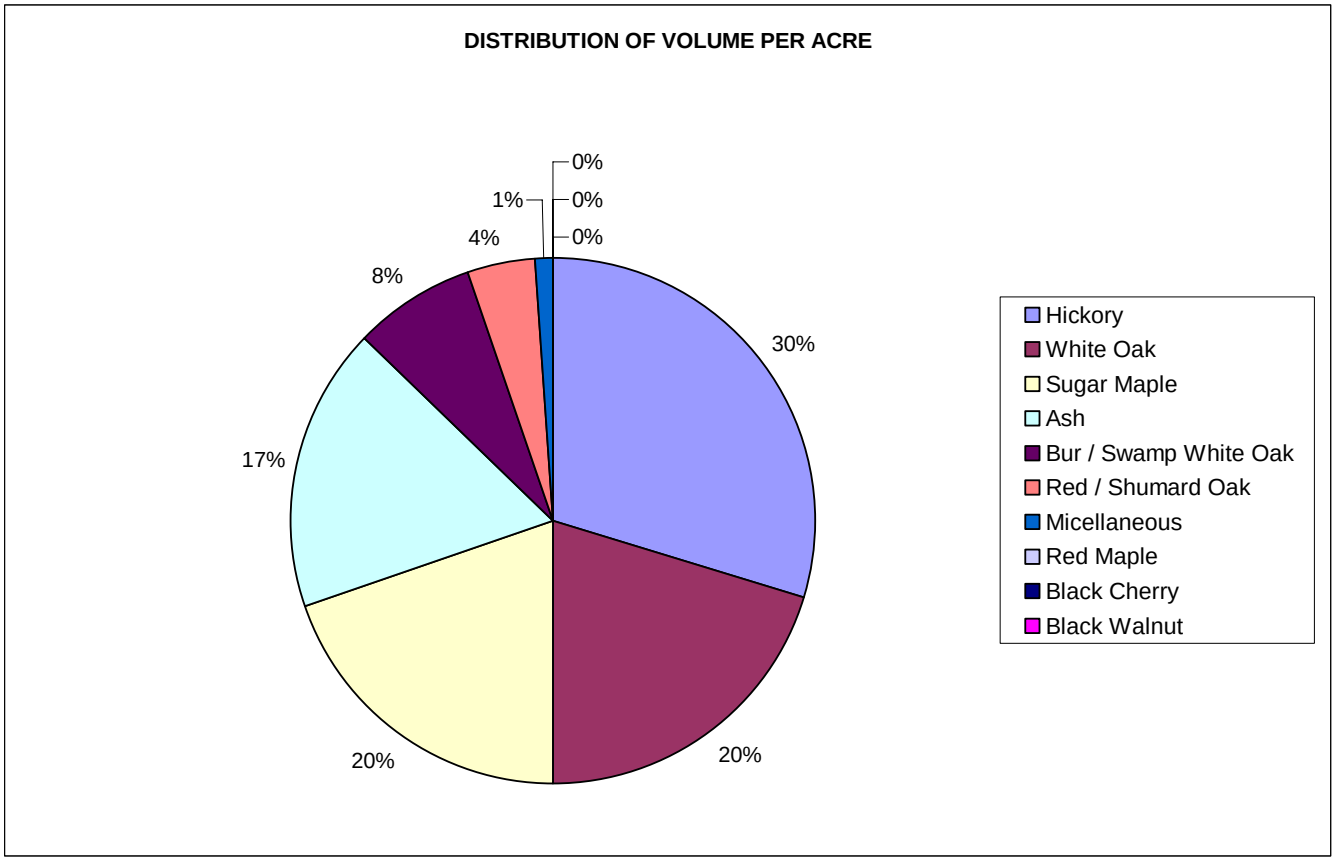
SPECIES	VOL. PER ACRE	PCT. OF PER ACRE VOL.	TREES PER ACRE	PCT. OF PER ACRE TREES	BASAL AREA/ ACRE	PCT. OF PER ACRE BA	AVG. DBH		**TOTAL STAND VOLUME**
Hickory	1295	29.8%	13.0	5.8%	16.4	17.1%	15.2		27,195
White Oak	878	20.2%	2.5	1.1%	7.1	7.4%	22.8		18,428
Sugar Maple	865	19.9%	66.5	29.8%	27.0	28.1%	8.6		18,155
Ash	757	17.4%	28.0	12.6%	18.0	18.7%	10.9		15,887
Bur / Swamp White Oak	329	7.6%	0.5	0.2%	2.5	2.5%	30.0		6,909
Red / Shumard Oak	178	4.1%	8.5	3.8%	4.9	5.0%	10.2		3,738
Micellaneous	47	1.1%	94.5	42.4%	17.1	17.7%	5.8		987
Red Maple			5.5	2.5%	2.3	2.4%	8.8		-
Black Cherry			3.5	1.6%	0.7	0.7%	5.9		-
Black Walnut			0.5	0.2%	0.4	0.4%	12.0		-
PER ACRE TOTALS	4348	100.0%	223.0	100.0%	96.3	100.0%	8.9		**91,298**

OWNER: Purdue University
TRACT: Miller- Comp. 3
ACRES: 21.00

DATE: June 2001
FORESTER: Don Carlson

SUMMARY OF VOLUME PER ACRE BY SPECIES AND SIZE CLASS

DBH	*** SPECIES LISTING ***										VOL. PER ACRE
	Hickory	White Oak	Sugar Maple	Ash	Bur / Swamp White Oak	Red / Shumard Oak	Micellaneous	Red Maple	Black Cherry	Black Walnut	
12	15		29								44
14			72	24							96
16	149		271	36		83	47				586
18	420		259			95					774
20	221	131		203							554
22	492	196	87	265							1039
24			147								147
26				230							230
28		551									551
30					329						329
32											
34											
36											
38											
40											
VOL./ACRE	1295	878	865	757	329	178	47				4348



SUMMARY AND ANALYSIS OF *FOREST INVENTORY 2000*
SUMMING ALL TREES

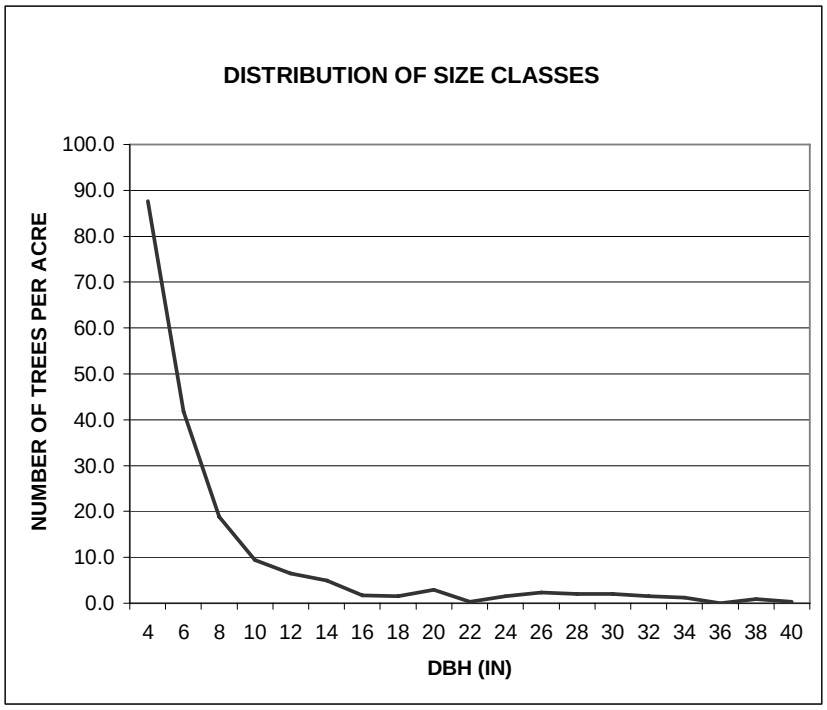
OWNER: Purdue University **DATE:** June 2001
TRACT: Miller- Comp. 4 **FORESTER:** Don Carlson
ACRES: 45.70

This inventory was accomplished by measuring all trees greater than 3" within 1/5 acre plots over 17 sample points.

All figures for volume are in board-feet (bd-ft) Doyle, all figures for basal area (BA) are in feet^2, and all figures for diameter at breast height (dbh) are in inches.

SUMMARY BY SIZE CLASS

DBH	VOL. PER ACRE	TREES PER ACRE	BASAL AREA / ACRE
4		87.6	7.6
6		41.8	8.2
8		18.8	6.6
10		9.4	5.1
12	9	6.5	5.1
14	188	5.0	5.3
16	153	1.8	2.5
18	204	1.5	2.6
20	511	2.9	6.4
22	69	0.3	0.8
24	637	1.5	4.6
26	1034	2.4	8.7
28	1158	2.1	8.8
30	1413	2.1	10.1
32	1214	1.5	8.2
34	1202	1.2	7.4
36			
38	1025	0.9	6.9
40	391	0.3	2.6
TOTAL	9207	187.4	107.6



SUMMARY BY SPECIES

SPECIES	VOL. PER ACRE	PCT. OF PER ACRE VOL.	TREES PER ACRE	PCT. OF PER ACRE TREES	BASAL AREA/ ACRE	PCT. OF PER ACRE BA	AVG. DBH		**TOTAL STAND VOLUME**
Bur / Swamp White Oak	2683	29.1%	4.1	2.2%	18.1	16.9%	28.4		122,597
White Oak	2628	28.5%	6.2	3.3%	20.5	19.1%	24.7		120,110
Red / Shumard Oak	2228	24.2%	7.1	3.8%	16.3	15.2%	20.6		101,803
Red Maple	994	10.8%	15.0	8.0%	14.5	13.5%	13.3		45,418
Ash	367	4.0%	32.6	17.4%	10.4	9.7%	7.6		16,788
Hickory	147	1.6%	9.7	5.2%	3.6	3.4%	8.3		6,734
Sugar Maple	64	0.7%	13.2	7.1%	5.4	5.0%	8.6		2,903
Micellaneous	54	0.6%	91.5	48.8%	16.2	15.0%	5.7		2,460
Black Walnut	28	0.3%	1.8	0.9%	0.9	0.9%	9.8		1,290
Black Cherry	14	0.2%	6.2	3.3%	1.6	1.5%	6.9		645
PER ACRE TOTALS	9207	100.0%	187.4	100.0%	107.6	100.0%	10.3		**420,749**

OWNER: Purdue University
TRACT: Miller- Comp. 4
ACRES: 45.70

DATE: June 2001
FORESTER: Don Carlson

SUMMARY OF VOLUME PER ACRE BY SPECIES AND SIZE CLASS

DBH	*** SPECIES LISTING ***										VOL. PER ACRE
	Bur / Swamp White Oak	White Oak	Red / Shumard Oak	Red Maple	Ash	Hickory	Sugar Maple	Micellaneous	Black Walnut	Black Cherry	
12					9						9
14				46	14	28	42	14	28	14	188
16	28	28		76			21				153
18		96	48	59							204
20	66	132			154	119		40			511
22				69							69
24	127	401	109								637
26	159	476		400							1034
28	162	452	162	191	191						1158
30		651	610	152							1413
32	542	130	542								1214
34	939	263									1202
36											
38	268		756								1025
40	391										391
VOL./ACRE	2683	2628	2228	994	367	147	64	54	28	14	9207