

Southern Pine Resource Analysis for Lumber Production Tuskegee, Alabama Drain Area



Prepared for:



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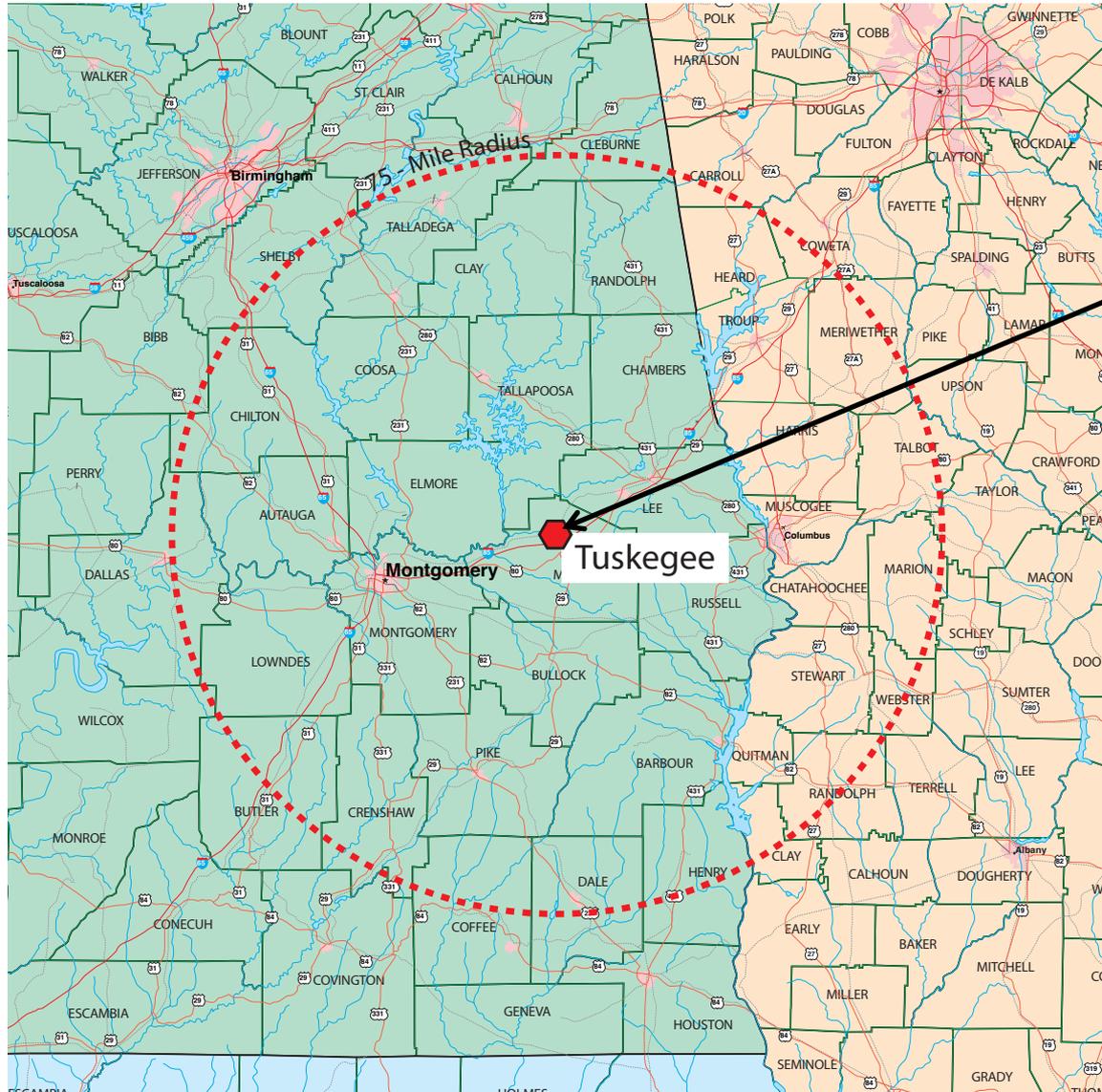
- The Tuskegee, Alabama study area is defined as the area within a 75-mile radius of latitude 32.4831, longitude -85.6996. The study area encompasses all, or part, of 27 counties in Alabama and 16 in Georgia. This study area is heavily forested with 8.3 million acres of timberland. This figure represents 73.7% of the total land area within that circle.
- Approximately 94.1% of the timberlands within the Tuskegee study area are owned by the private sector. Approximately 3.8% are held by the federal government and 2.1% by state and local governments. This ownership pattern is highly favorable with respect to accessing open market timber for industrial purposes.
- There is an estimated 432 million green tons of standing timber inventory within the Tuskegee study area. Approximately 57.5% of this inventory is comprised of softwood species, primarily Southern pines, and 42.5% is mixed hardwood species. Approximately 74.9% of the pine inventory is categorized as sawtimber, being of 9.0" minimum diameter and having suitable quality characteristics for lumber production.
- The Southern pine inventory is comprised of 92.7% loblolly, 3.8% shortleaf, 2.0% longleaf, 0.4% slash, and 1.0% other pine species. Approximately 56.7% of the pine inventory is found in plantations, with the remainder in naturally-regenerated stands.
- The diameter distribution of the pine timber inventory shows a good distribution throughout the diameter classes. The 10" diameter class contains the largest volume, followed by the 12" and 8" classes, respectively. Approximately 54.5% of the pine inventory is found in those three diameter classes.
- The average diameter of all pine trees on a volume-weighted basis is 11.8" dbh. The average diameter of pine sawtimber trees only is 13.9" dbh on the same basis. These average diameters have been increasing continually in recent years.
- The distribution of the pine inventory by stand age reveals that stands of age 21-25 years contain more volume than any other 5-year age class, followed by 26-30 and 31-35, respectively. The data reflects the high levels of planting experienced in the late 1980s and early 1990s, with most of these volumes currently of sawtimber size and quality. The average age of all pine timber is 33 years, on a volume-weighted basis.
- An examination of pine tree counts by diameter class reveals a large number of stems in the smaller, pre-merchantable diameter classes, representing future merchantable inventories. Approximately 53.7% of the 1.4 billion pine stems in the study area are too small to be counted in the inventory, but represent a healthy condition for future pine availability. There are 240 million pine trees currently of sawtimber size.

Summary of Findings (cont.)

- Approximately 76.5% of the pine sawtimber volume is found in tree grade #3, with the percentage of volume in tree grades #1 & #2 comprising 21.4%. The proportion of grades #1 & #2 increasing with diameter, as would be expected. The tree grade distribution is similar to most other regions of the U.S. South.
- The USDA Forest Service timber inventory data reveals that total annual pine timber growth within the study area exceeds annual removals by 6.85 million green tons. However, our analysis suggests that there is a net increase of 1.95 million green tons of pine removals within the study area that is not yet fully incorporated into the Forest Service data. Therefore, we estimate the net available surplus of pine growth over pine removals currently stands at 4.90 million green tons annually.
- The adjusted annual growth surplus within the pine sawtimber product category is estimated to be 3.40 million green tons, while the adjusted pine pulpwood growth surplus is put at 1.50 million green tons annually. Under foreseeable conditions, these surplus volumes represent timber supplies available to support new manufacturing capacity on a long-term sustainable basis.
- Over the past twenty years, the pine timber inventory volume in this study area has steadily grown, with the current Inventory of 247 million green tons over 83% larger than in the year 2000. The sawtimber component of the inventory has expanded even more rapidly, and is now more than double the level of twenty years earlier. It is expected that the pine inventory volume will continue to expand for the foreseeable future.
- Within the 75-mile Tuskegee study radius, there are nine pine sawmills and one pine veneer mill of significance. There are an additional three pine sawmills and one pine veneer mill that lie just outside of the study area boundaries. The timber consumption impacts of these mills have been fully incorporated into the previous removals numbers.
- There are at least twelve manufacturing operations within a reasonable haul distance of Tuskegee that could represent markets for sawmill manufacturing residuals, whether for fiber or fuel. These operations include seven pulp mills, two stand-alone biomass power plants, and one each pellet plant, OSB mill, and non-structural panel plant.
- Nominal prices for pine sawtimber and C-N-S within this study area have been relatively steady over the last ten years, both for stumpage and delivered timber. In real terms, prices have been in a slight downward trend. Due to the pervasive supply/demand imbalance in the region, these trends are expected to continue in the coming years.

Tuskegee Study Area: 75-Mile Radius

December 20, 2020
Tuskegee Pine Resource Analysis



The study area is defined as the land area with a 75-mile radius of Tuskegee, Alabama in Macon County. The area encompasses a total of 11.3 million acres, and includes all, or part, of 27 Alabama counties and 16 Georgia counties.

Specifically the focus of this hypothetical procurement circle is identified as:

Latitude = 32.4831

Longitude = -85.6996

Land Use

December 20, 2020
Tuskegee Pine Resource Analysis

TUSKEGEE STUDY AREA						
75-MILE RADIUS						
LAND USE (acres)						
State	County	Timberland	Other forestland	Nonforest	Water	Total
AL	01001 AL Autauga	304,104	0	79,644	354	384,102
	01005 AL Barbour	433,610	0	112,652	23,437	569,699
	01007 AL Bibb	7,563	0	5,075	0	12,638
	01011 AL Bullock	327,798	0	74,516	6,112	408,426
	01013 AL Butler	144,152	0	33,896	2,786	180,834
	01015 AL Calhoun	6,055	0	0	0	6,055
	01017 AL Chambers	310,773	0	60,824	7,260	378,857
	01021 AL Chilton	269,692	0	106,588	0	376,280
	01027 AL Clay	304,076	5,293	61,675	0	371,044
	01029 AL Cleburne	48,715	0	23,137	6,216	78,068
	01031 AL Coffee	121,501	0	58,159	0	179,660
	01037 AL Coosa	377,061	0	51,312	17,502	445,875
	01041 AL Crenshaw	283,343	0	63,900	1,963	349,206
	01045 AL Dale	170,696	0	39,377	0	210,073
	01047 AL Dallas	110,561	0	25,084	2,685	138,330
	01051 AL Elmore	238,142	0	130,687	36,203	405,032
	01067 AL Henry	177,658	0	62,232	6,112	246,002
	01081 AL Lee	252,394	0	148,655	0	401,049
	01085 AL Lowndes	314,459	0	166,229	0	480,688
	01087 AL Macon	331,666	0	74,412	0	406,078
	01101 AL Montgomery	256,207	0	246,419	6,452	509,078
	01109 AL Pike	303,583	0	118,517	4,432	426,532
	01111 AL Randolph	281,861	0	87,259	11,514	380,634
	01113 AL Russell	314,138	0	79,327	7,227	400,692
	01117 AL Shelby	105,639	0	43,444	11,514	160,597
	01121 AL Talladega	246,560	0	121,003	5,757	373,320
	01123 AL Tallapoosa	393,749	0	72,090	43,750	509,589

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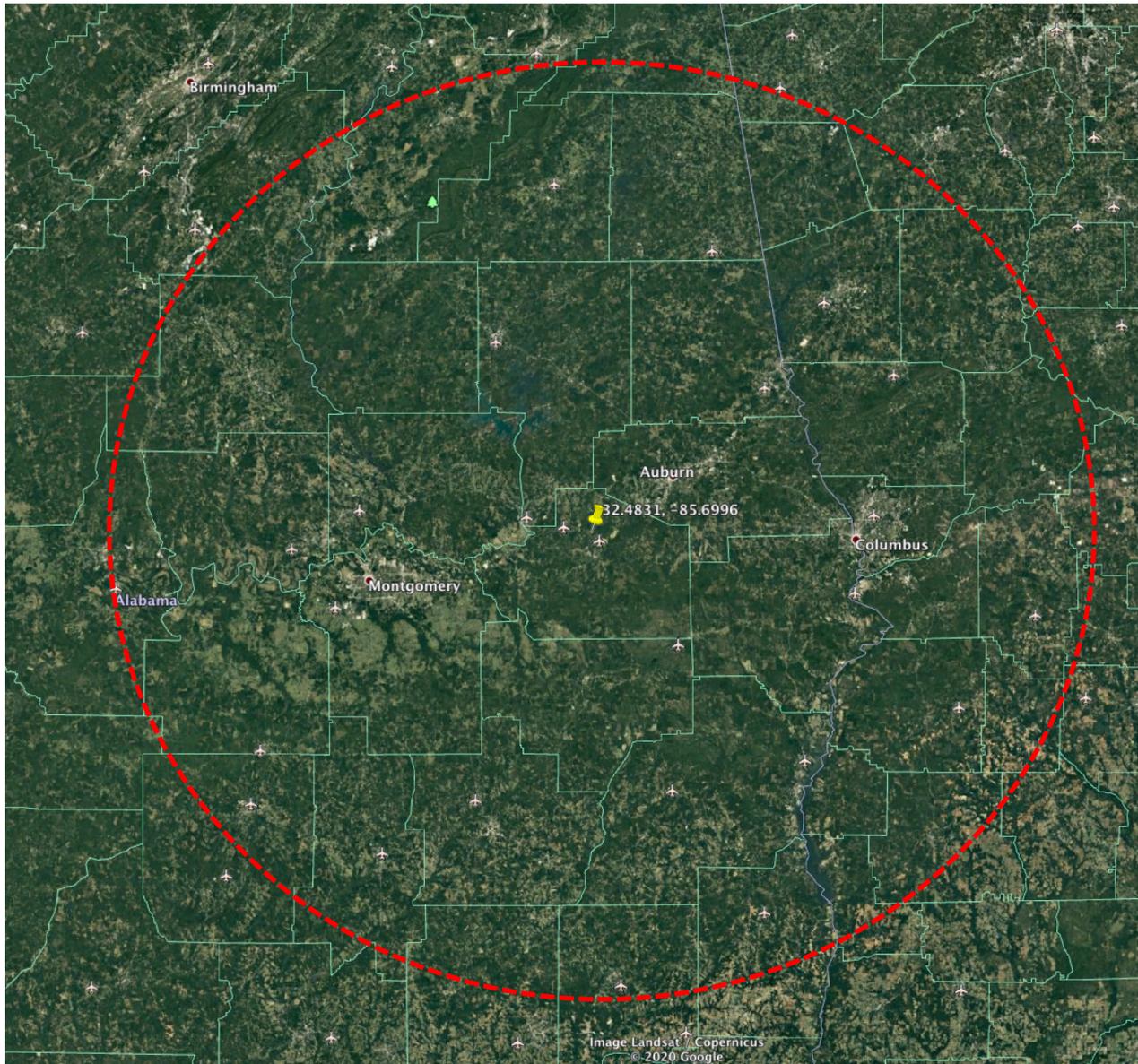
Land Use

December 20, 2020
Tuskegee Pine Resource Analysis

State	County	Timberland	Other forestland	Nonforest	Water	Total
GA	13045 GA Carroll	7,308	0	15,504	0	22,812
	13053 GA Chattahoochee	134,986	0	23,030	0	158,016
	13061 GA Clay	41,103	0	11,856	19,184	72,143
	13077 GA Coweta	45,490	0	7,611	0	53,101
	13145 GA Harris	237,209	0	52,538	15,525	305,272
	13149 GA Heard	113,662	0	51,424	5,663	170,749
	13197 GA Marion	159,932	0	52,562	1,477	213,971
	13199 GA Meriwether	200,563	0	48,424	0	248,987
	13215 GA Muscogee	68,380	0	59,116	0	127,496
	13239 GA Quitman	91,135	0	17,350	5,908	114,393
	13243 GA Randolph	117,214	0	33,681	0	150,895
	13259 GA Stewart	232,967	0	35,630	12,432	281,029
	13263 GA Talbot	171,670	0	21,554	3,262	196,486
	13269 GA Taylor	6,740	5,843	0	0	12,583
	13285 GA Troup	205,365	0	69,778	16,599	291,742
	13307 GA Webster	53,674	0	32,164	4,893	90,731
Total Tuskegee Drain Area		8,323,154	11,136	2,678,335	286,219	11,298,844
Percent		73.7%	0.1%	23.7%	2.5%	
Source: USDA Forest Service FIA Program, 2018 & 2020						



The study area is heavily forested with 73.7% of the entire land area comprised of commercial timberlands. This figure exceeds the Alabama average.



Satellite imagery shows predominately forested land area within the 75-mile radius. The study area avoids the urban land use influences of Atlanta and Birmingham, although it does encompass the less significant metropolitan areas of Montgomery, AL and Columbus, GA.

Timberland Ownership

December 20, 2020
Tuskegee Pine Resource Analysis

TUSKEGEE STUDY AREA						
75-MILE RADIUS						
TIMBERLAND OWNERSHIP (acres)						
State	County	National Forest	Other federal	State and local	Private	Total
AL	01001 AL Autauga	0	5,455	11,295	287,353	304,103
	01005 AL Barbour	0	5,465	30,055	398,090	433,610
	01007 AL Bibb	0	0	0	7,563	7,563
	01011 AL Bullock	0	0	0	327,798	327,798
	01013 AL Butler	0	0	4,306	139,846	144,152
	01015 AL Calhoun	0	0	0	6,055	6,055
	01017 AL Chambers	0	1,452	0	309,321	310,773
	01021 AL Chilton	0	0	0	269,692	269,692
	01027 AL Clay	62,194	0	0	241,882	304,076
	01029 AL Cleburne	5,293	0	6,055	37,368	48,716
	01031 AL Coffee	0	0	0	121,501	121,501
	01037 AL Coosa	0	0	0	377,061	377,061
	01041 AL Crenshaw	0	0	3,315	280,029	283,344
	01045 AL Dale	0	18,229	5,080	147,387	170,696
	01047 AL Dallas	0	0	0	110,561	110,561
	01051 AL Elmore	0	0	6,076	232,065	238,141
	01067 AL Henry	0	0	0	177,658	177,658
	01081 AL Lee	0	0	10,985	241,409	252,394
	01085 AL Lowndes	0	4,357	7,529	302,574	314,460
	01087 AL Macon	20,545	0	6,076	305,044	331,665
	01101 AL Montgomery	0	0	12,153	244,054	256,207
	01109 AL Pike	0	0	0	303,583	303,583
	01111 AL Randolph	0	0	6,055	275,807	281,862
	01113 AL Russell	0	11,921	0	302,217	314,138
	01117 AL Shelby	0	0	0	105,639	105,639
	01121 AL Talladega	35,095	0	12,753	198,712	246,560
	01123 AL Tallapoosa	0	0	12,153	381,596	393,749

continued

Timberland Ownership

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Tuskegee Pine Resource Analysis

State	County	National Forest	Other federal	State and local	Private	Total
GA	13045 GA Carroll	0	0	4,366	2,941	7,307
	13053 GA Chattahoochee	0	95,650	0	39,336	134,986
	13061 GA Clay	0	0	4,545	36,558	41,103
	13077 GA Coweta	0	0	0	45,490	45,490
	13145 GA Harris	0	0	5,836	231,373	237,209
	13149 GA Heard	0	5,822	-	107,840	113,662
	13197 GA Marion	0	0	5,215	154,717	159,932
	13199 GA Meriwether	0	0	11,918	188,644	200,562
	13215 GA Muscogee	0	29,095	0	39,285	68,380
	13239 GA Quitman	0	0	0	91,135	91,135
	13243 GA Randolph	0	0	0	117,214	117,214
	13259 GA Stewart	0	0	5,836	227,131	232,967
	13263 GA Talbot	0	0	0	171,670	171,670
	13269 GA Taylor	0	0	0	6,740	6,740
	13285 GA Troup	0	16,010	4,517	184,838	205,365
	13307 GA Webster	0	0	1,270	52,404	53,674
	Total Drain Area		123,127	193,456	177,389	7,829,181
Percent		1.5%	2.3%	2.1%	94.1%	

Source: USDA Forest Service FIA Program, 2018 & 2020



Timberlands in this study area are primarily in private ownership, at over 94% of the total. This ownership structure is very favorable for industrial wood procurement purposes.

Timber Inventory by Product & Major Species Group

December 20, 2020
Tuskegee Pine Resource Analysis

TUSKEGEE STUDY AREA							
75-MILE RADIUS							
INVENTORY OF GROWING STOCK BY PRODUCT CLASS ON NON-FEDERAL LAND (green short tons)							
State	County	Softwoods			Hardwoods		
		Sawtimber	Pulpwood	Total	Sawtimber	Pulpwood	Total
AL	01001 AL Autauga	5,926,065	2,837,634	8,763,699	4,075,003	1,830,195	5,905,198
	01005 AL Barbour	10,404,273	3,611,691	14,015,964	6,282,548	2,058,397	8,340,944
	01007 AL Bibb	534,229	59,305	593,534	116,496	88,785	205,281
	01011 AL Bullock	8,559,230	2,067,833	10,627,063	4,444,394	2,171,723	6,616,117
	01013 AL Butler	3,026,549	1,365,789	4,392,338	1,524,858	638,028	2,162,886
	01015 AL Calhoun	60,536	87,295	147,831	28,464	32,694	61,158
	01017 AL Chambers	8,866,185	3,390,468	12,256,653	4,276,528	1,704,417	5,980,944
	01021 AL Chilton	4,475,353	2,391,972	6,867,325	3,653,733	2,630,096	6,283,830
	01027 AL Clay	5,800,325	1,456,810	7,257,135	4,339,286	3,201,477	7,540,763
	01029 AL Cleburne	942,663	353,050	1,295,714	1,271,789	352,566	1,624,355
	01031 AL Coffee	2,720,106	1,077,166	3,797,272	716,491	954,140	1,670,631
	01037 AL Coosa	9,268,411	3,552,361	12,820,771	4,262,032	2,751,968	7,014,001
	01041 AL Crenshaw	6,827,040	1,381,732	8,208,773	4,116,597	1,615,713	5,732,310
	01045 AL Dale	3,058,046	775,558	3,833,603	1,824,985	1,222,100	3,047,086
	01047 AL Dallas	1,727,492	192,528	1,920,020	2,463,768	761,610	3,225,378
	01051 AL Elmore	6,685,944	2,098,597	8,784,541	4,542,062	1,957,754	6,499,817
	01067 AL Henry	2,940,243	912,542	3,852,785	2,420,321	1,057,735	3,478,055
	01081 AL Lee	7,944,569	2,135,490	10,080,059	4,648,733	2,216,579	6,865,312
	01085 AL Lowndes	7,976,591	1,964,826	9,941,418	3,889,956	1,704,894	5,594,850
	01087 AL Macon	6,433,197	2,211,818	8,645,015	6,428,447	1,920,157	8,348,604
	01101 AL Montgomery	3,913,219	1,708,324	5,621,543	7,427,376	1,838,205	9,265,581
	01109 AL Pike	8,139,153	2,235,085	10,374,238	4,281,620	2,410,175	6,691,795
	01111 AL Randolph	6,961,715	2,195,756	9,157,471	5,611,441	2,692,381	8,303,822
	01113 AL Russell	4,892,859	2,426,447	7,319,305	4,679,028	1,508,022	6,187,050
	01117 AL Shelby	1,845,725	1,203,520	3,049,245	713,927	598,046	1,311,972
	01121 AL Talladega	7,426,736	2,039,113	9,465,849	2,624,941	1,401,936	4,026,877
	01123 AL Tallapoosa	12,390,604	2,819,229	15,209,833	7,487,347	3,260,884	10,748,231

continued

Timber Inventory by Product & Major Species Group

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Tuskegee Pine Resource Analysis

State	County	Softwoods			Hardwoods		
		Sawtimber	Pulpwood	Total	Sawtimber	Pulpwood	Total
GA	13045 GA Carroll	87,088	25,338	112,427	213,043	153,760	366,803
	13053 GA Chattahoochee	486,438	204,668	691,106	1,187,566	140,558	1,328,124
	13061 GA Clay	581,613	412,612	994,224	51,052	306,833	357,885
	13077 GA Coweta	1,431,755	415,464	1,847,219	1,625,606	594,776	2,220,383
	13145 GA Harris	6,764,799	1,906,709	8,671,508	3,176,520	2,311,046	5,487,566
	13149 GA Heard	2,944,989	522,716	3,467,705	898,921	716,819	1,615,741
	13197 GA Marion	2,201,579	1,242,565	3,444,144	700,062	565,325	1,265,388
	13199 GA Meriwether	6,828,915	1,653,018	8,481,933	3,299,102	1,519,929	4,819,031
	13215 GA Muscogee	837,708	388,036	1,225,744	1,116,656	396,730	1,513,385
	13239 GA Quitman	1,411,145	591,442	2,002,587	1,913,143	935,132	2,848,276
	13243 GA Randolph	328,599	581,382	909,981	2,604,903	585,042	3,189,945
	13259 GA Stewart	2,522,358	2,515,129	5,037,487	2,063,794	1,236,181	3,299,975
	13263 GA Talbot	2,986,864	1,409,750	4,396,614	2,387,508	1,025,840	3,413,348
	13269 GA Taylor	295,280	1,753	297,033	0	1,531	1,531
	13285 GA Troup	5,830,509	1,661,470	7,491,979	5,874,451	1,823,614	7,698,064
	13307 GA Webster	830,057	283,287	1,113,344	729,049	730,782	1,459,832
	Total Drain Area		186,116,751	62,367,281	248,484,032	125,993,551	57,624,574
Percent of Species Group		74.9%	25.1%	100%	68.6%	31.4%	100%
Percent of Total		43.1%	14.4%	58%	29.2%	13.3%	42%
Source: USDA Forest Service FIA Program, 2018 & 2020							



There is a large timber inventory in this study area at nearly 432 million green tons. Approximately 57.5%, or 248 million green tons, are softwoods, of which 99.5% are Southern pines.

The softwood inventory includes nearly 186 million green tons of sawtimber and 162 million green tons of pulpwood. Sawtimber trees are defined as being a minimum of 9.0" in diameter and possessing suitable form and quality for lumber production.

Pine Timber Inventory by Species & Diameter

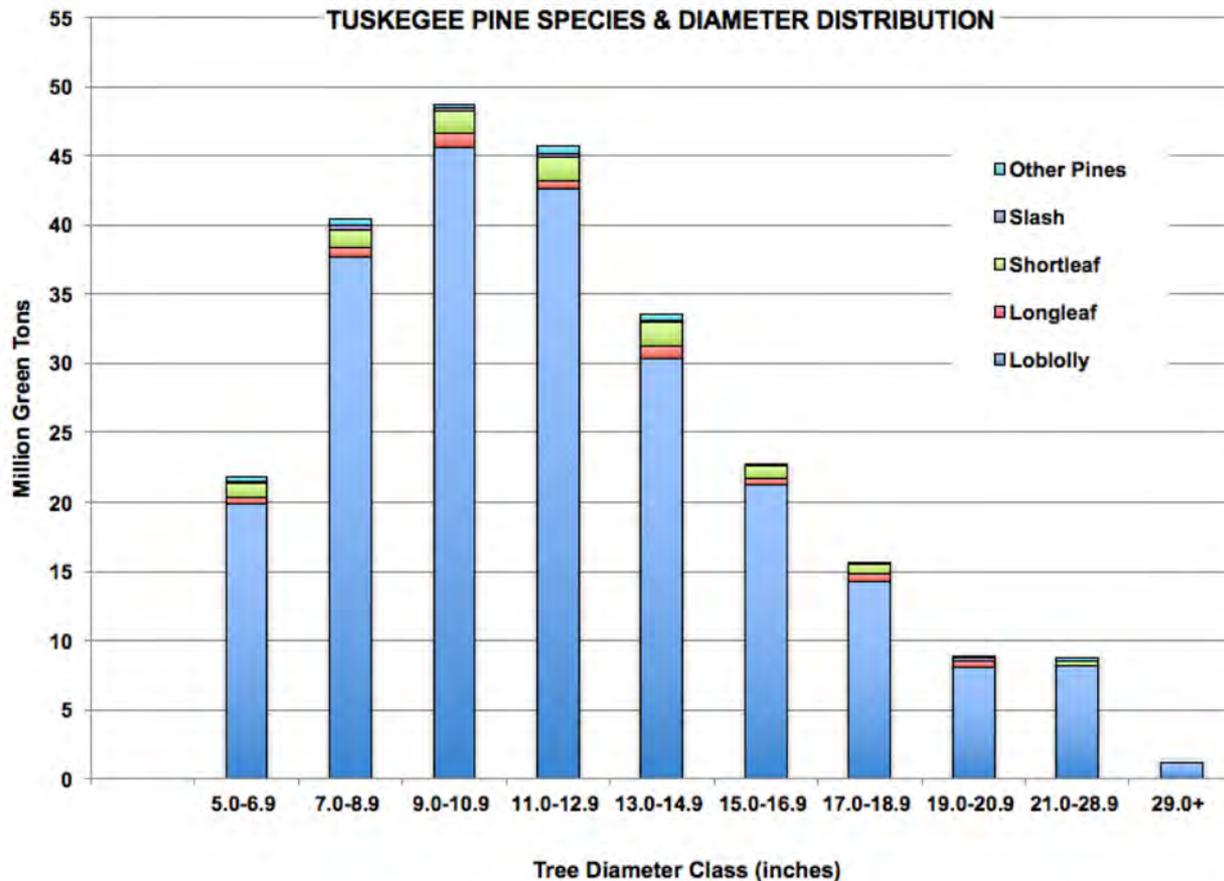
December 20, 2020
Tuskegee Pine Resource Analysis

TUSKEGEE STUDY AREA							
75-MILE RADIUS							
INVENTORY OF PINE GROWING STOCK BY SPECIES GROUP ON PRIVATE LAND (green short tons)							
Diameter Class	Loblolly	Longleaf	Shortleaf	Slash	Other Pines	Total Pines	
						(tons)	(%)
5.0-6.9	19,883,061	494,925	1,002,072	94,145	329,445	21,803,648	8.82%
7.0-8.9	37,708,135	688,638	1,268,350	294,049	420,432	40,379,604	16.33%
9.0-10.9	45,576,361	1,016,720	1,650,762	252,665	250,213	48,746,721	19.72%
11.0-12.9	42,628,383	582,802	1,694,389	231,563	572,415	45,709,551	18.49%
13.0-14.9	30,368,219	828,861	1,728,558	121,103	520,116	33,566,857	13.58%
15.0-16.9	21,243,069	427,857	928,848	42,275	128,313	22,770,362	9.21%
17.0-18.9	14,280,182	574,854	658,468	0	65,757	15,579,261	6.30%
19.0-20.9	8,116,032	352,761	88,592	162,252	78,568	8,798,204	3.56%
21.0-28.9	8,216,816	0	340,343	0	138,510	8,695,669	3.52%
29.0+	1,182,695	0	0	0	0	1,182,695	0.48%
Totals	229,202,953	4,967,417	9,360,381	1,198,052	2,503,769	247,232,572	100.00%
Percent	92.71%	2.01%	3.79%	0.48%	1.01%	100.00%	
Source: USDA Forest Service FIA Program, 2018 & 2020							

continued

Pine Timber Inventory by Species & Diameter

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Tuskegee Pine Resource Analysis



Almost 93% of the pine inventory is loblolly pine (*Pinus taeda*). Shortleaf pine (*Pinus echinata*) is the next most prevalent, at just under 4%

The weighted average diameter on a volume basis of all pine trees is 11.8". The weighted average diameter on a volume basis for pine sawtimber trees only is 13.9"

Pine Timber Inventories by Age & Stand Origin

December 20, 2020
Tuskegee Pine Resource Analysis

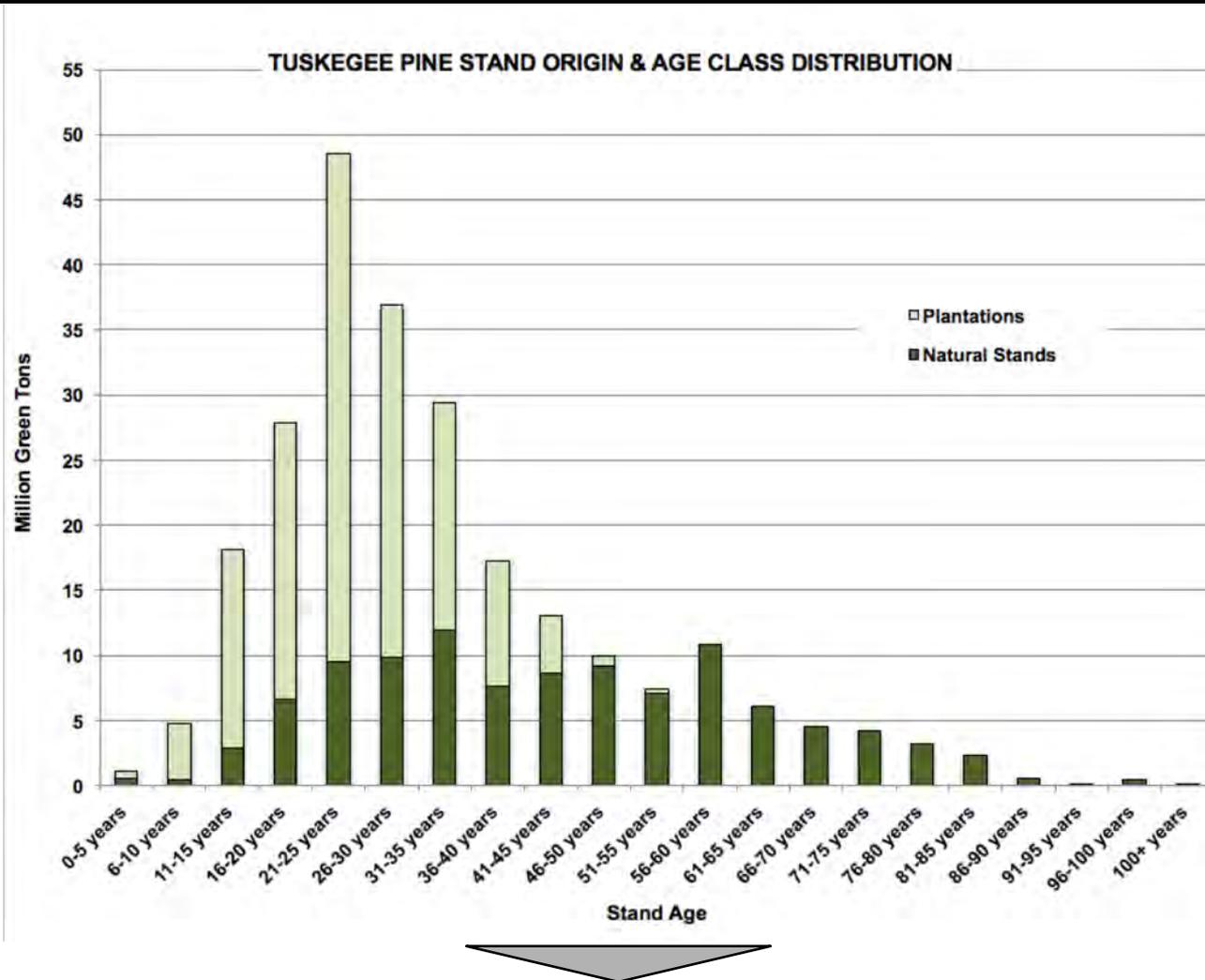
TUSKEGEE STUDY AREA				
75-MILE RADIUS				
INVENTORY OF PINE GROWING STOCK BY AGE CLASS (green short tons)				
Stand Age	Natural Stands	Plantations	Total Pines	
			(tons)	(%)
0-5 years	544,787	605,091	1,149,878	0.47%
6-10 years	504,653	4,254,006	4,758,659	1.92%
11-15 years	2,938,707	15,184,633	18,123,340	7.33%
16-20 years	6,631,582	21,239,892	27,871,474	11.27%
21-25 years	9,541,454	39,012,545	48,553,999	19.64%
26-30 years	9,807,858	27,173,138	36,980,996	14.96%
31-35 years	11,987,954	17,471,694	29,459,648	11.92%
36-40 years	7,623,342	9,626,435	17,249,777	6.98%
41-45 years	8,694,576	4,366,953	13,061,529	5.28%
46-50 years	9,193,372	801,134	9,994,506	4.04%
51-55 years	7,089,509	352,269	7,441,778	3.01%
56-60 years	10,853,002	0	10,853,002	4.39%
61-65 years	6,067,384	0	6,067,384	2.45%
66-70 years	4,589,037	0	4,589,037	1.86%
71-75 years	4,170,473	0	4,170,473	1.69%
76-80 years	3,214,620	0	3,214,620	1.30%
81-85 years	2,362,630	0	2,362,630	0.96%
86-90 years	632,389	0	632,389	0.26%
91-95 years	111,217	0	111,217	0.04%
96-100 years	490,427	0	490,427	0.20%
100+ years	95,809	0	95,809	0.04%
Totals	107,144,781	140,087,791	247,232,572	100.00%
Percent	43.34%	56.66%	100.00%	

Source: USDA Forest Service FIA Program, 2018 & 2020

continued

Pine Timber Inventories by Age & Stand Origin

December 20, 2020
Tuskegee Pine Resource Analysis



Approximately 57% of the pine inventory in this study area is in plantations.

The most prevalent age class is 21-25 years. The weighted average age of all pine timber on a volume basis is 33 years. For naturally regenerated timber, the average is 44 years, and for plantation timber, the average is 24 years.

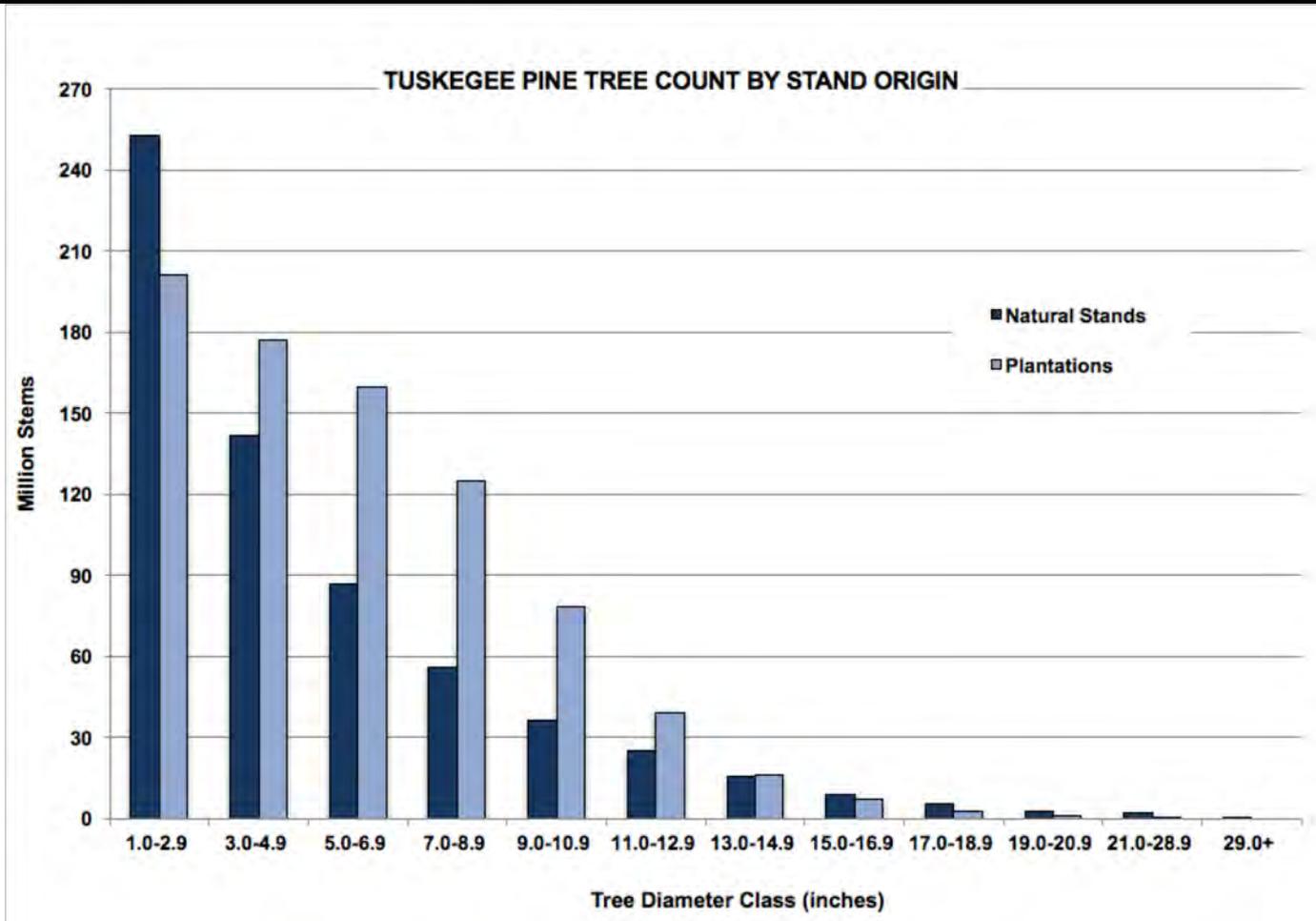
Pine Tree Count by Diameter & Stand Origin

December 20, 2020
Tuskegee Pine Resource Analysis

TUSKEGEE STUDY AREA				
75-MILE RADIUS				
PINE TREE COUNT BY DIAMETER & STAND ORIGIN ON PRIVATE LAND (no of stems)				
Diameter Class	Natural Stands	Plantations	Total Pine Stems	
			(no.)	(%)
1.0-2.9	252,652,555	201,144,804	453,797,359	31.52%
3.0-4.9	141,526,285	177,136,461	318,662,746	22.14%
5.0-6.9	86,714,623	159,713,400	246,428,023	17.12%
7.0-8.9	55,679,086	124,922,606	180,601,692	12.55%
9.0-10.9	36,137,938	78,107,917	114,245,855	7.94%
11.0-12.9	25,129,864	38,906,207	64,036,071	4.45%
13.0-14.9	15,711,706	16,108,356	31,820,062	2.21%
15.0-16.9	8,541,626	7,276,984	15,818,610	1.10%
17.0-18.9	5,428,880	2,505,671	7,934,551	0.55%
19.0-20.9	2,640,498	1,023,246	3,663,744	0.25%
21.0-28.9	2,166,769	255,482	2,422,251	0.17%
29.0+	181,229	0	181,229	0.01%
Totals	632,511,059	807,101,134	1,439,612,193	46.34%
Percent	43.94%	56.06%	100.00%	
Source: USDA Forest Service FIA Program, 2018 & 2020				

continued

Pine Tree Count by Diameter & Stand Origin



There are 1.44 billion pine trees in total, with 772 million stems under 5" in diameter. These small trees (under 5") are not counted in the inventory volumes, but represent a substantial future resource.

There are 240 million pine trees currently of sawtimber size.

Pine Sawtimber Inventory by Tree Grade

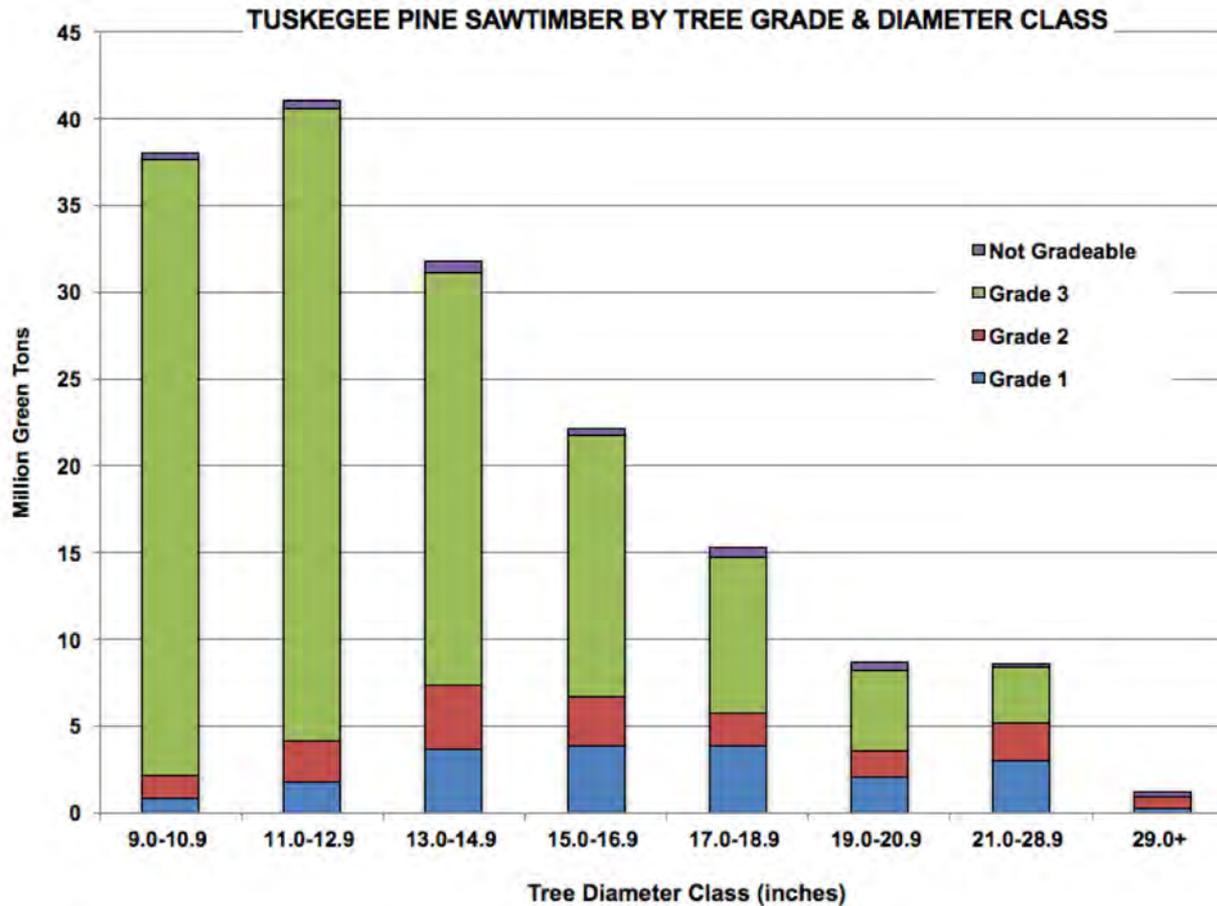
December 20, 2020
Tuskegee Pine Resource Analysis

TUSKEGEE STUDY AREA						
75-MILE RADIUS						
PINE SAWTIMBER TREE GRADE BY DIAMETER ON PRIVATE LAND (green short tons)						
Diameter Class	Tree Grade				Total Pine Stems	
	1	2	3	Not Gradeable	(tons)	(%)
9.0-10.9	836,716	1,290,366	35,499,006	367,484	37,993,573	22.79%
11.0-12.9	1,771,056	2,409,207	36,418,344	468,676	41,067,283	24.63%
13.0-14.9	3,620,570	3,754,103	23,773,077	625,246	31,772,996	19.06%
15.0-16.9	3,885,704	2,782,730	15,086,027	334,271	22,088,731	13.25%
17.0-18.9	3,808,553	1,958,154	8,962,548	596,470	15,325,724	9.19%
19.0-20.9	2,033,992	1,497,183	4,724,007	453,567	8,708,749	5.22%
21.0-28.9	3,043,014	2,152,988	3,155,949	256,761	8,608,712	5.16%
29.0+	277,965	613,261	0	279,643	1,170,868	0.70%
Totals	19,277,570	16,457,991	127,618,957	3,382,118	166,736,636	
Percent	11.56%	9.87%	76.54%	2.03%		100.00%
Source: USDA Forest Service FIA Program, 2018 & 2020						

continued

Pine Sawtimber Inventory by Tree Grade

December 20, 2020
Tuskegee Pine Resource Analysis



The most prevalent tree grade is Grade #3, containing 76.5% of total pine sawtimber volume. Grades #1 & #2 comprise approximately 21.4% of total volume, with the percentage increasing with tree diameter.

The tree grade distribution in this study area is similar to most other regions of the U.S. South.

Pine Timber Growth & Removals by Product

December 20, 2020
Tuskegee Pine Resource Analysis

TUSKEGEE STUDY AREA								
75-MILE RADIUS								
PINE TIMBER GROWTH AND REMOVALS BY PRODUCT ON NON-FEDERAL LAND (green short tons)								
State	County	Softwood Sawtimber			Softwood Pulpwood			Total Pine Surplus/(Deficit)
		Growth	Removals	Net	Growth	Removals	Net	
AL	01001 AL Autauga	419,986	316,586	103,399	286,179	133,068	153,112	256,511
	01005 AL Barbour	684,837	381,928	302,909	470,765	313,886	156,878	459,788
	01007 AL Bibb	10,074	0	10,074	1,178	0	1,178	11,251
	01011 AL Bullock	565,127	312,806	252,321	277,244	194,993	82,251	334,572
	01013 AL Butler	232,867	164,819	68,049	207,589	106,642	100,947	168,996
	01015 AL Calhoun	2,280	0	2,280	7,754	0	7,754	10,034
	01017 AL Chambers	621,429	447,410	174,019	428,721	192,995	235,726	409,745
	01021 AL Chilton	356,725	157,810	198,916	317,518	231,525	85,994	284,909
	01027 AL Clay	369,828	164,521	205,307	145,137	149,167	-4,030	201,277
	01029 AL Cleburne	42,880	0	42,880	30,957	938	30,019	72,899
	01031 AL Coffee	162,464	79,430	83,034	150,203	136,368	13,835	96,870
	01037 AL Coosa	509,914	425,287	84,627	427,911	268,222	159,689	244,316
	01041 AL Crenshaw	480,371	501,797	-21,426	191,020	88,564	102,456	81,030
	01045 AL Dale	172,110	83,598	88,512	111,445	99,416	12,029	100,541
	01047 AL Dallas	106,132	84,665	21,467	35,070	49,325	-14,255	7,212
	01051 AL Elmore	384,713	148,234	236,479	203,314	131,521	71,793	308,272
	01067 AL Henry	218,678	224,404	-5,726	144,058	195,218	-51,159	-56,885
	01081 AL Lee	472,966	198,603	274,363	255,584	159,573	96,011	370,374
	01085 AL Lowndes	597,732	219,265	378,467	275,090	266,072	9,019	387,486
	01087 AL Macon	301,160	231,034	70,126	242,543	75,753	166,790	236,916
	01101 AL Montgomery	254,997	89,088	165,909	225,959	64,836	161,123	327,032
	01109 AL Pike	442,121	185,640	256,481	260,599	166,167	94,432	350,912
	01111 AL Randolph	380,771	346,116	34,655	267,180	214,790	52,390	87,045
	01113 AL Russell	352,797	98,468	254,329	315,421	170,348	145,073	399,402
	01117 AL Shelby	135,744	54,294	81,451	165,242	112,387	52,855	134,306
	01121 AL Talladega	429,720	169,215	260,505	214,590	85,853	128,737	389,242
	01123 AL Tallapoosa	693,023	249,886	443,138	287,204	221,351	65,853	508,991

continued

Pine Timber Growth & Removals by Product

December 20, 2020
Tuskegee Pine Resource Analysis

State	County	Softwood Sawtimber			Softwood Pulpwood			Total Pine Surplus/(Deficit)
		Growth	Removals	Net	Growth	Removals	Net	
GA	13045 GA Carroll	-2,702	0	-2,702	190	0	190	-2,513
	13053 GA Chattahooch	25,031	11,378	13,652	38,808	84,074	-45,265	-31,613
	13061 GA Clay	42,990	0	42,990	57,125	10,848	46,277	89,267
	13077 GA Coweta	73,685	27,737	45,948	35,959	16,037	19,923	65,870
	13145 GA Harris	339,614	231,122	108,492	183,942	146,457	37,485	145,977
	13149 GA Heard	160,299	128,551	31,747	70,828	183,708	-112,880	-81,132
	13197 GA Marion	95,311	31,652	63,659	151,345	58,580	92,765	156,424
	13199 GA Meriwether	309,519	72,624	236,895	218,604	85,626	132,978	369,873
	13215 GA Muscogee	56,184	12,944	43,241	21,787	26,903	-5,117	38,124
	13239 GA Quitman	60,569	31,971	28,598	89,830	173,804	-83,975	-55,376
	13243 GA Randolph	-6,676	229,361	-236,037	96,125	112,398	-16,273	-252,310
	13259 GA Stewart	140,735	63,220	77,514	310,018	357,891	-47,873	29,642
	13263 GA Talbot	184,443	192,166	-7,723	212,855	349,357	-136,501	-144,224
	13269 GA Taylor	12,887	0	12,887	375	401	-26	12,862
	13285 GA Troup	291,120	89,965	201,156	197,063	58,476	138,586	339,742
	13307 GA Webster	56,204	59,522	-3,318	19,908	27,342	-7,434	-10,753
Total Volume (Unadjusted)		11,240,661	6,517,117	4,723,544	7,650,239	5,520,879	2,129,360	6,852,905
Source: JSDA Forest Service FIA Program, 2018 & 2020								



The data indicates that total softwood timber growth currently exceeds timber removals by 6.9 million green tons annually, with 90% of the surplus coming from the Alabama portion of the study area.

Approximately 4.7 million green tons of annual surplus is indicated in sawtimber-sized trees, while 2.1 million green tons is occurring in pulpwood trees. It should be noted, however, that trees move from the pulpwood category to the sawtimber category over time, making growth surpluses by product category a dynamic measure.

Some adjustments need to be made to the FIA removals numbers above to account for changes since the data was collected. These adjustments can be found on page 21.

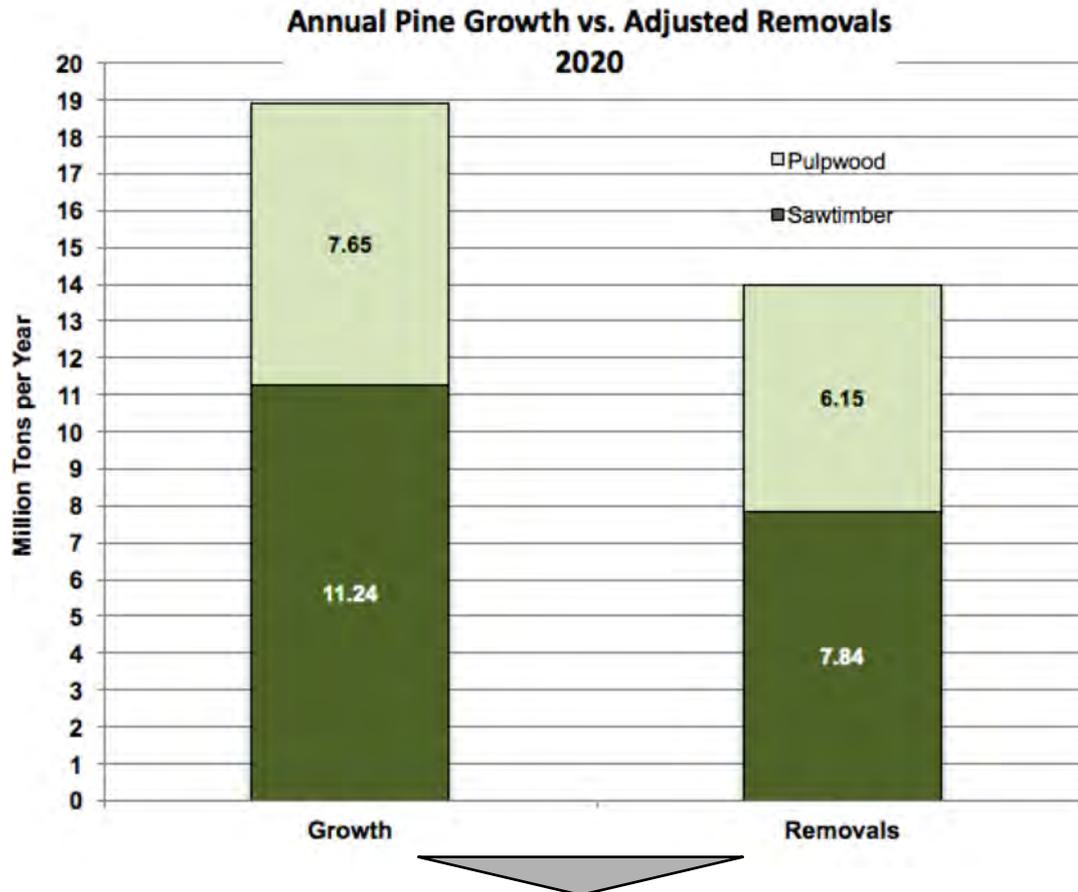
Pine Removals Adjustments

TUSKEGEE DRAIN AREA				
75-MILE RADIUS				
REMOVALS ADJUSTMENTS (green short tons)				
		Reason for Removals Adj.	Est. Removals Adjustment	
			Sawtimber	Pulpwood
Annual Surplus from USFA FIA data			4,723,544	2,129,360
Negative Removals Adjustment from Capacity Reductions				
	Georgia-Pacific - Warm Springs, GA	Closure	189,000	
Positive Removals Adjustment from Capacity Increases				
	Abbeville Fiber - Abbeville	New	134,400	
	Georgia-Pacific - Albany, GA	New	189,000	
	Georgia-Pacific - Talladega	New	201,600	
	International Paper - Selma	Product Change		252,000
	KyKenKee - Tuscaloosa	Expansion	25,200	
	Norbord - Huguley	Re-Start		378,000
	Rex Lumber - Troy	New	409,500	
	Slawson Mfg. - Louisville	Expansion	50,400	
	Sunbelt Forest Ventures - Selma	New	58,800	
	West Fraser - Maplesville	Expansion	53,760	
	West Fraser - Opeilka	Expansion	385,560	
Total Est. Removals Adjustment			1,319,220	630,000
Adjusted Net Annual Surplus			3,404,324	1,499,360
Source: USDA Forest Service FIA Program, 2018 & 2020, and K.J. Muehlenfeld & Assoc.				
Notes: Changes in roundwood consumption within the Tuskegee drain area are based on estimates of the percentage of each mill's procurement area falling within the Tuskegee procurement circle. Each mill's total consumption change is based on either published information or private file data. Only consumption that is estimated to be omitted from the published data is included, which is determined by the date of the consumption change relative to the age of the FIA data.				



It is estimated that there is a net annual increase of approximately 1.95 million green tons of pine roundwood consumption that is, or will be, procured from within the study area, and that is not reflected in the current FIA data. Approximately 1.3 million tons of this new demand will be for sawtimber-sized material. This incremental demand, while significant, is not sufficient to change the resource availability outlook for this study area, which remains very favorable.

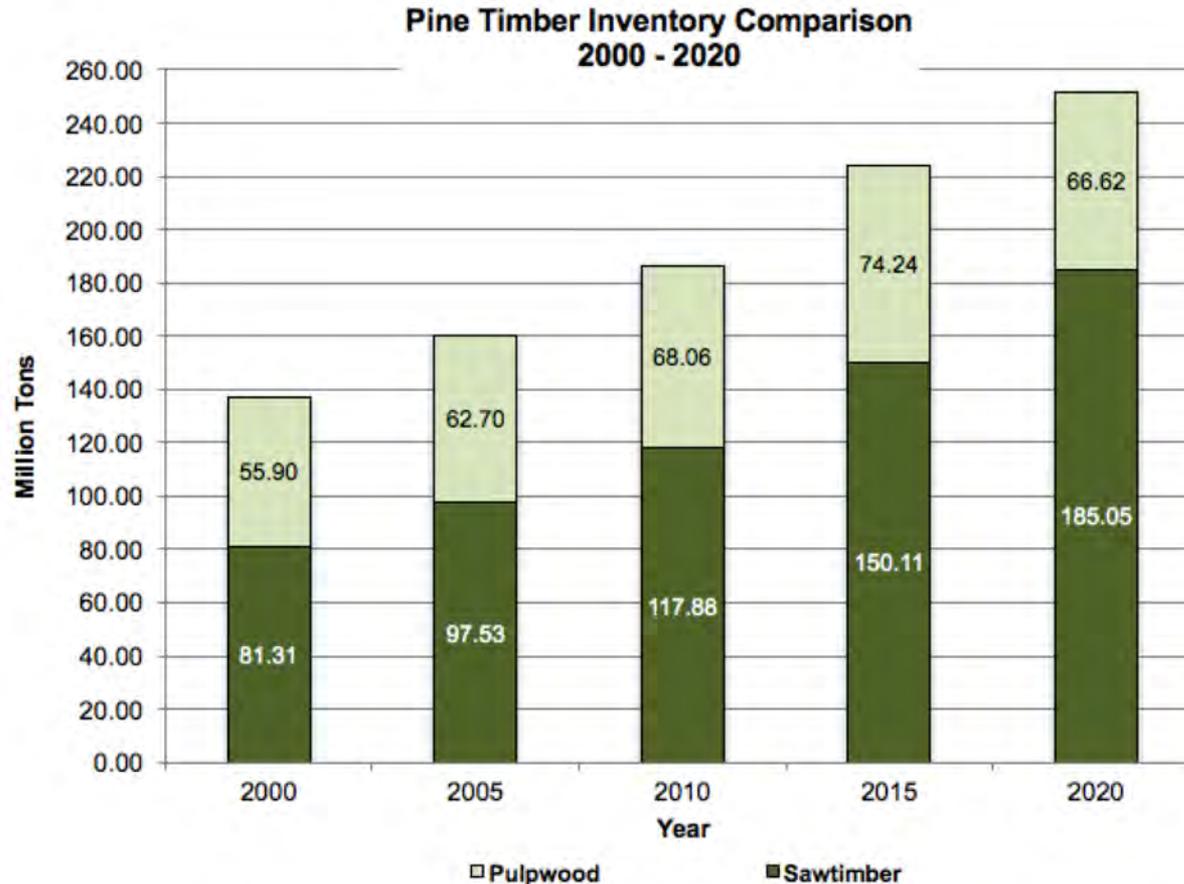
Pine Timber Growth & Removals by Product



Pine timber growth substantially exceeds timber removals with a growth:drain ratio of 1.35. The data suggests that there is currently 4.9 million green tons of surplus pine growth annually after adjustments for new timber demand. The surplus primarily exists in the sawtimber product group, where an annual surplus of 3.4 million tons, or 69% of the total, is indicated. Adjustments to removals were made to account for consumption changes not incorporated in the current data (see page 21).

This observed supply imbalance is expected to persist for the foreseeable future, providing for long-term resource sustainability and the likelihood of stable timber prices.

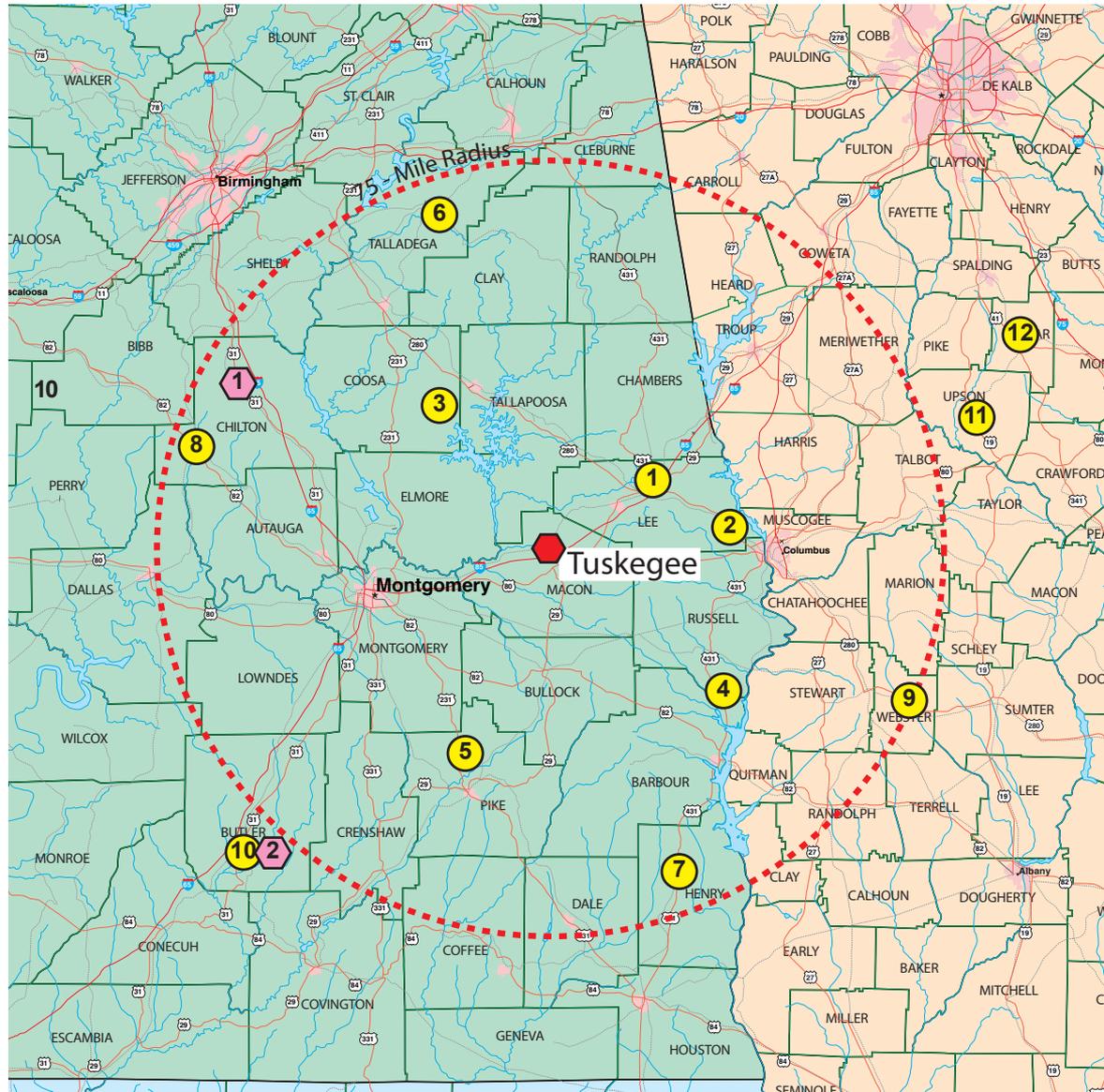
Pine Inventory Over Time



Pine timber supply has exceeded demand for the past twenty years, with the differential accelerating in recent years. The result has been a rapid expansion of the inventory, particularly for sawtimber trees where the inventory has more than doubled over that period. In 2020, sawtimber accounts for 75% of the pine inventory, versus 61% in 2000. The pine inventory expansion trend is expected to remain intact for the foreseeable future, albeit at a slightly slower growth rate.

Interestingly, the hardwood inventory over the same period has been significantly more stable. The result is that pine now accounts for 59% of the total timber inventory volume, versus 42% in 2000.

Major Pine Sawtimber Consumers



Existing pine sawmills and veneer mills of significance that are likely procuring sawtimber resources from within this study area include:

Sawmills = 12

Plywood & veneer plants = 2

(See map key, page 25)

Sawmills

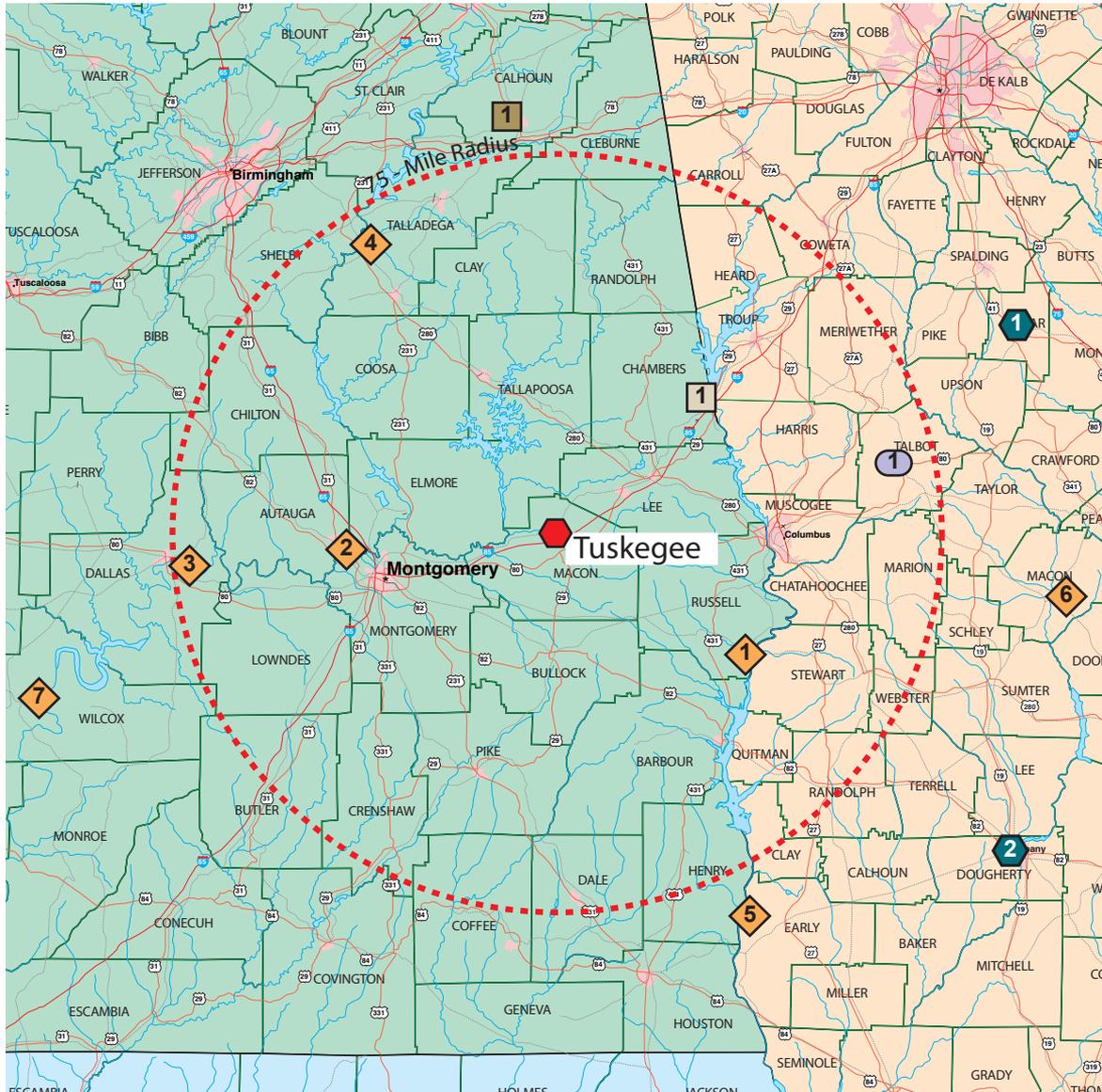
- ① West Fraser Inc. (Opelika, AL)
- ② Dudley Lumber Co. (Salem, AL)
- ③ East Alabama Lumber Co. (Salem, AL)
- ④ MeadWestvaco. (Cottonton, AL)
- ⑤ Rex Lumber Co. (Troy, AL)
- ⑥ Georgia-Pacific Corp. (Talladega, AL)
- ⑦ Abbeville Fiber (Abbeville, AL)
- ⑧ West Fraser Inc. (Maplesville, AL)
- ⑨ Interfor (Preston, GA)
- ⑩ Coastal Forest Products (Chapman, AL)
- ⑪ Keadle Lumber Co. (Thomaston, GA)
- ⑫ Jordan Forest Products (Barnesville, GA)

Plywood & Veneer Mills

- ① Boise Cascade Co. (Thorsby, AL)
- ② Coastal Forest Products (Chapman, AL)

Major Fiber & Fuel Consumers

December 20, 2020
Tuskegee Pine Resource Analysis



Consumers of wood fiber and fuel, representing potential markets for mill residues include:

Pulp Mills = 7

Biomass Power Plants = 2

Pellet Plants = 1

Non-Structural Panel Plants = 1

OSB Plants = 1

(See map key, page 27)

Pulp Mills

- 1 MeadWestvaco. (Cottonton, AL)
- 2 International Paper Co. (Prattville, AL)
- 3 International Paper Co. (Selma, AL)
- 4 Resolute Forest Products (Childersburg, AL)
- 5 Georgia-Pacific Corp. (Cedar Springs, GA)
- 6 Weyerhaeuser Co. (Oglethorpe, GA)
- 7 International Paper Co. (Pine Hill, AL)

Oriented Strandboard Mills

- 1 Norbord Inc. (Huguley, AL)

Particleboard and Fiberboard Plants

- 1 Kronospan (Eastaboga, AL)

Pellet Plants

- 1 Rock Wood Products (Thomaston, GA)

Power Generating Plants

- 1 Piedmont Green Power (Barnesville, GA)
- 2 Albany Green Energy (Albany, GA)

Historical Wood Costs

December 20, 2020
Tuskegee Pine Resource Analysis

CENTRAL ALABAMA PINE TIMBER & CHIP PRICES						
HISTORIC PINE SAWTIMBER, C-N-S, & SAWMILL CHIP PRICES: 2008-2020						(\$/green short ton)
Year	Quarter	Pine Sawtimber Stumpage	Pine C-N-S Stumpage	Delivered Pine Sawtimber	Delivered Pine C-N-S	Pine Sawmill Chips
2008	1	34.57	17.99	52.83	36.60	24.19
	2	35.33	17.32	51.09	36.17	28.69
	3	32.46	18.21	52.83	34.52	30.15
	4	33.58	19.53	53.03	35.89	29.00
2009	1	28.68	16.93	44.08	31.12	28.25
	2	25.57	15.42	44.18	30.85	28.59
	3	27.89	14.81	48.64	30.11	28.20
	4	28.13	16.01	45.80	30.59	26.78
2010	1	28.67	17.88	46.71	33.07	26.39
	2	29.55	17.30	45.77	34.17	26.08
	3	28.00	16.01	46.62	33.32	27.30
	4	25.77	15.84	43.06	33.12	28.00
2011	1	26.56	16.56	41.76	33.67	29.90
	2	23.59	14.43	41.10	32.43	28.30
	3	23.93	14.57	40.74	32.30	26.55
	4	25.97	14.63	42.91	31.99	25.65
2012	1	28.56	16.06	44.12	31.90	25.83
	2	26.01	15.80	43.63	33.17	26.57
	3	23.94	15.78	42.99	33.85	26.31
	4	23.97	15.77	43.40	33.67	27.08
2013	1	26.11	16.55	46.58	34.19	28.43
	2	26.85	16.45	45.75	29.09	26.88
	3	26.78	16.61	47.51	28.73	26.79
	4	25.10	18.31	45.84	36.42	27.54
2014	1	28.62	18.92	47.21	30.38	26.69
	2	26.96	18.36	47.63	38.11	28.12
	3	25.77	17.82	47.32	37.57	28.84
	4	24.98	17.82	45.61	37.36	28.23
2015	1	24.80	17.48	44.84	36.86	27.68
	2	25.05	18.36	43.98	37.10	28.34
	3	25.16	17.08	45.81	36.33	28.71
	4	24.25	17.61	42.85	36.17	28.12

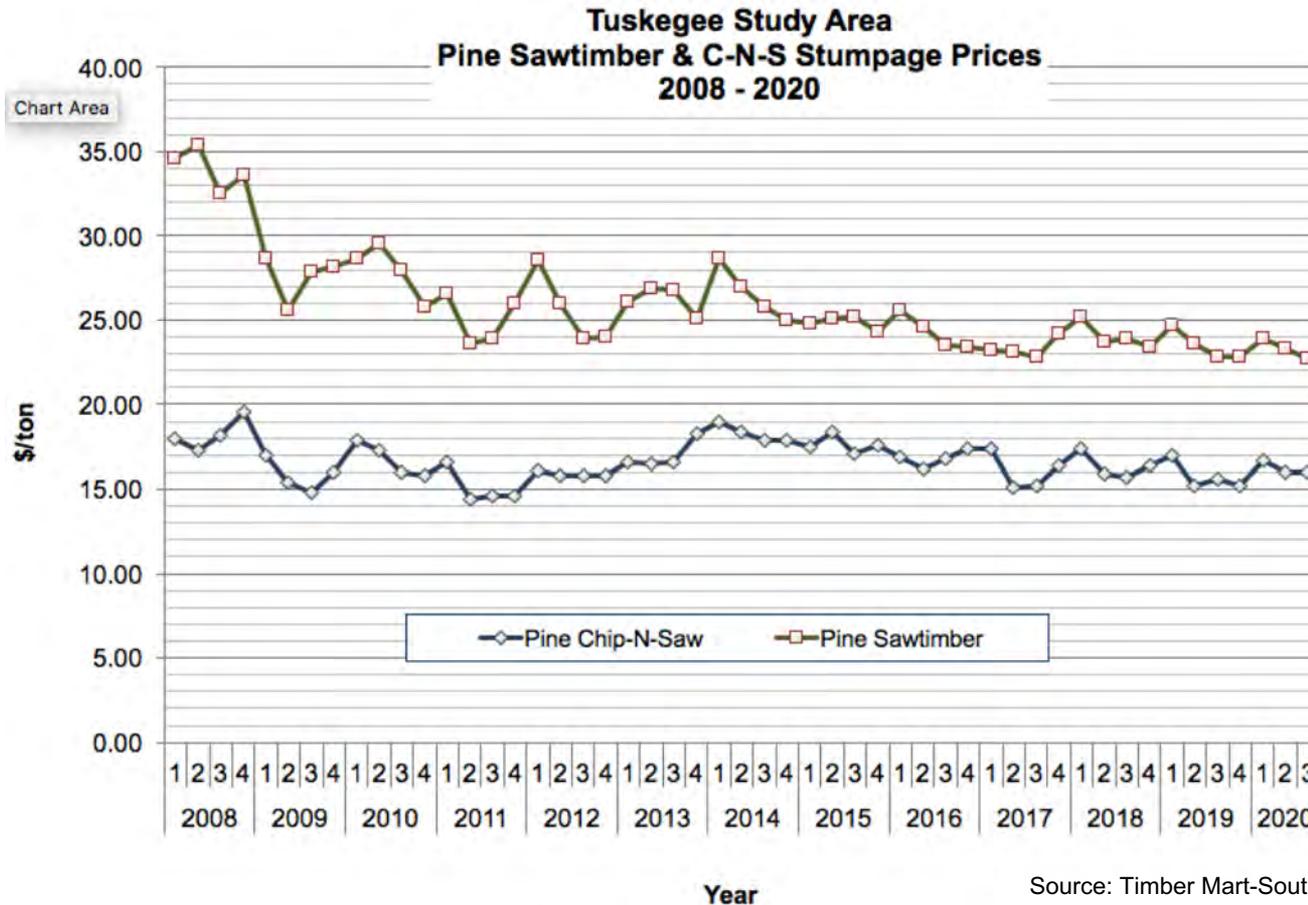
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Historical Wood Costs

December 20, 2020
Tuskegee Pine Resource Analysis

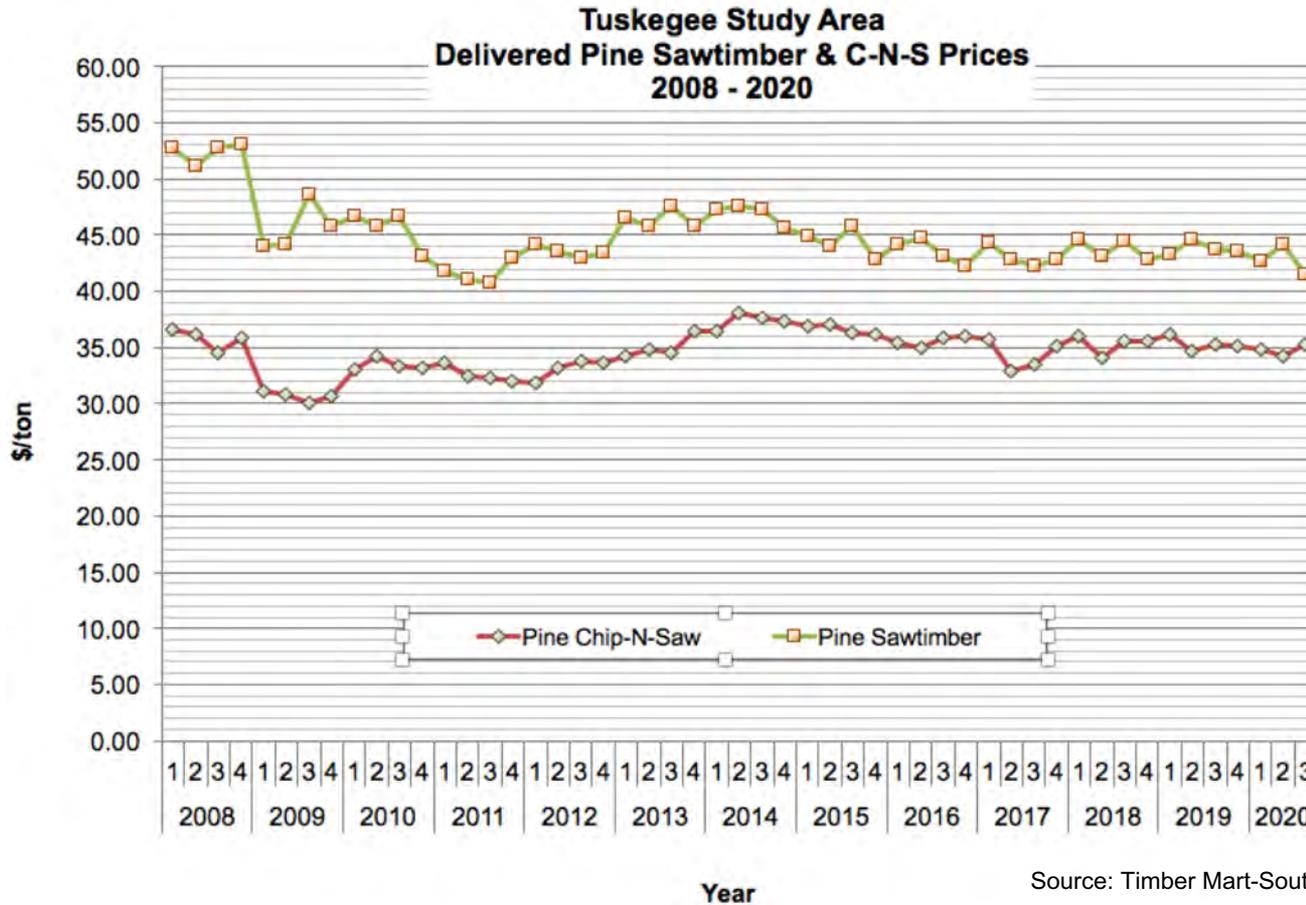
Year	Quarter	Pine Sawtimber	Pine C-N-S Stumpage	Delivered Pine	Delivered Pine C-N-S	Pine Sawmill Chips
2016	1	25.60	16.90	44.13	35.44	28.59
	2	24.63	16.16	44.83	34.95	29.14
	3	23.53	16.83	43.07	35.87	28.82
	4	23.36	17.36	42.20	35.97	28.54
2017	1	23.23	17.42	44.35	35.64	25.45
	2	23.07	15.12	42.82	32.88	25.85
	3	22.81	15.19	42.25	33.54	26.01
	4	24.19	16.39	42.83	35.07	27.62
2018	1	25.14	17.41	44.54	35.95	27.59
	2	23.70	15.88	43.07	34.09	27.05
	3	23.91	15.68	44.50	35.53	26.48
	4	23.37	16.40	42.87	35.63	25.56
2019	1	24.67	17.01	43.23	36.15	25.25
	2	23.59	15.20	44.61	34.72	25.45
	3	22.78	15.57	43.67	35.29	23.84
	4	22.84	15.16	43.64	35.07	25.68
2020	1	23.89	16.73	42.72	34.80	26.11
	2	23.28	15.97	44.17	34.25	23.99
	3	22.70	16.01	41.52	35.25	24.64
Source: Timber Mart-South						
Notes: 1. Delivered wood prices are for short hauls, generally under 50 miles.						
2. Sawmill chip prices are f.o.b. sawmill.						

continued



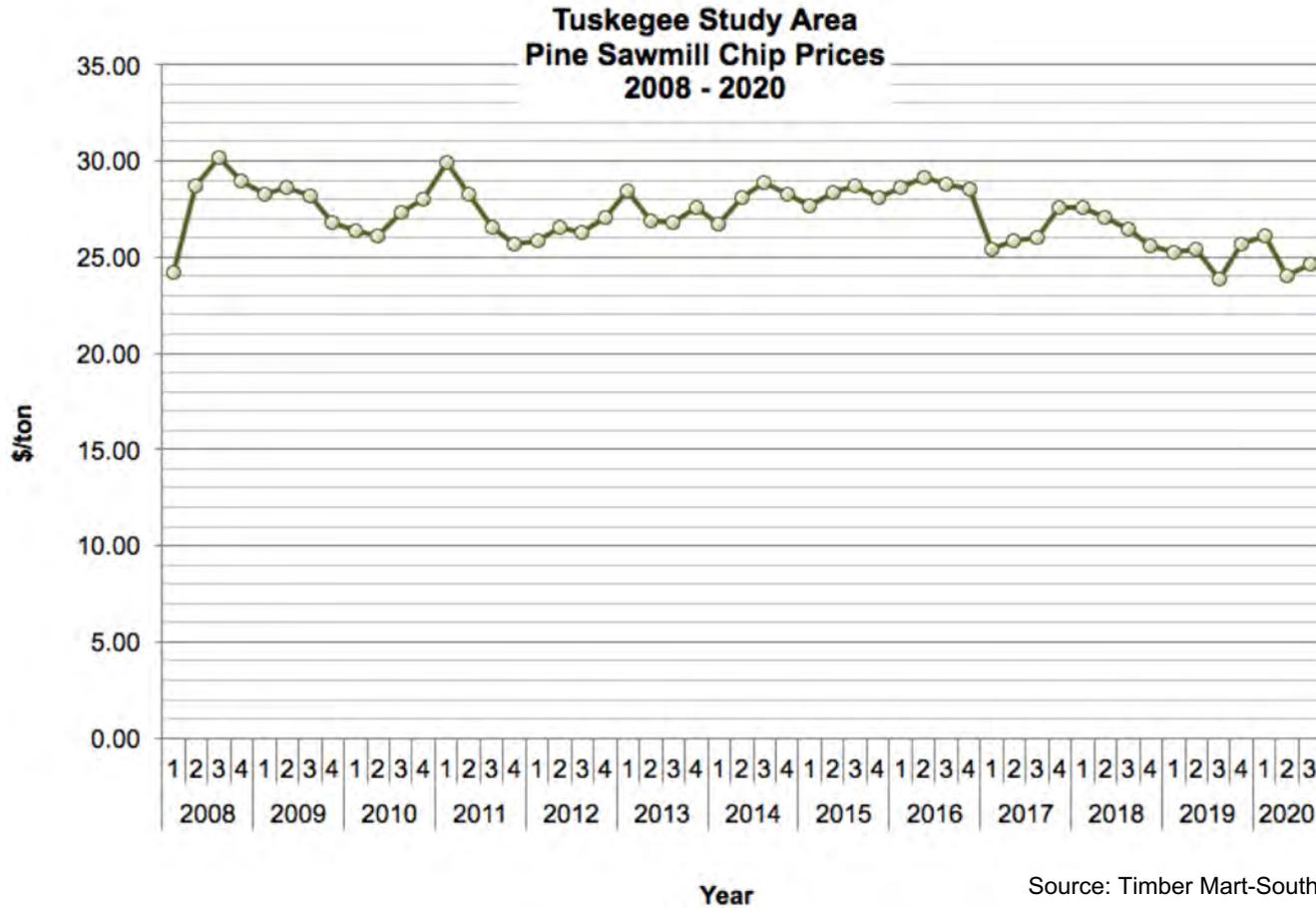
The pine sawtimber stumpage price trend in this study area has been steady to slightly declining over the last ten years. Pine C-N-S stumpage prices have been mostly stable. Note that prices shown are nominal, suggesting that real prices have been steadily declining.

The supply of both pine sawtimber and C-N-S is expected to exceed demand for the foreseeable future, resulting in a stable price outlook.



Source: Timber Mart-South

Delivered pine sawtimber and C-N-S price trends in this study area are similar to those of stumpage prices, being mostly stable in nominal terms over the last ten years. It is expected that these trends will continue, with the stumpage portion of the delivered cost unlikely to change significantly within the foreseeable future.



Nominal pine sawmill chip prices in this study area have been stable to slightly declining. Pulpwood and chip fiber supplies are expected outpace demand in the coming years, indicating that the sawmill chip price outlook will be for continued stability.



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