The Future of Forest Management on NIPF Lands in the South: Results of an Expert Opinion Survey

by

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Abstract

A survey was sent to each state forester in the 13 states in the Southeast and South Central Regions to ask their opinions regarding the future of forest management on NIPF lands in their state. The results indicate that changes are in store for NIPF lands between now and 2020. Planted pine is projected to increase 7% in area in the South, largely at the expense of natural pine, which is projected to decrease in area by 6%. The amount of land in the other forest types will remain relatively constant, although there will be significant shifts among forest types during the period. Management intensity is projected to increase dramatically, with more intensive practices being applied to all five forest management types - - even to upland hardwood stands (a 5% increase) - - with planted pine showing the greatest shift with a 22% increase to very high intensity management region-wide. A gradual reduction in the amount of land available for management is predicted to occur, with losses of 1% in the planted pines to an 11% decrease in bottomland hardwoods. Clearcutting is projected to decrease in the Southeast by 10% in pine plantations and 42% on upland hardwood sites. It is projected to increase slightly in the South Central by 1% to 3% for all five forest management types. Factors most likely to limit increases in productivity are tied to population growth and changes in owner objectives.

INTRODUCTION

The decennial USDA Forest Service efforts to assess the nation's resources include all the traditional forest resources of outdoor recreation, range, timber, water, and wildlife and fisheries resources. As part of these Renewable Resource Planning Act (RPA) efforts, a host of information is needed about each of these particular resources, the ownership trends and objectives, and the management practices and intentions. This paper summarizes one part of the many RPA inputs that will be used in the national timber supply modeling and assessment.

The timber assessment depends crucially on the trends in forest management types and in management intensity of the different forest management classes. Since nonindustrial private forests (NIPFs) comprise 59% of the nation's total timberland area, their management is particularly important. In fact, in the South, NIPF lands comprise 70% of the total timberland base. Whether or not we can continue to manage our southern forests for sustained yield of timber harvests, and indeed sustained yield of all the diverse outputs assessed by the RPA and produced by NIPFs, will depend on how they manage their lands.

This paper provides a summary of a survey done in conjunction with the 1999 RPA timber assessment regarding NIPF forest management prospects in the Southeast and South Central regions. The objective of the survey was to ask a group of experts what they believed the trends in forest management types and forest management intensities would be on NIPF lands in the South. Similar data are being collected for other forest ownership sectors in the nation. The forest industry collected data on its management status and future trends via a survey performed by the American Forest & Paper Association (AF&PA) of its member companies. However, collecting information on the approximately 5 million southern forest landowners obviously could not follow such a simple approach. Thus, rather than relying on surveying the forest landowners directly, we asked the opinions of the state foresters regarding their beliefs about current and future management practices in NIPF lands in their state.

To collect forest management information for NIPF lands, the Southern Forest Resource Assessment Consortium (SOFAC) was asked to lead an effort to canvass state foresters for opinions regarding the NIPF management intentions. This effort was conducted at North Carolina State University, in cooperation with SOFAC and with several USDA Forest Service divisions. Specifically, the Southern Research Station Forest Inventory and Analysis (FIA) Research Work Unit; the Economics of Forest Protection and Management Research Work Unit in Research Triangle Park; the Pacific Northwest Research Station Social and Economics Values Work Unit in Portland, Oregon; and the State

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& Private Forestry representative in Research Triangle Park all cooperated in developing and designing the survey and providing information for use. In addition, AF&PA staff provided their expertise and their forest industry survey also served as a model for our NIPF survey.

APPROACHES

Assumptions about and data on forest management intensities have been collected for the various Forest Service timber trends analyses for decades. In many of the early timber trends reports the analysts usually made base-line assumptions about forest management intensities as a simple continuation of current practices, without any explicit increased management intensity as a response to external economic stimuli. By the time of the South's Fourth Forest Report (USDA Forest Service 1988), timber assessments were made with the economic Timber Market Assessment Model (TAMM), and with the opportunity to model the effects of increased forest management practices in response to market incentives (prices) or public policies.

The Fourth Forest project made considerable efforts to collect accurate information on forest management prospects, opportunities for forest management, and even the appropriate growth and yield information for the South for use by the Forest Service in the timber supply analysis. At that time, the Southeastern Forest Experiment Station Forest Economics Research Work Unit collected information on forest practices and costs, and estimated the economic opportunities for forest management investments. Scientists in the Research Work Unit also estimated the land area trend information by forest management type, which is still relied on today. Estimates about forest management practices and costs, as well as projections of the appropriate growth and yield used in the Fourth Forest effort, were collected from a series of meetings with forest industry, state foresters, and scientists in the mid-1980s. These data were then used as the inputs into the Fourth Forest modeling efforts and subsequent conclusions. As part of the current 1999 RPA, we are trying to adapt this approach to develop similar information.

The Prominence of Planted Pine--The rapid increase in pine plantations, which have offered the greatest response to enhanced management efforts, have made the question of future management intensities on industry and NIPF lands more salient. In fact, most analyses now show that forest management intensities on pine plantations will be the key in determining inventory, harvest and price levels for softwoods in the South and indeed the nation in the future. Thus obtaining the "right" data and assumptions about forest management area and intensity on pine plantations has become the crucial question in affecting the results of the RPA timber assessments. As timber has become scarcer and prices have increased, the importance of making even better estimates of management intensity for the natural forest types, and even hardwood plantations, has increased as well.

The AF&PA Industry Survey--The principal model that we used for collecting information on NIPF management intensities for this effort was the recent survey conducted by AF&PA regarding forest management practices and intensities on forest industry lands. Forestry analysts at each member company filled out the AF&PA survey basing their responses on the current and projected state of technology and implementation of silvicultural systems on their company's lands. That survey assessed:

- Management intensity of ***existing*** stocked stands by forest type and site quality.
- Management intensity of ***future*** stands by forest type and site quality.
- Shifts between forest types after the next harvest.

Forest types included: planted pine, natural pine, mixed oak-pine, upland hardwood, bottomland hardwood, and planted hardwood. The definition of site quality varied among forest types. For planted pine, high sites were defined as having Site Index (SI) >70 base age 25; medium sites as having SI 56-70 base age 25; and low sites as having SI 55 or less, base age 25. All other forest types, except planted hardwood high sites, were defined as having SI >80 base age 50, medium sites as having SI 51-80 base age 50, and low sites as having SI 50 or less, base age 50. Respondents were asked to distribute their company's acres among 11 management intensity categories ranging from very high intensity methods of artificial regeneration, traditional methods of artificial regeneration, moderate intensity methods for natural regeneration, low intensity selective harvesting for all forest types, to reserved or no harvest whatsoever. A further distinction was made between stands <20 years old and those 20 years old or older.

Necessary Adjustments--Obviously, the level of detail allowed for determining management intensity on NIPF lands could not approach that possible with a relatively few forest products firms, who had good

information about the intensity of their forest management and analysts familiar the company's lands. Instead, we needed to rely on broad secondary sources and general knowledge of NIPF management practices by professionals familiar with those practices. This approach would have to resemble the earlier efforts made in the South's Fourth Forest, where experts in southern forestry were assembled and asked about prevailing forest management practices and likely trends. Accordingly, we agreed that a survey of the state foresters in each state would be the best approach to develop reasonable estimates of the prospects for changes in forest management types and forest management practices on NIPF lands in each state.

The NIPF Survey--We developed a survey instrument based on the AF&PA approach, but tailored it to suit the management practices that would likely be employed by NIPFs and the amount of data that could be collected with reasonable accuracy. To provide a starting point for the estimates of future trends, we collected the base-line information of FIA data by specific queries for each state. This provided historical and current information on broad forest management types and site qualities for NIPF owners in each state. These base-line data were provided to help the state foresters in making projections about future areas and intensities for forest management classes.

A draft survey instrument was developed and submitted to the scrutiny of a few graduate students and faculty at NC State, as well as by Forest Service Research Work Unit and State and Private forestry contacts. The instrument was then pre-tested by a Department of Forestry cooperative extension specialist and by persons at the North Carolina Division of Forest Resources.

The Survey--The final version of the survey was sent out to the state foresters in the 13 states in the Southeast and South Central regions. The survey had five sections.

- Section 1 asked the respondents to project the distribution of five forest types (the AF&PA types minus planted hardwood) for the years 2000, 2010, and 2020 and to estimate the shift between forest types after the next rotation

- Section 2 asked the respondents to estimate the percent NIPF acres in each forest type under five of the eleven AF&PA management intensity categories and, in the cases of planted and natural pines, the three site quality categories defined by the AF&PA.

- Section 3 directed the respondents to estimate changes in management intensity on the five forest types by 2010 and 2020, and to estimate the amount of land withdrawn from harvest now, in 2010, and 2020.

- Section 4 asked what percent of lands are likely to be clearcut as a final harvest method vs. how much will likely be subjected to partial harvest methods.

- Section 5 directed the respondents to select among several choices the factors they believe will limit and facilitate increased productivity on NIPF lands in coming years.

RESULTS

The results are summarized by survey section. See the tables in the appendix for a more thorough presentation of the numerical summaries.

Projected Distributions of Forest Types--The following table illustrates the projected changes among forest types in the South. (PP = planted pine; NP = natural pine; PH = pine-hardwood; UH = upland hardwood; BH = bottomland hardwood; SE = Southeast; SC = South Central).

% Change From Current FIA to Year 2020

	PP	NP	MPH	UH	BH
SE	+11	-11	+3	-3	-1
SC	+3	-2	-1	-1	+1
South	+7	-6	0	-1	0

Although the overall split between pines and other forest types is predicted to remain almost unchanged from now until the year 2020, the Southeast is projected to a undergo a reduction of natural pine acres and an increase in planted pine acres. A similar shift, albeit not as large in percentage terms, is projected for the South Central as well. The percentage of land either not stocked or understocked is not predicted to change significantly in any region over the time period. Little change is predicted for the other forest types.

Shifts Between Forest Types--With the exception of the pines, the state foresters estimate that the overall percentage distribution of acres in each forest type will remain fairly steady for the next 22 years, the respondents indicate significant shifts among some forest types. The table below indicates the percent of acres projected to be returned to the same type after

the next harvest. For complete details, see the tables in the appendix. (NS = not stocked.)

Acres to Remain in Each Forest Type Following the Next Rotation in the South

PP	NP	PH	UH	BH	NS
62%	19%	36%	88%	93%	37%

This table is slightly misleading regarding planted pine and mixed pine-hardwood stands; additions from other types offset some shifts in these two instances. Also, while it is heartening to see that 63% of the nonstocked acres will be put into production, in the future, natural pines will lose importance in our region.

Management Intensity; Now and Future-- Management intensity is projected to increase for all forest types over the next 22 years. The greatest increases are in the pines, with bottomland hardwood showing the next highest increase. (VI / h+ = very intensive management for planted pine / higher+ intensity for natural pine; HI = higher intensity management for non-pine types).

Percentage Change in Management Intensity From Now to the Year 2020 for the South

	PP	NP	PH	UH	BH
VI/h+	+22	+14	na	na	na
HI	na	+17	+9	+5	+12

Acres Withdrawn From Harvest--The respondents indicated that they believe relatively little land will be withdrawn from harvest, at least regionally. Some states, obviously, anticipate having significant amounts removed in some forest types. The least amount of removal comes from the pines; larger amounts come from the other natural forest types.

Percentage Change in Acres Available for Management From Now to 2020

	PP	NP	PH	UH	BH
SE	-1	-3	-6	-9	-8
SC	-1	-3	-13	-9	-13
South	-1	-2	-9	-9	-11

Changes in Harvest Methods--Clearcutting as a method of final harvest is projected to decrease significantly in the Southeast and increase slightly in the South Central. The silvicultural methods to replace clearcutting were not surveyed.

Percentage Change in Clearcutting as the Method of Final Harvest

	PP	NP	PH	UH	BH
SE	-11	-19	-23	-42	-40
SC	+3	+3	+1	-3	+1

Opinions About Factors Affecting Increased Productivity on NIPF Lands--The respondents were supplied with a list of 13 factors that may limit increased productivity on NIPF lands in coming years and a list of 12 factors that may facilitate increased productivity on NIPF lands in coming years. The state foresters were asked to select the three they felt were the most important facilitating and limiting factors.

The most commonly selected as ***limiting*** were:

- "Fragmentation / parcelization / suburban sprawl" (10/13)
- "Lack of interest in forest management / timber harvesting" (6/13)
- "Reforestation costs" tied with "lack of information demonstrating potential financial returns" (4/13)

The most commonly selected as ***facilitating*** were:

- "Providing technical assistance on how to apply intensive forest management and illustrating possible results" (10/13)
- "Target income tax relief for forest management" tied with "expanding cost-share programs" (6/10)

The two most commonly selected limiting factors - - parcelization / suburban sprawl and lack of interest in timber management - - indicate that NIPFs will continue to present challenges for those in the forestry community interested in working to facilitate greater timber production on these acres.

CONCLUSION

The USDA Forest Service and the forest products industry are cooperating to produce the most comprehensive RPA assessment to date. The AF&PA has collected information on its member companies' forest types, management intensity, and plans for conversions and plans for future management. The Forest Service is assessing similar information on its own lands. NIPF ownerships are a significant portion of the total forest base in the

United States and must be included in the Assessment.

Accordingly, a survey was developed to collect detailed information about the distribution of forest types, the current levels of management intensity, and the future levels of management intensity on NIPF lands. The survey was sent to each state forester in the 13 states in the Southeast and South Central Regions. The results of that survey indicate that significant changes are in store for NIPF lands between now and 2020. Planted pine will increase in importance, largely at the expense of natural pine. The amount of land in the other forest types will remain relatively constant, although there will be significant shifts among forest types during the period. Management intensity will increase while there will be a gradual reduction in the amount of land available for management. Clearcutting is projected to decrease in the Southeast and increase slightly in the South Central. Factors most likely to limit increases in productivity are tied to population growth and changes in owner objectives.

Literature Cited

USDA Forest Service. 1988. The South's Fourth Forest. Forest Resource Report No. 24. United States Department of Agriculture, Washington, DC.

Appendix - - Detailed Data Tables

Distribution of Forest Types in Each Region by Current FIA, and Projected for Years 2000, 2010, and 2020

Current FIA	Planted Pine	Natural Pine	Pine-Hwd.	Upland Hwd.	Bottom Hwd.	Not Stocked
Southeast	11%	22%	14%	36%	15%	2%
South Central	6%	13%	15%	51%	15%	0%
South	8%	17%	15%	44%	15%	1%
Year 2000						
Southeast	15%	18%	15%	35%	15%	2%
South Central	7%	13%	15%	49%	16%	0%
South	10%	15%	15%	44%	15%	1%
Year 2010						
Southeast	19%	14%	16%	35%	14%	2%
South Central	8%	12%	14%	50%	16%	0%
South	12%	13%	15%	44%	15%	1%
Year 2020						
Southeast	22%	11%	17%	33%	14%	3%
South Central	9%	11%	14%	50%	16%	0%
South	15%	11%	15%	43%	15%	1%

Projected Shifts Between Forest Types After the Next Rotation in the Southeast

% \ To From \	Planted Pine	Natural Pine	Mixed Pine-Hardwood	Upland Hardwood	Bottomland Hardwood	Not Stocked
PP	60	5	19	13	1	2
NP	33	19	34	11	0	2
PH	33	2	42	18	5	1
UH	14	0	4	81	0	1
BH	8	0	2	0	90	1
Not Stocked	20	8	8	13	12	39

Projected Shifts Between Forest Types After the Next Rotation in the South Central

% \ To From \	Planted Pine	Natural Pine	Mixed Pine-Hardwood	Upland Hardwood	Bottomland Hardwood	Not Stocked
PP	64	10	11	13	0	1
NP	37	20	20	19	2	1
PH	26	5	32	34	0	2
UH	5	0	2	92	0	1
BH	0	0	1	0	95	4
Not Stocked	20	25	30	19	5	1

Projected Shifts Between Forest Types After the Next Rotation in the South

% \ To From \	Planted Pine	Natural Pine	Mixed Pine-Hardwood	Upland Hardwood	Bottomland Hardwood	Not Stocked
PP	62	7	16	13	0	2
NP	35	19	28	15	1	2
PH	29	3	36	28	2	2
UH	8	0	3	88	0	1
BH	3	0	1	0	93	3
Not Stocked	20	8	9	13	12	37

Projected Percent Change in Management Intensity from Current Conditions to the Year 2020

Forest Type and Management Intensity Class (MIC)	Percent of Acres by Type and MIC for the Southeast Region	Percent of Acres by Type and MIC for the South Central Region	Percent of Acres by Type and MIC for the South as a Whole
Planted Pine, All Sites			
Very Intensive Mgmt.	+25%	+13%	+22%
Moderate Intensity	-16%	-5%	-18%
Low Intensity	-9%	-7%	-4%
Natural Pine, All Sites			
Higher+ Intensity	+7%	+20%	+14%
Higher Intensity Mgmt.	+26%	+12%	+17%
Lower Intensity Mgmt.	-33%	-32%	-31%
Mixed Pine-Hardwood All Sites			
Higher Intensity Mgmt.	+5%	+14%	+9%
Lower Intensity Mgmt.	-5%	-14%	-9%
Upland Hardwood All Sites			
Higher Intensity Mgmt.	+2%	+8%	+5%
Lower Intensity Mgmt.	-2%	-8%	-5%
Bottomland Hardwood All Sites			
Higher Intensity Mgmt.	+5%	+16%	+12%
Lower Intensity Mgmt.	-5%	-16%	-12%

Percent of NIPF Forest Land Currently Available for Management

	PP	NP	PH	UH	BH
Southeast	96	93	92	87	80
S. Central	98	96	97	93	96
South	97	94	95	91	90

Projected Percentages of NIPF Forest Land Available for Management in the Year 2010

	PP	NP	PH	UH	BH
Southeast	97	92	89	83	76
S. Central	98	96	85	86	84
South	97	94	87	85	81

Projected Percentages of NIPF Forest Land Available for Management in the Year 2020

	PP	NP	PH	UH	BH
Southeast	95	90	86	78	72
S. Central	97	93	86	84	83
South	96	92	86	82	79

Harvest Methods on NIPF Lands Based on Most Recent FIA Estimates

CC=Clearcut PH= Partial	P Pine CC	P Pine PH	N Pine CC	N Pine PH	M P-H CC	M P-H PH	Up H CC	Up H PH	Btm H CC	Btm H PH
Florida	99	1	92	8	73	27	66	34	88	12
Georgia	98	2	76	24	73	27	72	28	60	40
NC	71	29	86	14	66	34	84	16	84	16
SC	85	15	90	10	73	27	86	14	89	11
Virginia	48	52	91	9	84	16	68	32	87	13
Alabama	62	38	40	60	36	64	37	63	39	61
Arkansas	34	66	28	72	13	87	20	80	16	84
Kentucky	0	0	0	0	0	0	0	0	0	1
Louisiana	30	70	32	68	40	60	33	67	31	69
Mississippi	41	59	39	61	31	69	31	69	27	73
Oklahoma	0	100	0	100	25	75	3	97	9	91
Tennessee	72	28	36	64	17	93	10	90	0	100
Texas	31	69	24	76	26	74	25	75	24	76
Southeast	88	12	83	17	73	27	75	25	78	22
South Central	43	57	34	66	29	71	24	76	26	74
South	67	33	53	47	40	60	37	63	43	57

Projected Harvest Methods on NIPF Lands for the Year 2010

CC=Clearcut PH= Partial	P Pine CC	P Pine PH	N Pine CC	N Pine PH	M P-H CC	M P-H PH	Up H CC	Up H PH	Btm H CC	Btm H PH
Florida	100	0	95	5	95	5	95	5	75	25
Georgia	70	30	50	50	50	50	20	80	0	100
NC	90	10	80	20	60	40	40	60	35	65
SC	80	20	70	30	60	40	80	20	90	10
Virginia	90	10	90	10	50	50	30	70	40	60
Alabama	95	5	45	55	45	55	50	50	30	70
Arkansas	100	0	100	0	100	0	50	50	30	70
Kentucky	80	20	90	10	10	90	5	95	50	95
Louisiana	35	65	50	50	60	40	40	60	3	97
Mississippi	80	20	80	20	90	10	90	10	20	80
Oklahoma	80	20	80	20	50	50	20	80	5	95
Tennessee	95	5	60	40	40	60	30	70	40	60
Texas	100	0	75	25	75	25	100	0	80	20
Southeast	83	24	71	29	58	42	38	62	44	56
South Central	86	14	66	34	62	38	39	61	17	83
South	84	16	68	32	60	40	39	61	27	73

Projected Harvest Methods on NIPF Lands for the Year 2020

CC=Clearcut PH= Partial	P Pine CC	P Pine PH	N Pine CC	N Pine PH	M P-H CC	M P-H PH	Up H CC	Up H PH	Btm H CC	Btm H PH
Florida	100	0	90	10	90	10	90	10	60	40
Georgia	60	40	30	70	40	60	10	90	0	100
NC	90	10	80	20	60	40	40	60	35	65
SC	70	30	60	40	50	50	75	25	75	25
Virginia	90	10	90	10	40	60	20	80	30	70
Alabama	95	5	45	55	40	60	50	50	30	70
Arkansas	100	0	100	0	100	0	50	50	30	70
Kentucky	80	20	90	10	10	90	5	95	5	95
Louisiana	40	60	60	40	65	35	45	55	5	95
Mississippi	85	15	85	15	90	10	90	10	20	80
Oklahoma	70	30	70	30	50	50	20	80	5	95
Tennessee	95	5	50	50	50	50	40	60	50	50
Texas	100	0	100	100	75	25	100	0	80	20
Southeast	77	23	64	36	50	50	33	67	38	62
South Central	89	11	69	31	63	37	42	58	18	82
South	81	19	67	33	57	43	39	61	25	75