USDA

United States Department of Agriculture

Monitoring & Evaluation Specialists Report for FY2020-2023

Specialists Evaluation & Findings

National Forests in Mississippi

Bienville National Forest

Delta National Forest

De Soto National Forest

Holly Springs National Forest

Homochitto National Forest

Tombigbee National Forest

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Contents

List of Tables

List of Figures

Introduction

Purpose

The Biennial Monitoring and Evaluation Specialist Report (BMESR) contains supplemental information for the development of the Biennial Monitoring and Evaluation Report (BMER). These documents help the responsible official determine whether a change is needed to the 2014 Land and Resource Management Plan (Forest Plan) direction, such as plan components or other plan content that guide the management of resources in the plan area (36 CFR 219.12(a)(1)). The BMER represents one part of the Forest Service's overall monitoring program for the National Forests in Mississippi. The BMER is not a decision document (FSH 1909.12 Ch. 34). The report evaluates monitoring questions and performance indicators presented in the Forest Plan, Monitoring and Evaluation, Chapter 5. Monitoring and evaluation of the 2014 Revised Land and Resource Management Plan (LRMP) or Forest Plan is implemented relative to management actions in the plan area and in conjunction with the Region's Broader-scale Monitoring Strategy.

Monitoring and evaluation are continuous learning tools that form the backbone of adaptive management (36 CFR 219.12(d) (2)). For this reason, an evaluation report will be produced every two years. This is our second written report of this evaluation since the National Forests in Mississippi Forest Plan adopted the 2012 Planning Rule, finalized on April 27, 2016. This report indicates whether a change to the Forest Plan, management activities, monitoring program, or forest assessment may be needed based on the new information. For a copy of the current monitoring program, including supporting documents for this report, go to https://www.fs.usda.gov/main/mississippi/landmanagement/planning.

Monitoring Objectives

The objectives of the monitoring plan include:

- Assess the current condition and trend of selected forest resources.
- Document implementation of the Plan Monitoring Program.
- Evaluate relevant assumptions, changed conditions, management effectiveness, and progress toward achieving the selected desired conditions, objectives, and goals described in the Forest Plan.
- Assess the status of previously recommended options for change based on previous monitoring & evaluation reports.
- Document scheduled monitoring actions that have not been completed and the reasons and rationale why.
- Present any new information not outlined in the current plan monitoring program that is relevant to the evaluation of the selected monitoring questions.
- Present recommended change opportunities to the responsible official.

How to Use this Report

The BMESR is a tool and a resource for the Forest Service to assess the condition of forest resources in relation to Forest Plan direction and management actions. The document serves as a supplement to the BMER and provides the public with detailed information about how the Forest Service is monitoring and managing forest resources.

The concept of adaptive management is important for land management planning and project implementation in a dynamic and changing environment. Forest plans need to be adaptive to account for changes in resource conditions (such as from hurricanes or insect infestations) new information or scientific findings, or new regulations or policies. An effective monitoring and evaluation program is essential for determining when these situations exist and when we need to

make changes. When there are unanticipated changes in environmental conditions, we may need to adjust the monitoring program.

Monitoring activities generally involve collecting data and information by observation, direct measurement, or other appropriate data sources. Evaluation is the analysis of this data and is used to determine whether the plan is being implemented correctly and whether changes are needed. The monitoring program for the plan was developed using the following criteria:

- The amount and timing of change expected between the existing and desired conditions; monitoring is to be focused on conditions where large changes are expected during the planning period.
- The effect of management activities on desired conditions; monitoring is to be focused on actions being taken to carry out the plan.
- Desired conditions considered key by the participating public and agency specialist; monitoring is to be focused on the highest values expressed by the public and those required to meet legal and regulatory requirements.

The BMESR in combination with the BMER is designed to help the public, as well as Federal, State, local government, and Tribal entities anticipate key steps in the overall monitoring program. These steps include upcoming opportunities for public participation, how the public will be informed of those opportunities, and how public input will be used as the monitoring program progresses. The BMER is also intended to help people better understand reported results in relation to past monitoring reports, future monitoring reports, and the broader-scale monitoring strategy that is issued at the Forest Service Regional level.

The Importance of Public Participation

Reports (BMESR and BMER) will be developed by interdisciplinary teams (ID team) using collaborative engagement with the public as needed. The ID teams will develop a comprehensive evaluation of plan implementation and effectiveness, identifying any needs for adaptive responses. The agency will document the monitoring results and evaluations in the biennial report and make the report available to the public on the forest's website.

Monitoring and evaluations will build off previous reports and could lead to changes in forest plan direction or the monitoring program. For instance, desired conditions, objectives, standards, and guidelines described in the forest plan may be modified, and monitoring questions and indicators changed through the adaptive management approach. Significant findings that could lead to a change in the forest plan will be vetted through an open public involvement process before proposed changes are initiated.

About Our Forest Plan Monitoring Program

Roles and Responsibilities

The Forest Plan Monitoring Program requires a coordinated effort of many people, from the people who collect the data, to the people outside the Forest Service who provide feedback and assistance, to the decision-maker. The Forest Supervisor for the National Forests in Mississippi (NFMS) is the Responsible Official for approving or modifying the monitoring plan. The Specialist Report and BMER are posted online at https://www.fs.usda.gov/main/mississippi/landmanagement/planning.

How Our Plan Monitoring Program Works

Monitoring and evaluation requirements have been established through the National Forest Management Act (NFMA) at 36 CFR 219. Additional direction is provided by the Forest Service in Chapter 30 – Monitoring – of the Land Management Handbook (FSH 1909.12).

The NFMS monitoring program was developed during the 2014 Land and Resource Management Plan (LRMP) revision. Monitoring questions and indicators were selected to inform the management of resources in the plan area and not every

plan component was determined necessary to track [36 CFR 219.12(a)(2)]. The NFMS monitoring program was updated on April 27, 2016, for consistency with the 2012 planning regulations [36 CFR 219.12 (c)(1)]. The LRMP was administratively changed to include the updated monitoring program located in Chapter 5. See the Plan Monitoring Program at https://www.fs.usda.gov/main/mississippi/landmanagement/planning for additional information on how the monitoring questions were selected to be consistent with the 2012 planning regulations 36 CFR 219.12.

Providing timely, accurate monitoring information to the responsible official and the public is a key requirement of the plan monitoring program. The BMESR, along with the BMER for the National Forests in Mississippi, is the vehicle for disseminating this information.

In the context of forest planning there are three main monitoring goals:

- Are we implementing the Forest Plan properly? Are we meeting our management targets and project guidelines? (Implementation monitoring)
- Are we achieving our Forest Plan management goals and desired outcomes? (Effectiveness monitoring)
- Does our hypothesis testing indicate we may need to change the Forest Plan? (Validation monitoring)

Implementation monitoring is important for tracking progress and accomplishments. However, it is effectiveness and validation monitoring that drive and support the adaptive management process. Effectiveness monitoring evaluates conditions and trends relative to desired conditions. Validation monitoring tests hypotheses and provides information that might necessitate changes to desired conditions in the plan (e.g. is what we think the desired state should be accurate?)

Monitoring Evaluation

Monitoring Activities

The following sections present the most current information (data and analysis) for all applicable monitoring questions contained within the 2014 LRMP for the evaluation period.

MQ 1: A.1 Has progress been made toward maintaining and restoring desired conditions so that native ecological systems occupy appropriate sites?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition: 2.3 Ecosystem Diversity

Monitoring Indicator(s):

1. Abundance and distribution of ecological systems
2. Forest structure measured by age class
3. Fire return interval and percent of growing season burns by system
4. Acres of longleaf pine planted by year, and number of acres of longleaf pine classified in the Forest Service Vegetation Management Database (FSVEG)

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Abundance and distribution of ecological systems – No data.

Forest structure measured by age class – No data.

Fire return interval and percent of growing season burns by system – No new science or information collected outside of this monitoring program was considered in the evaluation of this monitoring question. Recommended to re-evaluate and update the NFMS ecosystem layer, specifically regarding smaller ecosystems and sites that have been restored to desired species since the ecosystem layer was made.

Acres of longleaf pine planted by year, and the number of acres of longleaf pine classified in Forest Service Vegetation Management Database (FSVEG) – No data.

Background & Driver(s):

Abundance and distribution of ecological systems – By having an emphasis on restoring native ecological systems and improving threatened and endangered species habitat, a lasting effect on the long-term sustainability of the National Forests in Mississippi (NFMS) can be achieved. There are several ecological systems that all play a role in the health of a forest. Having a well distributed system helps the resiliency of a forest to adapt to changing environmental conditions as well as society's use of the forests. The active management of the NFMS is focused on promoting diversity across the landscape not only in species composition but also in fully functioning ecosystems.

Forest structure measured by age class – An appropriate balance of vertical structure within each community provides critical habitat for associated species that require either early seral (grass/forb-seedling/shrub), mid-seral (poletimber – hardwoods 5-11 inches diameter breast height (d.b.h.); pines 5-9 inches d.b.h.), and late seral (sawtimber – hardwoods greater than 11 inches d.b.h.; pines greater than 9 inches d.b.h.) The overall quantity and distribution of vertical structure

contributes to the sustainability and diversity of the ecological communities by providing a mix of early seral, immature, and mature stands (NFMS EIS Appendices).

Fire return interval and percent of growing season burns by system – The majority of the ecosystems in Mississippi are fire-dependent requiring frequent low-intensity fires to maintain native ecosystems. Fire plays a major role in maintaining and restoring these fire dependent ecosystems.

Acres of longleaf pine planted by year, and number of acres of longleaf pine classified in Forest Service Vegetation Management Database (FSVEG) – This species was selected as an MIS to measure the effectiveness of management in restoring the longleaf pine ecosystem. The abundance of the Longleaf Pine Forest ecological system on the landscape is the most important characteristic of the system due to its widespread conversion to other forest types over the past century as a result of agricultural clearing, forest management, development, land conversion, and fire suppression. The Longleaf Pine Forest ecological system supports populations of associated threatened and endangered species (T&E), Regional Forester's Sensitive Species (RFSS), locally rare, and game species along with several rare communities that are typically embedded within this larger system including herbaceous seepage bogs, xeric sandhills, and depression ponds. The measure of effectiveness is by acres of longleaf pine planted by year and the number of acres of longleaf pine classified in FSVEG.

What monitoring activities have been conducted since the last evaluation?

Abundance and distribution of ecological systems – The original evaluation in the NFMS Land and Resource Management Plan (LRMP) identified ecological systems across the landscape and a goal to restore ecosystems through management practices. Forest Activity and Tracking System (FACTS) is the database of records that is used to track activities across the forest that affect changes in ecosystem types by treatment activity. FACTS is updated throughout the year as activities happen and has a spatial component that assist with locations and ecosystems improved across the forest.

Forest structure measured by age class – Stand exams have been conducted each year since the last evaluation. Stand exams are part of a forest inventory process that measures species, size, age, and stand condition. The data collected during stand exams allow the relative distribution of each ecological system represented on the NFMS to be calculated. For the purposes of this report, two databases were queried to answer multiple monitoring questions associated with ecosystem health.

Forest Activity and Tracking System (FACTS): the database of records that is used to track activities across the forest that affect changes in ecosystem types by treatment activity. FACTS is updated throughout the year as activities happen and has a spatial component that assist with locations and ecosystems improved across the forest.

Field Sampled Vegetation (FSVEG): the database of record for tracking inventories across the forests that measure species, size, age, and condition of forest stands. This database is updated yearly as prescriptions are completed for projects to be implemented.

Fire return interval and percent of growing season burns by system – FACTS spatial and FACTS tabular reporting for prescribed burns across all Districts of the National Forests in Mississippi.

Acres of longleaf pine planted by year, and the number of acres of longleaf pine classified in Forest Service Vegetation Management Database (FSVEG) – All forest vegetation management data is collected, entered, and stored in the FACTS database as activities are accomplished annually. FSVEG is updated as prescriptions are made.

Monitoring Results:

Abundance and distribution of ecological systems –

Table 1. FY 2023 Percent Distribution of Ecological Systems (*C-Current, D-Desired), National Forests in Mississippi.

Percent Distribution of Ecological Systems								
		Bienville	Desoto	Homochitto	Chickasawhay	Delta	Holly Springs	Tombigbee
East Gulf Coastal Plain Floodplain Forest	C	12	11	6	17		2	2
	D	[illegible]	12-20	9-16	23-32		6-18	7-22
East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest and Woodland	C	3					25	13
	D	[illegible]					34-52	28-47
East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland	C	4	45	10	46			
	D	[illegible]	64-74	69-78	65-73			
East Gulf Coastal Plain Near Coast Pine Flatwoods	C		4					
	D		3-9					
East Gulf Coastal Plain Northern Dry Upland Hardwood Forest	C						20	18
	D						34-52	28-46
Southern Loblolly - Hardwood Flatwoods	C	37						
	D	[illegible]						
East Gulf Coastal Plain Northern Mesic Hardwood Forest	C						10	13
	D						1-13	6-24
East Gulf Coastal Plain Southern Loess Bluff Forest	C			2				
	D			3-10				
East Gulf Coastal Plain Southern Mesic Slope Forest	C	11	2	3	2			
	D	5-15	1-8	2-10	0-5			
Loblolly Pine Forest	C	30	10	74	14		41	51
	D	0-5	0-5	0-5	0-5		0-5	0-5
Lower Mississippi River Bottomland and Floodplain Forest	C					100		
	D					100		
Slash Pine Forest	C		20		21			
	D		1-7		0-5			
Southern Coastal Plain Dry Upland Hardwood Forest	C	2	1	3	0			
	D	0-5	0-5	3-12	0-5			

Table 2. FY 2023 Distribution of Ecological Systems (Acres), National Forests in Mississippi.

Distribution of Ecological Systems								
	Bienville	Desoto	Homochitto	Chickasawhay	Delta	Holly Springs	Tombigbee	Total
Not Inventoried	507	9,190	3,765	310	1,616	1,180	1,430	**17,998**
Administrative Site	0	0	0	36	0	0	0	**36**
Cypress Dominated Wetland			503			187		**690**
East Gulf Coastal Plain Floodplain Forest	21,678	23,082	11,883	22,473	0	3,223	1,642	**83981**
East Gulf Coastal Plain Interior Shortleaf Pine-Oak Forest and Woodland	6,201					34,653	8,443	**49,297**
East Gulf Coastal Plain Interior Upland Longleaf Pine Woodland	6,715	171,963	16,267	66,873				**261,818**
East Gulf Coastal Plain Jackson Prairie and Woodland	160							**160**
East Gulf Coastal Plain Near Coast Pine Flatwoods		14,781						**14,781**
East Gulf Coastal Plain Northern Depression Pondshore						153		**153**
East Gulf Coastal Plain Northern Dry Upland Hardwood Forest						28,313	12,086	**40,399**
East Gulf Coastal Plain Northern Mesic Hardwood Forest						14,318	8,804	**23,122**
East Gulf Coastal Plain Northern Seepage Swamp						129		**129**
East Gulf Coastal Plain Southern Loess Bluff Forest			2,946					**2,946**
East Gulf Coastal Plain Southern Mesic Slope Forest	86,762	5,727	5,119	2,378				**99,986**
EGCP Black Belt Calcareous Prairie and Woodland							383	**383**
Herbaceous Seepage Bog		4,071						**4,071**
Loblolly Pine Forest	53,865	45,683	141,619	22,937		58,153	34,263	**356520**
Lower Mississippi River Bottomland and Floodplain Forest					59,242			**59,242**
Slash Pine Forest		75,365		32807		354	49	**108575**
Southern Coastal Plain Dry Upland Hardwood Forest	3,775	3,927	5,812	670				**14,184**
Southern Coastal Plain Seepage Swamp and Baygall	78	26,152	163	2,028				**28,421**
Total	**179,741**	**379,941**	**188,077**	**150,512**	**60,858**	**140,663**	**67,100**	**1,166,892**

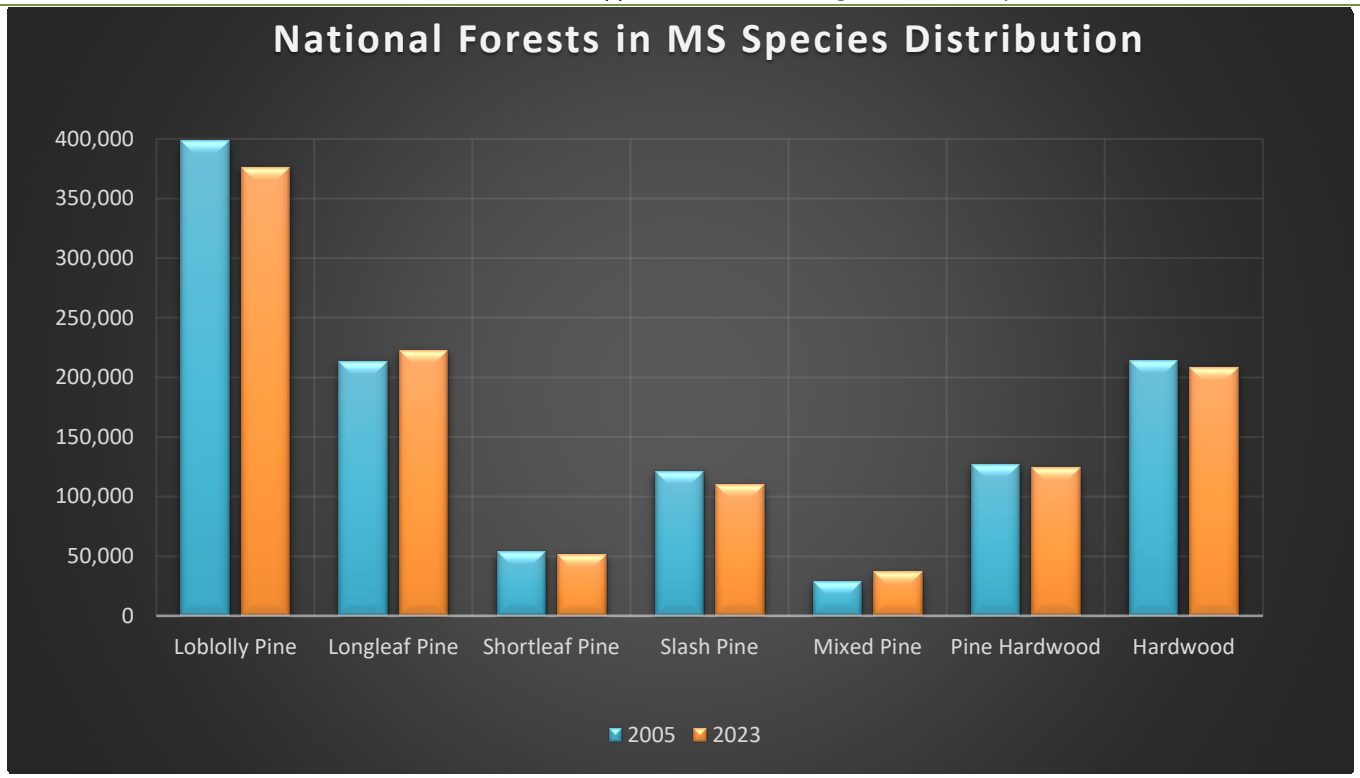

Figure 1. National Forests in Mississippi, 2005-vs-2023 Species Distribution.

Forest structure measured by age class –

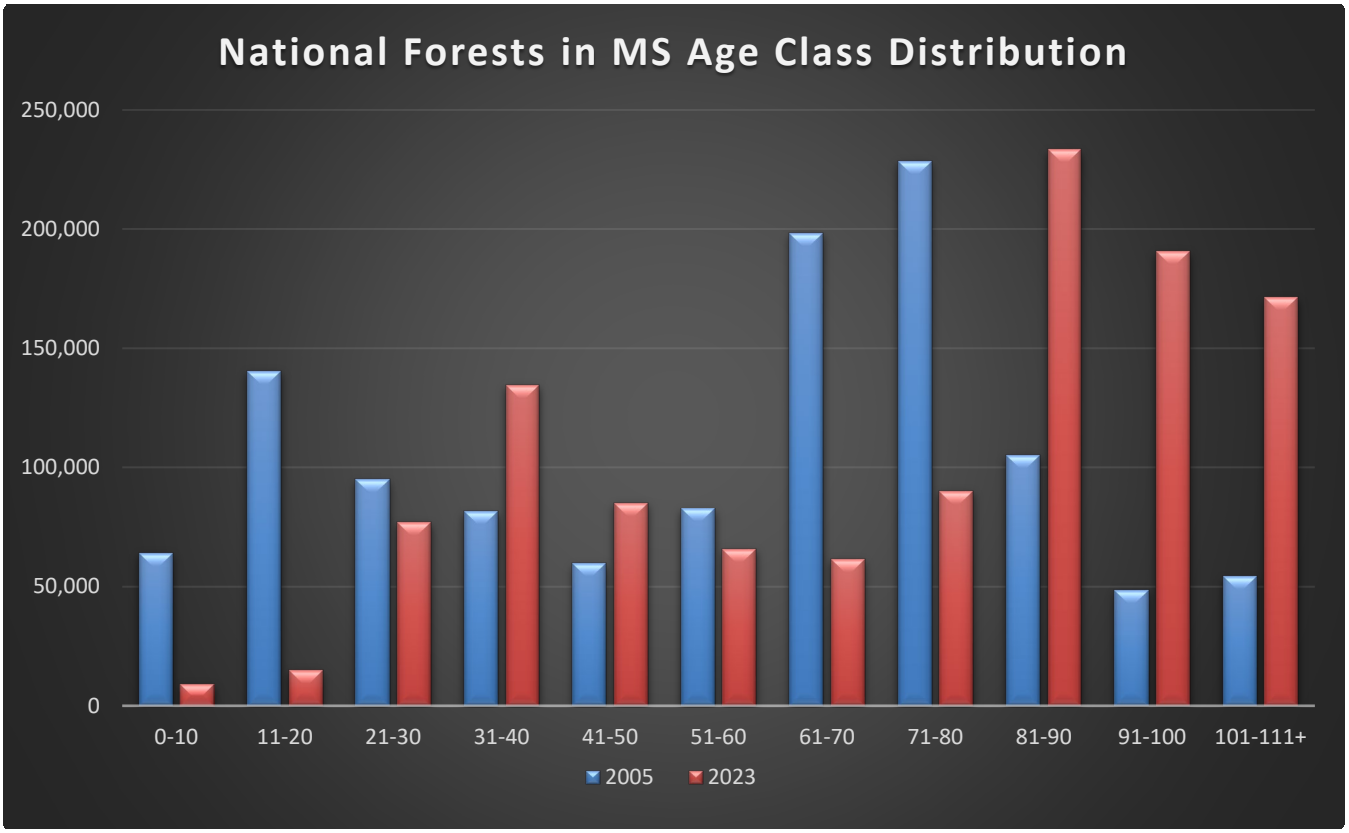

Figure 2. National Forests in Mississippi, 2005-vs-2023 Age Class Distribution.

Fire return interval and percent of growing season burns by system –

Table 3. – 26. Prescribed Burn Accomplishments and Percent of Growing Season Burns by System. (District Tables)

The following results reflect updates from data collected from FY2020 to FY2023. Miscellaneous System row represents accomplished acres without a specific ecosystem assigned for analysis.

Bienville National Forest - 2020

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Loblolly Pine Forest	3348	1369	4717	29
Longleaf Pine Forest	0	177	177	100
Shortleaf Pine Forest	22	174	196	89
Mesic Slope Hardwood Forest	397	453	850	53
Floodplain Forest	773	157	930	17
Southern Dry Hardwood	33	51	84	61
Miscellaneous System			**2425**	
Total	**5099**	**1856**	**9380**	

Bienville National Forest - 2021

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Loblolly Pine Forest	1630	2978	4608	65
Longleaf Pine Forest	0	1685	1685	100
Shortleaf Pine Forest	639	84	723	12
Mesic Slope Hardwood Forest	15454	9738	25192	39
Floodplain Forest	1934	779	2713	29
Southern Dry Hardwood	202	624	826	76
Miscellaneous System			**3843**	
Total	**19860**	**15888**	**39591**	

Bienville National Forest - 2022

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Loblolly Pine Forest	8664	1387	10051	14
Longleaf Pine Forest	558	0	558	0
Shortleaf Pine Forest	1451	751	2202	34
Mesic Slope Hardwood Forest	12287	7890	20176	39
Jackson Prairie	5	0	5	0
Floodplain Forest	2136	1967	4102	48
Southern Dry Hardwood	390	173	563	31
Miscellaneous System			**1597**	
Total	**25490**	**12167**	**39254**	

Bienville National Forest - 2023

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Loblolly Pine Forest	3365	2282	5647	40
Longleaf Pine Forest	942	242	1184	20

Shortleaf Pine Forest	112	445	557	80
Mesic Slope Hardwood Forest	11255	17870	29126	61
Floodplain Forest	772	521	1293	40
Southern Dry Hardwood	444	209	653	32
Miscellaneous System			**2865**	
Total	**16892**	**21570**	**41327**	

De Soto Ranger District, De Soto National Forest - 2020

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Upland Loblolly Pine Forest	1876	362	2238	16
Upland Longleaf Pine Forest	16013	2906	18919	15
Slash	8490	2183	10673	20
Flatwoods	2883	0	2883	0
Dry Upland Hardwood Forest	184	166	350	47
Mesic Slope Forest	271	32	303	10
Floodplain Forest	1493	74	1567	5
Herbaceous Seepage Bogs	1187	0	1187	0
Seeps, Springs, and Seepage Swamps	2221	551	2772	20
Miscellaneous System			**5845**	
Total	**34620**	**6272**	**46737**	

De Soto Ranger District, De Soto National Forest - 2021

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Upland Loblolly Pine Forest	741	1027	1768	58
Upland Longleaf Pine Forest	2602	17642	20244	87
Slash	1984	2795	4779	58
Flatwoods	389	580	969	60
Dry Upland Hardwood Forest	0	52	52	100
Mesic Slope Forest	159	42	201	21
Floodplain Forest	344	621	965	64
Pitcher Plant Bogs and Essentially Treeless Savanna	79	256	335	76
Miscellaneous System			**6566**	
Total	**6298**	**23015**	**35879**	

De Soto Ranger District, De Soto National Forest - 2022

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Upland Loblolly Pine Forest	1649	890	2539	35
Upland Longleaf Pine Forest	16434	9611	26045	37
Slash	9520	3368	12887	26
Flatwoods	2526	0	2526	0
Dry Upland Hardwood Forest	51	371	422	88

Mesic Slope Forest	358	338	696	49
Floodplain Forest	2340	927	3268	28
Pitcher Plant Bogs and Essentially Treeless Savanna	969	1	970	0
Miscellaneous System			**2790**	
Total	**33847**	**15506**	**52143**	

De Soto Ranger District, De Soto National Forest - 2023

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Upland Loblolly Pine Forest	1496	2328	3824	61
Upland Longleaf Pine Forest	11661	9115	20775	44
Slash	3690	2926	6616	44
Flatwoods	1043	697	1739	40
Dry Upland Hardwood Forest	243	138	381	36
Mesic Slope Forest	138	526	664	79
Floodplain Forest	1438	568	2006	28
Pitcher Plant Bogs and Essentially Treeless Savanna	106	917	1023	90
Miscellaneous System			**5886**	
Total	**19815**	**17215**	**42916**	

Homochitto National Forest - 2020

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Loblolly Pine Forest	4466	2173	6639	33
Upland Longleaf Forest & Woodland	766	410	1176	35
Southern Mesic Slope Forest	86	4	90	5
Floodplain Forest	131	221	352	63
Southern Dry Upland HW Forest	78	8	86	10
Miscellaneous System			**1831**	
Total	**5526**	**2817**	**10174**	

Homochitto National Forest - 2021

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Cypress dominated Wetlands	20	0	20	0
Loblolly Pine Forest	10270	8227	18497	44
Upland Longleaf Forest & Woodland	1336	1956	3292	59
Southern Mesic Slope Forest	230	147	377	39
Floodplain Forest	246	345	591	58
Southern Dry Upland HW Forest	315	223	537	41
Miscellaneous System			**1181**	

Total	**12417**	**10898**	**24496**

Homochitto National Forest - 2022

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Loblolly Pine Forest	10034	15070	6	53
Upland Longleaf Forest & Woodland	1944	2662	4606	58
Southern Mesic Slope Forest	140	223	363	61
Floodplain Forest	379	846	1225	69
Southern Dry Upland HW Forest	171	266	437	61
Miscellaneous System			**612**	
Total	**12668**	**19067**	**32347**	

Homochitto National Forest - 2023

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Loblolly Pine Forest	8753	13729	22482	61
Upland Longleaf Forest & Woodland	744	1642	2386	69
Southern Mesic Slope Forest	153	349	502	70
Floodplain Forest	480	852	1332	64
Southern Dry Upland HW Forest	160	457	617	74
Total	**10290**	**17029**	**27124***	

*195 additional acres analyzed in spatial burn polygons

Chickasawhay Ranger District, De Soto National Forest - 2020

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Flood Plain Forest	723	0	723	0
Upland Long Leaf	5214	0	5214	0
Loblolly	732	0	732	0
Slash	3481	0	3481	0
Southern Mesic Slope	317	0	317	0
Dry Upland HW	31	0	31	0
Seeps, Springs, and Seepage Swamps	65	0	65	0
Miscellaneous System			**3190**	
Total	**10563**	**0**	**13753**	

Chickasawhay Ranger District, De Soto National Forest - 2021

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Flood Plain Forest	1228	3734	4962	75
Upland Long Leaf	4500	10319	14819	70

Loblolly	880	2702	3582	75
Slash	2862	7235	10097	72
Southern Mesic Slope	136	245	381	64
Dry Upland HW	1	21	22	94
Seeps, Springs, and Seepage Swamps	0	135	135	100
Miscellaneous System			**741**	
Total	**9607**	**24391**	**34739**	

Chickasawhay Ranger District, De Soto National Forest - 2022

Ecological System	**Dormant (Acres)**	**Growing (Acres)**	**Total (Acres)**	**% Growing**
Flood Plain Forest	2326	1317	3643	36
Upland Long Leaf	6713	5599	12312	45
Loblolly	4652	807	5459	15
Slash	4959	3756	8715	43
Southern Mesic Slope	252	327	579	56
Dry Upland HW	207	53	260	21
Seeps, Springs, and Seepage Swamps	208	164	372	44
Admin Site	0	36	36	NA
Miscellaneous System			**2086**	
Total	**19317**	**12059**	**33462**	

Chickasawhay Ranger District, De Soto National Forest - 2023

Ecological System	**Dormant (Acres)**	**Growing (Acres)**	**Total (Acres)**	**% Growing**
Flood Plain Forest	2805	2131	4935	43
Upland Long Leaf	5140	9182	14322	64
Loblolly	1861	1907	3769	51
Slash	5838	5322	11160	48
Southern Mesic Slope	337	200	537	37
Dry Upland HW	54	23	77	30
Seeps, Springs, and Seepage Swamps	193	246	439	56
Miscellaneous System			**323**	
Total	**16228**	**19011**	**35562**	

Holly Springs National Forest – 2020

Ecological System	**Dormant (Acres)**	**Growing (Acres)**	**Total (Acres)**	**% Growing**
Floodplain Forest	2	0	2	0

Shortleaf Pine-Oak Woodland	333	418	751	56
Northern Dry Upland HW	462	114	576	20
Northern Mesic HW	141	43	184	23
Loblolly	1062	473	1535	31
Slash	64	0	64	0
Miscellaneous System			**1026**	
Total	**2064**	**1048**	**4138**	

Holly Springs National Forest – 2021

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Ephemeral Ponds and Emergent Wetlands	95	0	95	0
Floodplain Forest	131	63	194	32
Shortleaf Pine-Oak Woodland	1684	3079	4763	65
Northern Dry Upland HW	1590	1672	3262	51
Northern Mesic HW	665	1310	1975	66
Loblolly	2780	4845	7625	64
Slash	0	232	232	100
Miscellaneous System			**2448**	
Total	**6945**	**11201**	**20594**	

Holly Springs National Forest – 2022

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Ephemeral Ponds and Emergent Wetlands	0	7	7	100
Floodplain Forest	344	138	482	29
Shortleaf Pine-Oak Woodland	3118	2776	5894	47
Northern Dry Upland HW	2786	2167	4953	44
Northern Mesic HW	1079	780	1859	42
Loblolly	4558	3767	8325	45
Slash	0	0	0	NA
Miscellaneous System			**3044**	
Total	**11885**	**9635**	**24564**	

Holly Springs National Forest – 2023

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Cypress Dominated Wetlands	6	0	6	0

Ephemeral Ponds and Emergent Wetlands	NA	NA	NA	NA
Floodplain Forest	27	247	274	90
Shortleaf Pine-Oak Woodland	4125	2343	6468	36
Northern Dry Upland HW	2403	2338	4741	49
Northern Mesic HW	831	1068	1899	56
Loblolly	3423	5133	8556	60
Slash	0	63	63	6
Miscellaneous System			**1540**	
Total	**10815**	**11192**	**23547**	

Tombigbee National Forest – 2020

Ecological System	**Dormant (Acres)**	**Growing (Acres)**	**Total (Acres)**	**% Growing**
Black Belt	14	0	14	0
Floodplain Forest	427	0	427	0
Loblolly	4670	0	4670	0
Northern Dry Upland HW	1071	0	1071	0
Northern Mesic HW	1642	0	1642	0
Shortleaf Pine – Oak Woodland	696	0	696	0
Miscellaneous System			**361**	
Total	**8520**	**0**	**8881**	

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Tombigbee National Forest – 2021

Ecological System	**Dormant (Acres)**	**Growing (Acres)**	**Total (Acres)**	**% Growing**
Floodplain Forest	0	223	223	100
Loblolly	1724	3539	5263	67
Northern Dry Upland HW	263	2308	2571	90
Northern Mesic HW	534	778	1312	59
Shortleaf Pine – Oak Woodland	855	1024	1879	54
Miscellaneous System			**170**	
Total	**3376**	**7872**	**11418**	

Tombigbee National Forest – 2022

Ecological System	**Dormant (Acres)**	**Growing (Acres)**	**Total (Acres)**	**% Growing**
Floodplain Forest	449	60	509	12
Loblolly	5648	558	6206	9

Northern Dry Upland HW	1084	106	1190	9
Northern Mesic HW	1950	155	2105	7
Shortleaf Pine – Oak Woodland	1192	72	1264	6
Miscellaneous System			**253**	
Total	**10323**	**951**	**11527**	

Tombigbee National Forest – 2023

Ecological System	Dormant (Acres)	Growing (Acres)	Total (Acres)	% Growing
Black Belt Prairie	0	14	14	100
Floodplain Forest	123	76	199	38
Loblolly	3608	3116	6724	46
Northern Dry Upland HW	1343	1596	2939	54
Northern Mesic HW	390	815	1205	68
Shortleaf Pine – Oak Woodland	276	960	1236	78
Miscellaneous System			**1578**	
Total	**5740**	**6577**	**13895**	

Table 27. Fire Return Interval (Forest Tables for Summary Period FY2020-2023)
Fire interval calculated from utilizing acres within burn units only. Small ecosystems embedded within larger ecosystems have a lower confidence level regarding fire interval and seasonality due to spatial layers utilized for analysis.

Ecological System	Fire Interval (Years)	% Growing
Black Belt Prairie*	1.5	70
Floodplain Forest	7.5	43
Herb. Seepage Bogs and Flats	13.1	0
Jackson Prairie**	2	50
Loblolly Pine	7.2	54
Near-Coast Pine Flatwoods	6.9	16
Northern Dry Upland Hardwood	5.3	48
Northern Mesic Hardwood	5.4	41
Shortleaf Pine-Oak	6.5	46
Slash Pine	6.5	41
Southern Dry Upland Hardwood	6.9	53
Southern Loess Bluff	NA	NA
Southern Mesic Slope	4.7	48
Upland Longleaf Pine	6.5	50

***Black Belt Prairie interval and seasonality analysis only performed on 120-acre site on the Tombigbee National Forest.**
****Jackson Prairie interval and seasonality analysis performed on the Harrell Prairie site on the Bienville National Forest.**

Table 28. Burn Acres Chart Averages

Year	Bienville	Chickasawhay	De Soto	Holly Springs	Homochitto	Tombigbee	Total
2014	24961	29013	85114	20868	29157	3605	192718
2015	9405	14248	41285	10437	5152	3188	83715
2016	16703	26238	44166	20710	30399	14574	152790
2017	14843	14931	24873	16722	3101	3615	78085
2018	24265	33518	62575	21121	4553	11158	157190
2019	17232	18910	13162	12619	5853	5253	73030
2020	9380	13753	46737	4138	10174	8881	93064
2021	39591	34739	35879	20594	24496	11418	166717
2022	39254	33462	52143	24564	32347	11527	193297
2023	41327	35562	42916	23547	27124	13895	184371
AVERAGES							
10 yr.	23696	25437	44885	17532	17236	8711	137498
5 yr.	29357	27285	38168	17093	19999	10195	142096
3 yr.	40057	34588	43646	22902	27989	12280	181462
2 yr.	40291	34512	47530	24055	29736	12711	188834

2014-2023 section has green blocks showing where LRMP objective acres were achieved. Averages portion has green blocks showing a positive increase from the 10-year average.

Acres of longleaf pine planted by year, and number of acres of longleaf pine classified in Forest Service Vegetation Management Database (FSVEG) –

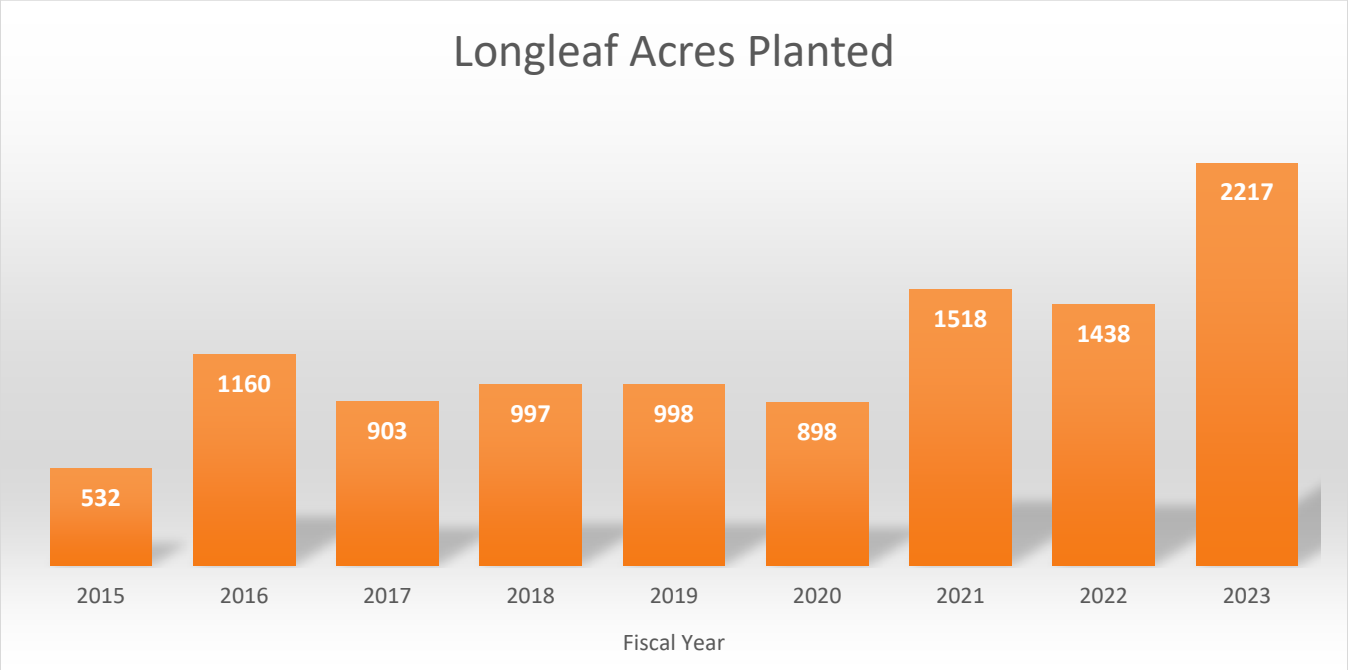


Figure 3. Acres of Longleaf Pine Planted by Year.

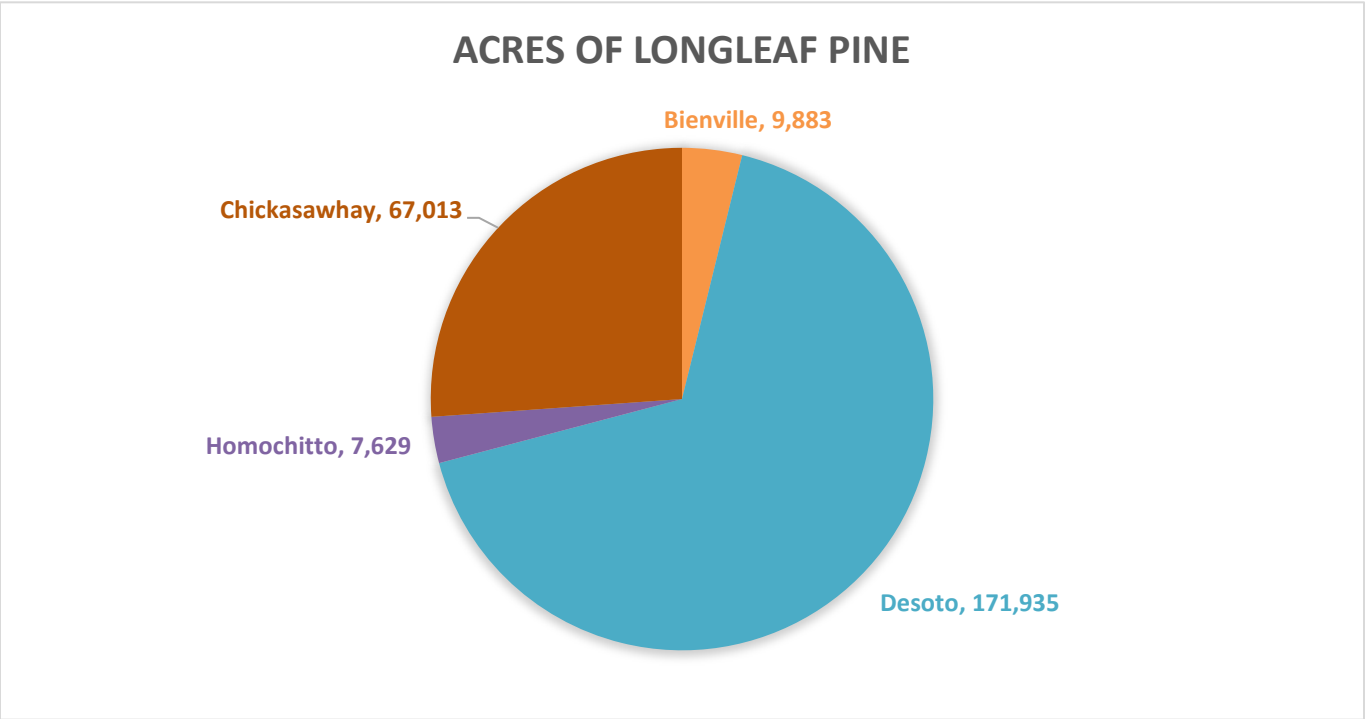


Figure 4. Acres of Longleaf Pine Currently Across Ranger Districts.

Monitoring Discussion and Findings:

Abundance and distribution of ecological systems – The lands within the National Forests in Mississippi support a broad range of ecological systems and species. Ecological systems (or ecosystems) represent recurring groups of biological communities found in similar physical environments that are influenced by similar dynamic ecological processes, such as fire or flooding. Ecosystem diversity and species diversity are closely connected, and by sustaining a diversity of ecosystems, National Forest System lands support ecological conditions for diverse plant and animal species (NFMS LRMP).

Existing ecosystems on the National Forests in Mississippi generally include a variety of widely distributed native pine and hardwood ecological systems, as well as rare communities such as prairies, bogs, and savannas. Twenty-four different ecological systems occur across the Forests, including several aquatic systems. The desired conditions of the NFMS are intended to shift away from the mass plantings of loblolly and slash pines and begin restoring and expanding native longleaf pine, shortleaf pine-oak, and floodplain forests ecosystems, and continue maintaining and enhancing native hardwoods and rare communities such as native prairies and bogs (NFMS LRMP).

The distribution of ecological systems across the forests are making progress towards the goals listed in the LRMP for several ecological systems; however, enhancing native hardwoods and rare communities needs more emphasis to increase improvements within these ecological types. Data gaps could be the issue with several of the hardwood types (Northern Dry Upland Hardwood Forest and Southern Dry Upland Hardwood Forest) and updated inventories might correct some of the apparent shortages when compared to 1st decade goals.

Interior Shortleaf Pine-Oak Forest and Woodland acreage across the NFMS is 51,700 with a goal of having 62,000 present at the end of the first decade. As stated earlier, recent inventory data are mainly available for a small percentage of projects that have been done over the last decade or so and could be lacking in the realistic acreages present.

Loblolly and Slash Pine types are 376,715 acres and 110,299 acres, respectively. These ecological systems are still above the desired acreages due to numerous reasons; however, they are trending in the right direction as increased longleaf pine restoration is implemented across the forest.

Prairie restoration on the Bienville and Tombigbee National Forests are both short of the goal of 1,200 acres and 600 acres, respectively. Bienville has approximately 160 acres designated as Jackson Prairie and Tombigbee has approximately 383 acres designated as Black Belt Calcareous Prairie. The Bienville National Forest has a prairie restoration project in the works that will move the needle toward additional acreage in this functioning ecosystem; however, the goal of 1,200 acres will be hard to meet during the first decade considering the current status. Multiple years of southern pine beetle outbreaks reduced the Bienville National Forest's ability to carry out planned projects to meet certain goals due to the vast amount of emergency response required to manage the pest infestation. Tombigbee National Forest also had several years with large amounts of tornado damage that reduced available manpower to deal with typical project work and was instead focused on the response to storm damage and the salvage and potential restoration of those sites.

Longleaf pine ecological systems are trending upwards as desired by the LRMP and should continue to do so with the clear goal of converting loblolly and slash pine stands to longleaf, on suitable sites. The amount of Interior Upland Longleaf Pine Woodland is up approximately 10,000 acres from 2005 forest data.

Forest structure measured by age class – Structure and age diversity are both important characteristics of forested ecological systems. Every forested community consists of a mixture of age classes and a diversity of vertical structure, with young growth replacing losses due to natural decadence, storm events, pest infestations, and wildfires. Structure is also important to non-forested systems such as grasslands and shrub/scrub habitats.

The goal for age class distributions at the end of the 1st decade is 2% in 0-10, 37% in 11-59, and 61% in 60 + age class. This trend lends itself to a long rotation age due to the amount of the forest in regeneration. Longleaf pine specifically has an increased goal of 5% in 0-10 age class with an understanding of it being higher in the early stages of converting off-site species to longleaf. Current conditions are very close to the 1st decade goal with 2% in 0-10, 34% in 11-59, and 64% in 60+ age class. With the current Forest Plan objectives of promoting restoration of longleaf pine from off-site species, the age class distribution is trending in the right direction to increase the number of acreages in the 0-10 age class and still be heavily skewed in the older age classes.

Fire return interval and percent of growing season burns by system – The majority of the ecosystems on the NFMS are within the range of percent growing season listed in the plan, while the Southern Mesic is the only system meeting the objective fire return interval in the LRMP. The majority of the systems are outside of the objective fire return interval and acres accomplished targets.

The smaller systems embedded within larger systems have low accuracy and precision regarding the data. This is due to the spatial ecosystem layer not correctly identifying these systems. The prairie systems, herbaceous seepage bog, and wet pine savanna are all examples of systems that do not have accurate spatial mapping in the ecosystem layer utilized. Also, the spatial ecosystem layer utilized for this geospatial analysis is older than 10 years old, which has not been updated with restoration efforts that have occurred on the landscape. For greater accuracy and confidence, there is a need to update our ecosystem layer on the GIS drive.

Another issue found through this spatial analysis is the difference between spatial and tabular reporting. 7 percent of the prescribed burns during the timeframe of this analysis do not have a spatial component tied to their tabular entry. Therefore, 42,819 acres burned within this four-year period have not been assigned to a footprint on the landscape.

Acres of longleaf pine planted by year, and the number of acres of longleaf pine classified in Forest Service Vegetation Management Database (FSVEG) – Since the 2014 LRMP, there has been an increase in acreage of longleaf pine-dominated ecosystems. Conversion of the loblolly and slash pine forest ecological systems to appropriate ecological systems is the highest priority for long-term sustainability of the forest. Restoration remains a long-term goal for longleaf pine forests on the NFMS, but the rate of progress will be slow given current program levels and competing Plan needs. As seen in Figure 3, 10,661 acres were planted since 2015 along with almost 2,000 acres of regeneration burns. Prescribed burning throughout longleaf dominated ecosystems is paramount to managing offsite tree species such as loblolly pine from outcompeting longleaf and taking over. Districts should continue to restore longleaf sites through planting and using timber harvest and prescribed fire to manage offsite species.

Adaptive Management Considerations:

The Forest Plan Monitoring Program is meant to "enable the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed" (36 CFR 219.12).

Abundance and distribution of ecological systems – The abundance of ecological systems on the NFMS is trending in the right direction with the exception of prairies and shortleaf pine restoration areas. The absence of consistent data to sufficiently analyze forest types and conditions is an issue that needs to be addressed to promote increased accuracy across the forest. Some data insufficiencies will correct themselves as inventories are completed and databases of record are updated to reflect current conditions. Management activities are focused on the goals of the forest with clear expectations of promoting longleaf pine restoration, rare species, and more efficient management. The continuation of a clear 5-year goal, by district, depicting areas with good/fair/poor conditions will contribute to management efficiencies and focus efforts toward realistic goals and desired outcomes given forest plan objectives. An increased focus on prairie restoration would be beneficial to the NFMS in achieving the desired objectives in these special ecological systems.

Forest structure measured by age class – Based on the findings in the discussion above, there is no recommended need for change to age class manipulation at this time, as management activities are trending toward the desired objective.

Fire return interval and percent of growing season burns by system – Accomplished prescribed fire acres for the years monitored ranged between 93,064 acres to 193,297 acres. The LRMP states an objective of an annual average of 220,000 acres will be targeted across the landscape and states fire return interval ranges for each ecosystem. Prioritization is key for ecosystem restoration and maintenance moving forward, as accomplished have been under the objective acres. While accomplished acres have been under the objective acres in the LRMP an increase across the forest on the 5-year, 3-year, and 2-year average was achieved when compared to the 10-year average. Focusing on footprints where prescribed fires has been accomplished is key to continue trends towards better condition class for ecosystems across the forest. Increasing the target acres when weather conditions, agency capacity, or opportunities for joint efforts with partners allows is also important. 2020 saw a decrease in acres due to restrictions from COVID-19 and 2023 had a decrease in acres due to the national prescribed fire review. Therefore, a look at the numbers should be on a 10-year or 5-year average, which is 137,498 acres and 142,096 acres respectively. Those accomplished acres are missing the average target in the LRMP by approximately 80,000 acres. A prioritization with an increase in scale needs to be addressed to reach desired fire return interval goals set forth in the LRMP.

Acres of longleaf pine planted by year, and number of acres of longleaf pine classified in Forest Service Vegetation Management Database (FSVEG) – Based on the findings in the discussion above, no recommended need for change in this monitoring element. However, there is a need for better data management throughout the Forest in databases such as FSVEG and FACTS.

MQ 2: A.2 Are wetland systems present on appropriate sites and functioning across the landscape?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 2.3 Ecosystem Diversity

Monitoring Indicator(s):

1. Distribution and abundance of wetland systems
2. Intact hydrologic function
3. Presence of native species

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Distribution and abundance of wetland systems – No data.

Intact hydrologic function – No data.

Presence of native species –

Schaefer, J.F. & Clark, S. (2019) Re-inventory of Fish Communities and Fish Habitats in Mississippi National Forests (Interim Report).

Warren, M.W., S.B. Adams, W.R. Haag, J.G. McWhirter, L.G. Henderson. 2002. Fish and fish habitat survey in Mississippi National Forests: fish community sampling 1999-2001. Report, Aquatic and Terrestrial Fauna Team, Center for Bottomland Hardwoods Research, Southern Research Station, Oxford, MS.

Figure 5. University of Southern Mississippi Stream Survey Crew Collecting Fish Sample.

Background & Driver(s):

Distribution and abundance of wetland systems – No data.

Intact hydrologic function – Understanding patterns of long-term fish assemblage (presence of native species) and habitat structure (intact hydrologic function) can provide insight into the impacts of natural or man-made alterations such as environmental or climate change.

Presence of native species – Rivers and streams consist of all lotic (flowing water) aquatic systems on the National Forests in Mississippi. These systems provide critical habitats for fish, mussels, invertebrates, reptiles, and amphibians. The desired conditions for these habitats are that they have intact riparian vegetation and connectivity of habitats for riparian-dependent species.

What monitoring activities have been conducted since the last evaluation?

Distribution and abundance of wetland systems – From 2015-2022 the University of Southern Mississippi (USM) sampled 366 stream sites (2015 – 37 sites, 2016 – 45 sites, 2017 – 47 sites, 2018 – 47 sites, 2019 – 45 sites, 2020 – 50, 2021 – 46, and 2022 - 49). For the purposes of this monitoring report, comparisons were made to historical samples (1999 – 2009) to assess trends in species diversity, canopy cover, and the presence of large woody debris (LWD). Sample methods, sample locations, other metrics measured, and comparisons of the survey to historical surveys are described in detail in "Re-inventory (2019) of Fish Communities and Fish Habitats in Mississippi National Forests (Interim Report)".

Intact hydrologic function – No data.

Presence of native species – No data.

Monitoring Results

Distribution and abundance of wetland systems – No data.

Intact hydrologic function –

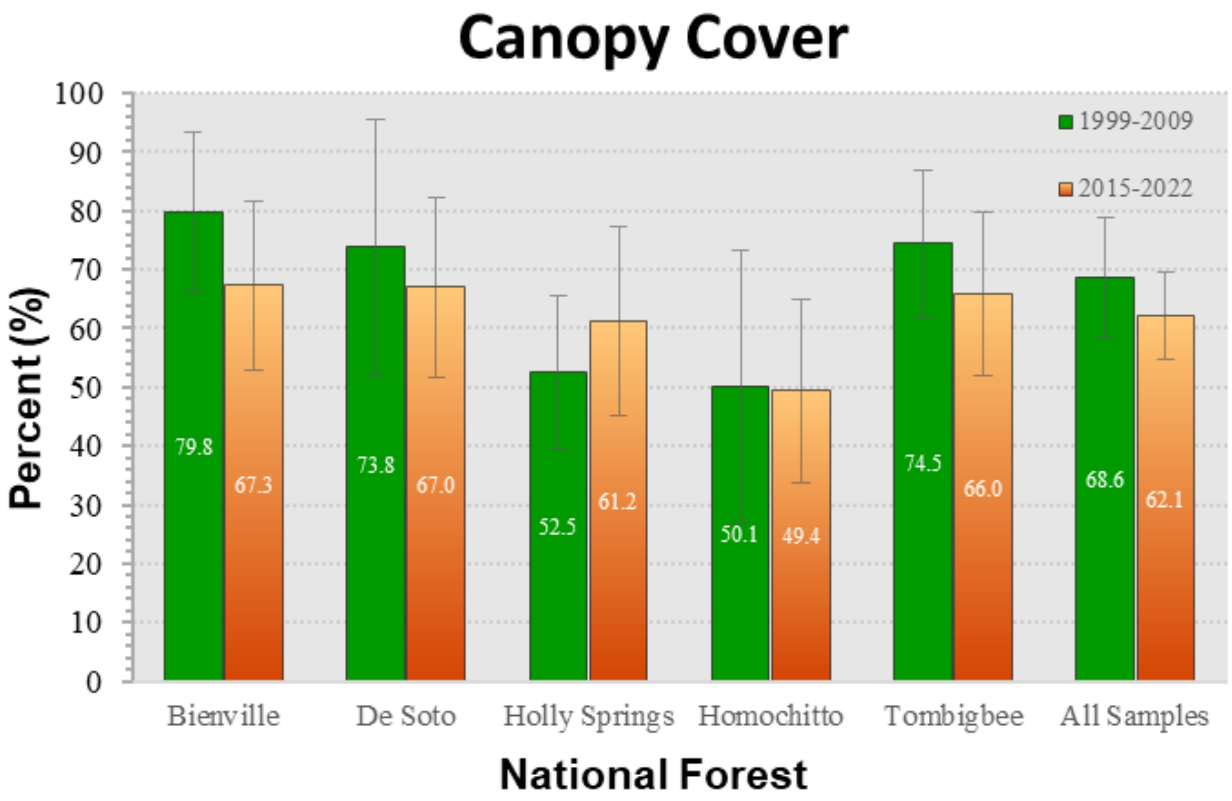


Figure 6. Mean (± 1 SD) Canopy Cover in the Historical (1999-2009) and Current (2015-2022) Surveys.

Canopy cover was the metric used to evaluate the effectiveness of streamside management zones (SMZ). Canopy cover is the percentage of a sample area shaded by vegetation. Canopy cover plays an important role in stream water quality. The canopy provides nutrient inputs through litter fall. It also provides shade that keeps the stream water cool. A large canopy cover may indicate a large amount of vegetation along the stream. This results in increased stabilization of the stream bank by roots, and therefore decreased erosion.

Large woody debris (LWD) was the metric used to evaluate the diversity of habitat within a stream. Large woody debris is needed to provide attachment sites for invertebrates and cover for fish. It is also needed to help create a diversity of habitats within the stream (pools, riffles, and runs). This measure is simply the presence/absence of large woody debris at selected transects within a sample site of a stream.

What level of confidence is there in the accuracy and precision? A standardized sampling protocol established by Warren et al (2002) to sample stream fish assemblages and quantify available habitats within Mississippi's National Forests was used for current samples (2015-2019). Due to the total number of baseline data sample sites established (300), all could not be sampled within a given year. Therefore, because random sites (42) were selected each year, the data will have some level of variance. Confidence intervals associated with the data are represented by error bars on the charts.

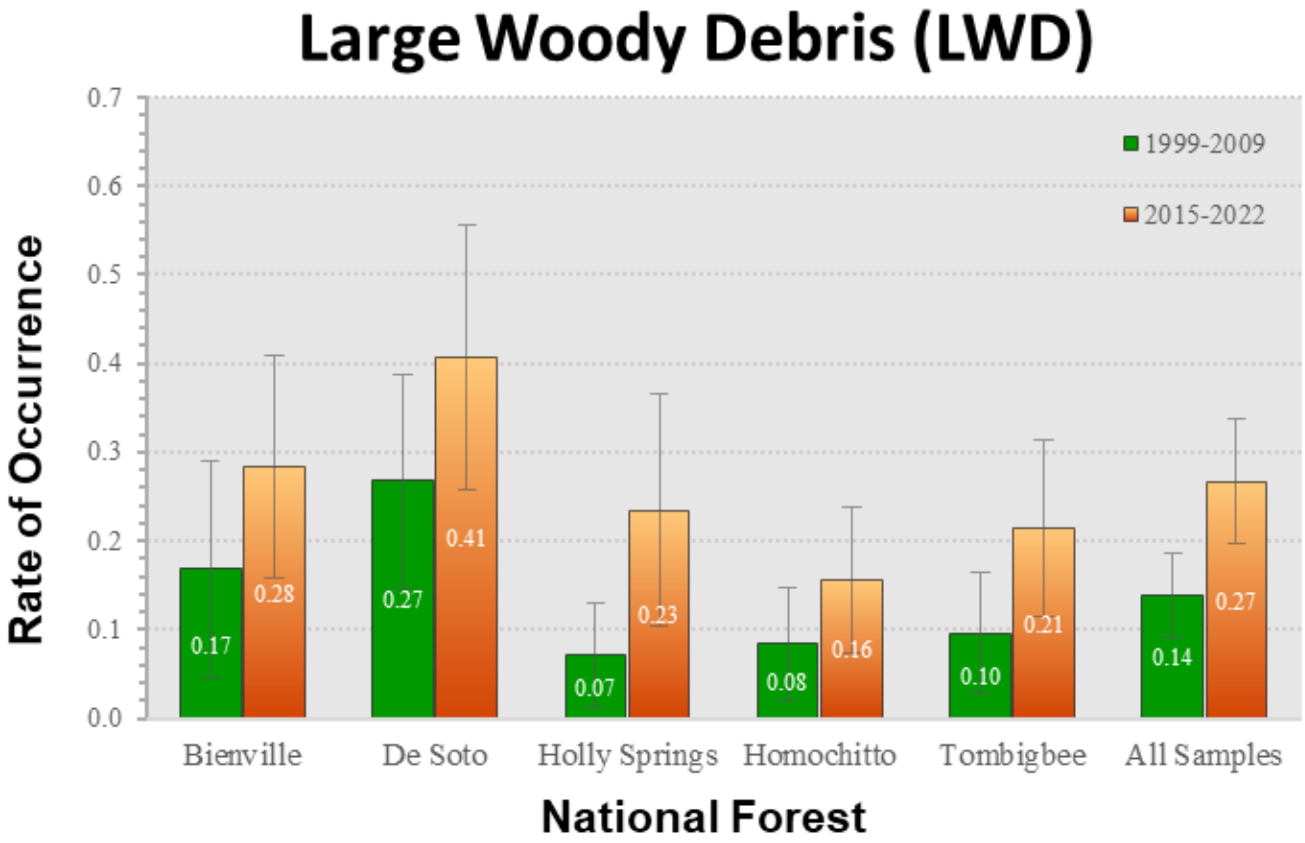
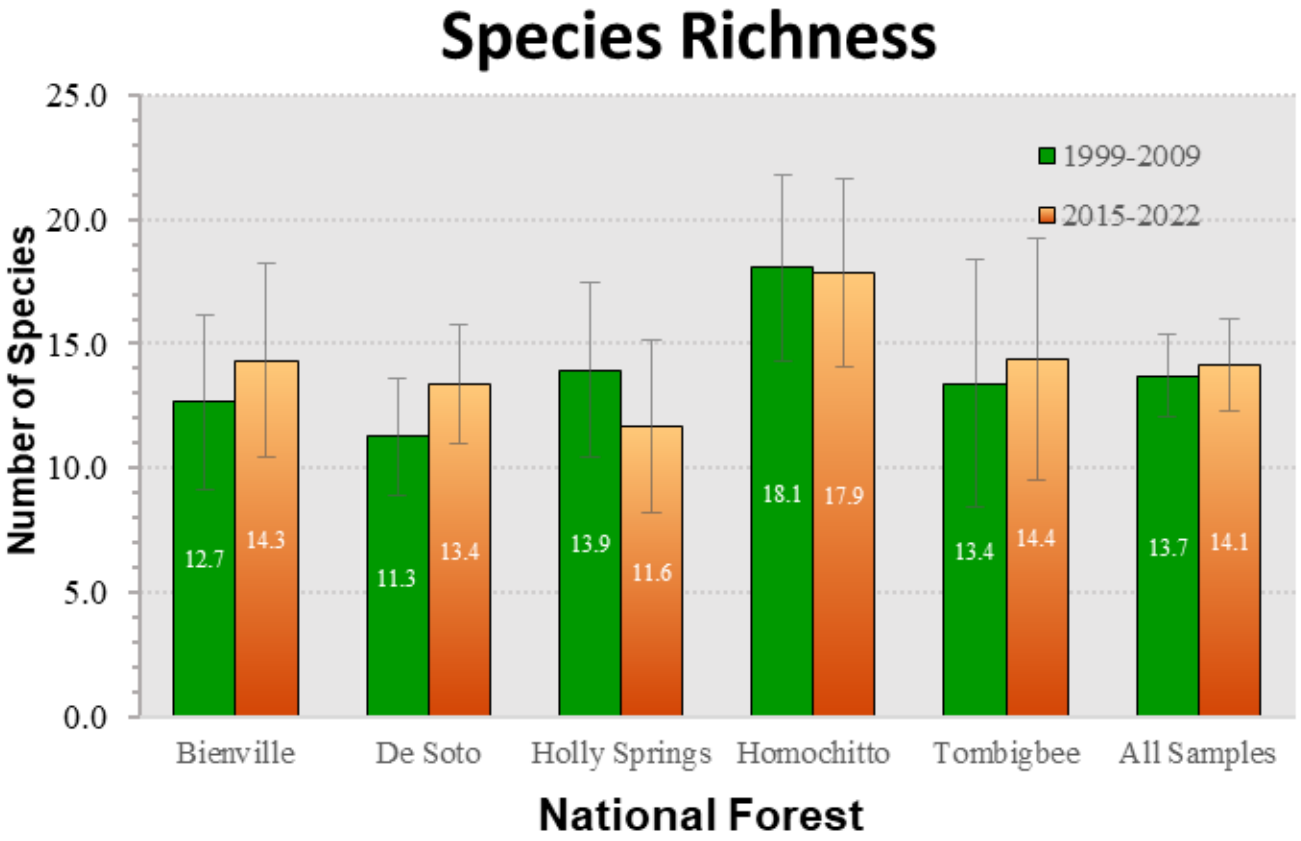


Figure 7. Mean (+ 1 SD) Large Woody Debris in the Historical (1999-2009) and Current (2015-2022) Surveys.

Presence of native species – Species richness was the metric used to evaluate temporal patterns of fish assemblages. Species richness is the number of different species represented in an ecological community, landscape, or region. Species richness is simply a count of species, and it does not take into account the abundance of the species or their relative abundance distributions.

Figure 8. Mean (+ 1 SD) Species Richness in the Historical (1999-2009) and Current (2015-2022).



Monitoring Discussion and Findings:

Distribution and Abundance of Wetland Systems – No data.

Presence of Native Species – Patterns of species richness remained relatively consistent between the historic and current surveys across individual national forests as well as across all samples. This pattern suggests a stable trend and meets the desired condition.

Intact Hydrologic Function – Currently no literature is available suggesting canopy cover objectives for low gradient streams in the southern U.S. However, when current samples were compared to historical samples, patterns of stream canopy cover remained relatively consistent across most individual national forests as well as across all samples. Data trends on Bienville National Forest suggest a slight decrease over time. This finding meets the desired condition for intact riparian vegetation.

Stable to slightly increasing LWD indicates an improvement in habitat for aquatic species is making progress toward forest plan desired condition of stream habitat connectivity for riparian dependent species.

Adaptive Management Considerations:

Distribution and Abundance of Wetland Systems – No data.

Presence of Native Species – No data.

Intact Hydrologic Function – The forest plan monitoring program is meant to "enable the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed" (36 CFR 219.12).

Due to the amount of variability that occurs within stream systems, monitoring of streams should continue on an annual basis to allow the ability to determine if they are continuing to provide intact hydrologic function and native species. Based on the findings in the discussion above, there is no recommended need for change.

MQ 3: A.3 Are annual average forest-wide and ecological system objectives being achieved?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 3.2 Ecosystem Diversity

Monitoring Indicator(s):

1. Lake and stream improvement acres and miles
2. Ecosystem restoration acres by type
3. Acres identified for management of old growth compared to 10% objective for each district
4. Forest thinning acres by type
5. Prescribed burning acres by system and percentage of burns by season

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information

Lake and stream improvement acres and miles – No data.

Ecosystem restoration acres by type – No data.

Acres identified for management of old growth compared to 10% objective for each district – No data.

Forest thinning acres by type – No data.

Prescribed burning acres by system and percentage of burns by season – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

Background & Driver(s):

Lake and stream improvement acres and miles – The desired conditions for rivers, streams, and lakes are to have good water quality, water quantity, site productivity, intact riparian vegetation, and sustainable sport fisheries. Forest Service management activities for these aquatic systems are focused on producing these desired conditions.

Ecosystem restoration acres by type – Restoring and maintaining a diversity of native ecological systems is the foundation of the Land and Resource Management Plan (LRMP). As we implement the plan, striving to achieve desired conditions and objectives, following standards and guidelines, and recognizing the contribution of unique geographic areas, ecosystem functionality should improve. This should not only improve ecosystem diversity, but also provide for many of the needs of plant and animal species in the forest.

To achieve the desired conditions for ecosystem diversity, we need to restore native ecological systems on suitable sites. We plan to accomplish these conversions primarily through vegetation management programs that result in improved habitats for a variety of plants and animals (including threatened, endangered, sensitive, and locally rare species) and increased resilience to the potential effects of climate change. Restoration activities will mainly involve reducing loblolly and slash pine plantations in favor of reestablishing longleaf pine, shortleaf pine, and hardwood communities. Restoring

and maintaining less common communities on appropriate sites will further enhance ecosystem diversity and conserve rare systems (NFMS LRMP).

Acres identified for management of old growth compared to 10% objective for each district – A number of selection criteria were used to identify stands for a preliminary list of possible old growth. These included lands withdrawn from timber production, red-cockaded woodpecker clusters, late-seral designations, stands at or above Southern Region minimum old-growth age, and rare community types.

The areas on the preliminary list of possible old growth range from small to large-sized patches. The Southern Region Guide establishes minimum size criteria for small, medium, and large-sized areas. Medium-sized areas are 100 to 2,499 acres. Small old-growth patches are less than 100 acres. Large-sized areas are larger than 2,499 acres. The Black Creek Wilderness and the connected wild and scenic river corridor constitute the only large possible old-growth area on the National Forests in Mississippi. Some research natural areas and other administratively designated unregulated areas provide medium-sized possible old-growth patches. The remainder of the preliminary list of possible old-growth is made up of small-sized possible old-growth patches (NFMS LRMP).

Forest thinning acres by type – This monitoring element focuses on the forest's ability to maintain the health of an ecosystem by providing treatments to stands in poor conditions. These thinning treatments will improve the light penetration to the forest floor and promote an increased herbaceous layer available for native wildlife. Thinning will also benefit the growth and health of the forests and sustain foraging and nesting opportunities needed by endangered species and other native wildlife.

Prescribed burning acres by system and percentage of burns by season – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

What monitoring activities have been conducted since the last evaluation?

Lake and stream improvement acres and miles – No data.

Ecosystem restoration acres by type – The original evaluation in the NFMS Land and Resource Management Plan (LRMP) identified ecological systems across the landscape and a goal to restore ecosystems through management practices. Forest Activity and Tracking System (FACTS) is the database of records that is used to track activities across the forest that affect changes in ecosystem types by treatment activity. FACTS is updated throughout the year as activities happen and has a spatial component that assists with locations and ecosystems improved across the forest.

Acres identified for management of old-growth compared to 10% objective for each district – Field Sampled Vegetation (FSVEG) is the database of record for tracking inventories across the forests that measure species, size, age, and condition of forest stands. This database is updated yearly as prescriptions are completed for projects to be implemented.

Forest thinning acres by type – The original evaluation in the NFMS Land and Resource Management Plan (LRMP) identified ecological systems across the landscape and a goal to restore ecosystems through management practices. Forest Activity and Tracking System (FACTS) is the database of records that is used to track activities across the forest that affect changes in ecosystem types by treatment activity. FACTS is updated throughout the year as activities happen and has a spatial component that assists with locations and ecosystems improved across the forest.

Prescribed burning acres by system and percentage of burns by season – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

Monitoring Results:

Lake and stream improvement acres and miles – Activities for improving lake habitat for enhancing recreational fishing activities included liming and fertilization, aquatic weed control, fish stocking, angler access improvement, adding fish attractors, nuisance animal control, and water level manipulation.

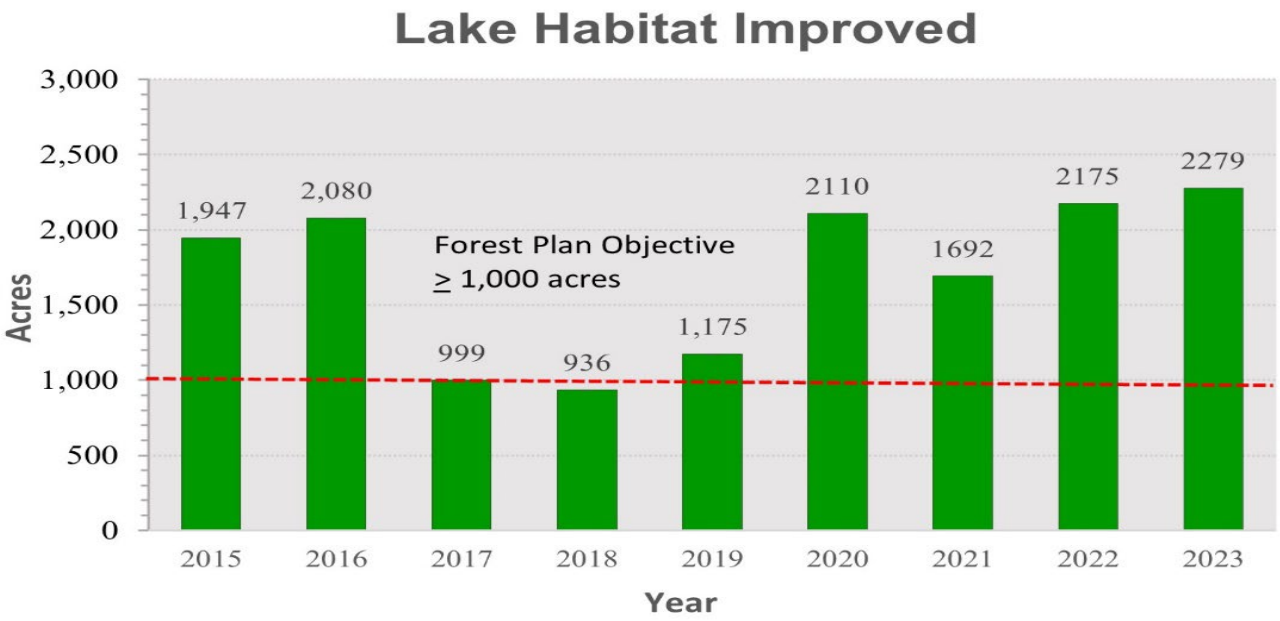


Figure 9. Lake Habitat Improved (acres) Across all National Forest Units (2015 - 2023).

The strategy for restoring, maintaining and enhancing rivers and streams emphasized maintain water quality and stream restoration. Annual stream clean-up activities were performed by volunteer groups to achieve this objective.

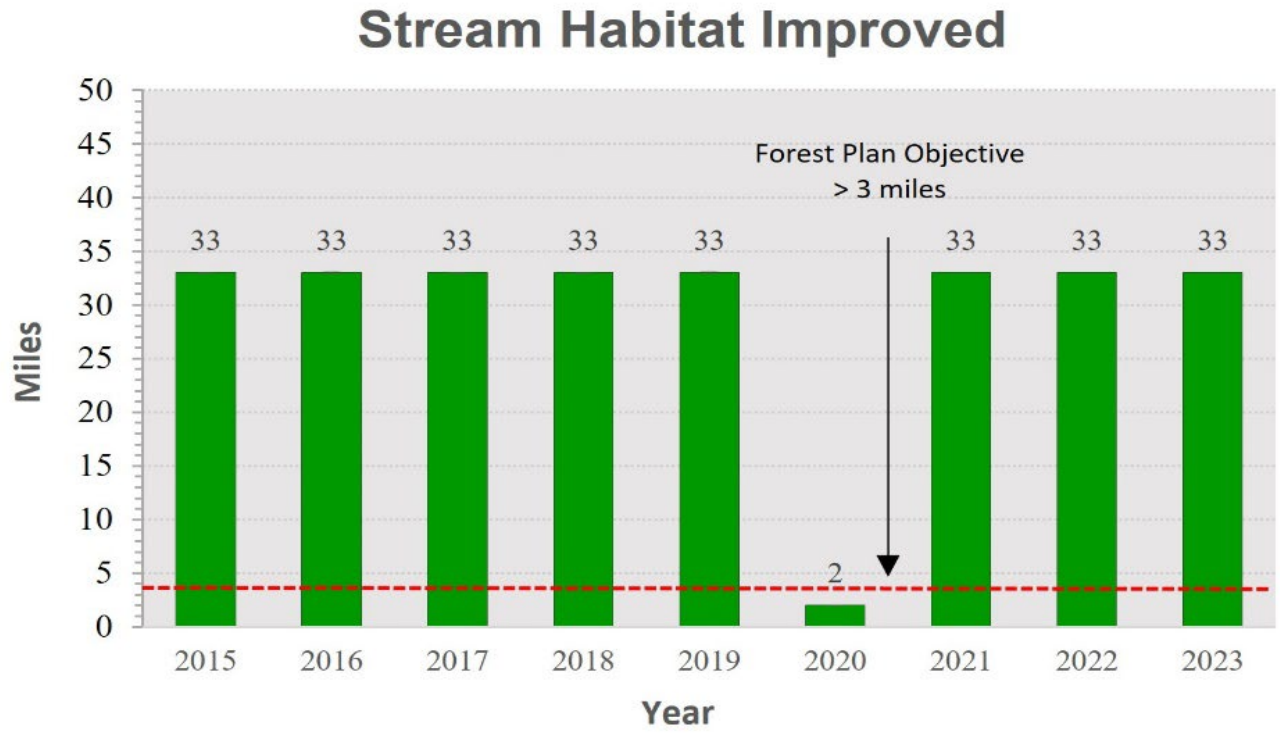


Figure 10. Stream Habitat Improved (miles) Across all National Forest Units (2015-2023).

What level of confidence is there in the accuracy and precision? The level of confidence in the reported accomplishments is high. Annual accomplishments for these Forest Plan objectives are reported in the Watershed Improvement Tracking (WIT) database.

Ecosystem restoration acres by type –

Table 29. Ecosystem Restoration by Ecological System Across National Forests in Mississippi, 2015-2023.

Ecosystem Restoration by Type										
Ecosystem Type	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
Shortleaf Pine- Oak Forest and Woodland	0	0	0	347	327	197	0	0	136	**1,007**
Upland Longleaf Pine Woodland	532	1,160	903	997	998	899	1518	1438	2217	**10,662**
Near Coast Pine Flatwoods	0	16	5	0	0	0	0	0	0	**21**
Herbaceous Seepage Bog	0	1	0	0	0	0	0	0	0	**1**
Lower MS River Bottomland and Floodplain Forest	139	290	0	0	0	0	0	0	0	**429**
Coastal Plain Seepage Swamp and Baygall	0	21	32	25	7	0	0	0	0	**163**
Loblolly Pine Forest	0	0	61	0	0	0	0	0	0	**61**
Total	**671**	**1,488**	**1,001**	**1,369**	**1,332**	**1,096**	**1,518**	**1,438**	**2,353**	**12,344**

Acres identified for management of old growth compared to 10% objective for each district –

Table 30. Old Growth Designation Across National Forests in Mississippi by Unit (2015-2023).

Acres Identified for Old Growth in FSVEG								
Selection Criteria	**Bienville**	**DeSoto**	**Homochitto**	**Chickasawhay**	**Delta**	**Holly Springs**	**Tombigbee**	**Total**
Wilderness (3)	0	5,841	0	0	0	0	0	5,841
Research Natural Area (4)	208	712	228	539	670	186	803	3,346
Other administratively designated unregulated areas (5)	310	4,299	70	561	3,397	235	811	9,683
Red-cockaded woodpecker clusters (6)	8,270	1,408	4,337	3,114	0	0	0	17,129
Late Seral (7) & R8 old growth minimum age (8)	10,834	18,139	7,058	7,155	4,745	4,855	3,002	55,788
Rare community types (9)	600	959	1,131	66	0	361	189	3,306

Total	20,222	31,358	12,824	11,495	8,812	5,687	4,805	95,093
% Designated	**11%**	**9%**	**7%**	**8%**	**15%**	**4%**	**7%**	**8%**

Forest thinning acres by type –

Table 31. Forest Thinning by Ecosystem Type, National Forests in Mississippi (2015-2023).

Commercial Thinning by Ecosystem Type										
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
Floodplain Forest	54	68	70	42	54	15	117	10	12	**442**
Interior Upland Longleaf Pine Woodland	2,685	2,709	3,247	1,061	1,187	171	1,192	1,375	1,197	**14,823**
Near Coast Pine Flatwoods	5	98		37	6		21	28	19	**214**
Northern Mesic Hardwood Forest				7					12	**19**
Southern Mesic Slope Forest	1,237	1,388	1,081	15			1,623	7		**5,350**
Herbaceous Seepage Bog		95	1	3			14	5	2	**119**
Loblolly Pine Forest	1,253	779	797	388	334	456	1,411		486	**5,418**
Lower Mississippi River Bottomland and Floodplain Forest	26									**26**
Slash Pine Forest	1,043	1,470	409	621	966	158	588	510	1,403	**7,168**
Dry Upland Hardwood Forest	36	1	37		1		18	2	41	**136**
Seepage Swamp and Baygall	72	74	96	37	68		6	1	86	**440**
Total	**6,410**	**6,681**	**5,739**	**2,211**	**2,615**	**800**	**4,990**	**1,938**	**3,258**	**34,642**

Prescribed burning acres by system and percentage of burns by season – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

Monitoring Discussion and Findings:

Lake and stream improvement acres and miles –

Lake Habitat Improved

The Forest achieved or surpassed its annual minimum objective of 1,000 acres for most years (Figure 9). Annual accomplishments for this Forest Plan objective are reported in the Watershed Improvement Tracking (WIT) database. These findings meet the desired condition of maintaining sustainable sport fisheries.

Stream Habitat Improved

The Forest surpassed its annual minimum objective of 3 miles for all years except 2020 (Figure 10). During 2020 many activities across the country were restricted as a result of the COVID-19 pandemic. Annual accomplishments for this Forest Plan objective are reported in the Watershed Improvement Tracking (WIT) database. These findings meet the desired condition of maintaining good water quality, water quantity, site productivity, and intact riparian vegetation.

Ecosystem restoration acres by type – The lands within the National Forests in Mississippi support a broad range of ecological systems and species. Ecological systems (or ecosystems) represent recurring groups of biological communities found in similar physical environments that are influenced by similar dynamic ecological processes, such as fire or flooding. Ecosystem diversity and species diversity are closely connected, and by sustaining a diversity of ecosystems, National Forest System lands support ecological conditions for diverse plant and animal species (NFMS LRMP). Existing ecosystems on the National Forests in Mississippi generally include a variety of widely distributed native pine and hardwood ecological systems, as well as rare communities such as prairies, bogs, and savannas. Twenty-four different ecological systems occur across the Forests, including several aquatic systems. The desired conditions of the NFMS are intended to shift away from the mass plantings of loblolly and slash pines and begin restoring and expanding native longleaf pine, shortleaf pine-oak, and floodplain forests ecosystems, and continue maintaining and enhancing native hardwoods and rare communities such as native prairies and bogs (NFMS LRMP).

The restoration efforts across the forest are restoring an average of 1,154 ac./yr. across all ecosystem types, which is below a forest plan goal of approximately 2,500 ac./yr. Longleaf pine restoration has a goal of 13,000 acres at the end of the 1st decade and currently, the forests have restored approximately 8,182 acres at the 8-year mark. Shortleaf pine has a goal of 2,800 acres in the 1st decade and currently, the forests have restored approximately 1,021 acres. Bottomland hardwood has a goal on Delta National Forest of 1,400 acres during the 1st decade and approximately 858 acres have been restored.

Restoration efforts are ongoing and will continue striving towards forest plan goals; however, pest and storm damage control has reduced the amount of manpower available to address restoration efforts over the last 5-8 years. Longleaf pine is a priority target that is increasing as projects can convert off-site slash and loblolly plantations. The next two years of planned regeneration are going to average just below the 1,300 ac./yr. target and should continue to trend up; however, the 1st decade target will most likely not be met.

Acres identified for management of old-growth compared to 10% objective for each district – The old-growth network should consist of both small and medium-sized areas. The Southern Region Guide defines what constitutes a network. The regional guide does not require large-size old-growth areas for the National Forests in Mississippi and does not establish a required acreage of small or medium-sized old-growth. The revised forest plan strategy of managing for a network of small to medium-sized old-growth areas is based on an evaluation of the distribution of old-growth necessary to ensure the integrity of ecological functions. In addition to the 10 percent by district goal, each ranger district should evaluate current medium-sized possible old-growth and the ecological need for medium-sized old-growth areas and designate a minimum of 1 percent of the unit's forested acres to manage as medium-sized old growth (NFMS LRMP).

As shown in Table 33 above, the objective of 10% across the forest has not been met but is at 8% largely because of the large percentage identified in Delta National Forest. Each district also has a goal of 10% and some work is needed to properly designate areas in the FSVEG database to identify these areas for future old-growth. Delta and Bienville National Forests are the only two districts that have met their goal for designation.

Each district silviculturist, timber management assistant (TMA), and ranger will need to sit down and figure out areas that meet the current condition of old growth or possible future old growth and identify these areas in FSVEG spatially. There is flexibility in the forest plan to designate old growth and still implement treatments to promote the old growth structure should it be needed. The goal of having 1% of old-growth be medium-sized was not analyzed in this monitoring report, as districts need to identify areas spatially with the 1% in mind and it can be reported on the next biannual monitoring report.

Forest thinning acres by type – Ecological restoration is the primary management emphasis of this forest plan. Restoration objectives address forest health needs through improved species composition and structural and age diversity. Forest management practices are the means for carrying out restoration goals while sustaining healthy forests that are resilient to extreme natural events and supply desired goods and services (NFMS LRMP).

Thinning goals on the NFMS are 141,000 acres in the 1st-decade and will be hard to achieve given current staffing levels and budget allocations. As shown in Table 34 above, the NFMS has thinned approximately 34,642 acres over the last 9 years and is in the process of building on those acres yearly; however, the 1st-decade goal will not be met. Districts are tasked with timber targets that drive the amount of timber sold each year and district managers focus these target volumes in areas that will benefit the desired ecological restoration goals for that project area. The forest plan goals came from a lot of 1st thinning needs across districts and are still needed. The increased use of weight scale, stewardship contracting, Good Neighbor Authorities (GNA), and focused ecosystem restoration will assist with the backlog of thinning across the forest. The ability of a district program to implement and meet goals with current budgets and manpower will be very difficult, but the districts are focused on implementing projects where the most benefit will occur following treatment to the ecosystems as a whole and how they affect the larger landscape objectives of a forest.

The NFMS is currently in the process of securing a timber strike team that will be able to float between districts and assist with projects to increase the overall capability of the timber program. The addition of this strike team approach should directly impact the amount of thinning ready for sale and hopefully free up district personnel to move forward with additional projects across the district.

Prescribed burning acres by system and percentage of burns by season – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

Adaptive Management Considerations:

Lake and stream improvement acres and miles – The forest plan monitoring program is meant to "enable the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed" (36 CFR 219.12). Based on the findings in the discussion above, there is no recommended need for change.

Ecosystem restoration acres by type – Based on the findings above more restoration is needed to meet forest plan goals. Current management activities are restoring proper species as outlined and desired in the forest plan just not a rate to meet the goals of the forest plan. The implementation of a strike team and further support for contracting work where feasible along with examining regulations that take away efficiencies in timber sale preparation (i.e. size restrictions for weight scale, certification of cruisers/markers) could benefit the NFMS's ability to restore more land.

Acres identified for management of old-growth compared to 10% objective for each district – As discussed above, the district managers will need to meet and identify old-growth stands in FSVEG to meet at least the minimum requirements by district. These areas will need to be strategically identified in areas where they make the most sense and should require the least amount of anticipated changes in the near future to help promote consistency over the years. While the forest plan does indicate that these areas can be managed to maintain the desired structure of old-growth, they should be identified in areas where little active management is needed to reach the desired condition. Red-cockaded woodpecker (RCW) clusters are likely already designated for old-growth characteristics and will likely remain that way for many years. These clusters will reach a point where management is needed and the availability of other old-growth areas near these clusters will be needed to provide consistent nesting opportunities.

Forest thinning acres by type – As discussed above, an increase in the number of acres thinned is needed to reach the goals listed in the forest plan. The implementation of a strike team and further support for contracting work where feasible along with examining regulations that take away efficiencies in timber sale preparation (i.e. size restrictions for weight scale, certification of cruisers/markers) could benefit the NFMS's ability to thin more land.

Prescribed burning acres by system and percentage of burns by season – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

MQ 4: B.1 Are threatened and endangered species recovered or moving toward recovery?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 2.4 Species Diversity

Monitoring Indicator(s):

1. Threatened and endangered species status reports

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Threatened and endangered species status reports – No data.

Background & Driver(s):

Threatened and endangered species status reports – In the 2014 Revised Forest Plan, ten threatened and endangered species were identified as potentially occurring in the National Forests in Mississippi. Thirteen species were included in this monitoring indicator as species listing has changed over time. Throughout the plan, threatened and endangered

species protection and habitat enhancement are a priority. Their status, habitat conditions, and distribution vary across the Forests.

What monitoring activities have been conducted since the last evaluation?

Threatened and endangered species status reports – The latest species status reports written by the USFWS were used to determine the amount of recovery achieved and population trends across each species' range.

Monitoring Results:

Threatened and endangered species status reports –

Table 32. Threatened and Endangered Species Status Across the Forest.

Species	Classification	Review/ List Year	Recovery Priority Number	Recommend Classification	Recovery Achieved	Population Trend
Red-cockaded Woodpecker (Picoides borealis)	Endangered	2006	8C	No Change	0-25%	Improving
Indiana Bat (Myotis sodalis)	Endangered	2019	5	No Change	0-25%	Decreasing
Gopher Tortoise (Gopherus polyphemus)	Threatened	2011	8	No Change	0-25%	Decreasing
Dusky Gopher Frog (Rano sevosa)	Endangered	2015	5	No Change	0-25%	Improving
Northern Long-eared Bat (Myotis septentrionalis)	Endangered	Listed 2022	5	N/A	N/A	N/A
Pearl Darter (Percina aurora)	Threatened	Listed 2017	8	N/A	N/A	N/A
Pondberry (Lindera melissifolia)	Endangered	2014	8C	No Change	0-25%	Stable to Declining
Louisiana Quillwort (Isoetes louisianensis)	Endangered	2019	14	No Change	0-25%	Stable
Black Pine Snake (Pituophis melanoleucus lodingi)	Threatened	Listed 2015	3	N/A	N/A	N/A

Species	Classification	Review/ List Year	Recovery Priority Number	Recommend Classification	Recovery Achieved	Population Trend
Gulf Sturgeon (Acipenser oxyrinchus desotoi)	Threatened	2008	12	No Change	26-50%	Stable
Pallid Sturgeon (Scaphirhynchus albus)	Endangered	2014	2C	No Change	0-25%	Unknown
Mississippi Sandhill Crane (Grus Canadensis pula)	Endangered	2019	6C	No Change	26-50%	Stable
Louisiana Black Bear (Ursus americanus luteolis)	Delisted/Recovery	2016	N/A	Delisted	N/A	N/A

Monitoring Discussion and Findings:

Threatened and endangered species status reports – As seen in Table 35, species were included in this monitoring and evaluation question. Since the Forest Plan was written, 3 species were listed as threatened by the USFWS, and one of those was upgraded to endangered later:

Pearl darter

The Pearl darter, a small species of fish, was listed as threatened in 2015. Currently, the Pearl darter is only known to occur in seven drainages within the Pascagoula River basin in south Mississippi. It has been found in scattered locations within the Pascagoula, Leaf, Chickasawhay, Chunky, and Bouie Rivers; and the Black and Okatoma Creeks. Some of these drainages are found in the DeSoto Ranger District. The Pearl darter also was known to occur within the Pearl River system of Louisiana and Mississippi; however, it has not been collected there for the past 40 years and is considered extirpated from that drainage.

Pearl darters occur in slow-flowing, coastal plain rivers and creeks. There have been no comprehensive microhabitat studies on the Pearl darter; however, based on field observations, microhabitat features consist of a bottom substrate mixture of sand, silt, loose clay, gravel, organic material, and snags.

The primary threat to the Pearl darter is water quality degradation caused by pollution in association with land-surface, stormwater, and effluent runoff from urban and municipal areas. Sediment and silt degrade the habitat. Riverside urbanization may lead to organic wastes being released into the water. Sand and gravel mining occurs in the river system and destabilizes the substrate. Habitat destruction has led to the species' populations being split and isolated, creating a disjunct distribution. This split, apparent low population numbers and indications of the species' low genetic diversity all make it more likely that populations will become extirpated should a catastrophic event such as an oil or chemical spill occur. Forest Service activities have very little to no effect on this species as long as best management practices, standards, and guidelines are followed.

Northern long-eared bat

The northern long-eared bat (*Myotis septentrionalis*) (NLEB) was listed as threatened in 2015. This species potentially could be found in the Tombigbee, Holly Springs, Bienville, and Delta Ranger Districts. The NLEB is a migratory bat that

hibernates in caves, mines, and occasionally culverts and migrates to wooded areas to raise young over the summer. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live trees and snags (dead trees). NLEB seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices.

A final 4(d) rule was published in 2016 prohibiting incidental take of NLEB within a hibernation site or tree removal activities within a quarter mile of a hibernaculum or from activities that cut down or destroy known occupied maternity roost trees, or any other trees within 150 feet of that maternity roost tree, during the pup-rearing season (June 1 to July 31). There are currently no known maternity roost trees in the state of Mississippi and only one historical hibernaculum in Tishomingo County near Pickwick Lake.

In 2022 the status of the NLEB was upgraded to endangered. This eliminated the 4(d) rule, however, some of those same protections may still be used in a region wide Bat Conservation Strategy (BCS) that is currently in development by the Forest Service and Fish and Wildlife Service. There are still no known hibernacula or roosts in National Forests in Mississippi.

Black pine snake

The black pine snake was listed as threatened in 2015. Black pine snakes (*Pituophis melanoleucus lodingi*) are large non-venomous snakes that are dark brown to black with occasional white splotches on their chin or lower body. They are capable burrowers and spend most of their time underground or in old stumps and rotting root channels. Telemetry studies indicate that black pine snakes spend most of their time in areas with well-drained sandy-loam soils on hilltops, ridges, and the upper parts of slopes generally in areas of open (or absent) canopies, sparse midstories suppressed by fire, and dense grassy understories or ground layers.

Historical records indicate a range restricted to one parish in Louisiana, 14 counties in south Mississippi, and 3 counties in Alabama. Although there are some records of black pine snakes on private and state lands, the majority of recorded locations are in the De Soto National Forest with black pine snakes documented to occur in all counties of both the Chickasawhay and De Soto Ranger Districts. The largest remaining populations (5 or 11) occur in the De Soto National Forest. As such much of the De Soto National Forest has been proposed for listing as critical habitat for the species.

The threats to the black pine snake include habitat eliminated through land use conversions, primarily urban development and conversion to agriculture and pine plantations. Forest management strategies such as fire suppression, increased stocking densities, and removal of downed trees and stumps all contribute to the degradation of preferred habitat attributes. Black pine snakes frequent the sandy hilltops and ridges where most roads are located and where road mortality occurs. Another threat is direct intentional killing.

Under section 4(d) of the ESA, the U.S. Fish and Wildlife Service (FWS) has the discretion to issue regulations that they find necessary and advisable to provide for the conservation of threatened wildlife. For the black pine snake, FWS has developed a 4(d) rule that is tailored to the specific threats and conservation needs of this subspecies. As discussed in the final rule to list the black pine snake as threatened under the ESA (80 FR 60468-60489), the primary threat to this subspecies is the continuing loss and degradation of the open pine forests habitat (e.g., the longleaf pine ecosystem), which requires active management to ensure appropriate habitat conditions are present. Foremost in the degradation of this habitat is the decline or absence of prescribed fire, as fire is the primary source of historical disturbance and maintenance, reduces mid-story and understory hardwoods, and promotes abundant native herbaceous groundcover in the natural communities of the longleaf pine ecosystem where the black pine snake normally occurs. FWS recognizes that forest management activities such as thinning, reforestation and afforestation, mid-story and understory vegetation management, and final harvest (particularly in stands with undesirable conditions) are often needed to maintain and/or restore forests to the conditions that are preferable to black pine snakes. The primary habitat features that require protection in this ecosystem are the burned-out or naturally decayed pine stump holes that are heavily utilized by black pine snakes, in association with the development of the herbaceous plant community that provides habitat and forage for prey. Activities such as prescribed burning and invasive weed control, as well as forest management activities associated with restoring and maintaining the natural habitat to meet the needs of the black pine snake, positively affect pine snake habitat and provide an overall conservation benefit to the subspecies.

Louisiana Black Bear

On March 10, 2016, the USFWS removed the Louisiana black bear from the List of Threatened and Endangered Wildlife under the Endangered Species Act due to recovery. Since the Louisiana black bear was listed in 1992, voluntary landowner-incentive-based habitat restoration programs and environmental regulations have not only stopped the net loss of forested lands in the Lower Mississippi River Alluvial River Valley but have resulted in significant habitat gains. A major factor in this positive habitat trend is the success of incentive-based private land restoration programs, such as the Wetland Reserve Program, additional private lands have been restored through the efforts of private landowners and organizations, and protection and restoration of bottomland hardwood forests through efforts of various groups and federal agencies. It has been since added to the Regional Forester's Sensitive Species list for the National Forests in Mississippi.

All other T&E species have had no change to their classification, recovery goals, or population trends.

Adaptive Management Considerations:

Threatened and endangered species status reports – The forest plan monitoring program is meant to "enable the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed" (36 CFR 219.12).

Based on the findings in the discussion above, there is no recommended need to change this monitoring component.

MQ 5: B.2 Are populations of rare species robust and secure?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 2.4 Species Diversity

Forest Plan Monitoring Indicator(s):

1. Species of Concern status reports

Monitoring Frequency: 5 years

New Science or Other Information:

Species of Concern status reports – No data.

Background & Driver(s):

Species of Concern status reports – In the LRMP, sensitive species, are "…those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, or significant current or predicted down trends in habitat capability that would reduce a species existing distribution" (FSM 2670.5), were identified as potentially occurring on the NFMS. Throughout the plan, sensitive species protection and habitat enhancement are a priority. Many forest management objectives, standards, and guidelines were created based on these species and their habitat protection and management. Their status, habitat conditions, and distribution vary across the Forests. Sensitive species policy applies to forests with forest plans that have been prepared under the 1982 planning regulations (36 CFR 219) such as the NFMS.

In 2018, the Regional Forester's Sensitive Species (RFSS) list was revisited and revised to reflect the best available scientific information. This revision included reviewing RFSS procedures, assessing all species in the region ranked G1-G3 or S1-S2, and incorporating forest inputs on a wide range of at-risk species. This led to a new RFSS list consisting of 56 species for the NFMS which will be used to review programs and activities as part of the process to determine potential

effects on these species. These species' status reports shall be used as a performance measure to answer this monitoring question.

What monitoring activities have been conducted since the last evaluation?

Species of Concern status reports – The NatureServe database was accessed and used to discern the status of each species. NatureServe. 2024. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available http://explorer.natureserve.org. (Accessed: March 21, 2024).

Monitoring Results:

Species of Concern status reports –

Table 33. Status of Sensitive Species in National Forests in Mississippi (2020-2023).

Organismal Group	Scientific Name	Common Name	Global Rank	State Rank	Change From
Amphibian	Plethodon websteri	Webster's salamander	G3	S2	S3
Bird	Peucaea aestivalis	Bachman's sparrow	G3	S3B,S4N	S3B
Crustacean	Creaserinus danielae (Formerly Fallicambarus)	Speckled burrowing crayfish	G2	S2	no
Crustacean	Fallicambarus gordoni (Formerly Fallicambarus)	Camp Shelby burrowing crayfish	G1	S1	no
Crustacean	Procambarus barbiger	Jackson Prairie crayfish	G2	S2	no
Crustacean	Procambarus fitzpatricki	Spinytail crayfish	G2	S2	no
Fish	Alosa alabamae	Alabama shad	G2	S1	G2,G3
Fish	Etheostoma faulkneri	Yoknapatawpha darter	G2	S1	New
Fish	Etheostoma raneyi	Yazoo darter	G2	S2	no
Fish	Noturus gladiator	Piebald madtom	G3	S1	no
Fish	Pteronotropis welaka	Bluenose Shiner	G3G4	S3	no
Insect	Bombus pensylvanicus	American bumble bee	G3	SNR	New
Insect	Danaus plexippus	Monarch Butterfly	G4	S5	no
Insect	Haploperla chukcho	Chukcho stonefly	G2	S2	no
Mammal	Corynorhinus rafinesquii	Rafinesque's big-eared bat	G3G4	S3	S3?B, S3?N

Organismal Group	Scientific Name	Common Name	Global Rank	State Rank	Change From
Mammal	Myotis austroriparius	Southeastern Myotis	GG4	S3	G3G4, S1?B,S1 ?N
Mammal	Myotis lucifigus	Little brown myotis	G3	SH	New
Mammal	Perimyotis subflavus	Tricolored bat	G3G4	S3	G2G3, S5
Mammal	Ursus americanus luteolus	Louisiana Black Bear	G5T2	S1	S3
Mussel	Anodontoides radiatus	Rayed creekshell	G2G3	S2	G3
Mussel	Obovaria unicolor	Alabama hickorynut	G2	S1	G3 S3
Mussel	Pleurobema beadleianum	Mississippi pigtoe	G3	S3	no
Mussel	Pleurobema rubrum	Pyramid pigtoe	G2	S1	G2G3,
Mussel	Pseudondontoides subvexus (Formerly Strophitus)	Southern Creek Mussel	G3	S2	No
Reptile	Crotalus adamanteus	Eastern Diamondback	G3	S3S4	G4
Vascular	Agalinis filicaulis	Thin Stemmed False-foxglove (Thread-stem False-foxglove)	G3G4	S2S3	S2
Vascular	Agrimonia incisa	Incised groovebur	G3	S2	New
Vascular	Aristida simpliciflora	Southern three-awn grass	G3G4	S2	S1
Vascular	Botrychium jenmanii	Dixie grapefern (Alabama grapefern)	G3G4	S1S2	no
Vascular	Calopogon oklahomensis	Oklahoma grass pink	G2	S1	G3
Vascular	Carex decomposita	Cypress-knee sedge	G3	S3	no
Vascular	Carex impressinervia	Ravine sedge	G3	S1	G2
Vascular	Cleistesiopsis bifaria	Small spreading pogonia	G3	S1	G4 S3
Vascular	Crataegus ashei	Ashe hawthorne	G2	S1	G2
Vascular	Crataegus triflora	Three-flower hawthorne	G2	S2	S1S2
Vascular	Desmodium ochroleucum	Cream tick-trefoil	G2G3	S1	G1G2

Organismal Group	Scientific Name	Common Name	Global Rank	State Rank	Change From
Vascular	Hamamelis ovalis	Big-leaf Witch-hazel (Leonard's Witch-hazel)	G1G2	S1	G1
Vascular	Juglans cinerea	Butternut	G3	S2	G4
Vascular	Lachnocaulon digynum	Pineland bogbutton	G3	S3	S2
Vascular	Lindera subcoriacea	Bog spicebush	G3	S2	G2G3
Vascular	Linum macrocarpum	Spring Hill flax	G2	S2	S2S3
Vascular	Macranthera flammea	Flame flower	G3	S3	no
Vascular	Marshallia trinervia	Broadleaf Barbara's buttons	G3	S3	no
Vascular	Myriophyllum laxum	Loose water-milfoil	G3	S1	no
Vascular	Panax quinquefolius	American ginseng	G3	S3	New
Vascular	Parnassia grandifolia	Large-leaved Grass-of-Parnassus	G3	S2	no
Vascular	Pinguicula planifolia	Chapman's butterwort	G3?	S2	no
Vascular	Pinguicula primuliflora	Southern butterwort	G3G4	S3	no
Vascular	Platanthera integra	Yellow fringeless orchid	G3G4	S3	no
Vascular	Polygala hookeri	Hooker's milkwort	G3	S1S2	S2
Vascular	Polygala leptostachys	Slender spike milkwort (Georgia Milkwort)	G3G4	S2	S1
Vascular	Pteroglossaspis ecristata	Giant Orchid	G4	S1	G2G3
Vascular	Quercus oglethorpensis	Oglethorpe oak	G3	S2	S3
Vascular	Rhynchospora crinipes	Hairy peduncled beakrush	G3	S1	G2
Vascular	Rhynchospora macra	Large beakrush	G3G4	S3	G3
Vascular	Ruellia noctiflora	Night flowering ruellia	G3	S2	G2
Vascular	Schisandra glabra	Bay starvine	G3	S3	no
Vascular	Spiranthes longilabris	Giant spiral ladies'-tresses	G3	S1S2	S2

Organismal Group	Scientific Name	Common Name	Global Rank	State Rank	Change From
Vascular	Uvularia floridana	Florida bellwort	G3	S1	no
Vascular	Xyris drummondii	Drummond's yelloweyed grass	G3G4	S2	G3 S3
Vascular	Xyris scabrifolia	Harper's yelloweyed grass	G3	S3	S2S3

Monitoring Discussion and Findings:

Species of Concern status reports – Determining which species and ecosystems are thriving and which are rare or declining is crucial for targeting conservation towards elements of biodiversity in greatest need. NatureServe uses a suite of factors to assess the conservation status of plant, animal, and fungal species, as well as ecosystems (ecological communities and systems). The outcome of researching and recording information on the conservation status factors is the assignment of a conservation status rank with supporting documentation. For species, these ranks provide an estimate of extinction risk. NatureServe status ranks, and the documentation that supports them, are often used by agencies in making official determinations, particularly in the identification of candidates for legal protection. The Forest Service uses these ranks during the selection process for RFSS.

In Table 36, 23 species showed no change in status rank while 33 did show status change of either global rank, state rank, or both since the RFSS list revision process. Of the change, nine species had global ranks that increased, and 8 species whose global ranks decreased. Eight species' state rank increased while 7 saw their state rank decrease. These rankings will fluctuate as new data is available and are based on both global and state distributions. Standards, guidelines, BMPs, and habitat management direction in the Forest Plan were created to protect species of viability concern and shall continue to be followed. If this direction is followed, the Forest Service should not negatively affect the distribution and status of the species. In 2023 five new species were added to the RFSS list and were subsequently added to the table. The change box is noted with New for these recently added species.

Adaptive Management Considerations:

Species of Concern status reports – Given the fluctuation of the rankings and factors creating the change in ranking status, changes in status are difficult to use to determine if change is needed in plan components. Based on the findings in the discussion above, the NFMS shall continue to protect and manage these species, but this may not be the best performance measure to determine needed changes in plan components. Performance measures based on management of current habitat, restoring native ecosystems, and following plan standards, guidelines, and best management practices are most important in the protection and management of these species.

MQ 6: B.3 Are species diversity and game abundance supporting nature viewing and hunting quality?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 2.4 Species Diversity

Monitoring Indicator(s):

1. Wildlife census
2. Statewide game population estimates
3. Visitor use monitoring

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information

Wildlife census – No data.

Statewide game population estimates – No data.

Visitor use monitoring – No data.

Background & Driver(s):

Wildlife Census – Conservationists have long been concerned about the apparent range-wide population declines of many forest and grassland birds, especially those that migrate to Central and South America (neo-tropical migrants). A coordinated program for monitoring land bird populations has been developed to provide information about population status and trends of breeding birds on national forests in the Southern Region. It involves several thousand permanent monitoring stations in national forests across the South, covering all major physiographic regions and habitat types. Each point is visited yearly using standard procedures to record all birds present. The resulting data resides and is analyzed in a regional database (R8 Bird).

Figure 11. The Common Yellowthroat, an Early Successional Bird Species, is Often Found in Recent Timber Harvests.

Statewide Game Population Estimates – This monitoring element is aimed at checking the effectiveness of overall management programs at maintaining stable populations of high-demand game species (white-tailed deer and wild turkey). Fourteen WMAs (wildlife management areas) are located on the NFMS and are managed jointly by the Mississippi Department of Wildlife, Fisheries & Parks (MDWFP) and the Forest Service. These WMAs have special seasons and hunting regulations designed to provide enhanced hunting opportunities. Population trends for deer and turkey on these WMAs are indexed through hunting harvest statistics compiled by MDWFP.

Visitor Use Monitoring – The general forest area provides a variety of dispersed recreational opportunities. Game and non-game wildlife populations are abundant and support viewing, photography, nature study, and hunting.

What monitoring activities have been conducted since the last evaluation?

Wildlife Census – Annual bird point counts for the NFMS were begun in 1994 and are now conducted annually in each district. From 1994 to July 2019, 206,581 individual birds of 171 species from 15,569 bird point counts have been recorded (Table 37).

Statewide Game Population Estimates – Population trends for white-tailed deer and wild turkey on National Forest WMAs are indexed through hunting harvest statistics compiled by MDWFP. Total harvest and man days have been monitored by the NFMS since the 1987 hunting season. Although data is collected for individual WMAs, it was compiled to a total number each hunting season to reflect general trends for deer and turkey across the forest since the 2010-11 hunting season.

Deer population response to changes in hunting regulations on Mississippi's national forests are also being monitored to detect trends in herd density. Spotlight counts were conducted in 2018 - 2022. The data collection methodology was changed to use thermal detection.

Visitor Use Monitoring – No data.

Monitoring Results:

Wildlife Census –

Table 34. Number of Bird Species by Unit Reported on Point Counts from 1994 to 2019.

Forest	Total Number of Birds	Number of Species	Number of Point Counts	Number of Years Reported
Bienville	27,222	96	2697	21
De Soto	14,164	90	1,233	21
Homochitto	64,936	112	4,703	22
Chickasawhay	13,351	102	945	19
Delta	21,853	107	1203	16
Holly Springs	35,658	119	2162	19
Tombigbee	29,391	105	2,625	20
TOTAL	206,581	171**	15,569	

Table 35. Most Common Bird Species by Unit Across National Forests in Mississippi.

Most Common Birds by Unit					
Bienville	NOCA (0.63)	CARW (0.63)	BLJA (0.58)	ETTI (0.56)	PIWA (0.48)
De Soto	EATO (0.62)	COYE (0.58)	NOCA (0.56)	CARW (0.55)	YBCH (0.52)
Homochitto	REVI (0.66)	NOCA (0.56)	ETTI (0.56)	HOWA (0.52)	PIWA (0.49)
Chickasawhay	CARW (0.67)	NOCA (0.60)	REVI (0.55)	HOWA (0.53)	BLJA (0.52)
Delta	NOCA (0.88)	INBU (0.71)	CARW (0.71)	RBWO (0.70)	ACFL (0.69)
Holly Springs	PIWA (0.69)	REVI (0.64)	INBU (0.63)	ETTI (0.61)	SUTA (0.51)
Tombigbee RD	REVI (0.67)	ETTI (0.56)	NOCA (0.51)	PIWA (0.47)	CARW (0.43)
NFMS	NOCA (0.56)	REVI (0.51)	ETTI (0.51)	CARW (0.49)	PIWA (0.45)

NOCA = Northern Cardinal
EATO = Eastern Towhee
REVI = Red-eyed Vireo
CARW = Carolina Wren
INBU = Indigo Bunting
ETTI = Eastern Tufted Titmouse
PIWA = Pine Warbler
SUTA = Summer Tanager
YBCH = Yellow-breasted Chat
HOWA = Hooded Warbler
PROW = Prothonotary Warbler
BLJA = Blue Jay
COYE = Common Yellowthroat
ACFL = Acadian Flycatcher
*Number in parentheses () is the frequency of occurrence represented by species.

State Game Population Estimates –

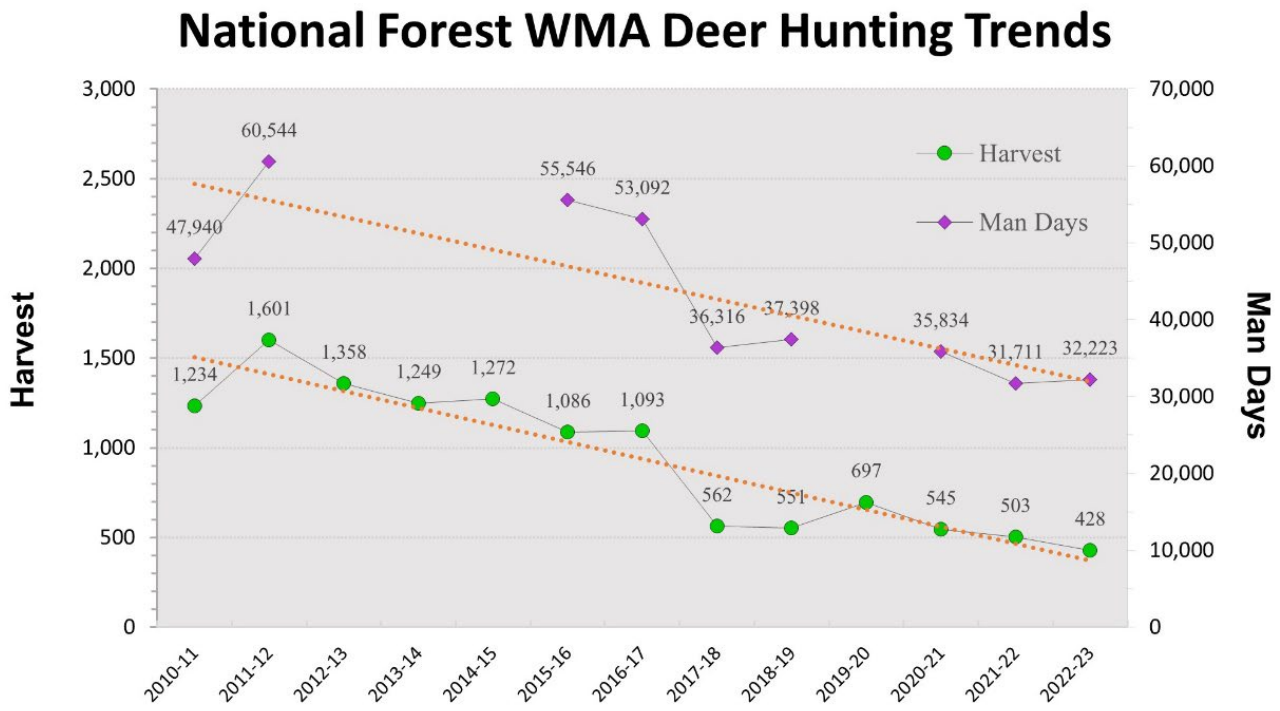


Figure 12. Total Harvest and Man Days for White-Tailed Deer on 14 National Forest WMAs.

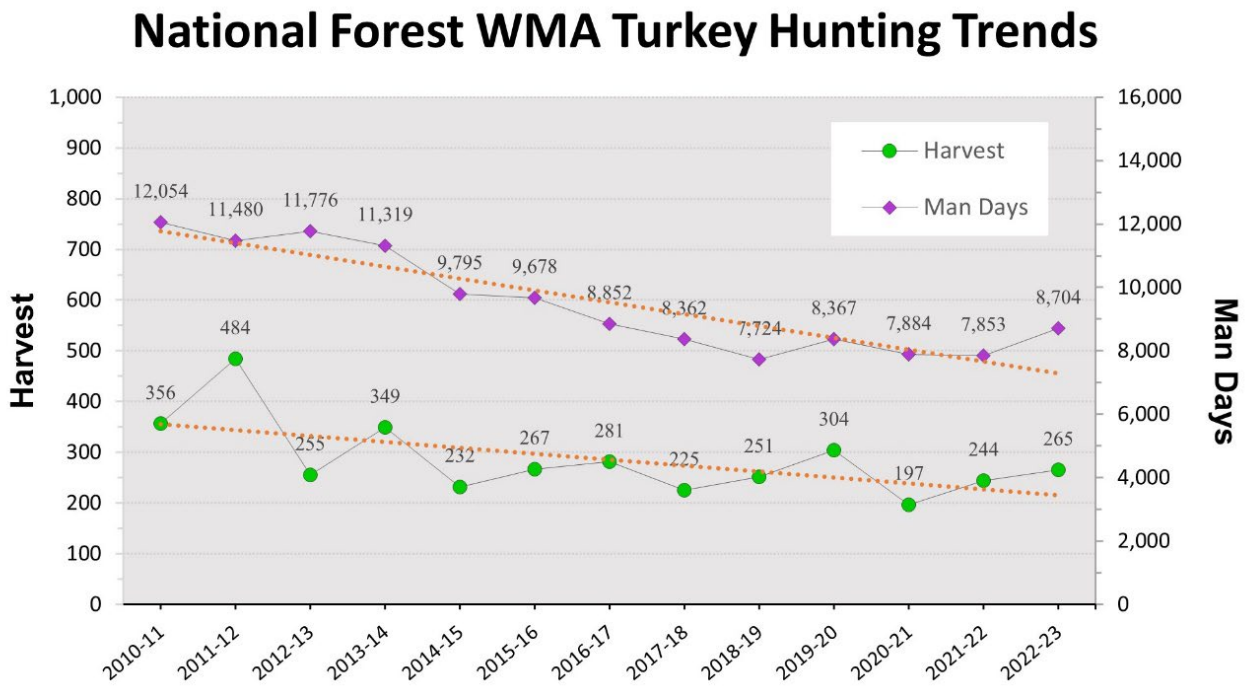


Figure 13. Total Harvest and Man Days for Wild Turkey on 14 National Forest WMA's.

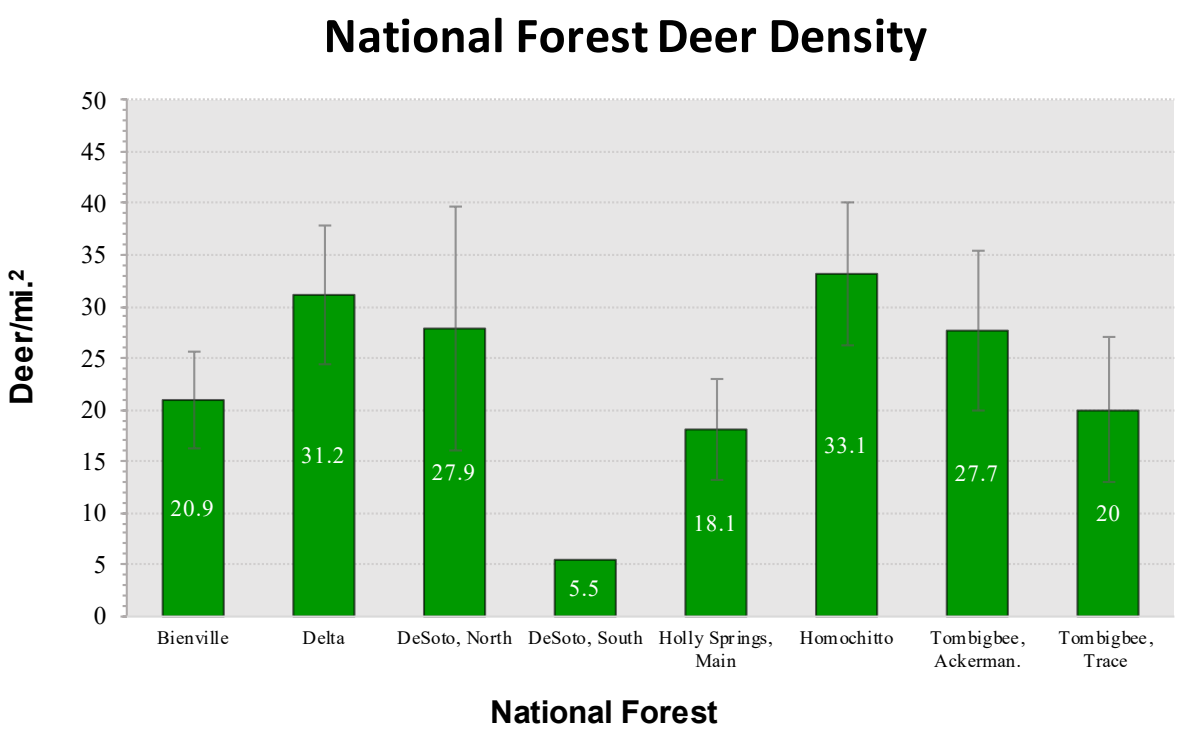


Figure 14. White-Tailed Deer Density (deer/mi.^{2}) Across the National Forests in Mississippi.

Visitor use Monitoring – Although visitors may engage in multiple activities when they visit the NFMS, hunting is their primary activity with 39% reporting it as the main reason for their visit and 43% engaging in the activity. Approximately 5% view wildlife with less than 1% reporting it as their main activity.

What level of confidence is there in the accuracy and precision? The accuracy and precision of the data are high as the fisheries standard/goal is to collect 100+ fish per lake to describe the population structure of a given species. The number of bass sampled for each of the 8 lakes ranged from 293-669.

Monitoring Discussion and Findings:

Wildlife Census – Of the 29 priority species outlined in the Landbird Conservation Strategy, 23 were detected on the NFMS during the sample period. Species not detected during the point counts were the American swallow-tailed kite, American woodcock, cerulean warbler, Henslow's sparrow, loggerhead shrike, and Mississippi sandhill crane. None of the bird species detected during the sample period were elevated to threatened, endangered, or sensitive status. These findings meet the desired condition of maintaining species diversity. Due to logistical challenges associated with the COVID-19 pandemic, bird point counts were not conducted 2020-2023. It is anticipated that these counts will start back in the future.

Statewide Game Population Estimates – Total harvest and man days for white-tailed deer have trended downward since the 2010-11 hunting season (Figure 12). However, a significant decline was experienced during the 2017-18 and 2018-19 hunting seasons. A large portion of that decline can be attributed to a hunting regulation change that was implemented for the 2017-18 firearm and primitive weapons season where antlerless deer harvest on national forest land was suspended. This regulation was implemented by MDWFP due to public concern about perceived declining deer populations on national forest land. Because antlerless deer made up approximately 50% of the overall annual deer harvest, it was anticipated that this regulation would cause a decline in harvest and hunter man days.

Wild turkey populations and hunter harvest have been on a long-term decline on national forest WMAs as indicated in Figure 13. Currently, the Mississippi turkey season is the longest in the country. MDWFP biologists suspect that one of the factors contributing to this decline may be the length of season that is allowing the harvest of too many gobblers before the hens begin nesting. To test this theory, MDWFP reduced the spring turkey season by approximately 15 days for the 2019 – 2021 hunting seasons on the following national forest WMAs: Choctaw WMA (Tombigbee NF), Little Biloxi WMA (De Soto NF), and Mason Creek WMA (De Soto NF).

Deer densities appear to be consistent across all national forest units with the exception of De Soto, South (Figure 14). Conduction of spotlight counts were inconsistent from 2019-2022 and therefore is not reflected in Figure 14. Because the data collection methodology was changed to thermal detection in 2023 this data could not be compared to previous years. It is anticipated that after several years of conducting thermal detection counts, changes in deer density can better be determined in the future.

While hunter harvest and man-days show a declining trend for both white-tailed deer and wild turkey, these findings show game species abundance meets the desired conditions for providing quality hunting opportunities.

Visitor Use Monitoring – In the 2009 NVUM, hunting was again the primary activity with 35% participating in the activity and 33% of the visitors surveyed reporting it as the main reason for their visit. The five-year trend shows a 6% increase in visitors reporting hunting as their primary activity.

Viewing wildlife as a reason for visitation decreased in the 2014 survey results. In 2009, approximately 23% participated in the activity and for 1.3% it was the main for their visit.

While wildlife viewing declined, these findings show that the forest continues to provide species diversity to meet the desired conditions for nature viewing.

Adaptive Management Considerations:

Wildlife Census - Monitoring of distribution and abundance of breeding forest birds (including neotropical migrants) is an important aspect of the Forest Service's commitment to providing habitats for these important indicators of habitat quality and stability. To that end, breeding bird point counts should continue with suitable adjustments to numbers of point counts as needed for statistical validity and to ensure that point counts are being made in the proper habitats. Based on the findings in the discussion above, there is no recommended need for change.

Statewide Game Population Estimates – Monitoring of population trends for high-demand game species (white-tailed deer and wild turkey) is an important aspect of the Forest Service's commitment to providing hunting opportunities to the public. To that end, total harvest and man days should continue to be tracked as well as the spotlight counts. The Forest Service should continue using this trend data to provide MDWFP with recommendations for adjusting harvest limits and seasons as needed. Based on the findings in the discussion above, there is no recommended need for change.

Visitor use monitoring – No data.

MQ 7: B.4 Are habitat conditions sufficient to allow aquatic and riparian-dependent species to complete all phases of their life cycles?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 2.4 Species Diversity

Monitoring Indicator(s):

1. Habitat connectivity measured by accomplishments of, and miles of stream improved through culvert and low-water ford replacements

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Habitat connectivity measured by accomplishments of, and miles of stream improved through culvert and low-water ford replacements – No data.

Background & Driver(s):

Habitat connectivity measured by accomplishments of, and miles of stream improved through culvert and low-water ford replacements – No data.

What monitoring activities have been conducted since the last evaluation?

Habitat connectivity measured by accomplishments of, and miles of stream improved through culvert and low-water ford replacements – No data.

Monitoring Results:

Habitat connectivity measured by accomplishments of, and miles of stream improved through culvert and low-water ford replacements –

NUMBER OF CULVERTS REPLACED FOR AQUATIC ORGANISM PASSAGE (B.4 and E.2)

Three culverts, one on road 703 (0.91 miles of stream improved), one on road 720 (2.51 miles of stream improved) in the Delta RD in 2021 and 2022 respectively, and one on road 206 (0.35 miles of stream improved) in the Chickasawhay RD in 2020 were replaced with AOP-friendly designs.

District engineering personnel were polled during November 2023 to gather this information.

NUMBER OF LOW-WATER FORDS REPLACED (B.4 and E.2)

One 34” culvert was replaced with a low water ford on road 234A (1.01 miles of stream improved) on the Chickasawhay RD in 2023.

District engineering personnel were polled during November 2023 to gather this information.

Monitoring Discussion and Findings:

Habitat connectivity measured by accomplishments of, and miles of stream improved through culvert and low-water ford replacements – No data.

Adaptive Management Considerations:

Habitat connectivity measured by accomplishments of, and miles of stream improved through culvert and low-water ford replacements – No data.

MQ 8: B.5 Are conditions needed for sustaining healthy populations of native plants and animals being maintained?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 2.4 Species Diversity

Monitoring Indicator(s):

1. Abundance of ecological attributes required for native plants and animals

Forest Plan Monitoring Frequency: 10 years

New Science or Other Information:

Abundance of ecological attributes required for native plants and animals – No data.

Background & Driver(s):

Abundance of ecological attributes required for native plants and animals – No data.

What monitoring activities have been conducted since the last evaluation?

Abundance of ecological attributes required for native plants and animals – No data.

Monitoring Results:

Abundance of ecological attributes required for native plants and animals – No data.

Monitoring Discussion and Findings:

Abundance of ecological attributes required for native plants and animals – No data.

Adaptive Management Considerations:

Abundance of ecological attributes required for native plants and animals – No data.

MQ 9: B.6: Are annual average T&E species recovery treatment objectives being accomplished?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Objective 3.3 Species Diversity

Monitoring Indicator(s):

1. Population trends for the red-cockaded woodpecker (MIS)
2. Red-cockaded woodpecker habitat improvement, acres of prescribed burning, mid-story removal, and forest thinning.

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Population trends for the red-cockaded woodpecker (MIS) – This monitoring element checks the effectiveness of management efforts to recover populations of this endangered species. This species is also identified in the Forest Plan as

a management indicator species to be monitored. The species is endemic to open, mature pine ecosystems in the southeastern United States. Today's second and third growth forests are substantially different from the pre-colonial pine forests, which were frequently burned, where the red-cockaded woodpecker (RCW) was a common inhabitant. The species is a cooperatively breeding species living in family groups. RCWs are non-migratory and excavate cavities in living pine trees.

Populations of red-cockaded woodpeckers are tracked by annual inventory of the number of clusters occupied by these birds. Those clusters deemed to be active will be followed closely to determine initiation of nesting. Nest attempts are followed to determine success or failure and whether or not re-nesting occurs. Additional surveys of general forest land to identify new clusters are conducted on a 10-year rotation.

Red-cockaded woodpecker habitat improvement, acres of prescribed burning, mid-story removal, and forest thinning – The Revised Recovery Plan for the RCW (2003) lists three key management actions as essential to the success of the recovery of this species: 1) development of large old pines to serve as cavity trees, 2) restoration and maintenance of appropriate habitat structure, and 3) protection of existing cavity trees. The National Forests in Mississippi continue to improve and maintain favorable habitat conditions for the RCW using different strategies tailored to individual populations and habitat conditions. It is the implementation of these strategies, carefully designed to meet the conditions of each of four very different populations and habitats, which will continue to enhance RCW recovery on the NFMS. Habitat improvement drivers for this species in the monitoring plan are based on prescribed burning, midstory removal, and forest thinning accomplished annually.

Background & Driver(s):

Population trends for the red-cockaded woodpecker (MIS) – No data.

Red-cockaded woodpecker habitat improvement, acres of prescribed burning, mid-story removal, and forest thinning – No data.

What monitoring activities have been conducted since the last evaluation?

Population trends for the red-cockaded woodpecker (MIS) – Each District has monitored all existing RCW clusters including active, inactive, and recruitment clusters along with surveying at a minimum of 10% of each District's potential habitat for new clusters/activity.

Red-cockaded woodpecker habitat improvement, acres of prescribed burning, mid-story removal, and forest thinning – Habitat improvement/management data is collected, entered, and stored in the FACTS database as activities are accomplished.

Monitoring Results:

Population trends for the red-cockaded woodpecker (MIS) –

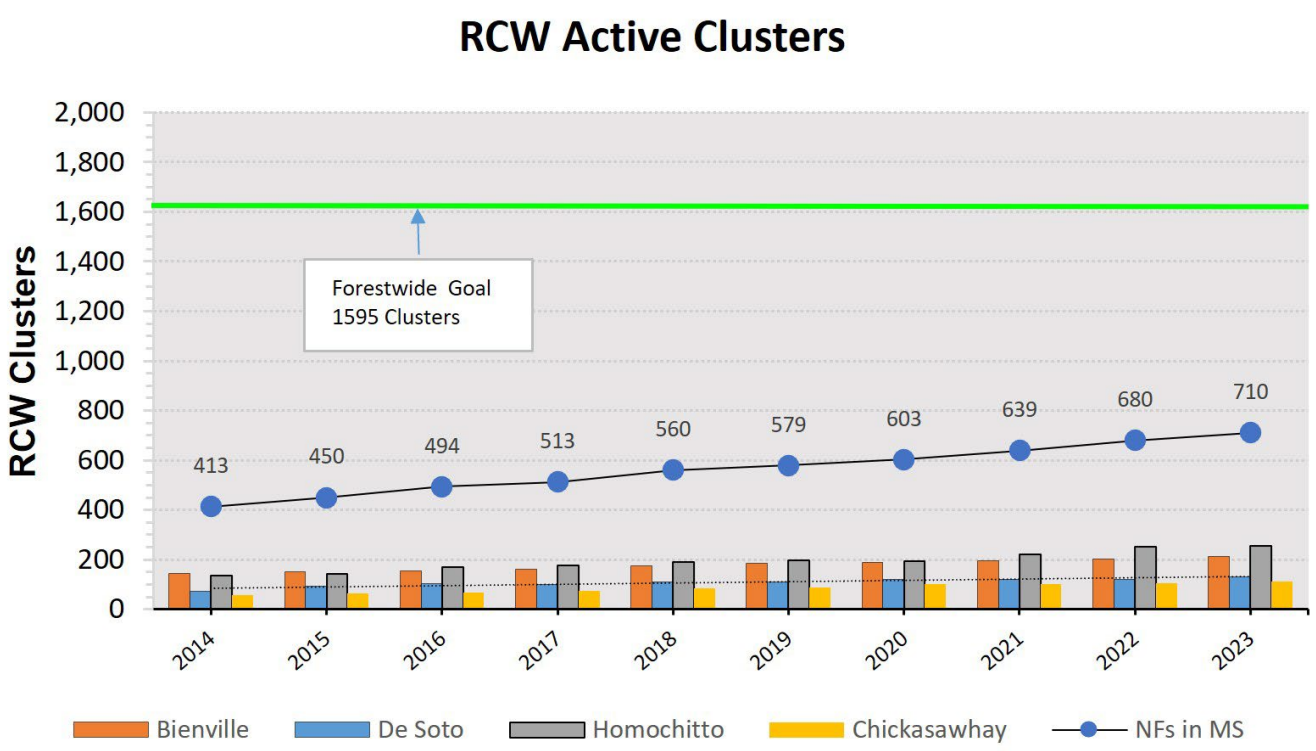


Figure 15. History of Active RCW Clusters in NFMS.

Red-cockaded woodpecker habitat improvement, acres of prescribed burning, mid-story removal, and forest thinning –

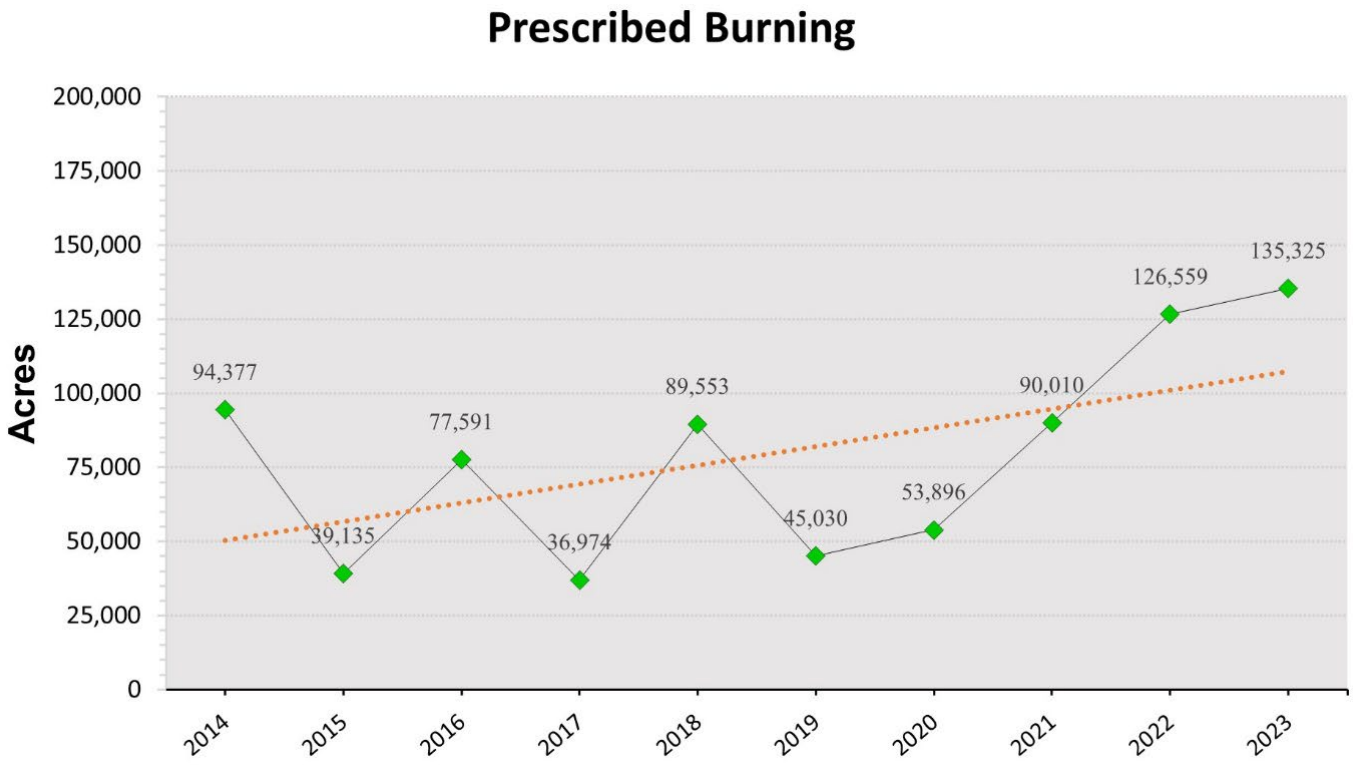


Figure 16. RCW Habitat Improvement by Prescribed Burning in the NFMS.

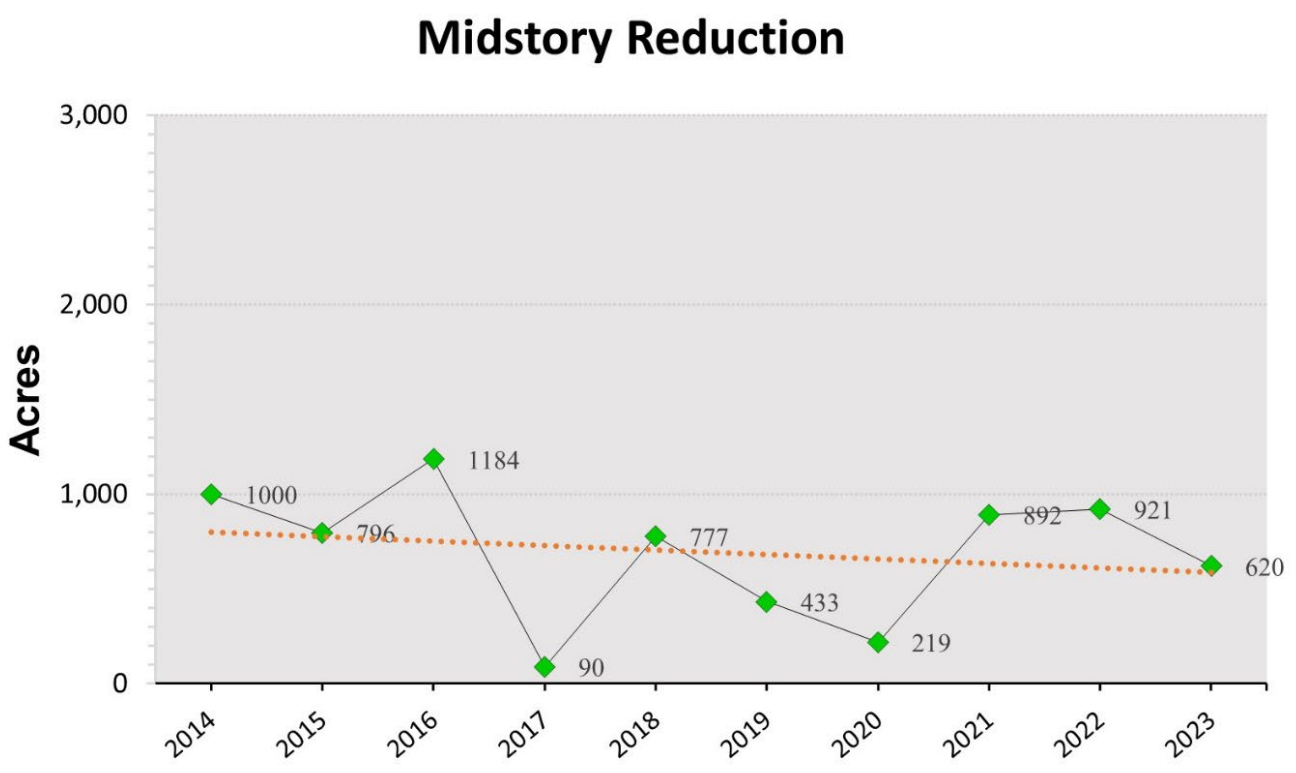


Figure 17. RCW Habitat Improvement by Midstory Reduction in NFMS.

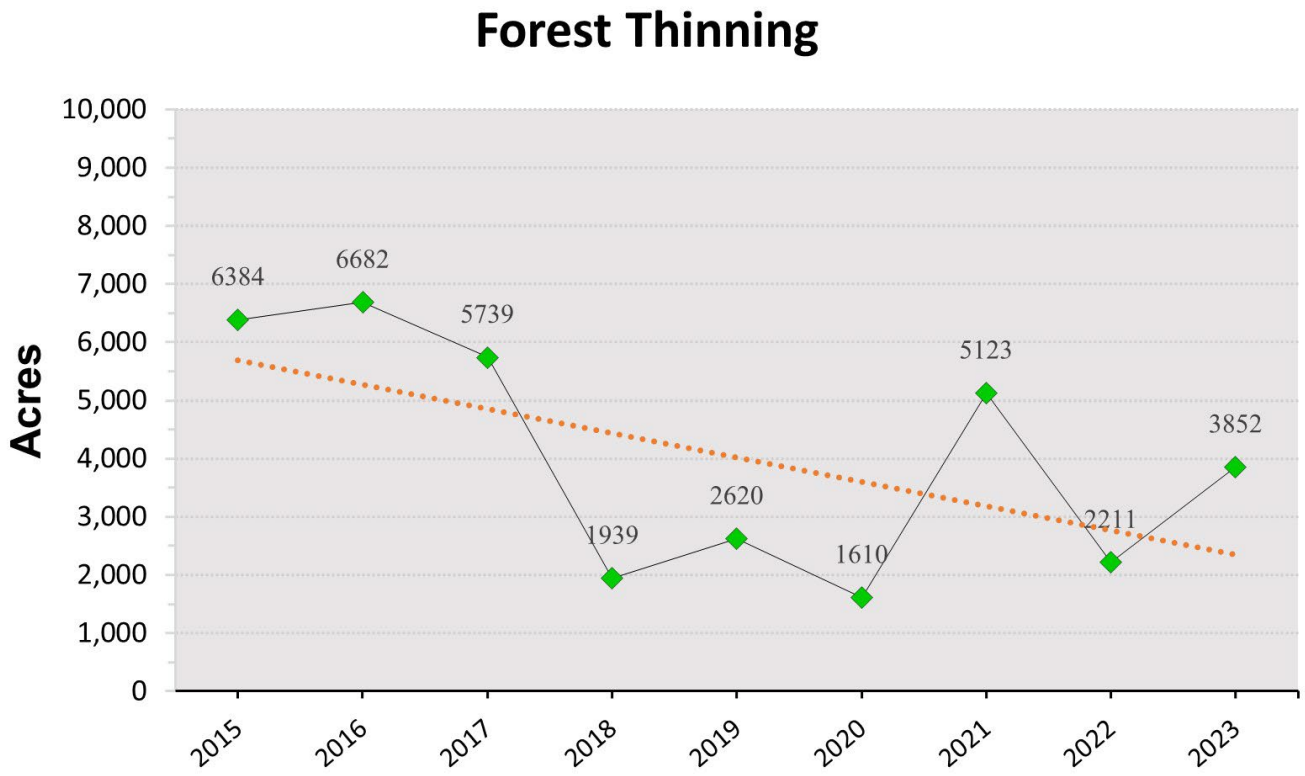


Figure 18. RCW Habitat Improvement by Forest Thinning in the NFsMS.

Monitoring Discussion and Findings:

Population trends for the red-cockaded woodpecker (MIS) – Currently there are 710 total active RCW clusters on the NFMS, an increase from 598 in 2020 and the 413 active clusters listed in the FY2014 Monitoring and Evaluation report. Although still far short of the population goals of 1,595 active clusters, the number of active clusters has increased across the Forest and all Districts since the Forest Plan revision (Figure 15). Monitoring of distribution and abundance of RCW is an important aspect of the Forest Service's commitment to recovering this species. The Forest has 2 primary core and 2 secondary core populations per the USFWS RCW Recovery Plan which not only includes population goals, but a rate at which the Forest should reach those goals. RCW surveys and monitoring should continue.

Red-cockaded woodpecker habitat improvement, acres of prescribed burning, mid-story removal, and forest thinning – The condition of RCW habitat has improved since the 80's due to a prescribed fire program and the application of midstory control. Aggressive application of prescribed fire is critical to maintaining open habitat conditions on the four districts where RCW occur. The application of fire has been sporadic over the last few years. Although better than the 80's, prescribed fire has declined or been sporadic across the Forest since plan implementation. However, since the 2014 revision, the trend has been toward a steady increase in burning acres across the Forest. A sporadic pattern can still be seen in the data and can somewhat be explained by wet years and a national standdown on prescribed burning for a whole fire season. Figure 16 depicts RCW habitat improvements by prescribed fire and Figure 17 shows RCW habitat improvements made by midstory control, across NFMS. Figure 18 represents the amount of thinned acres of pine-dominated ecosystems across the 4 Districts where the RCW is present. This management component is very important as with increased thinning, available habitat increases since this species depends on open pine habitat. In the last couple of years, thinning acres have decreased due to the southern pine beetle outbreak. The U. S. Fish and Wildlife Service Red-cockaded Woodpecker Recovery Plan (2003) described the restoration of good quality habitat as vital to the recovery of the species. Loss of quality habitat has resulted from fire suppression, overstocked stands, and an unnatural midstory of species such as sweetgum has developed in many areas. As habitat management becomes more aggressive and the use of prescribed fire escalates, available habitat will increase which should allow the populations to continue expansion across the Forest at acceptable rates (5% per USFWS Recovery Plan).

The prescribed burning acres for each District are well below that suggested by the Forest Plan in order to reach ecosystem management, sustainability, habitat, and restoration goals. Annual thinning acres of pine-dominated ecosystems are also below that suggested in the Forest Plan in all Districts with the DeSoto Ranger District being the exception for most years keeping in mind that the Bienville and Homochitto Ranger Districts priorities changed in 2017 due to the southern pine beetle epidemic. Normal timber operations should continue in those Districts with a continued focus on thinning pine dominated ecosystems for both RCW habitat management and forest health. Thinning acres should increase in order to meet 10-year objectives.

Adaptive Management Considerations:

The forest plan monitoring program is meant to "enable the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed" (36 CFR 219.12).

Population trends for the red-cockaded woodpecker (MIS) – Based on the findings in the discussion above, there is no recommended need for change.

Red-cockaded woodpecker habitat improvement, acres of prescribed burning, mid-story removal, and forest thinning – Monitoring habitat improvement indices is important to ensure that the National Forests in Mississippi is fulfilling Section 7 of the Endangered Species Act concerning this species. There is no need to change this monitoring component.

MQ 10: C.1 Are conditions needed to sustain ecological function and productivity of the land being maintained?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: 2.5 Healthy Watershed

Monitoring Indicator(s):

1. Identified water quality concerns
2. Intact hydrologic conditions
3. Conditions of soil cover and stability
4. Prescribed fire impacts measured against National Ambient Air Quality Standards
5. Results of Long-Term Soil Productivity Study

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Identified water quality concerns – No data.

Intact hydrologic conditions – No data.

Conditions of soil cover and stability – No data.

Prescribed fire impacts measured against National Ambient Air Quality Standards – The Fifth National Climate Assessment (NCA5) was released in December 2023. It is anticipated that climate change will increase the frequency and intensity of wildfires, increasing the amount of air pollution throughout the United States.[1] Additionally, in January 2023, the Environmental Protection Agency proposed revisions to the annual $PM_{2.5}$ National Ambient Air Quality Standard (NAAQS). This proposal would strengthen the standard from 12 $\mu g/m^3$ to a value ranging from 9.0 to 10.0 $\mu g/m^3$.[2] Both these releases may impact the application of prescribed fire throughout the Agency.

Results of Long-Term Soil Productivity Study – No data.

Background & Driver(s):

Identified water quality concerns – No data.

Intact hydrologic conditions – No data.

Conditions of soil cover and stability – No data.

Prescribed fire impacts measured against National Ambient Air Quality Standards – Particulate matter is a mixture of extremely small particles made up of soil, dust, organic chemicals, metals, sulfates, and nitrate acids. The size of the particles is directly linked to health effects, with smaller particles causing the worst impacts to human health. As a result, EPA has set a primary NAAQS for ultra-small (less than 2.5 microns in diameter) particulate matter on both a short-term

[1] West, J.J., C.G. Nolte, M.L. Bell, A.M. Fiore, P.G. Georgopoulos, J.J. Hess, L.J. Mickley, S.M. O'Neill, J.R. Pierce, R.W. Pinder, S. Pusede, D.T. Shindell, and S.M. Wilson, 2023: Ch. 14. Air quality. In: Fifth National Climate Assessment. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. https://doi.org/10.7930/NCA5.2023.CH14

[2] https://www.epa.gov/newsreleases/epa-proposes-strengthen-air-quality-standards-protect-public-harmful-effects-soot

(24-hour) and annual basis. The 24-hour fine particulate matter ($PM_{2.5}$). The $PM_{2.5}$ NAAQS is currently set at 35 $\mu g/m^3$, while the annual $PM_{2.5}$ NAAQS is 12 $\mu g/m^3$.

Results of Long-Term Soil Productivity Study – No data.

What monitoring activities have been conducted since the last evaluation?

Identified water quality concerns – No data.

Intact hydrologic conditions – No data.

Conditions of soil cover and stability – No data.

Prescribed fire impacts measured against National Ambient Air Quality Standards – The addition of this indicator occurred around 2016 and has a 10-year reporting period. The indicator relies on federal air quality monitors throughout the state of Mississippi. There is both a lack of continuous data and spatial coverage at present to properly address this indicator; however, an analysis was conducted to illustrate how the question can be addressed in future biennial monitoring reports.

Results of Long-Term Soil Productivity Study – No data.

Monitoring Results:

Identified water quality concerns – No data.

Intact hydrologic conditions – No data.

Conditions of soil cover and stability – No data.

Prescribed fire impacts measured against National Ambient Air Quality Standards – Data were collected from 6 federal air quality monitors throughout the state of Mississippi for calendar years 2018 through November 2023. The appropriate metric to determine the exceedance of the 24-HR $PM_{2.5}$ NAAQS and the annual $PM_{2.5}$ NAAQS are the three-year rolling average of the $PM_{2.5}$ concentration (98th percentile-based value) and the annual average, respectively. This methodology resulted in 4 data points for both $PM_{2.5}$ standards. These data points and their associated trend were qualitatively compared with acres blackened by each district using data from the Forest Service Activity Tracking System (FACTS).

Results of Long-Term Soil Productivity Study – No data.

Monitoring Discussion and Findings:

Identified water quality concerns – No data.

Intact hydrologic conditions – No data.

Conditions of soil cover and stability – No data.

Prescribed fire impacts measured against National Ambient Air Quality Standards –

The figure below contains the monitor sites selected for this indicator.

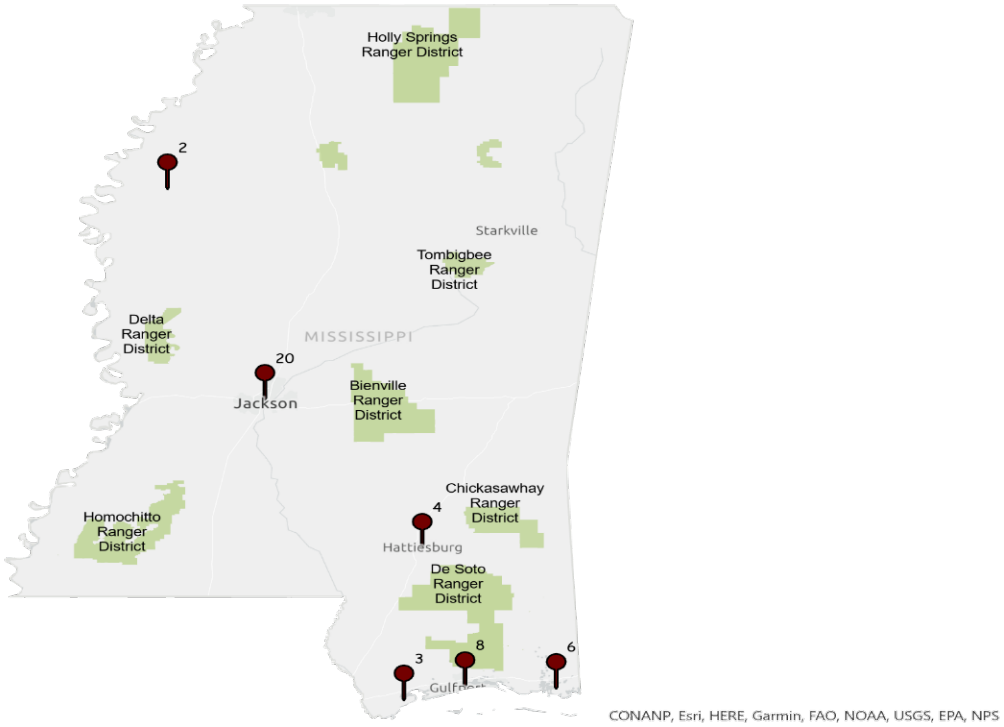


Figure 19. Select Federal Air Quality Monitors in Mississippi.

The 3-year rolling average for the 24-HR $PM_{2.5}$ standard (98th Percentile Based Value) and the 3-year rolling average for the $PM_{2.5}$ annual standard for years 2020, 2021, 2022, and 2023 from each monitor are shown in the tables below. All concentrations are expressed in µg/m^3.

Table 36. 3 Year Rolling Averages for the 24-HR $PM_{2.5}$ Standard.

County	Site	Lat	Long	2020	2021	2022	2023
DeSoto	2	33.751	-90.734	18.3	18.2	19.7	18.7
Hancock	3	30.301	-89.396	16.7	18.8	19.8	18.0
Forrest	4	31.324	-89.292	19.7	19.6	21.3	20.0
Jackson	6	30.378	-88.534	17.9	17.6	17.2	15.0
Harrison	8	30.390	-89.050	18.8	19.0	18.9	17.0
Hinds	20	32.329	-90.183	23.6	21.0	21.7	19.6

Table 37. 3 Year Rolling Averages for the Annual $PM_{2.5}$ Standard.

County	Site	Lat	Long	2020	2021	2022	2023
DeSoto	2	33.751	-90.734	8.5	8.4	8.6	8.8
Hancock	3	30.301	-89.396	7.8	8.3	8.6	7.8
Forrest	4	31.324	-89.292	9.3	9.4	9.8	9.2
Jackson	6	30.378	-88.534	8.6	8.4	8.2	7.7
Harrison	8	30.390	-89.050	9.1	9.2	9.0	8.3
Hinds	20	32.329	-90.183	10.1	10.1	10.1	9.5

Many of the selected monitors show a decline in both 24-HR $PM_{2.5}$ and annual $PM_{2.5}$ concentrations with all monitors being below the NAAQS for both 24-HR and annual $PM_{2.5}$ standards. This also does not account for reduced economic activity during the COVID-19 pandemic that stretched throughout most of 2020 and 2021, potentially resulting in lower concentrations than normal. The data for calendar year 2023 is only through late November. It is important to consider potential revisions to the annual $PM_{2.5}$ NAAQS. Although the 2023 annual value is below the current standard (12 µg/m^3), a strengthening to 8 or 9 µg/m^3 would result in several monitors exceeding the NAAQS.

The figures below show each monitor's trend (24-HR and annual) overlayed with the total acres blackened by the national forests in Mississippi.

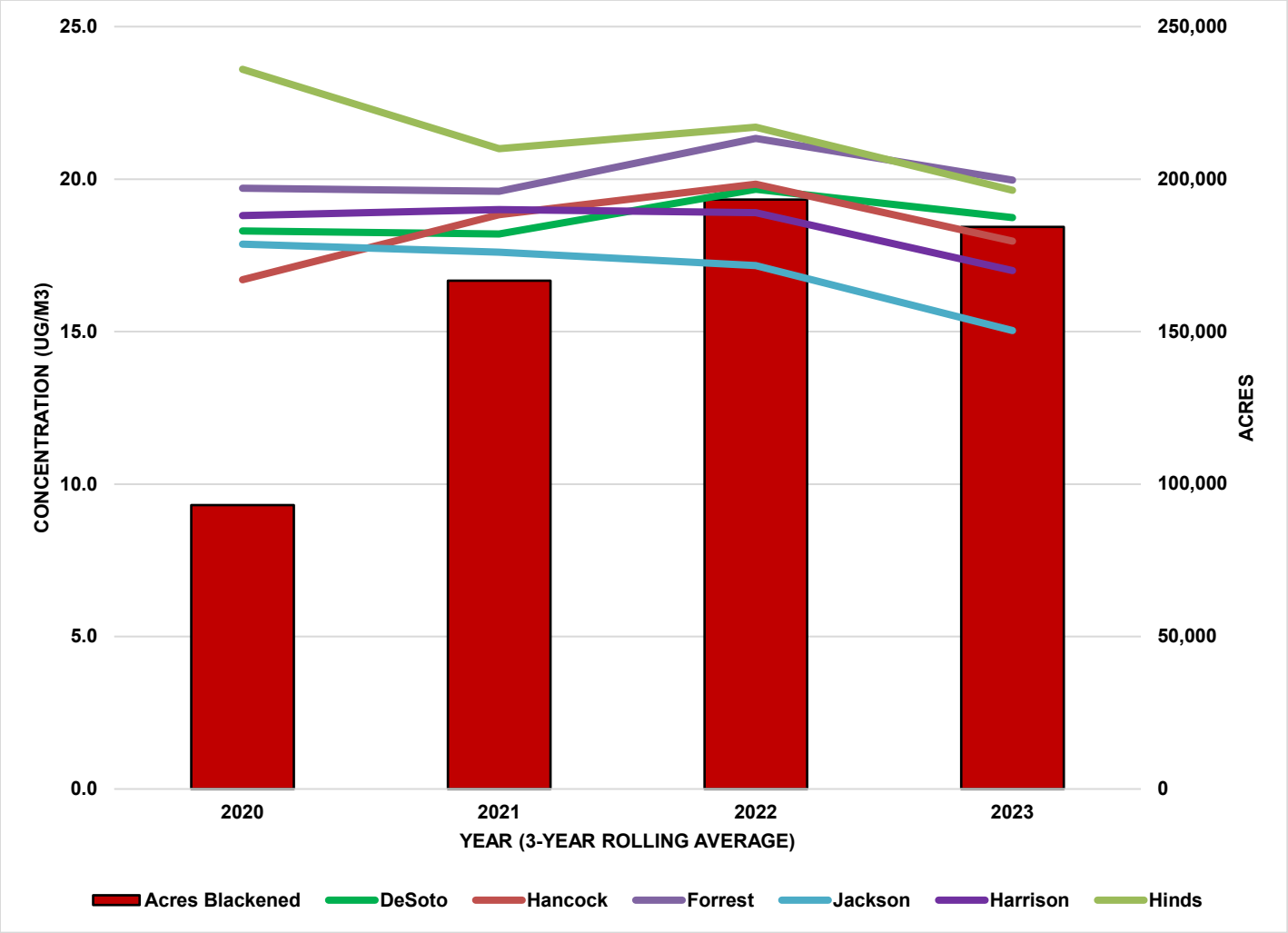


Figure 20. 24-HR $PM_{2.5}$ Concentration Variation with Total Acres Blackened.

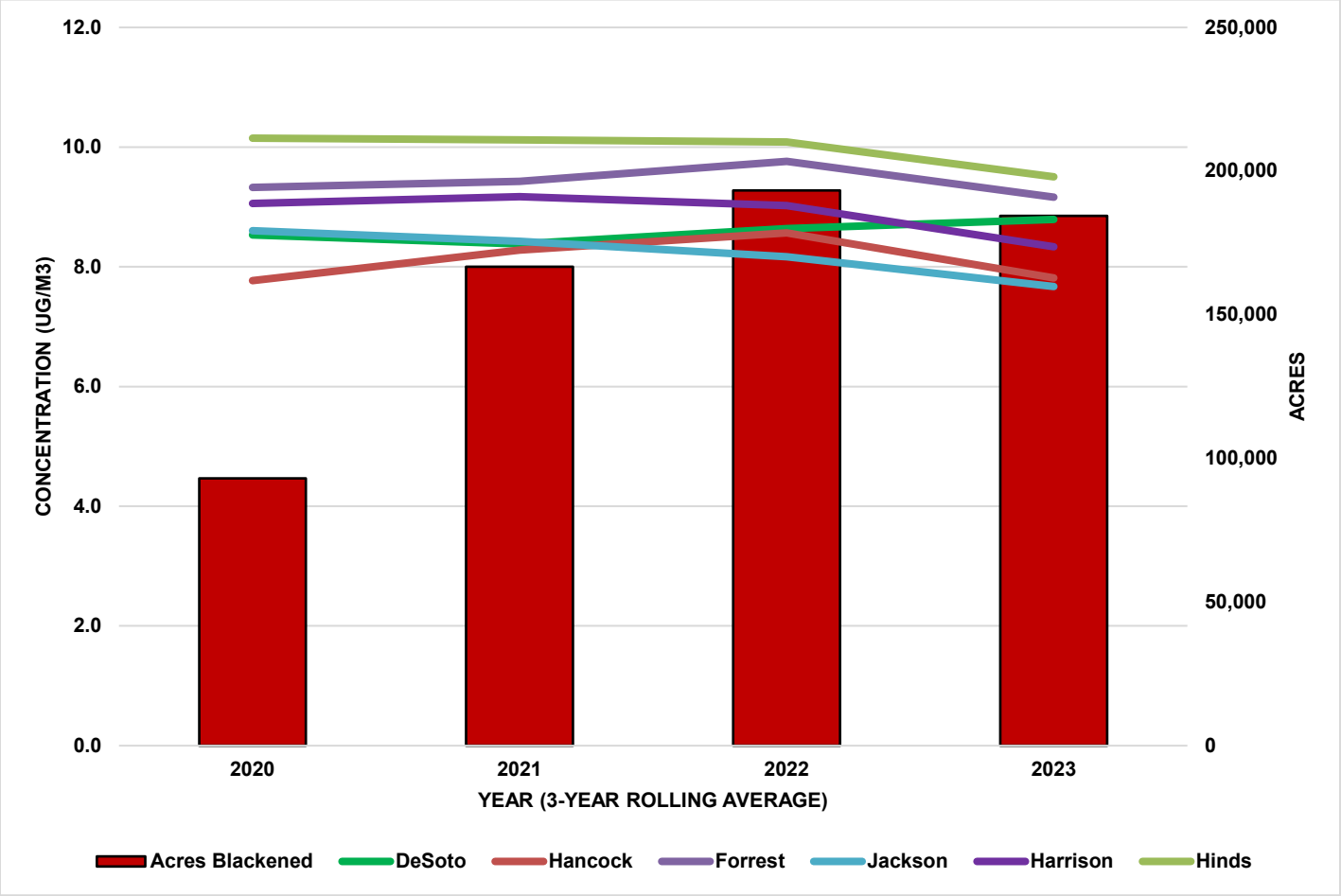


Figure 21. Annual $PM_{2.5}$ Concentration Variation with Total Acres Blackened.

There is no discernible trend within the figures that shows prescribed fire impacting monitor concentrations. Aside from impacts to monitor concentrations, the COVID-19 pandemic also affected prescribed fire applications in 2020 and 2021. All monitors are below the NAAQS for both 24-HR and annual $PM_{2.5}$ concentrations, those being 35 and 12 $\mu g/m^3$, respectively.

Results of Long-Term Soil Productivity Study – No data.

Adaptive Management Considerations:

Identified water quality concerns – No data.

Intact hydrologic conditions – No data.

Conditions of soil cover and stability – No data.

Prescribed fire impacts measured against National Ambient Air Quality Standards – It is challenging to assess prescribed fire impacts on the measured $PM_{2.5}$ concentrations at the various monitors in this analysis. Particulate matter (PM) originates from many different primary and secondary sources including smoke from fires and emissions (releases) from power plants, industrial facilities, cars and trucks, and construction sites. Several monitors in this analysis are in large metropolitan areas with heavy traffic including Jackson, Hattiesburg, and Gulfport, Mississippi. It is recommended that the forest continue implementing best smoke management practices to ensure $PM_{2.5}$ from prescribed fire does not contribute to or cause a NAAQS exceedance.

Results of Long-Term Soil Productivity Study – No data.

MQ 11: C.2 Are stream mitigation and restoration measures being implemented?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Objective 3.4 Healthy Watershed

Monitoring Indicator(s):

1. Acres of Brushy Creek watershed treated for head-cutting and sediment reduction projects
2. Miles of stream channel habitat restored in conjunction with aquatic organism passage culvert replacements

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Acres of Brushy Creek watershed treated for head-cutting and sediment reduction projects – No data.

Miles of stream channel habitat restored in conjunction with aquatic organism passage culvert replacements – No data.

Background & Driver(s):

Acres of Brushy Creek watershed treated for head-cutting and sediment reduction projects – No data.

Miles of stream channel habitat restored in conjunction with aquatic organism passage culvert replacements – No data.

What monitoring activities have been conducted since the last evaluation?

Acres of Brushy Creek watershed treated for head-cutting and sediment reduction projects – No data.

Miles of stream channel habitat restored in conjunction with aquatic organism passage culvert replacements – No data.

Monitoring Results:

Acres of Brushy Creek watershed treated for head-cutting and sediment reduction projects – No data.

Miles of stream channel habitat restored in conjunction with aquatic organism passage culvert replacements – No data.

Monitoring Discussion and Findings:

Acres of Brushy Creek watershed treated for head-cutting and sediment reduction projects – No data.

Miles of stream channel habitat restored in conjunction with aquatic organism passage culvert replacements – No data.

Adaptive Management Considerations:

Acres of Brushy Creek watershed treated for head-cutting and sediment reduction projects – No data.

Miles of stream channel habitat restored in conjunction with aquatic organism passage culvert replacements – No data.

MQ 12: D.1 Are forests in healthy condition?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 2.6 Healthy Forests

Monitoring Indicator(s):

1. Abundance of insect or disease damage
2. Infestations of invasive species
3. Abundance and distribution of forest seral stages and ages, including old growth
4. Timber yields compared to long-term sustained yield capacity and allowable sale quantity
5. Fire condition class within and out of urban interface areas
6. Fire return interval

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Abundance of insect or disease damage – No data.

Infestations of invasive species – No data.

Abundance and distribution of forest seral stages and ages, including old growth – No data.

Timber yields compared to long-term sustained yield capacity and allowable sale quantity – No data.

Fire condition class within and out of urban interface areas:

Anderson, C.T., Dietz, S.L., Pokswinski, S.M., Jenkins, A.M., Kaeser, M.J., Hiers, J.K. and Pelc, B.D., 2021. Traditional field metrics and terrestrial LiDAR predict plant richness in southern pine forests. *Forest Ecology and Management*, *491*, p.119118.

Fire return interval – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

Background & Driver(s):

Abundance of insect or disease damage – Southern pine beetle (SPB - *Dendroctonus frontalis* Zimmerman) infestations are common across the pine forests of the southeastern United States. In the National Forest in Mississippi (NFMS), population levels have fluctuated between latent and outbreak levels since the early 1950s. This species was selected to measure the effects of forest management aimed at promoting forest health (e.g., site/soil-based species selection, appropriate fire cycles, and preventing or thinning of overstocked stands) in pine-dominated ecosystems.

Factors that determine SPB hazard include the proportion of the stand in susceptibility host trees and the radial growth of those trees over a 5-year period. Trees with a relatively high radial growth are less susceptible to SPB-related mortality. While we do not have individual tree growth data to estimate susceptibility, we can use the Culmination of Mean Annual Increment (CMAI) as a proxy for radial growth. Trees within stands that have passed beyond CMAI are growing relatively slower and radial growth should be slower. CMAI for pine ranges from 35 to 50 years old depending upon site productivity. CMAI is also affected by trees that are overcrowded and un-thinned causing radial growth to slow. Management of these stands by thinning and/or regeneration harvests can increase radial growth and reduce susceptibility.

Infestations of invasive species – Non-native invasive species (NNIS) are an ever-increasing problem on NFMS. These species threaten forest health and ecosystems by reducing natural diversity and habitat for fish, wildlife, and native plants, as well as affecting soil stability. Effective treatment and control are compounded by the intermingled ownership pattern of federal, state, county, and private land throughout the state. The accelerated spread of noxious weeds has led to increased public awareness of the environmental problems associated with weeds. The National Forests in Mississippi is a partner in the Mississippi Cooperative Weed Management Area along with USDA Natural Resources Conservation Service (NRCS), Mississippi Department of Transportation (MDOT), Federal Highway Administration, Mississippi Forestry Commission, and others.

Each year, the NFMS uses the noxious weed control strategy to manage NNIS. The noxious weed control strategy outlines five emphasis areas which include: (1) cooperation, (2) education and prevention, (3) inventory, (4) control, and (5) monitoring. Kudzu and cogongrass are the priority species of concern although other pest plants do exist and are treated as opportunity arises.

Abundance and distribution of forest seral stages – An appropriate balance of vertical structure within each community provides critical habitat for associated species that require either early seral (grass/forb-seedling/shrub), mid-seral (poletimber – hardwoods 5-11 inches diameter breast height (d.b.h.); pines 5-9 inches d.b.h.), and late seral (sawtimber – hardwoods greater than 11 inches d.b.h.; pines greater than 9 inches d.b.h.) The overall quantity and distribution of vertical structure contributes to the sustainability and diversity of the ecological communities by providing a mix of early seral, immature, and mature stands (NFMS EIS Appendices).

A number of selection criteria were used to identify stands for a preliminary list of possible old-growth. These included lands withdrawn from timber production, red-cockaded woodpecker clusters, late-seral designations, stands at or above Southern Region minimum old-growth age, and rare community types (NFMS LRMP).

Timber yields compared to long-term sustained yield capacity and allowable sale quantity – No data.

Fire condition class within and out of urban interface areas – The majority of the ecosystems in Mississippi are fire-dependent requiring frequent low-intensity fires to maintain native ecosystems. Fire plays a major role in maintaining and restoring these fire-dependent ecosystems. Restoring and maintaining condition class provides for a resilient landscape and low-intensity fires through the systems within NFMS.

Fire return interval – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

What monitoring activities have been conducted since the last evaluation?

Abundance of insect and disease damage – All SPB treatment data is collected, entered, and stored in the FACTS database as activities are accomplished annually.

Infestations of invasive species – All invasive species treatment data is collected, entered, and stored in the FACTS database as activities are accomplished annually.

Abundance and distribution of forest seral stages – Field Sampled Vegetation (FSVEG) is the database of record for tracking inventories across the forests that measure species, size, age, and condition of forest stands. This database is updated yearly as prescriptions are completed for projects to be implemented.

Timber yields compared to long term sustained yield capacity and allowable sale quantity – No data.

Fire condition class within and out of urban interface areas – FACTS spatial and FACTS tabular reporting for prescribed burns across all Districts of the National Forests in Mississippi. NFMS is currently working on establishing terrestrial LiDAR plots to assist in better answering this question and tracking the trend of forest health and restoration within the NFMS.

Fire return interval – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

Monitoring Results:

Abundance of insect and disease damage –

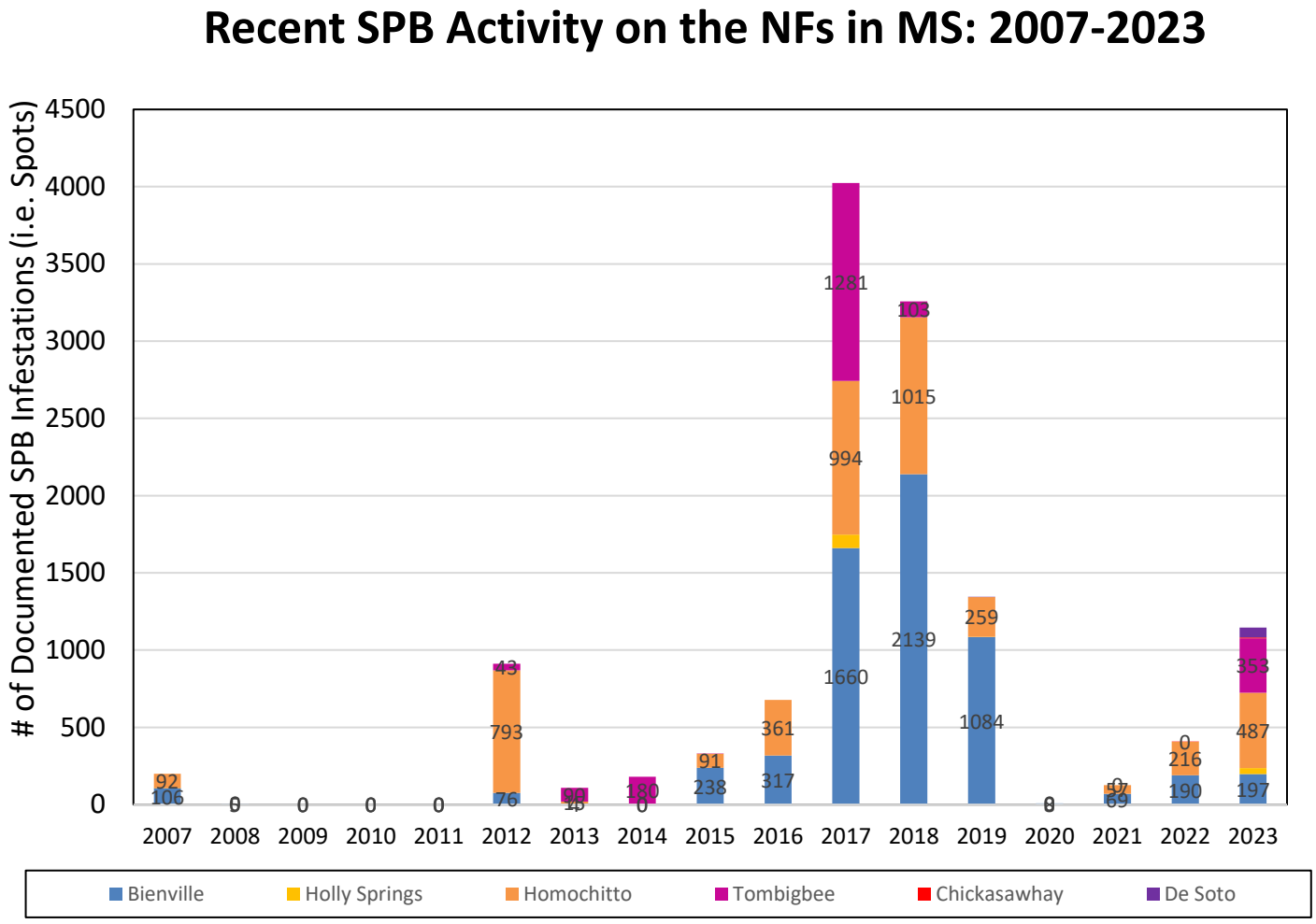


Figure 22. SPB Activity (# spots) in the National Forests in Mississippi.

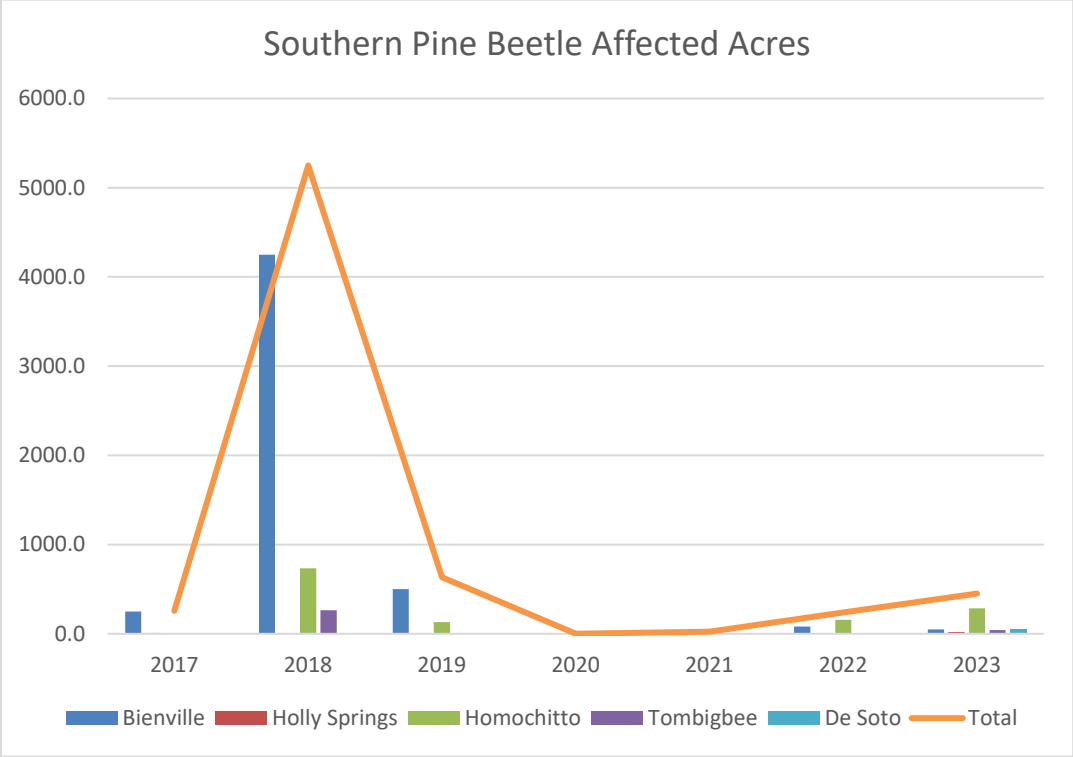
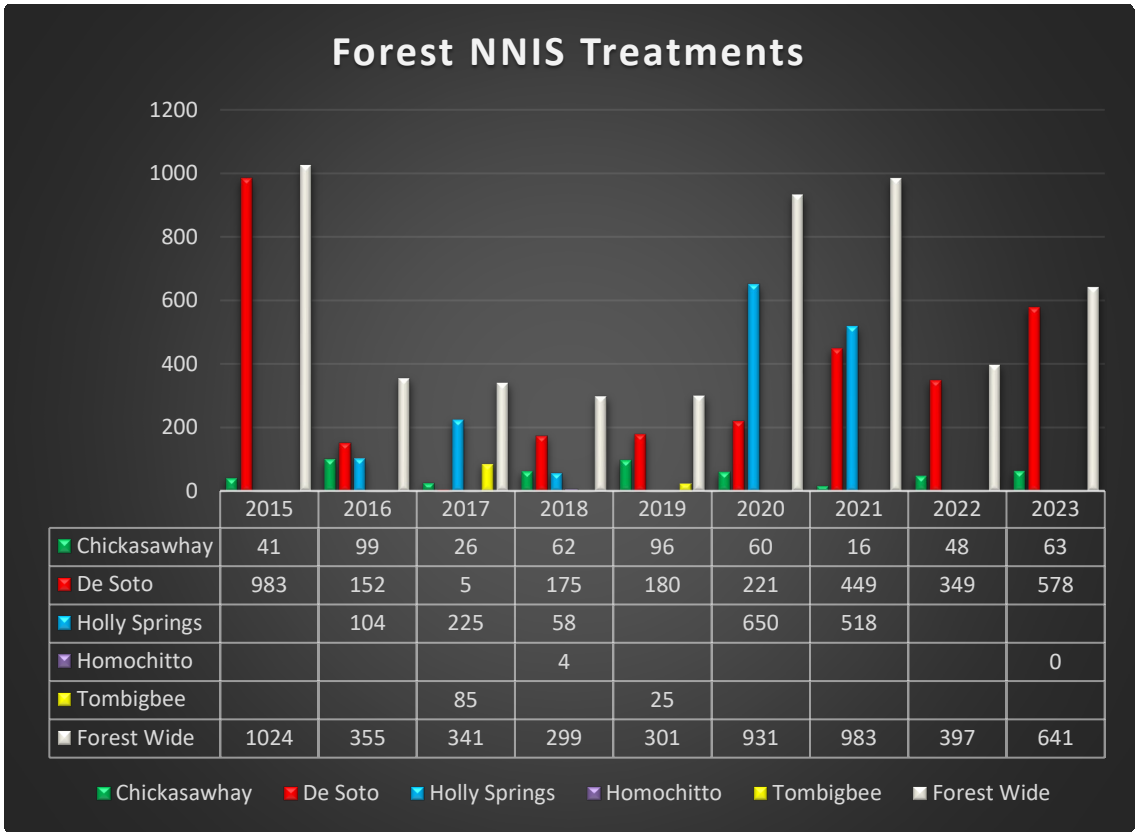


Figure 23. Acres Affected by SPB in the National Forests in Mississippi.

Infestations of invasive species –

Figure 24 shows the number of acres treated for NNIS by district for FY 2015-2023.



	2015	2016	2017	2018	2019	2020	2021	2022	2023
Chickasawhay	41	99	26	62	96	60	16	48	63
De Soto	983	152	5	175	180	221	449	349	578
Holly Springs		104	225	58		650	518		
Homochitto				4					0
Tombigbee			85		25				
Forest Wide	1024	355	341	299	301	931	983	397	641

Figure 24. Non-native Invasive Species Management in the National Forests in Mississippi.

Abundance and distribution of forest seral stages –

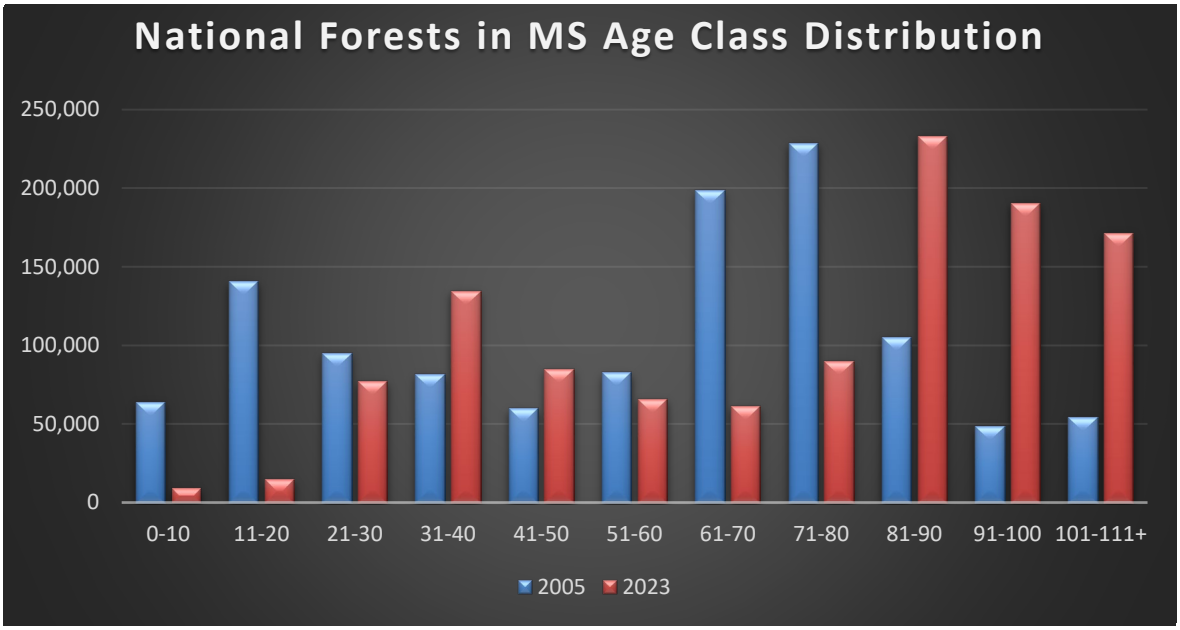


Figure 25. Distribution of Forest Age Classes.

Acres Identified for Old Growth in FSVEG								
Selection Criteria	**Bienville**	**DeSoto**	**Homochitto**	**Chickasawhay**	**Delta**	**Holly Springs**	**Tombigbee**	**Total**
Wilderness (3)	0	5,841	0	0	0	0	0	5,841
Research Natural Area (4)	208	712	228	539	670	186	803	3,346
Other administratively designated unregulated areas (5)	310	4,299	70	561	3,397	235	811	9,683
Red-cockaded woodpecker clusters (6)	8,270	1,408	4,337	3,114	0	0	0	17,129
Late Seral (7) & R8 old growth minimum age (8) combined	10,834	18,139	7,058	7,155	4,745	4,855	3,002	55,788
Rare community types (9)	600	959	1,131	66	0	361	136	3,306
Total	20,222	31,358	12,824	11,495	8,812	5,687	5,574	95,093
% Designated	**11%**	**9%**	**7%**	**8%**	**15%**	**4%**	**7%**	**8%**

Table 38. Old Growth Abundance Across the National Forests in Mississippi.

Timber yields compared to long term sustained yield capacity and allowable sale quantity – No data.

Fire condition class within and out of urban interface areas –

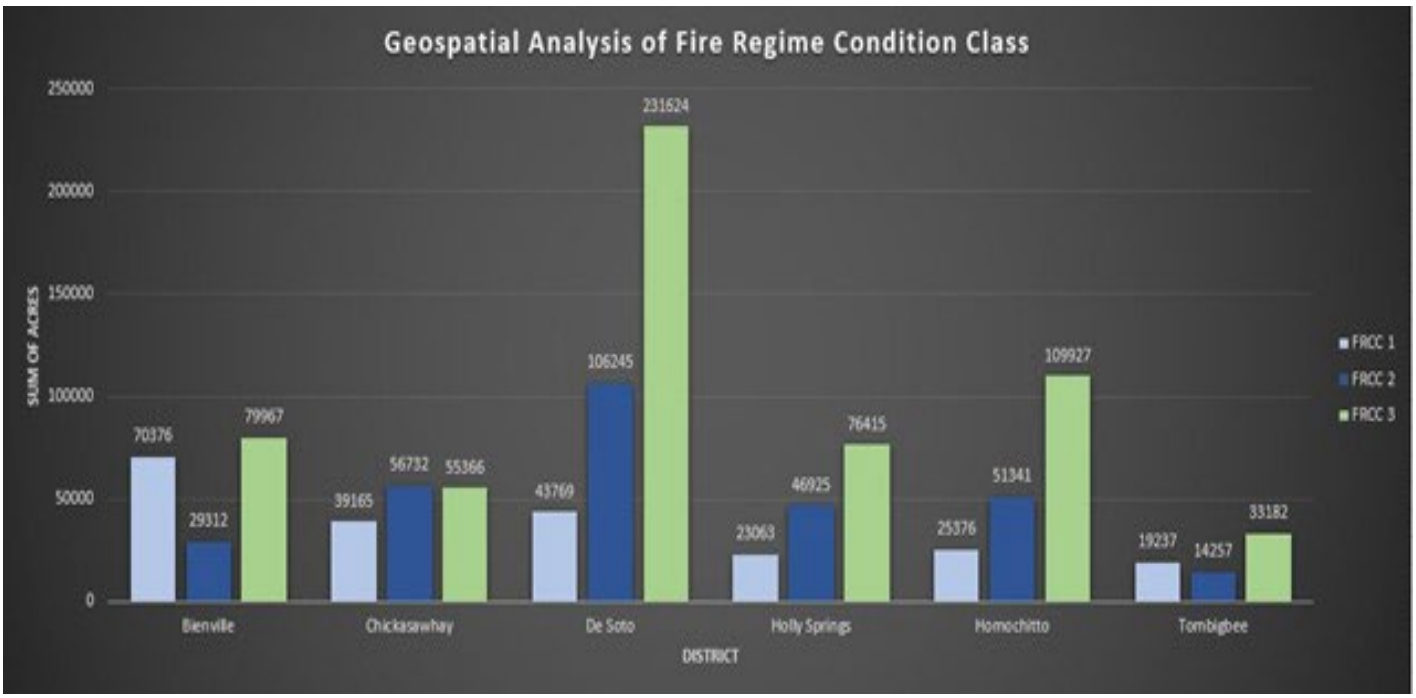


Figure 26. Geospatial Analysis of Fire Regime Condition Class.

The above condition class graph was created through a geospatial analysis that utilized the ecosystem layer and burn polygons. A union was created to look at the number of burns on one footprint. The following table depicts how each polygon was assigned a condition class depending on the ecosystem and burn polygon layers.

Burns in Polygon	FRI for System	Defined Condition Class
0 Burns	> 10 yrs	2
0 Burns	< 10 yrs	3
0-4 Years	Undefined	2
4	Any but 0	1
3	Any but 0	1
2	Any but 0	1
1	> 3.5	1
1	<2.5	2

Table 39. Polygon Condition Class.

The same process should be utilized in the future to track trends across NFMS. While there is an intent to establish a LiDAR monitoring program, the continuation of this analysis will provide a look at trends strictly looking at where and how often burns take place on the landscape.

District	Condition Class Acres Through Geospatial Analysis		
	Condition Class 1	Condition Class 2	Condition Class 3
Bienville	70,376 (39%)	29,312 (16%)	79,967 (45%)
Chickasawhay	39,165 (26%)	56,732 (38%)	55,366 (37%)
De Soto	43,769 (11%)	106,245 (28%)	231,624 (61%)
Holly Springs	23,063 (16%)	46,925 (32%)	76,415 (52%)
Homochitto	25,376 (14%)	51,341 (28%)	109,927 (59%)
Tombigbee	19,237 (29%)	14,257 (21%)	33,182 (50%)

Table 40. Condition Class Acres Through Geospatial Analysis.

Fire return interval – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

Monitoring Discussion and Findings:

Abundance of insect and disease damage – The most severe outbreak previously documented occurred in the Homochitto and Holly Springs Ranger Districts during 1994-1995. Populations fluctuated since that time but were generally in a latent phase from 2008 until 2012. In 2012 however, without indication, populations exploded in the Homochitto Ranger District marking the first time in 10 years that a SPB outbreak had occurred on the NFMS as well as the first severe outbreak (>3.0 spots/1000 ac host type) since 1995. Since 2012, southern pine beetle spots have been located every year, with 2017 representing the highest number of infestations in over 15 years (Figure 22).

In 2017, the National Forests in Mississippi (NFMS) documented over 3,500 pine beetle spots spread across four units: the Homochitto, the Bienville, the Holly Springs, and the Tombigbee ranger districts. NFMS attempted to implement the Strategic Plan for Southern Pine Beetle Suppression, with mixed results. Thousands of acres were treated in hopes that the beetle activity could be suppressed. The beetles not only continued to kill trees during the warm season, but they also remained active through the winter. 2018 started with clear evidence that the impending year would be another extreme SPB situation which ended in over 3,000 spots whereas 2019 was possibly a beginning of decline, although still high pine beetle damage, having approximately 1300 spots. In 2023, SPB spots once again began increasing until extreme summer heat and drought hindered further infestations. Since 2015, over 30,000 acres have been affected by SPB across the Forest (Figure 23).

Infestations of invasive species – Six Districts in the Forest have treated NNIS since the Forest Plan was completed. NNIS treatment has varied among Districts and years (Figure 24). In 2015, over 1000 acres were treated across the Forest, followed by 2020 & 2021 resulting in over 900 acres treated annually. Subsequent years averaged a total of approximately 586 acres treated across the Forest. There is an obvious drop off in NNIS acres treated annually in years with SPB epidemics due to available resources. The control strategy for NNIS is: 1) locate and eradicate small, isolated infestations to prevent the establishment of new patches; 2) control and stop the spread of well-established populations by reducing the vigor and health of these patches with repeated treatments over time until eradication has occurred; 3) continue to monitor treated patches to ensure that the NNIS is eradicated. There is not a good measure of how many acres are infested with NNIS, but it is known that treatment will need to continue to combat a long-term strategy to control the spread.

Cogongrass is aggressively spreading on roadsides within the De Soto and Chickasawhay Ranger Districts and is beginning to be found in all Districts. The Forest's annual prescribed burning program releases previously unknown cogongrass infestations and spreading occurs due to the lack of native bunchgrass competition in a timely manner. Treatment is planned and accomplished annually. Kudzu is an invasive species in the Holly Springs and Tombigbee Ranger Districts impacting an estimated 20,000 and 7,000 acres respectively. It also occurs in the Bienville, De Soto, and Homochitto Ranger Districts, but to a much lesser extent. The majority of the infested areas are within 150 to 200 feet of roads. The Forest Plan objective over the first decade of the plan is to generate a minimum of 1800 acres free of NNIS

that were previously infested. The Forest is on the path to meet this objective (5,272 acres treated since 2015) but NNIS management needs to remain a priority across the Forest.

Abundance and distribution of forest seral stages – Structure and age diversity are both important characteristics of forested ecological systems. Every forested community consists of a mixture of age-classes and a diversity of vertical structure, with young growth replacing losses due to natural decadence, storm events, pest infestations, and wildfires. Structure is also important to non-forested systems such as grasslands and shrub/scrub habitats.

The goal for age class distributions at the end of the 1st decade is 2% in 0-10, 37% in 11-59, and 61% in 60 + age class. This trend lends itself to a long rotation age due to the amount of the forest in regeneration. Longleaf pine specifically has an increased goal of 5% in 0-10 age class with an understanding of it being higher in the early stages of converting off-site species to longleaf. Current conditions are very close to the 1st decade goal with 2% in 0-10, 34% in 11-59, and 64% in 60+ age class. With the current Forest Plan objectives of promoting restoration of longleaf pine from off-site species, the age class distribution is trending in the right direction to increase the number of acreages in the 0-10 age class and still be heavily skewed in the older age classes.

As shown in Table 41 above, the objective of 10% across the forest has not been met but is at **8%** largely because of the large percentage identified in the Delta National Forest. Each district also has a goal of 10% and some work is needed to properly designate areas in the FSVEG database to identify these areas for future old-growth. Delta and Bienville National Forests are the only two districts that have met their goal for designation.

Each district silviculturist, timber management assistant (TMA), and ranger will need to sit down and figure out areas that meet the current condition of old growth or possible future old-growth and identify these areas in FSVEG spatially. There is flexibility in the forest plan to designate old-growth and still implement treatments to promote the old-growth structure should it be needed. The goal of having 1% of old-growth be medium-sized was not analyzed in this monitoring report, as districts need to identify areas spatially with the 1% in mind and it can be reported on the next biannual monitoring report.

Timber yields compared to long-term sustained yield capacity and allowable sale quantity – No data.

Fire condition class within and out of urban interface areas – The data from previous years did not have protocols to determine the condition class for this monitoring period. Therefore, the data above is a good baseline to compare trends with data collected in the future. That data should be collected for a longer duration of time than the above, which is only data from four years. Once a 10-year period is collected, better and more accurate results showing trends will be available for comparison for every frequency of measurement. A look at the good/fair/poor layer from districts was also performed for comparison. However, the good/fair/poor layer was not ideal due to prescribed fire polygons not matching up with the good/fair/poor layer. An example is numerous polygons showing as "good" when they had not received a prescribed fire for over 10 years. Also, if the good/fair/poor layer was utilized for comparison a downward trend would be shown. Therefore, this geospatial analysis should be performed incorporating a longer period and the same way to improve monitoring for any adaptive management considerations.

Fire return interval – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

Adaptive Management Considerations:

The forest plan monitoring program is meant to "enable the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed" (36 CFR 219.12).

Abundance of insect and disease damage – Based on the findings in the discussion above, there is no recommended need for change of the planning strategy but first thinnings of pine stands should continue to be a priority and the Forest Plan must be adhered to concerning this measure.

Infestations of invasive species – Based on the findings in the discussion above, there is no recommended need for change of the planning strategy, but the Forest may need to increase treatment across all Districts as needed to ensure eradication/control of NNIS, safeguard forest health, and meet plan objectives.

Abundance and distribution of forest seral stages – As discussed above, the district managers will need to meet and identify old growth stands in FSVEG to meet at least the minimum requirements by district. These areas will need to be

strategically identified in areas where they make the most sense and should require the least amount of anticipated changes in the near future to help promote consistency over the years. While the forest plan does indicate that these areas can be managed to maintain the desired structure of old growth, they should be identified in areas where little active management is needed to reach the desired condition. Red-cockaded woodpecker (RCW) clusters are likely already designated for old growth characteristics and will likely remain that way for many years. These clusters will reach a point where management is needed and the availability of other old growth areas near these clusters will be needed to provide consistent nesting opportunities.

Other than the old-growth considerations above, there is no recommended need for change to age class manipulation currently, as management activities are trending toward the desired objective.

Timber yields compared to long-term sustained yield capacity and allowable sale quantity – No data.

Fire condition class within and out of urban interface areas – As stated above this is an ideal protocol that provides a baseline unless previous years are looked at prior to this monitoring window. Incorporating LiDAR plots in the future to ensure the accuracy of this protocol will also assist in ensuring accuracy. A prescribed fire footprint does not always mean objectives are met within that footprint.

Fire return interval – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system

MQ 13: D.2 Are disturbance events, including those that may be related to climate change, changing in frequency?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition: 2.6 Healthy Forests

Monitoring Indicator(s):

1. Extent, severity, and frequency of wind and ice storms, drought, and insect, disease or decline outbreaks.

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Extent, severity, and frequency of wind and ice storms, drought, and insect, disease or decline outbreaks – No data.

Background & Driver(s):

Extent, severity, and frequency of wind and ice storms, drought, and insect, disease or decline outbreaks –
Primary vegetation management activities for attaining healthy forests include regeneration, thinning, timber harvest, and prescribed burning. While timber harvesting contributes to the local economy and America's supply of wood products, it is also used to create wildlife habitat conditions, manage fuels, and manage vegetation to achieve shifts in species composition and restoration of native ecological communities.

Healthy forests are resilient to stressors and have sufficient nutrients and physical growing conditions. For the National Forests in Mississippi, the most common traditional threats to forest health include nonnative invasive species (especially cogon grass and kudzu), disease outbreaks, and insect infestations (particularly recurring cycles of southern pine beetle infestations). However, overly dense stands, hazardous fuel levels, urban expansion, and climate change disturbances can also affect forest health (NFMS LRMP).

What monitoring activities have been conducted since the last evaluation?

Extent, severity, and frequency of wind and ice storms, drought, and insect, disease or decline outbreaks – All SPB treatment data is collected, entered, and stored in the FACTS database as activities are accomplished annually.

All negative impacts to the forest are not tracked directly, such as ice storms, drought, wind, and disease occurrence. Treatments that follow tornados or storms such as salvage operations can be stored in the FACTS database.

Monitoring Results:

Extent, severity, and frequency of wind and ice storms, drought, and insect, disease or decline outbreaks –

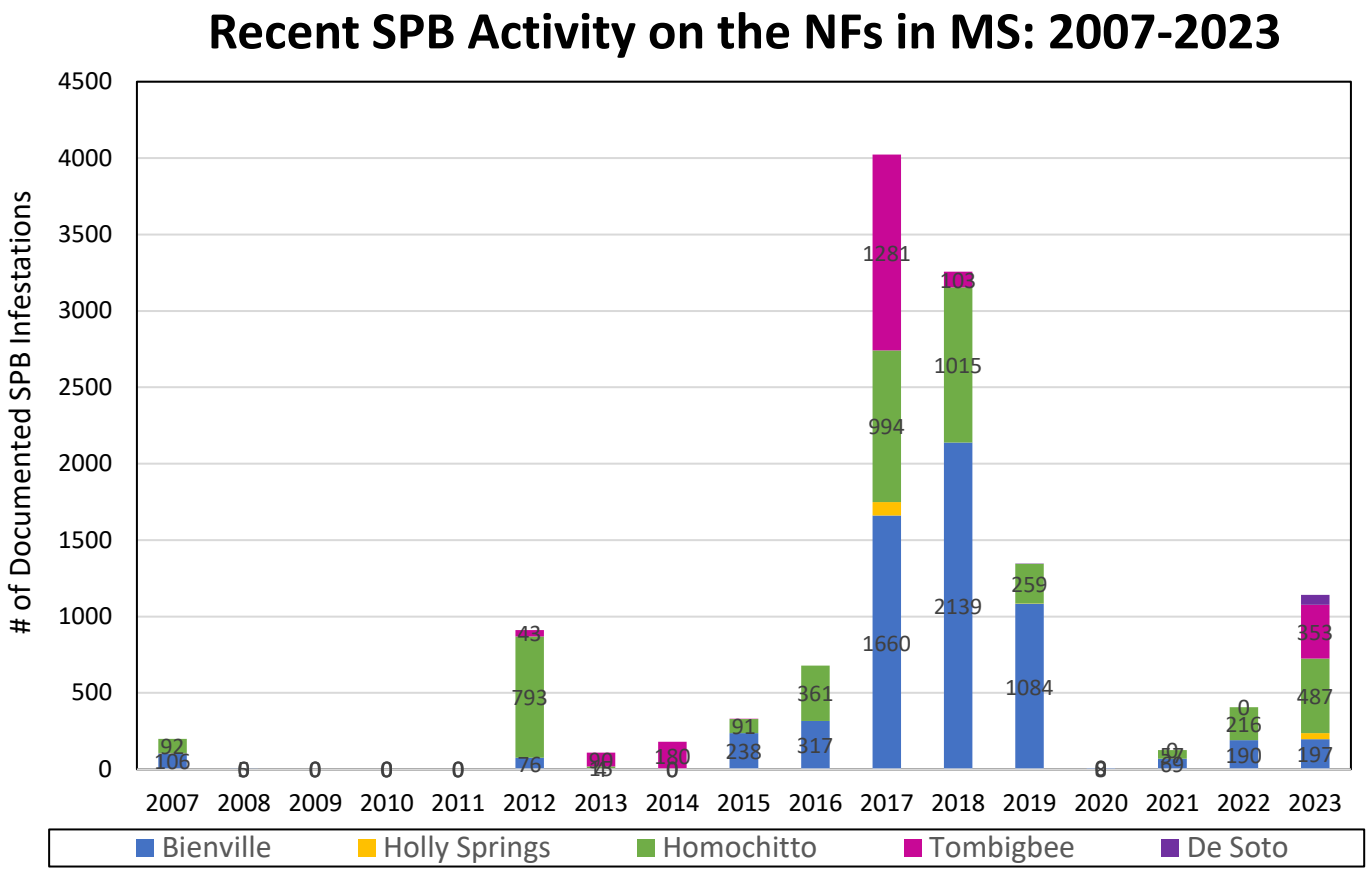


Figure 27. SPB Activity (# Spots) on the National Forests in Mississippi for 2007-2023.

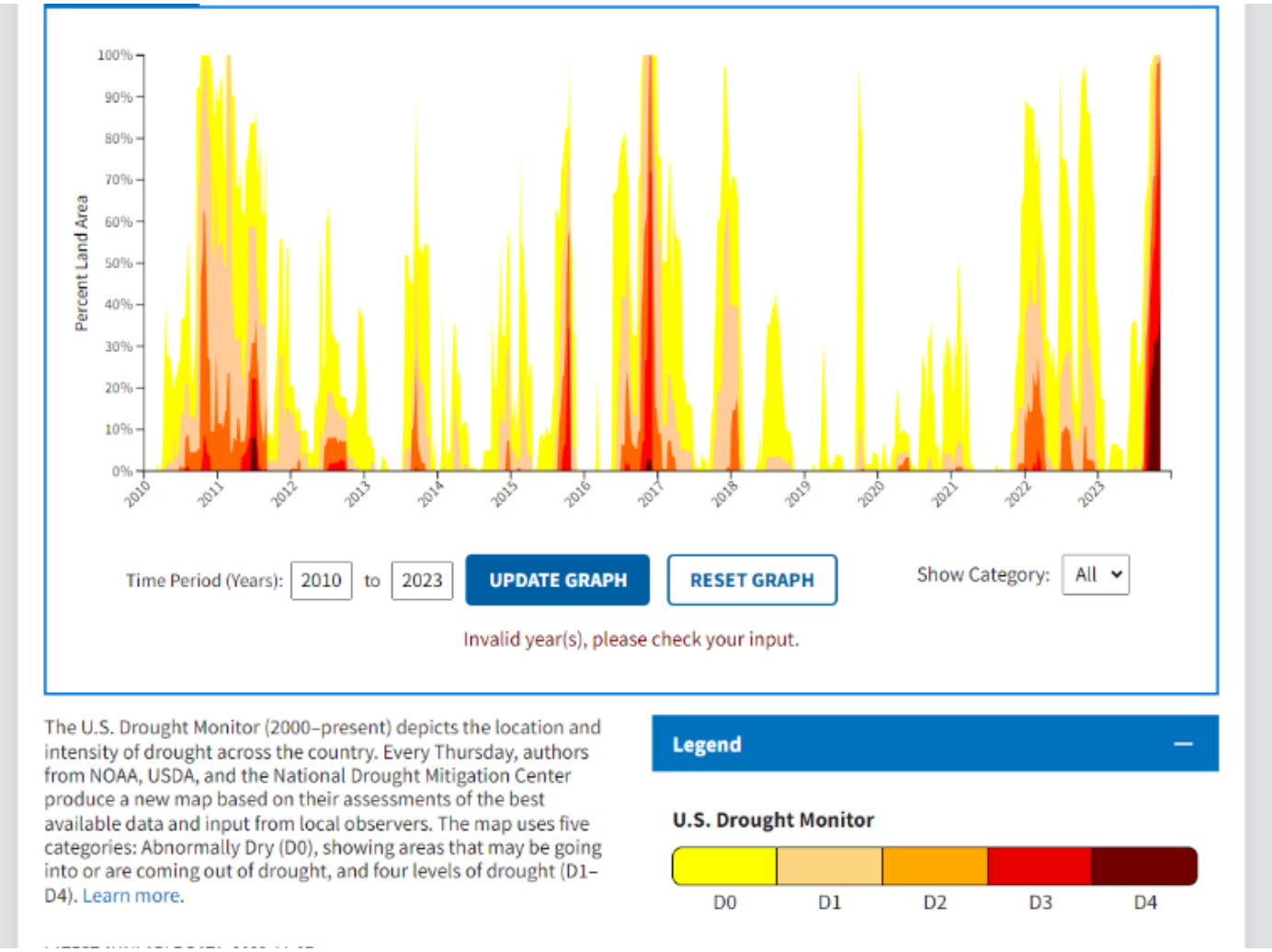


Figure 28. Mississippi Drought Monitor for 2010-2023 (source: https://www.drought.gov/drought/states/Mississippi).

Monitoring Discussion and Findings:

Extent, severity and frequency of wind and ice storms, drought, and insect, disease or decline outbreaks – The most severe SPB outbreak previously documented occurred in the Homochitto and Holly Springs Ranger Districts during 1994-1995. Populations fluctuated since that time but were generally in a latent phase from 2008 until 2012. In 2012 however, without indication, populations exploded in the Homochitto Ranger District marking the first time in 10 years that a SPB outbreak had occurred on the NFMS as well as the first severe outbreak (>3.0 spots/1,000 ac host type) since 1995. Since 2012, southern pine beetle spots have been located every year, with 2017 representing the highest number of infestations in over 15 years (Figure 27).

In 2017, the National Forests in Mississippi (NFMS) documented over 3,500 pine beetle spots spread across four units: the Homochitto, Bienville, Holly Springs, and Tombigbee ranger districts. NFMS attempted to implement the Strategic Plan for Southern Pine Beetle Suppression, with mixed results. Thousands of acres were treated in hopes that the beetle activity could be suppressed. The beetles not only continued to kill trees during the warm season, but they also remained active through the winter. 2018 started with clear evidence that the impending year would be another extreme SPB situation which ended in over 3,000 spots whereas 2019 was possibly a beginning of decline, although still high pine beetle damage, having approximately 1300 spots. Since 2015, over 30,000 acres have been affected by SPB across the Forest.

In 2015 the Holly Springs district had tornado damage amounting to approximately 1,200 acres and in 2019 the Tombigbee had tornado damage of approximately 120 acres. The abundance and frequency of these severe events has not

been measured in a Forest Service database. Past knowledge of events through local district personnel recounts events that have negatively impacted the forest resources over the years.

Hurricanes are a definite threat to the National Forests in Mississippi, especially in the Desoto National Forest. Hurricane Katrina in 2005 did significant damage to the Desoto, Bienville, and Chickasawhay Ranger Districts along with impacts on the Holly Springs and Tombigbee districts, but to a lesser extent. There has not been a major hurricane that affected the National Forest in Mississippi in the timeframe examined in this monitoring report (2015-2023).

Ice damage is an issue especially when it comes to young plantations up to plantations that are coming up on 1st thinning size. The northern districts (i.e. Tombigbee and Holly Springs) are the most susceptible to an increased threat of ice storms; however, they definitely can occur across the entire National Forests in Mississippi. There has not been a major ice storm that affected the National Forest in Mississippi in the timeframe examined in this monitoring report (2015-2023).

Drought has not been a major issue in the last few years on the National Forests in Mississippi, minus 2017. As seen in Figure 28 above, the years 2001, 2008, 2011, 2017, and 2023 were years with the most area of Mississippi in drought conditions. The frequency of these droughts doesn't appear to be increasing over the last 20 years with severe droughts occurring on average once every 8 years.

Managing a resilient forest by ensuring it is as healthy as possible will help future survival of sensitive ecosystems and the plants and animals that depend on them daily.

Adaptive Management Considerations:

Extent, severity, and frequency of wind and ice storms, drought, and insect, disease or decline outbreaks – Based on the information above adaptive management is the only way to manage for a majority of natural disasters. However, proper management should be emphasized to promote a healthy forest that can survive through natural events that forests have survived through for thousands of years. An emphasis on young plantation thinning by promoting weight scale sales and innovative authorities available to the Forest Service will help tremendously in increasing the overall health of the NFMS.

MQ 14: D.3 Are disturbance events, including those that may be related to climate change, affecting desired conditions in the forest?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition: 2.6 Healthy Forests

Monitoring Indicator(s):

1. Changes in condition caused by disturbance events
2. Rate of mortality of large trees

Forest Plan Monitoring Frequency: 10 years

New Science or Other Information:

Changes in condition caused by disturbance events – No data.

Rate of mortality of large trees – No data.

Background & Driver(s):

Changes in condition caused by disturbance events – No data.

Rate of mortality of large trees – No data.

What monitoring activities have been conducted since the last evaluation?

Changes in condition caused by disturbance events – No data.

Rate of mortality of large trees – No data.

Monitoring Results:

Changes in condition caused by disturbance events – No data.

Rate of mortality of large trees – No data.

Monitoring Discussion and Findings:

Changes in condition caused by disturbance events – No data.:

Rate of mortality of large trees – No data.

Adaptive Management Considerations:

Changes in condition caused by disturbance events – No data.

Rate of mortality of large trees – No data.

MQ 15: D.4 Are healthy forest objectives being achieved?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Objective: 3.5 Healthy Forests

Monitoring Indicator(s):

1. Timber removal volume
2. Five-year regeneration certifications measuring regeneration to desirable species
3. Commercial thinning acres
4. Noncommercial thinning acres
5. Regeneration release acres
6. Effective nonnative invasive species treatment acres/sites
7. Southern pine beetle (MIS) mortality and removal acres
8. Southern pine beetle pheromone trapping survey results and Southern Pine Beetle Information System (SPBIS) database review
9. Longleaf pine (MIS) regeneration prescribed burn acres
10. Percentage of each unit and system managed for old growth
11. Prescribed burning acres by unit and season
12. Acres of land acquired by donation, purchase, transfer, or land for land exchange

13. Trend monitoring of pileated woodpeckers (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with geographic information system (GIS) analysis of mature forest stands.

14. Trend monitoring of wood thrush (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with GIS analysis of mature forest stands as compared to open areas.

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Timber removal volume – No data.

Five-year regeneration certifications measuring regeneration to desirable species – No data.

Commercial thinning acres – No data.

Noncommercial thinning acres – No data.

Regeneration release acres – No data.

Effective nonnative invasive species treatment acres/sites – No data.

Southern pine beetle (MIS) mortality and removal acres – No data.

Southern pine beetle pheromone trapping survey results and Southern Pine Beetle Information System (SPBIS) database review – No data.

Longleaf pine (MIS) regeneration prescribed burn acres – No new science or other information.

Percentage of each unit and system managed for old growth – No data.

Prescribed burning acres by unit and season – No new science or information collected outside of this monitoring program was considered in the evaluation of this monitoring question. Recommend re-evaluating and updating the NFMS ecosystem layer, specifically regarding smaller ecosystems and sites that have been restored to desired species since the ecosystem layer was made.

Acres of land acquired by donation, purchase, transfer, or land for land exchange – No data.

Trend monitoring of pileated woodpeckers (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with geographic information system (GIS) analysis of mature forest stands. – No data.

Trend monitoring of wood thrushes (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with GIS analysis of mature forest stands as compared to open areas. – No data.

Background & Driver(s):

Timber removal volume – No data.

Five-year regeneration certifications measuring regeneration to desirable species – Restoring and maintaining a diversity of native ecological systems is the foundation of the Land and Resource Management Plan (LRMP). As we implement the plan, striving to achieve desired conditions and objectives, following standards and guidelines, and recognizing the contribution of unique geographic areas, ecosystem functionality should improve. This should not only improve ecosystem diversity, but also provide for many of the needs of plant and animal species in the forest.

To achieve desired conditions for ecosystem diversity, we need to restore native ecological systems on suitable sites. We plan to accomplish these conversions primarily through vegetation management programs that result in improved habitats for a variety of plants and animals (including threatened, endangered, sensitive, and locally rare species) and increased resilience to potential effects of climate change. Restoration activities will mainly involve reducing loblolly and slash pine plantations in favor of reestablishing longleaf pine, shortleaf pine, and hardwood communities. Restoring and maintaining

less common communities on appropriate sites will further enhance ecosystem diversity and conserve rare systems (NFMS LRMP).

Commercial thinning acres – This monitoring element focuses on the forest's ability to maintain the health of an ecosystem by providing treatments to stands in poor conditions. These thinning treatments will improve the light penetration to the forest floor and promote an increased herbaceous layer available for native wildlife. Thinning will also benefit the growth and health of the forests and sustain foraging and nesting opportunities needed by endangered species and other native wildlife.

Noncommercial thinning acres – This element is a tool used to manipulate the stocking and species composition of a young forest stand. These treatments ensure that desirable species are given a free-to-grow situation with very limited competition and promote desirable species present in the main canopy into the future.

Regeneration release acres – This element is a tool used to manipulate the stocking and species composition of a young forest stand. These treatments ensure that desirable species are given a free to grow situation with very limited competition and promote desirable species present in the main canopy into the future.

Effective nonnative invasive species treatment acres/sites – Non-native invasive species (NNIS) are an ever-increasing problem on NFsMS. These species threaten forest health and ecosystems by reducing natural diversity and habitat for fish, wildlife, and native plants, as well as affecting soil stability. Effective treatment and control is compounded by the intermingled ownership pattern of federal, state, county, and private land throughout the state. The accelerated spread of noxious weeds has led to increased public awareness of the environmental problems associated with weeds. The National Forests in Mississippi is a partner in the Mississippi Cooperative Weed Management Area along with USDA Natural Resources Conservation Service (NRCS), Mississippi Department of Transportation (MDOT), Federal Highway Administration, Mississippi Forestry Commission, and others.

Each year, the NFsMS uses the noxious weed control strategy to manage NNIS. The noxious weed control strategy outlines five emphasis areas which include: (1) cooperation, (2) education and prevention, (3) inventory, (4) control, and (5) monitoring. Kudzu and cogongrass are the priority species of concern although other pest plants do exist and are treated as opportunity arises.

Southern pine beetle (MIS) mortality and removal acres – Southern pine beetle (SPB - *Dendroctonus frontalis* Zimmerman) infestations are common across the pine forests of the southeastern United States. In the National Forest in Mississippi (NFMS), population levels have fluctuated between latent and outbreak levels since the early 1950s. This species was selected to measure the effects of forest management aimed at promoting forest health (e.g., site/soil-based species selection, appropriate fire cycles, and preventing or thinning of overstocked stands) in pine-dominated ecosystems.

Factors that determine SPB hazard include the proportion of the stand in susceptibility host trees and the radial growth of those trees over a 5-year period. Trees with a relatively high radial growth are less susceptible to SPB-related mortality. While we do not have individual tree growth data to estimate susceptibility, we can use the Culmination of Mean Annual Increment (CMAI) as a proxy for radial growth. Trees within stands that have passed beyond CMAI are growing relatively slower and radial growth should be slower. CMAI for pine ranges from 35 to 50 years old depending upon site productivity. CMAI is also affected by trees that are overcrowded and un-thinned causing radial growth to slow. Management of these stands by thinning and/or regeneration harvests can increase radial growth and reduce susceptibility.

Southern pine beetle pheromone trapping survey results and Southern Pine Beetle Information System (SPBIS) database review – Monitoring is conducted using Southern Pine Beetle (SPB) Pheromone Trapping survey. Increased index numbers is used as evidence for decreased forest health. This monitoring element is a tool to display and predict potential Southern Pine Beetle outbreaks annually in participating Districts using pheromones to attract pine beetles and predators into strategically placed traps.

Longleaf pine (MIS) regeneration prescribed burn acres – Longleaf pine is a fire-dependent species that requires frequent fire.

Percentage of each unit and system managed for old growth – This monitoring element focuses on the acreage of possible old growth management strategies designated on each respective district across the forest.

Prescribed burning acres by unit and season – The majority of the ecosystems in Mississippi are fire dependent requiring frequent low-intensity fires to maintain native ecosystems. Fire plays a major role in maintaining and restoring these fire-dependent ecosystems.

Acres of land acquired by donation, purchase, transfer, or land for land exchange – No data.

Trend monitoring of the pileated woodpecker (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with geographic information system (GIS) analysis of mature forest stands. – The pileated woodpecker was selected as a MIS and focal species because it requires large snags for nesting and feeding. The occurrence of this species may be correlated with forested habitats containing abundant large dead trees and fallen logs, which also are used by other woodpeckers, owls, and numerous other birds, mammals, and amphibians. This species is selected to help indicate the effects of management activities on the availability of forests with desired abundance of snags

Trend monitoring of the wood thrush (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with GIS analysis of mature forest stands as compared to open areas. – This species is known to require large tracts of unbroken forest interior for successful breeding to occur. The species was selected to measure effectiveness of minimizing "edge" in the implementation of the vegetation management program and to measure management effects on interior forest habitats.

What monitoring activities have been conducted since the last evaluation?

Timber removal volume – No data.

Five-year regeneration certifications measuring regeneration to desirable species – The original evaluation in the NFMS Land and Resource Management Plan (LRMP) identified ecological systems across the landscape and a goal to restore ecosystems through management practices. Forest Activity and Tracking System (FACTS) is the database of records that is used to track activities across the forest that affect changes in ecosystem types by treatment activity. FACTS is updated throughout the year as activities happen and has a spatial component that assists with locations and ecosystems improved across the forest.

Commercial thinning acres – The original evaluation in the NFMS Land and Resource Management Plan (LRMP) identified ecological systems across the landscape and a goal to restore ecosystems through management practices. Forest Activity and Tracking System (FACTS) is the database of records that is used to track activities across the forest that affect changes in ecosystem types by treatment activity. FACTS is updated throughout the year as activities happen and has a spatial component that assists with locations and ecosystems improved across the forest.

Noncommercial thinning acres – The original evaluation in the NFMS Land and Resource Management Plan (LRMP) identified ecological systems across the landscape and a goal to restore ecosystems through management practices. Forest Activity and Tracking System (FACTS) is the database of records that is used to track activities across the forest that affect changes in ecosystem types by treatment activity. FACTS is updated throughout the year as activities happen and has a spatial component that assists with locations and ecosystems improved across the forest.

Regeneration release acres – See Noncommercial thinning acres response.

Effective nonnative invasive species treatment acres/sites – All invasive species treatment data is collected, entered, and stored in the FACTS database as activities are accomplished annually.

Southern pine beetle (MIS) mortality and removal acres – SPB mortality is collected in the field using global positioning systems and field sheets, and acquired data is reported in the SPBIS database. Infestations are prioritized for possible treatments at the district level based on threatening factors and carried out appropriately.

Southern pine beetle pheromone trapping survey results and Southern Pine Beetle Information System (SPBIS) database review – SPB traps are utilized annually in all Districts (excluding the Delta Ranger District). Trap data is collected and

sent to the Pineville Forest Protection Office where the contents are analyzed for each trap. Data is reported back to the participating Districts with predictions of possible upcoming outcomes. Pheromone trapping surveys are completed and entered in the SPBIS annually.

Longleaf pine (MIS) regeneration prescribed burn acres – FACTS tabular reporting for prescribed burns within longleaf systems and FACTS tabular entries for site preparation burning within FACTS.

Percentage of each unit and system managed for old growth – Field Sampled Vegetation (FSVEG): the database of record for tracking inventories across the forests that measure species, size, age, and condition of forest stands. This database is updated yearly as prescriptions are completed for projects to be implemented.

Prescribed burning acres by unit and season – FACTS spatial and FACTS tabular reporting for prescribed burns across all Districts of the National Forests in Mississippi.

Acres of land acquired by donation, purchase, transfer, or land for land exchange – No data.

Trend monitoring of the pileated woodpecker (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with geographic information system (GIS) analysis of mature forest stands. – Monitoring is accomplished via annual Breeding Bird Survey points and Forest Service Vegetation Management Database (FSVEG) in conjunction with Geographic Information System (GIS) analysis of mature forest stands to provide a full picture of management effects on this species and other snag-dependent wildlife.

Trend monitoring of the wood thrush (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with GIS analysis of mature forest stands as compared to open areas. – Monitoring is accomplished via annual Breeding Bird Survey points and FSVEG database in conjunction with Geographic Information System (GIS) analysis of mature forest stands as compared to open areas.

Monitoring Results:

Timber removal volume – No data.

Five-year regeneration certifications measuring regeneration to desirable species – No data.

Five-year regeneration certifications –

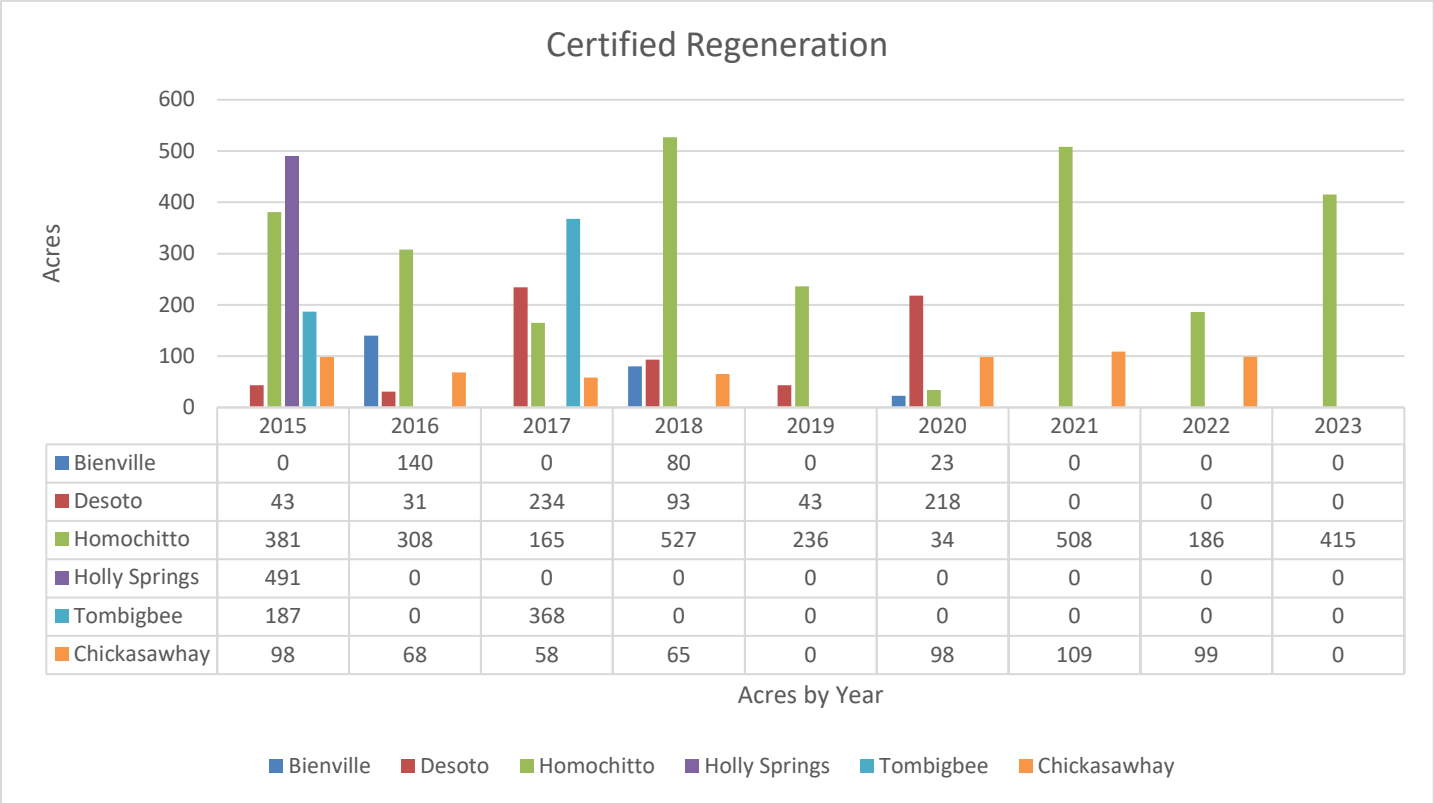


Figure 29. National Forests in Mississippi, 2015-2023 Certified Regeneration.

Commercial thinning acres –

Commercial Thinning by Ecosystem Type										
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
Floodplain Forest	54	68	70	42	54	15	117	10	12	**442**
Interior Upland Longleaf Pine Woodland	2,685	2,709	3,247	1,061	1,187	171	1,192	1,375	1,197	**14,823**
Near Coast Pine Flatwoods	5	98		37	6		21	28	19	**214**
Northern Mesic Hardwood Forest				7					12	**19**
Southern Mesic Slope Forest	1,237	1,388	1,081	15			1,623	7		**5,350**
Herbaceous Seepage Bog		95	1	3			14	5	2	**119**
Loblolly Pine Forest	1,253	779	797	388	334	456	1,411		486	**5,418**
Lower Mississippi River Bottomland and Floodplain Forest	26									**26**
Slash Pine Forest	1,043	1,470	409	621	966	158	588	510	1,403	**7,168**
Dry Upland Hardwood Forest	36	1	37		1		18	2	41	**136**
Seepage Swamp and Baygall	72	74	96	37	68		6	1	86	**440**
Total	**6,410**	**6,681**	**5,739**	**2,211**	**2,615**	**800**	**4,990**	**1,938**	**3,258**	**34,642**

Table 41. Commercial Thinning by Ecosystem Type Across National Forests in Mississippi, 2015-2023.

Noncommercial thinning acres –

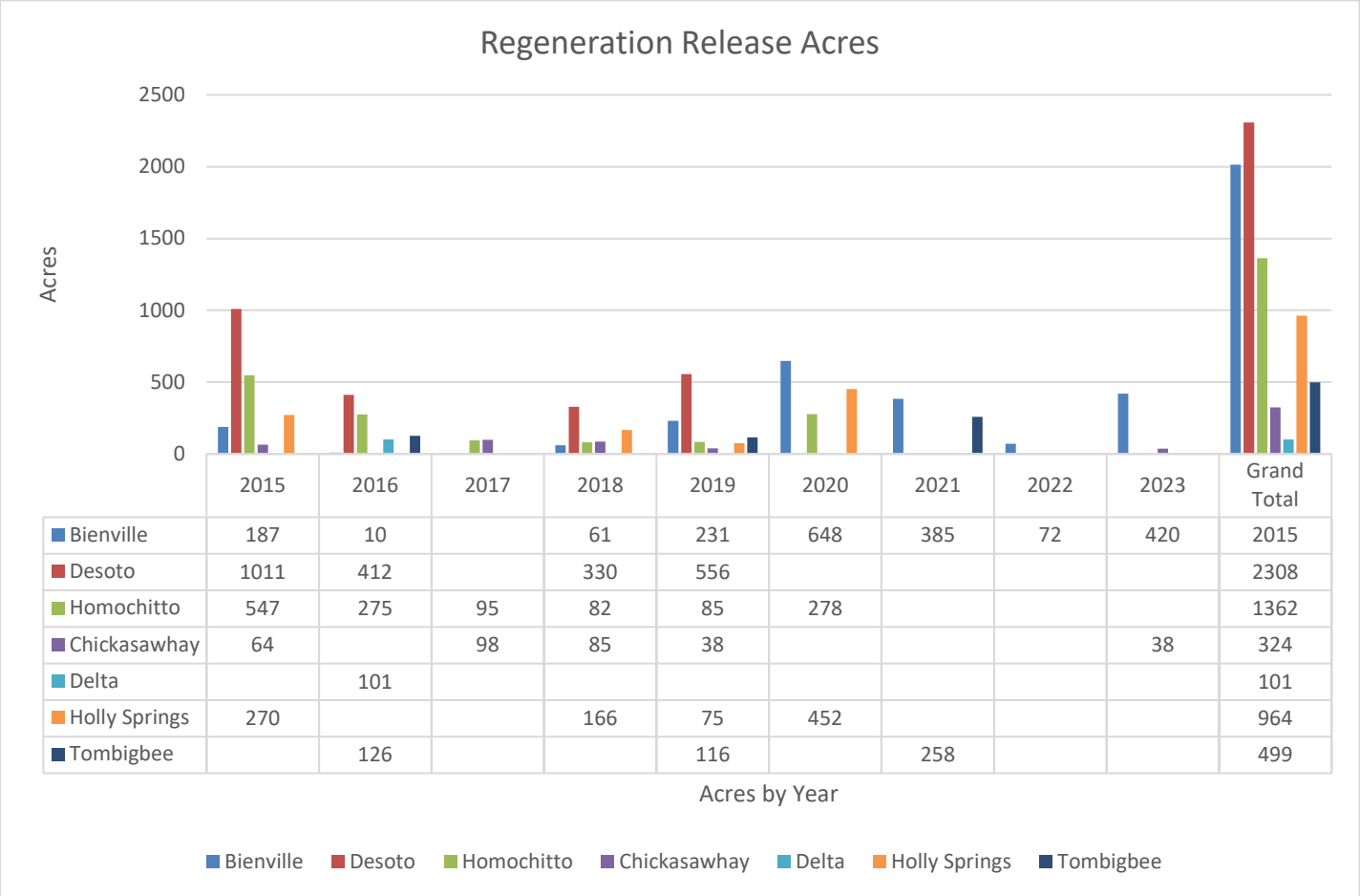
Noncommercial thinning acres/Regeneration release –

Pre-Commercial Thinning by Ecosystem Type										
	2015	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**

Floodplain Forest	0	11	4	3		2				**20**
Interior Shortleaf Pine-Oak Forest and Woodland					15					**15**
Interior Upland Longleaf Pine Woodland	128	191	50	34	4	75	10			**491**
Northern Dry Upland Hardwood Forest				0						**0**
Southern Mesic Slope Forest			122	247		22			236	**627**
Loblolly Pine Forest	424	296	264	642	342	1,081	123	273	636	**4,081**
Dry Upland Hardwood Forest	0			5						**5**
Total	**552**	**498**	**439**	**930**	**361**	**1,180**	**133**	**273**	**872**	**5,238**

Table 42. National Forests in Mississippi, Pre-commercial Thinning 2015-2023.

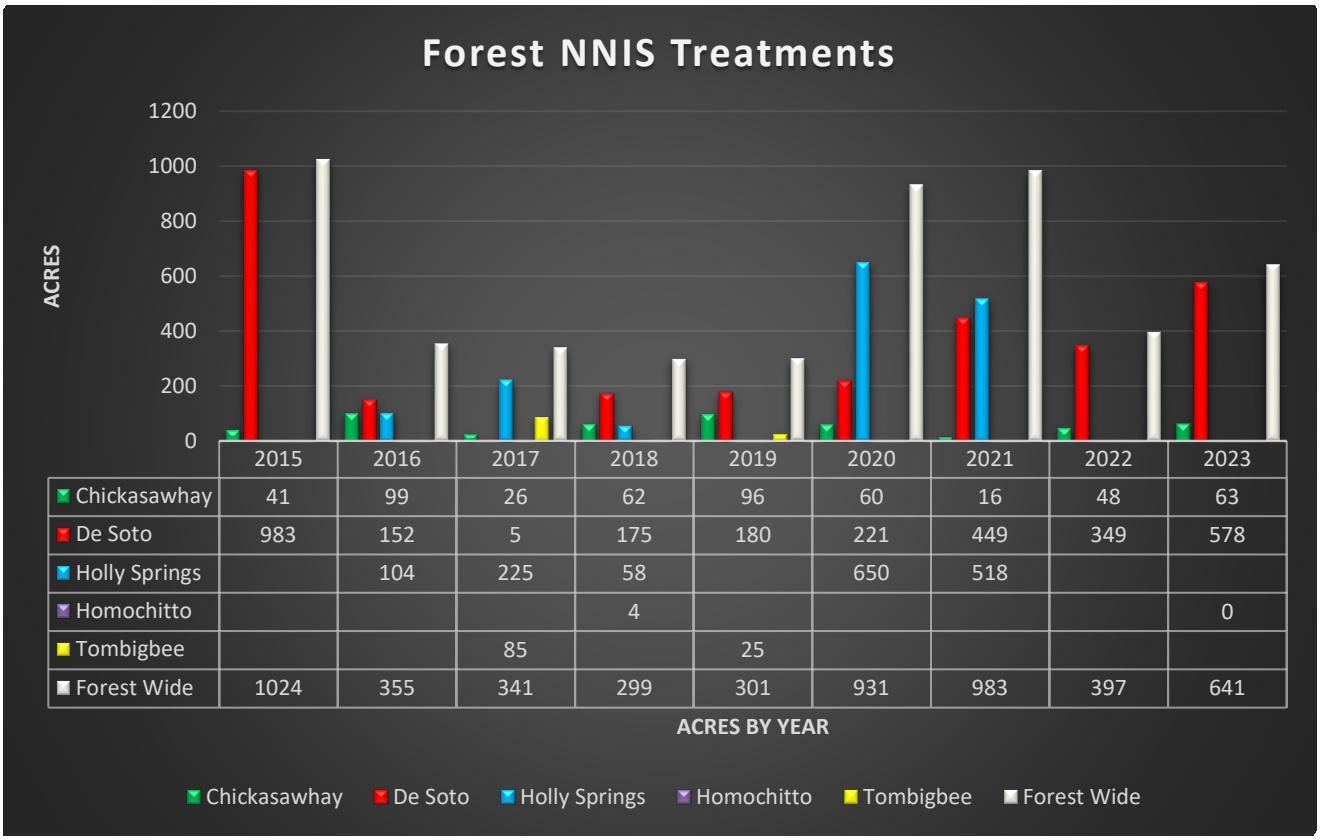
Regeneration release acres –



	2015	2016	2017	2018	2019	2020	2021	2022	2023	Grand Total
Bienville	187	10		61	231	648	385	72	420	2015
Desoto	1011	412		330	556					2308
Homochitto	547	275	95	82	85	278				1362
Chickasawhay	64		98	85	38				38	324
Delta		101								101
Holly Springs	270			166	75	452				964
Tombigbee		126			116		258			499

Figure 30. National Forests in Mississippi, 2015-2023 Regeneration Release.

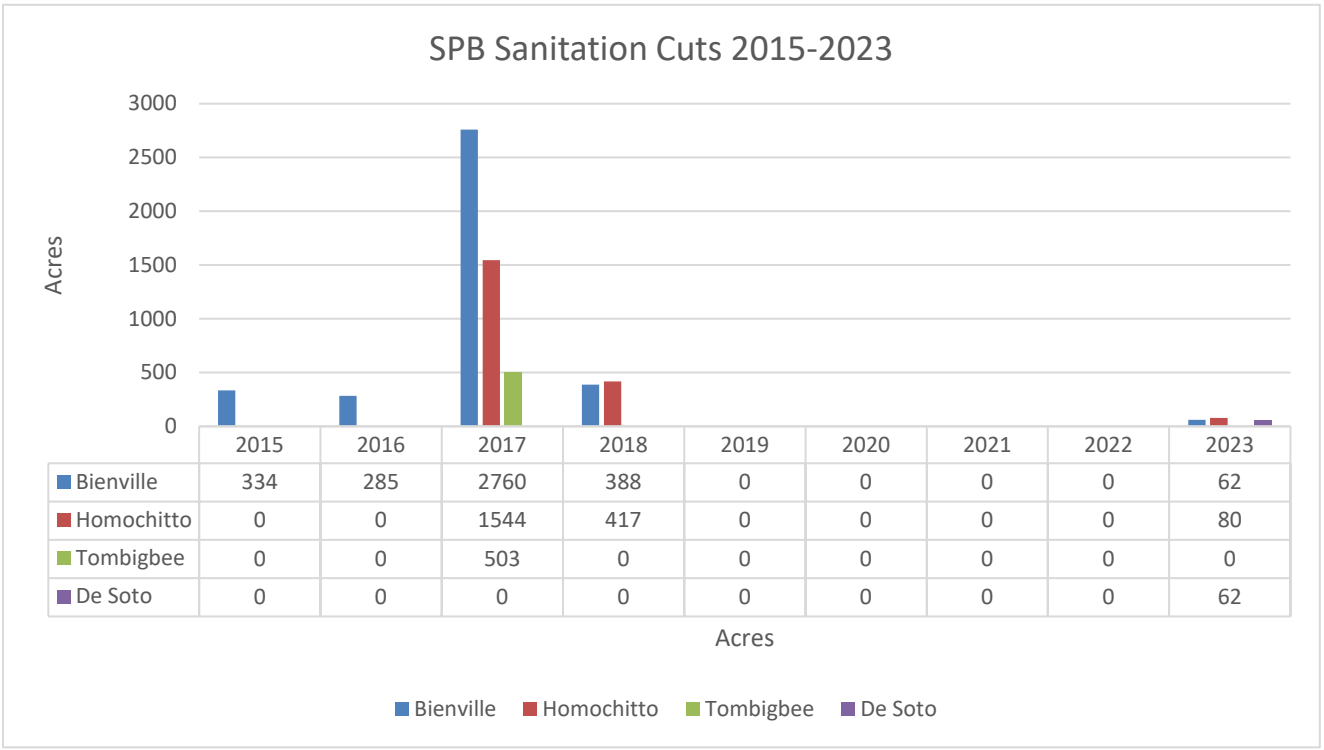
Effective nonnative invasive species treatment acres/sites –



	2015	2016	2017	2018	2019	2020	2021	2022	2023
Chickasawhay	41	99	26	62	96	60	16	48	63
De Soto	983	152	5	175	180	221	449	349	578
Holly Springs		104	225	58		650	518		
Homochitto				4					0
Tombigbee			85		25				
Forest Wide	1024	355	341	299	301	931	983	397	641

Figure 31. National Forests in Mississippi, 2015-2023 NNIS Treatments.

Southern pine beetle (MIS) mortality and removal acres –



	2015	2016	2017	2018	2019	2020	2021	2022	2023
Bienville	334	285	2760	388	0	0	0	0	62
Homochitto	0	0	1544	417	0	0	0	0	80
Tombigbee	0	0	503	0	0	0	0	0	0
De Soto	0	0	0	0	0	0	0	0	62

Figure 32. Southern Pine Beetle Sanitation Cuts 2015-2023.

Southern pine beetle pheromone trapping survey results and Southern Pine Beetle Information System (SPBIS) database review –

Figure 33. Southern Pine Beetle Pheromone Trapping Survey Results 2016-2023.

	Bienville N.F.			Homochitto N.F.			Tombigbee N.F.			Chickasawhay R.D.			DeSoto N.F.			Holly Springs N.F.		
Date	%SPB	SPB/ trap/ day	CY Spots	%SPB	SPB/ trap/ day	CY Spots	%SPB	SPB/ trap/ day	CY Spots	%SPB	SPB/ trap/ day	CY Spots	%SPB	SPB/ trap/ day	CY Spots	%SPB	SPB/ trap/ day	CY Spots
Spring 2016[1,6]	41%	2.4		63%	7.6		10%	2.3		0%	0.0		0%	0		28%	1.7	
Fall 2016[1,6]	32%	3.8	317	20%	4.7	361	26%	0.6	0	1%	0.2	0	0%	0	0	38%	1.3	0
Spring 2017[1,6]	25%	9.8*		77%	143.4		58%	20.4		13%	0.5		1%	0.0		29%	2.6	
Fall 2017[1,6]	20%	7.9	1660	39%	14.9	994			1281			0			0			88
Spring 2018[1,6]	45%	17.0		74%	188.2		57%	27.3		51%	8.8		5%	0.1		27%	3.9	
Fall 2018[1,6]	59%	3.3	2139	38%	6.5	1015	57%	0.3	103	8%	0.2	0	4%	0.0	0	76%	1.7	0
Spring 2019[1,6]	50%	14.8		86%	66.5		32%	8.2		13%	1.1		12%	0.4		20%	1.6	
Fall 2019[1,6]	10%	0.1	1084	45%	4.3	259	65%	0.2	0	0%	0.0	0	0%	0.0	0	50%	0.1	1
Spring 2020[1,6]	32%	2.6		52%	18.9		28%	2.6		0%	0.0		0%	0.0		NA	NA	
Fall 2020[1,6]	NA	NA	8	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0	NA	NA	0
Spring 2021[1,6]	58%	11.9		68%	48.9		73%	18.7		49%	4.0		33%	0.4		56%	13.2	
Fall 2021[1,6]	40%	1.2	69	66%	18.6	57	92%	29.0	0	17%	1.9	0	84%	1.1	0	79%	6.7	0
Spring 2022[1,6]	61%	43.3		87%	229.2		79%	54.0		18%	2.3		80%	7.3		76%	12.5	
Fall 2022[1,6]	22%	1.6	190	59%	28.7	216	59%	19.1	0	14%	1.4	1	95%	14.1	0	58%	7.2	0
Spring 2023[1,6]	59%	15.5		90%	197.5		73%	61.6		56%	3.4		95%	63.2		72%	23.1	
Fall 2023[1,6]	NA	NA	197	NA	NA	487	NA	NA	353	NA	NA	5	NA	NA	64	NA	NA	40

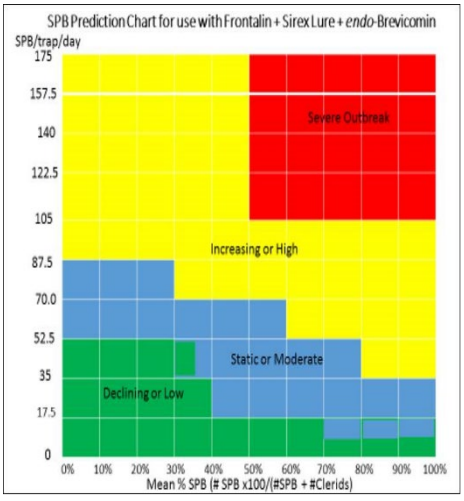
[1] Based on 3 traps per District/Forest, except for 6 traps on the Homochitto.

[4] D=Declining, S=Static, I=Increasing

[5] L=Low, M=Moderate, H=High, O=Outbreak

[6] Trap lures consisted of sandard frontalin pouch + 100g polysleeve of 70% alpha-pinene and 30% beta-pinene, (Sirex lure) and endo-brevicomin lure. Traps placed in hardwood stands.

* Spring 2017 Traps on Bienville did not have additional endo-brevicomin lure



Longleaf pine (MIS) regeneration prescribed burn acres –

Figure 34. Longleaf Pine Regeneration Prescribed Burn Acres 2020-2023.

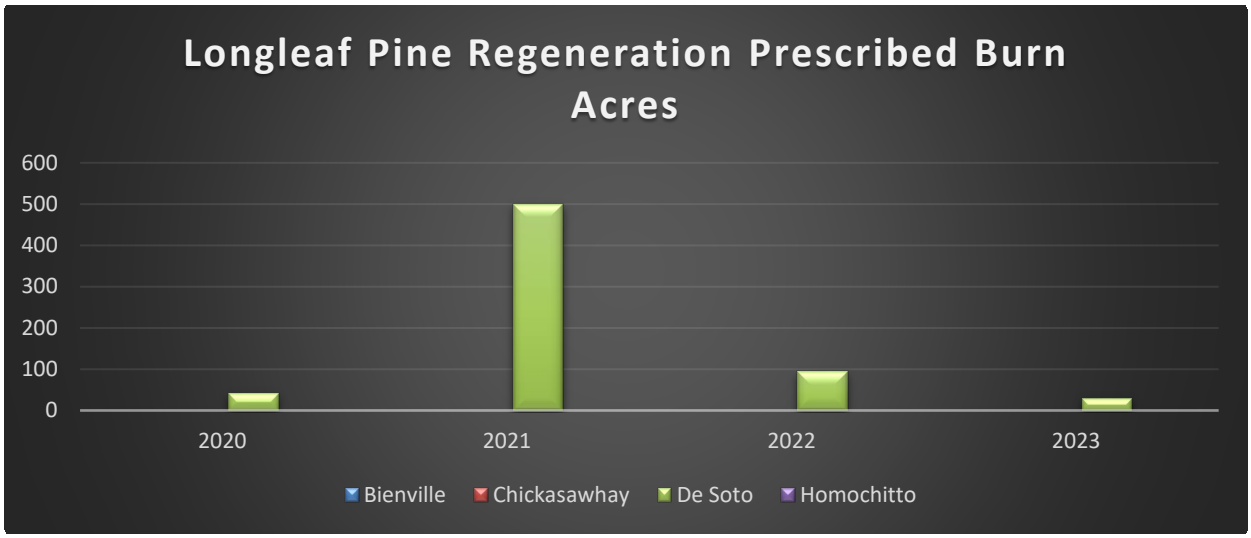


Figure 35. Total Spatial Acres of Upland Longleaf Pine.

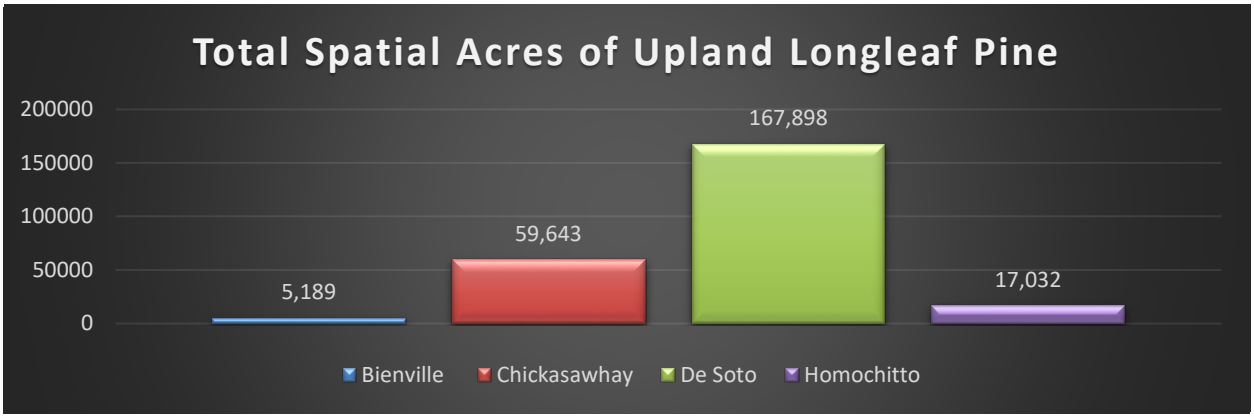
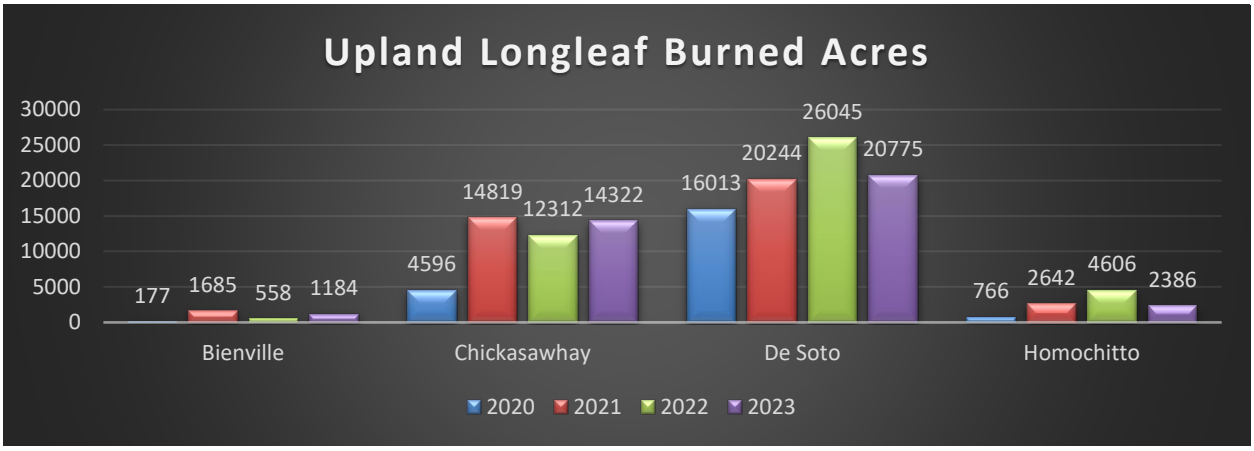


Figure 36. Upland Longleaf Burned Acres.



Percentage of each unit and system managed for old-growth –

Table 43. Percentage of Each Unit and System Managed for Old-growth.

Acres Identified for Old Growth in FSVEG by District								
Selection Criteria	**Bienville**	**DeSoto**	**Homochitto**	**Chickasawhay**	**Delta**	**Holly Springs**	**Tombigbee**	**Total**
Wilderness (3)	0	5,841	0	0	0	0	0	5,841
Research Natural Area (4)	208	712	228	539	670	186	803	3,346
Other administratively designated unregulated areas (5)	310	4,299	70	561	3,397	235	811	9,683
Red-cockaded woodpecker clusters (6)	8,270	1,408	4,337	3,114	0	0	0	17,129
Late Seral (7) & R8 old growth minimum age (8)	10,834	18,139	7,058	7,155	4,745	4,855	3,002	55,788
Rare community types (9)	600	959	1,131	66	0	361	189	3,306
Total Old Growth	20,222	31,358	12,824	11,495	8,812	5,687	4,805	95,093
Total District Acres	178,541	368,218	191,842	150,369	60,898	155,661	67,005	1,172,534
% Designated	**11%**	**9%**	**7%**	**8%**	**15%**	**4%**	**7%**	**8%**

Prescribed burning acres by unit and season –

Table 44. Prescribed Fire Accomplishment Acres and Seasonality by District and Year
The following results reflect updates from data collected from FY2020 to FY2023.

Bienville National Forest – 2020

District/Year	Total (Acres)	% Growing
Bienville 2020	9380	20
Bienville 2021	39591	40
Bienville 2022	39254	31
Bienville 2023	41327	52
De Soto 2020	46737	13
De Soto 2021	35879	69
De Soto 2022	52143	31
De Soto 2023	42916	28

Homochitto 2020	10174	22
Homochitto 2021	24496	44
Homochitto 2022	32347	59
Homochitto 2023	27124	62
Chickasawhay 2020	13753	0
Chickasawhay 2021	34739	70
Chickasawhay 2022	33462	36
Chickasawhay 2023	35562	53
Holly Springs 2020	4138	25
Holly Springs 2021	20594	54
Holly Springs 2022	24564	39
Holly Springs 2023	23547	48
Tombigbee 2020	8881	0
Tombigbee 2021	11418	69
Tombigbee 2022	11527	8
Tombigbee 2023	13895	47

Acres of land acquired by donation, purchase, transfer, or land for land exchange – No data.

Trend monitoring of the pileated woodpecker (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with geographic information system (GIS) analysis of mature forest stands. –

Annual bird point counts for NFsMS began in 1994 and are now conducted annually on each district. This data as displayed in Figure 4 indicates a stable to increasing population trend of pileated woodpeckers on the NFsMS.

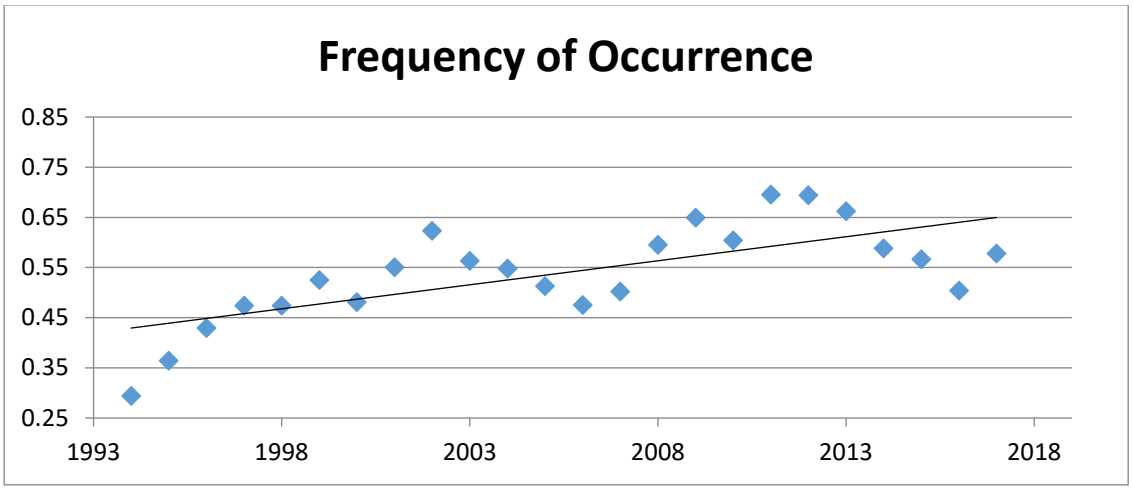


Figure 37. Pileated Woodpecker Frequency of Occurrence Trend

Trend monitoring of the wood thrush (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with GIS analysis of mature forest stands as compared to open areas. – Annual bird point counts for the NFsMS began in 1994 and are now conducted annually on each district. The data displayed in Figure 5 indicates a declining population trend of wood thrush on the NFsMS.

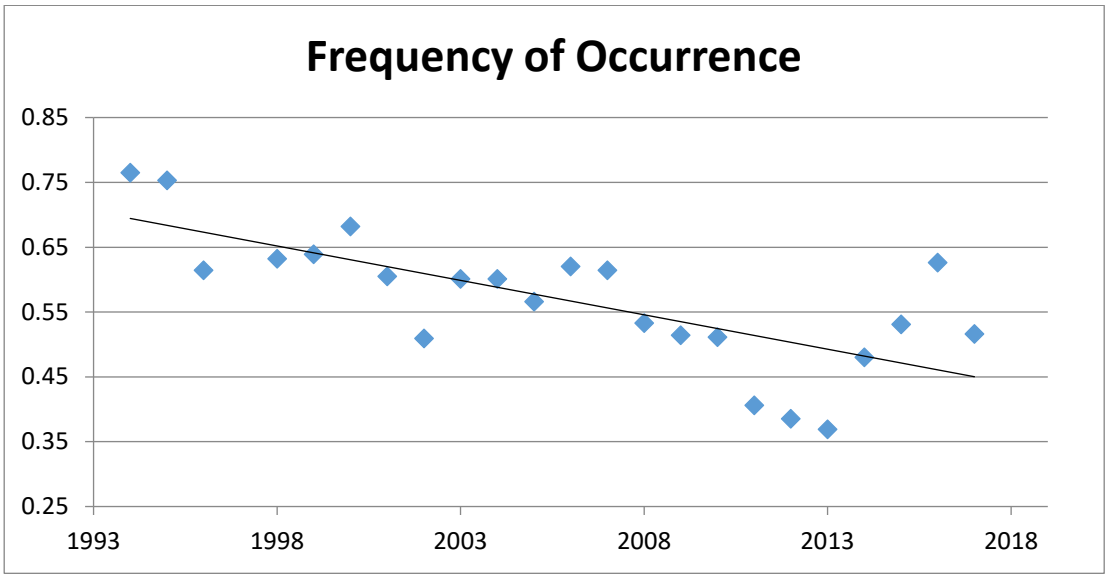


Figure 38. Wood Thrush Frequency of Occurrence Trend

Monitoring Discussion and Findings:

Timber removal volume – No data.

Five-year regeneration certifications measuring regeneration to desirable species – The lands within the National Forests in Mississippi support a broad range of ecological systems and species. Ecological systems (or ecosystems) represent recurring groups of biological communities found in similar physical environments that are influenced by similar dynamic ecological processes, such as fire or flooding. Ecosystem diversity and species diversity are closely connected, and by sustaining a diversity of ecosystems, National Forest System lands support ecological conditions for diverse plant and animal species (NFMS LRMP).

Existing ecosystems on the National Forests in Mississippi generally include a variety of widely distributed native pine and hardwood ecological systems, as well as rare communities such as prairies, bogs, and savannas. Twenty-four different ecological systems occur across the Forests, including several aquatic systems. The desired conditions of the NFMS are intended to shift away from the mass plantings of loblolly and slash pines and begin restoring and expanding native longleaf pine, shortleaf pine-oak, and floodplain forests ecosystems, and continue maintaining and enhancing native hardwoods and rare communities such as native prairies and bogs (NFMS LRMP).

As reported above, the regeneration certifications are down compared to actual planting acres. The FACTS database stores this information and needs to be coded correctly for these certifications to be correct, following a field measurement of survival percentages. The annual average of 841 acres/yr. certified is well below the goal of planting 2,500 ac/yr. Data management will need addressing to have the most accurate data as possible, but other variables are contributing to the shortages in certified regeneration acres. Actual planting accomplishments across the forest are restoring an

average of 1,154 ac./yr. across all ecosystem types, which is below a forest plan goal of approximately 2,500 ac./yr. Longleaf pine restoration has a goal of 13,000 acres at the end of the 1st-decade and currently, the forests have restored approximately 8,182 acres at the 8-year mark. Shortleaf pine has a goal of 2,800 acres in the 1st-decade and currently, the forests have restored approximately 1,021 acres. Bottomland hardwood has a goal on Delta National Forest of 1,400 acres during the 1st-decade and approximately 858 acres have been restored.

Restoration efforts are ongoing and will continue striving towards forest plan goals; however, pest and storm damage control has reduced the amount of manpower available to address restoration efforts over the last 3-4 years. Longleaf pine is a priority target that is increasing as projects are able to convert off-site slash and loblolly plantations. The next two years of planned regeneration are going to average just below the 1,300 ac./yr. target and should continue to trend up; however, the 1st-decade target will most likely not be met.

Commercial thinning acres – REPETITIVE – ALREADY SEEN IN MQ3_A.3

Ecological restoration is the primary management emphasis of this forest plan. Restoration objectives address forest health needs through improved species composition and structural and age diversity. Forest management practices are the means for carrying out restoration goals while sustaining healthy forests that are resilient to extreme natural events and supply desired goods and services (NFMS LRMP).

Thinning goals on the NFMS are 141,000 acres in the 1st-decade and will be hard to achieve given current staffing levels and budget allocations. As shown in Table 44 above, the NFMS has thinned approximately 34,642 acres over the last 9 years and is in the process of building on those acres yearly; however, the 1st-decade goal will not be met. Districts are tasked with timber targets that drive the amount of timber sold each year and district managers focus these target volumes in areas that will benefit the desired ecological restoration goals for that project area. The forest plan goals came from a lot of first-thinning needs across districts and are still needed. The increased use of weight scale, stewardship contracting, Good Neighbor Authorities (GNA), and focused ecosystem restoration will assist with the backlog of thinning across the forest. The ability of a district program to implement and meet goals with current budgets and manpower will be very difficult, but the districts are focused on implementing projects where the most benefit will occur following treatment to the ecosystems as a whole and how they affect the larger landscape objectives of a forest.

The NFMS Is currently in the process of securing a timber strike team that will be able to float between districts and assist with projects to increase the overall capability of the timber program. The addition of this strike team approach should directly impact the amount of thinning ready for sale and hopefully free up district personnel to move forward with additional projects across the district.

Noncommercial thinning acres – These projects may be noncommercial thinning or release accomplished by mechanical, manual, fire, or chemical application. Fire should be used throughout the life of a longleaf or shortleaf stand from sapling through old growth or final harvest stages. The goal in the forest plan is 20,000 acres released from competition or at lower densities during the 1st-decade or an average of 2,000 ac./yr. As shown in Table 45 and Figure 30 above, the forest is currently averaging 1,423 ac./yr. either pre-commercial thinned or released using different methods. This is below the goal of the forest plan as already stated but does meet 75% of the goal, and with current staffing and budget levels, this seems to be in line with expected outcomes. There is always room for improvement and efficiencies that can be realized by an increase in the scale of operations. This scaled increase could reduce preparation times/costs and even get better prices per unit on a larger project area. As regeneration amounts plan to increase in the future the amount of release acres should

follow that trend and put the acres accomplished in these projects where they need to be to meet forest plan objectives.

Regeneration release acres – These projects may be noncommercial thinning or release accomplished by mechanical, manual, fire, or chemical application. Fire should be used throughout the life of a longleaf or shortleaf stand from sapling through old growth or final harvest stages. The goal in the forest plan is 20,000 acres released from competition or at lower densities during the 1st-decade or an average of 2,000 ac./yr. As shown in Table 45 and Figure 30 above, the forest is currently averaging 1,423 ac./yr. either pre-commercial thinned or released using different methods. This is below the goal of the forest plan as already stated but does meet 75% of the goal, and with current staffing and budget levels, this seems to be in line with expected outcomes. There is always room for improvement and efficiencies that can be realized by an increase in the scale of operations. This scaled increase could reduce preparation times/costs and even get better prices per unit on a larger project area. As regeneration amounts plan to increase in the future the amount of release acres should follow that trend and put the acres accomplished in these projects where they need to be to meet forest plan objectives.

Effective nonnative invasive species treatment acres/sites – Non-native invasive species (NNIS) are an ever-increasing problem on NFMS. These species threaten forest health and ecosystems by reducing natural diversity and habitat for fish, wildlife, and native plants, as well as affecting soil stability. Effective treatment and control are compounded by the intermingled ownership pattern of federal, state, county, and private land throughout the state. The accelerated spread of noxious weeds has led to increased public awareness of the environmental problems associated with weeds. The National Forests in Mississippi is a partner in the Mississippi Cooperative Weed Management Area along with USDA Natural Resources Conservation Service (NRCS), Mississippi Department of Transportation (MDOT), Federal Highway Administration, Mississippi Forestry Commission, and others.

Each year, the NFMS uses the noxious weed control strategy to manage NNIS. The noxious weed control strategy outlines five emphasis areas which include: (1) cooperation, (2) education and prevention, (3) inventory, (4) control, and (5) monitoring. Kudzu and cogongrass are the priority species of concern although other pest plants do exist and are treated as opportunity arises.

Southern pine beetle (MIS) mortality and removal acres – Southern Pine Beetle (SPB - *Dendroctonus frontalis* Zimmerman) infestations are common across the pine forests of the southeastern United States. On the National Forest in Mississippi (NFMS), population levels have fluctuated between latent and outbreak levels since the early 1950s. This species was selected to measure the effects of forest management aimed at promoting forest health (e.g., site/soil-based species selection, appropriate fire cycles, and preventing or thinning of overstocked stands) in pine-dominated ecosystems.

Factors that determine SPB hazard include the proportion of the stand in susceptibility host trees and the radial growth of those trees over a 5-year period. Trees with a relatively high radial growth are less susceptible to SPB-related mortality. While we do not have individual tree growth data to estimate susceptibility, we can use the Culmination of Mean Annual Increment (CMAI) as a proxy for radial growth. Trees within stands that have passed beyond CMAI are growing relatively slower and radial growth should be slower. CMAI for pine ranges from 35 to 50 years old depending upon site productivity. CMAI is also affected by trees that are overcrowded and un-thinned causing radial growth to slow. Management of these stands by thinning and/or regeneration harvests can increase radial growth and reduce susceptibility.

Southern pine beetle pheromone trapping survey results and Southern Pine Beetle Information System (SPBIS) database review – Unfortunately, with the limited number of traps and changes in lures and predictive models over the years, confidence of these trapping survey results to accurately forecast

outbreaks is low. Despite the severe limitations to making accurate forecasts about expected beetle activity levels in the future on the NFs in MS, it appears from these recent survey results that the Forest may have a reprieve from numerous actively enlarging and proliferating spots of SPB on the NFs in MS (i.e., outbreak conditions). In order to possibly extend that reprieve and/or to prevent and mitigate future outbreaks of SPB, the Forest can continue to work towards treating the remaining large acreages of highly susceptible host material (dense stands of loblolly or shortleaf) still present. The Forest has recently experienced how rapidly SPB populations and infestations can increase/expand, so despite the lack of apparent problems currently and these relatively low catches, the Forest should be constantly vigilant going into 2020, particularly on the Homochitto. Field personnel should be particularly watchful for any suspicious spots of pine mortality, and anticipate and plan for treating infestations requiring suppression measures as soon as possible.

Longleaf pine (MIS) regeneration prescribed burn acres – The first graph was produced from data from FACTS and from the district silviculturist or fire management officer. These are acres where the sole purpose of the prescribed fire was for natural regeneration. Prescribed burns within longleaf promote natural regeneration and this was the purpose of including the second and third graph that shows all upland longleaf pine acres from the spatial ecosystem layer and total acres of burns within this system.

The LRMP targets 251,000 acres of this system to have received a return interval of 1 to 4 years. The monitoring period data shows 143,130 acres being accomplished within this 4-year period the monitoring covered. While seed production for longleaf is sporadic, fire and maintaining a short fire return interval is required for natural regeneration success within this system.

Percentage of each unit and system managed for old-growth – No data.

Prescribed burning acres by unit and season – See response to MQ A.1 – Fire return interval and percent of growing-season burns by system.

Acres of land acquired by donation, purchase, transfer, or land for land exchange – No data.

Trend monitoring of the pileated woodpecker (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with geographic information system (GIS) analysis of mature forest stands. – Pileated woodpeckers generally prefer mature forests. There are currently 777,151 acres of mature forest over the age of 40 across the National Forests in Mississippi. This species is a primary cavity nester/excavator, requiring large snags for nesting cavities and large dead trees for feeding. Generally, this species requires trees greater than 15 inches DBH for cavities, but prefers trees greater than 20 inches DBH. Based on the results of monitoring data and habitat evaluation, this species is showing stable and increasing population trends on the NFsMS. Pileated woodpeckers have the abundance and distribution across the Forest that will provide for its persistence into the foreseeable future.

Trend monitoring of the wood thrush (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with GIS analysis of mature forest stands as compared to open areas. – Trend estimates for this species indicate moderately declining populations as is comparable to that shown across the southern region (La Sorte 2007). Habitat management for the wood thrush centers on maintaining large tracts of deciduous forest habitat. Relative abundance of mature forest is a key factor for this species, as is tree age diversity. There are currently 777,151 acres of mature forest over the age of 40 across the National Forests in Mississippi. Restoration and maintenance of mature and old-growth forest should help to sustain this and associated species. Population trends correspond to regional declines of the species. Although this species is monitored via the annual bird point counts,

the management indicator factor that this species represents is problematic for the Forest to address both through data analysis via GIS and given the broken pattern of Forest Service land within the proclamation boundary. This species is affected by "edge" due to its vulnerability to nest parasites like the brown headed cowbird and is predominantly found in unbroken old growth deciduous forest with a moderate to heavy shrub layer. The Forest does not anticipate vegetation management practices within the habitat types of this species but the reduction of edge effect is problematic given that thousands of acres unbroken deciduous forest does not exist on the Forest due to factors such as private inholdings and ecosystem site type change throughout the Forest.

Adaptive Management Considerations:

The forest plan monitoring program is meant to "enable the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed" (36 CFR 219.12).

Timber removal volume – No data.

Five-year regeneration certifications measuring regeneration to desirable species – Based on the findings above more restoration is needed to meet forest plan goals. Current management activities are restoring proper species as outlined and desired in the forest plan just not a rate to meet the goals of the forest plan. The implementation of a strike team and further support for contracting work where feasible along with examining regulations that take away efficiencies in timber sale preparation (i.e. size restrictions for weight scale, certification of cruisers/markers) could benefit the NFMS's ability to restore more land. There also appears to be an issue with data input as plantations are certified and this needs to be emphasized to district staff as an important step in the regeneration process.

Commercial thinning acres – As discussed above, an increase in the number of acres thinned is needed to reach the goals listed in the forest plan. The implementation of a strike team and further support for contracting work where feasible along with examining regulations that take away efficiencies in timber sale preparation (i.e. size restrictions for weight scale, certification of cruisers/markers) could benefit the NFMS's ability to thin more land.

Noncommercial thinning acres – Based on the findings in the discussion above, there is no recommended need for change at this time to release or noncommercial activities, as management activities are trending toward the desired objective and are expected to increase in the future.

Regeneration release acres – Based on the findings in the discussion above, there is no recommended need for change at this time to release or noncommercial activities, as management activities are trending toward the desired objective and are expected to increase in the future.

Effective nonnative invasive species treatment acres/sites – Based on the findings in the discussion above, there is no recommended need for change at this time for effective nonnative invasive species control activities, as management activities are trending toward the desired objective and are expected to increase in the future.

Southern pine beetle (MIS) mortality and removal acres – Based on the findings in the discussion above, there is no recommended need for change at this time. Efforts are being made to address Southern Pined Beetle mortality and removal of acres are planned as they occur and where feasible. These occurrences stem from multiple factors including weather, forest health, predator populations, and overwintering of beetles. Proactive forest management activities including thinning, restoration,

pre-commercial thinning, and prescribed burning all have positive effects on decreasing possible outbreaks in the future.

Southern pine beetle pheromone trapping survey results and Southern Pine Beetle Information System (SPBIS) database review – Based on the findings in the discussion above, there is no recommended need for change of the planning strategy.

Longleaf pine (MIS) regeneration prescribed burn acres – Continue targeting objectives within the LRMP, prioritize a good/fair/poor layer for ecosystem restoration and management.

Percentage of each unit and system managed for old growth – Timber stands will be evaluated by district personnel and old growth will be retained when deciding parameters are met.

Prescribed burning acres by unit and season – Accomplished prescribed fire acres for the years monitored ranged between 93,064 acres to 193,297 acres. The LRMP states an objective of an annual average of 220,000 acres will be targeted across the landscape and states fire return interval ranges for each ecosystem. Prioritization is key for ecosystems due to reaching the target of 220,000 acres burned annually will still not achieve the longest fire return interval numbers for each system. Focusing on footprints where prescribed fires have been accomplished is key to continuing trends towards better condition class, while increasing the target acres when weather conditions, agency capacity, or opportunities for joint efforts with partners are also important. The plan also states that approximately 180,000 to 250,000 acres will be treated by prescribed burning annually. 2020 saw a decrease in acres due to restrictions from COVID-19 and 2023 had a decrease in acres due to the national prescribed fire review. Therefore, a look at the numbers should be on a 10-year or 5-year average, which is 137,498 acres and 142,096 acres respectively. Those accomplished acres are missing the average target in the LRMP by approximately 80,000 acres. Therefore, fire frequency targets on the landscape as a whole are not being achieved. With recent averages priority needs to be assigned by ecosystem and an updated layer like the good/fair/poor layer the districts have utilized in the past would be beneficial for achieving objectives on the landscape. A prioritization with an increase in scale needs to be addressed to reach desired fire return interval goals set forth in the LRMP.

Included in Table 73 is a 10-year look at burn accomplished burn acres compared to the objective acres per district. A look at the 10 and 5-year averages show no districts were able to hit the average objective acres in the LRMP, while trends show the 3 and 2-year averages are being achieved by some districts. This shows the increase in scale in the last couple of years that is required to achieve LRMP objectives.

A forest-wide look at the geospatial ecosystem layer needs to be performed, this way we can accurately report and monitor the progress towards LRMP objectives. Recommended to ensure all geospatial analysis monitoring of systems is performed with the same updated ecosystem layer for consistency in monitoring. Also, ensure updates to this layer are performed prior to answering monitoring questions to capture the work of converting and restoring ecosystems to desired conditions.

Acres of land acquired by donation, purchase, transfer, or land for land exchange – No data.

Trend monitoring of the pileated woodpecker (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with geographic information system (GIS) analysis of mature forest stands. – Based on the findings in the discussion above, there is no recommended need for change of the planning strategy.

Trend monitoring of the wood thrush (MIS) by breeding bird survey and Forest Service Vegetation database in conjunction with GIS analysis of mature forest stands as compared to open areas. – Based on the findings in the discussion above, there is no recommended need for change of the planning strategy.

MQ 16: D.5 Are disturbance events impacting the accomplishment of forest plan objectives?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Objective 3.5 Healthy Forests

Monitoring Indicators:

1. Effect on performance measures for all land management plan objectives attributed to wind and ice storms, drought, insect or disease outbreaks and any effects on workload and funding that result.

Forest Plan Monitoring Frequency: 10 years

New Science or Other Information:

Effect on performance measures for all land management plan objectives attributed to wind and ice storms, drought, insect or disease outbreaks and any effects on workload and funding that result. – After an incident, damage is assessed.

Background & Driver(s):

Effect on performance measures for all land management plan objectives attributed to wind and ice storms, drought, insect or disease outbreaks and any effects on workload and funding that result. – No data.

What monitoring activities have been conducted since the last evaluation?

Effect on performance measures for all land management plan objectives attributed to wind and ice storms, drought, insect or disease outbreaks and any effects on workload and funding that result. – Trails and recreation areas are typically accessed for damage after significant thunderstorms or high wind events to check for downed trees, snags, or hazardous conditions to the public.

Monitoring Results:

Effect on performance measures for all land management plan objectives attributed to wind and ice storms, drought, insect or disease outbreaks and any effects on workload and funding that result. – Disturbance events including tornados, floods, SPB outbreak, and hurricanes have affected recreation sites and activities in all Districts. The disturbance events resulted in damage to recreation infrastructure, access roads, and trails. Recreation areas and trails were closed temporarily for safety

reasons during disturbance events. Sites and trails damaged by disturbance events were temporarily closed until repairs could be made.

During a safety inspection in July 2023 at Choctaw Lake Recreation Area after the area had eight inches of rain within a few hours. The severe rain event increased the intensity of the spillway's outflow causing erosion adjacent to the spillway's infrastructure. National Forests in Mississippi requested $157,000 in emergency funding to repair the erosion around the spillway.

Monitoring Discussion & Findings:

Effect on performance measures for all land management plan objectives attributed to wind and ice storms, drought, insect or disease outbreaks and any effects on workload and funding that result. – No data.

Adaptive Management Considerations:

Effect on performance measures for all land management plan objectives attributed to wind and ice storms, drought, insect or disease outbreaks and any effects on workload and funding that result. – No data.

MQ 17: D.6 How has climate variability changed and how is it projected to change across the regions?

Refer to Appendix C of the "Broad-Scale Climate Change Monitoring Evaluation Report for the Southern Region" for individual assessments of climate change effects and mitigations for the national forests in Region 8.

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

New Science or Other Information:

No data.

Background & Driver(s):

No data.

What monitoring activities have been conducted since the last evaluation?

No data.

Monitoring Results:

No data.

Monitoring Discussion & Findings:

No data.

Adaptive Management Considerations:

No data.

MQ 18: D.7 How is climate variability and change influencing the ecological, social, and economic conditions and contributions provided by plan areas in the regions? (REGIONAL IN SCOPE)

Refer to Appendix C of the "Broad-Scale Climate Change Monitoring Evaluation Report for the Southern Region" for individual assessments of climate change effects and mitigations for the national forests in Region 8.

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

New Science or Other Information:

No data.

Background & Driver(s):

No data.

What monitoring activities have been conducted since the last evaluation?

No data.

Monitoring Results:

No data.

Monitoring Discussion & Findings

No data.

Adaptive Management Considerations

No data.

MQ 19: D.8 What effects do national forests in the region have on changing climate?

Refer to Appendix C of the "Broad-Scale Climate Change Monitoring Evaluation Report for the Southern Region" for individual assessments of climate change effects and mitigations for the national forests in Region 8.

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

New Science or Other Information:

No data.

Background & Driver(s):

No data.

What monitoring activities have been conducted since the last evaluation?

No data.

Monitoring Results:

No data.

Monitoring Discussion & Findings:

No data.

Adaptive Management Considerations:

No data.

MQ 20: E.1 Is reasonable and safe access and use by the public and for resource management being provide?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 2.7 Infra-structure

Monitoring Indicators:

1. Open road and trail mileage
2. Off-system road and trail use violations

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Open road and trail mileage – A goal of the Great American Outdoors Act was to improve access to our recreation areas and trails.

The Chickasawhay Ranger District completed the Little Tiger ATV Access Road and Trailhead Project in November of 2022 using Legacy Roads and Trails funds. The objective of this project was to improve access to the Little Tiger ATV Trailhead by resurfacing FS 220 and reworking the side ditches.

Off-system road and trail use violations – No data.

Background & Drivers:

Open road and trail mileage – No data.

Off-system road and trail use violations – Safety and security is a key measure of Trail National Quality Standards and is measured in two ways:

1) Hazards do not exist on or along the trail.
2) Laws, regulations, and special orders are enforced.

What monitoring activities have been conducted since the last evaluation?

Open road and trail mileage – The Forest has 1,635.8 miles of open road as shown in the table below.

Table 45. Open Road Mileage.

District	ML2	ML3	ML4	ML5	Totals
Bienville	73.2	119.7	23.9	1.8	218.7
De Soto	295.5	272.6	0.8	0.3	569.2
Homochitto	179.4	78.2	11.7	2.2	271.5
Chickasawhay	210.1	79.6	47.8	3.0	340.5
Delta	0.5	32.3	0.0	0.0	32.8
Holly Springs	68.9	57.2	14.6	0.0	140.7
Tombigbee	34.1	23.6	4.7	0.0	62.4
Totals	861.7	663.2	103.5	7.3	1,635.8

Data Source: This information was pulled from the Infra roads database on 11/6/2023.

Open Trail Mileage – Trails include hiking/pedestrian, motorized (ATV/motorcycle), equestrian, and mountain bicycle.

Table 46. Trail Mileage Trend

NFMS Trail Mileage Trend			
FY20	**FY21**	**FY22**	**FY23**
405	406	407	429

Data Source: Infra

Off-system road and trail use violations – Law enforcement and recreation technicians patrol trails, particularly motorized trails, to ensure users are being safe and comply with rules and regulations. Districts inspect trails annually to record deferred maintenance and miles of trail to standard. This data is entered into NRM.

Off-System Road and Trail Use Violations – From FY 20 through FY 2023, there were 1011 tickets written for off-system road and trail violations.

Table 47. Violation Count by District.

Violation	Bienville	De Soto	Homo-chitto	Chick-asawhay	Delta	Holly Springs	Tom-bigbee	Totals
MVUM violation	94	492	141	80		83	4	894
Operating with no valid license		1						1
Operating under the influence								
Operating recklessly	20	10						30
Causing resource damage	59	23	2	1		1		86
Violating state law								
Totals	173	526	143	80		84	4	1011

Data Source: Information furnished by Forest Service law enforcement on 10/23/2023.

Monitoring Results:

Open road and trail mileage – No data.

Off-system road and trail use violations – No data.

Monitoring Discussion & Findings:

Open road and trail mileage – Since FY20, the NFMS trail mileage has increased by 6%. Recently, the Holly Springs added a horse trail system at Chewalla Recreation Area. With trail budgets continuing to decline, partnerships will become increasingly important for trail maintenance.

Off-system road and trail use violations – No data.

Adaptive Management Considerations:

Open road and trail mileage – Establish partnerships with local interest groups and communities to maintain trails.

Off-system road and trail use violations – No data.

MQ 21: E2: Are important road and trail maintenance, closure, and construction activities being accomplished to provide for public access, public safety, and resource protection?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Objective 3.6 Infra-structure

Monitoring Indicators:

1. Miles of road downgraded, including decommissioning
2. Number of structurally deficient bridges
3. Number of culverts replaced for aquatic organism passage
4. Number of low-water fords replaced
5. Miles of trail construction or reconstruction
6. Trail miles maintained to standard

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Miles of road down-graded, including decommissioning – No data.

Number of structurally deficient bridges – No data.

Number of culverts replaced for aquatic organism passage – No data.

Number of low-water fords replaced – No data.

Miles of trail construction or reconstruction – No new information.

Trail miles maintained to standard – No data.

Background & Drivers:

Miles of road down-graded, including decommissioning – No data.

Number of structurally deficient bridges – No data.

Number of culverts replaced for aquatic organism passage – No data.

Number of low-water fords replaced – No data.

Miles of trail construction or reconstruction – Annual and routine maintenance is conducted to ensure trails and its structures are serviceable and in good repair throughout their designed service life.

Trail miles maintained to standard – No data.

What monitoring activities have been conducted since the last evaluation?

Miles of road down-graded, including decommissioning – No data.

Number of structurally deficient bridges – No data.

Number of culverts replaced for aquatic organism passage – No data.

Number of low-water fords replaced – No data.

Miles of trail construction or reconstruction – Trails are evaluated yearly as part of our annual trail accomplishment reporting. Data is recorded in NRM Infra Trails

Trail miles maintained to standard – No data.

Monitoring Results:

Miles of road down-graded, including decommissioning – Of the 2,912 miles of system road on the Forest in 2019, no miles have been downgraded up to the present time. However, NFMS has made a decision to implement a Sept 2023 TAR Revision that will downgrade or decommission more road miles and remove them from the MVUM.

Table 48. Miles of Road Downgraded, Including Decommissioning.

Maintenance Level	Miles, 2019	Miles Downgraded	Miles, 2023
5	7	0	7
4	104	0	104
3	663	0	663
2	862	0	862
1	1,276	0	1,276
Totals	**2,912**	**0**	**2,912**

This information was pulled from the Infra roads database on 11/6/2023.

Number of structurally deficient bridges – FHWA defines a structurally deficient bridge as one that has been given a rating of "poor" (4 on a scale of 0 to 9) for either the deck, substructure, superstructure, or overall structural condition. NFM has two such bridges, both with substructure, and thus overall, ratings of "serious" (3 on a scale of 0 to 9). The two bridges, listed below, were given these ratings during the spring 2022 inspection cycle.

Road 506, Milepost 3.40, Bienville NF
Road 972, Milepost 1.60, Tombigbee NF

Both bridges have been posted for five tons each. If not sooner, when the road 972 bridge deteriorates to the point it is unsafe for any traffic, it will be closed and taken out. The short detour for this bridge does not justify replacing it for passenger vehicles. The district may decide to replace with a complex trail bridge for UTV or bicycle use. The road 506 bridge is NFMS's top bridge priority to replace based on it being a thoroughfare for the Bienville District with benefits to timber, fire and public use and unacceptable detour distances. This information is based on bridge inspections that were performed from February to April 2022.

Number of culverts replaced for aquatic organism passage – Three culverts, one on road 703 (0.91 miles of stream improved),one on road 720 (2.51 miles of stream improved) in the Delta RD in 2021

and 2022 respectively, and one on road 206 (0.35 miles of stream improved) in the Chickasawhay RD in 2020 were replaced with AOP-friendly designs. District engineering personnel were polled during November 2023 to gather this information.

Number of low-water fords replaced – One 34" culvert was replaced with a low water ford on road 234A (1.01 miles of stream improved) on the Chickasawhay RD in 2023. District engineering personnel were polled during November 2023 to gather this information.

Miles of trail construction or reconstruction – Miles of trail improved to standard includes activities such as trail alteration, expansion, or new construction.

Within this monitoring period, all 10.4 miles of the Little Tiger ATV Trail on the Chickasawhay have been reworked to improve drainage and reduce erosion. All stream crossings along the trail were hardened and geotextile was used to stabilize the surface and prevent erosion.

Trail miles maintained to standard – Miles of National Forest System trail on which at least one maintenance task is performed to standard during the fiscal year. "Standard" refers to the Trail National Quality Standards. Maintenance includes annual maintenance and deferred maintenance.

Table 49. Miles of Road Downgraded, Including Decommissioning.

National Forests in Mississippi Miles Maintained to Standard by Fiscal Year			
FY20	**FY21**	**FY22**	**FY23**
58 miles	56 miles	280 miles	126 miles

Data Source: Infra

Monitoring Discussion & Findings:

Miles of road down-graded, including decommissioning – No data.

Number of structurally deficient bridges – No data.

Number of culverts replaced for aquatic organism passage – No data.

Number of low-water fords replaced – No data.

Miles of trail construction or reconstruction – According to the 2019 NVUM, hiking/walking is one of the most popular activities in the National Forests in Mississippi with 28.0% of visitors recording this as one of their main activities. In FY 23 less than 30% of NFMS trails were maintained to standard. Trail condition was identified as a satisfaction element that needed improvement for day use and overnight developed sites.

Trail miles maintained to standard – No data.

Adaptive Management Considerations:

Miles of road down-graded, including decommissioning – No data.

Number of structurally deficient bridges – No data.

Number of culverts replaced for aquatic organism passage – No data.

Number of low-water fords replaced – No data.

Miles of trail construction or reconstruction – Districts are encouraged to improve trails through alteration and expansion rather than building new trails. New construction must be consistent with sustainable recreation goals.

Partnerships are key to a sustainable trail system. Districts are encouraged to establish long-term partnerships at a local community level.

Trail miles maintained to standard – No data.

MQ 22: F.1 Do the National Forests in Mississippi provide forest visitors safe and enjoyable developed and dispersed outdoor recreation experiences that are diverse and responsive to their needs?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Desired Condition 2.8 Recreation, Wilderness, Wild and Scenic River, Cultural Resources, and Forest Setting

Monitoring Indicators:

1. Visitor Use
2. Visitor Satisfaction
3. Recreation Facility Condition
4. Recreation Information Availability

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Visitor Use – No data.

Visitor Satisfaction – Visitor satisfaction is also a critical success factor in the 2024 Southern Region's Sustainable Recreation Strategy. Regional priorities included providing excellent customer service and improving internal and external communication.

Recreation Facility Index – No data.

Recreation Information Availability – No data.

Background & Drivers:

Visitor Use – No data.

Visitor Satisfaction – The Great American Outdoors Act (GAOA) was signed into law in 2020 to provide major investments in deferred maintenance needs, increase recreational access to our public lands, and conserve our lands and waters.

Recreation Facility Index – No data.

Recreation Information Availability – No data.

What monitoring activities have been conducted since the last evaluation?

Visitor Use – NVUM was last conducted in 2019. The next NVUM is scheduled for FY 2024.

Visitor Satisfaction – No data.

Recreation Facility Index – No data.

Recreation Information Availability – No data.

Monitoring Results:

Visitor Use – The information in the table below is from the 2014 and 2019 NVUM Report for the NFMS.

Table 50. NFMS Visitation.

NFMS Visitation			
Total Estimated Site Visits	**2014 NVUM Visits**	**2019 NVUM Visits**	**Visitation Trend**
Total Estimated Site Visits[1]	2,343,000	1,445,000	898,000 Less Site Visits
Day Use Developed Site Visits	204,000	97,000	107,000 Less Site Visits
Overnight Use Developed Site Visits	41,000	2,000	39,000 Less Site Visits
General Forest Area Visits	2,097,000	1,342,000	725,000 Less Visits
TOTAL Estimated National Forest Visits[2]	1,853,000	1,125,000	728,000 Less Visits

[1]A site visit is the entry of one person onto a National Forest site or area to participate in recreation areas for an unspecified period of time.
[2]A National Forest Visit is defined as the entry of one person upon a national forest to participate in recreation activities for an unspecified period of time. A National Forest Visit can be composed of multiple Site Visits.

Visitor Satisfaction –

Table 51. Visits by Overall Satisfaction Rating.

Percent of NFMS Visits by Overall Satisfaction Rating		
Satisfaction Rating	**2014 NVUM Results**	**2019 NVUM Results**
Very Satisfied	37.3%	51.7%
Somewhat Satisfied	38.3%	24.2%
Neither Satisfied nor Dissatisfied	17.8%	6.9%
Somewhat Dissatisfied	3.7%	8.8%
Very Dissatisfied	2.9%	8.5%

Recreation Facility Index – Recreation sites maintained to standard should have a facility condition index (FCI) of 90% or higher meaning in good or fair condition. FCI is calculated using the following formula: FCI = 1- (deferred maintenance/replacement value.) Deferred maintenance is maintenance that is past due.

If a recreation site has a FCI of 90% or better, the site is maintained to a quality standard. If the FCI is less than 90% the site is not maintained to standard.

Table 52. NFMS % of Recreation Sites Maintained to Standard.

NFMS % of Recreation Sites Maintained to Standard			
FY 20	**FY 21**	**FY 22**	**FY 23**
72.9%[1]	67.2%	55.2%	65.7%

Source: Trend Tracker

[1] An average was used that included financially sustainable sites and all other sites to calculate this percentage.

Recreation Information Availability – Recreation information is available on the Forest Service website and Facebook. The district offices also provide informational brochures of their recreation areas.

Monitoring Discussion & Findings:

Visitor Use – As shown in the NFMS Visitation table above, visits to the NFMS decreased from 2014 to 2019. The greatest decline was in overnight use developed site visits. There was approximately 52% less overnight use at developed sites. I strongly suspect that there is an error or a change in how the data was collected that would explain this drop in use.

Visitor Satisfaction – The 2019 NVUM found that 76% of visitors were very satisfied and somewhat satisfied with their visit which was a 1% increase from 2014. The 2019 NVUM found that 17.3% of visitors were somewhat or very dissatisfied which is a 10.7 % increase from 2014.

Recreation Facility Index – Condition of facilities is a key measure for National Quality Standards for Recreation Site. In 2023 NFMS is maintaining 65.7% sites to standard. These statistics show that deferred maintenance is steadily increasing and the need for a more sustainable recreation program. The NFMS currently has far more recreation facilities than it can afford to maintain over the long run.

Recreation Information Availability – No data.

Adaptive Management Considerations:

Visitor Use – No data.

Visitor Satisfaction – The 2019 NVUM rated satisfaction elements for day use, overnight developed sites, and undeveloped areas. Satisfaction elements that are important to the public and improvement is needed are listed below. Visitors were overall satisfied with undeveloped area (general forest area). Efforts would most likely have the greatest payoff for customer satisfaction if focused on these elements.

Satisfaction Elements Requiring Improvement for Day-Use Developed Sites:

- Restroom cleanliness
- Developed facilities
- Parking lot condition
- Trail condition

Satisfaction Elements Requiring Improvement for Overnight Developed Sites:

- Signage adequacy

Recreation Facility Index – Focus on maintaining and improving sites that have the most value. Priority sites include Regional Priority Investment List sites and Forest priority sites. Reduce unnecessary infrastructure at non-priority sites. Decommission low value sites with high maintenance costs. Seek partnerships to manage sites more effectively.

Recreation Information Availability – No data.

MQ 23: F.2 Are important recreational, cultural resource, and forest setting opportunities being provided?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Objective 3.7 Recreation, Wilderness, Wild and Scenic River, Cultural Resources, and Forest Setting

Monitoring Indicators:

1. Acres of primitive and semi-primitive recreation settings identified
2. Track the use of visitor information
3. Miles of short loop trails
4. Surface acres of aquatic invasives treatment
5. Largemouth bass (MIS) monitoring by electrofishing and seining to evaluate population structure

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Acres of primitive and semi-primitive recreation settings identified – No data.

Track use of visitor information – No data.

Miles of short loop trails – No data.

Surface acres of aquatic invasives treatment – No data.

Largemouth bass (MIS) monitoring by electrofishing and seining to evaluate population structure –

Gablehouse, D.W. 1984. A Length Categorization System to Assess Fish Stocks, North American Journal of Fisheries Management 4: 273-285.

Murphy, Brian & Willis, David & Springer, Timothy. (1991). The Relative Weight Index in Fisheries Management: Status and Needs. Fisheries. 16. 30-38.

Background & Drivers:

Acres of primitive and semi-primitive recreation settings identified – No data.

Track use of visitor information – In 2021, one of the priorities for the Southern Region was to provide innovative approaches to sustainable recreation, wilderness, heritage, and volunteer and service program delivery in an integrated, shared stewardship manner. Through these approaches, we will strengthen connections with our local communities, provide the benefits associated with quality recreation experiences, and bring positive economic impacts.

Characteristics of the recreation visits such as participation help managers understand recreation use patterns and use of facilities. This allows them to plan workforce and facility needs.

Miles of short loop trails – Short-loop trail walks provide opportunities to enjoy the beauty of nature on a relatively non-strenuous walk on trails.

Surface acres of aquatic invasives treatment – No data.

Largemouth bass (MIS) monitoring by electrofishing and seining to evaluate population structure – Fisheries management is practiced on the Forest to provide fishing opportunities to the public. Various management practices to enhance recreational fishing opportunities on national forest lakes include liming and fertilization, spawning habitat improvement, fish attractors, aquatic weed control, stocking, length and creel limits, and angler access improvement. Largemouth bass was identified as a management indicator species (MIS) to measure the effectiveness of recreational fisheries management on National Forest lakes. Largemouth bass is a highly sought after game species and is the principal predator in most lakes on the forest. The presence and abundance of this species influence the overall balance of the fish population in National Forest lakes. Population structure of the largemouth bass has been a good indicator of the effectiveness of Forest Service management practices.

Eight of the 72 lakes in the Forest (Chewalla, Puskus, Tillatoba, Davis, Choctaw, Marathon, Turkey Fork, and Okhissa) rated highest in priority for management based on factors such as existing fish populations, habitat conditions, and angler access. For the purposes of this Monitoring & Evaluation Report, these lakes are the ones that will be used to evaluate the effectiveness of Forest Service management practices.

Figure 39. Forest Service Employee Displays Largemouth Bass Meeting Criteria for "Memorable - Trophy" Category.

What monitoring activities have been conducted since the last evaluation?

Acres of primitive and semi-primitive recreation settings identified – No Data.

Track use of visitor information – Last NVUM was completed in 2019.

Miles of short loop trails – No Data.

Surface acres of aquatic invasives treatment – No Data.

Largemouth bass (MIS) monitoring by electrofishing and seining to evaluate population structure – From 2012 through 2022, a total of 3,992 largemouth bass were sampled in those lakes by shoreline electrofishing. A length categorization system was used to describe largemouth bass size structure in each lake (Gablehouse 1984).

- Stock – Quality (S–Q) 8 – 11.9 inches
- Quality – Preferred (Q–P) 12 – 14.9 inches
  (Size bass most anglers like to catch)
- Preferred – Memorable (P–M) 15 – 19.9 inches
  (Size bass most anglers would prefer to catch)
- Memorable – Trophy (M–T) 20 – 24.9 inches
  (Size bass most anglers remember catching)

Monitoring Results:

Acres of primitive and semi-primitive recreation settings identified – There are 1.2 million acres available for primitive and semi-primitive recreation on the National Forests in Mississippi (2014 NFMS LRMP.)

Track use of visitor information – According to the 2019 NVUM, the majority of visitors engage in hunting (51%), followed by viewing natural features (35.2%) and hiking/walking (28%).

Miles of short loop trails – For the purpose of this report, short loops are defined as trails 1 mile or less in length. As of FY 2023, there are 7.5 miles of short loop trails.

Table 53. Trail Length in Miles.

Ranger District	Trail Name	Trail Length in Miles
Bienville	Shongelo Hiking	.5
Bienville	Bienville Interpretive Walking	.6
Homochitto	Office Nature Trail	.5
DeSoto	Big Biloxi Interpretative Trail	.5
Chickasawhay	Little Tiger Warm Up Segment	.2
Delta	Blue Lake Hiking	1
Delta	717B Green Ashe Trail - East Sec	.9
Delta	709A Spanish Fort Trail – A Sec	.8
Tombigbee	Cabin Lake Trail	.48
Tombigbee	Davis Lake Hiking Trail	.3275
Delta	703F Red Rock Trail	1
Delta	734A Rock Bottom Trail	.7

Data Source: Infra

Surface acres of aquatic invasives treatment – No Data.

Largemouth bass (MIS) monitoring by electrofishing and seining to evaluate population structure – Incremental Relative Stock Density (RSD) for largemouth bass was the first metric used to evaluate the effectiveness of recreational fisheries management practices. Incremental RSD is simply a measure of the percent (%) of fish in each length category. Incremental RSD values for largemouth bass were generated for each of the eight lakes and displayed in Figure 38. Objectives reflecting a moderate density of bass for each length category are shaded in gray.

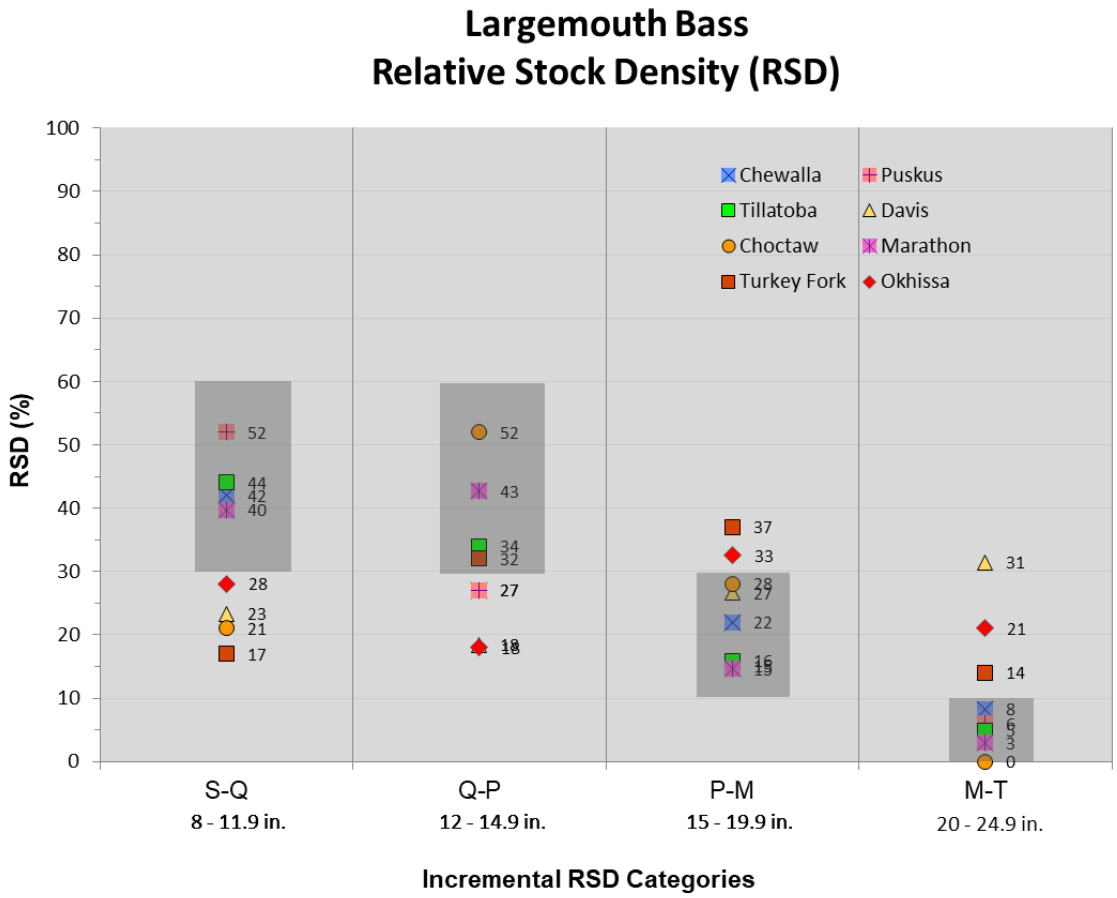


Figure 40. Incremental RSD Values Displayed by Length Category for Largemouth Bass for Eight National Forest Lakes.

Most of the lakes had RSD values that fell within or below the desired objective range for both S-Q and Q-P length categories, indicating that none of them are severely overpopulated with smaller sized bass. In addition, most of the lakes had RSD values that fell within or above the desired objective range for both the P-M and M-T length categories, indicating that they are providing producing numbers of larger sized bass.

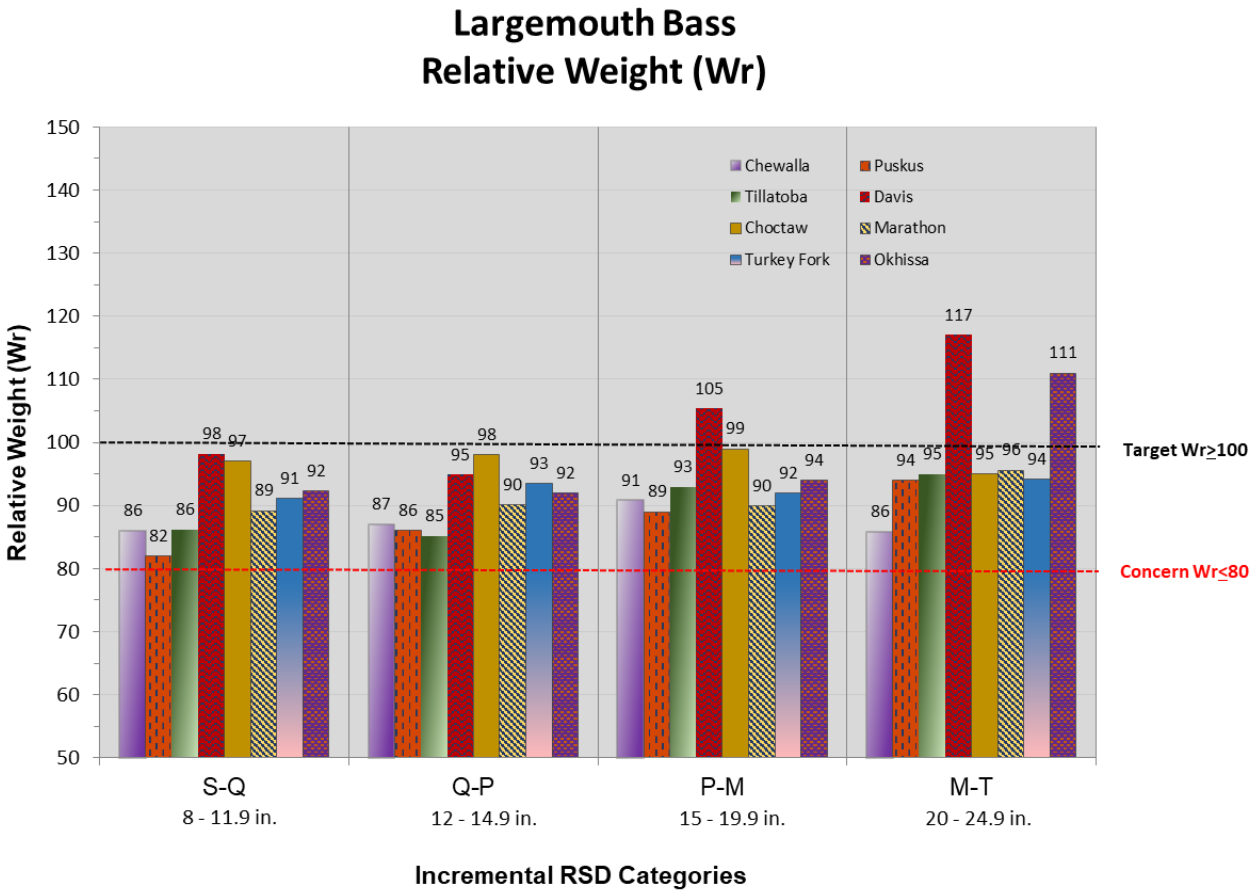


Figure 41. Relative Weight (Wr) Values Displayed by Length Category for Eight National Forest Lakes.

Relative Weight (Wr) for largemouth bass was the second metric used to evaluate the effectiveness of recreational fisheries management practices. Wr is simply a value (%) obtained by dividing the observed weight of individual fish by the expected weight for the given length. Average Wr values for largemouth bass were generated for each length category for each of the eight lakes and displayed in Figure 39. Target Wr is displayed on the chart by a black dotted line. Fish populations with an average Wr values ≥ 100 are considered to be healthy (fat). Concern Wr is displayed on the chart by a red dotted line. Fish populations with an average Wr value ≤ 80 are considered to be unhealthy (skinny).

The majority of the lakes had Average Wr values for each length category fell below the Target Wr (≥100), but above the Concern Wr (≤80). This indicates that moderate density of largemouth bass is present in each lake, which still allows some forage to be produced to maintain adequate health and growth. This in turn is providing an overall balanced population of all fish species in each lake. A few lakes had Average Wr values for the P-M and M-T length categories that were above the Target Wr (≥100) indicating a low density of largemouth bass. As a result, these lakes have less predation on forage fish, thus producing healthier (fatter than average) individual bass.

What level of confidence is there in the accuracy and precision? The accuracy and precision of the data is high as the fisheries standard/goal is to collect 100+ fish per lake to adequately describe the population structure of a given species. The number of bass sampled for each of the 8 lakes ranged from 293 – 669.

Monitoring Discussion & Findings:

Acres of primitive and semi-primitive recreation settings identified – No data.

Track use of visitor information – Since the primary activities are hunting, viewing natural features and hiking/walking, effort should be towards enhancing these activities.

Miles of short loop trails – No data.

Surface acres of aquatic invasives treatment – No data.

Largemouth bass (MIS) monitoring by electrofishing and seining to evaluate population structure –

Largemouth Bass Population Structure

- Most of the lakes had RSD values that fell within or below the desired objective range for both S-Q and Q-P length categories, indicating that none of them are severely overpopulated with smaller sized bass. In addition, most of the lakes had RSD values that fell within or above the desired objective range for both the P-M and M-T length categories, indicating that they are providing producing numbers of larger sized bass.
- The majority of the lakes had Average Wr values for each length category fell below the Target Wr ($\geq$100), but above the Concern Wr ($\leq$80). This indicates that moderate density of largemouth bass is present in each lake, which still allows some forage to be produced to maintain adequate health and growth. This is turn is providing an overall balanced population of all fish species in each lake. A few lakes had Average Wr values for the P-M and M-T length categories that were above the Target Wr ($\geq$100) indicating a low density of largemouth bass. As a result, these lakes have less predation on forage fish, thus producing healthier (fatter than average) individual bass.

Both of these largemouth bass population structure indices show that Forest Service management practices to enhance recreational fishing opportunities on national forest lakes are meeting the desired condition.

Adaptive Management Considerations:

Acres of primitive and semi-primitive recreation settings identified – No data.

Track use of visitor information – Since hiking/walking is a primary activity, attention should be placed on maintaining trails to standard. If hunters are also camping, campgrounds would want to remain open during hunting season.

Miles of short loop trails – No data.

Surface acres of aquatic invasives treatment – No data.

Largemouth bass (MIS) monitoring by electrofishing and seining to evaluate population structure – The forest plan monitoring program is meant to "enable the responsible official to determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed" (36 CFR 219.12).

Continue the current management program to maintain moderate density of largemouth bass on these lakes with an emphasis on maintaining adequate harvest levels. On those lakes where larger individual fish are desired, a lower density of bass should be the target. Creel and length limits should continue to be one of the main tools to achieve/maintain density and length objectives.

Based on the findings in the discussion above, there is no recommended need for change.

MQ 24: F.3 Are Wilderness characters being preserved or enhanced?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Objective 3.8 Recreation, Cultural Resources, and Forest Setting

Monitoring Indicators:

1. Wilderness Character

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Wilderness Character – Detailed management strategies, standards, and guidelines for the Black Creek and Leaf Wilderness Areas were developed through the Limits of Acceptable Change (LAC) process and amended into the 1985 Land and Resource Management Plan in 1994.

Background & Drivers:

Wilderness Character – In 1984, Public Law 98-515 designated Black Creek and Leaf Wilderness Areas. This Act may be cited as the "Mississippi National Forest Wilderness Act of 1984". The Act designated 4560 acres as the Black Creek Wilderness and approximately 940 acres as Leaf Wilderness in the De Soto National Forest for inclusion in the National Wilderness Preservation System.

WSP measures track the Forest Service's stewardship actions taken to preserve wilderness character. The lead forest for each wilderness is responsible for the selection and annual reporting of 10 core elements associated with wilderness stewardship. The WSP framework contains four mandatory elements (agency management actions, workforce capacity, education, and wilderness character baseline) and the lead forest must select six other elements from a list of 16. Each element is worth a maximum of ten points, for a total of 100 points. An additional four points may be scored by satisfying two "additional requirements" checkboxes (Wilderness Boundaries and Upward Reporting). A wilderness scoring 60 points or higher will equate to "Wilderness meeting baseline performance for preserving wilderness character" (a.k.a., "Wilderness Managed to Standard").

What monitoring activities have been conducted since the last evaluation?

Wilderness Character – Law Enforcement Officials and Forests Protection Officers regularly monitor use in the Wilderness Areas to ensure that visitors are following rules and guidelines.

Monitoring Results:

Wilderness Character – Black Creek and Leaf Wilderness Areas were not maintained to standard during FY20-FY23. Below are the WSP scores for each fiscal year.

Table 42. Black Creek Wilderness Area WSP Score by FY

Black Creek Wilderness Area WSP Score by FY			
FY 20	**FY 21**	**FY 22**	**FY 23**
10	14	20	22

Data Source: Infra

Table 43. Leaf Wilderness Area WSP Score by FY

Leaf Wilderness Area WSP Score by FY			
FY 20	**FY 21**	**FY 22**	**FY 23**
2	2	4	6

Data Source: Infra

Monitoring Discussion & Findings:

Wilderness Character – Designated by Congress and managed under the guidance of the Wilderness Act of 1964, wilderness areas are the jewels of our public lands. The Forest Service created WSP measures to ensure we meet our responsibilities to these special places. Establishing character baseline, surveying and clearly marking wilderness boundaries are key steps in accomplishing this responsibility.

Adaptive Management Considerations:

Wilderness Character – Establish wilderness baseline character and increase scores each year until Wilderness is managed to standard.

MQ 25: F.4 Are the free-flowing condition, scenic and recreational values for the wild and scenic river and the Black Creek Corridor Scenic Area being protected or enhanced?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Objective 3.8 Recreation, Cultural Resources, and Forest Setting

Monitoring Indicators:

1. Wild & Scenic River (WSR) and Associated Scenic Corridor Conditions

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Wild & Scenic River (WSR) and Associated Scenic Corridor Conditions – Detailed management strategies, standards, and guidelines for the Black Creek WSR were developed through the Limits of Acceptable Change (LAC) process and amended into the 1985 Land and Resource Management Plan in 1994.

Background & Drivers:

Wild & Scenic River (WSR) and Associated Scenic Corridor Conditions – On October 30, 1986, Public Law 99-590 designated a 21-mile segment of Black Creek, in the De Soto Ranger District, as a Wild and Scenic River (WSR) and added Black Creek to the National Wild and Scenic Rivers System Inventory. The NFMS has been managing this segment and interim corridor as scenic since its designation in 1986. Sections 3(d)(1) and 3(d)(2) of the Wild and Scenic Rivers Act (Act), require the administering agency to establish a detailed river corridor boundary within one year from the date of designation; and to prepare a comprehensive river management plan within three full fiscal years after designation. The Forest completed pieces of the management plan since designation, but a CRMP has not been completed. A preliminary boundary has been delineated but has not been finalized.

The Act requires that a coordinated river management plan achieve the following: describe the existing resource conditions, define the goals and desired conditions for protecting river values, address the development of lands and facilities, visitor capacity, water quality issues, and instream flow requirement, reflect a collaborative approach with stakeholders; identify regulatory authorities or other governmental agencies to assist in protecting river values and, include a monitoring strategy to maintain desired conditions. An interdisciplinary team of resource specialists has been convened to prepare the comprehensive river management plan for Black Creek Scenic River and to complete the associated environmental assessment pursuant to the National Environmental Policy Act (NEPA) requirements, under Forest Service Handbook 1909.15.

What monitoring activities have been conducted since the last evaluation?

Wild & Scenic River (WSR) and Associated Scenic Corridor Conditions – None since this is the first evaluation.

Monitoring Results:

Wild & Scenic River (WSR) and Associated Scenic Corridor Conditions – The Black Creek WSR was not managed to standard during FY20-FY23. The CRMP and environmental documentation is expected to be complete soon.

Monitoring Discussion & Findings:

Wild & Scenic River (WSR) and Associated Scenic Corridor Conditions – A CRMP provides guidance on how to protect wild and scenic rivers. Once completed, the Black Creek WSR CRMP will provide a final map and legal description which will be key to river management.

Adaptive Management Considerations:

Wild & Scenic River (WSR) and Associated Scenic Corridor Conditions – Recommend implementing the monitoring strategy developed in the CRMP.

MQ 26: F.5 What changes are occurring in the social, cultural, and economic conditions in the areas influenced by national forests in the region?

Refer to Appendix the "Broad-Scale Socioeconomic Monitoring Evaluation Report for the Southern Region" for socioeconomic indicators and comparisons of National Forests in Mississippi area with Region 8 area.

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Forest Plan Monitoring Frequency: 5 Years

New Science or Other Information:

No data.

Background & Driver(s):

No data.

What monitoring activities have been conducted since the last evaluation?

No data.

Monitoring Results:

No data.

Monitoring Discussion & Findings

No data.

Adaptive Management Considerations

None.

MQ 27: G.1 Are appropriate and relevant design and criteria (guidelines) applied and effective in projects?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Guidelines

Monitoring Indicators:

1. Annual review of records and field checks for effectiveness of guidelines in a sampling of projects by project type. BMP monitoring being used to address this monitoring question.

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Annual review of records and field checks for effectiveness of guidelines in a sampling of projects by project type. BMP is monitoring being used to address this monitoring question. – No data.

Background & Drivers:

Annual review of records and field checks for effectiveness of guidelines in a sampling of projects by project type. BMP monitoring is being used to address this monitoring question. – No data.

What monitoring activities have been conducted since the last evaluation?

Annual review of records and field checks for effectiveness of guidelines in a sampling of projects by project type. BMP monitoring is being used to address this monitoring question. – No data.

Monitoring Results:

Annual review of records and field checks for effectiveness of guidelines in a sampling of projects by project type. BMP monitoring is being used to address this monitoring question. – No data.

Monitoring Discussion & Findings:

Annual review of records and field checks for effectiveness of guidelines in a sampling of projects by project type. BMP monitoring is being used to address this monitoring question. – No data.

Adaptive Management Considerations:

Annual review of records and field checks for effectiveness of guidelines in a sampling of projects by project type. BMP monitoring is being used to address this monitoring question. – No data.

MQ 28: G.2 Are special area conditions and needs consistent with the land management plan?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Special Areas

Monitoring Indicators:

1. Assessment of existing areas and new proposals during comprehensive evaluations

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Assessment of existing areas and new proposals during comprehensive evaluations – No data.

Background & Drivers:

Assessment of existing areas and new proposals during comprehensive evaluations – No data.

What monitoring activities have been conducted since the last evaluation?

Assessment of existing areas and new proposals during comprehensive evaluations – No data.

Monitoring Results:

Assessment of existing areas and new proposals during comprehensive evaluations – No data.

Monitoring Discussion & Findings:

Assessment of existing areas and new proposals during comprehensive evaluations – No data.

Adaptive Management Considerations:

Assessment of existing areas and new proposals during comprehensive evaluations – No data.

MQ 29: G.3 Are final, project determinations of suitability of uses and activities in harmony with forest plan desired conditions and determinations of generally compatible?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Suitability of Land

Monitoring Indicators:

1. Annual review of final suitability of uses and activities for a sample of projects compared with the plan.
2. Assessment of total acres classified as suitable for timber production during comprehensive evaluations

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Annual review of final suitability of uses and activities for a sample of projects compared with the plan. – No data.

Assessment of total acres classified as suitable for timber production during comprehensive evaluations – No data.

Background & Drivers:

Annual review of final suitability of uses and activities for a sample of projects compared with the plan. – If activities were not in harmony with the Forest Plan desired conditions (and standards), a forest plan amendment would have been necessary to approve such activities. Plans may be amended due to changing conditions or incorrect assumptions; amendments may be used as new information becomes available for land managers to consider.

Assessment of total acres classified as suitable for timber production during comprehensive evaluations – No data.

What monitoring activities have been conducted since the last evaluation?

Annual review of final suitability of uses and activities for a sample of projects compared with the plan. – This is the first reported assessment of this monitoring question.

Assessment of total acres classified as suitable for timber production during comprehensive evaluations – No data.

Monitoring Results:

Annual review of final suitability of uses and activities for a sample of projects compared with the plan. – No plan amendments were signed between 2015 and 2023. *Check with Leadership Team, NEPA, etc. None to my knowledge.*

Assessment of total acres classified as suitable for timber production during comprehensive evaluations – No data.

Monitoring Discussion & Findings:

Annual review of final suitability of uses and activities for a sample of projects compared with the plan. – No data.

Assessment of total acres classified as suitable for timber production during comprehensive evaluations – No data.

Adaptive Management Considerations:

Annual review of final suitability of uses and activities for a sample of projects compared with the plan. – None.

Assessment of total acres classified as suitable for timber production during comprehensive evaluations – No data.

MQ 30: G.4 Are the costs of implementing this Plan comparable to the estimated costs?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Strategies

Monitoring Indicators:

1. Annual tracking of costs for land management activities (timber sales, silvicultural, prescribed fire, wildlife, and fish habitat improvement, etc.), recreation and other user services, and roads and facilities maintenance
2. Five-year review of projected forest plan costs compared to actual costs and annual budgets.

Forest Plan Monitoring Frequency: 5 years

New Science or Other Information:

Annual tracking of costs for land management activities (timber sales, silvicultural, prescribed fire, wildlife, and fish habitat improvement, etc.), recreation and other user services, and roads and facilities maintenance – No data.

Five-year review of projected forest plan costs compared to actual costs and annual budgets. – No data.

Background & Drivers:

Annual tracking of costs for land management activities (timber sales, silvicultural, prescribed fire, wildlife, and fish habitat improvement, etc.), recreation and other user services, and roads and facilities maintenance – No data.

Five-year review of projected forest plan costs compared to actual costs and annual budgets. – No data.

What monitoring activities have been conducted since the last evaluation?

Annual tracking of costs for land management activities (timber sales, silvicultural, prescribed fire, wildlife, and fish habitat improvement, etc.), recreation and other user services, and roads and facilities maintenance – No data.

Five-year review of projected forest plan costs compared to actual costs and annual budgets. – No data.

Monitoring Results:

Annual tracking of costs for land management activities (timber sales, silvicultural, prescribed fire, wildlife, and fish habitat improvement, etc.), recreation and other user services, and roads and facilities maintenance – No data.

Five-year review of projected forest plan costs compared to actual costs and annual budgets. – No data.

Monitoring Discussion & Findings:

Annual tracking of costs for land management activities (timber sales, silvicultural, prescribed fire, wildlife, and fish habitat improvement, etc.), recreation and other user services, and roads and facilities maintenance – No data.

Five-year review of projected forest plan costs compared to actual costs and annual budgets. – No data.

Adaptive Management Considerations:

Annual tracking of costs for land management activities (timber sales, silvicultural, prescribed fire, wildlife, and fish habitat improvement, etc.), recreation and other user services, and roads and facilities maintenance – No data.

Five-year review of projected forest plan costs compared to actual costs and annual budgets. – No data.

MQ 31: G.5 Are the forest management activities in compliance with terms and conditions of USDI F&WS Biological Opinion on Indiana bat and Dusky gopher frog?

Date(s) of most current evaluation and past evaluation(s): 2020-2023 and 2015-2019

Plan Component(s) the monitoring questions is tracking: Guidelines

Monitoring Indicators:

1. Indiana bat: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in the Holly Springs Unit to ensure the total acreages do not exceed the authorized incidental take criteria.
2. Dusky gopher frog: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in Dusky gopher frog critical habitat in the De Soto Ranger District. Ensure the total annual treatment acreages do not exceed the authorized incidental take criteria.

Forest Plan Monitoring Frequency: 1 year

New Science or Other Information:

Indiana bat: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in the Holly Springs Unit to ensure the total acreages do not exceed the authorized incidental take criteria. – No data.

Dusky gopher frog: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in Dusky gopher frog critical habitat in the

De Soto Ranger District. Ensure the total annual treatment acreages do not exceed the authorized incidental take criteria. – No data.

Background & Drivers:

Indiana bat: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in the Holly Springs Unit to ensure the total acreages do not exceed the authorized incidental take criteria. – No data.

Dusky gopher frog: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in Dusky gopher frog critical habitat in the De Soto Ranger District. Ensure the total annual treatment acreages do not exceed the authorized incidental take criteria. – The biological assessment of the Land and Resource Management Plan for National Forests in Mississippi 2014 indicated management activities that were likely to adversely affect two threatened and endangered species, the Indiana bat, and the Dusky gopher frog. The U.S. Fish and Wildlife Service's Biological Opinion for this federal undertaking contained an Incidental Take Statement that allows for incidental take of these two federally listed species.

What monitoring activities have been conducted since the last evaluation?

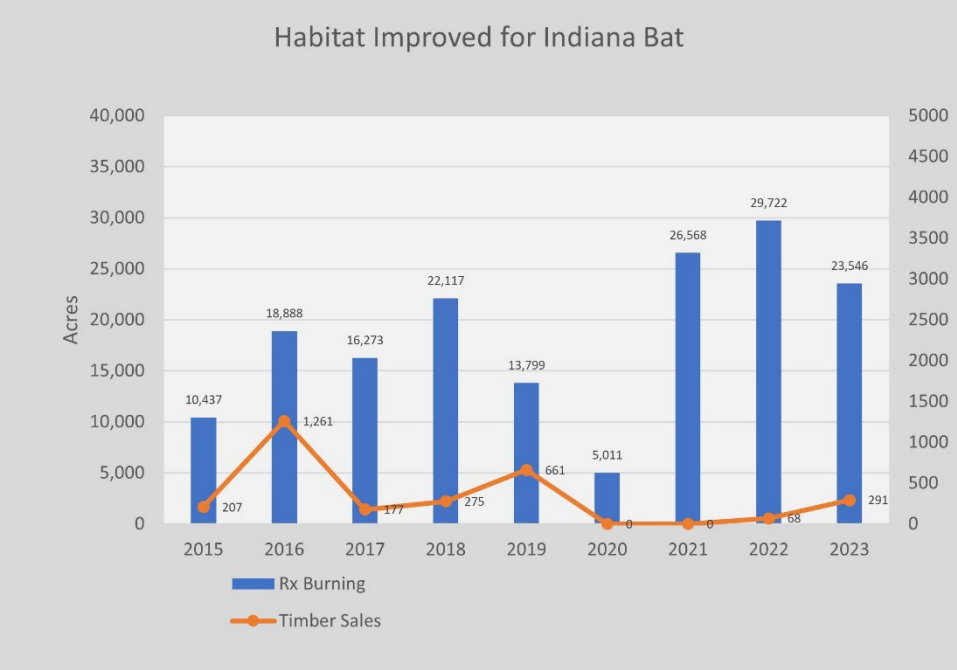
Indiana bat: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in the Holly Springs Unit to ensure the total acreages do not exceed the authorized incidental take criteria. – No data.

Dusky gopher frog: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in Dusky gopher frog critical habitat in the De Soto Ranger District. Ensure the total annual treatment acreages do not exceed the authorized incidental take criteria. – Acres of habitat improved annually are tracked to monitor for Indiana bat and for Dusky gopher frog. For Indiana bat, timber sales and prescribed burning are tracked and for Dusky gopher frog, acres of prescribed burning are tracked.

Monitoring Results:

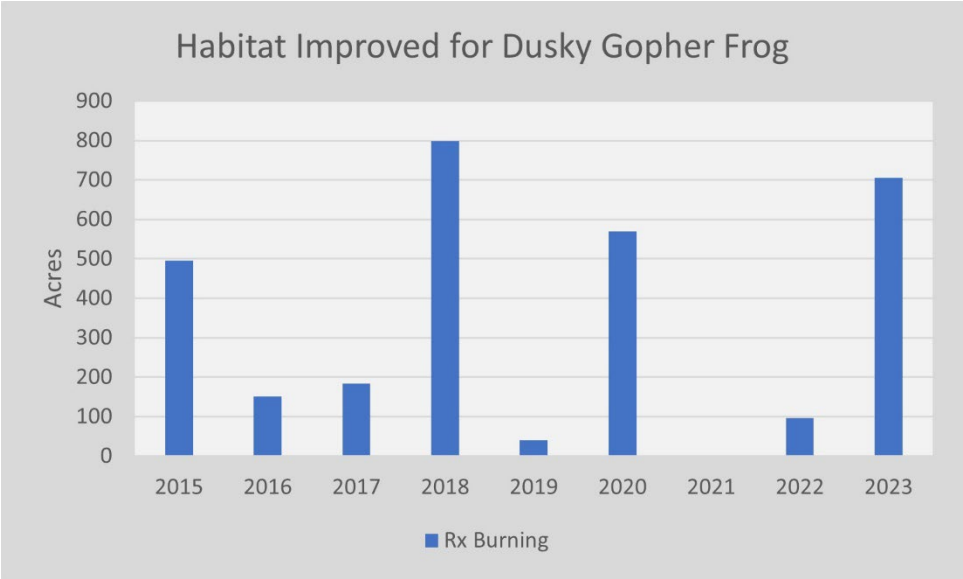
Indiana bat: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in the Holly Springs Unit to ensure the total acreages do not exceed the authorized incidental take criteria. – No data.

Figure 44. Acres of Habitat Accomplished in Relation to the Indiana bat, Holly Springs NF, 2015-2023.



Dusky gopher frog: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in Dusky gopher frog critical habitat in the De Soto Ranger District. Ensure the total annual treatment acreages do not exceed the authorized incidental take criteria. –

Figure 45. Acres of habitat Accomplished in Dusky Gopher Frog Critical Habitat, DeSoto NF, 2015-2023.



Monitoring Discussion & Findings:

Indiana bat: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in the Holly Springs Unit to ensure the total acreages do not exceed the authorized incidental take criteria. – No data.

Dusky gopher frog: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in Dusky gopher frog critical habitat in the De Soto Ranger District. Ensure the total annual treatment acreages do not exceed the authorized incidental take criteria. – Monitoring the acres of habitat managed or improved through vegetation management projects such as timber sales and application of prescribed burning is used as a surrogate for the actual species presence. Prescribed burning and timber sales are in compliance with the biological opinion on Indiana bat and Dusky gopher frog.

Adaptive Management Considerations:

Indiana bat: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in the Holly Springs Unit to ensure the total acreages do not exceed the authorized incidental take criteria. – Indiana bat benefits from land management practices that provide for an open canopy forest structure type. Management tools used on the National Forest that promote this type of habitat include prescribed burning and thinning. Restoration of native forest types is also considered beneficial for the overall health of the ecosystem. Indiana bats have proven difficult to detect in the district.

Dusky gopher frog: Annual summary of number of acres of non-commercial and commercial forest management practices and prescribed fires implemented in Dusky gopher frog critical habitat in the De Soto Ranger District. Ensure the total annual treatment acreages do not exceed the authorized incidental take criteria. – Dusky gopher frog has a couple of life strategies that are dependent on a pyric or fire-dependent ecosystem. They reproduce and grow in ephemeral ponds. Fire helps to maintain a healthy environment in these temporary ponds and helps to keep them open and free from encroaching vegetation. The frogs also spend part of their annual cycle hiding in the burrows created by the gopher tortoise which is also dependent on open ground within the longleaf pine ecosystem again maintained by controlled burning. The DeSoto Ranger District is committed to the recovery of this frog through the development and maintenance of ephemeral ponds and the maintenance of the healthy longleaf pine ecosystem.

Conclusion

This Biennial Monitoring and Evaluation Specialist Report (BMESR) contains supplemental information for the development of the Biennial Monitoring and Evaluation Report (BMER). This document helps the responsible official determine whether a change is needed to the 2014 Land and Resource Management Plan (Forest Plan) direction, such as plan components or other plan content that guide management of resources in the plan area (36 CFR 219.12(a)(1)). The BMER represents one part of the Forest Service's overall monitoring program for the National Forests in Mississippi.