United States Department of Agriculture

Biennial Monitoring Evaluation Report for the Ozark-St. Francis National Forests FY20-22

Buffalo River

Forest Service Ozark-St. Francis National Forests October 2023

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Part I - About the Plan Monitoring Program

Purpose

The Plan Monitoring Program is described in the 2005 Revised Land and Resource Management Plan (Forest Plan). This Biennial Monitoring Evaluation Report is not a decision document—it evaluates monitoring questions and indicators presented in the Plan Monitoring Program as described in the Forest Plan. The purpose of the Biennial Monitoring Evaluation Report is to help the responsible official determine whether a change is needed in Forest Plan direction, such as plan components or other plan content that guide management of resources in the plan area. The Biennial Monitoring Evaluation Report represents one part of the Forest Service's overall monitoring program for this National Forest unit.

Monitoring elements in this report are organized into nine topics. This includes the topic of social, economic, and cultural sustainability along with the following additional topics required under FSH 1909.12:

- The status of select watershed conditions.
- The status of select ecological conditions
- The status of focal species
- The status of federally listed threatened, endangered, proposed, and candidate species
- The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives
- Measurable changes on the plan area related to climate change
- Progress toward meeting the desired conditions and objectives in the plan
- The effects of management systems on the productivity of the land

How the 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 Ozark-St. Francis National Forests (OSFNF) monitoring program was developed during the 2005 revision of the Land and Resource Management Plan. Monitoring indicators were selected in the plan to inform management of resources on the plan area. Monitoring questions have been developed that are consistent with the 2012 planning regulations (36 CFR 219.12) in order to evaluate the status of these indicators.

Providing timely, accurate monitoring information to the responsible official and the public is a key requirement of the Plan Monitoring Program. This Biennial Monitoring Evaluation Report is the vehicle for disseminating this information.

Monitoring Objectives

The objectives of the Plan Monitoring Program include:

- Assess the current condition and trend of selected 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 previous 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 indicators.
- Incorporate broader scale monitoring information from the Regional Broader Scale Monitoring Strategy that is relevant to the understanding of the monitoring questions.
- Present recommended change opportunities to the responsible official.

Public Outreach

Information on the OSFNF monitoring program can be found on the Monitoring and Evaluation web page. Links to this monitoring report as well as previous monitoring reports are also available at this link: https://www.fs.usda.gov/detail/osfnf/landmanagement/planning/?cid=stelprdb5212211

Information on the OSFNF planning program is available on the Planning web page. A link to the 2005 Revised Land and Resource Management Plan (Forest Plan) is also available at this link: https://www.fs.usda.gov/main/osfnf/landmanagement/planning

Information regarding the Ozark-St. Francis National Forests can be found on the OSFNF home page: https://www.fs.usda.gov/main/osfnf/home

Information regarding the publication of this monitoring report and other OSFNF news can also be found on the News and Events web page:
https://www.fs.usda.gov/news/osfnf/news-events

Also, on Facebook:
https://www.facebook.com/ozarkstfrancis

Or on X (twitter):
https://twitter.com/ozarkstfrancis

Subscribe to get email updates from the OSFNF about ongoing projects through GovDelivery:
https://public.govdelivery.com/accounts/USDAFS/subscriber/new?preferences=true

In addition, members of the public can contact Janine Book, Environmental Coordinator, by email at janine.book@usda.gov for more details regarding this report and other monitoring or planning information.

Part II - Summary of Results and Certification

Monitoring Results Summary

Monitoring results are recorded for 25 questions covering a broad range of the 200 or so monitoring elements and objectives in the Plan Monitoring Program. As mentioned in Part I, these 25 questions are separated into nine topic areas. Not every element or objective is looked at every monitoring cycle, but enough data is reviewed for each topic area to effectively answer the monitoring questions. A crosswalk relating the 25 questions with the Forest Plan's elements and objectives is available in Part IV of this monitoring report.

For the 25 monitoring questions, monitoring results from 2020-2022 revealed that there are two areas that would benefit from management action. Also, there are five items that can be addressed in future forest plans. Finally, there are two areas that need both current management action and perhaps modification in future forest plans. These last two also represent areas where managers have not been able to meet the pace and scale of Forest Plan direction. Of the other 16 questions, no action or change to either the Forest Plan or monitoring program is recommended.

These results are summarized in Tables 1 through 4 here in Part II for the Forest Supervisor's review. Detailed highlights of the results for the 9 topic areas and the associated 25 questions are presented in Part III of this report.

Table 1. Quantitative Summary of Monitoring Results Addressed in Report (25 Questions)

Results	Yes, need for change	Uncertain	No
Results inconsistent with Forest Plan direction		2	23
Change to future Forest Plan may be warranted	3	4	18
Change to Plan Monitoring Program may be warranted			25
Change to management activities warranted	4		21

Table 2. Summary of Findings for each Monitoring Question

Monitoring Question	Last Year Updated	Consistency with Forest Plan Intent[1]	Change or Update?	Type of Change or Update Recommended[2]
Is water quality being protected by application of appropriate best management practices (BMPs) during project implementation?	2020	Yes	No	N/A
Are watershed improvements conducted on at least 20 acres per year?	2020	Yes	No	N/A
Is the road system being managed to protect water quality where possible?	2020	Yes	No	N/A
Are livestock impacts on water quality being reduced?	2020	Yes	Yes	Update Range NEPA[3] Analysis
Are management actions improving and/or maintaining aquatic communities and habitat?	2020	Yes	No	N/A
Are range allotments managed to standard and what is their progress toward desired condition?	2020	Yes	Yes	Update Range NEPA Analysis
Are Forest Plan objectives being met to reduce or eliminate occurrences of non-native, invasive plant species (NNIS)?	2020	Yes	No	N/A
Do population trends for focal species suggest a need to change forest management or monitoring plans?	2020	Yes	No	N/A
Are management actions improving and/or maintaining habitat for focal species?	2020	Yes	No	N/A
Are forest management actions contributing to declines or recovery of populations of listed species?	2020	Yes	No	N/A
Are developed and dispersed recreation opportunities being managed and maintained to national quality standards?	2020	Yes	No	N/A
Are Wild and Scenic Rivers being managed for free-flowing, outstandingly remarkable values, and water quality?	2020	Yes	No	N/A
Is scenery being considered at the project level for areas of high scenic integrity and for scenic byways?	2020	Yes	No	N/A
Are wilderness character indicators (trends) improving or diminishing over time within designated wilderness areas?	2020	Yes	No	N/A

Table 2. Summary of Findings for each Monitoring Question Continued

Monitoring Question	Last Year Updated	Consistency with Forest Plan Intent[1]	Change or Update?	Type of Change or Update Recommended[2]
How has climate variability changed and how is it projected to change across the region?	2020	N/A	Yes	Add Relevant Elements to Future Forest Plans
How is climate variability and change influencing ecological conditions on the OSFNF?	2020	N/A	Yes	Add Relevant Elements to Future Forest Plans
What effect do management units in the region have on a changing climate?	2020	N/A	Yes	Add Relevant Elements to Future Forest Plans
At a landscape-level, is composition of major forest communities within desirable ranges of variability?	2020	Uncertain	Yes	Increase management activities Confirm Objectives in Future Forest Plans
Are treatment activities such as regeneration cutting, thinning, and prescribed fire being utilized to increase forest diversity and community safety?	2020	Uncertain	Yes	Increase management activities Confirm Objectives in Future Forest Plans
Are rare communities being maintained at desired composition, structure, and function and managed to provide for the species associated with each community type?	2020	Yes	No	N/A
Have management practices maintained or improved soil productivity?	2020	Yes	No	N/A
Is timber production meeting sustainable levels?	2020	Yes	Uncertain	Recalibrate Sustainable Levels in Future Forest Plans
What changes are occurring in the social, cultural, and economic conditions in the area?	2020	Yes	No	N/A
Is timber harvest enough to continue to support the social and economic needs of the surrounding communities?	2020	Yes	Uncertain	Recalibrate Sustainable Levels in Future Forest Plans
Are Forest Plan objectives being met for conservation education, heritage, facilities, lands, minerals, special uses, law enforcement, and safety?	2020	Yes	No	N/A

[1]Do results demonstrate progress toward achievement of the plan components associated with this monitoring item?

[2]Refer to Part III Topics discussions for more details regarding any specific recommendations for change.

[3]National Environmental Policy Act

Table 3. Past Monitoring Recommendations Status

Monitoring Items	Year of Recommendation	Previous Observation and Current Status
Watershed Conditions • Livestock Fencing	2020 2023	A potential need for change in the monitoring of livestock fencing was identified in 2020. In this monitoring cycle, this need remained a concern. A complete inventory of livestock fencing, its condition, and opportunities to complete new fencing installation should be completed. This is an item that would be addressed during an update to the environmental analysis (NEPA) for the allotments on the OSFNF which is recommended by this report.
Focal Species • Bobwhite Quail • Wild Turkey	2016 2020	Concerns for bobwhite quail and wild turkey were highlighted in the 2016 and the 2020 Monitoring Report. Treatments to increase the amount of open woodland and early seral habitat which would benefit both bobwhite quail and wild turkey continue to be completed. The acres required in the Forest Plan for the implementation of other vegetation restoration efforts is high enough to ensure the objectives for bobwhite quail and wild turkey are met so no additional concerns were identified for these species in this monitoring cycle.
Focal Species • Small-Mouth Bass	2016 2020	Concerns for small-mouth bass were highlighted in the 2016 and the 2020 Monitoring Report. The need to monitor stream temperatures in order to protect small-mouth bass populations is still uncertain as no effects on populations have yet been identified. So, rather than tracking temperatures in relation to small-mouth bass specifically, this may be better as one of the potential monitoring elements tracked under climate change which this report recommends.
Climate Change	2020 2023	There are no monitoring objectives in the current Forest Plan to monitor the effects of climate change on the Forests. However, the 2020 and 2023 Monitoring Reports considered climate change in compliance with NFMA. The monitoring questions chosen here are not set and may still be adjusted up to the point that future forest plans are able to set this topic as a permanent part of the monitoring program.

Table 3. Past Monitoring Recommendations Status Continued

Monitoring Items	Year of Recommendation	Previous Observation and Current Status
Desired Conditions • Distribution • Treatment Objectives	2016 2020 2023	The 2016 and 2020 Monitoring Reports found the distribution of age classes across the major forest communities is skewed heavily to older age classes. This continues to be true in this monitoring cycle. In 2020 it was further identified that treatment objectives identified in the monitoring program were not being met. That trend has also continued in this report. The need to increase regeneration cutting, thinning, and burning treatments to Forest Plan objective levels remains.
Productivity • Timber Sustainability • Timber	2020 2023	In 2020 the fact that sales and treatments remained below the Forest Plan objectives brought up the question of whether the objectives set by the Forest Plan are still accurate, achievable, or ecologically and economically sustainable. This question is still relevant due to the results of this monitoring cycle. Likely a recalibration of these numbers won't be completed until the next iteration of the Forest Plan.

Table 4. Recommended Questions for Addition to Monitoring Program

Monitoring Item	Recommended Change	Status
Climate Change	There are no monitoring objectives in the current Forest Plan to monitor the effects of climate change on the Forests. Future Forest Plans should include this topic in the monitoring program.	The status of this need was already covered in Table 3.

Forest Supervisor's Certification

This report documents the results of monitoring activities that occurred through Fiscal Year 2022 on the Ozark-St. Francis National Forests. Monitoring on some topics is long-term and evaluation of those data will occur later in time.

I have evaluated the monitoring and evaluation results presented in this report. I have examined any recommended changes to the 2005 Revised Land and Resource Management Plan, as amended at this time. Based on these results and my evaluation, I consider the 2005 Revised Land and Resource Management Plan sufficient to continue to guide land and resource management of the Ozark-St. Francis National Forests.

Dan Olsen
Acting Forest Supervisor

Date: 11/16/2023

Part III – Topics

Status of Select Watershed Conditions

Summary

Streams and rivers on the Ozark-St. Francis National Forests (OSFNF) provide for aquatic habitat, riparian dependent species, and for recreation, municipal, commercial, and agricultural uses. Many streams and river systems within north and central Arkansas originate within National Forest boundaries. These streams supply water to the five major rivers – White, Buffalo, Little Red, Illinois, and Arkansas. Potential sources of negative effects on water quality come from recreation, road construction, timber harvesting, agriculture, urban development, and natural disturbances.

The goal of monitoring is to determine if watersheds are being maintained (and where necessary restored) to provide resilient and stable conditions to support the quality and quantity of water necessary to protect ecological functions and support intended beneficial uses. These results will help determine what effect (if any) management actions are having on watershed conditions. Due to the potential effects of the road system on water quality, that is discussed here.

Monitoring Questions

Is water quality being protected by application of appropriate best management practices (BMPs) during project implementation?

Are watershed improvements conducted on at least 20 acres per year?

Is the road system being managed to protect water quality where possible?

Are livestock impacts on water quality being reduced?

Key Results

- Monitoring shows that overall application of BMPs for evaluated activities results in the protection of watershed conditions. Occasional small sediment releases do occur despite best efforts. This is represented by the occasional Fair or Poor rating. In particular, the trends observed in this monitoring period reflect an increase in sediment near fire lines. It should be noted that hundreds of feet of fire line are observed. However, if only one location shows signs of sediment reaching a water body, the entire review may be rated as Poor.

Table 5. Percent Rating for BMP Compliance

Year	# Excellent	# Good	# Fair	# Poor
2020	75%	0	0	25%
2021	86%	14%	0	0
2022	43%	14%	14%	29%

- The number of acres of watershed improvements continues to far exceed the 20-acre objective. A significant portion of these acres involves the trapping and removal of feral hogs which greatly reduces damage to watershed resources. In addition, gates have been installed to reduce vehicle traffic on closed roads thus reducing sediment.

Table 6. Acres of Watershed Improvements

Year	Acres Accomplished
2020	2,053
2021	879
2022	5,753

- Roads are one of the highest manmade contributors of sediment to streams on national forest. Therefore, the OSFNF's objective is to maintain a transportation system that allows for forest management and access to the public while still closing and decommissioning roads where appropriate.

- With increasing maintenance costs, very little funding is available for road decommissioning and only one mile of road decommissioning was completed this reporting period. Less road improvements have been completed recently as well. In addition to budget constraints, it is unclear if the COVID pandemic also impacted these elements, therefore it won't be evident if there is a trend until the next monitoring period.

- Likewise, road maintenance is very budget driven. Reduced road maintenance budgets over recent years have caused road maintenance managers to put more emphasis on maintaining higher-level roads and reduce maintenance on lower-level, less-traveled roads. These lower-level roads have been closed where appropriate to reduce sediment.

- Over the reporting period, the amount of open road has decreased, while the amount of open road maintained to standard has remained steady. This has resulted in a higher percentage of the OSFNF's open road miles being maintained.

Table 7. Miles of Road Maintenance and Improvements

Open Roads Receiving Maintenance		Open Roads Receiving Improvements	
FY 2019	**FY 2022**	**FY 2019**	**FY 2022**
575	571	30	8.6

- The range program has identified a need to update the environmental analysis for the OSFNF's allotments (this will be addressed further in the next section). This analysis will give managers the opportunity to inventory the current livestock fencing and better identify opportunities to either build or repair fence. Progress on this element should be reflected in the next report.

Recommended Changes

See the change recommended in the next section.

Status of Select Ecological Conditions

Summary

This section includes ecological indicators or monitoring elements that haven't been covered elsewhere in this monitoring report. This includes the results of stream condition surveys and allotment inspections. Stream condition surveys are taken periodically to measure aquatic habitat conditions. Forest Plan objectives include increasing pool habitat by placing large woody debris in-stream and improving aquatic organism passage. Monitoring is also done to evaluate both lake and stream fish communities. In addition, the Forest Plan also has set objectives for range management and treatment of non-native invasive plant species (NNIS) which will be discussed here.

Monitoring Questions

Are management actions improving and/or maintaining aquatic communities and habitat?

Are range allotments managed to standard and what is their progress toward desired condition?

Are Forest Plan objectives being met to reduce or eliminate occurrences of non-native, invasive plant species (NNIS)?

Key Results

- Stream condition surveys were conducted during this monitoring period. Twenty reaches were sampled for the presence of pool habitat and large woody debris (LWD) and for the stability of riffle habitat.

- The results show the sampled reaches contained 35-60% pool habitat which meets the Forest Plan objective. In addition, 50-150 of smaller pieces of LWD was present in all streams and larger pieces of LWD were present in 14 out of 20 of the surveyed streams. This amount of LWD is somewhat short of Forest Plan objectives thus supporting continued effort to increase the amount of LWD added to streams during project implementation.

- Riffle Stability Indices (RSI) were determined for the 20 reaches sampled. Based on the stability index referenced in Kappesser (2002)[1] a reach with an RSI value above 70 has a higher percent of mobile particles indicating increased sediment. Of the 20 sites surveyed, RSI values slightly over 70 were found at 3 of the sample reaches.

- Fish community composition and macroinvertebrates were also collected. These samples will be analyzed to determine the biological integrity of the sites (a comparison of the types and numbers of fish or other aquatic life observed to what is expected in a natural condition).

[1] Kappesser, G.B. (2002). A RIFFLE STABILITY INDEX TO EVALUATE SEDIMENT LOADING TO STREAMS. JAWRA Journal of the American Water Resources Association, 38(4): 1069-1081. https://doi.org/10.1111/j.1752-1688.2002.tb05547.x

- The Forest Plan calls for improvement of six stream crossings per year. However, due to the high complexity and cost of these improvements, the OSFNF continues at a pace closer to one crossing per year. In one project of note, emergency action was taken to remove a damaged concrete slab over the Mulberry River restoring fish passage to 50 miles of upstream fish habitat.

- All active allotments have been fully managed to standard from 2020 to 2022. All allotments, with few exceptions, have either stable to improving ecological conditions and are either at, or moving toward, desired conditions. Any ecological problems that arise are usually temporary and relatively minor and can usually be solved by adjustments in number of livestock, changes in class of livestock, modifications to the season of use, or adjustments to distribution patterns.

- Well over 200 acres per year have been consistently treated for reduction or elimination of non-native, invasive plant species. far exceeding the 200-acre Forest Plan objective.

Table 8. Acres of NNIS Treatment

Year	Acres Accomplished
2020	3,001
2021	2,986
2022	1,257

Recommended Changes

1. There is a need to update the environmental analysis under NEPA for the range program on at least three of the districts on the OSFNF. New analysis would allow the program to integrate adaptive management into permit compliance. Adaptive management would give the districts opportunity to take prompt, needs-based actions when unforeseen issues arise with allotment conditions.

Status of Focal Species

Summary

The results of this section will identify any notable changes in status or trends in either the habitat or population of the focal species listed below. These species represent various habitat types or focus areas managed by the OSFNF. Changes in population trends serve as early warning signs that management may need to make extra effort to support these populations or their associated niches. In addition, the status of fish and game species is evaluated.

Monitoring Questions

Do population trends for focal species suggest a need to change forest management or monitoring plans?

Are management actions improving and/or maintaining habitat for focal species?

Key Results

Table 9. Focal Species Trend Data Based on R8 Bird Counts

Species	30-year Trend	3-year trend	Ecosystem
Acadian Flycatcher	Increasing	Stable	Mature Mesic Hardwood
Scarlet Tanager	Stable	Declining	Mature Dry-Mesic Oak
Ovenbird	Declining	Stable	Dry-Mesic Oak
Northern Parula	Increasing	Increasing	Riparian Forests
Redheaded Woodpecker	Increasing	Increasing	Oak Woodland
Brown-headed Nuthatch	Stable	Stable	Pine Woodland
Cerulean Warbler	Stable	Increasing	Mature Oak – Complex Canopy
Pileated Woodpecker	Declining	Increasing	Snags
Yellow-Breasted Chat	Increasing	Stable	Regenerating Forests
Prairie Warbler	Declining	Increasing	Grasslands and Regenerating Forests
Northern Bobwhite	Declining	Stable	Pine/Oak Woodland and Grasslands

- Ovenbirds are declining across their range but are relatively stable on the OSFNF. Pileated woodpeckers have declined very modestly over time across their range but are abundant on the OSFNF and have increased during the current monitoring period.

- Prairie warbler and northern bobwhite quail declines had indicated that more work is needed to promote stable grassland and oak savannah habitat. Many of the woodland restoration areas have been successful, but areas with more open canopies are needed for these species. The numbers of these species have improved in areas where canopies have been opened significantly.

- In the R8 Bird dataset, there were very few quail observations (0-4 birds per year at 238 monitoring points) during the monitoring period, indicating that the widespread decline of the species across the OSFNF has not been substantially reversed. This trend is comparable to breeding bird survey data state-wide. At the same time, there is data available indicating that glade restoration efforts on the Sylamore Ranger District have had positive effects on quail populations as seen in the Sylamore Quail Focal Area. This large, restored landscape serves as an example for future quail habitat projects both on and off National Forest.

- Sylamore Wildlife Management Area (WMA) and Ozark National Forest WMA were the top two public hunting areas for turkey harvest in 2021 and Mount Magazine WMA, White Rock WMA, and Piney Creeks WMA were all in the top 10 areas for turkey harvest. In the larger WMAs a significant increase in the average harvest was seen by as much as 45% since 2019. However, while poults per hen for the Ozarks has increased, it remains well below target levels. Whether this increased harvest can be sustained and if it is a sign of overall population increase will hopefully be more apparent during the next monitoring cycle.

- White-tailed deer harvest on the OSFNF has been stable to slightly increasing over the past decade and that trend continued over this monitoring period. Arkansas Game & Fish Commission and University of Georgia are conducting a multi-year study on the population effects of chronic wasting disease on deer populations in the Ozarks. Although most of the project is off National Forest, it is expected to provide important insights into the effects of the disease for populations across the ecoregion.

- OSFNF has partnered with Arkansas Game & Fish Commission (AGFC) to complete lake fisheries monitoring. Spring and Cove Lakes have continued issues with slow growth of largemouth bass due to low lake productivity and high bass populations. The lakes have been treated with fertilizing nutrients to compensate. In contrast, Shores Lake has quality fish size distribution despite recovering from multiple drawdown events. Bear Creek Lake on the St. Francis has an invasion of alligator weed, a non-native and invasive aquatic plant that could reduce recreational opportunities and impact fisheries if not treated. Additionally, AGFC is conducting a study to determine detailed ranges of Arkansas' distinct populations of smallmouth bass and assign conservation priorities to those stocks throughout the state.

Recommended Changes

None identified.

Status of Listed Species

Summary

Conditions required to contribute to species recovery are monitored to measure management specific effects to federally listed threatened and endangered species, and of selected sensitive and locally rare species. It is important to identify species with notable changes in status or trends for both habitat and population. The desired condition is populations of threatened, endangered, or sensitive species above the levels necessary for long-term viability and available habitat to maintain and support the recovery of these species.

Monitoring Questions

Are forest management actions contributing to declines or recovery of populations of listed species?

Key Results

- There are four Endangered Species Act (ESA) listed bats on the OSFNF, including gray bats, Indiana bats, Ozark big-eared bats, and Northern long-eared bats. In March of 2022, US Fish and Wildlife Service proposed to uplist the Northern long-eared bat from threatened to endangered. Tricolored bats have been proposed for listing as endangered.

- Winter counts during the monitoring period indicated positive trends in gray bat population in the two major hibernacula on the OSFNF. Ozark big-eared bat surveys resulted in discovery of an important hibernacula resulting in a much higher population estimate on the OSFNF than previously known, and the trend for the species is likely stable.

- Female Indiana bats were radio tracked to a maternity colony on the Big Piney Ranger District. Summer maternity use of the species had not previously been recorded on the OSFNF. The colony was active during 2021 and 2022. Numbers from winter counts appeared stable.

- White-nose syndrome (WNS) continues to cause declines in little brown bats, tricolored bats, and northern long-eared bats across their range. Northern long-eared bats, which were abundant across the Forest prior to the arrival of WNS in the region, were detected by acoustic recorders at only two locations during the sampling period, one in 2020 and one in 2021.

- The Forest Service has responded to the threats for bats by closing caves to reduce the risk of human-caused spread of white-nose syndrome, gating important Indiana bat and gray bat hibernacula, and improving forest foraging and roosting habitat in the Indiana bat conservation zones.

- Additionally, an amendment to the Forest Plan updating the bat conservation measures applied during project work was completed in March of 2021.

- An occupancy survey of known and potential habitats of Boston Mountain crayfish (Cambarus causeyii) conducted in spring of 2019 and 2020 found the species at 9 of 51 sites surveyed. Because of the low detectability, trend data for the species is unreliable, but occupancy was detected at a number of sites that the species had not been detected at in previous surveys. The author felt that protective status was still warranted for the species.[2]

- No other category of federally listed threatened and endangered species, selected sensitive, or locally rare species exhibited remarkable change in distribution or abundance this monitoring cycle.

Recommended Changes

None identified.

[2] Quebedeaux, K. B., Taylor, C. A., Curtis, A. N., & Larson, E. R. (2023). A multi-method approach for assessing the distribution of a rare, burrowing North American crayfish species. PeerJ, 11, e14748.

Visitor Use, Satisfaction, and Progress on Recreation Objectives

Summary

Abundant opportunities exist for the public to use and enjoy the Ozark-St. Francis National Forests (OSFNF). Areas or facilities include developed recreation sites, wilderness areas, trails (motorized and non- motorized), and wild and scenic rivers. This section will discuss visitor use and satisfaction as well as track success on recreation objectives.

Monitoring Questions

Are developed and dispersed recreation opportunities being managed and maintained to national quality standards?

Are Wild and Scenic Rivers being managed for free-flowing, outstandingly remarkable values, and water quality?

Is scenery being considered at the project level for areas of high scenic integrity and for scenic byways?

Are wilderness character indicators (trends) improving or diminishing over time within designated wilderness areas?

Key Results

- All districts continue to complete annual inspections of developed sites, trails, and bridges. Developed and dispersed recreation areas are being managed to national and regional quality standards. Sixty-one percent of trails inspected met standards. Monitoring has shown a substantial and unprecedented increase in the use of off-highway vehicle (OHV) trails and rock-climbing activities.
- National Visitor Use Monitoring is completed every five years. Results show that visitor experience is typically high and/or moderate and rarely if ever low or very low. This shows that standards are being met, however, there is increased use on all sites and maintenance budgets continue to decrease. The overall goal is to be as fiscally sustainable as possible when prioritizing repairs.
- Great American Outdoors Act funding has allowed the OSFNF to significantly reduce the overall maintenance backlog and improve the condition of many developed recreation facilities with more projects planned for the future. Projects completed include White Rock Recreation Area roads, Alum Cove and Cove Lake Pavilion Roofs, Hwy 215 Interpretive KIOSKs, Blanchard Springs Trail, and North Sylamore Creek trail signs.
- Monitoring results show that Wild and Scenic Rivers (WSR) are being managed for free-flowing, outstandingly remarkable values and water quality. Projects completed that positively affect conditions include the bridge repair on Panther Creek and bridge replacement at Wolf Pen Creek. Completing Section 7 (WSR Act) analyses ensures projects do not adversely affect the rivers' characteristics for which they were designated.

- When accomplishing management activities along scenic byways and in areas of high scenic quality, projects incorporate scenery considerations through design criteria included in the NEPA analysis process. Overlooks and public viewing points are being maintained by districts with attention to view-shed quality and visual interpretation. Many of the scenic byways and scenic overlooks are maintained through partnership with Arkansas Department of Transportation.

- Wilderness Character Monitoring is now the primary means used to measure wilderness conditions. There are five qualities described in the Wilderness Act that are used to measure wilderness character. These are Untrammeled, Natural, Undeveloped, Solitude or Primitive and Unconfined Recreation, and Other Features of Value. The scores in the chart below represent the status of the OSFNF wilderness areas with 60 points being a passing score.

Table 10. Wilderness Character Scores

Wilderness Area	2020	2021	2022
East Fork	56	60	62
Hurricane Creek	58	62	64
Leatherwood	50	54	56
Richland Creek	50	54	56
Upper Buffalo	60	62	64

- To obtain these scores the five qualities of character are further broken down into 13 elements including items such as air quality and trail conditions. Of note, the OSFNF has a top score for air quality throughout all wilderness areas. Lower scores for trail conditions in Leatherwood and Richland Creek reflect the effects from user created horse trails and a lack of designated trails. The scores from 2021 will serve as a wilderness character baseline which will be utilized in future monitoring cycles.

Recommended Changes

None identified.

Climate Change

Summary

Forest lands are experiencing increased threats from fire, insect and non-native plant invasions, disease, extreme weather, and drought. Scientists project increases in temperature and changes in rainfall patterns that can make these threats occur more often, with more intensity, and/or for longer durations. Some of the areas that may require extra attention in monitoring include temperature, precipitation, forest health, non-native invasive species, and fire management as well as the effects on climate from carbon sequestration.

The latest climate change assessment for the Ozark-St. Francis National Forests (OSFNF) can be found in the Broad- Scale Climate Change Monitoring Evaluation Report for the Southern Region which can be accessed at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd786360.pdf. Specifics from that assessment were included in the last monitoring report, so this cycle only includes the repetition of that information and any updates in the current climate change monitoring program.

Monitoring Questions

How has climate variability changed and how is it projected to change across the region?

How is climate variability and change influencing ecological conditions on the OSFNF?

What effect do management units in the region have on a changing climate?

Key Results

- In the short-term, the regional report found no need for change in individual National Forests' plan direction, management activities, or monitoring arising from this evaluation. However, there is a potential for the following elements to become a concern.
- Projections suggest that future warming is expected, resulting in 25 to 70 more days above 90 degrees Fahrenheit and 11 to 32 fewer freezing days per year. Change in precipitation is less of a concern for the Southern Region as a significant decrease in precipitation is not expected.
- Amphibians such as salamanders may be most at risk, due to dependencies on moisture and cool temperatures that could be altered. The Ozark hellbender is one such amphibian seeing a rapid decline in population and may be particularly affected. Greater ambient temperatures may also be harmful to mammals such as the endangered Indiana bat.
- It will be increasingly important to emphasize conservation of riparian habitats as well as high elevation areas in order to provide refugia for species adjusting to changing climate conditions. Restoration activities should be planned to maintain and improve habitat connectivity in those areas that may become increasingly important as habitat islands.

- Projected increase in temperatures can allow invasive pests and plants to increase their spread. Invasive and aggressive plant and insect species may increasingly outcompete or negatively affect native species in the future. Winter freezes currently limit many forest pests, but higher temperatures will likely allow these species to increase. Destructive insects may be better able to take advantage of forests due to factors such as increased drought. Certain invasive plant species may increase dramatically as they are able to tolerate a wide range of harsh conditions, allowing them to rapidly move into new areas.
- Increased water temperature due to warming climate can potentially lead to an increase in toxic algal blooms in lakes as well as negatively affect cool-water stream communities.
- Extended periods of extreme high temperature and drought may lead to drier forest fuels which will burn more easily and contribute to larger and more frequent wildfires.
- Finally, forest management can play a key role in carbon sequestration. Recent declines in timber harvesting have slowed the rate of carbon accumulation in the product sector.

- The Forest Service recently updated its climate change monitoring program replacing the annual climate change scorecard for each National Forest with the climate action tracker (CAT). By the next monitoring report there will be completed CATs to refer to in this section. In addition, each National Forest has a climate change white paper with programmatic information specific to them. This white paper will be updated in 2023 and that information will also be included in the next monitoring report. Additionally, Council of Environmental Quality (CEQ) guidelines for analyzing project effects on greenhouse gases was recently updated and that will also be evaluated in the next round of monitoring results.

Recommended Changes

1. The current Forest Plan did not include monitoring elements for climate change. The monitoring questions included here have been developed to meet the National Forest Management Act (NFMA) requirement. Future Forest Plan revisions need to consider short and long term climate change effects to forest ecosystems and the need to manage tree densities through practices such as thinning and prescribed fire to maximize carbon sequestration and reduce the vulnerability of forest stands to water stress, insect and disease outbreaks, and fire.

Progress Toward Meeting Desired Conditions and Objectives

Summary

A key indicator of desired condition in the Forest Plan is the abundance and distribution of the various forest types. Several management objectives are tied to percentage of each type, age class distribution within type, and treatment acres for each. Monitoring allows managers to identify forest types that are under-represented across the landscape and areas where the pace and scale of treatment does not meet the desired goals. Consideration of traditional silvicultural treatments including prescribed fire will be included here. Application of prescribed fire in the Wildland Urban Interface (WUI) will also be discussed here as it is not covered elsewhere in the report.

Monitoring Questions

At a landscape-level, is composition of major forest communities within desirable ranges of variability?

Are treatment activities such as regeneration cutting, thinning, and prescribed fire being utilized to increase forest diversity and community safety?

Are rare communities being maintained at desired composition, structure, and function and managed to provide for the species associated with each community type?

Key Results

- Data continues to show an imbalance in age-class distribution with trends skewed heavily towards the older age classes. The majority of acres monitored and treated are in the management areas 3.A-3.E. The distribution in those areas is summarized in the following table.

Table 11. Distribution of Age Classes in Select Management Areas^

Management Area	Age Class					Total Acres
	1-10	11-40	41-70	71-100	>100	
3.A Pine Woodland	538	19,192	18,543	25,154	32,435	95,862
3.B Oak Woodland	866	8,406	13,875	53,738	75,783	152,668
3.C Mixed Forest	2,216	32,072	46,045	104,909	165,095	350,337
3.D Oak Decline Areas	6	4,350	5,824	21,232	35,987	67,399
3.E High Quality Forest	1,237	21,259	24,435	64,050	102,814	213,795
Total =	4,863 (0.6%)	85,279 (9.7%)	108,722 (12.4%)	269,083 (30.6%)	412,114 (46.8%)	880,061
Forest Plan Objectives	3.8-6.8%	20-30%	25-30%	20-30%	20%	

^Number of acres in each age class (age range in years) as of 2022

- Forest Plan objectives commit to restoring and maintaining acres at an approximate pace of 20,000 acres per decade for both oak woodland and pine woodland. However, according to the following table approximately 5,000-9,000 acres has been treated over the last decade in each of these community types. However, these communities do occur in other management areas being treated as well.

Table 12. Acres Treated^ in Select Management Areas

Management Area	2019*	2022**	Total acres treated over last decade (2013-2022)
3.A Pine Woodland	2,159	3,241	8,524
3.B Oak Woodland	2,524	783	5,864
3.C Mixed Forest	8,697	5,283	31,545
3.D Oak Decline Areas	1,662	603	3,994
3.E High Quality Forest	4,094	4,341	12,918
3.I Riparian Corridor	12	10	137
Total =	19,148	14,261	62,982
Forest Plan Objective			150,000

*Three-year cumulative acres 2017-2019/ **Three-year cumulative acres 2020-2022
^Acres are a combination of thinning and regeneration cuts.

- Though the OSFNF has made progress increasing open canopy, early seral stage conditions are lacking within most management areas and more can be done to increase the number of acres in a regenerating condition. More regeneration and thinning treatments are needed in order to develop more early seral stage habitat, helping to create more age diversity on the landscape along with more open habitat.

- When comparing current period treatment acres versus treatment acres across management areas reported on the previous monitoring report, the data will show a decrease in acres. Impacts from the COVID pandemic may have had the greatest effect on the results, specifically with increases in fuel prices and decreases in labor participation.

- Prescribed burning is also being successfully used as a tool where appropriate to meet Forest Plan goals. However, the OSFNF has faced numerous challenges since the last report with the prescribed burn program. Some of the major challenges have been extreme rainfall amounts, COVID19, lack or resources available and furloughs. Support personnel (militia) are starting to retire and/or deciding not to participate in prescribed burning anymore. Still, the districts are taking advantage of the burn windows that are open to them.

Table 13. Acres Burned in Select Management Areas

Management Area	Three-year cumulative acres (2020-2022)	Forest Plan Objectives
3.A Pine Woodland	24,240	
3.B Oak Woodland	37,285	
3.C Mixed Forest	48,351	

Table 13. Acres burned in Select Management Areas Continued

Management Area	Three-year cumulative acres (2020-2022)	Forest Plan Objectives
3.D Oak Decline Areas	6,856	
3.E High Quality Forest	17,393	
3.I Riparian Corridor	1,657	
All MAs	186,952	360,000
During Growing Season	1,222 (0.7%)	30%
WUI	167,705 (90%)	150,000-300,000

- One element that is showing great success is the amount of fuels treatments that have been done to protect the wildland urban interface (WUI) and therefore local communities adjacent to the OSFNF. Over 90% of the burns planned have been in these populated areas. The OSFNF will need to increase effort to maintain this while starting to move into areas farther out to impact fire condition class in less populated areas as well.
- Restoration treatments continue to be accomplished in rare communities where feasible, including the completion of 6,000 acres of glade restoration during this monitoring cycle using a combination of manual and mechanical treatments and prescribed burning, 265 acres of canebrake restoration, and 6,237 acres of native grassland maintenance.
- The application of special initiative funding from projects such as the Ozark Highland Collaborative Restoration Project and the many Joint Chiefs' projects has accelerated this restoration along with strong partnerships such as the Sylamore Ranger District's work with The Nature Conservancy (TNC) on glade management.
- There was not enough information covering the bottomland and floodplain forest communities on the St. Francis unit to recognize any trends. No active management has occurred in these areas recently; therefore, management activities would not be the driver of conditions. An analysis was recently completed for the St. Francis unit describing management activities expected to occur in the future. Those activities will be monitored once implementation begins.

Recommended Changes

1. The OSFNF continue to provide quality habitat for a diverse set of ecological communities. However, it remains a challenge to maintain a diversity of age classes. Stands aged 71-100 years continue to cross over into the >100 range with little progress recruiting into the 0-10 year age class which is necessary to repopulate the 11-40 and 41-70 ranges. As the forest continues to age, it becomes increasingly vulnerable to a natural event creating large scale die-off. Prioritizing treatments to alleviate this concern will need to be the focus of future projects.
2. Similarly, efforts to return fire to the landscape have also fallen short of Forest Plan goals. However, programs are recovering momentum after the initial consequences of the COVID pandemic, and fire managers have already been able to increase the pace and scale of burning in 2023. That said, it is more difficult to increase burn acres, with many constraints to burn windows such as weather, personnel, legal requirements, etc. and therefore there may be little management can do to ensure targets are consistently reached.
3. For both mechanical treatments and prescribed burning, the OSFNF is achieving around 50% of its treatment goals. During the next Forest Plan revision, it will be important to consider if the objectives set by the Forest Plan reflect an accurate, realistic representation of the appropriate number of acres that can be implemented successfully.

Effects of Management Systems on Productivity

Summary

Management activities can have a negative effect on the productivity of forests. The National Forest Management Act requires forest managers to, “Conserve soil and water resources and not allow significant or permanent impairment of the productivity of the land.” It is important to monitor for any signs of degradation for habitat and watershed conditions. Silviculture practices should be mindful of maintaining site productivity and timber production should be based on sustainable levels. Watershed conditions were covered in an earlier section of this monitoring report, so the focus in this section will be on soil and timber productivity.

Monitoring Questions

Have management practices maintained or improved soil productivity?

Is timber production meeting sustainable levels?

Key Results

- The soil resources on the OSFNF have been maintained by adherence to Best Management Practices (BMP) and Forest Plan standards. Of the 22 BMP Reviews conducted during this reporting period, 8 were conducted on timber sales which is where soil exposure is most likely. These reviews evaluate streamside management zones, soil exposure, and rutting. Of the 8 timber sales reviewed, none exceeded the 85 percent threshold for exposed soils. Short segments of light rutting were occasionally observed.

- During this monitoring period, the OSFNF achieved 85% or greater of the yearly timber volume sold target, assigned by the Regional Office, with the exception of 2021 where approximately 71% of the target was accomplished. The effects of the COVID pandemic were greatest in 2021. Initial targets were revised lower during fiscal years 2020 and 2021, also due to the pandemic.

- The average volume sold annually over the last decade remains at 58 MMBF, which is approximately 80% of the Forest Plan target of 73.1 MMBF. The question of whether this amount both meets the demand of the local communities while also remaining ecologically sustainable has not been well studied. However, since this amount is well below the need to accomplish the restoration goals discussed in the previous section it is clear that managers should continue to progress towards reaching the Forest Plan target of 73.1 MMBF.

- The OSFNF continue to have success restoring landscapes to appropriate native species. This includes an active reforestation program where the OSFNF established approximately 5,000 acres of shortleaf pine, white oak, and red oak through artificial and natural regeneration during this reporting period.

- Survival and stocking percentages of those plantings yielded 61% or better success and are in line with historical averages, given the below average site indices across the landscape. Final stocking checks, which include the recruitment of naturally regenerated native species, are at or above the minimum stocking guidelines identified in the Forest Plan. In addition, managers implemented over 14,000 acres of vegetation improvement treatments on previously reforested areas.

Table 14. Reforestation Success Rates^

Survey Type	2020	2021	2022
1st Year Survival Percent	64%	77%	70%
3rd Year Stocking Percent	73%	91%	61%

^Combination of Red Oak, White Oak, and Shortleaf Pine

Recommended Changes

See the change recommended in the next section.

Social, Economic, and Cultural Sustainability

Summary

Socio-economic conditions for the Ozark-St. Francis National Forests and the Southern Region can be found in the Broad-Scale Socioeconomic Monitoring Evaluation Report for the Southern Region which can be accessed at https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd786359.pdf.

The Regional report highlights that National Forests can contribute to the economic base of local communities by providing a sustained yield of high-quality wood products at a level consistent with sound economic principles, local market demands, and desired ecological conditions. They can also promote area economic well-being by using resources to generate revenues for local counties and to provide direct or indirect employment opportunities.

The Forest Plan also lists as a priority, to manage timber, recreational, and scenic resources in a manner that enables local communities to capitalize on the potential of these resources to contribute to economic well-being.

Social, economic, and cultural factors will be included in this section as well as conservation education, heritage, facilities, lands, minerals, special uses, law enforcement, and safety which are other programs likely to have an effect on or be affected by social, economic, and cultural conditions.

Monitoring Questions

What changes are occurring in the social, cultural, and economic conditions in the area?

Is timber harvest enough to continue to support the social and economic needs of the surrounding communities?

Are Forest Plan objectives being met for conservation education, heritage, facilities, lands, minerals, special uses, law enforcement, and safety?

Key Results

- According to the Regional Report, growing populations and development may place greater demand on National Forest resources. Managers can expect to be tasked with maintaining the quality of visitors' experiences while providing forest products and cultural and recreational experiences to a greater number of people.

- This proved to be an accurate prediction during the height of COVID. The pandemic had an almost overwhelming effect on the OSFNF's ability to provide safe and well-maintained recreation facilities and experiences as well as other services. During that time National Forests also saw an unprecedented uptick in visitors so the number of customers that were not able to access services was even more apparent.

- Over the last three years the difficult task of accomplishing the Forest Service mission while not able to be present during various closures and reduction in engagement was very challenging for the OSFNF, its employees, and the public. However, much good work was still accomplished as is highlighted throughout this report.

- As mentioned in the previous section, timber sale volume remained steady. The OSFNF has been able to maintain production around 60 MMBF per year even when accounting for budget and personnel shortages. It is unclear if that amount matches the demand for timber in local communities. After a few years of being negatively impacted by the COVID pandemic, timber markets are showing some signs of strengthening. With this recovery it is too soon to know what the market will bear and if sales will continue to see no-bids.

- This year has seen renewed interest in prospective purchasers that have not bid on OSFNF timber sales in over a decade. In addition, proposed mill expansions are in discussions for the area. University of Arkansas at Monticello (UAM) has expanded with new forestry economic resources available to potentially help the OSFNF to improve productivity and sustainability monitoring as well as gauge impact on local communities.

- Very few conservation education programs were offered during this monitoring cycle. Due to COVID, the number dropped essentially to zero for many months. Typically, many of the OSFNF's departments offer educational programs. Now that programs are starting to be offered again, managers plan to consolidate the records for all of these separate program areas into one database to better track accomplishments. This consolidated approach will ensure future reports are more accurate.

- The OSFNF has consistently protected and managed heritage resources to standard over the reporting period also seeing some success in maintaining programs and partnerships. One socially-distanced cemetery workshop was hosted with the Arkansas Historic Preservation Program in 2021 and Historicorps projects have been completed at the historic Wedington Recreation Area. The OSFNF continued partnerships with the United Keetoowah Band, the Arkansas Archeological Survey, and the Arkansas Archeological Society and re-started an historic partnership with Arkansas Tech University. Additionally, the 2022 Bridging the Gap Meeting was able to successfully pivot to a virtual environment.

- Along with heritage surveys to support project work, additional non-project surveys to identify unknown heritage sites were completed with at least 200 acres annually. The heritage team focused these additional acres on landforms not normally surveyed during regular project surveys. Specifically focusing on bluff and rock shelters and Special Interest Areas (SIAs), this led to the identification of a site type not previously known about that has particular cultural sensitivity.

- The government-to-government programmatic agreement, which defines protocols with all local recognized tribes and organized groups of interested Native Americans, expired in FY2018. Work continues, consulting with tribal partners to develop a replacement.

- For the facilities program area, each building on the OSFNF is inspected every five years to document maintenance needs. Reduced funding has created a deferred maintenance backlog. Limited funds are focused first on health and safety needs of occupied buildings. Approximately 82% of facilities have a Facility Condition Rating (FCR) of poor due to the aging infrastructure and decreased funding for maintenance needs. Many buildings need renovations and upgrades.

- That being said, multiple HVAC upgrades/replacements have been completed across the OSFNF to replace lower efficiency units to those with a higher SEER rating. Also, the HVAC controls at the Koen building were recently upgraded to provide better online monitoring and programing. Lighting at the Sylamore district office was recently upgraded to LED for better energy efficiency. The parking lot at the Sylamore district office was recently upgraded to provide better access to the building. Finally, upgrades to water heaters across the OSFNF have been made as needed and more efficient models have been selected.

- The lands, minerals, and special uses programs are being managed to Forest Plan standards. Despite the slowdowns associated with COVID, 98 new special use authorizations were processed, 128 acres were acquired, and boundary survey continued.

Table 15. Survey Program Accomplishments

Activity	Total FY 2020 - 2022
Corner Monument Maintenance	399
Corner Monument Restoration	23
New Boundary Line Establishment	6 Miles
Boundary Line Maintenance	164 Miles

- Law enforcement reports that illegal OHV use and crimes associated with OHVs, such as impaired driving (both alcohol and drugs) seem to be increasing every year and that occupies a great deal of officer time, especially during the spring, summer, and fall months.

- The safety program was highly involved during this monitoring cycle keeping up with protocols for facility closures, masking, social distancing, etc.

Recommended Changes

1. The Forest Plan projected sustainable timber volume outputs based on various factors including site productivity, local demand for timber products, forest capacity, and ecological constraints. Unfortunately, the Forest Plan did not clearly articulate how timber yield was connected to site conditions or market conditions. This makes it difficult to adjust targets to changing circumstances. In future Forest Plan revisions, it will be important to better document the connection between annual sale quantity, ecological considerations, and local market conditions so that targets being determined by the agency can be adjusted to OSFNF specific criteria.

Part IV - Crosswalk of Plan Monitoring Indicators to Monitoring Questions

Monitoring Questions with Associated Elements and Objectives

As mentioned in Part I, the Forest Plan Monitoring Program includes about 200 unique indicators to be monitored. These are included in the plan as both monitoring elements and objectives. Select elements and objectives were highlighted in this report in response to the monitoring questions addressed. A summary of these is included below with the associated questions from each topic.

For a table with the complete list of monitoring program elements and objectives, including those not covered in this monitoring cycle, refer to Appendix I of the Forest Plan which can be found at https://www.fs.usda.gov/main/osfnf/landmanagement/planning.

Monitoring questions relating to climate change were included in this report as a NFMA requirement, but climate change monitoring elements were not included in the current Forest Plan and there are no elements or objectives for that topic to include in this crosswalk. Therefore, that topic will not be included in this Part.

Status of Select Watershed Conditions

Is water quality being protected by application of appropriate best management practices (BMPs) during project implementation?

- The level of BMP compliance as a percent of the number of projects investigated

Are watershed improvements conducted on at least 20 acres per year?

- OBJ19. Conduct watershed improvements on 20 acres per year

Is the road system being managed to protect water quality where possible?

- OBJ49. Decommission unnecessary roads
- OBJ53. Reduce miles of road under Forest Service maintenance

Are livestock impacts on water quality being reduced?

- OBJ20. Fence out livestock from riparian areas

Status of Select Ecological Conditions

Are management actions improving and/or maintaining aquatic communities and habitat?

- Conduct stream condition surveys
- OBJ21. Maintain or restore pool habitat in 30–70% of stream reaches
- OBJ22. Maintain or restore large woody debris (LWD) levels for pieces larger than 3.3 ft x 3.9 in at 75-200 pieces/mile
- OBJ23. Maintain or restore large woody debris (LWD) levels for pieces larger than 16.4 ft x 19.7 in at 8-20 pieces/mile
- Composition of stream fish communities based on an index of biotic integrity (IBI)
- Improve aquatic organism passage on an average of six stream crossings per year

Are range allotments managed to standard and what is their progress toward desired condition?

- Number of acres in allotments managed to standard

Are Forest Plan objectives being met to reduce or eliminate occurrences of non-native, invasive plant species (NNIS)?

- Treat at least 200 acres per year for reduction or elimination of NNIS

Status of Focal Species

Do population trends for focal species suggest a need to change forest management or monitoring plans?

- Habitat and population trends for focal species

Are management actions improving and/or maintaining habitat for focal species?

- OBJ10. Improve and maintain habitat for bobwhite quail
- OBJ11. Improve and maintain habitat for whitetail deer
- OBJ12. Improve and maintain habitat for eastern wild turkey

Status of Listed Species

Are forest management actions contributing to declines or recovery of populations of listed species?

- Habitat and (trends in) status of federally listed threatened and endangered species, and of selected sensitive and locally rare species

Visitor Use, Satisfaction, and Progress on Recreation Objectives

Are developed and dispersed recreation opportunities being managed and maintained to national quality standards?

- MAOBJ.7 Maintain all recreation facilities to standard
- Monitor and evaluate trends in visitor satisfaction
- MAOBJ.5 Reduce the recreation facilities maintenance backlog

Are Wild and Scenic Rivers being managed for free-flowing, outstandingly remarkable values, and water quality?

- Monitor and evaluate trends in outstandingly remarkable values

Is scenery being considered at the project level for areas of high scenic integrity and for scenic byways?

- Monitor and evaluate trends in meeting scenic integrity objectives along scenic byways
- Determine if projects adequately consider scenic integrity objectives

Are wilderness character indicators (trends) improving or diminishing over time within designated wilderness areas?

- Monitor and evaluate trends in visitor use and resource damage

Progress Toward Meeting Desired Conditions and Objectives

At a landscape-level, is composition of major forest communities within desirable ranges of variability?

- OBJ03. Across all community types, maintain more than 50% of forest and woodland in a mature condition and develop old growth conditions on approximately 20%
- OBJ06. Across all community types, maintain 3.8 – 6.8% of forest and woodland in regenerating forest conditions (0- 10 years old)
- Monitor and evaluate trends in 3.A Pine Woodland MA
- Abundance of pine woodland for all ages and each age class
- Monitor and evaluate trends in 3.B Oak Woodland MA
- Abundance of oak woodland for all ages and each age class

Are treatment activities such as regeneration cutting, thinning, and prescribed fire being utilized to increase forest diversity and community safety?

- OBJ02. Report annually total treatment acres by management area
- OBJ04. Restore and maintain 22,000 acres/decade (oak woodland)
- OBJ05. Restore 20,000 acres/decade (pine woodland)
- OBJ08. Reduce the risk of mortality by thinning and regenerating 150,000 acres/decade (all forest)
- Number of acres harvested within 3.C Mixed Forest Area
- Number of acres restored within 3.D Oak Decline Restoration Areas MA
- Number of acres harvested within 3.E High Quality Forest Products MA
- MAOBJ.13 Treat up to 300 acres per decade within 3.I Riparian Corridors MA
- OBJ61. Burn under prescribed conditions 120,000 acres/year (all forest)
- OBJ07. Burn one-third of this acreage within the growing season (April 1 through October 15)
- Proportion of burning in 3.A Pine Woodland MA
- Proportion of burning in 3.B Oak Woodland MA
- OBJ57. Annually complete 50,000 to 100,000 acres of hazardous fuel reduction in WUI

Are rare communities being maintained at desired composition, structure, and function and managed to provide for the species associated with each community type?

- Acreage of each rare community type at desired conditions

Effects of Management Systems on Productivity

Have management practices maintained or improved soil productivity?

- NFMA Requirement for soils - documentation of the measured prescriptions and effects, including significant changes in productivity of the land

Is timber production meeting sustainable levels?

- OBJ62. Provide 73.1 MMBF of timber volume sold annually (ecological sustainability)
- NFMA Requirement for timber - lands are adequately restocked

Social, Economic, and Cultural Sustainability

What changes are occurring in the social, cultural, and economic conditions in the area?

- No specific monitoring element exists in the Forest Plan for this question as it is an overarching theme and required monitoring report topic

Is timber harvest enough to continue to support the social and economic needs of the surrounding communities?

- OBJ62. Provide 73.1 MMBF of timber volume sold annually (economic sustainability)

Are Forest Plan objectives being met for conservation education, heritage, facilities, lands, minerals, special uses, law enforcement, and safety?

- Number and type of educational programs developed
- Number of heritage resources protected and managed to standard
- Participate in the leadership of the To Bridge a Gap Conference
- OBJ35. Evaluate historic sites for appropriate management
- OBJ36. Provide public involvement programs
- OBJ37. Develop partnerships in heritage resource stewardship
- OBJ38. Increase the heritage resource database by surveying non-project acreage
- OBJ39. Develop programmatic agreements with local recognized tribes and organized groups of interested Native Americans
- Evaluate trends in the maintenance backlog to determine progress toward the desired condition
- OBJ45. Upgrade all identified publicly accessible facilities to Architectural Barriers Act standards
- OBJ46. Complete energy efficiency upgrades on administrative buildings
- OBJ47. Inspect all buildings compliance with health and safety standards
- Annually report acres of land adjustment
- OBJ24. Maintain existing known corner monuments.
- OBJ25. Survey and restore lost/obliterated or found corner monuments
- OBJ26. Establish new boundary line
- OBJ27. Maintain existing boundary line
- Ensure permitted areas are sustained and used in harmony with other uses and resources
- Evaluate trends in unlawful or criminal behaviors including cumulative impacts to natural resources