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FY22-25 Monitoring Evaluation Report for the Uwharrie and Croatan National Forests



Forest Service

National Forests in North Carolina

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About Our Plan Monitoring Program

Purpose

Each National Forest has a Land Management Plan, commonly referred to as a forest plan. The forest plan provides strategic direction for the forest and guidance for project and activity-level decision making. The plan describes desired ecological, social, and economic conditions of the forest and provides constraints that focus management activities toward maintaining or achieving those conditions over time. Each forest plan also includes a plan monitoring program to evaluate whether the plan is being implemented properly, whether it is effective at guiding management toward long-term outcomes, or whether changes need to be made. The plan monitoring program includes the specific monitoring questions and associated indicators that are to be used for forest plan evaluations, feedback for adaptive responses, and reporting. Monitoring and evaluation are continuous learning tools that form the backbone of adaptive management.

This biennial monitoring evaluation report reviews the questions included in the forest plan monitoring program and aids the Forest Supervisor in determining whether a change is needed in forest plan direction. The biennial monitoring evaluation report is not a decision document—it evaluates monitoring questions and indicators presented in the plan monitoring program chapter of the forest plan, in relation to management actions carried out across the forest and conditions in the broader landscape.

This monitoring report addresses the plan monitoring programs of two separate Land Management Plans – one for the [Croatan National Forest](#), and one for the [Uwharrie National Forest](#). While they are separate national forests and are guided by separate forest plans, they are both administered by the National Forests in North Carolina, have multiple forest resources and conditions in common, and share some monitoring questions. The biennial monitoring evaluation report represents one part of the Forest Service’s overall monitoring program for the Croatan and Uwharrie National Forests.

Our monitoring plan covers these eight topics required under FSH 1909.12 in addition to social, economic, and cultural sustainability. You’ll find each of these topics addressed in this report.

1. The status of select watershed conditions.
2. The status of select ecological conditions, including key characteristics of terrestrial and aquatic ecosystems.
3. The status of focal species to assess the ecological conditions required under § 219.9.
4. The status of a select set of the ecological conditions required under § 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.
5. The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.
6. Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.
7. Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.
8. The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 U.S.C. 1604(g)(3)(C)). (36 CFR 219.12(a))

How the Croatan and Uwharrie Plan Monitoring Programs Work

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 Croatan and Uwharrie monitoring programs were updated in 2016 for consistency with the 2012 planning regulations [36 CFR 219.12 (c)(1)]. Each Plan was administratively changed to include the updated monitoring program (Uwharrie, Chapter 4 and Croatan, Chapter 5). For a copy of the current monitoring program, go to <https://www.fs.usda.gov/land/nfsnc/landmanagement>. Monitoring questions and indicators were selected to inform the management of resources on the plan area, and not every plan component was determined necessary to track [36 CFR 219.12(a)(2)]. See the Plan Monitoring Program at <https://www.fs.usda.gov/land/nfsnc/landmanagement> for discussion on how the monitoring questions were selected to be consistent with the 2012 planning regulations [36 CFR 219.12].

The monitoring evaluation implementation guide (monitoring guide) is part of the overall plan monitoring program and provides more specific direction for implementing selected indicators of the strategic plan monitoring program and details monitoring methods, protocols, and roles and responsibilities. The monitoring guide is not part of the plan decision and is subject to change as new science and methods emerge. The Croatan and Uwharrie monitoring guide documentation is in progress.

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 our plan 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 towards 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 questions.
- Incorporate broader scale monitoring information from the Regional Broader Scale Monitoring Strategy that is relevant to the understanding of the selected monitoring question.
- Present recommended change opportunities to the responsible official.

Monitoring Results Summary

The results of monitoring and evaluation of two national forest plans are presented in this report. The Uwharrie NF Forest Plan was approved in 2012. This plan is relatively current with existing agency policies and guidance for managing desired conditions throughout the plan area. The Croatan NF Forest Plan was approved in 2002.

This report covers the biennial FY22-23 and FY24-25 monitoring cycles. Two reporting periods were combined since the FY22-23 report was delayed, largely due to staff impacts from Hurricane Helene, which impacted staff capacity across the National Forests in North Carolina.

During this monitoring cycle, there are no recommendations to change forest plans. Current forest plans are guiding projects appropriately, such as longleaf pine restoration, use of prescribed fire, protection and maintenance of heritage asset sites, recreation settings, trail maintenance, and habitat for aquatic and terrestrial wildlife and plants, which includes threatened and endangered species.

During this monitoring cycle, the Croatan and Uwharrie management team designed and implemented a new approach for project planning-analysis-adaptation at the landscape scale. Landscape level analyses were used in the environmental assessments for the Lomax (Uwharrie) and the White House Forks (Croatan) projects. This new analytical approach is more efficient, effective and comprehensive, thus allowing for more field time.

Watershed restoration work was completed for Crow Creek (Uwharrie) along with restoration work in Mocosin Creek. As such, watershed conditions are gradually improving on the Uwharrie NF. Culvert replacements (Croatan) have been the focus of water quality efforts due to damage from Hurricane Florence. Completing the Holston Creek and Hunter's Creek (Croatan) watershed action plans is recommended.

Both forests are focused on longleaf pine restoration. About 14,000 acres are currently managed as longleaf pine and approximately half of the managed longleaf are in maintenance or partial restoration condition. The Lomax (Uwharrie) and White House Forks (Croatan) together will restore approximately 7,000 acres of longleaf pine, most of which are conversions from loblolly to longleaf pine.

Northern bobwhite is still in low abundance. However, the abundance of bobwhite on the forests should increase over time due to substantial longleaf pine restoration along with consistent prescribe fire programs. Other bird focal species appear to be stable. Monitoring activity should include R8 Breeding Bird surveys in the future.

Red Cockaded woodpecker populations are estimated to be stable. On the Croatan NF, there has been about 65 active clusters since 1997. This includes mitigating the loss of clusters from effects of Hurricane Florence by installing 35 cavity inserts. Monitoring activity has been affected by the Covid-19 pandemic and personnel changes and needs more attention to verify the occupancy of the clusters.

Of the 24 Botanical Special Interest Areas on the Uwharrie, about half were surveyed and found to be in good to excellent condition. The 17 Botanical Special Interest Areas are in good to excellent condition. Venus flytrap was added to the Regional Foresters Sensitive Species list.

Carolina Maritime Goldenrod was added to the Locally Rare species list. Mitigation of impacts to plant rare species from the Havelock Bypass is continuing by NCDOT.

The NUVM (Recreation Satisfaction) study was conducted during this monitoring cycle. Visits increased from 893,000 (2018) to 1,200,000 (2023). About three-fourths of the visitors are “very or somewhat satisfied” with their recreational experience. Nearly all “felt safe “ during their visit. Visitors were least satisfied with signage.

The deferred maintenance backlog for trails on the Uwharrie NF had declined during this monitoring cycle. Most of the 130 miles of system trails are maintained over a 2-3 year period. The Uwharrie National Recreation Trail is 75% complete, with 29 of the original 40 miles now on NFS lands. Croatan recreation sites: Flanners Beach (campground, day use, and beach), Fisher’s Landing, Pinecliff Recreation Area, and Siddie Fields, are under major repairs due to Hurricane Florence (2018).

Seventy-eight heritage sites on the Uwharrie were monitored. At least 13 sites need stabilization. Maintaining the integrity of heritage sites continues to be a challenge due to recreational use, unauthorized trails, rock hounding, gold panning and other activities. The Lewis-Thornburg Farm is the only listed NRHP listed site on Uwharrie NF and needs repair from storm damage in 2024.

Forty-eight heritage sites were monitored on the Croatan NF. A forest-wide cultural resource inventory is underway as a response to damage by Hurricane Florence. Preservation of high priority sites has been well maintained this monitoring period, with active stabilization plans ongoing for National Register of Historic Places (NRHP)-eligible sites along the Neuse River. The Camp Patterson Special Interest Area entered an interpretive planning phase beginning in FY24, with development of an interpretive trail ongoing through FY26.

Prescribed fire is on target for both the Croatan and Uwharrie but challenged in 2025 due to drought conditions. The Uwharrie National Forest averaged 4000-6000 acres per year in prescribed burn acres from 2022 to 2024. Croatan continued an annual average of more than 20,000 acres prescribed burned for FY’s 22-24. Recovery efforts are underway from a large wildfire on the Croatan in 2023.

Effects of climate change is likely to be more apparent on the Croatan NF. Sea level rise is monitored by multiple agencies. Potential mitigating efforts to offset the effects of climate change are located in the Project Record for the 2020 report. Examples include restoring longleaf as soon as possible, and to thin and prescribe burn to reduce tree densities from threats of drought, outbreaks of insect and disease and wildland fire.

Broad scale economic trends (Project Record, 2020 Southern Region Broad Scale Monitoring Report) show that the surrounding counties of the Croatan and Uwharrie NFs have indicator(s) values like regional averages. Indicators such as payments to counties, expenditures, unemployment rates, and populations below poverty level were similar to regional averages. Population change is somewhat lower than regional averages.

The Uwharrie Forest Plan management area geodatabase is being updated to reflect recent acquisitions and ensure all management areas can be located in one file location.

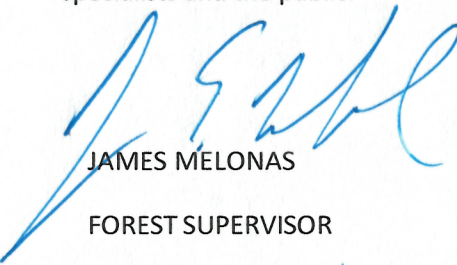
Forest Supervisor's Certification

I have evaluated the findings of this report, documenting the results of monitoring activities that occurred through Fiscal Year 2025 on the Uwharrie and the Croatan National Forests and associated management recommendations.

Monitoring on some topics is long-term and evaluation of those data will occur at a later date.

I have directed that the administrative changes recommended throughout the report be implemented. Changes to the monitoring and management activities should respond to these recommendations, unless new information or changed resource conditions warrant otherwise.

I consider both the 2012 Uwharrie Land Management Plan and 2002 Croatan Land Management Plan, as amended sufficient to continue to guide land and resource management for the near future. A few topics have been identified for deeper evaluation as to whether there is a need to change the plan in the future. Deeper evaluation for these topics is not immediately needed but should be considered when the forest undergoes a future plan assessment to inform a potential amendment or revision with input of resource specialists and the public.



JAMES MELONAS

FOREST SUPERVISOR

Date

6/29/26

Watershed conditions, including conditions of aquatic ecosystems and aquatic species

Summary

The intent of this monitoring category is to estimate water quality and condition of habitat for aquatic organisms by tracking overall watershed conditions using the Watershed Condition Framework.

Monitoring Questions and Indicators

Uwharrie

- Q1. What are the trends in conditions for hydrologic stability?
- Q2. What are the trends for instream and streamside habitat conditions for selected stream segments?

Croatan

- Q1. Are aquatic habitat and biota conditions of tidal and non-tidal streams progressing toward desired conditions?

Key Results

Data are stored in Box Drive: Monitoring and Evaluation/CroatanUwharrie MonitoringGuide /CU Analysis Folders/Category 1.

Uwharrie

Summary: Stream stabilization and aquatic habitat restoration occurred on the Uwharrie NF during the 2022-25 period, thus trends in stream condition improved.

Since the development of the Uwharrie Plan in 2012, stream rehabilitation activities have occurred in the Forest. Specifically, the Crow Creek – Uwharrie River 6th-level Watershed (HUC: 030401030502) became a forest priority watershed with a comprehensive Watershed Restoration Action Plan in 2018. Watershed improvement work occurred in this watershed until December of 2022 when the Watershed Restoration Action Plan was completed. Additionally, stream restoration also occurred in the Moccasin Creek drainage within the Outlet Uwharrie River Watershed (Hydrologic Unit Code 030401030505) in the Badin Lake Recreation Area during the summer of 2022.

Continued monitoring of Watershed Improvement projects shows that hydrologic stability, habitat quality, and diversity continue to be on an improving trend in these stream reaches.

Maintaining the species mix along streamside zones is critical for restoration to ensure that desired future species mix is can be met. Plan vegetation requirements for streamside zones should be reviewed to ensure that the plan is not constraining the ability to manage nondesirables from returning.

Croatan

Road crossings of streams have been improved across the Forest because of Hurricane Florence damage and subsequent crossing replacement at 90 locations. Many of these replaced crossings increased resiliency to future flooding by being designed with stream simulation techniques that address flood flows, aquatic passage, sedimentation, and unstable stream conditions.

The Watershed Restoration Action Plan (WRAP) for the Holston Creek Watershed remains in draft form, and planning is occurring to also draft a WRAP for the Hunters Creek and Black Swamp Creek Watersheds to improve wetting of drained pocosin wetlands. Until now, watershed-wide projects have not been implemented to move *functioning at risk* watersheds toward *properly functioning*. There are currently seven 6th-level watersheds of the twenty-two watersheds on the forest, considered as properly functioning (32%). The remaining 15 watersheds are functioning at risk (68%).

Watershed restoration and improvements to water and soil quality have occurred on the Croatan NF over the last decade through implementation of changes in general management, such as eliminating soil bedding and addressing erosion and aquatic passage at road/stream crossings. Specific improvements to the forest have been focused on timber stands, transportation systems, and wildlife habitat. These activities are resulting in an improving trend in aquatic habitat and biota conditions of tidal and non-tidal streams progressing toward desired conditions.

Recommended Changes

Management activity

- Finalize the Watershed Action Plans for Holston Creek and Hunters Creek Watershed. (Croatan)
- Review vegetation requirements for streamside zones to ensure that the plan is not constraining the ability to manage non-desirables from returning (Uwharrie)

Terrestrial ecosystem conditions, including key characteristics, stressors, and threats

Summary

Restoring and maintaining the Longleaf Pine Ecosystems has been the primary focus for these national forests during this monitoring cycle. One driver has been the R8 Million Acre Longleaf Restoration Challenge (2018) that set goals for longleaf restoration by 2025.

Monitoring Questions and Indicators

Uwharrie

Indicator for the following questions: Estimate condition classes of Maintain, Improve, Restore.

Q3. What are the conditions of longleaf pine ecosystems and the trends for restoring these systems?

Q4. What are the conditions of oak-hickory forests and the trends of restoring those forests?

Q5. What are the conditions of shortleaf pine woodlands and the trends for restoring these systems?

Croatan

Q2. Are pine savannas, pine flatwoods, and woodlands improving toward desired conditions?

Q3. Are hardwood cypress wetlands maintained and functioning as planned?

Q4. Are upland hardwood conditions maintained or improving?

Key Results

Silviculturists and Plant ecologists developed a classification system (see 2022 Biennial Report, Appendix A) for the condition of Longleaf Pine systems and used in the report. The condition classes are the following: Maintenance (desired condition); Partial Restoration (nearing desired condition but needs further restoration); Heavy Restoration (severely departed from desired conditions).

- Estimates of Longleaf Condition classes are shown in the table below. The amount of Heavy Restoration will be adjusted during the next monitoring cycle due to the extensive conversion of loblolly pine to longleaf pine presently ongoing for the Lomax (Uwharrie) and White House Forks (Croatan) projects. Together, these projects would restore or improve nearly 7,000 acres, which are mostly focused on longleaf pine.
- The R8 Million Acre Longleaf Restoration Challenge (Internal Document, 2018) estimated about 18,000 to 21,000 acres contribution of longleaf by 2025. The currently managed longleaf on both forests is approximately 14,000 acres and when the Lomax and White House Forks projects are completed, then approximately 21,000 acres of longleaf would be managed.

Longleaf Condition Class Summary for the Croatan & Uwharrie NFs

Condition Class	Croatan (Ac/%)	Uwharrie
Maintenance	3178 ac/ 28%	721 ac/ 18%
Partial Restoration	3082 ac/ 27%	1139 ac /28%
Heavy Restoration	3836 ac/ 34%	1949 ac/ 48%
Loblolly	298 ac/ 3%	111 ac/ 3%
Other	833 ac/ 8%	132 ac/ 3%
Total	11263 /100%	4052 ac/ 100%

Uwharrie NF

- About 46% of the managed longleaf sites on the Uwharrie are maintained or partially restored.
- The potential natural vegetation (PNV) mapping for longleaf is estimated to be about 7,760 acres and the managed estimated longleaf for 2022 is approximately 4,052 acres or about 52% of the PNV.
- Most of the managed longleaf are on the upland longleaf sites, with less than 1 percent on sites with co-occurrence with shortleaf pine. These later sites are the steepest longleaf sites across the Uwharrie.
- Due to the focus of longleaf pine restoration, there has been a lack of work in oak-hickory forests as well as shortleaf pine woodlands forests.

Croatan NF

- 28% of the managed longleaf acreage is in maintenance condition and about 27% of managed acreage is in partial restoration.
- The potential natural vegetation (PNV) mapping for longleaf is estimated to be about 32,794 acres and the managed estimated longleaf for 2025 is approximately 11,263 acres or about 1/3 of the PNV. The other two-thirds of the PNV are coded as either loblolly or pond pine in the FSveg inventory.
- Most (>85%) of the longleaf sites on the Croatan are Mesic Loamy ecozones or Wet Flatwoods, which are more challenging to prescribe burn for effective results. About 7 percent of the managed longleaf are on upland sites that can be burned effectively at prescribed fire intervals.
- Due to the focus of longleaf pine restoration, there has been a lack of work in upland hardwood and hardwood cypress wetlands. They are currently functioning and maintained at current levels.

Recommended Changes

- **Monitoring Activity:** Update condition classes for longleaf pine for the 2027 monitoring cycle.

Focal Species

Summary

The intent of Category 3 is to track the presence of species that would provide insight into the functioning of key characteristics of selected ecological conditions and habitats. The key ecological systems or fine filter habitat elements are noted in the questions below.

Monitoring Questions and Indicators

Uwharrie

The indicator is relative abundance for the following questions:

Q6. What is the status of brown headed nuthatch as a focal species for the function of longleaf pine ecosystems?

Q7. What is the status of scarlet tanager as a focal species for the function of dry oak and oak hickory forests?

Q8. What is the status of Acadian flycatcher as a focal species for the function of streamside zones?

Q9. What is the status of pileated woodpecker as a focal species for the function of large canopy trees and presence of snags?

Q10. What is the status of northern bobwhite quail as a focal species for the conditions of early successional habitat?

Croatan

Q5. What is the status of red-cockaded woodpecker to assess the ecosystem functioning of pine savannas, flatwoods, and woodlands? Indicator: Active clusters, nesting success

Q6. What is the status of black bear to assess ecosystem function and connectivity of hardwood cypress wetlands? (harvest trends)

Q7. What is the status of eastern wild turkey to assess the function of upland hardwoods? ((summer brood counts) and harvest trends)

Key Results

The data used for analyzing trends of bird focal species (Uwharrie) differs from the previous monitoring cycle. The database, R8 Bird was used previously, however, disruptions due to Covid 19 outbreaks and personnel vacancies prevented that data collection process. The R8 Bird data collection has recently re-started on the Uwharrie NF. Instead, E-bird data was downloaded for the 3-county area of the Uwharrie National Forest over the last 5-year period and compared with the findings of the last monitoring cycle. These data are documented in the analysis folders for Category 3 Focal Species (Box Drive: Monitoring and Evaluation/CroatanUwharrie MonitoringGuide /CU Analysis Folders/Category 3).

Brown-headed nuthatch, *Sitta pusilla*, this species is associated with the small, fragmented longleaf pine stands and serves as an indicator of longleaf forest restoration. It is also found in loblolly pine and other mixed pine-hardwood forest types across the Forest. It was previously reported that population trends appear to be increasing across all habitat types on the Uwharrie and was documented to occur in longleaf habitats for the

first time in 2016. Over the past 5 years, the E-bird data concurs that observations are generally increasing throughout the 3-county area, averaging approximately 676 observations with a range from 272 to 978, with higher counts in the last 3 years. Increased efforts to target restoration of longleaf pine ecosystems on the Uwharrie began in 2002 and carried forward with the Lomax longleaf conversion project currently underway. This conversion from loblolly to longleaf may correlate with the increase in nuthatch observations during migratory bird monitoring.

Scarlet tanager, *Piranga olivacea*, abundance appears to be stable to slightly increasing (E-bird) within the 3-county area, averaging 140 observations with a range from 48 to 162. The highest counts were observed from 2023-2025. This species has been identified with oak-hickory habitats. Treatments of oak-hickory forests have been minimal during this monitoring cycle due to the focus on longleaf restoration. Previously, the scarlet tanager was reported to be declining slightly due to fragmented habitats that support presence of brown headed cowbirds. More clarity about the status of this species is needed for the next monitoring report.

Acadian flycatcher, *Empidonax alnorum*, was identified to indicate streamside forested habitat quality and quantity. Previously, the species abundance was reported to be stable, indicating healthy streamside forested habitats. The E-bird data for this monitoring cycle shows a steady increase in observations over the last 5 years, which tends to support continued healthy streamside forest habitats on the Uwharrie.

Pileated woodpecker, *Dryocopus pileatus*, indicate the presence of mature mixed deciduous and coniferous forests with many snags and downed logs. The E-bird data shows a substantial increase in observations over the last 5 years, averaging 278 observations with a range from 111 to more than 390. The highest counts were documented over the last 3 years. Previously, its abundance was reported to be declining due to the potential of fewer snags distributed over fragmented forest ownership. Further monitoring is needed to investigate the species abundance related to its preferred habitat on the forest.

Northern bobwhite, *Colinus virginianus*, indicates quality early successional habitat with abundant native plants and bunchgrasses. It was previously reported that species abundance has been declining since 1997, with fewer observations on the Uwharrie. The E-bird data over the past 5 years throughout the 3-county area seems to corroborate the previous findings with an average of 27 observations ranging from as few as 7 observations to 45. But the abundance of northern bobwhite is expected to increase on the Uwharrie due to the consistent increase of prescribed fire throughout the districts and the focus of longleaf restoration.

Red-cockaded woodpecker (RCW), *Dryobates borealis*, is a Federally listed threatened species that is dependent on mature pine savanna, flatwoods, and woodlands. RCW populations on the Croatan NF are expected to remain stable or increase slowly as more stands are brought into a suitable habitat condition. Currently, the Croatan NF has approximately 65 active clusters, which has been consistent since 1997. This included 35 cavity inserts to mitigate the losses incurred from Hurricane Florence in 2018.

Red cockaded woodpeckers occupy **suitable habitat** of longleaf pine on the Croatan NF. Longleaf pine habitat restoration projects have been implemented across the Forest, removing loblolly pine plantations and replanting longleaf pine. However, it is a long process (time-lag) from newly planted longleaf to habitat suitability for red-cockaded woodpeckers – as long as 40 years; and even then, restored habitat will likely serve as foraging habitat and will not be developing breeding habitat characteristics for another 20 years. In the interim, with continued prescribed burning and active longleaf pine forest restoration, RCW populations on the Croatan are expected to remain stable or increase slowly as more stands are brought into suitable habitat conditions.

Black bear, *Ursus americana*, require large tracts of land with linkages between patches of suitable habitat, hard

mast foods, escape cover for bears hunted with dogs, and freedom from motorized disturbances.

Bear population estimates and population growth rates are estimated annually by the NCWRC from biological data collected voluntarily from harvested bears through the Bear Cooperator Program. A 10-year trend line of bear harvest on the Croatan was calculated using NCWRC available data from 2013-2023. The trend line shows that bear harvests are slightly increasing over the 10-year period, average of about 21 with a range from 8 to 26 with higher harvests in the later years. Despite annual variation in the number of bears harvested (reported) from the Croatan National Forest, the long-term trend is stable, likely to reflect varying degrees in hunter success as opposed to reflecting estimated bear populations.

Most of the landscape outside of the Forest is developed, which suggests that the bear population in the surrounding area is likely tied to the Croatan. The surrounding agricultural areas provide higher foraging values that increase fitness; however, reproductive success is heavily influenced by having refuge from disturbance and year-round forage provided by the Forest. Also, the high occurrences of prescribed fire on the Croatan enhances woodland and savannah habitats that are important for summer foraging (i.e., huckleberry and blackberry). The natural mosaic pattern of these burns allows for enough retaining cover to provide for escape.

Wild turkey, *Meleagris gallopavo*, rely heavily on acorns and other hard mast as forage. Oak-dominated Forest types have been in gradual decline across the Southeast due to residential and commercial development, conversion to pine plantations and farmland, and oak decline. Because Wild Turkey is so dependent on hard mast, it was identified as a focal species for upland hardwood forest types on the Croatan National Forest.

A ten-year trend line was calculated using available data of Spring Turkey harvests from NCWRC from 2015-2025. The spring harvest remains stable as was reported previously. The average over 10-year period on Croatan is approximately 55 counts with range of 31 to 72. Stable populations of eastern wild turkey on the Croatan are most likely due to consistent, widespread application of prescribed fire on fire adapted ecotypes and enhancement of oak dominated sites where they exist.

Recommended Changes

Monitoring program or monitoring activity:

Uwharrie /Croatan: Resume bird surveys using R8 Breeding Bird Survey protocols and record data in the R8 Bird database. Use E-bird data as a complimentary verification check on bird focal species findings.

Ecological Conditions Required to Contribute to Species Recovery

Summary

The purpose of this category is to monitor conditions that are required for rare species and to demonstrate conformance with both the Endangered Species Act and the planning regulations at 36 CFR 219.9. Both plans for the national forests focus on conditions of botanical special interest areas (SIA) where most of the rare plant species are present or where suitable habitat can be provided. The emphasis for this monitoring cycle has been to track the condition of special interest areas.

Monitoring Questions and Indicators

Uwharrie

- Q11. What are the trends in Schweinitz's sunflower across the UNF?
- Q12. What are the trends in element occurrences across the forest?
- Q13. Are botanical special interest areas fully functioning?
- Q14. What are the trends of NNIS?

Croatan

- Q9. What are the conditions of special interest natural areas on the CNF?
- Q10. What are the occurrences of specific at-risk species?
- Q11. What are the amounts and conditions of old growth in each ecological type?
- Q12. What is the status of rare land types in the plan area?

Key Results

Uwharrie

A summary of information is as follows. Specific information is stored in Box Drive: Monitoring and Evaluation/CroatanUwharrie MonitoringGuide /CU Analysis Folders/Category 4.

- **Special Interest Areas (SIAs).** The Uwharrie has 24 special interest areas. Ten of these communities were surveyed during this monitoring cycle and found 5 in excellent condition and 5 in good condition. Generally, the SIA's are in good condition due to the consistent use of prescribed fire. Also, design measures are in place for ongoing timber sales (Lomax Resource Management Project) to protect rare plant populations and plant communities within these SIAs.
- **Schweinitz's Sunflower (*Helianthus schweinitzii*)** . There are 21 EOs on Uwharrie NF. Prescribed fire is an important management tool in this area. Typically, prescribed fire does not reach Schweinitz's Sunflower locations along roadsides, but they are vulnerable to roadside spraying and mechanical disturbance (mowing). Five element occurrences were surveyed and updated during this cycle.
- **Rare plant Occurrences.** There are 53 vascular and non-vascular rare plants on the Uwharrie NF. There were no new occurrences that have been found. Twelve rare plants were surveyed during this monitoring cycle and found to be in stable condition.

- **Non-Native Invasive Species (NNIS).** There are major infestations of NNIS along roadsides, recreation areas, wildlife openings, and campsites. Timber compartments 30 and 32 have large populations of *Lespedeza bicolor*. A NNIS survey was completed in the Birkhead Mountains Wilderness in 2022 (Siripoonsup, 2022). The botanist from NCNHP surveyed 10.5 miles of official trails and 4.5 miles of unofficial trails were surveyed and 10 NNIS were found.

Croatan

- **Special Interest Natural Areas:** There are 17 Special Interest Areas (SIAs) on the Croatan NF (National Forest). All the SIA(s) are in good to excellent condition, mostly due to the consistent prescribed fire program. One SIA, Flanner's Beach, was found to be in fair condition due to weather related damage and now is scheduled for rehabilitation. Survey work by NCNHP botanist/ecologist was completed on the north section of the SIA Sheep Ridge Wilderness, a section of Flanner's Beach Natural Area, SIA Gum Swamp Bottomland Hardwood Forest, a section of Hunters Creek Upland Forest, Little Road Longleaf Pine Savannas, a section of Island Creek Natural Area and sections of the Pettiford Creek Open Flatwoods Natural Area.
- **At risk plant species:** There are 100 vascular and non-vascular rare plants on the Croatan NF. Newly found species include the following: Showy Aster (*Eurybia spectabilis*), Winged Seedbox (*Ludwigia alta*), and Shortleaf Basket Grass (*Oplismenus setarius*).
- **Rough leaved loosestrife (*Lysimachia asperulifolia*).** There are 61 element occurrences (EOs) of Roughleaf Loosestrife on the Croatan NF in the NCNHP database. A detailed survey of Roughleaf Loosestrife was completed in 2021. There are two large mega sites in the southern portion of the forest. Five of the subpopulations had stem counts greater than a thousand. (Siripoonsup 2021). Populations are flourishing where it is found in suitable habitats south of Millis and Roberts Road from Hibbs Road west to Pettiford Creek.
- **Spring flowering goldenrod (*Solidago verna*).** There are 42 records for Spring-flowering Goldenrod on the Croatan National Forest (CNF) based on the NCNHP database. CNF has one of largest populations of Spring-flowering Goldenrod in North Carolina with several populations numbering hundreds of plants. The Havelock Bypass and Highway 17 projects have removed large populations of Spring-flowering Goldenrod. The NCDOT is currently mitigating the impacts to this plant mostly through replanting.
- **LeConte's thistle (*Cirsium lecontei*).** There are 11 records for LeConte's thistle in the Croatan National Forest (CNF) based on the NCNHP database. Four of these are historic records. This is one of the rarest plants in the forest. One population was impacted by the new Havelock Bypass construction. Mitigating measures to restore plant populations are underway with NCDOT and Duke Energy.
- **Newly Added: Carolina Maritime Goldenrod (*Solidago villosicarpa*).** Locally Rare species. There is 1 EO (EO 35, EOID 42413) on the Croatan NF surveyed in 2023. This population is located along the Neusiok Trail in the east part of the Croatan National Forest (CNF) not far from the Neuse River. A total of 395 rosettes were counted and 138 flowering stems observed on the northern portion of the occurrence. Plants are doing well with exception of populations that are growing close to the Neusiok trail, where extra care is occurring during trail maintenance.
- **Newly Added: Venus Flytrap (*Dionaea muscipula*).** RFSS species. There are 27 elemental occurrences in the forest. This plant occurs on wet pine savannas in fire-adapted

communities and occurs in the southern section of the forest. The Croatan NF is one of the few federal refuges for Venus Flytrap on the southeastern coastal plain. Venus Flytrap was recently reviewed for possible changes in conservation status but after population analysis in May of 2023, its conservation status has remained imperiled (S2) and found not warranted for federal endangered or threatened status. Most of the Croatan NF populations are in the southern portion of the forest in ecotones between longleaf pine and pocosins. Venus Flytrap populations were surveyed in 2024 (Hibbs Road Pine Ridges-1400 plants) and 2025(Sam Hatcher Road-300 plants).

Recommended Changes

None

5.0 Visitor Use, Satisfaction, and Progress on Recreation Objectives

Summary

This monitoring category is comprised of questions that relate to environmental and social conditions that affect visitors and recreation users of the forest's lands and waters. Nature-based recreation experiences, trail maintenance, and changes to recreation settings are considered in this category. The National Visitation Use Monitoring (NVUM) study was conducted during this monitoring period.

Monitoring Questions and Indicators

Uwharrie

- Q15. What amount and kind of visitor use activities are occurring on the forests, and how satisfied are people with their experience? (NVUM survey)
- Q16. What are the trends in trail conditions? (Miles of trail maintained to regional standards)
- Q17. What is the percent of completion of the Uwharrie National Recreation Trail? (Additions)

Croatan

- Q13. What amount and kind of visitor use activities are occurring on the forests, and how satisfied are people with their experience? (NVUM survey)
- Q14. What are the changes in conditions of ROS settings? (Change in Settings). What is the status of rare land types in the plan area?

Key Results

Uwharrie and Croatan: NVUM Survey

A National Visitation Use Monitoring (NVUM) survey was conducted in 2023, within this monitoring cycle. The previous survey was conducted in 2018. For practical and statistical considerations, the survey includes both the Uwharrie and Croatan National Forests. The survey provides information about the kinds of activities and satisfaction ratings.

Key Results of the surveys follow.

- Visitation increased from 893,000 (NUVM,2018) to 1,200,000 (NUVM,2023) visits per year on the Croatan and Uwharrie National Forests.
- Visitors that were very satisfied with the recreational experiences increased from 62% (2018) to 77% in 2023. About 16 percent of visitors were somewhat satisfied with recreational experiences in both 2018 and 2023.
- Visitors reported satisfaction about a "Feeling of Safety" that ranged from 84% for Developed Sites to 100 percent for Dispersed sites and 91 percent for Designated Wilderness.
- Visitors satisfied with access to developed, dispersed, or wilderness sites averaged about 83 percent, which is slightly lower than an average of 91 percent in 2018.
- The lowest satisfaction ratings regarded signage, with 36% Very Satisfied and 25% Somewhat Satisfied.

- Many visitors engaged in several activities during the visit. For example, visitors engaged in hiking or camping also engaged in viewing natural features (55%) and Relaxing (47%). In contrast, visitors engaged in more focused activities such as OHV use (12%) or Horseback riding (11%) visited only for those specific activities.

Uwharrie

Trail Maintenance: There are approximately 130 miles of system trail on the Uwharrie NF. In FY 2022 about 52 miles of trail were maintained to meet standards, and 1.3 miles of trails were improved. In FY 2023 about 18.5 miles of system trails were maintained and 1.9 miles of trail were improved through a reroute / new construction. In FY 2024, approximately 104 miles of trail was maintained. In FY 2025 approximately 103 miles of trail was maintained. These four years of maintenance totals 279 miles of system trails. The deferred maintenance backlog is decreasing because of rotating maintenance and construction projects.

Uwharrie National Recreation Trail (UNRT): No additions were made to the UNRT since the last monitoring report. The trail is about 75% completed.

Croatan

Recreation opportunity settings were significantly impacted by Hurricane Florence in 2018. Major repairs will be made at Flanners Beach (campground, day use, and beach), Fisher's Landing, Pinecliff Recreation Area, and Siddie Fields. All other recreation areas and opportunities are present and intact.

Recommended Changes

None

Climate Change and Other Stressors

Summary

This monitoring category is comprised of questions related to the 2012 Planning Rule about how climate variability has changed, the influence of climate change on the plan area, and effects of national forests on climate change. This monitoring is conducted and reported by the Southern Region as part of the broad scale monitoring requirements in the 2012 Planning Rule. The following results reflect findings from the 2020 Southern Region Broad Scale Monitoring Report that was used in the previous Croatan & Uwharrie NF update and repeated here. The next update of the Southern Region Broad Scale Monitoring Report is scheduled for 2025 but has yet to be released. The current report is posted at the following link :<https://www.fs.usda.gov/main/r8/landmanagement/planning#Monitoring>

Monitoring Questions and Indicators

Uwharrie

- Q18. How has climate variability changed, and how is it projected to change across the region?
- Q19. How is climate variability and change influencing the ecological, social, and economic conditions and contributions provided by the plan areas in the region?
- Q20. What effects do national forests in the region have on a changing climate?

Croatan

- Q15. How has climate variability changed, and how is it projected to change across the region?
- Q16. How is climate variability and change influencing the ecological, social, and economic conditions and contributions provided by the plan areas in the region?
- Q17. What effects do national forests in the region have on a changing climate?
- Q18. Are land cover changes occurring due to sea level rise, especially lands adjacent to tidal streams?

Key Results

- **Sea Level Rise.** Croatan. The relative sea level trend is 3.22 millimeters per year with a 95% confidence interval of plus or minus 0.35 millimeter per year based on monthly mean sea level data from 1953 to 2019 which is equivalent to a change of 1.06 feet in 100 years. Forecasted 2036 coastal high tide flooding is expected to increase to seven (7) days per year under the representative concentration pathway 4.5 (low greenhouse gas emissions scenario) and 17 days per year under the representative concentration pathway 8.5 (high greenhouse gas emissions scenario) and increase in 2065 to 34 days (low) and 265 days (high).

- **Temperature.** 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.
- **Precipitation.** There appears to be a trend toward a modest increase in total precipitation with little change in the number of dry days per year. Changes in total precipitation and in days per year with over two (2) inches of precipitation include a considerable amount of uncertainty when accounting for both representative concentration pathways 4.5 and 8.5 scenarios.
- **Forest Health** – Southeast forests will be affected by many factors including extreme weather, shifts in plant hardiness zones, sea level rise and saltwater intrusion, and increased pressure from invasive plants and pests, drought, and wildfire frequency. Increasing temperatures will worsen disturbance due to invasive plants and insects.
- **Animal Communities** – Some bird species along the coast have been negatively affected by development of ghost forests and consequent habitat loss. Certain amphibian and insect species such as the red legged salamander or the Diana Fritillary that are highly dependent on elevation are becoming more and more isolated due to habitat fragmentation and loss.
- **Plant Communities** – Suitability conditions are projected to change for different tree species with certain species having more adaptive capacity (southern pines, oaks, and hickories) than others (balsam fir, red spruce, eastern hemlock, and sugar maple) due to pests and climate competition. Changes in growing season and flowering dates are also possible with increasing minimum temperatures. Projected increase in temperatures can allow invasive pests and plants to increase their spread.
- **Water Resources** – With climate change projected to cause warmer temperatures and variable precipitation in the future, water resources will likely be even more affected by drought and extreme weather events. Severe drought impacts could lower streamflow in forested watersheds. Increased water temperature due to a warming climate can potentially lead to an increase in toxic algal blooms in lakes.
- **Recreation** – Changes in precipitation due to drought could negatively impact water-based outdoor recreation like canoeing, kayaking, and motorized activities. Increase in temperature can impact visitors' comfort. Climate change can also have impacts on culturally significant natural resources.
- **Extreme Weather** – Extreme precipitation events are becoming more likely; however, there are longer dry periods between storms. Increasing drought frequency and a projected increase in dry season, as much as 156 days in some areas, will increase the risk of wildfires. Not only are extreme precipitation events becoming more likely, but hurricanes are also becoming more severe and are able to sustain damaging conditions for longer periods of time.

Recommended Changes

See Project Record (2020) for potential mitigation recommendations to be considered during Forest Plan Assessment, Need to Change.

Social, Economic and Cultural Sustainability

Summary

This monitoring sub-category is comprised of questions about conditions of cultural resources and the program for prescribed fire that is essential for reaching the desired ecological conditions as well as providing community protection of adjacent lands.

This monitoring category also applies a question related to the 2012 Planning Rule about the contribution of national forests toward economic sustainability. This monitoring is conducted and reported by the Southern Region as part of the broad scale monitoring requirements in the 2012 Planning Rule. The following results are from the 2020 report that was cited in the previous Croatan and Uwharrie report of 2020 and repeated here. The “Broad-Scale Socioeconomic Monitoring Evaluation Report for the Southern Region” is posted at the following link: <https://www.fs.usda.gov/main/r8/landmanagement/planning#Monitoring>.

Monitoring Questions and Indicators

Uwharrie

- Q23. What are the trends in protection and/or stabilization and preservation of cultural or historic sites? (# High Priority Sites Maintained)
- Q24. What are the risks of wildfire that may affect local communities, and what strategies may provide for community protection from wildfire? (Amount, timing, and location of prescribed fire)
- Q25. What changes are occurring in the social, cultural, and economic conditions in the areas influenced by national forests in the region?

Croatan

- Q24. What are the conditions of cultural and historic Special Interest Areas? (Changes in cultural/historic site conditions)
- Q25. What are the risks of wildfire that may affect local communities, and what strategies may provide for community protection from wildfire? (Projects through community wildfire protection plans)
- Q26. What changes are occurring in the social, cultural, and economic conditions in the areas influenced by national forests in the region?

Key Results

Uwharrie – Cultural Resources

- Seventy-eight sites were monitored on the Uwharrie National Forest during this monitoring cycle, including 16 Priority Heritage Assets (PHAs). At least thirteen of these sites were noted to have stabilization needs of varying degrees upon monitoring.
- Damages from off-highway vehicle (OHV) use have decreased, reflecting mitigations and continued management efforts from past years, including closure and rehabilitation of the Kodak Rock OHV Trail in FY22. While overall OHV improvements have been observed, sites continue to experience ongoing

disturbance from recreational use, including dispersed camping, unauthorized horse trails, and rock hounding activities. Deeply entrenched unauthorized trails and repeated access attempts to restricted areas, such as Russell Gold Mine, have resulted in increased maintenance and repair needs. Economic shifts appear to have contributed to increased rock hounding and crystal mining, posing continued risks to archeological resources. In FY25, increased rain events and storm pressures prompted preventative survey of historic culverts to document conditions prior to further damage or full culvert destruction.

- A wildfire event in FY23 resulted in dozerline impacts to two NRHP-eligible resources, resulting in a damage assessment to the sites. The execution of the proposed FY25 Uwharrie District-Wide Prescribed Burn EA will aid in identifying cultural needs and protections more consistently within the prescribed burn program of the Uwharrie NF.
- The NRHP Listed Lewis-Thornburg Farm, was damaged in a storm and repaired in FY22; however, additional storm-related impacts in FY24 resulted in further damage along with simultaneous vandalism in the main house. The discontinuation of the “Alternative Break” partnership with Central Michigan University, combined with budget limitations, has contributed to a gradual decline in overall site condition. Efforts to stabilize and reverse this trajectory are being explored as of FY25. Thornburg remains the only NRHP-listed site in the forest.
- Impacts have been observed across several historic SIAs, including Talbert, Thornburg, Russell Mine, Roberdo Bog, Nifty Rocks, and Cotton Place, where recreational use, road construction, and fire-related effects have contributed to site data recoveries or disturbances. Graffiti and evidence of looting were documented in the Birkhead Wilderness and within the broader recreation area, including impacts to several NRHP eligible sites.
- Conversely, positive stewardship actions have also occurred to mitigate the notable recreational strain on cultural resources. A Section 110 cemetery stewardship project was undertaken to relocate and clean up historic cemeteries, improving long-term preservation conditions. The Buck Mountain Fire Lookout Tower, identified as needing repairs since 2019, is scheduled for a condition assessment in FY26.
- Based on monitoring from FY22-FY25, cultural resource conditions on the Uwharrie NF are not fully meeting desired conditions, particularly with respect to ARC-1 (protection from loss). While targeted stabilization, monitoring, and stewardship efforts have been rigorously implemented, ongoing impacts from recreation (OHV use, dispersed camping, unauthorized trails), vandalism, wildfire suppression activities, and storm events continue to affect site integrity.

Croatan – Cultural Resources

- From FY22 to FY25, a total of 48 sites were monitored through Section 110 and 106, including six Priority Heritage Assets between FY22-FY25. This represents a decrease from earlier monitoring efforts conducted in anticipation of hurricane-related impacts, reflecting a shift from reactive monitoring to more targeted assessments and stabilization of sites.
- In response to Hurricane Florence, recovery has focused on completing a forest-wide cultural inventory and addressing shoreline vulnerability along the Neuse River, including stabilization efforts and inventory at Pine Cliff, Flanners Beach, and Fisher’s landing Special Interest Areas (SIAs). The DART team has also contributed to interpretive planning at Island Creek SIA, where partial survey has been completed in support of a proposed trail system and a draft interpretive panel was developed in FY25. Sites along the White Oak River remain stable.
- Preservation of high priority sites has been well maintained this monitoring period, with active stabilization plans for National Register of Historic Places (NRHP)-eligible sites along the Neuse River are ongoing. Preservation of NRHP eligible sites along the White Oak River and in the Holland Point SIA has remained a challenge with recreational residences, or other recreational uses. The NRHP-Eligible Newport-Simmons Fire Lookout Tower continued to need repairs since deteriorating conditions were identified in 2019, and its condition assessment to capture stabilization requirements is slated for FY26.

- The Camp Patterson SIA entered an interpretive planning phase beginning in FY24, with development of an interpretive trail ongoing through FY26. Holland Point SIA continues to be monitored annually due to its vulnerability to recreational residence activities. While impacts associated with residence enhancements were assessed in FY22-23, no new damages have been documented from FY23-FY25. Fort Cannady SIA has remained stable with no significant changes in condition. In contrast, Brice Creek SIA has seen limited monitoring during FY22-FY25, though evaluation of the cemetery condition and additional site inventory and assessments are planned for FY26-27. FY22-FY25 patterns demonstrate a mix of stable conditions, stabilization efforts, ongoing risks, some interpretation, and planned future work.
- Conditions within SIAs on the Croatan NF are progressing towards Forest Plan desired conditions, particularly in the areas of inventory, evaluation, and targeted stabilization. However, ongoing environmental and recreational pressures, combined with incomplete inventory and variable management across SIAs, indicate that desired conditions have not yet been fully achieved. Continued monitoring is recommended.

Uwharrie - Prescribed Fire and Wildfire

- **Prescribed Fire:** The Uwharrie National Forest averaged 4000-6000 acres per year in prescribed burn acres from 2022 to 2025. In 2025 numbers were slightly lower due to lapse in funding and a pause in burning for hurricane recovery. In 2025 the district accomplished 2969 acres.
- **Wildfire Risk:** The risk of wildfire that affects the local community has increased due to expanded development and wildland urban interface. Increased numbers of visitors hiking the Uwharrie Trail, as it has gained national recognition, have triggered a slight uptick in fire occurrences. The recent signing of the Uwharrie Districtwide Prescribed Fire Project allows managers to expand prescribed fire efforts throughout the Uwharrie National Forest, including the Birkhead wilderness, more efficiently reducing hazardous fuel accumulation and fire behavior in the event of a wildfire. Timing of burn units is key to success between seasonal trail closures, hunting seasons, and industrial transit volumes along roadways. Cooperative efforts with the North Carolina State Forest Service, through Stevens Amendment funding, allow for prescribed burning on private lands within a determined proximity to federal land thus reducing hazardous fuels accumulations in wildland urban interface areas.
- **Wildfire Risk:** Another risk to the local community is the amount of smoke associated with wildfire. Having the ability to strategically control fire behavior, spread, and smoke dispersion with a prescribed burn reduces the negative impacts to adjacent lands and smoke sensitive communities.

Croatan - Prescribed Fire and Wildfire

- **Prescribed Fire:** The Croatan continued an annual average of more than 20,000 acres prescribed burned for FY's 22-24, improving longleaf pine ecosystems and significantly reducing hazardous fuel adjacent to wildland urban interface communities. Totals equal 79 burns for 62,819 acres during the monitoring period.
- FY25 prescribed burning was negatively impacted by an extended forest wide drought, drought still ongoing in 2026, resulting in only 1,655 acres accomplished.
- **Wildfire:** Croatan fire management also suppressed 129 fires for 35,331 acres during the same monitoring period with the most significant being the 32,156-acre Great Lakes Fire in 2023; greatly impacting acres consumed, threatening the City of New Bern, and resulting in the formation of the collaborative multi-agency Croatan Area Fireshed Partnership.

Broad Scale Economic Trends (from the 2020 R8 Broad Scale Monitoring Report)

- **Population Change:** Increase in population growth places more demands on resources. Populations increased about 10% in the Uwharrie plan area and about 13% in the Croatan plan area. These are modest increases but below the R8 average of 17%.

- **Unemployment Rate:** Corresponds between residents' skills and employment opportunities. Unemployment rates were 4.9% (Uwharrie) and 5.2% (Croatan), which is near the level at the regional scale of 5.1%.
- **Population below poverty level:** Changes or restrictions to forest uses may affect individuals depending on local resources. Populations below poverty levels are 17% (Uwharrie) and 15% (Croatan), which is similar to the regional scale of 18%.
- **Payments to Counties:** Payments contribute to employment and labor to counties where forests are located. The average payment per acre is \$1.47 (Uwharrie) and \$0.92 (Croatan) which is below the regional average of \$2.08.
- **Expenditures:** Expenditures by the national forests and their employees contribute to economic activity surrounding the forests. The statistics are only available for all of NFsNC, where \$17MM are spent on salaried employees and \$13MM are spent on non-salaried work.
- **Land use change:** To understand the baseline for land use change over time, the Forest GIS Coordinator and Croatan and Uwharrie GIS Editor developed a method to provide annual estimates of the acreage gain or loss of vegetation, landcover, and land use types. During this monitoring period, 1983 raster products were generated to serve as a baseline for showing changes. For future reports, acreage change estimates will be derived from the agency's Landscape Change Monitoring System application developed by USDA Forest Service Geospatial Technologies and Applications Center (GTAC). In addition, investigate other remote sensing applications currently in development for change detection analysis.

Recommended Changes

Cultural Resources. Continued monitoring, stabilization planning, and integration of heritage considerations into recreation and land management activities are necessary to meet desired conditions for cultural resource protection and preservation as noted in the Uwharrie Forest Plan. Changes to the monitoring plan may be warranted to better prioritize high-risk and high-value sites, and management activities should continue to emphasize early integration of cultural resources into project.

Effects of Management Systems on Productivity of the Land

Summary

This monitoring category is comprised of a question related to potential impairment of soil productivity.

Monitoring Questions and Indicators

Uwharrie

Q26. Are there significant changes in soil productivity? (Percent detrimental soil disturbance at selected sites)

Croatan

Q27. Are there any impairments to soil productivity? And, if so, what are the restoration strategies (Best Management practices monitoring)

Key Results

Data are stored in Box Drive: Monitoring and Evaluation/CroatanUwharrie MonitoringGuide /CU Analysis Folders/Category 8.

Uwharrie: A summary of the Soil Disturbance Monitoring (SDM) data is stored in the CU Analysis Folders for Category 8. Approximately 3 to 5 timber sale units were surveyed from 2010-2019, No timber sales were surveyed on the Uwharrie after 2019 due to travel restrictions during the Covid pandemic and hurricane Helene in 2024 which redirected staff to higher priorities. For those units surveyed, all were surveyed post-harvest, were ground-based harvested, and had some degree of detrimental soil disturbance, however all disturbance was below the impairment level. Several units surveyed pre-harvest in 2010, were resurveyed the year following logging. Although an increase in disturbed areas occurred from pre-harvest, the units surveyed maintained appropriate land productivity.

Croatan: All timber sale units were ground-based harvested. All harvested units surveyed had some degree of detrimental soil disturbance, but levels were well below the threshold impairment level. The data shows that in some cases soil disturbance is generally higher within the units on the Croatan than on other NFsNC Forest units. This is likely a result of harvesting techniques used on the coast not implemented to this extent elsewhere, such as mechanical chopping vegetation throughout the unit for site preparation to restore longleaf pine. Also, soil conditions can be very moist to wet when harvested, resulting in additional soil disturbance off designated skid roads. Overall, the Croatan NF staff has been very successful at managing these challenges to protect soil productivity.

Recommended Changes

Monitoring Activity: Conduct unit-wide assessments of soil moisture in proposed timber sale units prior to logging to inform the loggers of areas of concern that will need to be avoided by ground disturbing equipment (Croatan).

Survey 3 to 5 units in the Lomax and White House timber projects for the 2028 monitoring report.