

# ***Uwharrie NF Monitoring Program***

## ***Administrative Change 05/02/2016***

### **Chapter 4 – Monitoring and Evaluation Requirements**

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Monitoring and evaluation is used to assess the degree to which on-the-ground management is maintaining or making progress toward the goals/desired conditions and objectives in the Plan. This monitoring program was developed with public participation and focuses on key plan components where management projects and activities are likely to cause a change over time. Consideration in the selection of items to be monitored included:

1. Goals/Desired Conditions and Objectives viewed as most important, as determined by the collaborative process participants.
2. The monitoring questions and associated performance measures will provide useful information for the effectiveness of implementing the Plan.
3. The monitoring methodology currently available for a particular item is practical and affordable.

Monitoring may address key desired conditions directly or indirectly by focusing on objectives or guidelines. As part of the collaborative process, the following Goals/Desired Conditions were identified as key conditions to be monitored:

- VEG-2. Plant communities that were more common in the past occur on appropriate sites across the forest. Examples include longleaf pine woodlands, shortleaf pine woodlands, and oak-hickory forests.
- VEG-3. Non-native invasive species are at low levels that do not interfere with native plant reproduction and distribution. New outbreaks are not spreading. Visitors understand how they can limit the introduction and spread of non-native invasive species on the national forest.
- VEG-4. Schweinitz's sunflowers (federally listed as endangered since 1991) that historically occurred across the Piedmont of North and South Carolina are restored on appropriate sites across the national forest (longleaf pine woodlands, dry oak-hickory forests, mafic hardpan woodlands, and xeric forests). Other rare plant species are sustaining or increasing in number of occurrences or the extent of the occurrences.
- VEG-5. Biological diversity is evident across the national forest, and is further enhanced by a system of botanical special interest areas. All plant communities found on the Uwharrie NF are represented in this system, including rare plant communities and the species they

support. These botanical special interest areas are intact and fully functioning; without evidence of unnatural erosion or non-native invasive species, and with intact hydrologic systems. VEG -8. The composition, structure, and processes of ecological systems are improving.

FM-1. There is increasing evidence of prescribed fire used to restore the structure, composition and ecosystem processes in ecological systems. Forest ecosystems are well-adapted to fire occurrence.

SWF -6. Streambanks are dominated by native riparian vegetation, including trees capable of adding large woody debris for hydrologic stability and instream fish habitat. Aquatic habitat is diverse and relatively free of unnatural sediments. Pool habitats are frequent and provide cover for many species of fish. Vegetated streambank areas are effective in providing shading to the streams and filtering sediments.

ARC-1. Cultural resources are protected from loss. Significant sites are stabilized, treated, managed and preserved for their historical research value.

TRL-1. Exceptional trails are available for hikers, horseback riders, off-roaders, mountain bikers, hunters, and anglers. The trails are designed, constructed, and maintained so that a variety of levels of challenge is available and other national forest resources such as soil and water are protected.

TRL-5. The 50-mile Uwharrie National Recreation Trail is complete and marked for hikers. That portion on national forest system lands has high scenic integrity.

In addition to these key Goals/Desired Conditions, monitoring associated with land productivity, water quality, and costs associated with carrying out the planned management prescriptions are required:

- Monitoring compliance with North Carolina Forest Practices Guidelines Related to Water Quality.
- Monitoring changes in productivity of the land (36 CFR 219.12(k)(2))
- Documentation of costs associated with carrying out the planned management prescriptions as compared with costs estimated in the forest plan

The following monitoring table in the UNF Plan was reformatted in 2016 to meet the requirements of the 2012 Planning Rule monitoring transition. The reporting frequencies for the monitoring program have been updated using multiples of 2-year periods, as shown in Table 4.1. The 2012 Planning Regulations changed the reporting frequency from an annual to biennial evaluation of monitoring results.

Some questions in the UNF Plan Monitoring Program link to a broad scale monitoring strategy. The 2012 Planning Regulations require a broad scale monitoring strategy, in addition to the plan level monitoring program. The Regional Office is responsible for the broad scale strategy, which is under development as of March 2016. The purposes of the broad scale strategy are to address:

- Monitoring needs most efficiently addressed for multiple plan areas at the same time or are beyond the technical feasibility of a single plan area
- Contribute to a broader understanding of the landscape surrounding national forests
- Provide information necessary to evaluate plan implementation

Questions and indicators that cite the broad scale strategy can be reviewed on the regional website: [www.fs.usda.gov/main/r8/landmanagement/planning](http://www.fs.usda.gov/main/r8/landmanagement/planning).

**Table 4.1 Monitoring Program**

Question	Indicators	Desired Condition/ Objective	Frequency
<b>(i) The status of select watershed conditions</b>			
Q1. What are the trends in conditions for hydrologic stability?	% stream segments using: <ul style="list-style-type: none"> <li>• NC index of Biotic Integrity</li> <li>• NCEPT rating: Ephemeroptera, Plecoptera, Tricoptera ratings</li> </ul>	<i>Goal/DC: SWF-6</i>	4-year
Q2. What are the trends for instream and streamside habitat conditions for selected stream segments?	% stream segments using: <ul style="list-style-type: none"> <li>• NC index of Biotic Integrity</li> <li>• NCEPT rating: Ephemeroptera, Plecoptera, Tricoptera ratings</li> </ul>	<i>Goal/DC: SWF-6</i>	4-year
<b>(ii) The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems</b>			
Q3. What are the conditions of longleaf pine ecosystems and the trends in restoring these systems?	Determine the Maintain, Improve, or Restore Condition Classes using the following key characteristics: <ul style="list-style-type: none"> <li>• Pine dominated canopy, open conditions</li> <li>• Understory dominated with small shrubs and grasses</li> <li>• Fire (prescribed fire) is dominant ecological process</li> </ul>	<i>Goal/DC Veg-2, &amp; Objective</i>  <i>Goal/DC: Veg-8 ; FM-1&amp; Objectives</i>	4- year
Q4. What are the conditions of oak-hickory forests and the trends of restoring those forests?	Determine the Maintain, Improve, or Restore Condition Classes using the following key characteristics: <ul style="list-style-type: none"> <li>• Canopy composition and density</li> <li>• Canopy gaps</li> <li>• Understory composition and density</li> </ul>	<i>Goal/DC: Veg-2 &amp; Objective</i>	4-year
Q5. What are the conditions of shortleaf pine woodlands and the trends for restoring these systems?	Determine the Maintain, Improve, or Restore Condition Classes using the following key characteristics: <ul style="list-style-type: none"> <li>• Dominate shortleaf pine canopy, open canopy (25-60% canopy closure)</li> <li>• Herbaceous layer of grasses</li> <li>• Fire return of 3-5 years</li> </ul>	<i>Goal/DC: Veg-2</i>	4-year
<b>(iii) The status of focal species to assess the ecological conditions under 36 CFR 219.9</b>			
Q6. What is the status of brown headed nuthatch	Species presence/absence	<i>Goal/DC: Veg-8</i>	2-year

Question	Indicators	Desired Condition/ Objective	Frequency
as a focal species for the function of longleaf pine ecosystems?	(R8 Breeding Bird Surveys)		
Q7. What is the status of Scarlet tanager as a focal species for the function of dry oak and oak hickory forests?	Species presence/absence (R8 Breeding Bird Surveys)	<i>Goal/DC: Veg-8</i>	2-year
Q8. What is the status of Acadian flycatcher as a focal species for the function of streamside forests?	Species presence/absence (R8 Breeding Bird Surveys)	<i>Goal/DC: Veg-8</i>	2-year
Q9. What is the status of Pileated Woodpecker as a focal species for the function of large canopy trees and presence of snags?	Species presence/absence (R8 Breeding Bird Surveys)	<i>Goal/DC: Veg-8</i>	2-year
Q10. What is the status of Northern Bobwhite Quail as a focal species for the conditions of early successional habitat?	Species presence/absence (R8 Breeding Bird Surveys)	<i>Goal/DC: Veg-8</i>	2-year
<b>(iv) The status of a select set of ecological condition required under 36 CFR 219.9 to contribute to the recovery of federally listed threatened or endangered species, conserve proposed and candidate species, and maintain a viable population of species of conservation concern.</b>			
Q11. What are the trends in Schweinitz's sunflower across the UNF?	Counts per populations	<i>Goal/DC: Veg-4 &amp; Objective</i>	2-year
12. What are the trends in element occurrences across the forest?	Extent of occurrences and threats	<i>Goal/DC: Veg-4 &amp; Objective</i>	2-year
Q13. Are botanical special interest areas fully functioning?	Use the following characteristics: <ul style="list-style-type: none"> <li>• Extent of element occurrences</li> <li>• Threats</li> <li>• NNIS</li> <li>• Use of fire in appropriate SIA's</li> </ul>	<i>Goal/DC: Veg-5</i>	2-year
Q14. What are the trends	Acres of treatment by plant location	<i>Goal/DC: Veg-3</i>	2-year

Question	Indicators	Desired Condition/ Objective	Frequency
in NNIS plants?		<i>&amp; Objective</i>	
<b>(v) The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives</b>			
Q15. What amount and kinds of visitor use activities are occurring on the UNF and how satisfied are people with their experiences?	NVUM Surveys National Visitor Use Monitoring program		6-year
Q16. What are the trends in trail conditions?	Miles of trail maintained to regional standards  Change in amount of trail maintenance backlog	<i>Goal/DC: TRL-2 &amp; Objectives</i>	2-year
Q17. What is the presence of completion of the Uwharrie National Recreation Trail?	Additions to the Uwharrie National Recreation Trail.	<i>Goal/DC: TRL-5</i>	2-year
<b>(vi) Measureable changes on the plan area related to climate change and other stressors that may be affecting the plan area</b>			
Q18. How has climate variability changed and how is it projected to change across the region?	This question will be addressed through the R8 Broad Scale Monitoring Strategy		
Q19. How is climate variability and change influencing the ecological, social, and economic conditions and contributions provided by plan areas in the region?	This question will be addressed through the R8 Broad Scale Monitoring Strategy		
Q20. What effects do national forests in the region have on a changing climate?	This question will be addressed through the R8 Broad Scale Monitoring Strategy		
<b>(vii-a) Progress toward meeting the desired conditions and objectives in the plan, including</b>			

Question	Indicators	Desired Condition/ Objective	Frequency
<b>providing for multiple use opportunities</b>			
Q21. How do actual costs of management compare with estimated costs?	Cost comparison for selected activities	<i>Legal requirement</i>	4-year
Q22. Are management practices in compliance with NC Forest Practices Guidelines related to Water Quality	Documented implementation and effectiveness at selective sites	<i>Legal requirement</i>	4-year
<b>(vii-b) Social, economic, and cultural sustainability must also be addressed in the monitoring program</b>			
Q23. What are the trends in protection, and/or stabilization and preservation of cultural or historic sites?	Number of High Priority Assets receiving maintenance	<i>Goal/DC: ARC-1 &amp; Objective</i>	2-year
Q24. What are the risks of wildfire that may affect local communities and what strategies may provide for community protections from wildfire?	Fire Regime Condition Class  Amount, timing, and location of prescribed fire	<i>Goal/DC: Veg-8 and FM-1)</i>	2-year
Q25. What changes are occurring in the social, cultural, and economic conditions in the areas influenced by national forests in the region?	This question will be addressed through the R8 Broad Scale Monitoring Strategy		
<b>(vii) The effects of each management system to determine that they do not substantially and permanently impair the productivity of the land (16 USC 1604(g)(3)(C))</b>			
Q26. Are there significant changes in soil productivity?	Percent detrimental soil disturbance at selected sites.	<i>Legal requirement</i>	2-year

## FOCAL SPECIES

In selecting focal species, emphasis has been placed on species that are closely associated with habitats of interest, and species that can produce meaningful data about the functioning of ecosystems of interest. Focal species for this plan are listed below along with the habitat they

would be used to assess.

**Table 4-2. Uwharrie Focal Species**

SPECIES	HABITAT
Pileated Woodpecker	Habitat specialist – snags and cavities
Brown-headed nuthatch	Longleaf pine woodland
Acadian flycatcher	Streamside forest
Northern Bobwhite Quail	Wildlife demand species
Scarlet tanager	Dry oak and oak-hickory forest

**Pileated woodpecker**

The pileated woodpecker, *Dryocopus pileatus*, has been selected as the species to provide information for assessing the function of snag dependent wildlife species. This bird species is known to inhabit deciduous, coniferous and mixed forests across its range. The pileated woodpecker is a snag dependent species that uses no less than four cavities per year making it an excellent species by which to gauge management effects on snags. Based on breeding bird surveys conducted on the Uwharrie NF from 1997-2008 (USDA 2010) the pileated woodpecker population on the national forest is currently stable to slightly increasing. Goal WLF-4 (“Den trees, snags, and downed wood are evident in most stands....”) and Vegetation/Wildlife Guideline 1 (“When restoring or thinning stands, standing live and dead den trees should be retained and clumped with other trees for protection.”) in this Revised Forest Plan would maintain and improve habitat for the pileated woodpecker which should encourage this trend.

**Brown-headed nuthatch**

The brown-headed nuthatch, *Sitta pusilla*, has been selected as the species to provide information for assessing the functioning system of longleaf pine savannas and woodlands. The primary habitat for this bird species in the coastal plain is the longleaf pine ecosystem (NatureServe 2010). The brown-headed nuthatch relies on cavities, especially in longleaf pine trees, making this species an excellent indicator of management for longleaf pine forests. This species has not been recorded often in the breeding bird surveys conducted on the Uwharrie NF from 1997-2008 (USDA 2010), this is expected due to the limited amount of longleaf pine woodlands currently available on the Uwharrie NF. It appears that the brown-headed nuthatch population, although small, is stable. Objectives proposed in this LRMP to restore longleaf pine ecosystems and continue maintenance of existing longleaf pine would lead to an increase in habitat and habitat quality for the brown-headed nuthatch which should lead to an increase in the current population.

### **Acadian flycatcher**

The Acadian flycatcher, *Empidonax vireescens*, has been selected as the species to provide information to assess the function of streamside forests. This bird species' habitat is near streams in mature deciduous and mixed forests (NatureServe 2010) making this species an excellent indicator of streamside forest management. Based on breeding bird surveys conducted on the Uwharrie NF from 1997-2008 (USDA 2010) the Acadian flycatcher population on the national forest is stable to slightly increasing. Establishment of the Streamside Management Area, as well as standards and guidelines for conservation of streamside ecosystems in this Revised Forest Plan, would lead to an increase in habitat quality for the Acadian flycatcher which should encourage this trend.

### **Northern Bobwhite Quail**

The northern bobwhite quail, *Colinus virginianus*, is a wildlife demand species that has been selected to provide information to assess the function of early successional habitat for species dependent on that habitat type. This bird species inhabits early successional and open woodland habitats (NatureServe 2010). Early successional habitat was more present on the landscape due to agriculture in the early to mid 1900's, however, this habitat is found less often today and quail are more often hunted in open woodland situations, similar to that of the longleaf pine forest found historically across the southern part of the Uwharrie NF. Hunting demand for this species makes it a good indicator for wildlife demand species. Based on breeding bird surveys conducted on the Uwharrie NF from 1997-2008 (USDA 2010) the northern bobwhite quail population on the national forest is slightly decreasing. Objectives in this Revised Forest Plan for restoration and maintenance of longleaf pine ecosystems, including increasing prescribed burning, would lead to an increase in habitat and habitat quality for the northern bobwhite quail which should reverse this trend.

### **Scarlet Tanager**

The scarlet tanager, *Piranga olivacea*, has been selected as the species to provide information for assessing the function of dry oak and oak-hickory forests. This bird species relies on deciduous forests, especially in areas with a fairly closed canopy, dense understory and high shrub diversity (NatureServe 2010) making this species an excellent indicator of dry oak and oak-hickory forests management. Based on breeding bird surveys conducted on the Uwharrie NF from 1997-2008 (USDA 2010) the scarlet tanager population on the national forest is stable. Objectives in this Revised Forest Plan for restoration of oak-hickory forests would lead to an increase in habitat and habitat quality for the scarlet tanager which should encourage population growth.

## **RESEARCH NEEDS (36 CFR 219.28)**

Develop cost-effective techniques for re-establishing an herb layer on a depauperate site such as determining the minimal plug planting density and/or seed sown.

Develop a regional fire return interval for fire adapted vegetation with a dendrochronology

study in fire adapted pine and oak habitats.

Fragmentation of native aquatic species populations by roads, trails, and other man-made barriers (e.g. old mill dams, etc.).

Impacts to the wilderness and wilderness values from dispersed recreation use.

Socio/economic impacts from the national forest recreation to the county.

Spread of nonnative invasives through recreation use and impacts to native ecosystems and T&E plant habitats.

Availability of secondary wood products on NFS lands to support biofuel technology. Enhancing natural regeneration