

## Appendix 1. Draft Monitoring Questions and Indicators

This attachment outlines only those monitoring questions and associated indicators that the Ottawa proposes to add, modify or delete. The existing, 44 monitoring questions are available on the Forest’s website (<http://www.fs.usda.gov/goto/ottawa/forestplan>; see Chapter 4 of the Forest Plan).

The information in this attachment is divided into three categories: **Proposed Monitoring Questions** - The first table outlines the proposed monitoring questions that address the eight required monitoring elements outlined in the 2012 Planning Rule; **Modification of Existing Monitoring Questions** - The second table identifies questions that have been modified because the focus of the proposed monitoring would change from what is listed in the Forest Plan; and **Deletion of Proposed Monitoring Questions** - The final table describes those monitoring questions that are proposed for deletion to comply with the 2012 Planning Rule, reduce redundancy or for other stated reasons.

A list of definitions has been provided on page 6 for reference.

**Table 1. Monitoring Questions Proposed to Address the Eight Required Monitoring Elements**

Proposed Monitoring Question(s)	Indicator(s)	Driver	Measurement & Reporting Frequency	Original Question Wording
What is the status of selected watershed conditions?	See below	<b>2012 Planning Rule Required Monitoring Element</b>  Status of select watershed conditions. (36 CFR 219.12(a)(5)(i))	See below	Not applicable; this is a new question.
a. To what extent are we moving riparian areas towards desired conditions?	Acres of riparian habitat improved.		Measure Annually/Report every 2-6 years	
b. To what extent are we restoring aquatic habitat connectivity?	Number of barriers removed for aquatic organism passage.			
	Number of stream miles reconnected.			
c. Does the relative abundance, density, and species richness of EPT within sampled reaches indicate plan objectives for stream water quality and habitat are being obtained? <sup>1</sup>	Extent of change in EPT abundance, density, and species.	Measure Annually/Report every 2-4 years	To what extent are forest management activities providing habitat for EPT.	

<sup>1</sup> EPT stands for Ephemeroptera, Plecoptera, Trichoptera; representing the Order names for mayflies, stoneflies and caddisflies, respectively.

Proposed Monitoring Question(s)	Indicator(s)	Driver	Measurement & Reporting Frequency	Original Question Wording
<p>To what extent are the key habitat components in aquatic and terrestrial habitat being provided?</p>	<p>a. The extent of large woody material in streams.</p>	<p><b>2012 Planning Rule Required Monitoring Element</b></p> <p>The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems. (36 CFR 219.12(a)(5)(ii))</p>	<p>Measure Annually/Report every 2-6 years</p>	<p>To what extent are the key terrestrial habitat components (e.g., soft mast, hard mast, snags, down woody material, low dense conifer regeneration) being provided?</p>
	<p>b. The extent of terrestrial large woody material provided (snags and down wood).</p>			
	<p>c. The extent of low dense conifer regeneration in areas of aspen regeneration.</p>			
<p>Are northern hardwood forest management activities promoting the regeneration of mid-tolerant tree species, specifically basswood, red oak, white pine and yellow birch?</p>	<p>Comparison of the seedling/sapling-sized, mid-tolerant tree species component in the understory and overstory of managed stands.</p>	<p><b>2012 Planning Rule Required Monitoring Element</b></p> <p>The status of focal species to assess the ecological conditions required under 36 CFR 219.9. (36 CFR 219.12(a)(5)(iii))</p>	<p>Measure every 5 years/Report every 10 years</p>	<p>Not applicable; this is a new question.</p>
	<p>Difference in the number of seedling/sapling-sized, mid-tolerant tree species in managed and unmanaged northern hardwood forest stands.</p>			

Proposed Monitoring Question(s)	Indicator(s)	Driver	Measurement & Reporting Frequency	Original Question Wording
To what extent is forest management contributing to the conservation of threatened and endangered species and moving toward desired habitat conditions and population trends for these species?	Acres of suitable Kirtland's warbler habitat.	<p><b>2012 Planning Rule Required Monitoring Element</b></p> <p>The status of 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. (36 CFR 219.12(a)(5)(iv))</p>	Measure every 1-5 years/Report every 2-6 years	No change to wording of original question.
What is the status of visitor use and visitor satisfaction?	a. Number of visitors participating in recreation activities.	<p><b>2012 Planning Rule Required Monitoring Element</b></p> <p>The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives. (36 CFR 219.12(a)(5)(v))</p>	Measure every 5 years/Report every 6 years	Not applicable; this is a new question.
	b. Percentage of overall visitor satisfaction.			
How is drought duration, severity, geographic extent or timing changing across the planning area on an annual basis?	The extent of effects from changes in drought.	<p><b>2012 Planning Rule Required Monitoring Element</b></p> <p>Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area. (36 CFR 219.12(a)(5)(vi))</p>	Measure annually/Report every 6 years	Not applicable; this is a new question.
How are the timing and duration of winter weather conditions changing across the planning area on an annual basis?	The extent of effects from changes in winter severity.	<p><b>2012 Planning Rule Required Monitoring Element</b></p> <p>Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area. (36 CFR 219.12(a)(5)(vi))</p>	Measure annually/Report every 6 years	Not applicable; this is a new question.

<b>Proposed Monitoring Question(s)</b>	<b>Indicator(s)</b>	<b>Driver</b>	<b>Measurement &amp; Reporting Frequency</b>	<b>Original Question Wording</b>
To what extent are forest management activities restoring vegetation composition and spatial landscape patterns and moving toward desired conditions at the Forest, management area and other appropriate landscape scales?	Comparison of current and desired percentages of forest types, by management area.	<b>2012 Planning Rule Required Monitoring Element</b>  Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities. (36 CFR 219.12(a)(5)(vii))	Measure every 5 years/Report every 6 years	No change to wording of original question.
Is Forest Plan implementation resulting in impacts that may substantially and permanently impair the productivity of the land?	Extent of soil disturbance affecting soil function and soil productivity on managed lands.	<b>2012 Planning Rule Required Monitoring Element</b>  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)).(36 CFR 219.12(a)(5)(viii))	Measure every 1-5 years/Report every 2-6 years	Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?

**Table 2. Monitoring Questions Modified to Address a Change to the Resources Monitored in the Future**

<b>Modification of Existing Monitoring Question</b>	<b>Indicator</b>	<b>Driver</b>	<b>Measurement &amp; Reporting Frequency</b>	<b>Original Question Wording</b>
To what extent is forest plan implementation affecting streams, lakes, ponds and wetlands and their associated riparian ecosystems?	Results of best management practices implementation and effectiveness monitoring in activity areas.	Links to Goals 3, 20, 21, 22, 23, and 24 of the Forest Plan, as well as the 2012 Planning Rule's Required Monitoring Element #1.	Measure every 1-5 years/Report every 2-6 years	To what extent is forest management affecting riparian and wetland ecosystems?

Modification of Existing Monitoring Question	Indicator	Driver	Measurement & Reporting Frequency	Original Question Wording
To what extent is forest plan implementation contributing or responding to the species of conservation concern and moving toward desired habitat conditions for these species?	Number of actions implemented from approved recovery plans, conservation strategies and/or Forest Plan direction.	Links to Goals 26, 28, 29, and 31 of the Forest Plan, as well as the 2012 Planning Rule's Required Element #4.	Measure Annually/Report every 2-6 years	To what extent is forest plan implementation contributing or responding to the conservation of species of viability concern (such as Regional Forester's Sensitive Species) and moving toward desired habitat conditions for these species?

**Table 3. Monitoring Questions Proposed for Deletion to Comply with the 2012 Planning Rule, Reduce Redundancy, or Address Other Needs**

Deletion of Proposed Monitoring Questions	Rationale
What are the effects of OHVs on the physical and social environment?	Combined into other monitoring questions addressing OHV effects.
To what extent are road and trail closures effective in prohibiting unauthorized motor vehicle use?	Combined into other monitoring questions addressing similar recreation topics.
Are the effects of Forest management, including prescriptions, resulting in significant changes to productivity of the land?	Combined into other monitoring questions addressing productivity.
To what extent are forest management activities providing habitat for Management Indicator Species (ruffed grouse).	The 2012 Planning Rule does not support continued monitoring of management indicator species.
To what extent are forest management activities providing habitat for Management Indicator Species (American marten).	The 2012 Planning Rule does not support continued monitoring of management indicator species.
To what extent are forest management activities providing habitat for Management Indicator Species (cutleaf toothwort).	The 2012 Planning Rule does not support continued monitoring of management indicator species.
To what extent does the Forest emphasize agency, tribal and public involvement and intergovernmental coordination with federal, state, county governments and agencies?	There is no meaningful measure that can be compared over the lifetime of the Plan in order to determine improvement.
To what extent is the Forest providing a range of motorized and nonmotorized recreation opportunities that incorporate diverse public interests yet achieve applicable management area objectives and desired conditions?	Combined into other monitoring questions addressing similar recreation topics.

Deletion of Proposed Monitoring Questions	Rationale
To what extent are Forest management activities in semi-primitive nonmotorized management areas in alignment with the Recreation Opportunity Spectrum Objectives?	Combined into other monitoring questions addressing similar recreation topics.
To what extent is Forest management contributing to the preservation, evaluation of, and education for heritage resources?	Combined into other monitoring questions addressing similar topics.
To what extent is forest management maintaining or restoring conditions that result from or emulate natural ecological patterns and processes such as fire, wind, flooding, and insect and disease outbreaks?	It is difficult to provide a meaningful measure for emulating natural processes due to the effects of climate change.
To what extent is forest management utilizing the Ecological Classification System and its components to implement ecosystem based management?	Combined into other monitoring questions addressing productivity.
How is forest plan implementation affecting soil quality (by management system)?	Combined into other monitoring questions addressing productivity.
To what extent is forest management providing ecological conditions to maintain viable populations of native and desired non-native species? (a. Botany) (b. Breeding Bird Census) (c. Frogs) (d. Bobcat).	The 2012 Planning Rule focuses on monitoring for ecological conditions, particularly when it relates to common species; not species monitoring.
To what extent are OHVs producing impacts to wildlife or wildlife habitats?	Combined into other monitoring questions addressing OHV effects.
How have fire suppression tactics been implemented on the Forest relative to the threat posed to human life, property, or threatened resources?	This is not relevant to plan implementation monitoring; instead, accomplishments are captured by other program review.
To what extent are road and trail closures effective in prohibiting unauthorized motor vehicle use?	Combined into other monitoring questions addressing similar recreation topics.

**Key**

**Monitoring Question:** A specific question developed to ensure that monitoring and evaluation address information essential to measuring the effects of Forest Plan implementation.

**Monitoring Indicator:** A statement used in concert with the monitoring question to measure trends, either quantitatively or qualitatively.

**Driver:** Identifies the reasons why we are monitoring a particular element, such as legal requirements for the 2012 Planning Rule.

**Measurement and Reporting Frequency:** How often monitoring information is collected (Monitoring Frequency) and evaluated for reporting (Reporting Frequency).

**Original Question Wording:** If noted, this original wording is from the existing 2006 Forest Plan monitoring program.