

Monitoring Questions	Element	Task #	Method of Collection	Reporting Frequency	Precision/ Reliability	Responsibility
4 & 25	Trends in the conditions of Special Biological Areas	1	Annually schedule site visits to track locations, composition and condition of selected sample of Special Biological Areas utilizing standard GIS coverage and NRIS Terra, FSVeg and Fauna databases. Utilize standard reports for reporting.	5 Year Intervals	Moderate	Forest Ecologist or Botanist
1	Status and trend in the extent and condition of ecological systems.	2	Map and update changes through annual routine inventories. Monitor acres by major forest and woodland community type and trends	5 Year Intervals	Moderate	Forest Silviculturist
2 & 3	Acres of silvicultural treatments implemented by activity type and forest type	3	Summarize acres of treatments by major community type utilizing established activity tracking systems.	Annual	Moderate	Forest Silviculturist
2 & 3	Acres burned (wildfire and prescribed fire) by forest type and season of burn compared to desired fire regimes	4	Acres burned (wildfire and prescribed) by ecological system. Maps of prescribed burn units are incorporated into the GIS data base annually, by the end of the burning season. Total acres are determined from a GIS query.	Annual	Moderate	Forest Ecologist
6 & 25	Trends in MIS populations in relationship to the ecological system/condition MIS was selected to indicate.	5	Annual Breeding Bird Survey occurrence trends for selected MIS compared to status and trends in forest cover acreage in Task #3.	5 Year Intervals	Moderate	Forest Ecology Group
4, 5 & 25	How many acres of high-elevation early successional habitats exist and what are the trends in their abundance and condition	6	Map and update changes through periodic routine inventories. Monitor acres and trends.	5 Year Intervals	Moderate	Forest Silviculturist
3	Acreage of existing and potential old growth by forest community class	7	Rerun FSVeg analysis periodically or as needed	5 Year Intervals	Moderate	Forest Silviculturist
3	Trends in hard mast production capability	8	Map and update changes in forest composition and condition through annual routine inventories. Infer mast production capability from the status of older age classes of oak forest community types	5 Year Intervals	Moderate	Forest Silviculturist

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4 & 5	Abundance of snags and downed wood	9	Map and update changes in forest successional conditions and area impacted by insect and disease through routine annual inventories. Infer snag and downed wood by the acres of late-successional stage forests and mortality due to insects and disease	Annual	Moderate	Forest Silviculturist
13, 14 & 25	Conditions and trends in the overall health of streams including trends in water quality parameters and physical habitat conditions in relationship to aquatic communities	10	Water quality sampling, emphasis on nitrogen, sulfur, and mercury compounds. Aquatic macroinvertebrate sampling (EPA's Rapid Bioassessment Protocol II (EPA 1989) with modifications by Smith & Voshell (1997)). Systematic stream fish community inventories, stream stability, streambed structure and large woody debris as appropriate. Sample selected streams on a periodic basis and use fixed sampling points - coordinate locations with other aquatic monitoring.	Annual	High to Moderate	Forest Ecology Group
13, 14 and 25	Trends in presence and abundance of wild trout in relation to acidification of stream systems and the application of mitigating measures.	11	Sample selected streams on a periodic basis for wild trout and pH in high elevation streams using systematic stream fish community inventories.	As Available	High	Forest Aquatic Biologist
13, 14 & 25	Trends in air pollution effects on forest soil and vegetation.	12	Complete assessment of watersheds at risk from acid deposition. Sample soil water and vegetation in high risk areas.	As Available	High to Moderate	Forest Ecology Group & Silviculturist
13, 14 & 25	Trends in air pollutants (ozone, fine particulates, and acid deposition).	13	Summarize air quality monitoring data from sites on or near the Forest, especially acid deposition and ozone.	Annually	High to Moderate	Zone Air Specialist
9 & 10	Conditions and trends of forest fuels and acres of fuels treated through the use of wildland fire and mechanical treatment	14	Fuel monitoring following Regional protocol. Acres of fuels treated through the use of wildland fire and mechanical treatment mapped into the GIS data base reports generated through GIS/NRIS FSveg queries.	Annual	Moderate	Forest Fire Management Group
7, 8, 11, 12 & 25	What are the trends in insect and disease effects? [36 CFR 219(k)(5)(iv), 36 CFR 219.20(b)]	15	Map and update trends in insect and disease outbreaks and epidemics using routine inventory methods as part of Forest Health Monitoring Program.	Annual	High	Forest Health Program

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4 & 5	Population status of shale barren rock cress and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	16	Support monitoring efforts outlined in recovery plan and visit an average of 20% of known sites on GWNF annually.	Annual	Moderate	Forest Botanist
4 & 5	Population status of James spinymussel and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	17	Support monitoring efforts outlined in recovery plan as feasible given that known locations are not on the GWNF.	Annual	Moderate	Forest Aquatic Biologist
4 & 5	Population status of Virginia big-eared bat and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	18	Support monitoring efforts outlined in recovery plan as feasible given that known hibernacula are not on the GWNF.	Annual	Moderate	Forest Biologist
4 & 5	Population status of Indiana bat and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	19	Follow recovery plan and protocols of Indiana bat Recovery Team. Support biennial surveys of all Indiana bat hibernacula. Yearly surveys for 3 years on newly gated hibernacula, then biennial.	2 Year Intervals	Moderate	Forest Ecologist
4 & 5	Population status of northeastern bulrush and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	20	Support monitoring efforts outlined in recovery plan and visit known sites on GWNF at least once every five years.	Annual	High	Forest Botanist
4 & 5	Population status of Virginia sneezeweed and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	21	Support monitoring efforts outlined in recovery plan and visit known sites on GWNF at least once every five years.	Annual	High	Forest Botanist
4 & 5	Population status of swamp pink and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	22	Support monitoring efforts outlined in recovery plan and visit an average of 20% of known sites on GWNF annually.	Annual	High	Forest Botanist
4 & 5	Population status of smooth coneflower and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	23	Support monitoring efforts outlined in recovery plan and visit known sites on GWNF at least once every five years.	Annual	High	Forest Botanist
4 & 5	Population status of Virginia northern flying squirrel and progress towards recovery. [MIS - 36 CFR 219.19(a)(6)]	24	Support monitoring efforts outlined in recovery plan and visit known sites on GWNF at least once every five years	Annual	High	Forest Biologist

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4 & 5	Presence/absence of golden-winged warblers in suitable habitats.	54	Standardized surveys for Golden-winged warblers using transects and playback in high-elevation early successional habitats. Habitat characterized at occupied sites.	5 Year Intervals	High	Forest Ecology Group
4 & 5	Presence/absence of cerulean warblers in suitable habitats.	55	Using standardized survey methods, determine presence/absence of cerulean warbler in optimum habitats. If present, determine habitat relationships.	5 Year Intervals	High	Forest Ecology Group
6 & 26	Trends in harvest data for demand MIS in relationship to habitat improvement activities for those animals? [MIS - 36 CFR 219.19(a)(6)]. (See Table 5-6 in Chapter 5).	25	Collect harvest data from Cooperating State Agency related to annual accomplishments for habitat improvement tracked with standard tracking systems	5 Year Intervals	High	Forest Biologist
16, 17, 24 & 26	Results and trends in user satisfaction ratings [36 CFR 219.21(a)]	26	Analysis of NVUM customer satisfaction data for Day Use, Overnight General Forest Area, and Wilderness programs and local Customer Satisfaction survey tools.	5 Year Intervals	Low/Moderate	SO-Recreation Staff
16, 17 & 26	Are semi-primitive recreation settings and backcountry recreation opportunities maintained or increased?	27	Analysis of road construction, reconstruction, and maintenance activities in relation to semi-primitive (SPNM, SPM, & SP2) ROS settings through review of site-specific projects.	Annual	High	Forest Recreation Staff
20, 21, 23 & 26	Are motorized and nonmotorized trails being maintained?	28	Analysis of INFRA Deferred Maintenance Report and reporting of per cent change in backlog.	Annual	High	Forest Recreation Staff
22	Where is unauthorized use occurring?	29	Analysis of law enforcement citations	Annual	Moderate	Forest Recreation Staff
16, 17 & 26	Is wilderness visitor use within limits that do not impair the values for which the wilderness was established? [36 CFR 219.18(a)]	30	Analyze trends in wilderness visitor use and compile summary report using GIS mapping (number and location of concentrated use areas) and use of visitor satisfaction results using NVUM and wilderness trailhead registration data.	5 Year Intervals	Moderate	Forest Recreation Staff

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1	Trends in fire regimes and effects on fire dependent communities in Wilderness	31	Annual summary report of number of Wildland Fire Use Fires and acres and number of management ignited fires and season of burn.	Annual	Moderate	Forest Fire Management Group
13, 14 & 25	Trends in air quality related values in Class 1 Wilderness areas [36 CFR 219.27(a)(12)]	32	IMPROVE national aerosol monitoring network, water quality sampling for acid deposition, vegetation sampling for ozone & long-term trends, soil water sampling.	As Available	High to Moderate	Zone Air Specialist & National data analysis
16, 17 & 26	Acres of National Forest land that meet or exceed established scenic quality objectives [36 CFR 219.27(c)(6), 36 CFR 219.27(d)(1)]	33	Treatment and location data entered in activity tracking system at time treatment completed. Summary report of project acres that meet or exceed the assigned SIO.	Annual	Low/ High	Forest Landscape Architect
17 & 26	Are heritage sites being identified for protection? Are protection measures effective? [36 CFR 219.24(a)(4)]	34	Heritage inventories and surveys pursuant to 106 for all ground disturbing projects are reviewed by SHPO/THPO per Regional PA and Forest MOUs. Sample field condition assessment of sites eligible or listed in National Register. Review of preservation/maintenance plans completed. Condition assessments on Priority Heritage Assets are current and allocated to mgmt category to guide the asset's protection and use.	Annual	High	Forest Archeologist
13, 14 and 25	Condition and trend of chemical resilience of watersheds across the Forest as indicated by chemical parameters	35	Water quality sampling protocol	Periodic	Moderate/ High	Forest Hydrologist
14	Effect of management activities on soil quality and productivity [36 CFR 219.12(k)(2), 36 CFR 219.27(a)(1)]	36	Assess projects for long term effects to soil productivity. Compare assessments to NEPA estimates.	Periodic or at random	Moderate/ High	Forest Soil Scientist
14 & 23	Are temporary roads being revegetated within 10 years of contract or permit termination? [36 CFR 219.27(a)(11)]	37	Sample projects during program reviews to determine and document that standard is being met.	Annual	Moderate	Forest Soil Scientist and Forest Engineer
14	Are State BMPs and Forest Standards being implemented to protect and maintain soil and water resources? [36 CFR 219.27(a)(4), 36 CFR 219.12(k)(2)]	38	Field inspection of project sites following established monitoring protocol. Review of sample of project documents and related EAs/EISs for compliance with BMPs and standards.	Annual	Moderate/ High	Forest Hydrologist and Soil Scientist

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14	Are Standards (BMPs) Effective minimizing non-point source pollution?	39	Sample project activities related to BMPs for effectiveness of BMPs and standards. 1) Visual inspection of implemented standards, 2) Measured effects of standards, and/or 3) Aquatic biota inventories.	Periodic or at random	Moderate	Forest Hydrologist and Soil Scientist
19 & 20	Are forest products being produced within predicted ranges? [36 CFR 219.27 (c)(2)]	40	Sales Tracking and Reporting System	Annual	High	Forest Timber Management Staff
14	Are livestock management systems and improvements adequately protecting riparian areas and aquatic habitats?	41	Pastures monitored annually for livestock damage.	Annual	High	Forest Soil Scientist
14 & 23	Are roads being maintained, constructed or reconstructed to reduce sediment delivery to water bodies and to provide a transportation system that supplies safe and efficient access for forest users while protecting forest resources. [36 CFR 219.27 (a)(10)]	42	Miles of National Forest System Roads (NFSR) exist compared to miles maintained to their objective maintenance level. Miles of road improved. Routine condition surveys on 25-33% of roads per year. Miles of road decommissioned (classified and unclassified) with reasons for decommissioning. Miles of right-of-way settled and acres of National Forest land accessed as a result.	Annual	Moderate	Forest Engineer
19, 20 & 26	Were special use authorizations processed in a timely manner?	43	Review of requests received and process time elapsed to decision.	5 Year Intervals	High	Forest Lands Staff
18, 19 & 26	Are National Forest System lands being managed to improve management effectiveness and enhance public benefits?	44	Miles of boundary surveyed. Title claims and encroachments resolved. Acres of lands acquired and reasons for acquisition. Lands conveyed and reasons for conveyance.	Annual	High	Forest Lands Staff
18 & 26	How do estimated and actual costs of plan implementation compare? [36 CFR 219.12(k)3]	45	Review of projected forest plan costs compared to actual costs and annual budgets.	5 Year Intervals	Moderate	Forest Planning Staff
3 & 15	Are lands being adequately restocked within 5 years of regeneration treatments? [36 CFR 219.27(c)(3)]	46	Routine regeneration examinations following standard protocols.	Annual	High	District Silviculturists

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3 & 15	Are lands not suited for timber production classified as such? [36 CFR 219.12(k)5(ii)] Have lands identified as not suitable for timber production become suitable? [36 CFR 219.14 (a)(d), 36 CFR 219.27(c)(1)]	47	Routine timber stand inventory and prescription documented in CISC. Review changes every ten years.	10 Year Intervals	Moderate	District Silviculturists and Forest Silviculturist
3 & 15	Are harvest unit sizes within the allowable limits? [36 CFR 219.12(k)5(iii)] Should maximum harvest unit size limits be continued? [36 CFR 219.27(d)]	48	Annual field inspection of selected site-specific projects. Document needs for change in annual Monitoring and Evaluation Report if appropriate.	As Appropriate	Moderate	Forest Silviculturist, Planning IDT
3 & 15	Are appropriate harvest methods used on the Forest? [36 CFR 219.27]	49	Annual field inspection of selected site-specific projects. Document needs for change in annual Monitoring and Evaluation Report if appropriate.	As Appropriate	Moderate	Forest Silviculturist, Planning IDT
	Determine whether standards, guidelines, and management requirements are being met and are effective in achieving expected results. [36 CFR 219.27 (a)(6)]	50	Annual field inspection of selected site-specific projects. Document needs for change in annual Monitoring and Evaluation Report if appropriate.	As Appropriate	Moderate	Planning IDT
	Determine when changes in GPRA, policies, or other direction would have significant effects on Forest Plans. [36 CFR 219.10(g)]	51	5 year review	5 Year Intervals	Moderate	Forest Planning Staff
	Determine if planning information or physical conditions have changed. [36 CFR 219.10(g)]	52	5 year review	5 Year Intervals	Moderate	Forest Planning Staff
	During monitoring determine research needs. [36 CFR 219.28]	53	Document research needs in annual Monitoring and Evaluation Report if appropriate.	As Appropriate	Moderate	Planning IDT
26	Identify plan contributions to the social, cultural and economic sustainability of communities, which is part of monitoring the progress toward meeting the desired conditions and objectives,		The Region 8 Broader-Scale Monitoring Strategy will address and evaluate this monitoring questions. The Forest will incorporate in the Forest Evaluation Report.	TBD	TBD	Region 8

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	including providing multiple use opportunities. [36 CFR 219.12(a)(5)(vii)]					
27, 28 & 29	Identify 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)]		The Region 8 Broader-Scale Monitoring Strategy will address and evaluate these monitoring questions. The Forest will incorporate in the Forest Evaluation Report.	TBD	TBD	Region 8