

# White River Forest Plan: Updated Monitoring Plan

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# Introduction and background on Forest plan monitoring under the 2012 rule

## Introduction

The 2012 Planning Rule includes a requirement that all Forests that are not in plan revision update their forest plan monitoring within four years, or as soon as is practicable (36 CFR 219.12c). This document updates our forest plan monitoring to meet this requirement of the 2012 rule.

## The Role of Monitoring under the 2012 Planning Rule

The National Forest Management Act requires “continuous monitoring and assessment in the field” to evaluate “the effects of each management system to the end that it will not produce substantial and permanent impairment of the productivity of the land” (16 USC 1604(g)(3)(C)). The 2012 rule includes a three-part iterative cycle of assessment, planning, and monitoring in a continuous feedback loop. Monitoring is meant to support the assessment process and evaluate plan implementation over time. This planning framework is designed to “inform integrated resource management and allows the Forest Service to adapt to changing conditions, including climate change, and improve management base on new information and monitoring” (§ 219.5 (a)).

## Specific Requirements for Monitoring under the 2012 Rule

A monitoring plan will consist of “monitoring questions and associated indicators” which “must be designed to inform the management of resources on the plan area, including by testing relevant assumptions, tracking relevant changes, and measuring management effectiveness and progress toward achieving or maintaining the plan’s desired conditions or objectives” (219.12 (a)(2)). The monitoring program must also be “coordinated with the regional forester and Forest Service State and Private Forestry and Research and Development” (§ 219.12 (a)(1)) and support and align with a broader-scale monitoring program, to be developed at the regional level, that will address monitoring questions at a geographic scale broader than one plan area (§ 219.12 (b)). Furthermore, in developing the monitoring plan, the responsible official should also provide opportunities for public participation, “taking into account the skills and interests of affected parties”, as well as the scope, methods, forum and timing of those opportunities (§ 219.4 (a)).

Monitoring may involve evaluating: if standards and guidelines are implemented (implementation monitoring); if management actions and standards and guidelines are effective in achieving goals and objectives (effectiveness monitoring); the long term trend and condition of key resources (condition or surveillance monitoring). At a minimum, the plan monitoring

program must contain one or more monitoring questions and associate indicators addressing the following eight items (see §219.12[a][5][i-viii]):

- (i) —The status of select watershed conditions;
- (ii) —The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems;
- (iii)—The status of focal species to assess the ecological conditions required under § 219.9;
- (iv)—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;
- (v)—The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives;
- (vi)—Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area;
- (vii)—Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities;
- (viii)—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)).

A monitoring evaluation report is to be produced and made available to the public every two years (§ 219.12 (d)). It “must indicate whether or not a change to the plan, management activities, or the monitoring program, or a new assessment, may be warranted based on the new information... [and] must be used to inform adaptive management of the plan area” (§ 219.12 (d)(2)). The monitoring program and evaluation report are part of the administrative record (§ 219.14 (b)) and the Forest Supervisor must document “how the best available scientific information was used to inform planning, the plan components, and other plan content, including the plan monitoring program” (§219.13 (a)(4)).

Forests will also have to document how Best Available Scientific Information (BASI) is used to develop the monitoring plan and specific monitoring items.

This Updated Monitoring Plan will replace Chapter 4 Monitoring and Evaluation of the Land and Resource Management Plan 2002 Revision for the White River National Forest

## Monitoring plan components

The following section details the specific components of the monitoring plan. Specific monitoring items are organized by the required categories of monitoring questions identified in the planning rule (§ 219.12), with at least one monitoring question and indicator for each category. For each question, there will be a brief description of the desired condition or objective each monitoring item is associated with, followed by the question, a description of the specific indicator or metric used to answer or evaluate the monitoring question, the data source or measurement protocol associated with the monitoring item, and finally, a rationale or justification for the specific monitoring indicator and protocol. This will ensure that the requirements for best available science are met.

## I. The status of select watershed conditions

### 1. Watershed condition framework

**Related Plan Components:** Goal 1 “Ecosystem Health”, Objective 1a “Improve and protect watershed conditions to provide the water quality and quantity and soil productivity necessary to support ecological functions and intended beneficial uses.”

**Monitoring Question:** Is the unit improving condition in priority watersheds?

**Indicator:** Completion of the number and percentage of essential projects identified in Watershed Restoration Action Plan(s).

**Data Sources/Protocol:** List of accomplishments from appropriate resource staff.

**Background and rationale:** The 2012 Planning Rule requires identification of priority watersheds using the Watershed Condition Framework (WCF) approach. WCF provides consistent methodology for National Forests to evaluate improvements in watershed condition.

### 2. National BMP program

**Related Plan Components:** Goal 1, Objective 1a.

**Monitoring Question:** Are Best Management Practices (BMPs) implemented, and are they effective at protecting water quality?

**Indicator:** Monitoring protocols rating system

**Data Sources/Protocol:** [National Best Management Practices for Water Quality Management on National Forest System Lands \(2012\)](#).

**Background and rationale:** The purpose of this set of Best Management Practices (BMPs) is to avoid, minimize, or mitigate adverse effects to soil, water quality, and riparian resources that may result from construction and maintenance activities in aquatic ecosystems.

The National BMP Program will provide consistency among Forest Service administrative units to efficiently administer the program and demonstrate improvements in performance and accountability at multiple scales. The National BMP Program consists of four main components: (1) a set of National Core BMPs, (2) a set of standardized monitoring protocols to evaluate implementation and effectiveness of those BMPs, (3) a data management and reporting structure, and (4) corresponding national direction.

### 3. Watershed Condition Class

**Related Plan Components:** Goal 1, Objective 1a. Strategy 1a.3 Identify and Over the life of the plan, monitor watershed condition in all watersheds. Evaluate degraded watersheds for improvement potential. Where restoration work has been applied, assess trends towards positive watershed condition.”

**Monitoring Question:** Is the unit maintaining or improving watershed condition class in non-priority watersheds?

**Indicator:** Percentage of subwatersheds maintained or improved.

**Data Sources/Protocol:** Watershed Condition Framework (WCF) updates every five years.

**Background and rationale:** The WCF condition classes were developed in 2010 and are updated (theoretically) every five years. Since the reporting period is every two years, condition class data will be rolled over for many reporting periods.

## II. The status of select ecological conditions

### 1. Air Quality

**Related Plan Components:** Physical, Air Resources, Standard 1. “Meet state and federal air quality standards and comply with local, state, and federal air quality regulations and requirements either through original project design or through mitigation for such activities as prescribed fire, ski area development or expansion, mining, and oil and gas exploration and production.”

**Monitoring Question:** What are the conditions and trends for visibility in Class I and selected Class II areas on the unit?

**Indicator:** Deciview graph displaying trend data for visibility.

**Data Sources/Protocol:** VIEWS database: <http://views.cira.colostate.edu/>

**Background and rationale:** The White River National Forest’s management activities are not a central driver of air quality, but the monitoring data collected for this program helps inform management actions.

### 2. Forest and Grassland Health

**Related Plan Components:** : Goal 1, Objective 1d “Increase the amount of forest and rangelands restored to or maintained in a healthy condition with reduced risk and damage from fires, insects, disease, and invasive species.”

**Monitoring Question:** What are the status and trends of insects and disease in and around the plan area?

**Indicator:** Type of outbreak, acres, and location

**Data Sources/Protocol:** Maps and GIS shapefiles at <http://www.fs.usda.gov/detail/r2/forest-grasslandhealth/>

**Background and rationale:** Data collected at the regional level for Broad Scale Monitoring.

### 3. Ecosystem Health

**Related Plan Components:** Goal 1 “Ecosystem Health”, Objective 1d.

**Monitoring Question:** How are major vegetation types on the planning unit changing over time?

**Indicator:** Acres, age class, size class, structural stages

**Data Sources/Protocol:** GIS mapping based on FSVEG spatial, including new mapping for forested veg types.

### III. The status of focal species

Focal species are identified as indicators for ecosystem health and integrity; effects of management; effectiveness of plan components; progress toward meeting desired conditions.

#### 1. Macroinvertebrates

**Related Plan Components:** Goal 1, Objective 1b “Provide ecological conditions to sustain viable populations of native and desired nonnative species and to achieve objectives for Management Indicator Species (MIS) and focal species.

**Monitoring Question:** Is Forest management contributing to conditions that maintain or improve biological stream health trends for lotic macroinvertebrate communities?

**Indicator:** Aquatic macroinvertebrate richness; Presence/Absence of indicator species; CDPHE aquatic life standards

**Data Sources/Protocol:** USFS macroinvertebrate surveys; USFS standardized data collection protocols

**Background and rationale:** Based on a number of long term data sets that have indicated static or changing levels of stream health over time, this quantitative monitoring approach gives the forest a rigorous multi variate dataset and successfully evaluates biological stream health over time.

#### 2. Red Squirrel

**Related Plan Components:** Goal 1, Objective 1b

**Monitoring Question:** What do red squirrel populations tell us about the extent and condition of mid to late successional forested ecosystems on the planning unit?

**Indicator:** Extent, density and occupancy of red squirrels

**Data Sources/Protocol:** Bird Conservancy of the Rockies (BCR) red squirrel surveys

**Background and rationale:** Collected in BCR Surveys and are a suitable focal species.

### 3. Pika

**Related Plan Components:** Goal 1, Objective 1b

**Monitoring Question:** What is the status of American pika populations as an indicator for alpine ecosystem integrity?

**Indicator:** Extent, density and occupancy of American pika

**Data Sources/Protocol:** BCR pika surveys

**Background and rationale:** Collected by BCR and may be important to understanding the effects of climate change in alpine ecosystems

### 4. Avian Species

**Related Plan Components:** Goal 1, Objective 1b

**Monitoring Question:** What are the status and trends of select avian species on the White River National Forest?

**Indicator:** Species richness, density and occupancy of, and trends of bird communities; Monitored species may include American pipit (alpine), hairy woodpecker (all forest types), golden-crowned kinglet (late seral conifer), mountain bluebird (open forests), Brewer's sparrow (sagebrush), and common flicker (cavity excavator).

**Data Sources/Protocol:** BCR avian monitoring program data; USFS bird survey data

**Background and rationale:** Using BCR data for terrestrial wildlife focal species allows the forest to leverage a key partnership and expertise.

## IV. The status of select ecological conditions for TES and SPCCs

### 1. Cutthroat Trout

**Related Plan Components:** Goal 1, Objective 1c “Help ensure viability of species of concern for the White River National Forest”

**Monitoring Question:** What is the status and trend of cutthroat trout across the planning area?

**Indicators:** Number of conservation populations in the planning area; Miles of occupied habitat; Presence/absence of aquatic nuisance species and/or non-native trout Elevation, snow depth inches, and snow-water-equivalent (SWE)

**Data Sources/Protocol:** USFS sensitive species monitoring data; Colorado Parks and Wildlife (CPW) cutthroat monitoring data; FWS Recovery Plan; CRCT Conservation Agreement

**Background and rationale:** The forest plans to continue monitoring trout populations in cooperation with CPW aquatic biologists and increasing our monitoring of native cutthroat populations.

### 2. Amphibians

**Related Plan Components:** Goal 1, Objective 1c.

**Monitoring Question:** What is the status and trend of boreal toads and northern leopard frogs being across the planning area?

**Indicators:** Number of active breeding populations in the panning area; Presence/absence of chytrid fungus

**Data Sources/Protocol:** CNHP survey data; CPW survey data; USFS survey data; Future eDNA testing based on new research

**Background and rationale:** The forest conducts boreal toad surveys annually and provides this data to CPW. It also participates in the Boreal Toad Conservation Plan working group and provide valuable information regarding management decisions and population status.

### 3. Canada Lynx

**Related Plan Components:** Goal 1, Objective 1c.

**Monitoring Question:** What is the status and trend of early successional conifer and late seral spruce-fir forests to promote recovery of Canada lynx?

**Indicator:** Extent and condition of early successional and late seral spruce-fir forests; Habitat connectivity; Dense horizontal cover

**Data Sources/Protocol:** FS Veg Spatial; Project impacts or mitigation; Habitat improvements; FWS consultation history; Future FWS Recovery Plan

**Background and rationale:** Monitoring Canada Lynx will help the forest meet the Endangered Species Act obligations and the Southern Rockies Lynx Amendment.

## V. Visitor use, visitor satisfaction, and progress toward meeting recreation objectives

### 1. National Visitor Use and Satisfaction Monitoring

**Related Plan Components:** Goal 2 “Multiple Benefits to People”, Objective 2a “Improve the capability of the national forests and grasslands to provide diverse, high quality recreation opportunities.”

**Monitoring Question:** What is the level and trend of visitor use and satisfaction for high quality recreational opportunities on the unit?

**Indicators:** Visitor Satisfaction, Number of visitors, Demand within the Forests niche. Collected within NVUM report every 5 years.

**Data Sources/Protocol:** National Visitor Use Monitoring (NVUM) surveys and 5 year reports

**Background and rationale:** The purpose of this monitoring objective is to be able to identify recreation trends so the forest can prioritize and adapt management actions as needed to sustain the high quality and high demand recreation opportunities visitors seek within the forests niche.

### 2. Special Uses Administration

**Related Plan Components:** Goal 2, Objective 2c “Improve the capability of national forests and rangelands to sustain desired uses, values, products, and services.”

**Monitoring Question:** What are the number and type of Special Use Permits administered to standard?

**Indicator:** Permits administered to standard, number of service days permitted, type of permit.

**Data Sources/Protocol:** INFRA, Administering Recreation Special Use Permits To Standard Best Practices

**Background and rationale:** Special use permits provide the public high quality opportunities on the White River National Forest and support the local economy. Administering these permits to standard is key to maintaining these experiences.

### 3. Sustaining Recreation Infrastructure

**Related Plan Components:** Goal 2 Objective 2a

**Monitoring Question:** How is the forest trending towards implementing a sustainable program for recreation related infrastructure?

**Indicator:** Site Condition Survey results

**Data Sources/Protocol:** INFRA, Site Condition Survey is completed a minimum of once every five years for all developed recreation sites, including trailheads. Data sources would also include results and implementation of Recreation Site Analysis (RSA) or similar assessment and implementing trail prioritization program, number of agreements, permits etc. that convey management to other outside entities.

**Background and rationale:** The status of recreation infrastructure is a key factor in determining whether the forest is making progress towards goals for providing quality recreation opportunities.

## VI: Measureable changes on the plan area related to climate change and other stressors

### 4. Snowpack and Precipitation

**Related Plan Components:** Goal 1, Objective 1e “Work cooperatively with individuals, organizations, local, state, tribal, and other federal agencies to promote ecosystem health and sustainability across landscapes.”

**Monitoring Question:** What are the status and trends of snowpack and precipitation in the planning area?

**Indicator:** Elevation, snow depth inches, and snow-water-equivalent (SWE)

**Data Sources/Protocol:** Monthly summarized basin data reports currently available from NRCS SNOTEL sites

**Background and rationale:** SNOTEL information will be available through Regional Office broader-scale monitoring strategy.

## VII. Progress toward meeting desired conditions and objectives

### 1. Economic Contributions from Specific Programs

**Related Plan Components:** Goal 5, “Public Collaboration.” Objective 5a “Work cooperatively with individuals and organizations, local, state, tribal, and federal governments to promote ecological, economic, and social health and sustainability across landscapes.”

**Monitoring Question:** What are the contributions from the range, timber, recreation, and minerals program from the National Forest or Grassland?

**Indicator:** Employment, income, and contribution to gross domestic product (GDP)

**Data Sources/Protocol:** FEAST and IMPLAN models and appropriate resource coefficient

**Background and rationale:** This analysis will be completed by the Regional Office and made available for the biennial monitoring report.

### 2. Heritage Program Stewardship

**Related Plan Components:** Heritage Program, Standard 1: “Conduct all land management activities in such a manner as to comply with all applicable federal, state and local regulations. Many heritage resources values can be protected effectively through application of the provisions of these regulations:”

**Monitoring Question:** To what extent have management activities on the Forest complied with Section 110 of the National Historic Preservation Act and provided quality heritage recreational experiences?

**Indicator:** Number of heritage stewardship actions taken, including preservation, stabilization, research, interpretation, partnerships, volunteer opportunities, and other forms of public outreach.

**Data Sources/Protocol:** National Resource Manager Database, Heritage Program reports – frequency 10 years.

**Background and rationale:** Heritage Program Managed to Standard Measure

### 3. Travel Management Implementation

**Related Plan Components:** Goal 4; “Effective Public Service”, Objective 4a; “Improve the safety and economy of Forest roads, trails, facilities, and operations and provide greater security for the public and employees”

**Monitoring Question:** What are the status and trends of roads and trails in the White River NF?

**Indicator:** Miles of Roads Managed to Standard, Miles of Trails managed to Standard, Miles of Routes (Roads/Trails) Decommissioned, Number of Kiosks and Information Panels installed

**Data Sources/Protocol:** Every 5 years, INFRA Roads and Trails database and Kiosk/Sign Panel Tracking Sheet.

**Background and rationale:** This will enable the forest to comply with the 2011 Travel Management Planning ROD and will help to inform sustainability and prioritization of management actions related to existing forest system routes and proposals for new system routes.

#### 4. Wilderness

**Related Plan Components:** Goal 2; “Multiple Benefits to People”, Objective 2b; “Improve the capability of wilderness and protected areas to sustain a desired range of benefits and values. Manage wilderness so that changes in the ecosystem are primarily a consequence of natural forces or within the range of natural variability and succession.”

**Monitoring Question:** What is the status and trend of the Wilderness Stewardship Performance elements?

**Indicator:** Wilderness Stewardship Performance (WSP) elements

**Data Sources/Protocol:** Every 5 years, trends as per WSP results

**Background and rationale:** This aligns with the newly implemented Wilderness Stewardship Performance monitoring and reporting that will inform the overall condition of each wilderness areas wilderness character. It also supplements information regarding the forests success in meeting the forest plans desired conditions and objectives.

#### 5. Management Activity Bare Ground Recovery Monitoring

**Related Plan Components:** Goal 2; “Multiple Benefits to People”, Objective 2c “Improve the capability of national forests and rangelands to sustain desired uses, values, products, and services.”

**Monitoring Question** - Are project level design criteria and mitigation measures addressing ground disturbing management activities meeting the direction to "...maintain or improve levels of soil organic matter on all lands" through bare ground rehabilitation projects?

**Indicators-** field/ground-truthed soil organic matter transects coupled with a comparison of time-stamped, remotely-sensed data of bare ground rehabilitation areas prior to and following mitigation.

**Data Sources/Protocols-** For soil organic matter transects, 10-point samples across a discrete landscape feature (i.e. grading polygons, bare ground rehab target areas) will be conducted by a qualified soil scientist to document depth of soil O and/or A horizons (i.e. "duff" layer and "topsoil") layers prior and subsequent to rehabilitation. For remote-sensed (i.e. color orthophotography, Google Earth, GIS Bare Ground Digitization polygons) data sources, the WRNF and/or contractors can supply the base imagery for a visual comparison of vegetative ground cover before and after rehabilitation endeavors.

**Background and Rationale-** Effectiveness monitoring to meet LRMP and related WCPH policy direction on soil and watershed resources protections. Monitoring whether bare ground rehabilitation mitigation measures or project design criteria are working will help to inform future decisions. Authorized ground disturbance activities will be included in this analysis, including but not limited to: grading, earthwork, building construction, and temporary road/landing rehabilitation.

VIII. The effects of each management system to determine that they do not substantially and permanently impair the productivity of land (soils)

1. Soil Productivity Monitoring

**Related Plan Components:** Goal 2; Objective 2c

**Monitoring Question** - What are the status and trends of soil productivity?

**Indicators-** Type, degree, and extent of soil disturbance and risk rating.

**Data Sources/Protocols:** Protocols defined in Soil Disturbance Field Guide.

**Background and Rationale-** Based on National Forest Management Act requirements for soil productivity as it is related to Timber Management.