Rio Grande National Forest

Monitoring Implementation Plan for the 2020 Land Management Plan

Last Modified: March 22, 2021

Acronyms used

BCR – Bird Conservancy of the Rockies
CDPHE – Colorado Department of Public Health and Environment
CNHP – Colorado Natural Heritage Program
CPW – Colorado Parks and Wildlife
FACTS – Forest Service Activity Tracking System
FIA – Forest Inventory and Analysis
FSVeg – Field Sampled Vegetation model
HPMtS – Heritage Program Managed to Standard
HUC – Hydrologic Unit Code
IMPLAN – Economic input output modeling application
IMPROVE – Interagency Monitoring of Protective Visual Environments
INFRA - Forest Service Infrastructure Database
LANDFIRE – Landscape Fire and Resource Management Planning Tool
NRIS – Forest Service Natural Resource Information system
NADP – National Atmospheric Deposition Program
NASIS - National Soils Information System
NAS – USGS Nonindigenous Aquatic Species
NICE – Forest Service Nature Watch Interpretation and Conservation Education database
NVUM – National Visitor Use Monitoring
RGC – Rio Grande Chub
RGCT – Rio Grande cutthroat trout
RGS – Rio Grande Sucker
SNOTEL – USDA Natural Resource Conservation Service Snow Telemetry
TIM – Forest Service Timber Information Manager
USGS – U.S. Geological Survey
WCF -WCATT – Watershed Condition Framework Classification and Assessment Tracking Tool
WIT – Forest Service Watershed Improvement Tracking

Contents

Background

The Rio Grande National Forest began implementing the Land Management Plan (revised 2020) in June 2020. The new plan implemented three broad goals, new management areas and direction and a monitoring plan based on the identified goals that compliant with the 2012 Planning Rule (36 CFR 219).

The Forest has a complete set of monitoring reports that were valuable in revising the 1996 Forest Plan. Reports were available from extending from 1997 to 2013. While completing revision of the Forest Plan the Rio Grande did not produce Monitoring Reports.

Leader's Intent

This process was designed to provide opportunities for frequent and timely public involvement in the monitoring process. During revision of the Forest Plan the most often repeated public comments suggested that members of the public be more involved in the planning process. Commenters also requested the plan provide more flexibility for changing conditions. This flexibility was deliberately built into the monitoring section of the new Rio Grande National Forest Land Management Plan (LMP).

Providing an annual stakeholder meeting that will consider implementation and monitoring of the plan will provide updates to the public and allow for continued public involvement. The monitoring plan also provides opportunities for the public to be involved in data collection and inventory processes.

Monitoring shows how the environment may be changing based on project implementation and environmental conditions. The iterative process allows for planning, implementing, checking and adjusting. This will increase transparency and involvement in maintaining the Land Management Plan over time.

Areas such as Big Meadows Reservoir on the Divide Ranger District may include several monitoring elements such as air and water quality and economic contributions. Photo: Rio Grande NF

Assessments

The monitoring reports produced were used in completing the assessments used in revised the forest plan. The 2012 Planning Rule implemented a phased approach to revising Land Management Plans that begins with preparing assessments. Assessments identify available information that is relevant to the plan revision, assesses the available information with the public and other interested parties and develops an understanding of conditions and trends for the topics.

The Planning Rule at 36 CFR 219.6(b) identified the following topics to be addressed in assessments:

- Terrestrial ecosystems, aquatic ecosystems, and watersheds;
- Air, soil, and water resources and quality;
- System drivers, including dominant ecological processes, disturbance regimes, and stressors;
- Baseline assessments of carbon stocks;
- Threatened, endangered and proposed candidate species and potential species of conservation concern present in the plan area;
- Social cultural, and economic conditions;
- Ecosystem services;
- Multiple uses and their contributions to the local, regional, and national economies;
- Recreation settings opportunities and access, and scenic character;
- Renewable and nonrenewable energy and mineral resources;
- Infrastructure (recreation facilities, transportation and utility corridors);
- Areas of tribal importance;
- Cultural and historical resources uses;
- Land status and ownership, use, and access patterns; and
- Existing designated areas located in the plan area include wilderness and wild and scenic rivers and opportunities for additional designated areas.

The Forest completed 10 assessments that can be accessed on the Forest website (link). The completed assessment includes:

- Assessments 1 & 3 – Ecosystem Integrity Drivers and Stressors
- Assessment 2 – Air, Soils and Water
- Assessment 4 - Carbon
- Assessment 5 – At-Risk Species Assessments
- Assessments 6, 7 & 8 – Social Cultural and Economic Resources
- Assessment 9 – Recreation and Scenic Resources
- Assessment 10 - Minerals and Energy
- Assessments 11 & 14 – Lands and Infrastructure
- Assessments 12 & 13 – Cultural and Historic Resources
- Assessment 15 – Wilderness and Special Designate Areas

Prescribed burning is a common forest management practice used to maintain and restore ecosystems. Prescribed burning can reduce fuels built up on the forest floor. Clearing undergrowth recycles nutrients back into the soils.

Land Management Plan Monitoring

LMP monitoring provides feedback for the Forest's planning cycle by testing assumptions, tracking relevant conditions, and evaluating management implementation and effects of management practices. The monitoring program that is developed as part of the forest plan should be strategic, effective, and useful. Forest plan monitoring is an important part of the continuous improvement of the plan through the adaptive management process. Direction for monitoring and evaluation of forest plans is contained in 36 CFR 219.12, and in planning directives at 1909.12, Chapter 30.

LMP monitoring is arranged by Forest Goals identified in the Land Management Plan (2020):

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 Planning Rule emphasizes a three-part iterative cycle of assessment, planning, and monitoring in a continuous feedback loop. Monitoring is intended to support the assessment process and evaluate plan implementation over time. This framework is designed to "inform integrated resource management and allows the Forest Service to adapt to changing conditions, including climate change, and improve management based on new information and monitoring" (219.5 (a)).

Monitoring Requirements under the 2012 Planning Rule

A monitoring plan consists of monitoring questions and indicators that are designed to inform the management of resources on the Forest by testing relevant assumptions, tracking relevant changes, and measuring management effectiveness and progress toward achieving or maintaining the plan's desired conditions or objectives. 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 it should consider a broader-scale monitoring strategy to address monitoring questions at a geographic scale broader than one single national forest (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)). This monitoring plan was informed by public input received throughout the development of the Land Management Plan.

Monitoring may involve evaluating if standards and guidelines are implemented (implementation monitoring), if management actions, 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 associated indicators that address the following eight items (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, and
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 will be produced and published every two years (219.12 (d)). The report "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)).

Additional project level monitoring will continue to occur over time. This monitoring will be used, where feasible, to inform Land Management Plan level monitoring requirements. Other monitoring requirements will also continue to occur including required National Visitor Use Survey Monitoring and additional long-term monitoring that could include National Atmospheric Deposition Monitoring, species surveys, and air quality monitoring.

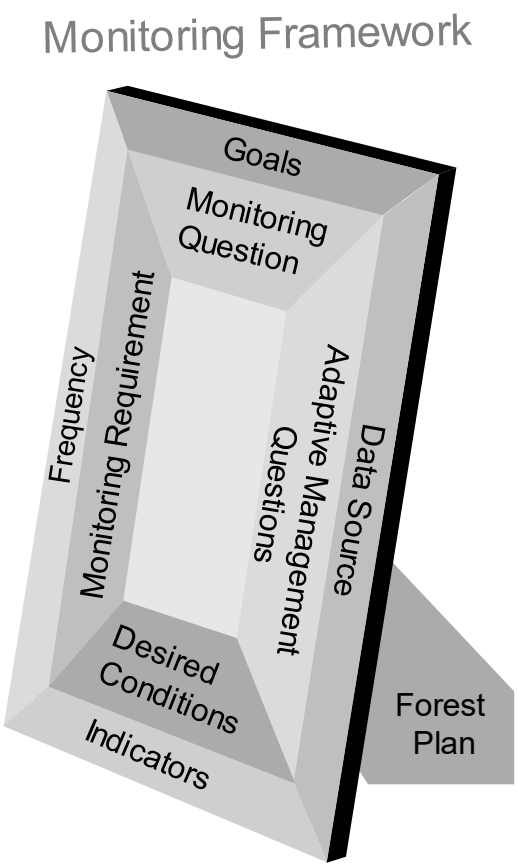
Adaptive Management Process

The Land Management Plan (revised 2020) requires an adaptive management process that uses Forest Plan monitoring to evaluate necessary adjustments in Forest Plan direction. As a part of the adaptive management process the Forest Supervisor will annually host an April meeting of Forest stakeholders to consider the preliminary results of monitoring and address any changes that might be necessary to the Forest Plan as a result of the monitoring. Formal reports are required every however, to be as proactive as possible the Rio Grande will host the stakeholder meeting on an annual basis.

This ongoing communication between the Forest Supervisor and stakeholders will allow for necessary changes to be identified prior to beginning the necessary process of analysis to make any changes in Land Management Plan direction.

The process is described in the Land Management Plan on page 107.

Forest Monitoring Framework



The monitoring framework addresses each of the eight monitoring requirements and will adapt over time to continue to use the best available scientific information. It is designed to promote iterative evaluation of plan components associated with social and ecological desired conditions, and to facilitate effective and efficient biennial reporting.

The proposed monitoring framework is composed of the following elements.

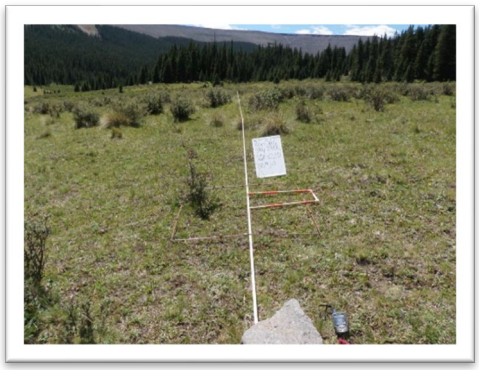
Goals are broad themes associated with core aspects of the Forest Service mission, including goals for social and ecological sustainability and resilience. Monitoring questions, plan components, and indicators are organized under these broad goals.

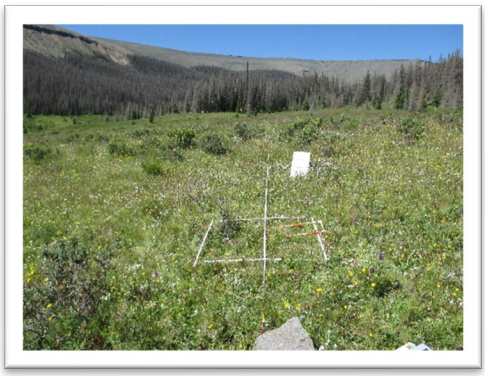
Monitoring Requirement identifies which of the eight monitoring requirements a specific question and set of indicators addresses. In many cases, questions meet the requirements of two or more monitoring requirements.

Monitoring Questions are priority questions of high relevance for forest planning and decision-making that can be used to test relevant assumptions, track relevant changes, and measure progress toward achieving desired conditions. While these are accumulated and applied at the Land Management Plan level (whole Forest) they can be answered by collecting information at the site-specific level.

Desired Conditions are select desired conditions that represent priority goals and approaches for maintaining or improving the resilience of social and ecological conditions within and across the broader landscape context of the forest plan area.

Indicators are measurable attributes of social and ecological conditions that are used to answer monitoring questions and evaluate progress toward maintaining or achieving desired conditions.





This long-term Cover Frequency transect in the La Garita Wilderness tracks vegetation over time to ensure compliance with management objectives and drive landscape level decision making. A change in ground cover, forb diversity, and overall productivity shows a shift towards desired alpine meadow conditions. The visible change in timber survival rate due to the spruce bark beetle shows a shift away from a desired forest conditions.

USFS Photos: Meg Armistead

Data Source represents the data repositories or sources of information from which measures of indicators are derived at the time the plan was developed. New data sources will likely become available as technology evolves and data sources considered during development of the plan may become obsolete. The Forest recognizes the need for adaptive management of the monitoring plan itself and will incorporate changes over time as appropriate.

The data sources field also includes notes on who could be responsible for collecting the monitoring data. Where "forest responsibility" is noted, the Forest is the primary party responsible for collecting the information. Where "partner engagement" is identified, the monitoring information is highly dependent on key partners and their ability to collect monitoring information. "Broader scale monitoring" indicates that this information may be better collected and evaluated at a scale larger than the Rio Grande National Forest. In most cases, broader-scale data sources are contingent on partnership information, including other federal, state, and non-governmental agencies.

Frequency describes the timing and frequency of monitoring evaluation and reporting. Evaluation and reporting frequencies are determined by the frequency of data collection and/or the spatial and temporal variability of resources (i.e., it takes several years of data collection to establish a trend for many resources).

Adaptive Management Questions: The Forest's monitoring plan also includes adaptive management questions that are paired with most monitoring questions. These questions are intended to serve two primary functions. First, they highlight the relevancy of the monitoring questions and data to land management decision-making. Without this lens it can be difficult to sift through volumes of data and analyses and identify salient, possibly actionable information and decision-points. Second, they offer some specific examples of ways that monitoring data may be used to identify needs to adapt our land

management decisions. These needs may spring from information on changing conditions, stagnant conditions where the goal is to achieve some improvement, or new information about the status of natural resources on the Forest.

The questions are not an exhaustive list of potential management applications. Instead, they highlight realistic ways in which monitoring data might be interpreted, evaluated, and used by line officers to inform decision-making. They are also intended to stimulate the development of additional questions among Forest staff, and they may evolve over time.

Finally, it is important to note that the questions are not intended to trigger, or require, decisions or management actions. Monitoring information is one piece of a larger puzzle that must be put together during land management decision-making processes; line officers will need to couple insights from monitoring data with other information, including resource availability, staffing capacity, multiple use priorities, and public opinion.

Monitoring Implementation Plan

In the initial years of implementing the Land Management Plan, Rio Grande personnel will focus on response to those questions identified with a 2-year time frequency.

These questions will be addressed in every monitoring report. To focus the work, the questions are listed below, organized by goal. More information about the specific question can be found in Chapter 4 or the Land Management Plan.

Monitoring reports will be filed in under 1930 Inventory and Monitoring and will be made available to the public via the Forest website. Monitoring reports will be released on a biennial basis according 36 CFR 219.12(d).

Monitoring questions (MQ) that are responded to every 2 years

MQ 1: What is the status and trend of populations of Rocky Mountain elk, Rocky Mountain bighorn sheep, and pronghorn primary use areas?

Indicator's to measure response include populations of elk, pronghorn, mule deer and Rocky Mountain bighorn sheep.

Data will be collected from Colorado Parks & Wildlife (CPW) and through engagement with other partners.

Adaptive Management Questions

- Are there changes in ungulate populations that are outside of expected levels of fluctuation?
- If so, do they correlate with changes in habitat conditions that might be addressed through management activities?

MQ3: What is the status and trend of key ecosystem characteristics associated with species of conservation concern(SCC), threatened and endangered species, and resident and migratory bird species?

Indicators to measure response:

- Acres/location impacted by disturbance and management actions (i.e., in Lynx Analysis Units/lynx habitat)
- Distribution of old-forest/late-successional conditions
- Acres and extent of Gunnison prairie dog colonies

Data sources include the Forest Service Activity Tracking Systems (FACTS)/FSVEG, the Forest Inventory and Analysis Program (FIA), the Forest Health Monitoring Program – aerial surveys, fire layers, or monitoring trends from the Burn Severity Program, and partners. For Gunnison prairie dog: National Agriculture Imagery Program, CPW, and partners.

Forest resource specialists collaborate with external partners to determine monitoring criteria. After timber harvest activities are completed, specialist periodically revisit sites to ensure the data gathered supports management goals. Monitoring and consultation also occur during implementation of the project.

Adaptive Management Questions

- Are there changes to the status of at-risk species that warrant additional plan direction?
- Do changes in lynx habitat warrant additional plan direction?
- Do changes to key ecosystem characteristics for SCC warrant additional plan direction?
- Are there opportunities to improve habitat or to reduce uses that may be negatively impacting Gunnison's prairie dog colonies?

MQ4: What is the status and trend of ecosystem characteristics associated with SCC, TES, and resident and migratory bird species?

Indicators include the number of live trees per acre that are 15 to 20 and greater than 20 inches in diameter (for all indictors forestwide and in major types); number of live and dead trees per acres less than 15 inches in diameter; percentage with greater than 40, 40 t0 70, and less than 70 % live crown cover; number of snags per acres 10 to 15, 15 to 20 and greater than 20 inches in diameter; number of pieces of coarse woody debris per acre 5 to 10, greater than 15 inches in diameter and greater than 15 feet long; volume of coarse woody debris per acre and; net volume of mortality and percent of live versus dead. Specific to bat species, indicators include the number of abandoned mines that are gated and maintained for bats.

Sources of data can include the FIA program, the abandoned mine land program (bats) and partner engagements.

Adaptive Management Questions

- Are abandoned mines being inventoried for bat use and gated prior to mine closure?
- What is the trend in white-nose syndrome?

MQ6: What are the trends in climate, including drought and long-term climate change, and how are they affecting vegetative phenology, snowpack, streamflow, and alpine vegetation?

Indicators for response include; length, spatial extent, severity of drought (Palmer Drought Index), and evaporative demand (Evaporative Demand Drought Index). Additionally, the National Phenology network (first bloom index) or extended spring indices.

Data can be obtained from: DRI/University of Idaho Climate Engine, Evaporative Demand Drought index (WWA), National Phenology Network, partners, and broad-scale monitoring.

Adaptive Management Questions

- Do drought trends fall within expected ranges, or if outlier events are occurring, are there management activities that should be considered (e.g., reduction in AUMs)? Do outlier events warrant additional or plan direction?
- Do extended spring indices reflect conditions that fall within ranges expected during plan development?
- If not, are there needs to reconsider vegetation management or other management strategies?

MQ7: How are key characteristics of forest ecosystems (structure, composition, function, and disturbance regimes) changing over time and are they within the natural range of variation?

Indicators include acres/location of vegetation management in different forest types and extent of insect mortality.

Data will be obtained from FACTS, FSVeg, Forest Health Monitoring program, and partners.

MQ8: What is the status and trend of upland species?

Indicators include bird guilds.

Data will be obtained from Bird Conservancy of the Rockies (BCR) and other partners.

MQ9: What is the status of progress toward meeting objectives identified in this plan?

Indicators include LMP objectives and progress towards those objectives.

Data will be obtained from projects implemented on the Forest.

MQ10: What is the status and trend of aquatic ecosystem conditions?

Indicators include the number of fish barriers removed or improved, macrobenthic invertebrate monitoring, presence of beavers, presence/distribution of nonnative aquatic invasive species and pathogens, acres/miles treated, number of impaired streams (303d).

Data will be obtained from FACTS, forest monitoring, beaver activity in HUC-12 watersheds, CPW/USGS Nonindigenous Aquatic Species, partners, and broader scale monitoring, CDPHE, and partners.

Adaptive Management Questions

- Is the Forest achieving goals for improving fish habitat connectivity, or is there a need to increase these efforts?
- Do trends in macrobenthic invertebrate communities point to the need for adjusting management practices or implementing restoration activities?
- Where other aquatic ecosystem indicators suggest potential restoration needs are beavers absent, and if so, would beaver relocation be beneficial?
- Are nonnative aquatic invasive species and pathogens such as chytrid fungus spreading, and if so, are there control efforts that could be considered?
- Is there an increase if the number of impaired streams, and if so, are there measures that can be adopted to curb this?
- Are there measures that could be considered to remedy this impairment? Has progress been made in removing streams from the impaired list?
- Do trends in sedimentation/water quality, stream temperature, or flow warrant management actions to conserve and protect Rio Grande cutthroat, Rio Grande chub, and Rio Grande sucker?

MQ12: Is the unit improving condition in priority watersheds?

Indicators include the number of projects completed in priority watersheds, BMP monitoring.

Data will be obtained from WIT, monitoring protocols rating system, WCF-WCATT.

Adaptive Management Questions

- Are watershed conditions improving in priority watersheds, or do additional management measures need to be considered to facilitate improvement?

MQ13: What actions have been taken to restore riparian and wetland ecosystems?

Indicators include the number of acres restored.

Data will be obtained from partners.

Adaptive Management Questions

- If multi-year declines in riparian/wetland vegetation are observed at the Forest level, what is causing them, and are planning or management decisions needed to address them?

MQ14: What is the status and trend of aquatic and riparian focal species?

Indicators include beaver presence.

Data will be obtained by noting the number of HUC-12 level watersheds with beaver activity.

Adaptive Management Questions

- Where other riparian and wetland ecosystem indicators suggest potential restoration needs, are beavers absent, and if so, would beaver relocation be beneficial?

MQ15: What are the economic contributions of the range, timber, recreation, and minerals programs, and how are they changing over time?

Indicators include employment, income, and contribution to gross domestic product; board feet of timber sold or harvested and; acres treated.

Data will be obtained from the Forest Service IMPLAN model; Forest Service Timber Information Manager (TIM), and; Forest Service Activity Tracking System (FACTS).

Adaptive Management Question

- Does the Forest continue to provide sufficient economic benefits to different communities through various program areas? If not, are there programmatic changes that could be considered?

MQ16: What are the economic contributions of the wildlife and fisheries program to the local economy and how are they changing over time?

Indicators include number of recreational user/activity days related to hunting, fishing, and wildlife viewing, and economic contribution to local counties; number of special events hosted such as Free Fishing Day, Migratory Bird Day; etc.

Data will be obtained from CPW and the Forest Service NICE database.

Adaptive Management Question

- How do fish and wildlife values contribute to the recreational pursuits of various communities in the San Luis Valley and what are the benefits of these programs to agency goals such as Kids in the Woods, and helping to get people outside?

MQ17: What is the status and trend of rangeland health?

Indicators of change include presence and extent of nonnative invasive species and noxious weeds and acres noxious weeds treated.

Data will be collected through FACTS.

MQ18: What is the status and trend of roads and trails?

Indicators of change include miles of roads and trails open year-round or open seasonally; miles of roads and trails built and decommissioned; miles of roads and trails maintained by maintenance level; and miles of roads and trails maintained or improved to standard.

Data can be obtained through INFRA.

MQ21: How is the Forest engaging visitors, local communities, tribes, and partners to achieve desired conditions, goals, and objectives (i.e., through outreach, education, consultation, and collaboration)? The frequency for this question is annual.

Indicators include number and type of outreach, education consultation, collaboration and volunteer activities and the NICE database.

Data will be obtained through HPMtS particularly Indicators 2, 3 and 5.

MQ22: What management activities are being implemented to reduce the threat of wildland fire to real property and infrastructure and restore forest ecosystems?

Indicators can include acres and location of fuel management and restoration treatments (mechanical and prescribed fire).

Data will be collected from FACTS.

MQ23: What are the conditions and trends of visibility and air quality/deposition in selected Class II areas on the unit?

Indicators for change include visibility and nitrates and sulfate deposition.

Data will be obtained from IMPROVE, the USGS, and NADP.

The Uncompahgre Fritillary Butterfly (Boloria acrocnema) is found at high elevations in the Southern Colorado Rocky Mountains. The species is listed as "endangered" and is protected under the Endangered Species Act. A long-term partnership with Western Colorado University has provided valuable data related to the status of the butterfly populations on the Rio Grande National Forest.

USFS photo: Dale Gomez

Forest Plan Monitoring Questions that are recorded more than every two years

Some monitoring questions and items will take longer to show change in condition. For example, considering indicators such as trends in alpine vegetation based on climate may not show much change in shorter time periods. However, a longer monitoring interval for alpine, of every 4 years (MQ# 6), will present a more valuable data set.

MQ2: What is the status and trend of forage and cover for big game species?

Frequency is 4 years.

Indicators include trends in forage availability; acres of big game habitat maintained or improved; acres of cover and security habitat in mapped winter range affected by disturbance/mortality; changes in crown cover in mapped winter range.

Data will be obtained from Forest Health Monitoring program; National Agriculture Imagery Program; and fire data.

Sustaining and improving big game winter range is an important consideration for the Rio Grande National Forest. Adequate winter range encourages big game to remain on public lands in the winter, which helps to decrease the chance of animals damaging private property or crops.

Photo courtesy Frankie Wilson, Blanca, CO.

Adaptive Management Questions

- Are there declines in forage availability and amount of canopy cover that could impact key wildlife species?
- If so, where are opportunities to address these through management activities?

MQ5: What are the status and trends of soil productivity and function?

Frequency: 4 years.

Indicators include type, degree, and extent of soil disturbance and risk rating to determine the effect of soil disturbance on soil productivity and hydrologic function.

Data sources for this question include Soil Disturbance Field Guide, NASIS database, and soils BMP monitoring.

Adaptive Monitoring Questions

- Are management prescriptions, standards, guidelines, and management approaches effectively maintaining or improving soil productivity by reducing or minimizing impacts to soil resources? If not, do they need to be changed?

MQ6: What are the trends in climate including drought and long-term climate change, and how are they affecting vegetative phenology, snowpack, streamflow, and alpine vegetation?

Frequency 10 years, Uncompahgre Fritillary butterfly (6 & 10 years), alpine vegetation (4 years)

Indicators include DRI/University of Idaho Climate Engine, Broadscale monitoring, long-term trends in temperature and precipitation, snowpack/snow water equivalent, trends in streamflow, Occupancy and trend of Uncompahgre fritillary butterfly, alpine vegetation, USGS, National Park Service Alpine Vegetation and soils (GLORIA), USDA Natural Resources Conservation Service – SNOTEL, and National Oceanic and Atmospheric Administration – National Centers for Environmental Information (NCEI),

Adaptive Management Questions

- Are longer-term climatic trends consistent with those expected and underpinning current plan content?
- If not, is there a need for additional or forest plan direction?
- How is climate change or other factors influencing vulnerable alpine systems such as snow willow, the phenology of flowering nectar plants, and occupancy of Uncompahgre fritillary butterfly colony sites?

MQ7: How are key characteristics of forest ecosystems (structure, composition, function, and disturbance regimes) changing over time, and are they within the natural range of variation?

Frequency acquisition every 5 years, reporting years 6 and 10; fire size and severity reporting after years with fires larger than 1,000 acres.

Indicators Percentage cover of different forest ecosystems; percent of different structural classes in major forest ecosystems; mortality: number of snags per acre; net volume live vs dead; regeneration: number of saplings per acre; species composition of saplings in all ecosystem; coarse woody debris (see MQ 4); changes in fire regime condition class; size and severity of fires greater than 1,000 acre (net change in volume/number of live vs. dead trees); number and acres of all fires.

Data sources for information gathering include FIA, LANDFIRE, monitoring trends in burn severity program, FACTS, and FS Veg.

MQ11: What is the status of populations of fishes that are species of conservation concern?

Frequency populations monitored every 5 years

Indicators include the status of Rio Grande cutthroat trout, Rio Grande Sucker, and Rio Grande chub conservation populations

Adaptive Management Questions

- Is the overall goal of the RGCT, RGS, and RGC Conservation Strategy to provide for the long-term persistence of the species being met?

MQ19: What recreational activities are the public participating I, and what is their current satisfaction level??

Frequency 5 years

Indicators include National Visitor Use Monitoring

Adaptive Management Questions

- If and where trends in recreational satisfaction and use are increasing or decreasing?
- What factors or trends are leading to this change?
- What changes could be made to improve current and future visitor satisfaction?
- How is the public contributing to the local community?
- What are people coming from to use the Forest?

MQ20: Is the Forest preserving, protecting, and/or restoring cultural resources, including traditional cultural resources and landscapes?

Frequency 25 percent of Priority Heritage Assets each year. All Priority Heritage Assets are monitored at least once every 5 years.

Indicators include number of areas of tribal importance, cultural resources, and properties identified, preserved, protected or restored.