

# Appendix B. Monitoring Program

## Table of Contents

Introduction ..... 1

    Required 2012 Planning Rule Monitoring Items..... 2

    Focal Species ..... 3

        Invasive annual grasses..... 3

Monitoring Elements by Resource Area ..... 4

    Aquatic Ecosystems – Watershed (WTR)..... 4

    Aquatic Ecosystems – Fisheries and Aquatic Habitat (FAH) ..... 5

    Aquatic Ecosystems – Riparian Management Zones (RMZ) ..... 5

    Soil (SOIL) ..... 6

    Air Quality (AIR) ..... 6

    Fire and Fuels Management (FIRE) ..... 6

    Vegetation – Terrestrial (VEGT) ..... 7

    Vegetation – Forested (VEGF)..... 8

    Vegetation – Nonforested (VEGNF)..... 9

    Threatened, Endangered, Proposed and Candidate Plant Species; and Plant Species of Conservation Concern (PLANT) ..... 10

    Vegetation – Invasive Plants (INV)..... 11

    Wildlife (WL) ..... 11

    Recreation Opportunities (REC) ..... 16

    Recreation Special Uses (RSUP) ..... 16

    Designated Areas ..... 17

    Cultural and Historic Resources (CR) and Areas of Tribal Importance (TRIBAL)..... 18

    Land Status and Ownership (LAND) and Land Uses (LAND USE) ..... 19

    Infrastructure – Roads and Trails (RT), Bridges (BRDG), and Facilities (FAC) ..... 19

    Benefits to People –Public Information, Interpretation, and Education (CONNECT)..... 19

    Benefits to People – Livestock Grazing (GRAZ)..... 20

    Benefits to People – Timber (TIM)..... 20

    Benefits to People – Other Forest Products and Wood for Fuel (OFP) ..... 21

    Benefits to People – Fish and Wildlife (FWL)..... 21

## List of abbreviations

The following abbreviations are in addition to those that can be found at the end of the Table of Contents.

BMP – best management practice

FSH – Forest Service Handbook

NCDE – Northern Continental Divide Ecosystem

PVT – potential vegetation type

## Introduction

The monitoring program includes monitoring, or the collection of data and information, followed by the evaluation of that information. Monitoring and evaluation are separate, sequential activities required by the National Forest Management Act. Effective land management plan monitoring fosters adaptive management and more informed decisions.

Monitoring and evaluation are conducted at several scales and for many purposes, each of which has different objectives and requirements. Monitoring occurs at the scale of the Forest, the Region, and even larger areas. Monitoring may be the responsibility of the Forest Service, another agency, or may involve multiple agencies and organizations.

Monitoring provides the feedback for the forest planning cycle by testing assumptions, tracking relevant conditions over time, measuring management effectiveness, and evaluating effects of management practices. Monitoring information should enable the Forest to determine if a change in plan components or other plan management guidance may be needed, forming a basis for continual improvement and adaptive management. Direction for the monitoring and evaluation of forest plans is found under the 2012 planning rule at 36 Code of Federal Regulations 219.12 and in the directives at 1909.12 Chapter 30.

The plan monitoring program addresses the most critical components for informed management of the Forest's resources within the financial and technical capability of the agency (see 6 considerations below used to select plan components). Every monitoring question links to one or more desired conditions, objectives, standards, or guidelines. However, not every plan component has a corresponding monitoring question.

The monitoring program is not intended to depict all monitoring, inventorying, and data gathering activities undertaken on the Forest. Consideration and coordination with broad-scale monitoring strategies, multi-party monitoring collaboration, and cooperation with state agencies where practicable will increase efficiencies and help track changing conditions beyond the forest boundaries to improve the effectiveness of the plan monitoring program. In addition, project and activity monitoring may be used to gather information for the plan monitoring program if it will provide relevant information to inform adaptive management. Monitoring also provides feedback to prioritize and improve the plan monitoring program and broader-scale monitoring strategy.

The monitoring plan sets out the plan monitoring questions and associated indicators and measures. The Forest used the best available scientific information in the development of the monitoring plan, giving consideration to expected budgets and agency protocols.

The monitoring program will include a biennial monitoring evaluation report. The status of all monitoring questions will be reported biennially and only evaluated when new information is collected or available. It is important to note that monitoring questions will have variable data collection intervals that will not correspond with the biennial monitoring evaluation report interval. Some monitoring indicators will require longer time frames for thorough evaluation of results, but a biennial review of what information has been collected will ensure timely evaluation to inform planning.

The biennial monitoring evaluation report will summarize the results of monitoring, evaluate the data, consider relevant information from broad-scale or other monitoring efforts, and make recommendations to the responsible official. The monitoring evaluation report will indicate whether a change to the Forest Plan, management activities, or the monitoring program, or a new assessment, may be warranted based on the new information. The monitoring evaluation report is used to inform adaptive management of the plan area and will be made available to the public.

Modifying a plan's monitoring program does not require any other change to the plan; that is, a plan need not be amended nor revised simply to facilitate monitoring pursuant to the Rule.

A change to a monitoring question or an indicator may be made administratively, but only after the public has had an opportunity to comment. A change to a monitoring guide or annual monitoring work plan does not require public notification. In addition, because the broader-scale monitoring strategy is comprised of questions and indicators from plan monitoring programs, a change of the broader-scale monitoring strategy questions and indicators would require a change of the relevant plan monitoring programs.

## Required 2012 Planning Rule Monitoring Items

The Forest Service has discretion to set the scope, scale, and priorities for plan monitoring within the financial and technical capabilities of the administrative unit. However, they are required to include one or more monitoring question(s) and associated indicator(s) for the eight items set out in the Planning Rule at 36 CFR 219.12(a)(5) as follows:

- 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 36 CFR 219.9.
- iv. The status of a select set of the ecological conditions required under 36 CFR 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 providing for 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)). (36 CFR 219.12(a)).

Social, economic, and cultural sustainability must also be addressed in the monitoring program (FSH 1909.12 Section 32.13f).

The following was also considered to help determine the need to track information related to the plan components.

1. Required by law – collection of information is required through Biological Opinion Terms and Conditions, court orders, settlement agreements, etc.
2. Magnitude of departure from desired condition (if of concern) - Is there a high degree of disparity between existing and desired conditions? Examples: (1) a particular habitat component is at a

much lower level than desired; (2) the amount of use of a particular resource or use at a particular location is much higher than desired.

3. Degree of uncertainty regarding the available data or uncertainty due to lack of data (FSH 1909.12 Section 32.1, 32.11). Is available information incomplete or inconclusive?
4. Long standing management assumptions that need to be verified or re-verified? (FSH 1909.12 Section 32.1, 32.11). Is there a high degree of uncertainty associated with management assumptions? Examples: (1) a new way of doing something where there is limited experience with the new technique; (2) actions taken in response to an unprecedented situation; (3) a lack of information or out dated information on the effects of a management action on specific habitat needs
5. The risk and consequences to the resource for not having information to reduce the uncertainty/knowledge gap/assumption.
  - i. Risk of action/event occurring - Are management activities AND/OR other drivers and stressors (climate change, invasives, insect diseases, flooding events, etc.) likely to occur that would have discernable outcomes to the resource? Is the parameter responsive to changed conditions (climate, insect/disease, invasives, management activities, etc.?)
  - ii. Consequences to resource – What are consequences to resource for not having this information? I.e. collection of this information will make a difference in how we manage for sustainability of the resource.
6. Distinctive roles and contributions within the broader landscape (FSH 1909.12 Sec. 32.1). Will monitoring respond to a key public issue? Key issues identified through scoping may warrant monitoring even if they are (1) well understood, (2) the existing condition is good and (3) management activities will have little impact. Monitoring may be necessary for educational and/or accountability purposes.

## Focal Species

The following focal species have been identified for the HLC NF. Monitoring for these species is indicated in the applicable resource monitoring sections.

### Invasive annual grasses

Invasive annual grass species have been selected as a focal species for monitoring to help assess the habitat integrity of nonforested vegetation types across the HLC NF. Species of invasive annual grasses are extremely competitive, crowding out native vegetation, and have exhibited the ability to rapidly expand in multiple habitat types. Once annual grasses establish, they present a direct threat to ecosystem function by decreasing native plant community diversity, altering fire return intervals, diminishing the quality of wildlife habitat, and reducing livestock carrying capacity.

Species such as downy brome (*Bromus tectorum*), Japanese brome (*Bromus japonicus*), ventenata (*Ventenata dubia*), and bulbous bluegrass (*Poa bulbosa*) are present or have been recently found in the plan area. Medusahead rye (*Taeniatherum caput*) is another species of concern that could significantly alter ecosystem function if the species were to establish. Many other invasive grass species are also present in the Pacific Northwest, with a high likelihood of eastern expansion. Monitoring for invasive annual grasses can gauge native vegetation communities' resistance from invasion and resiliency after disturbance.

# Monitoring Elements by Resource Area

## Aquatic Ecosystems – Watershed (WTR)

**Table 1. Aquatic ecosystems – Watershed (WTR), Fisheries and Aquatic Habitat (FAH), Riparian Management Zone (RMZ), and Conservation Watershed Network (CWN)**

| Selected plan components   | Monitoring question  | Indicator(s) and measure(s)   |
|--|--|---|
| FW-WTR-DC-03; FW-WTR-DC-04; FW-WTR-DC-08; FW-WTR-DC-10; FW-FAH-DC-02; FW-FAH-DC-03; FW-RMZ-DC-01 | MON-WTR-01<br>What is the trend in instream physical characteristics for managed watersheds as compared to unmanaged?  | Instream physical habitat data collected through Pacfish/Infish Biological Opinion monitoring <ul style="list-style-type: none"> <li>• Woody debris, bank angle, pooltail fines, percent pool and residual pool depth, pebble count data (D50)</li> </ul>   |
| FW-WTR-DC-05; FW-WTR-DC-11; FW-WTR-STD-01; FW-WTR-STD-02   | MON-WTR-02<br>Which best management practices (BMPs) are implemented in wetlands in order to not impede the sustainability of wetland characteristics and diversity? | BMP implementation for projects with wetlands <ul style="list-style-type: none"> <li>• Number and types of BMPs implemented</li> <li>• Quality at which the BMP are implemented</li> </ul>  |
| FW-WTR-DC-06; FW-WTR-DC-07; FW-WTR-DC-08   | MON-WTR-03<br>What is the status of 303 and 305 State listed streams?  | State listed stream segments forestwide and by conservation watershed network <ul style="list-style-type: none"> <li>• Number and locations of stream reaches on 303 and 305 list</li> <li>• Acres, miles, and types of actions that improve the reasons for which the stream reach was listed</li> <li>• MT State assessment of Beneficial Uses status (fully supporting, not fully supporting, threatened) for each listed stream segment</li> </ul>    |
| FW-CWN-GDL-02; FW-CWN-GDL-03<br>FW-WTR-OBJ-01; FW-WTR-OBJ-02                                     | MON-WTR-04<br>Are watershed restoration projects occurring in priority watersheds?   | Watershed restoration projects <ul style="list-style-type: none"> <li>• Number, type, and location of projects in priority watersheds (Conservation Watershed Framework and priority watersheds as identified in the Watershed Condition Framework)</li> <li>• Number, type, and location of projects NOT in priority watersheds (Conservation Watershed Framework and priority watersheds as identified in the Watershed Condition Framework)</li> </ul> |
| FW-CWN-DC-01; FW-FAH-OBJ-01; FW-FAH-OBJ-02   | MON-WTR-05<br>What stream habitat improvement actions have occurred?   | Stream habitat improvements <ul style="list-style-type: none"> <li>• Miles, types, and locations of stream habitat improvements</li> </ul>  |
| FW-CWN-GDL-01; FW-CWN-GDL-02<br>FW-CWN-OBJ-01; FW-CWN-OBJ-02                                     | MON-WTR-06<br>What road and access improvements have been completed in Conservation Watershed Network areas?   | Road management in conservation watershed networks <ul style="list-style-type: none"> <li>• Number, types, miles or road management actions/decisions in watershed conservation network</li> </ul>  |

| Selected plan components     | Monitoring question   | Indicator(s) and measure(s)   |
|------------------------------|---|---|
| FW-FAH-GDL-04; FW-CWN-GDL-03 | MON-WTR-07<br>Are new and revised livestock management plans designed to maintain or improve water quality? | Water quality maintained or improved forestwide and by conservation watershed network <ul style="list-style-type: none"> <li>• Miles of intermittent and perennial streams moving towards desired condition within allotments</li> <li>• Number of improved management strategies expected to move RMZs towards desired conditions within allotments</li> </ul> |

## Aquatic Ecosystems – Fisheries and Aquatic Habitat (FAH)

**Table 2. Aquatic ecosystems – Fisheries and Aquatic Habitat (FAH)**

| Selected plan components                                   | Monitoring question  | Indicator(s) and measure(s)  |
|--|--|--|
| FW-FAH-DC-01; FW-FAH-DC-04<br>FW-FAH-DC-05; FW-FAH-DC-08   | MON-FAH-01<br>What is the status of westslope cutthroat trout?   | Presence and abundance of genetically pure westslope cutthroat trout populations <ul style="list-style-type: none"> <li>• Number of fish per mile, or miles of occupied stream reaches</li> <li>• Locations of populations</li> </ul>  |
| FW-RT-STD-02; FW-RT-STD-03;<br>FW-RT-STD-04; FW-BRDG-DC-01 | MON-FAH-02<br>Are culverts and bridges on fish-bearing streams being constructed/upgraded/removed to allow aquatic organism passage? | Infrastructure for aquatics systems <ul style="list-style-type: none"> <li>• Number of culverts and bridges on fish-bearing streams that comply with standards</li> <li>• Number of culverts and bridges on fish-bearing streams that DO NOT comply with standards.</li> </ul> |

## Aquatic Ecosystems – Riparian Management Zones (RMZ)

**Table 3. Aquatic ecosystems – Riparian Management Zones (RMZ)**

| Selected plan components                     | Monitoring question   | Indicator(s) and measure(s)   |
|--|---|---|
| FW-RMZ-DC-01; FW-RMZ-DC-02;<br>FW-RMZ-OBJ-01 | MON-RMZ-01<br>How many acres of riparian management zones have been improved? | Acres of riparian management areas improved through activities including but not limited to: <ul style="list-style-type: none"> <li>• Road obliteration</li> <li>• Riparian planting</li> <li>• Reconstruction of flood plains through removal of roads or berms</li> </ul> |

## Soil (SOIL)

**Table 4. Soil (SOIL)**

| Selected plan components                       | Monitoring question   | Indicator(s) and measure(s)  |
|--|---|--|
| FW-SOIL-STD-02; FW-SOIL-GDL-04; FW-SOIL-GDL-05 | MON-SOIL-01<br>Are post management activities conserving forest floor and coarse woody debris at levels that maintain dynamic soil quality? | Post-treatment forest floor conditions: <ul style="list-style-type: none"> <li>• Detrimental soil disturbance (<i>% areal extent</i>)</li> <li>• Course woody debris (<i>tons/acres</i>)</li> <li>• Visual ground cover estimates</li> <li>• Soil burn severity</li> </ul> |
| FW-SOIL-GDL-06; FW-SOIL-GDL-07                 | MON-SOIL-02<br>Were road or trails restored to provide for soil quality to trend towards improvement?                                       | Number/acres and types of road/trail treatment   |

## Air Quality (AIR)

**Table 5. Air Quality (AIR)**

| Selected plan components | Monitoring question  | Indicator(s) and measure(s)   |
|--------------------------|--|---|
| FW-AQ-DC-01              | MON-AQ-01<br>Is air quality in compliance with and maintained per Clean Air Act and Wilderness Act requirements? | Air quality, forestwide: <ul style="list-style-type: none"> <li>• National Ambient Air Quality Standards</li> <li>• Regional Haze Rule – State of Montana Regional Haze 5 Year Progress Report (are the State’s goals met)</li> <li>• Air quality related values</li> </ul> |

## Fire and Fuels Management (FIRE)

**Table 6. Fire and Fuels Management (FIRE)**

| Selected plan components | Monitoring question  | Indicator(s) and measure(s)   |
|--------------------------|--|---|
| FW-FIRE-DC-01            | MON-FIRE-01<br>What is the extent and severity of wildfire burned areas? | Burn severity, forestwide <ul style="list-style-type: none"> <li>• Acres burned by wildfire and by severity class (low, moderate, high) by R1 Broad Potential Vegetation Type (PVT) (Only for fires &gt;1000 acres.)</li> </ul> |



| Selected plan components        | Monitoring question  | Indicator(s) and measure(s)   |
|---------------------------------|--|---|
| FW-FIRE-GDL-02                  | MON-FIRE-02<br>Are fire management strategies supporting ecosystem function resulting in becoming self-regulating?   | Fire management efficacy, forestwide <ul style="list-style-type: none"> <li>• Acres of re-burn</li> <li>• Fire severity on those re-burned acres</li> <li>• Fire spread limited by previous fires</li> </ul>  |
| FW-FIRE-OBJ-01                  | MON-FIRE-03<br>To what extent are fuels management activities occurring to meet the objective of at least 15,000 acres of treatment per decade within the WUI? | Hazardous fuels management, forestwide <ul style="list-style-type: none"> <li>• Acres of prescribed fire</li> <li>• Acres of wildfire</li> <li>• Acres of other fuels treatments (rearrangement of fuels, pile burning, chipping, mastication)</li> </ul> |
|                                 | MON-FIRE-04<br>Are treated fuel management areas being maintained?   | Maintenance of treated acres, forestwide <ul style="list-style-type: none"> <li>• Acres and locations of existing fuel treatments</li> <li>• Acres of maintenance treatments completed</li> </ul>   |
| FW-FIRE-STD-01                  | MON-FIRE-05<br>Did reportable injuries occur on any wildfires?   | Wildfire-related injuries, forestwide <ul style="list-style-type: none"> <li>• Number of wildfire related injuries</li> </ul>   |
| FW-FIRE-DC-02<br>FW-FIRE-GDL-03 | MON-FIRE-06<br>Are fuels treatments helping to protect high value resources and assets, and control and/or management of the fire?                             | Fuel treatment effectiveness, forestwide <ul style="list-style-type: none"> <li>• Number of fuel treatments that changed fire behavior</li> </ul>   |

## Vegetation – Terrestrial (VEGT)

**Table 7. Vegetation - Terrestrial (VEGT)**

| Selected plan components | Monitoring question   | Indicator(s) and measure(s)   |
|--------------------------|---|---|
| FW-VEGT-DC-01            | MON-VEGT-01<br>What management activities have promoted shade intolerant trees (i.e., promoted resiliency)? | Vegetation management activities that promote shade intolerant trees, forestwide. <ul style="list-style-type: none"> <li>• Acres of regeneration harvest</li> <li>• Acres of natural regeneration and plantings</li> <li>• Acres of intermediate harvest</li> <li>• Acres of stand improvement</li> <li>• Acres of mechanical fuels treatments</li> <li>• Acres of prescribed burning</li> <li>• Acres of artificial and natural regeneration after wildfire</li> </ul> |

| Selected plan components  | Monitoring question  | Indicator(s) and measure(s)   |
|---|--|---|
| FW-VEGT-DC-02; BB-VEGT-DC-01, CA-VEGT-DC-01, CR-VEGT-DC-01; DI-VEGT-DC-01; EH-VEGT-DC-01; HW-VEGT-DC-01; LB-VEGT-DC-01, RM-VEGT-DC-01; SN-VEGT-DC-01; UB-VEGT-DC-01 | MON-VEGT-02<br>What is the abundance of R1 cover types, (forested and nonforested)?                | Cover type proportions forestwide, by broad potential vegetation type, and by geographic area <ul style="list-style-type: none"> <li>• Percent of each cover type: ponderosa pine, Douglas-fir, lodgepole pine, aspen/hardwood, spruce/fir, whitebark pine, and nonforested.</li> </ul>   |
| FW-VEGT-OBJ-01  | MON-VEGT-03<br>To what extent have vegetation management treatments been applied on the landscape? | Vegetation management treatments, forestwide <ul style="list-style-type: none"> <li>• Acres of timber harvest</li> <li>• Acres of planned ignitions</li> <li>• Acres of unplanned ignitions</li> <li>• Acres of planting</li> <li>• Acres of precommercial thinning or other noncommercial stand tending</li> <li>• Acres of fuel reduction treatments (re-arrangement of fuels, pile burning, chipping, mastication, etc)</li> </ul> |

## Vegetation – Forested (VEGF)

**Table 8. Vegetation - Forested (VEGF)**

| Selected plan components  | Monitoring question   | Indicator(s) and measure(s)   |
|---|---|---|
| FW-VEGF-DC-01   | MON-VEGF-01<br>What is the distribution of individual tree species? | Tree species distribution forestwide and by broad potential vegetation type. <ul style="list-style-type: none"> <li>• Percent presence of each tree species (at least 1 tree any size; at least 1 tree &lt;5" DBH; and at least 1 tree &gt;5" DBH)</li> </ul> |
| FW-VEGF-DC-02; BB-VEGF-DC-02; CA-VEGF-DC-02; CR-VEGF-DC-02; DI-VEGF-DC-02; EH-VEGF-DC-02; HW-VEGF-DC-02; LB-VEGF-DC-02; RM-VEGF-DC-02; SN-VEGF-DC-02; UB-VEGF-DC-02 | MON-VEGF-02<br>What is the abundance of size classes?               | Size class proportions, forestwide, by broad potential vegetation type, and by geographic area <ul style="list-style-type: none"> <li>• Percent of each size class (0 to 4.9" DBH; 5 to 9.9" DBH; 10 to 14.9" DBH; 15 to 19.9" DBH; and 20"+ DBH)</li> </ul>  |
| FW-VEGF-DC-03   | MON-VEGF-03   | Density class proportions, forestwide and by broad potential vegetation type  |

| Selected plan components         | Monitoring question  | Indicator(s) and measure(s)   |
|----------------------------------|--|---|
|                                  | What is the abundance of forest density classes?                                       | <ul style="list-style-type: none"> <li>Percent of each density class (&lt;40% canopy cover; 40-59.9% canopy cover; 60% + canopy cover)</li> </ul>   |
| FW-VEGF-DC-04                    | MON-VEGF-04<br>What is the distribution of large-tree structure?                       | Large-tree structure, forestwide and by broad potential vegetation type. <ul style="list-style-type: none"> <li>Percent presence of large-tree structure (large and very large)</li> </ul>  |
| FW-VEGF-DC-05                    | MON-VEGF-05<br>What is abundance of old growth?  | Old growth forestwide and by broad potential vegetation type <ul style="list-style-type: none"> <li>Percent and total acres of old growth</li> </ul>  |
| FW-VEGF-DC-06<br>FW-POLL-DC-01   | MON-VEGF-06<br>What is the quantity and distribution of snags?                         | Snags by snag analysis groups, by size class (10"+ dbh; 15"+ dbh; and 20"+ dbh) <ul style="list-style-type: none"> <li>Percent presence of at least 1 snag</li> <li>Number of snags per acre</li> </ul>   |
| FW-VEGF-DC-07<br>FW- POLL-DC- 01 | MON-VEGF-07<br>What is the quantity of coarse woody debris?                            | Coarse woody debris (>3" diameter) by broad potential vegetation types <ul style="list-style-type: none"> <li>Tons per acre</li> </ul>  |
| FW-VEGF-DC-09                    | MON-VEGF-08<br>What is the hazard to forest insects?                                   | Hazard to insect and pathogen (low, moderate, high), forestwide and by broad potential vegetation types <ul style="list-style-type: none"> <li>Percent of mountain pine beetle hazard</li> <li>Percent of Douglas-fir beetle hazard</li> <li>Percent of western spruce budworm hazard</li> </ul>  |
| FW-VEGF-GDL-04                   | MON-VEGF-09<br>Do old growth stands retain minimum old growth criteria post-treatment? | Stand characteristics in old growth treated with vegetation management <ul style="list-style-type: none"> <li>Use stand-level criteria to determine if old growth definition is met 1 year after treatment occurs. Monitor all treated old growth stands, if fewer than 5 are treated during the biennial monitoring period; or on 50% if more than 5 are treated.</li> </ul> |

## Vegetation – Nonforested (VEGNF)

**Table 9. Vegetation – Nonforested (VEGNF)**

| Selected plan components   | Monitoring question  | Indicator(s) and measure(s)   |
|--|--|---|
| FW-VEGT-DC-01; FW-VEGNF-DC-01; FW-VEGNF-DC-02; FW-POLL-DC-01; FW-WL-GDL-01 | MON-VEGNF-01<br>What is the condition of nonforested plant communities?<br>See also MON-VEGT-02 and MON-FOCAL-01 | Rangeland condition and trend forestwide <ul style="list-style-type: none"> <li>Composition of shrubs, grasses, and forbs on rangeland sites over time, compared to the estimated natural range of variability for the rangeland site.</li> <li>Changes in percent bare ground, litter and invasive species cover in nonforested cover types</li> </ul> |

| Selected plan components | Monitoring question  | Indicator(s) and measure(s)   |
|--------------------------|--|---|
| FW- POLL-DC- 01          | MON-POLL-01<br>Do plant communities contain pollinator-attractive species and species which bloom at different times including both early and late season species? | Plant (forb, graminoids, and shrub) diversity in rangelands, forestwide <ul style="list-style-type: none"> <li>• Similarity index by allotment or pasture (<i>weight of plant species within dominant sites in a pasture/allotments</i>)</li> <li>• Species composition/richness in nonforested PVTs.</li> <li>• Number of projects implemented that improved pollinator habitat forestwide (<i>beneficial seed mix, habitat improvements, etc</i>).</li> </ul> |
|                          | MON-POLL-02<br>Do both non-forested and forested plant communities provide structural diversity?   | Mosaic of vegetation structures forestwide <ul style="list-style-type: none"> <li>• Size class proportions, forestwide, by broad PVT, and GA (see MON-VEGF-02)</li> <li>• Acres of regeneration harvest (see MON-VEGT-01)</li> <li>• Acres of high severity fires (see MON-FIRE-01)</li> <li>• Spatial distribution of transitional VMap class</li> </ul>   |

## Threatened, Endangered, Proposed and Candidate Plant Species; and Plant Species of Conservation Concern (PLANT)

**Table 10. Vegetation – Threatened, endangered, proposed and candidate plant species; and plant species of conservation concern (PLANT)**

| Selected plan components | Monitoring question  | Indicator(s) and measure(s)   |
|--------------------------|--|---|
| FW-PLANT-DC-01           | MON-PLANT-01<br>What is the status of the known occurrences of Plant Species of Conservation Concern (SCC) species?    | At-risk plant distribution and condition forestwide <ul style="list-style-type: none"> <li>• Presence/absence of existing occurrences</li> <li>• Population trends and response to threats, evaluated at species specific level using species specific methods (e.g. # stems, # individuals, acres of occupied habitat)</li> </ul>      |
| FW-PLANT-DC-01           | MON-PLANT-02<br>What is the distribution and condition of whitebark pine?  | Whitebark distribution and condition forestwide, by broad PVT, and by GA <ul style="list-style-type: none"> <li>• Percent presence of whitebark pine (at least 1 tree present, any size; at least 1 tree present &lt;5" DBH; and at least 1 tree present &gt;5" DBH)</li> <li>• Number of whitebark pine snags by size class</li> </ul> |
| FW-PLANT-OBJ-01          | MON-PLANT-03<br>What management actions help restore whitebark pine, and what is the success of established seedlings? | Whitebark pine restoration actions forestwide <ul style="list-style-type: none"> <li>• Acres treated for the purpose of sustaining or restoring whitebark pine.</li> <li>• Survival of planted whitebark pine seedlings</li> </ul>  |

## Vegetation – Invasive Plants (INV)

**Table 11. Vegetation – Invasive Plants (INV)**

| Selected plan components         | Monitoring question  | Indicator(s) and measure(s)   |
|----------------------------------|--|---|
| FW- VEGNF-DC- 02<br>FW-INV-DC-02 | MON-INV-01<br>What is the extent of nonnative plant species?   | Invasive plant presence and abundance forestwide <ul style="list-style-type: none"> <li>• Net infested acres by species</li> <li>• Percent invasive species cover in inventoried areas</li> </ul>   |
| FW-INV-DC-01                     | MON-FOCAL-01<br>What is the status of non-forested ecosystems?   | Non-native annual in non-forested systems <ul style="list-style-type: none"> <li>• Net infested acres (percent cover as feasible) and/or presence/absence of invasive annual grasses (focal species)</li> </ul>   |
| FW-INV-OBJ-01                    | MON-INV-02<br>What is the status of invasive plant treatments?   | Acres of the following treatment types <ul style="list-style-type: none"> <li>• Biocontrol, herbicide, cultural, sheep grazing, or other types</li> <li>• Efficacy percentage</li> </ul>  |
| FW-INV-GDL-03<br>FW-PLANT-DC-01  | MON-INV-03<br>Are non-detrimental weed treatments occurring in areas that overlap with known populations of at-risk plant species? | Invasive weed treatments that occur in at-risk plant populations <ul style="list-style-type: none"> <li>• Number of at-risk plant occurrences that receive beneficial weed treatments</li> <li>• Invasive plant treatments used in at-risk plant communities</li> </ul> |

## Wildlife (WL)

**Table 12. Grizzly bear**

| Selected plan components   | Monitoring question  | Indicator(s) and measure(s)   |
|--|--|---|
| PCA-NCDE-DC-01<br>PCA-NCDE-STD-01<br>PCA-NCDE-STD-02<br>PCA-NCDE-STD-03<br>PCA-NCDE-STD-04 | MON-NCDE-01<br>Within the HLC NF portion of the Northern Continental Divide Ecosystem (NCDE) primary conservation area, have levels of motorized access or secure core changed compared to the established baseline? | Motorized access and secure core in PCA<br>The following measures are to be calculated as described in PCA-NCDE-STD-01 and compared to established baseline: <ul style="list-style-type: none"> <li>• Percent of each bear management unit subunit in &gt;1 mile per square mile open motorized route density</li> <li>• Percent of each Subunit of each Subunit &gt;2 miles per square mile total motorized route density</li> <li>• Percent of each Subunit in secure core</li> <li>• Ten-year running average of the above measures for each project area</li> <li>• Number and duration of 'projects' (per NCDE definition of 'project')</li> </ul> |
| Z1-NCDE-DC-01<br>Z1-NCDE-STD-01  | MON-NCDE-02  | Motorized access in Zone 1  |

| Selected plan components  | Monitoring question  | Indicator(s) and measure(s)   |
|---|--|---|
|   | Within the HLC NF portion of Zone 1, has the level of motorized access changed compared to the established baseline?   | <ul style="list-style-type: none"> <li>For Zone 1 on the HLC NF, density of motorized routes open for public use during the non-denning season on NFS lands, calculated as total miles divided by total area (HLC portion of Zone 1 only, and to be compared with established baseline)</li> </ul>  |
| PCA-NCDE-DC-01<br>PCA-NCDE-DC-02<br>PCA-NCDE-DC-03<br>PCA-NCDE-STD-06           | MON-NCDE-03<br>Within the HLC NF portion of the NCDE primary conservation area, has the amount of developed recreation changed compared to the established baseline?   | <p>Developed recreation sites and capacity in PCA</p> <p>The following measures are to be calculated for each bear management unit in the PCA for comparison to established baseline:</p> <ul style="list-style-type: none"> <li>Number of developed recreation sites (per NCDE definition)</li> <li>Capacity of developed sites managed for public overnight use</li> <li>Number of day-use recreation sites and trailheads</li> </ul>   |
| PCA-NCDE-DC-06<br>PCA-NCDE-STD-10<br>PCA-NCDE-STD-11                            | MON-NCDE-04<br>Within the HLC NF portion of the NCDE primary conservation area, has the amount of permitted livestock grazing changed compared to the established baseline?  | <p>Grazing allotments and sheep grazing use in PCA</p> <p>The following measures are to be calculated within the PCA, for comparison with the established baseline:</p> <ul style="list-style-type: none"> <li>Number of commercial livestock grazing allotments</li> <li>Number of permitted sheep animal unit months</li> </ul>   |
| PCAZ1-NCDE-DC-01<br>PCAZ1-NCDE-STD-01<br>PCAZ1-NCDE-STD-02<br>PCAZ1-NCDE-STD-04 | MON-NCDE-05<br>Within the HLC NF portion of the NCDE primary conservation area and Zone 1, have there been conflicts between grizzly bears and livestock on NFS lands?   | <p>Grizzly bear-livestock conflicts</p> <p>The following measure is to be calculated Within the PCA and Zone 1:</p> <ul style="list-style-type: none"> <li>Number of grizzly bear–livestock conflicts occurring on NFS lands</li> </ul>   |
| PCAZ1-NCDE-DC-01<br>PCAZ1-NCDE-STD-09<br>PCAZ1-NCDE-STD-10<br>PCAZ1-NCDE-GDL-05 | MON-NCDE-06<br>Within the HLC NF portion of the NCDE primary conservation area and zone 1, what measures have been taken to monitor and mitigate potential impacts of leasable or locatable minerals activities?     | <p>Monitoring and mitigation plans for leasable and locatable minerals activities</p> <p>The following measures are to be reported for the PCA and Zone 1:</p> <ul style="list-style-type: none"> <li>Number of monitoring plans for leasable or locatable mineral activities</li> <li>Changes to habitat resulting from leasable or locatable activities (including land surface and vegetation disturbance, road construction, work camp construction, etc.)</li> <li>Measures used to mitigate for habitat changes, disturbance, or displacement</li> <li>Costs of and funding sources for monitoring and mitigation measures</li> </ul> |
| PCA-NCDE-STD-09   | MON-NCDE-07<br>Within the HLC NF portion of the NCDE primary conservation area, have there been changes in the amount of area where late-season over-snow motorized use occurs compared to the established baseline? | <p>Denning habitat with late-season motorized over-snow use</p> <p>The following measure is to be reported for areas within the PCA, for comparison with the established baseline:</p> <ul style="list-style-type: none"> <li>Percentage of modeled grizzly bear denning habitat (as updated by Montana Fish, Wildlife, and Parks) where public motorized over-snow vehicle use is allowed during the den emergence time period (as defined by NCDE Science Team)</li> </ul>  |

**Table 13. Canada lynx**

| Selected plan components   | Monitoring question   | Indicator(s) and measure(s)  |
|--|---|--|
| FW-WL-DC-09<br>DI-VEGF-DC-04<br>RM-VEGF-DC-04<br>UB-VEGF-DC-04<br>NRLMD Biological Opinion (dated 3/27/2007) Term and Condition #4 | MON-LYNX-01<br>What is the status of lynx habitat forestwide?   | Lynx habitat structural mosaic <ul style="list-style-type: none"> <li>• Acres, and percent, of lynx habitat in the early stand initiation, stand initiation, multi-story mature, other, stem exclusion, and non-forested structural stages, by LAU.</li> </ul>   |
| NRLMD, Plan Appendix F, Standard VEG S2  | MON-LYNX-02<br>How much lynx habitat has been regenerated by vegetation management projects?  | Lynx habitat affected by regeneration harvest <ul style="list-style-type: none"> <li>• Percentage of lynx habitat on NFS land in each LAU that has been affected by regeneration harvest within the past decade.</li> </ul>  |
| NRLMD, Plan Appendix F, Required Monitoring item 1a, Required Monitoring item 1b, Required Monitoring item 1c                      | MON-LYNX-03<br>How much lynx habitat has been affected by fuels treatment projects and how much of that was/was not in compliance with NRLMD standards?       | Fuels Treatments <ul style="list-style-type: none"> <li>• Acres of fuel treatment in lynx habitat by LAU, and whether the treatment was within or outside the WUI as defined by HFRA.</li> <li>• Whether or not the fuel treatment met the NRLMD vegetation standards or guidelines. If standard(s) are not met, report which standard(s) are not met, why they were not met, and how many acres were affected.</li> <li>• Whether or not 2 adjacent LAUs exceed Standard VEG S1 (30% in a stand initiation structural stage that is too short to provide winter snowshoe hare habitat), and what event(s) or action(s) caused the standard to be exceeded.</li> </ul> |
| NRLMD, Plan Appendix F, Standard VEG S5; Required Monitoring item 2  | MON-LYNX-04<br>What changes to lynx habitat have occurred as a result of pre-commercial thinning?   | Application of exception in Standard VEG S5 <ul style="list-style-type: none"> <li>• For areas where any of the exemptions 1 through 6 listed in Standard VEG S5 were applied: Report the type of activity, the number of acres, and the location (by LAU) and whether or not Standard VEG S1 was within the allowance.</li> </ul>   |
| NRLMD, Plan Appendix F, Standard VEG S6; Required Monitoring item 3  | MON-LYNX-05<br>What changes to multi-story mature or late successional snowshoe hare habitat have resulted from vegetation management projects?               | Application of exceptions in Standard VEG S6 <ul style="list-style-type: none"> <li>• For areas where any of the exemptions 1 through 3 listed in Standard VEG S6 were applied: Report the type of activity, the number of acres, and the location (by LAU) and whether or not Standard VEG S1 was within the allowance</li> </ul>   |
| NRLMD, Plan Appendix F, Guidelines; Required Monitoring item 4   | MON-LNX-06<br>To what extent have vegetation management projects, grazing activities, and human use projects incorporated lynx habitat management guidelines? | Application of guidelines <ul style="list-style-type: none"> <li>• Document the rationale for deviations to guidelines. Summarize what guideline(s) was not followed and why.</li> </ul>   |

| Selected plan components                      | Monitoring question  | Indicator(s) and measure(s)   |
|---|--|---|
| NRLMD, Plan Appendix F<br>Required Monitoring | MON-LYNX-07<br>What changes to snow compacting activities have occurred? | Snow compaction in lynx habitat <ul style="list-style-type: none"> <li>• Map the location and intensity of snow compacting activities (per definition in the NRLMD glossary) and groomed routes that occurred inside LAUs then monitor any changes to that condition every five years.</li> </ul> |

**Table 14. Wildlife (WL)**

| Selected plan components   | Monitoring question  | Indicator(s) and measure(s)   |
|--|--|---|
| DI-WL-DC-01<br>UB-WL-DC-01<br>DI-WL-GO-01<br>DI-WL-GDL-01<br>UB-WL-GDL-01                        | MON-WL-01<br>Have there been changes to landscape-scale connectivity in the Divide and Upper Blackfoot GAs?    | Landscape scale connectivity <ul style="list-style-type: none"> <li>• Changes in mileage of motorized access in identified areas of Divide GA and Upper Blackfoot GA (per descriptions in DI-WL-DC-01 and UB-WL-DC-01)</li> <li>• Miles of new trail constructed in identified areas of Divide GA and Upper Blackfoot GA (per descriptions in DI-WL-DC-01 and UB-WL-DC-01)</li> <li>• Number and acreage of land acquisitions in Divide GA</li> </ul>   |
| FW-WL-DC-05<br>FW-WL-GDL-02<br>FW-NCDE-DC-01<br>PCAZ1Z2-DC-01<br>PCAZ1Z2-STD-01<br>FW-REC-GDL-07 | MON-WL-02<br>Are wildlife-human conflicts being minimized?   | Human-wildlife conflicts <ul style="list-style-type: none"> <li>• Number, type, and cause of conflict incidents</li> <li>• Number of food storage violations</li> </ul>   |
| BB-WL-DC-02; DI-WL-DC-02;<br>EH-WL-DC-03; UB-WL-DC-02  | MON-WL-03<br>What is the status of habitat conditions that support flammulated owls during the nesting season? | Ponderosa pine and snag habitat<br>The following measures should be reported for the warm-dry biophysical setting forestwide and for GAs within known flammulated owl distribution (Big Belts, Divide, Elkhorns, and Upper Blackfoot): <ul style="list-style-type: none"> <li>• Percent of area with ponderosa pine dominance types</li> <li>• Percent of warm dry biophysical setting with ponderosa pine trees <math>\geq</math> 15 inches dbh</li> <li>• Within ponderosa pine dominance types, proportion of low/medium (&lt;40%) canopy cover classes</li> <li>• Within ponderosa pine dominance types, number of acres burned (via wildfire or prescribed fire) in the past 2-20 years</li> </ul> |



| Selected plan components  | Monitoring question  | Indicator(s) and measure(s)   |
|---|--|---|
| FW-WL-DC-06<br>FW-WL-GDL-06<br>EH-ACCESS-SUIT-01  | MON-WL-04<br>What actions have been taken to minimize potential disturbances to ungulates and other wildlife on winter range?  | Management actions and motorized travel on winter range <ul style="list-style-type: none"> <li>• Miles of route open to public motorized use and acres of area open to public motorized over-snow use from the end of hunting season through early spring on identified winter ranges, by GA</li> <li>• Number, type, and timing of vegetation management actions with implementation occurring between the end of hunting season and early spring on identified winter ranges, by GA</li> </ul>  |
| FW-WL-GDL-04<br>FW-WL-GDL-10  | MON-WL-05<br>What management actions are occurring to prevent the spread of diseases and pathogens to and among wildlife populations?  | Preventative actions <ul style="list-style-type: none"> <li>• Number, type, and location of actions taken to prevent or reduce potential spread of white-nose syndrome or other diseases</li> <li>• Number, type, and location of actions taken to prevent or reduce potential spread of pathogens to western toads at known breeding sites</li> </ul>  |
| FW-WL-DC-04<br>EH-WL-DC-01  | MON-WL-06<br>Have there been changes in the amount of area most likely to provide seclusion and habitat security for wildlife?   | Available area with non-motorized or non-mechanized designations <ul style="list-style-type: none"> <li>• Total acres in and percent of each GA that is in primitive or semi-primitive non-motorized ROS category</li> <li>• Total acres in and percent of each GA in which both motorized and mechanized travel are not allowed</li> <li>• Miles of new permanent road constructed in the Elkhorns GA</li> </ul>   |
| BB/EH/LB/RM-WL-DC 01<br>BB/EH/LB -WL-STD 01<br>RM-WL-STD-02<br>FW-GRAZ-STD-03<br>FW-GRAZ-STD-04 | MON-WL-07<br>What management activities have occurred in bighorn sheep occupied habitat that address the potential for contact between domestic sheep and goats and bighorn sheep? | Potential for contact between bighorn sheep and domestic sheep and goats <ul style="list-style-type: none"> <li>• Number of domestic sheep and/or goat grazing allotments with completed risk analyses and management actions implemented per best available agency/interagency recommendations</li> <li>• Number of permits for pack goat use in GAs with bighorn sheep occupied habitat</li> <li>• Number of reported occurrences of comingling or contact between domestic sheep and/or goats with bighorn sheep on NFS lands</li> </ul> |

## Recreation Opportunities (REC)

**Table 15. Recreation Opportunities (REC)**

| Selected plan components                                     | Monitoring question  | Indicator(s) measure(s)   |
|--|--|---|
| FW-REC-DC-01<br>FW-REC-DC-03<br>FW-REC-DC-05<br>FW-REC-DC-06 | MON-REC-01<br>What is the status of developed recreation site management (including interpretive sites)?                               | Developed recreation site conditions <ul style="list-style-type: none"> <li>• Number, type, and location of developed recreation and interpretive sites.</li> <li>• Number of changes/improvements to developed recreation and interpretive sites.</li> <li>• Deferred maintenance needs at developed recreation and interpretive sites.</li> </ul>   |
| FW-REC-DC-04<br>FW-REC-DC-07                                 | MON-REC-02<br>What is the status of social and resource conditions at dispersed recreation sites, trailheads, and airstrip facilities? | Dispersed recreation site conditions <ul style="list-style-type: none"> <li>• Number and type of dispersed recreation sites</li> <li>• Number of reported social conflict or resource damage incidents.</li> </ul>  |
| FW-REC-OBJ-01<br>FW-REC-OBJ-02<br>FW-REC-OBJ-03              | MON-REC-03<br>What is the progress toward meeting developed recreation objectives in the plan?   | Developed recreation objectives <ul style="list-style-type: none"> <li>• Number of dispersed recreation sites on the forest that have been rehabilitated to correct erosion or sanitation issues.</li> <li>• Number of developed and/or dispersed recreation facilities that have been removed or relocated outside of riparian management zones or have undergone other measures to improve the conditions of aquatic or riparian resources.</li> <li>• Number of facilities or programs at developed recreation sites that have been improved to meet National accessibility requirements.</li> </ul> |

## Recreation Special Uses (RSUP)

**Table 16. Recreation Special Uses (RSUP)**

| Selected plan components | Monitoring question  | Indicator(s) measure(s)  |
|--------------------------|--|--|
| FW-RSUP-DC-01            | MON-RSUP-01<br>What is the status of recreation special use permits? | Recreation special use permits <ul style="list-style-type: none"> <li>• Number, type, and location of recreation SUPs</li> </ul> |

## Designated Areas

Designated areas are both administratively designated through the Forest Plan and congressionally designated by law. In the table below they include (but are not limited to); designated wilderness (WILD), recommended wilderness areas (RECWILD), wilderness study areas (WSA), national recreation trails (NRT), the Grandview Recreation Area (GVRA), and the Badger Two Medicine area (BTM). This section also includes components that address recreation access (ACCESS).

**Table 17. Designated Areas**

| Selected plan components         | Monitoring question  | Indicator(s) measure(s)  |
|----------------------------------|--|--|
| FW-WILD-DC-01                    | <p>MON-WILD-01<br/>Do management activities in designated wilderness areas protect and maintain wilderness character?</p> <p>MON-WILD-02<br/>Are natural process and disturbance the primary forces affecting the composition, structure, and pattern of vegetation?</p> | <p>Designated wilderness</p> <ul style="list-style-type: none"> <li>• Wilderness character monitoring</li> <li>• Number of authorized motorized and mechanized entries into designated wilderness</li> <li>• Number, kind, and extent of vegetation treatments (including prescribed fire) that has occurred in designated wilderness areas.</li> </ul>                          |
| FW-RECWILD-DC-01<br>FW-WSA-DC-02 | MON-RECWILD/WSA-01<br>Do management activities in recommended wilderness and wilderness study areas maintain and protect the ecological and social characteristics that provide the basis for wilderness recommendation?   | <p>Recommend wilderness areas</p> <ul style="list-style-type: none"> <li>• Number, kind, and extent of vegetation treatments (including prescribed fire) that has occurred in recommended wilderness and wilderness study areas.</li> <li>• Number of reported social conflict or resource damage incidents within recommended wilderness and wilderness study areas.</li> </ul> |
| SN-GVRA-SUIT-02                  | <p>MON-GVRA-01<br/>Are unauthorized trails created by mechanical means of transportation (mountain bike) present within the GVRA?</p> <p>How do mechanical means of transportation within the GVRA affect the primitive recreation setting?</p>                          | <p>Grandview Recreation Area</p> <ul style="list-style-type: none"> <li>• Number, mileage, and extent of unauthorized trails created for mountain bike trails within the GVRA.</li> <li>• Number and kind of reported social conflict or resource damage incidents within the GVRA.</li> </ul>   |
| FW-NRT-DC-01                     | MON-NRT-01<br>Is access to national recreation trails provided and maintenance conducted?  | <p>National recreation trails</p> <ul style="list-style-type: none"> <li>• Miles maintained to standard</li> <li>• Miles improved to standard</li> </ul>   |
| EH-ACCESS-DC-01                  | MON-EH-01  | <p>Elkhorns core</p> <ul style="list-style-type: none"> <li>• Number of reported social conflict incidents within the core area of the Elkhorns.</li> </ul>  |

| Selected plan components | Monitoring question  | Indicator(s) measure(s)  |
|--------------------------|--|--|
|                          | How do mechanized means of transportation (including mountain bikes) within the Elkhorns affect the primitive recreation setting?          |  |
| RM-BTM-DC-02             | MON-BTM-01<br>How do mechanical means of transportation (including mountain bikes) within the BTM affect the primitive recreation setting? | Badger Two Medicine <ul style="list-style-type: none"> <li>• Number of reported social conflict incidents within the core area of the Badger Two Medicine area.</li> </ul> |

## Cultural and Historic Resources (CR) and Areas of Tribal Importance (TRIBAL)

**Table 18. Cultural and Historic Resources (CR) and Areas of Tribal Importance (TRIBAL)**

| Selected plan components                            | Monitoring question   | Indicator(s) and measure(s)  |
|---|---|--|
| FW-CR-GDL-01  | MON-CRT-01<br>What is the progress toward preservation and conservation of significant cultural resources?                                | Cultural resources conservation actions by forest and geographic area <ul style="list-style-type: none"> <li>• Number of new sites recorded</li> <li>• Number of significant evaluations</li> <li>• Number of sites nominated</li> <li>• Number of scientific excavations</li> <li>• Number of public education events about sites</li> <li>• Number of damages</li> <li>• Number of 106 (project driven) vs 110 (non-project driven)</li> </ul> |
| FW-CR-DC-03<br>FW-CONNECT-DC-01<br>FW-CONNECT-DC-02 | MON-CRT-02<br>What public cultural resource learning opportunities are provided?  | Cultural resources outreach <ul style="list-style-type: none"> <li>• Number of education and interpretation outreach events</li> <li>• Number of publications</li> </ul>   |
| FW-CR-DC-04   | MON-CRT-03<br>What opportunities are provided for volunteers to participate in cultural resource conservation activities?                 | Cultural resource volunteer opportunities <ul style="list-style-type: none"> <li>• Number of volunteers by site or cultural project</li> </ul>   |
| FW-CR-GO-02   | MON-CRT-04<br>What consultations have occurred with Native America tribes to aid in the protection and enhancement of cultural resources? | Tribal consultations <ul style="list-style-type: none"> <li>• Number of consultations (with whom and what projects)</li> </ul>   |

## Land Status and Ownership (LAND) and Land Uses (LAND USE)

**Table 19. Land Status and Ownership (LAND) and Land Uses (LAND USE)**

| Selected plan components | Monitoring question   | Indicator(s) measure(s)   |
|--------------------------|---|---|
| FW-LAND-DC-02            | MON-LAND-01<br>To what extent are management actions occurring to provide road and trail easements? | Easements <ul style="list-style-type: none"> <li>• Number and location of new and existing easements</li> <li>• Number and location of existing temp easements at risk</li> <li>• Number and location of access/easement needs</li> </ul> |

## Infrastructure – Roads and Trails (RT), Bridges (BRDG), and Facilities (FAC)

**Table 20. Infrastructure – Roads and Trails (RT), Bridges (BRDG), and Facilities (FAC)**

| Selected plan components   | Monitoring question  | Indicator(s) measure(s)   |
|--|--|---|
| FW-RT-DC-01  | MON-INFRA-01<br>To what extent are road status changes occurring to provide a safe and cost-effective transportation system? | Road status conversion <ul style="list-style-type: none"> <li>• Number of miles decom or converted</li> <li>• Percent of decom road that were ID by subpart A (by forest)</li> </ul>  |
| FW-RT-DC-03<br>FW-RT-OBJ-03<br>FW-RT-OBJ-04<br>FW-RT-OBJ-05<br>FW-ACCESS-DC-01 | MON- INFRA -02<br>What is the status of road and trail improvement and maintenance?  | Road improvement and maintenance <ul style="list-style-type: none"> <li>• Miles of maintained roads</li> <li>• Miles of maintained trails</li> <li>• Miles of improved roads</li> <li>• Miles of improved trails</li> </ul> |

## Benefits to People –Public Information, Interpretation, and Education (CONNECT)

**Table 21. Benefits to People –Public Information, Interpretation, and Education (CONNECT)**

| Selected plan components  | Monitoring question  | Indicator(s) measure(s)  |
|---|--|--|
| FW-CONNECT-DC-01: FW-CONNECT-DC-02<br>See also Cultural Resources and Areas of Tribal Importance section. | MON-CONNECT-01<br>To what extent is the Forest providing opportunities for public information, interpretation and education? | <ul style="list-style-type: none"> <li>• Percent change in the # of education and interpretation programs offered (since the previous monitoring cycle)</li> <li>• Percent change in the # of people who attended education and interpretation programs (since the previous monitoring cycle)</li> </ul> |

## Benefits to People – Livestock Grazing (GRAZ)

**Table 22. Benefits to People – Livestock Grazing (GRAZ)**

| Selected plan components   | Monitoring question   | Indicator(s) and measure(s)  |
|--|---|--|
| FW-GRAZ-DC-01; FW-GRAZ-DC -02; FW-GRAZ-DC-03; FW-GRAZ-STD-02   | MON-GRAZ-01<br>Are rangelands maintaining or moving towards desired resource condition in response to livestock grazing management? | Long-term effectiveness monitoring <ul style="list-style-type: none"> <li>• Changes in bare ground and litter</li> <li>• Changes in vegetation composition and cover</li> </ul>                |
| FW-GRAZ-DC-02; FW-GRAZ-GDL-01  | MON-GRAZ-02<br>How are riparian plant communities responding to grazing by domestic livestock?                                      | Long-term condition and trend <ul style="list-style-type: none"> <li>• Permanent riparian vegetation transects</li> <li>• Hydrology cross-sections</li> <li>• Riparian photo points</li> </ul> |
| FW-GRAZ-GDL -05  | MON-GRAZ-03<br>What adaptive actions are being implemented and how are resources trending as a result of management changes?        | <ul style="list-style-type: none"> <li>• Range vegetation acres improved</li> <li>• Range betterment funds expended</li> </ul>   |
| <ul style="list-style-type: none"> <li>• Also see Aquatics section for FW-FAH-GDL-03; FW-CWN-GDL-03</li> </ul> |   |  |

## Benefits to People – Timber (TIM)

**Table 23. Benefits to People – Timber (TIM)**

| Selected plan components                        | Monitoring question   | Indicator(s) and measure(s)   |
|---|---|---|
| FW-TIM-DC-02                                    | MON-TIM-01<br>What is the severity of natural disturbances on lands suitable for timber production?             | Disturbances in lands suitable for timber production, forestwide <ul style="list-style-type: none"> <li>• Acres of wildfire in lands suitable for timber production, by severity</li> <li>• Acres of insect and disease infestations in lands suitable for timber production</li> </ul>         |
| FW-TIM-OBJ-01<br>FW-TIM-OBJ-02<br>FW-TIM-STD-07 | MON-TIM-02<br>What is the quantity of wood products sold by the Forest?   | Volume wood sold forestwide <ul style="list-style-type: none"> <li>• Timber sale quantity (products that meet utilization standards) in MMBF and MMCF.</li> <li>• Wood sale quantity (all wood products, including firewood, biomass, post/poles, non-saw material) in MMBF and MMCF</li> </ul> |
| FW-TIM-STD-02                                   | MON-TIM-03<br>What is the restocking status of stands that have had a regeneration harvest in the last 5 years? | Reforestation certification status forestwide <ul style="list-style-type: none"> <li>• Number of stands and acres that were harvested in the last 5 years by reforestation status: certified, progressing, or failed</li> </ul>   |

| Selected plan components                        | Monitoring question   | Indicator(s) and measure(s)   |
|---|---|---|
| FW-TIM-STD-08<br>FW-TIM-STD-09<br>FW-TIM-STD-10 | MON-TIM-04<br>What are the patch sizes of regeneration harvest, and to what extent are maximum patch size exceptions being implemented? | Patch size of regeneration harvest units by broad potential vegetation types<br><ul style="list-style-type: none"> <li>• Number of regeneration harvest units less than 40 acres; between 40 acres and 75 acres; and greater than 75 acres</li> </ul> |

## Benefits to People – Other Forest Products and Wood for Fuel (OFP)

**Table 24. Benefits to People – Other Forest Products and Wood for Fuel (OFP)**

| Selected plan components                        | Monitoring question  | Indicator(s) and measure(s)  |
|---|--|--|
| FW-OFP-DC-01<br>FW-OFP-DC-02<br>FW-TRIBAL-DC-01 | MON-OFP-01<br>What quantities of other forest products are sold by the Forest? | Other forest products sold forestwide<br><ul style="list-style-type: none"> <li>• Number of Christmas tree permits sold</li> <li>• Quantity of mushrooms sold</li> </ul> |

## Benefits to People – Fish and Wildlife (FWL)

**Table 25. Benefits to People – Fish and Wildlife (FWL)**

| Selected plan components                      | Monitoring question  | Indicator(s) and measure(s)   |
|---|--|---|
| FW-FWL-DC-01, FW-FWL-DC-03, FW-FWL-DC-04      | MON-FWL-01<br>Is the Forest continuing to provide opportunities for fish and wildlife related activities (including fishing, hunting, photography and wildlife viewing)? | Visitors engaged in fish and wildlife activities<br><ul style="list-style-type: none"> <li>• Percent change in # of visitors engaged in fishing, hunting, photography and wildlife viewing (since previous monitoring cycle)</li> </ul>   |
| FW-FWL-DC-01<br>FW-FWL-DC-05<br>FW-FWL-GDL-01 | MON-FWL-02<br>What management actions have been taken to influence big game availability on NFS lands during the hunting season?   | Management actions specifically related to big game habitat during the archery and rifle hunting seasons<br><ul style="list-style-type: none"> <li>• Number, type, and location by GA and species-specific analysis unit (where available) of management actions taken specifically for the purpose of providing or maintaining big game habitat security or influencing distribution of big game species during archery and rifle seasons</li> </ul> |

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