



United States Department of Agriculture

Forest Service

# 2020 Biennial Monitoring and Evaluation Report

## Humboldt National Forest Land and Resource Management Plan



May 2020

**For More Information Contact:**

James Winfrey

Humboldt-Toiyabe National Forest

1200 Franklin Way

Sparks, NV 89431

Phone: 775-355-5308

Email: [jwinfrey@fs.fed.us](mailto:jwinfrey@fs.fed.us)

Copper Basin Bog, Mountain City, Ruby Mountains, and Jarbidge Ranger District,  
Humboldt-Toiyabe National Forest

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at [http://www.ascr.usda.gov/complaint\\_filing\\_cust.html](http://www.ascr.usda.gov/complaint_filing_cust.html) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: [program.intake@usda.gov](mailto:program.intake@usda.gov).

USDA is an equal opportunity provider, employer and lender.

# SUMMARY OF FINDINGS AND RESULTS

The following table summarizes the results and recommendations of the 2018 Biennial Monitoring information provided in this report. Recommended changes to the management of NFS lands, and implementation of best management practices associated with forest projects will be implemented during the next monitoring cycle. Recommended changes to the Monitoring program, either changes to the monitoring questions or the indicators, will require an administrative change to the Forest Plan monitoring program. The proposed changes are included in the findings for the Monitoring Questions in the main body of the report. Table 1 identifies which monitoring items require a change. For more detail see the Monitoring item in the body of this report.

**Table 1. Summary of findings**

Monitoring Item	Do monitoring results demonstrate intended progress or trend toward Plan targets?	Based on the evaluation of monitoring results, may changes be warranted?	If a change may be warranted, where may the change be needed? <sup>2</sup>
(MON-WTRSHD-01) How is watershed condition changing?	No	Yes	There is a need to conduct an assessment to determine the causes and potential response to the high number of watersheds across the Forest that fall into the Function at Risk or non-function class.
(MON-AQH-01) What water bodies are not meeting desired water quality conditions?	Yes	No	N/A
(MON-SOIL-01) How are characteristics of soil health and productivity changing?	Yes	No	N/A
(MON-SOIL-02) How are management activities affecting soil health and productivity?	Yes	No	N/A

Monitoring Item	Do monitoring results demonstrate intended progress or trend toward Plan targets?	Based on the evaluation of monitoring results, may changes be warranted?	If a change may be warranted, where may the change be needed? <sup>2</sup>
(MON-VEG-COND-01) What changes have occurred to landscape scale vegetative community types?	Uncertain (B)	Yes	<p>Projects are currently under way to provide more accurate data for Cheatgrass and Medusahead. <i>Need to incorporate this data in next monitoring report and change to include all annual invasive grasses.</i></p> <p>There is a need to remove sagebrush, whitebark pine and bristlecone pine as indicators in this monitoring question as they are poor indicators of management actions or the need for change in strategies.</p>
(MON-VEG-COND-02) How are current allotment management strategies effective in meeting or moving toward desired conditions?	Yes	Yes	<p>Need to increase focused management on wild horses, elk and permitted livestock where there are impacts to vegetation condition.</p> <p>There has been an effort to improve ecological condition on grazing allotments, and 2018-2019 data indicates grazed riparian areas are improving. However, some sites in the Mountain City, Ruby Mountains and Ely Districts continue to show a downward trend and may need additional management changes.</p>
(MON-FOCAL-SPECIES-01) How are Populus tremuloides (aspen) communities changing over time?	Yes	Yes	Need to increase aspen stand management to address effects from combined effects of all ungulates.

Monitoring Item	Do monitoring results demonstrate intended progress or trend toward Plan targets?	Based on the evaluation of monitoring results, may changes be warranted?	If a change may be warranted, where may the change be needed? <sup>2</sup>
(MON-FOCAL-SPECIES-02) What do aquatic macroinvertebrate communities indicate about stream ecosystem integrity?	Yes	No	N/A
(MON-T&E-01) Are forest management activities affecting recovery of T and E species?	No (C)	No	<p>T and E species that are dependent on riparian streams and meadows, aspen and drier sagebrush ecosystems have seen a drop in available habitat due to wild horse use, feral livestock use and inadequate livestock management practices. This drop in available habitat suggests a need to change management practices related to these activities.</p> <p>Because the watershed classification data which are available to inform Indicator 1 were primarily developed in 2011 during a very rapid assessment, it would benefit the Forest if a more current and comprehensive assessment were completed of watershed condition.</p>
(MON-REC-01) Is the Forest's developed recreation program meeting visitor needs and providing for public health and safety at Forest facilities?	Yes	Yes	N/A
(MON-REC-02) Is the Forest's dispersed recreation program meeting visitor needs?	Uncertain (A)	Yes	Need to modify the indicator #5 it is redundant with indicator #4.

Monitoring Item	Do monitoring results demonstrate intended progress or trend toward Plan targets?	Based on the evaluation of monitoring results, may changes be warranted?	If a change may be warranted, where may the change be needed? <sup>2</sup>
(MON-REC-03) Do visitors have safe and sufficient access to recreational opportunities and other areas of interest around the Forest?	Uncertain (A)	No	N/A
(MON-WILD-01) How is wilderness character being preserved on wilderness areas across the Forest? Is fire being allowed to maintain its natural role as an ecosystem component within wilderness?	Uncertain (A)	No	N/A
(MON-CULT-01) Are cultural resources being evaluated for the National Register of Historic Places and protected and if required, are mitigation measures (avoidance, data recovery, etc.) appropriate and effective in the given situation?	Uncertain (A)	Yes	Need to include number of sites monitored to better understand the sample size of sites impacted.
(MON-CULT-02) Are significant cultural resources being interpreted?	Uncertain (A)	No	N/A
(MON-CLIM-01) How is climate change altering patterns of recreational activities and visitor use on the Forest?	Yes	Yes	Need to change Indicator #1 to remove components where data is unavailable.

Monitoring Item	Do monitoring results demonstrate intended progress or trend toward Plan targets?	Based on the evaluation of monitoring results, may changes be warranted?	If a change may be warranted, where may the change be needed? <sup>2</sup>
(MON-CLIM-02) How do recent temperature and precipitation trends (1-5 years) compare to long term averages (30+ years)?	Yes	No	N/A
(MON-CLIM-03) How do recent stream discharge trends (1-5 years) compare to long term averages (30+ years)?	Yes	No	N/A
(MON-WHB-01) What are the actual or estimated numbers of wild horses and burros	Yes	No	Suggest need for future management of wild horse herds.
(MON-MULTI-01) Is the supply of firewood adequate to meet the demand?	Yes	No	N/A
(MON-MULTI-02) How many road and trail rights of way are acquired annually?	Yes	No	N/A
(MON-MULTI-03) Are property boundaries sufficiently marked and identified to prevent trespass?	Yes	No	N/A
(MON-MULTI-04) Are Aspen/Hardwood stands being managed for multiple benefits?	Yes	No	N/A

Monitoring Item	Do monitoring results demonstrate intended progress or trend toward Plan targets?	Based on the evaluation of monitoring results, may changes be warranted?	If a change may be warranted, where may the change be needed? <sup>2</sup>
(MON-FIRE-01) How is fire and fuels management being used for resource benefit?	Yes	No	N/A
(MON-FIRE-02) Is the management of wildland fires accomplishing protection objectives for important Values at Risk (VAR)?	No	Yes	Need to remove Monitoring question from Monitoring Program.
(MON-FIRE-03) Is the response to wildland fires trending more towards using fire as a management tool to achieve land and resource management objectives?	No	Yes	Need to amend plan to allow for the management of wildland fires for land and resource objectives.
<p><sup>1</sup>Interval of data collection is beyond this reporting cycle (A); or more time/data are needed to understand status or progress of the plan component (B); or methods/results are inadequate to answer monitoring question (C).</p> <p><sup>2</sup> see body of the report for more details regarding any specific recommendations/opportunities for change.</p>			

Based on results of the monitoring program the Humboldt National Forest Plan is working as intended. This monitoring report indicates a need to make minor changes to the Monitoring Program there is no intention at this time to make the changes prior to Forest Plan Revision which begins in 2021. Problems arise during project planning resulting from the age of the plan and absence of measurable plan level desired conditions and objectives. These issues will be addressed during plan revision which will begin in 2022. While the report provides some data for the Cultural Resource Monitoring questions a transition of data from one platform to another resulted in the inability to provide accurate or current data for some questions. The data transfer should be complete in time for full responses in the 2020 biennial report. Wilderness monitoring item indicators related to the use and management of wildfires in wilderness were not provided in this report. A transition in fire staff left the Fire Planning Staff position vacant during a period this report was being prepared. This position has now been filled and the 2020 biennial report should be complete.

# Forest Supervisor's Certification

This report documents the results of monitoring activities that occurred through Fiscal Year 2020 on the Humboldt National Forest] National Forest. Monitoring on some topics is long-term and evaluation of those data will occur later in time.

I have evaluated the monitoring and evaluation results presented in this report. I have examined the recommended changes to the 1986 Land Management Plan, as amended at this time. I therefore consider the 1986 Land Management Plan sufficient to continue to guide land and resource management of the Humboldt National Forest for the near future and plan a deeper examination of the recommended changes through engagement with resource specialists and the public. Information about public engagement sessions will be posted on the H-T website when available.

---

William A. Dunkelberger

Date

Forest Supervisor

Humboldt-Toiyabe National Forest



# CONTENTS

SUMMARY OF FINDINGS AND RESULTS.....	iii
Forest Supervisor's Certification.....	ix
INTRODUCTION.....	1
Purpose.....	1
Objectives.....	1
How Our Plan Monitoring Program Works.....	2
Monitoring Objectives.....	2
How to Use this Report.....	3
MONITORING EVALUATION.....	3
Water.....	3
Soils.....	5
Vegetation.....	8
Focal Species.....	11
Threatened and Endangered.....	14
Recreation.....	16
Wilderness.....	20
Cultural Resources.....	22
Climate.....	24
Wild Horses and Burros.....	26
Multiple Uses.....	26
Fire.....	28
DETERMINATIONS FROM THE BIENNIAL EVALUATION.....	30
Need for Changing the Forest Plan.....	30
Need for Changing Management Activities.....	30
Need for Changing the Monitoring Program.....	30
Need for Conducting an Assessment to Determine Preliminary Need to Change the Plan.....	31
ABOUT OUR FOREST PLAN MONITORING PROGRAM.....	31
Roles and Responsibilities.....	31
HOW THE MONITORING PROGRAM WORKS.....	32
NATIONAL DATABASES.....	33
MONITORING AND EVALUATION REPORT TIMING.....	37



# INTRODUCTION

## Purpose

The purpose of the biennial monitoring evaluation report is to help the responsible official determine whether a change is needed in forest plan direction, such as plan components or other plan content that guide management of resources in the plan area. The biennial monitoring evaluation report represents one part of the Forest Service's overall monitoring program for the Humboldt Toiyabe National Forest. The biennial monitoring evaluation report is not a decision document; it evaluates monitoring questions and indicators presented in the Plan Monitoring Program chapter of the forest plan, in relation to management actions carried out in the plan area. In April of 2016 the Humboldt National Forest Land and Resource Management Plans Monitoring Program (Chapter 5) was modified to meet the requirements of the 2012 planning rule by May 2016. This modified monitoring program is presented below in this biennial monitoring report.

Monitoring and evaluation are continuous learning tools that form the backbone of adaptive management. For this reason, we will produce an evaluation report every two years. This is our first written report of this evaluation since the Humboldt National Forest Plan Monitoring program was finalized in 2016. This report indicates whether a change to the forest plan, management activities, monitoring program or forest assessment may be needed based on the new information. The 2018 biennial monitoring reports for the Humboldt-Toiyabe National Forest is available at <https://www.fs.usda.gov/main/htnf/landmanagement/planning>.

Our Monitoring covers these eight topics required under FSH 109.12, in addition to social, economic, and cultural sustainability. You'll find each of these topics addressed in the report.

1. The status of select watershed conditions.
2. The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems.
3. The status of focal species to assess the ecological conditions required under § 219.9.
4. 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.
5. The status of visitor use, visitor satisfaction, and progress toward meeting recreation objectives.
6. Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.
7. Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.
8. 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))

## Objectives

There are several objectives for this report, including:

- Make information obtained from monitoring available to the public.

- Document implementation of the Plan Monitoring Program including changed conditions or status of key characteristics used to assess accomplishments and progress toward achievement of the selected Land and Resource Management Plan components.
- Assess the current condition (i.e., status) and trend of selected forest resources.
- Assess the status of previous recommended options for change based on previous monitoring & evaluation reports.
- Evaluate relevant assumptions, changed conditions, management effectiveness, and progress towards achieving the selected desired conditions, objectives, and goals described in the Forest Plan.
- Present recommended change opportunities to the responsible official.

## How Our Plan Monitoring Program Works

Monitoring and evaluation requirements have been established through the National Forest Management Act (NFMA) at 36 CFR 219. Additional direction is provided by the Forest Service in Chapter 30 – Monitoring – of the Land Management Handbook (FSH 1909.12).

The Humboldt National Forest monitoring program was updated in *April 2016* for consistency with the 2012 planning regulations [36 CFR 219.12 (c)(1)]. The Humboldt National Forest Plan was administratively changed to include the updated monitoring program (Chapter 5). For a copy of the current monitoring program go to [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd541249.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd541249.pdf). Monitoring questions and indicators were selected to inform the management of resources on the plan area and not every plan component was determined necessary to track [36 CFR 219.12(a)(2)]. See the Plan Monitoring Program for discussion on how the monitoring questions were selected to be consistent with the 2012 planning regulations 36 CFR 219.12.

Providing timely, accurate monitoring information to the responsible official and the public is a key requirement of the plan monitoring program. This biennial monitoring evaluation report is the vehicle for disseminating this information.

## Monitoring Objectives

The objectives of our plan monitoring plan include:

- Assess the current condition and trend of selected forest resources.
- Document implementation of the Plan monitoring Program
- Evaluate relevant assumptions, changed conditions, management effectiveness, and progress towards achieving the selected desired conditions, objectives, and goals described in the Forest Plan.
- Assess the status of previous recommended options for change based on previous monitoring & evaluation reports.
- Document scheduled monitoring actions that have not been completed and the reasons and rationale why.
- Present any new information not outlined in the current plan monitoring program that is relevant to the evaluation of the selected monitoring questions.
- Present recommended change opportunities to the responsible official.

## How to Use this Report

This report is a tool and a resource for the Humboldt-Toiyabe National Forest to assess the condition of forest resources in relation to Forest Plan direction and management actions. It is also a tool and a resource for the public to learn more about how the Forest Service is managing forest resources.

This monitoring report, along with the biennial monitoring report prepared for the Humboldt National Forest will be used to identify where the forest needs to take or change management practices to improve the conditions of the natural, physical or social resources found on the Forest. The monitoring reports will be used as the forest begin the Forest Plan revision process in 2022 to provide information regarding the need for change and supporting information for the plan assessment process.

The biennial monitoring evaluation report is designed to help the public, as well as Federal, State, local government, and Tribal entities anticipate key steps in the overall monitoring program. The biennial monitoring evaluation report is also intended to help people better understand reported results in relation to past monitoring reports, future monitoring reports and the broader-scale monitoring strategy that is issued at the Forest Service Regional level.

## MONITORING EVALUATION

### Water

#### **MON-WTRSHD-01 How is watershed condition changing?**

##### **Indicator 1: Watershed condition indicators (Class) from the Watershed Condition Framework.**

Data source: Data were retrieved from the US Forest Service Watershed Condition Assessment Tracking Tool (WCATT) database.

##### **Indicator 2: Essential projects completed.**

Data source: Data were identified by personal knowledge of the Forest Hydrologist, John McCann, of projects completed on the Forest.

### **Monitoring Result**

**Indicator 1:** Indicator 1 data show 14 sub-watersheds are in a Functional condition, 191 sub-watersheds are in a Functional-at-Risk condition, and 15 sub-watersheds are in a Non-Functional condition. Most watersheds were rated for functionality in 2011 during a rapid assessment which was based on available spatial data and professional judgement of resource specialists with on-the-ground knowledge of certain watershed condition considerations. A few watershed condition class ratings have been updated in the intervening years as new or better data became available. The two most common indicators rated individually as Non-Functional were Aquatic Habitat and Riparian/ Wetland Vegetation with 56% and 55% of watersheds being rated as Non-Functional for these indicators, respectively. No changes to any watershed conditions have been recorded since the last report.

**Indicator 2:** Data show that no essential projects were completed in either of the two Priority Watersheds currently identified in the planning area in the remainder of FY18 or FY19. Fires in the summer and fall of 2018 and the fall of 2019, along with subsequent post-fire treatments reduced resource specialist capacity to complete additional rehabilitation work in Priority Watersheds.

## Finding

**Indicator 1:** Because the watershed classification data which are available to inform Indicator 1 were primarily developed in 2011 during a very rapid assessment, it would benefit the Forest if a more current and comprehensive assessment were completed of watershed condition. It is expected that additional targeted watershed condition assessments will occur in 2021 and that all watersheds will be reassessed in 2026 based on recent discussions. While current watershed condition data (i.e., 87% of watersheds rated as Functional-at-Risk and 7% rated as Non-Functional) seem to indicate a need for changing either the Humboldt National Forest Plan or management within the planning area, such Plan or management changes should not be made unless improved assessment data show the same need.

**Indicator 2:** Monitoring does not indicate a need for change of the Humboldt National Forest Plan.

## MON-AQH-01: What water bodies are not meeting desired water quality conditions?

### Indicator 1: Miles of impaired 303(d) streams.

Data source: Indicator #1 data were retrieved from spatial Integrated Water Quality Report data from both California (data collected in 2012) and Nevada (data collected in 2014).

### Indicator 2: Aquatic macroinvertebrate metrics (where sampled).

Data source: Indicator #2 PacFish/InFish (PIBO) 2012-2014 report

## Monitoring Result

**Indicator 1:** Data show 160 miles of impaired streams (34 segments) and 60 acres of lakes/reservoirs (two locations). No new impaired water reports are available from the state of Nevada which would indicate any additions to the impaired water previously reported.

**Indicator 2:** For Jerritt Canyon associated streams, baseline condition samples in the 1970s were dominated by mayflies. The flow and habitat conditions of these streams appear to be the most influential factors for macroinvertebrate populations. When flow is present, streams in the study area support generally healthy communities of macroinvertebrates, indicating that water quality is sufficient to support these populations. However, the macroinvertebrate community at the upstream site on Snow Canyon Creek, Site SC-100, is likely somewhat affected by influences upstream of the site in the remediated reach of the stream. Other than this observation we found no evidence that Jerritt Canyon Gold activities are affecting the aquatic communities in streams in the vicinity of the Jerritt Canyon Mine. Monitoring was completed on 7 streams within the PIBO area since 2014, all of which were sampled in 2017. All seven streams sampled had a RIVPACS

score below 0.78 (Scores > 0.78 indicate good quality habitat whereas scores < 0.78 indicate poorer quality habitat.)

## Finding

**Indicator 1:** Monitoring results do not indicate a need for changing the Humboldt National Forest Plan. However, several streams, lakes, and reservoirs are listed as not attaining water quality standards for identified beneficial uses. Generally, management under the Forest Plan is intended to preserve, conserve, or improve water quality. In some cases, altered management may lead to an improvement in or in some cases more rapid improvement of water quality.

**Indicator 2:** Monitoring has not indicated a need for change of the Humboldt National Forest Plan. For monitoring (2019) macroinvertebrate in streams associated with mine activities at the Jerritt Canyon Mine, the change in the persistence of flows (perennial to ephemeral) has caused a shift in macroinvertebrate communities more associated with degraded water quality conditions. This change is mostly attributable to drought conditions not forest management activities.

PacFish/InFish (PIBO) monitoring group monitors streams with the Columbia River Watershed on the Humboldt National Forest. The PIBO sampling scheme includes repeat sampling of streams every 5 years. They are currently in the 2015-2019 sampling period. Since 2014, only seven sites have been sampled so far. The most recent macroinvertebrate sampling by PIBO of several streams indicate that the water bodies may have water quality conditions that are less than desired. It is likely that land management activities are a contributing factor to these conditions.

## Soils

### **MON-SOIL-01: How are characteristics of soil health and productivity changing?**

**Indicator 1: Change in surface organic matter (litter).**

**Indicator 2: Soil temperature trends at select locations.**

**Indicator 3: Depth to water at select locations.**

**Indicator 4: Soil stability: Erosion and sedimentation.**

**Indicator 5: BMP implementation and effectiveness monitoring.**

**Indicator 6: Burn severity (any management activity that uses fire as a tool).**

Data source: Ecological condition monitoring plots, climate station data, BMP monitoring reports. USFS R04 BMP Monitoring database.

## Monitoring Results

**Indicator 1,3,4:** Wild horse use is detrimentally impacting some springs and streams at lower elevations particularly on the Ely and Santa Rosa Ranger districts. Physical impacts such as soil

compaction, and changes in vegetative composition from wetland to upland species is indicative of a loss of upward capillary movement of water in the soil thereby lowering of the water table.

Long term monitoring plots on uplands are showing slight increases in litter, basal area, overstory cover, and corresponding decreases in bare soil. Some of the more heavily used rangelands are seeing increases in cheatgrass, lowering soil productivity.

Indicator 2: Soil temperature is being measured by a variety of SnoTel, SCAN, and other micrometeorological stations. Efforts are currently ongoing to compile this data to start developing trends to determine if any long-term changes in soil climate is occurring. There are currently 30 SnoTel Stations collecting climate data within the Ruby Mtn/Jarbridge/Mtn city (19), Ely (8), and Santa Rosa (3) Ranger districts.

Note: While the SNOTEL stations have been collecting atmospheric climate data for up to 40 years, soil temperature and soil moisture sensors were only installed in the past 15 years.

**Indicator 5:** In FY18, the Range A BMP monitoring protocol was completed at two sites and the Roads C protocol was applied at one site, all for both implementation and effectiveness. Both Range A protocols resulted in a composite score of “poor”. The Roads C protocol resulted in a composite score of “excellent”. In FY19, the Recreation A protocol was applied to one site for effectiveness only with the result of “not”. This monitoring was conducted across the combined Humboldt and Toiyabe planning areas.

**Indicator 6:** No known prescribed fires had burn severity mapping conducted on them.

## Finding

Soil health and productivity across the Humboldt portion of the forest is for the most part stable. Localized impacts from wildfire, cattle, sheep, and wild horses has reduced soil health and productivity due to loss of surface organic matter, and accelerated erosion and sedimentation.

Projects to convert pinyon-juniper woodlands back to sagebrush ecosystems are continuing. Soil function in those areas are, for the most part, improving. A few of those areas have seen an increase in annual brome (cheatgrass) that are negatively affecting the health of those soils.

In 2018 and 2019, seven fires burned over 181,026 acres of the Humboldt portion of the National Forest. Total acres burned that **included other** federal and private lands totaled 713,281 acres. Physical impacts to the soil from the heat by the fires included changes in soil structure, reduced infiltration, increased hydrophobicity, and increased runoff and erosion. In addition, the effects of these fires have removed all organic matter from these areas. Loss of vegetative cover has exposed soils to higher surface and near surface temperatures. Once vegetation recovers in these fire areas, erosion rates will decrease, litter will **increase**, and soil temperatures will return to prefire conditions.

Numerous post fire treatments were implemented in these fire areas predominately in late 2018 and 2019. It is a little too early to tell how the fire areas are recovering naturally and from the treatments. The next monitoring report should provide a better analysis of the fire recovery.

**Indicator 5:** Monitoring results indicate that improved management to conserve water quality is needed for both rangeland management and recreation management. However, the small number of sites monitored may not be indicative of the entire Forest.

## **MON-SOIL-02: How are management activities affecting soil health and productivity?**

**Indicator 1: Change in surface organic matter (litter).**

**Indicator 2: Soil stability: Erosion and sedimentation.**

**Indicator 3: BMP implementation and effectiveness monitoring.**

**Indicator 4: Burn severity (any management activity that uses fire as a tool).**

Data source: Ecological condition monitoring plots, BMP monitoring reports, USFS R04 BMP Monitoring database.

### **Monitoring Results**

**Indicator 1, 2:** Wild horse use is detrimentally impacting uplands, springs and streams at lower elevations on the Ely and Santa Rosa Districts. Physical impacts such as increased soil compaction, bare soil, and accelerated erosion is resulting in changes in vegetative composition from wetland to upland species. This is indicative of a loss of upward capillary movement of water in the soil thereby lowering of the water table.

Ecological monitoring plots on uplands are showing increases in litter, basal area, overstory cover, and corresponding decreases in bare soil. Some of the more heavily used rangelands are seeing increases in cheatgrass (annual invasive grasses) and bare soil, lowering soil productivity.

**Indicator 3:** In FY18, the Range A BMP monitoring protocol was completed at two sites and the Roads C protocol was applied at one site, all for both implementation and effectiveness. Both Range A protocols resulted in a composite score of “poor”. The Roads C protocol resulted in a composite score of “excellent”. In FY19 the Recreation A protocol was applied to one site for effectiveness only with the result of “not”. This monitoring was conducted across the combined Humboldt and Toiyabe planning areas.

Indicator 4: No known prescribed fires had burn severity mapping conducted on them.

### **Finding**

Soil health and productivity across the Humboldt portion of the forest is for the most part stable. Localized impacts from prescribed burning, cattle, sheep, and wild horse grazing, recreation management has reduced soil health and productivity due to loss of surface organic matter, compaction, increased bare soil, and accelerated erosion.

Projects converting pinyon-juniper woodlands to sagebrush ecosystems are improving the soil function in those areas. These projects will result in higher vegetative ground cover to effectively reduce erosion and sedimentation. A few of those areas have seen an increase in cheatgrass (annual invasive grasses) that are negatively affecting the health of those soils by outcompeting the establishment of native vegetation.

Watershed, and site-specific restoration projects on the Santa Rosa and Ely Ranger districts are being implemented to reduce erosion on uplands, and improve riparian soil function, along streams and spring systems.

**Indicator 5:** Monitoring results indicate that improved management to conserve water quality is needed for both rangeland management and recreation management. However, the small number of sites monitored may not be indicative of the entire Forest.

## Vegetation

### **MON-VEG-COND-01: What changes have occurred to landscape scale vegetative community types?**

**Indicator 1 Invasive and noxious species, sagebrush, pinyon-juniper, white bark pine, bristlecone, wet-to-dry meadows and riparian zones, aspen, and fir encroachment.**

Data source: Ecological Condition Monitoring Plots

**Indicator 2 Fire risk assessment, fire regime condition class, and wildfire**

Data source: Corporate Data Warehouse – FACTS, Interagency Fire Dispatch Center/GIS

### **Monitoring Results**

In riparian meadows noxious weed occurrences have remained fairly stable, with areas being treated almost equaling areas being inhabited. Invasive weeds continue to move and expand into disturbed meadow sites but can ebb with positive management changes. The Forest is now home to some newer invasive species, not previously encountered during field monitoring, such as littlepod false flax (*Camelina macrocarpa*), desert madwort (*Alyssum desertorum*), and several annual brome grasses (*Bromus* species). In mesic to wet sites with disturbance Musk thistle (*Caardus nutans*), Canada thistle (*Circium arvense*) and Scotch cotton thistle (*Onopardum acanthium*) continue to be a problem.

Medusahead (*Tainiatherum caput-medusae*) was found in a dry graminoid meadow community on the Santa Rosa District. Most sagebrush sites are in functional condition and stable. However, some Wyoming big sagebrush and low sagebrush sites have converted to a predominance of invasive species cheatgrass (*Bromus tectorum*) and annual forbs such as tumbled mustard (*Sisymbrium altissimum*) with recent fires. Several species such as littlepod false flax (*Camelina macrocarpa*), desert madwort (*Alyssum desertorum*), and several annual brome grasses (*Bromus species*) have been added to forest plan monitoring since the 2018 report.

In past efforts to stabilize soils and increase forage, there are several areas across the Forest that have been seeded to introduced grasses, such as crested wheatgrass (*Agropyron cristatum*), Siberian wheatgrass (*Agropyon fragile*), Siberian wheatgrass (*Elymus sibiricus*), tall oatgrass (*Arrhenatherum elatius*) and smooth brome (*Bromus inermis*). While these species do a good job of stabilizing soils, they lack palatability for grazing animals, and tend to dominate the herbaceous component of seeded sagebrush communities. These seeded sites have a higher percentage of bare soil, when compared to native vegetated sites.

In 2019 several wildfires occurred in some non-native seeded sites. In coordination with Nevada Department of Wildlife, new seedlings with native species were planted in 2019.

Most sagebrush sites are in functional condition and stable. However, some Wyoming big sagebrush and low sagebrush sites have converted to a predominance of invasive species cheatgrass (*Bromus tectorum*), other annual brome grasses, and annual forbs such as tumbled mustard (*Sisymbrium altissimum*) with recent fires.

2018 monitoring data on the Santa Rosa Ranger District reported medusahead (*Tainiatherum caput-medusae*), scotch cotton thistle (*Onopordum acanthium*), Canada thistle (*Cirsium arvense*) and bull thistle (*Cirsium vulgare*). In the Mountain City District monitoring reported whitetop (*Cardaria draba*) and perennial pepperweed (*Lepidium latifolium*).

Five aspen stands were monitored on the Humboldt Forest, three in the Ruby Mountains, one in Jarbidge and one in Ely District. Four of the Aspen stands are in good to excellent condition. One stand in the Ruby Mountain Wilderness (McCutcheon Creek) appears to have been grazed heavily for some time and is in low ecological condition. Bare soil on this willow/mesic graminoid site was 66%.

Eighteen plots were monitored on the Ely Ranger District in 2018 & 2019. The purpose of monitoring 12 of these sites was to form a baseline for planning projects to improve ecological condition in an area prone to livestock congregation. Current condition on these sites ranged from poor to good.

Eleven plots in spring habitats were monitored in a wild horse territory on the Ely Ranger District. Four of the plot locations could not be monitored in detail, because the water was piped away, the spring was in a narrow, slot canyon, or the remnant vegetation was limited to a tall, wild rose thicket. All of the monitored sites, except for two in slot canyons, had heavy trampling, low amounts of desirable vegetation and high amounts of bare soil. None were in functioning condition. The data indicates this wild horse population is beyond the capacity of the Forest to support those numbers.

**Indicator 2:** Fire risk was reduced and fire regime condition class moved towards improved conditions as a result of forest vegetation and fuels reduction treatments. There was a combined 22,300 acres treated across the forest in 2016 and 2017 (12,400 and 9,900 acres respectively). This amount is within the forest 5-year average of acres treated annually.

## Finding

**Indicator 1:** Changes in wetland vegetative communities where wild horses and burros (WHB) are present in active grazing allotments indicate a need to change monitoring protocols. Increasing the number of monitoring plots and how often data is collected in a) areas where WHB and livestock grazing occur, b) where WHB exists without livestock grazing, and c) where WHB do not exist in active grazing allotments and analyzing for differences in changes to riparian and other wetland vegetative community types will provide a better understanding for need for change in management activities.

**Indicator 2:** Noxious weeds are being treated and there are positive signs of success in treatments, but infestations of new species are occurring and few restoration projects have resulted in a reduction of invasive species. Broadly categorized, populations of species such as Cheatgrass (*Bromus tectorum*), Medusahead (*Tainiatherum caput-medusae*), Barbed Goat Grass (*Aegilops triuncialis*), Jointed Goat Grass (*Aegilops cylindrical*), North Africa Grass (*Ventenata dubia*), and many others result from similar ecological conditions. As these species are increasing in occurrences and densities they can be used as indicators for the need for change in

management practices. Project partners at the University of Nevada Reno, Rocky Mountain Research Station, and program partners at Intermountain Regional Office are currently implementing low and high elevation data collection with the use of unmanned aerial vehicles (UAVs) and existing satellite networks. These efforts are expected to yield additional protocols and more accurate data for mapping and monitoring infestations of several annual invasive grass species. As they develop, these data sets and monitoring protocols will be evaluated over the next monitoring period for appropriateness and efficiency in forest plan monitoring.

<b>Annual Invasive Grass Species on Humboldt National Forest as of 2019</b>	<b>Species Code</b>	<b>Acres</b>
Barbed Goat Grass	AETR	ND
Cheatgrass	BRTE	3,110.24
Japanese Brome		ND
Jointed Goat Grass	AECY	0.19
Medusahead	TACA8	1,283.07
North Africa Grass (Ventenata)	VEDU	926.43
Red Brome	BRRU2	ND
Ripgut Brome	BRDI3	ND
<b>Total</b>		<b>5319.93</b>

Some community types have proven to be less than reliable as indicators of management action and planning. For example, a loss of 5,000 acres of sagebrush community may not register a significant change if monitoring accounts for millions of acres. Evaluating the expansion or loss of bristlecone acres are challenging and less useful for managers as those communities are slow to change. As whitebark and limber pine share ecological parameters, geographic range, and similar reflective index, there is low confidence in being able to discern between the two communities at a landscape scale. Therefore, there is a need to remove sagebrush, whitebark and bristlecone pine from monitoring as they are poor indicators of management action or the need for change in strategies. The analysis for changes in the remaining habitat types are based upon differences in acreages as GIS information is updated in databases described in the project record.

## **MON-VEG-COND-02: How are current allotment management strategies effective in meeting or moving toward desired conditions?**

**Indicator 1: Ground cover, invasive species, Aspen, species composition, water quality, soil productivity to determine satisfactory condition.**

Data source: Ecological Condition Monitoring Plots

### **Monitoring Results**

Aspen on the Jarbidge Ranger District has not seen tree cover change significantly, but the understory vegetation has seen significant improvement due to changes in grazing management.

Other than the Cherry Creek allotment, permitted livestock are being effectively managed to maintain or improve ecological condition. A cottonwood monitoring plot location in the Jarbidge District was graded and the trees removed to make an unauthorized campsite.

The Ely District has experienced aspen decline related to the introduction of elk. Heavy elk and permitted livestock use in aspen is resulting in the decline of some stands. Wild horse use in the west side of the White Pine Range of the Ely District has expanded outside of the wild horse territory and now covers much of the north half of the mountain range. The ecological condition of riparian areas and surrounding sagebrush plant communities has declined as a result. The soil is compacted, and productivity is low to non-existent.

The Mountain City District has many good roads and gentle rolling topography that make it suitable for dispersed recreation in areas also attractive to permitted livestock. Riparian conditions are improving for the locations sampled. Relatively flat meadows close to roads that have been resting sites for cattle are now also parking sites for large recreation vehicles. This dual use is resulting in site specific degradation of riparian meadows through soil compaction and loss a vegetation.

Monitoring data from Santa Rosa District indicates there are condition concerns with riparian sites throughout much of the District. More than half of the plots monitored have rooting depths functioning at risk or not functioning, and all of the plots sampled had cover of desirable plants in functioning at risk or non-functioning condition. Four noxious species were found in two of the 18 sampled areas. The one repeated plot showed a downward trend.

## Finding

Working with ranchers/permittees appears to have resulted in improved livestock management on most of the Forest. Introduced elk and wild horse herds are in need of focused management. Recreation use is causing cumulative damage to some riparian areas.

## Focal Species

### **MON-FOCAL-SPECIES-01: How are Populus tremuloides (aspen) communities changing over time?**

#### **Indicator 1: Spatial extent (acres) regeneration, disease, age classes, and understory.**

Data source: Ecological Condition Monitoring plots

## Monitoring Results

Aspen was monitored on the Jarbidge Ranger District, the tree cover has not changed significantly, the understory vegetation has seen significant improvement due to changes in grazing management. Repeat monitoring on two mesic meadows in the Mountain City District occurred, and both show some decline due to a combination of livestock grazing and recreational vehicle camping. Large RV camping in meadows, which are already impacted by livestock grazing, is having impacts across accessible sites in the Forest.

The Ely Ranger District has experienced aspen decline related to the introduction of elk. Heavy elk and permitted livestock use in aspen is resulting in the decline of some stands.

## Finding

Aspen stands on the Jarbidge District are improving with changes in grazing management. Aspen stands on the Ely Ranger District are declining in areas with heavy elk, permitted and feral wild horse, and livestock use.

### **MON-FOCAL-SPECIES-02: What do aquatic macroinvertebrate communities indicate about stream ecosystem integrity?**

#### **Indicator 1: Diversity; species composition; and other indices of macroinvertebrate response to current conditions (e.g., index of biotic integrity [IBI], Ephemeroptera, Plecoptera Trichoptera index [EPT]).**

Data source: 2016 Macroinvertebrate Report prepared by BLM/USU National Aquatic Monitoring Center, Logan, Utah.

## Monitoring Results

**Indicator 1:** For Jerritt Canyon associated streams, baseline condition samples in the 1970s were dominated by mayflies. The flow and habitat conditions of these streams appear to be the most influential factors for macroinvertebrate populations. When flow is present, streams in the study area support generally healthy communities of macroinvertebrates, indicating that water quality is sufficient to support these populations. However, the macroinvertebrate community at the upstream site on Snow Canyon Creek, Site SC-100, is likely somewhat affected by influences upstream of the site in the remediated reach of the stream. Other than this observation we found no evidence that Jerritt Canyon Gold activities are affecting the aquatic communities in streams in the vicinity of the Jerritt Canyon Mine.

Monitoring was completed on 7 streams within the PIBO area since 2014, all of which were sampled in 2017. All seven streams sampled had a RIVPACS score below 0.78 (Scores > 0.78 indicate good quality habitat whereas scores < 0.78 indicate poorer quality habitat.)

## Finding

**Indicator 1:** Monitoring has not indicated a need for change of the Humboldt National Forest Plan. For monitoring macroinvertebrates, in streams associated with mine activities at the Jerritt Canyon Mine, the change in the persistence of flows (perennial to ephemeral) causes a shift of macroinvertebrate communities from one that dominated by diverse Ephemeroptera, Plecoptera Trichoptera (EPT) taxa to one that is dominated by a single taxa (Chironomidae) depending on the presence of water.

The PacFish/InFish (PIBO) monitoring group monitors streams with the Columbia River Watershed on the Humboldt National Forest. The PIBO sampling scheme includes repeat sampling of streams every 5 years. The most recent (2015-2019, which currently only includes samples from 2017) macroinvertebrate sampling by PIBO of several streams indicate that these water bodies may have water quality condition below what is desired. It is likely that land management activities is a contributing factor to reduced stream integrity.

---

## **MON-FOCAL-SPECIES-03: How is the abundance and distribution of invasive annual grasses (e.g. *Bromus tectorum* (cheatgrass)) changing over time?**

### **Indicator 1: Spatial extent (acres) and cover (%).**

Data source: Ecological Condition Monitoring Plots

### **Monitoring Results**

In riparian meadows noxious weed occurrences have remained fairly stable, with areas being treated almost equaling areas being inhabited. Invasive weeds continue to move and expand into disturbed meadow sites, but can ebb with positive management changes. The Forest is now home to some newer invasive species, not previously encountered during field monitoring prior to 2018, such as littlepod false flax (*Camelina macrocarpa*), desert madwort (*Alyssum desertorum*), and several annual brome grasses (*Bromus* species). These populations continue to expand and increase in density. In mesic to wet sites with disturbance Musk thistle (*Cardus nutans*), Canada thistle (*Cirsium arvense*) and Scotch cotton thistle (*Onopordum acanthium*) continue to be a problem. Medusahead (*Tainiatherum caput-medusae*) can now be found in a dry graminoid meadow communities on the Santa Rosa, Ruby Mountains, and Carson Ranger Districts.

Most sagebrush sites are in functional condition and stable. However, some Wyoming big sagebrush and low sagebrush sites have converted to a predominance of invasive species cheatgrass (*Bromus tectorum*) and annual forbs such as tumbled mustard (*Sisymbrium altissimum*) with recent fires. 2018 and 2019 monitoring data indicates that the Santa Rosa Ranger District continues to treat medusahead (*Tainiatherum caput-medusae*) populations with some success. This highly invasive species is of great concern, as it can out compete the current dominant annual invasive Cheatgrass and requires a intensive effort to treat due to the thick thatch layers it creates.

### **Finding**

The Santa Rosa District has seen increases in invasive annual grasses cheatgrass (*Bromus tectorum*), field brome (*Bromus arvensis*), bald brome (*Bromus racemosus*) and rattlesnake brome (*Bromus briziformis*) with increased fire or other disturbance. Large fires (>10,000 acres) that occurred throughout northeastern Nevada have allowed most infestations within those areas to expand and have allowed crews to identify large populations of a new annual invasive grass (*Ventenata* aka African wire grass) on the Mountain City Ranger District. The other Districts on the Humboldt National Forest have some invasive species, but higher elevations, more resistant soil types and lower levels of disturbance have protected these areas from large acres of invasives.

## Threatened and Endangered

### **MON-T&E-01: Are forest management activities affecting recovery of T and E species?**

#### **Indicator 1: Watershed condition indicators (Class) from the Watershed Condition Framework.**

Data source: Indicator #1 data were retrieved from the US Forest Service Watershed Condition Assessment Tracking Tool (WCATT) database.

#### **Indicator 2: Essential projects completed.**

Data source: Indicator #2 data were identified by personal knowledge of the Forest Hydrologist, John McCann, of projects completed on the Forest.

#### **Indicator 3: Invasive and noxious species, sagebrush, pinyon-juniper, whitebark pine, wet-to-dry meadows and riparian zones, aspen, and fir encroachment.**

Data source: Indicator #3 Ecological Condition Monitoring Plots

### **Monitoring Results**

**Indicator 1:** Indicator 1 data show 14 sub-watersheds are in a Functional condition, 191 sub-watersheds are in a Functional at Risk condition, and 15 sub-watersheds are in a Non-Functional condition. Most watersheds were rated for functionality in 2011 during a rapid assessment which was based on available spatial data and professional judgement of resource specialists with on-the-ground knowledge of certain watershed condition considerations. A few watershed condition class ratings have been updated in the intervening years as new or better data became available. The two most common indicators rated individually as Non-Functional were Aquatic Habitat and Riparian/ Wetland Vegetation with 56% and 55% of watersheds being rated as Non-Functional for these indicators, respectively. No changes to any watershed conditions have been recorded since the last report.

**Indicator 2:** The Forest completed Endangered Species Act consultation for Gance Creek BDA Project for LCT, The determination was that these actions would adversely affect LCT in the short term but provide long term benefit in the long term by reducing sediment post fire. Completed NEPA for a rotenone project on Falls canyon Creek to secure the LCT population above a waterfall barrier.

Specific recovery efforts are ongoing to recover T and E species. These include: mechanical non-native trout removal from Abel Creek (Santa Rosa) and Pearl Creek (Rubies), rotenone treatment on Falls Canyon Creek (Santa Rosa) and Brown Creek (Rubies), installation of beaver dam analogs on Gance Creek and Cole Canyon Creek to reduce sediment in the stream post fire.

**Indicator 3:** In riparian meadows noxious weed occurrences have remained fairly stable, with areas being treated almost equaling areas being inhabited. Invasive weeds continue to move and expand into disturbed meadow sites, but can ebb with positive management changes. The Forest is now home to some newer invasive species, not previously encountered during field monitoring, such as littlepod false flax (*Camelina macrocarpa*), desert madwort (*Alyssum desertorum*), and

several annual brome grasses (*Bromus* species). In mesic to wet sites with disturbance Musk thistle (*Cardus nutans*), Canada thistle (*Cirsium arvense*) and Scotch cotton thistle (*Onopordum acanthium*) continue to be a problem. Medusahead (*Tainiatherum caput-medusae*) was found in a dry graminoid meadow community on the Santa Rosa District.

Most sagebrush sites are in functional condition and stable. However, some Wyoming big sagebrush and low sagebrush sites have converted to a predominance of invasive species cheatgrass (*Bromus tectorum*) and annual forbs such as tumbled mustard (*Sisymbrium altissimum*) with recent fires.

Wild horse use in the west side of the White Pine Range of the Ely District has expanded outside the wild horse territory and covers much of the north half of the mountain range. As a result of this use ecological condition of riparian meadows, stream ecosystems and surrounding sagebrush communities has declined. The soil is compacted, and productivity is low to non-existent.

Aspen was monitored on the Jarbidge Ranger District, and although the tree cover has not changed significantly, the understory vegetation has seen significant improvement due to changes in grazing management. Repeat monitoring occurred on two mesic meadows in the Mountain City District, and both show some decline due to a combination of livestock grazing and recreational vehicle camping. Large RV camping in meadows, which are already impacted by livestock grazing, is having impacts across accessible sites in the Forest.

## Finding

**Indicator 1:** Because the watershed classification data which are available to inform Indicator 1 were primarily developed in 2011 during a very rapid assessment, it would benefit the Forest if a more current and comprehensive assessment were completed of watershed condition. It is expected that additional targeted watershed condition assessments will occur in 2021 and that all watersheds will be reassessed in 2026 based on recent discussions. While current watershed condition data (i.e., 87% of watersheds rated as Functional-at-Risk and 7% rated as Non-Functional) seem to indicate a need for changing either the Humboldt National Forest Plan or management within the planning area, such Plan or management changes should not be made unless improved assessment data show the same need.

**Indicator 2:** Monitoring results do not indicate a need for change of the Humboldt National Forest Plan, forest management, or the monitoring program.

**Indicator 3:** Monitoring results show some improvement in habitat conditions on the Mountain City and Jarbidge Ranger Districts. In other portions of the Forest T and E species that are dependent on riparian streams and meadows, aspen and drier sagebrush ecosystems have seen a drop in available habitat due to wild horse use, feral livestock use and inadequate livestock management practices. This drop in available habitat suggests a need to change management practices related to these activities.

## Recreation

### **MON-REC-01: Is the Forest's developed recreation program meeting visitor needs and providing for public health and safety at Forest facilities?**

#### **Indicator 1: Percent Meets Expectations in Developed Sites for developed facilities, access, services and perception of safety**

Frequency: 5 years, Data Source: National Visitor Use Monitoring

#### **Indicator 2: Percent Participation in recreation activities in developed facilities or in developed sites/acres**

Frequency: 5 years, Data Source: National Visitor Use Monitoring

#### **Indicator 3: Number of passing and failing tests per water system**

Frequency: 1 year, Data Source: Infra/NRM, District

Files, <https://ndwis.ndep.nv.gov/DWW/>, <https://sdwis.waterboards.ca.gov/PDWW/>

#### **Indicator 4: Number of public water systems (ex. campground, picnic site) decommissioned/removed**

Frequency: 1 year, Data Source: Infra/NRM

#### **Indicator 5: Number of annual skier days**

Frequency: 1 year, Data Source: Special Use Permit Files

#### **Indicator 6: Annual percent occupied sites in concessionaire campgrounds and picnic areas**

Frequency: 1 year, Data Source: Special Use Permit Files

### **Monitoring Result**

**Indicator 1:** National Visitor Use Monitoring (NVUM) data is collected and reported on a five-year cycle. Data is not broken down by the Humboldt National Forest (HNF) and the Toiyabe National Forest (TNF); rather, data is shown for the Spring Mountains National Recreation Area (SMNRA) and for the rest of the Humboldt-Toiyabe National Forest (HTNF), or all combined Forest districts other than the SMNRA.

Based on CY 2016 NVUM data, Forest visitors both on the SMNRA and the rest of the HTNF report that developed recreation sites meet their expectations to a very high degree. They have between an 87.8 and 98.3 percent satisfaction rate with developed facilities, access, services and feeling of safety at the Forest's developed sites.

**Indicator 2:** At developed sites on the SMNRA in CY 2016, visitors participated most in Nature Center Activities (15.0%) and Picnicking (15.6%) and least in Resort Use (2.2%). On the rest of

the HTNF, visitors participated most in Downhill Skiing (21.1%) in developed sites and least in Visiting Historic Sites (0.5 %).

**Indicator 3:** On the Humboldt NF in CY2018, pass/fail data was available for 7 of 9 water systems. The 2 other water systems were not publicly available due to campground construction. There were 25 (92.6 percent) passing tests and 2 (7.4 percent) failing tests (total coliform present).

In CY2019 on the Humboldt NF, pass/fail data was available for 8 of 9 water systems. The remaining water system was not publicly available due to campground construction. There were 29 (90.6 percent) passing tests and 3 (9.4 percent) failing tests (total coliform present).

**Indicator 4:** In 2000, there were 13 active water systems on the Humboldt NF. There were nine water systems managed on the Humboldt NF as of the last monitoring report in 2018. No changes to the number of water systems occurred in 2018 or 2019, and no water systems were decommissioned during this monitoring period.

**Indicator 5:** There are no permitted ski areas on the HNF. There is one permitted Heliski operations. The number of skier days for that operation during this time period were not available for this report.

**Indicator 6:** According to Special Use Permit files for the Forest, there is no substantive change in the occupation rates at concessionaire operated campgrounds and picnic areas from 2018 to 2019. This indicates that the Forest's developed recreation program's ability to meet visitor needs and provide for public health and safety at Forest facilities has not changed during this brief time.

## Finding

Monitoring has not indicated a need to change the forest plan, to change management activities, to change the monitoring program, or to conduct an assessment to determine preliminary need to change the plan. This monitoring question and its indicators are designed to assess trends over time and compare data reported with a one-year frequency with National Visitor Use Monitoring data reported on a five-year frequency. The next monitoring cycle for this Monitoring Question will occur in 2021. With the data available for reporting in the 2022 Monitoring report.

## **MON-REC-02: Is the Forest's dispersed recreation program meeting visitor needs?**

### **Indicator 1: Percent Meets Expectations in Undeveloped Areas (General Forest Areas, GFAs) for developed facilities, access, services and perception of safety**

Frequency: 5 years, Data Source: National Visitor Use Monitoring

### **Indicator 2: Percent Participation in recreation activities outside of developed facilities**

Frequency: 5 years, Data Source: National Visitor Use Monitoring

### **Indicator 3: Trail miles maintained to standard**

Frequency: 1 year, Data Source: Infra/NRM

## Indicator 4: Trail miles improved to standard

Frequency: 1 year, Data Source: Infra/NRM

## Indicator 5: Miles of new trail constructed

Frequency: 1 year, Data Source: Infra/NRM

This indicator is recommended for removal from the monitoring program. Miles of trail constructed is a component of Trail miles improved to standard in annual accomplishment reporting in the Trails Infra module of NRM. Trail miles improved to standard is captured in Indicator 4.

## Indicator 6: Trail miles meeting standard

Frequency: 1 year, Data Source: Infra/NRM

### Monitoring Result

**Indicator 1:** National Visitor Use Monitoring (NVUM) data is collected and reported on a five-year cycle. Data is not broken down by the Humboldt National Forest (HNF) and the Toiyabe National Forest (TNF); rather, data is shown for the Spring Mountains National Recreation Area (SMNRA) and for the rest of the Humboldt-Toiyabe National Forest (HTNF), or all combined Forest districts other than the SMNRA.

Based on CY 2016 NVUM data, visitors to undeveloped areas on the SMNRA feel that access, services and feeling of safety met their expectations relatively well (between 82.6 and 88.2%). However, visitors to undeveloped areas are disappointed with developed facilities, with only a 26.7% rate of expectations met. On the rest of the HTNF, visitors to undeveloped areas feel that developed facilities, access, services and feeling of safety meet their expectations relatively well, between 83.9% for developed facilities and 99.9% for feeling of safety.

**Indicator 2:** Outside of developed facilities across the Forest, the activities that people participate in the most are as follows:

Activity	SMNRA	HTNF outside SMNRA
Hiking/Walking	62.5%	58.7%
Viewing Natural Features	48.7%	28.5%
Viewing Wildlife	42.1%	21.1%
Relaxing	31.4%	12.4%
Driving for Pleasure	25.3%	10.8%

**Indicator 3:** No districts reported completing trail maintenance in FY2018 or FY2019 on the Humboldt NF.

**Indicator 4:** No districts reported completing trail improvements in FY2018 or FY2019 on the Humboldt NF.

**Indicator 5:** This indicator is recommended for removal from the monitoring program. This indicator is redundant with Indicator 4 “Trail miles improved to standard” in annual accomplishment reporting in the Trails Infra module of NRM.

**Indicator 6:** In FY2018, no districts reported having trail miles meeting standard on the Humboldt NF. In FY2019, one district on the Humboldt NF reported having trail miles meeting standard, for a total of 0.04 mile.

## Finding

Monitoring has not indicated a need to change the forest plan, to change management activities, or identified the need to conduct an assessment to determine preliminary need to change the plan. This monitoring question and its indicators are designed to assess trends over time and compare data reported with a one-year frequency with National Visitor Use Monitoring data reported on a five-year frequency. The next monitoring cycle for this Monitoring Question will occur in 2021. With the data available for reporting in the 2022 Monitoring report.

Monitoring has indicated a need to change the monitoring program. Indicator 5 (MON-REC-02-05: Miles of new trail constructed) should be removed from the monitoring program. Indicator 4 (Trail miles improved to standard), in its format for annual accomplishment reporting in the Trails Infra NRM module, incorporates miles of new construction into the definition of miles improved. Indicator #5 is redundant.

## **MON-REC-03: Do visitors have safe and sufficient access to recreational opportunities and other areas of interest around the Forest?**

### **Indicator 1: Percent Meets Expectations in Developed Sites, Undeveloped Areas (GFAs) and Designated Wilderness for Access**

Frequency: 5 years, Data Source: National Visitor Use Monitoring

### **Indicator 2: Miles of system or non-system roads decommissioned**

Frequency: 1 year, Data Source: Infra/NRM (gPAS)

### **Indicator 3: Miles of high clearance road maintained**

Frequency: 1 year, Data Source: Infra/NRM (gPAS)

### **Indicator 4: Miles of high clearance road improved, constructed or reconstructed**

Frequency: 1 year, Data Source: Infra/NRM (gPAS)

### **Indicator 5: Miles of passenger car road maintained**

Frequency: 1 year, Data Source: Infra/NRM (gPAS)

## **Indicator 6: Miles of passenger car road improved, constructed or reconstructed**

Frequency: 1 year, Data Source: Infra/NRM (gPAS)

### **Monitoring Result**

**Indicator 1:** National Visitor Use Monitoring (NVUM) data is collected and reported on a five-year cycle. Data is not broken down by the Humboldt National Forest (Humboldt NF) and the Toiyabe National Forest (Toiyabe NF); rather, data is shown either for the Spring Mountains National Recreation Area (SMNRA), or for the rest of the Humboldt-Toiyabe National Forest (HTNF) outside of the SMNRA.

Based on FY2016 NVUM data, visitors felt that access to developed sites, undeveloped areas and designated wilderness met their expectations relatively well, from 82.7 to 90.6 percent on the SMNRA and from 88.9 to 94.2 percent on the rest of the HTNF.

**Indicator #2:** In FY2018, 0.3 miles of road were reported as having been decommissioned on the Humboldt NF. In FY2019, no miles of road were reported as having been decommissioned on the Humboldt NF.

**Indicator 3:** No districts reported completing trail maintenance in FY2018 or FY2019.

**Indicator 4:** No districts reported completing trail improvements in FY2018 or FY2019.

**Indicator 5:** This indicator is recommended for removal from the monitoring program. This indicator is redundant with Indicator 4 “Trail miles improved to standard” in annual accomplishment reporting in the Trails Infra module of NRM.

**Indicator 6:** In FY2018, no districts reported having trail miles meeting standard on the Humboldt NF. In FY2019, one district on the Humboldt NF reported having trail miles meeting standard, for a total of 0.04 mile.

### **Finding**

Monitoring has not indicated a need to change the forest plan, to change management activities, or identified the need to conduct an assessment to determine preliminary need to change the plan. This monitoring question and its indicators are designed to assess trends over time and compare data reported with a one-year frequency with National Visitor Use Monitoring data reported on a five-year frequency. The next monitoring cycle for this Monitoring Question will occur in 2021. With the data available for reporting in the 2022 Monitoring report.

Monitoring has indicated a need to change the monitoring program. Indicator 5 (MON-REC-02-05: Miles of new trail constructed) should be removed from the monitoring program. Indicator 4 (Trail miles improved to standard), in its format for annual accomplishment reporting in the Trails Infra NRM module, incorporates miles of new construction into the definition of miles improved. Indicator #5 is redundant.

## **Wilderness**

### **MON-WILD-01: How is wilderness character being preserved on wilderness areas across the Forest? Is**

## **fire being allowed to maintain its natural role as an ecosystem component within wilderness?**

### **Indicator 1: Percent Meets Expectations in Designated Wilderness for developed facilities, access, services and perception of safety**

Frequency: 5 years, Data Source: National Visitor Use Monitoring

### **Indicator 2: Scores on Wilderness Stewardship Performance per wilderness, per element**

Frequency: 1 year, Data Source: Infra/NRM

### **Indicator 3: Number of authorized (emergency vs. planned with MRDG) and known unauthorized motorized/mechanized incursions**

Frequency: 1 year, Data Source: Infra/NRM

### **Indicator 4: Number and acres of wildland fires in wilderness managed at less than full suppression to achieve land and resource management objectives (demonstrating an increasing trend over time of allowing wildland fires in wilderness to be managed as opposed to being fully suppressed)**

Frequency: 1 year, Data Source: Data not available at time of publication.

### **Indicator 5: Number and acres treated by managing wildland fires in wilderness at less than full suppression to achieve land and resource management objectives (demonstrating an increasing trend over time of allowing wildland fires in wilderness to be managed as opposed to being fully suppressed)**

Frequency: 1 year, Data Source: Data not available at time of publication

## **Monitoring Result**

**Indicator 1:** National Visitor Use Monitoring (NVUM) data is collected and reported on a five-year cycle. Data is not broken down by the Humboldt National Forest (Humboldt

NF) and the Toiyabe National Forest (Toiyabe NF); rather, data is shown either for the Spring Mountains National Recreation Area (SMNRA), or for the rest of the Humboldt-Toiyabe National Forest (HTNF) outside of the SMNRA.

Based on FY2016 NVUM data, visitors to designated wilderness on the SMNRA are moderately satisfied with the developed facilities, access, services, and feeling of safety they experience,

ranging from developed facilities that meet their expectations at 64.9 percent to feeling of safety meeting expectations at 89.4 percent. Visitors to designated wilderness on the rest of the HTNF are more satisfied than those on the SMNRA, with a range of developed facilities meeting their expectations at 68.8 percent to feeling of safety that meets their expectations at 97.0 percent.

**Indicator 2:** Based on the INFRA/NRM data Wilderness Stewardship Performance Scores have remained fairly constant between FY 2018 and FY 2019. Out of the 110 points possible, the average Wilderness Stewardship Performance Score for the 24 wilderness areas on the HTNF was 23.8 in 2018 and 24.3 in 2019.

**Indicator 3:** According to INFRA/NRM data, there were 124 emergency incursions into wilderness in 2018 and 4 emergency incursions and 6 administrative incursions into wilderness in 2019. This data represents incursions into wilderness across the entire HTNF. The emergency incursions were primarily related to wildfire response.

**Indicator 4:** Data was not available at the time of this report.

**Indicator 5:** Data was not available at the time of this report.

## Finding

Monitoring has not indicated a need to change the forest plan, to change management activities, to change the monitoring program, or to conduct an assessment to determine preliminary need to change the plan. This monitoring question and its indicators are designed to assess trends over time and compare data reported with a one-year frequency with National Visitor Use Monitoring data reported on a five-year frequency. The next monitoring cycle for this Monitoring Question will occur in 2021. With the data available for reporting in the 2022 Monitoring report.

## Cultural Resources

**MON-CULT-01: Are cultural resources being evaluated for the National Register of Historic Places and protected and if required, are mitigation measures (avoidance, data recovery, etc.) appropriate and effective in the given situation?**

**Indicator 1: Number of acres inventoried, and number of cultural resources recorded.**

Data source: The baseline data presented here is from both the Humboldt-Toiyabe National Forest and the Humboldt-National Forest and uses Forest Service Heritage INRA and data and Forest Service Heritage files.

**Indicator 2: Number of significant properties evaluated to the National Register?**

Data source: The baseline data presented here is from both the Toiyabe National Forest and the Humboldt National Forest and uses Forest Service Heritage INFRA and data and Forest Service Heritage files.

### **Indicator 3: Number of eligible significant properties being adversely impacted by federal undertakings, looting, environmental disturbance, and other actions.**

Data source: The baseline data presented here is from both the Toiyabe National Forest and the Humboldt National Forest and uses Forest Service Heritage INFRA and data and Forest Service Heritage files.

#### **Monitoring Results**

**Indicator 1:** The baseline data for the Humboldt-Toiyabe National Forest is 1,005,877 acres inventoried and 12,497 sites discovered.

**Indicator 2:** There are 591 properties that have been evaluated on combined Humboldt-Toiyabe National Forest as significant.

**Indicator 3:** Cultural resources are being evaluated for the National Register and are being protected. The baseline data only indicates three significant sites being adversely impacted by federal undertakings, looting, environmental disturbance, and other actions.

#### **Finding**

Monitoring has not indicated a need to change of the management direction for Cultural Resources in the Humboldt National Forest Plan. There may be a need to change the monitoring program to include reporting on the number of sites monitored as well as the number of significant properties being adversely impacted. The inconsistencies between the Humboldt NF and the Toiyabe NF Cultural Resources Monitoring Programs there is a need to change the two monitoring programs to make them consistent.

### **MON-CULT-02: Are significant cultural resources being interpreted?**

#### **Indicator 1: Number of significant properties evaluated to the National Register.?**

Data source: The baseline data presented here is from both the Toiyabe National Forest and the Humboldt National Forest and uses Forest Service Heritage INFRA.

#### **Indicator 2: Number of significant cultural resources being interpreted (e.g. graphics, tours, etc.) and interpretative Heritage products created.**

Data source: Baseline data is from both the Toiyabe National Forest and the Humboldt National Forest and uses Forest Service Heritage INFRA.

#### **Monitoring Results**

**Indicator 1:** The baseline data for the Humboldt National Forest indicates that 591 significant properties have been evaluated to the National Register.

**Indicator 2:** The baseline data for the Humboldt National Forest indicates that six cultural resources have interpreted and five interpretative Heritage products produced.

Monitoring has not indicated a need for change of the Humboldt National Forest Plan.

## Finding

The available data lacks the accuracy to produce valid monitoring at this time. The 2022 Monitoring report will provide additional information related to this monitoring question.

## Climate

### **MON-CLIM-01: How is climate change altering patterns of recreational activities and visitor use on the Forest?**

**Indicator 1: Number of open/operational days at winter recreation sites and services (i.e. Ruby Mountains Heli-Ski, ski resorts, SMNRA winter use/snow play permit).**

Data source: Indicator #1 District records, internet search.

**Indicator 2: NRCS Basin Index (Percent Median) monthly snowpack for each basin in Nevada for each winter season (October through May).**

Data source: Indicator 2 data were retrieved from the NRCS Snow Survey Program's online database.

## Monitoring Results

**Indicator 1:** On the Humboldt NF, operational days for the Ruby Mountain Helicopter Skiing recreation special use permit is recommended for removal from the monitoring program. The holder's permit does not include a requirement of reporting number of operational days to the Forest Service.

**Indicator 2:** Water year 2018 (October 1, 2017 – September 30, 2018) was well below median snow packs throughout the planning area until a series of storms in March added to the existing snowpack; however, this was not enough to get up to “normal” snowpack. Most sites were clear of snow by May. Water year 2019 (October 1, 2018 – September 2019) was a huge year with many sites holding 1.5 times the median snowpack or more through the core winter months. Many sites had anomalously high snow packs at the end of the season (i.e., through the end of May). Through the end of February, most sites are showing about normal snowpack throughout the planning area for water year 2020 (October 1, 2019 – September 30, 2021).

## Finding

**Indicator 1:** Monitoring has indicated a need to change the monitoring program. Components of Indicator #1 (MON-CLIM-01-01: Number of open/operational days at winter recreation sites and services) should be removed from the monitoring program. On the Humboldt NF, permittee reporting at the end of their season for the Ruby Mountain Helicopter Skiing recreation special use permit does not include a requirement of reporting number of operational days to the Forest Service.

**Indicator 2:** Does not indicate a need for change of the Humboldt National Forest Plan.

## **MON-CLIM-02: How do recent temperature and precipitation trends (1-5 years) compare to long term averages (30+ years)?**

**Indicator 1: Monthly/ annual precipitation totals, max snow water equivalent, number of days with snow cover, melt out date, monthly/ annual temperature statistics.**

Data source: Indicator 1 data were retrieved from Desert Research Institute's online database (for precipitation and temperature) and the NRCS online SNOTEL database (for snow data).

### **Monitoring Results**

**Indicator 1:** Precipitation data, in respect to calendar year totals, were variable from year to year and from site to site without much indication of signals related to needs for change in management. Temperature data do not indicate any major anomalies, hot or cold, throughout the planning area. In the northeast portion of the forest, snow cover duration and maximum snow water equivalent were pretty close to normal in the 2017-2018 winter, but higher than normal in the 2018-2019 winter. In the southern portion of the forest, the 2017-2018 winter brought only about 60% of normal precipitation in the form of snow, while the 2018-2019 winter brought closer to 160% of normal snow.

### **Finding**

**Indicator 1:** Does not indicate a need for change of the Humboldt National Forest Plan.

## **MON-CLIM-03: How do recent stream discharge trends (1-5 years) compare to long term averages (30+ years)?**

**Indicator #1: Total annual discharge data from USGS gaging stations.**

Data source: Indicator #1 data were retrieved from the National Water Inventory System online database maintained by the USGS.

### **Monitoring Results**

**Indicator 1:** In water year 2018, annual discharge in the planning area was generally below normal (Percent of normal: 70-75% at Lamoille Creek and Jarbidge River and a 50-55% at Martin Creek and Steptoe Creek). Water year 2019 saw much higher flows (Percent of normal: 160% at Lamoille Creek, 130% at Jarbidge River and Steptoe Creek, and 145% at Martin Creek). Three out of the last four water years have been above average. 2020 is currently shaping up to deliver around average flows.

### **Finding**

**Indicator 1:** does not indicate a need for change of the Humboldt National Forest Plan.

## Wild Horses and Burros

### **MON-WHB-01: What are the actual or estimated numbers of wild horses and burros**

#### **Indicator 1: Census or modeled data for population size.**

Data source: 2019 population data comes from estimates of population growth entered in the INFRA Range Database. These estimates are based on the June 2016 statistical analysis of February 2016 aerial census data for the Triple B (Cherry Spring Territory) and Pancake (Monte Cristo Territory) Complexes. The Cherry Spring Territory accounts for the horses removed during the 2019 Bald Mountain Road public safety gather.

#### **Monitoring Results**

Cherry Springs Wild Horse Territory estimated population is 42 horses. AML range is 42 to 68 horses. The Monte Cristo Wild Horse Territory estimated population is 122 horses. AML range is 72-96. Monte Cristo Territory is over the AML range by 27%.

#### **Finding**

The Cherry Springs Wild Horse Territory is at low AML. The Monte Cristo Wild Horse Territory is over AML suggesting the need for future management action.

## Multiple Uses

### **MON-MULTI-01: Is the supply of firewood adequate to meet the demand?**

#### **Indicator 1: Number of cords (ccf) sold.**

Data source: Forest Service PTSAR database

#### **Monitoring Results**

The forest sold 760 and 690 cords in 2016 and 2017 respectively. This amount fits within previous year sales of public fuelwood. There were no commercial sales of fuelwood offered during this time.

#### **Finding**

The forest sells fuelwood permits based upon supply and demand from users. Forest management projects and tree mortality lead to a consistent supply of fuelwood for the public. Should demand increase or change, the forest is able to increase its number of permits sold for both public and commercial use.

## **MON-MULTI-02: How many road and trail rights of way are acquired annually?**

### **Indicator 1: Miles of ROW or acres accessible.**

Data source: Landownership Adjustment Data System (LADS) and discussing with RO Land Management Personnel.

### **Monitoring Results**

The forest did not acquire any parcels during the 2018-2020 monitoring period

### **Finding**

No changes to management direction are indicated at this time.

## **MON-MULTI-03: Are property boundaries sufficiently marked and identified to prevent trespass?**

### **Indicator 1: Number of boundary miles posted and number of trespass cases identified.**

Data source: The data source for the number of boundary miles posted is the end of the year report provided to the Regional Office from the Nevada Zone Lead Land Surveyor. The data source for the number of trespass cases identified is the Title Claims and Encroachments Program database.

### **Monitoring Results**

In 2019 the number of miles of new boundary line that was posted was 20.95 miles, 3.25 miles was new boundary. The number of trespass cases identified in 2019 was 1. Since this is the third year of monitoring, do not recommend any changes to the forest plan or forest management, continue to monitor.

### **Finding**

Monitoring has not indicated a need for change of the current National Forest Plan.

## **MON-MULTI-04: Are Aspen/Hardwood stands being managed for multiple benefits?**

### **Indicator 1: Acres of aspen stands treated.**

Data source: Corporate Data Warehouse – FACTS, contract documents.

### **Monitoring Results**

In 2016 and 2017 there were approximately 430 acres of aspen stands treated with mechanical conifer removal, piling, and prescribed burning on the Ely and Jarbidge districts. These aspen stands are expected to regenerate by aspen suckering post treatment.

## **Finding**

Aspen treatments within these areas have met multiple objectives for fuels reduction, forest health, wildlife habitat improvement, and aesthetics/recreation. Multiple benefits are accomplished with these treatments. The forest will continue to treat aspen and establish a trend in acres treated.

## **Fire**

### **MON-FIRE-01: How is fire and fuels management being used for resource benefit?**

#### **Indicator 1: Acres of hazardous fuels reduction in WUI and non-WUI.**

Data source: Corporate Data Warehouse – FACTS

### **Monitoring Results**

In 2018 and 2019 forest fuels treatments totaled 16,399 acres (6,564 and 9,835 acres respectively). Approximately 75 percent of the treatments were conducted outside of the WUI, while 25 percent occurred in the WUI. These treatments occurred in pinyon/juniper types for sage brush ecosystem restoration. In addition, approximately 350 acres (2 percent) were treated using prescribed fire. Fuels treatments across the forest contributed towards an improvement in FRCC as reported in the FACTS database. Treatment amounts over 2018 and 2019 are representative of the forest 5-year average of acres treated annually.

## **Finding**

Fire and fuels management is occurring both within and outside the WUI in order to meet multiple resource objectives. Landscape treatments meet fuels reduction goals across multiple land allocations.

### **MON-FIRE-02: Is the management of wildland fires accomplishing protection objectives for important Values at Risk (VAR)?**

**Indicator 1: The trend in loss or damage to important VARs is remaining stable or is decreasing.**

**Indicator 2: The trend in allowing wildland fires to be managed as opposed to fires being fully suppressed is increasing (both the number of fires being managed and the amount of acres treated).**

Data source: Corporate Data Warehouse – FACTS

## Monitoring Results:

In 2018 and 2019 forest fuels treatments totaled 16,399 acres (6,564 and 9,835 acres respectively). Of this amount approximately 3/4 of the treatments were conducted outside of the WUI, while 1/4 was done in the WUI. These values were attributed to treatments within pinyon/juniper types for sage brush ecosystem management. In addition, approximately 350 acres were treated using prescribed fire, which accounts for ~2% of the treatment accomplished. Fuels treatments across the forest contributed towards an improvement in FRCC as reported in the FACTS database. Treatment amounts over 2018 and 2019 are representative of the forest 5-year average of acres treated annually.

## Finding

Fire and fuels management is occurring within the WUI and outside of the WUI in order to meet multiple resource objectives. It is recommended that this monitoring question be dropped from the monitoring plan because all wildland fires are managed to meet identified objectives from the WFDSS. The forest plan identifies areas across the landscape where values at risk occur. Based on the uncertainty of where and when wildfires would occur in any given year it would be difficult to identify a trend in loss to VARs as well as how suppression strategies vary from year to year. Therefore, the Forest Service will continue to follow policy under the forest plan, WFDSS, and Forest Service Handbook direction for managing wildfires for multiple objectives while protecting VARs.

## **MON-FIRE-03: Is the response to wildland fires trending more towards using fire as a management tool to achieve land and resource management objectives?**

**Indicator 1: The trend in allowing wildland fires to be managed as opposed to fires being fully suppressed is increasing (both the number of fires being managed and the amount of acres treated).**

**Indicator 2: Spatial extent (acres) regeneration, disease, age classes, and understory.**

Data source: Not available

## Monitoring Results

While there is very little data available for this report there is general consensus among managers that allowing wildland fire to be managed to help achieve land and resource management objectives would be a useful tool.

## Finding

There is a need to amend the Forest plan to make it easier for Forest Line Officers and Wildland Fire Managers and to assess wildland fires manage them to achieve land and resource objectives.

## DETERMINATIONS FROM THE BIENNIAL EVALUATION

Based on evaluations that were conducted, the following are the determinations for adaptive management, per 36 CFR 219.12(d)(2):

### Need for Changing the Forest Plan

Monitoring has indicated a need to change Forest Plan Direction in the following ways. While the plan is 32 years old these changes will be made during the Plan Revision effort scheduled to begin in 2022. At that time the Forest will review this and subsequent monitoring reports and use them during the assessment process to identify needs for change across the forest.

**MON-FIRE-03:** There is a need to amend the Forest plan to make it easier for Forest Line Officers and Wildland Fire Managers and to assess wildland fires manage them to achieve land and resource objectives.

### Need for Changing Management Activities

**Mon-Veg-Cond-2:** Indicates a need for focused management on wild horse and elk populations to reduce impacts to aspen stands and elk and wild horse winter ranges.

**Mon-TES-01 Indicator #3:** In portions of the Forest T and E species that are dependent on riparian streams and meadows, aspen and drier sagebrush ecosystems have seen a drop in available habitat due to wild horse use, feral livestock use and inadequate livestock management practices. This drop in available habitat suggests a need to change management practices related to these activities.

**Mon-WHB-01:** The Monte Cristo Wild Horse Territory is over AML suggesting the need for future management action.

### Need for Changing the Monitoring Program

Monitoring has indicated a need to change or remove monitoring indicators for several of the monitoring questions. The indicators to be removed or changed along with the recommended change are listed below

**Mon-VEG-COND-01 Indicator #1** Changes in wetland vegetative communities where wild horses and burros (WHB) are present in active grazing allotments indicate a need to change monitoring protocols. Increasing the number of monitoring plots and how often data is collected in a) areas where WHB and livestock grazing occur, b) where WHB exists without livestock grazing, and c) where WHB do not exist in active grazing allotments and analyzing for differences in changes to riparian and other wetland vegetative community types will provide a better understanding for need for change in management activities.

**MON-VEG-COND-02 Indicator #01:** There is a need to remove sagebrush, whitebark pine and bristlecone pine as indicators in this monitoring question as they are poor indicators of management actions or the need for change in strategies.

**MON-REC-02 Indicator #04:** Trail miles improved to standard), in its format for annual accomplishment reporting in the Trails Infra NRM module, incorporates miles of new construction into the definition of miles improved. Indicator #5 of the MON-REC-02-05: Miles of

new trail constructed) should be removed from the monitoring program. Indicator #5 is redundant.

**MON-CULT-01 Indicator #1:** There may be a need to change the monitoring program to include reporting on the number of sites monitored as well as the number of significant properties being adversely impacted. The inconsistencies between the Humboldt NF and the Toiyabe NF Cultural Resources Monitoring Programs there is a need to change the two monitoring programs to make them consistent.

**MON-CLIM-01 Indicator #1:** Number of open/operational days at winter recreation sites and services) should be removed from the monitoring program. On the HNF, permittee reporting at the end of their season for the Ruby Mountain Helicopter Skiing recreation special use permit does not include a requirement of reporting number of operational days to the Forest Service. Being able to track these numbers does not provide meaningful information regarding climate change.

**Mon-Fire-02:** It is recommended that this monitoring question be dropped from the monitoring plan because all wildland fires are managed to meet identified objectives from the WFDSS.

## **Need for Conducting an Assessment to Determine Preliminary Need to Change the Plan**

**MON-WTRSHD-01 Indicator 1** Monitoring has indicated a need to conduct an assessment to evaluate the existing watershed data used to respond to Monitoring questions (MON-WTRSHD-01 and MON-TES-01). Using the WCATT data seems to indicate that approximate 87 percent of all the watersheds on the Forest are either functioning at risk or not functioning. Knowledge of watershed conditions based on field observations suggest the WCATT data may be in error. Conducting an Assessment (36 CFR 219.5 and 6) of the Watersheds across the Forest could help better define watershed conditions across the Forest and verify the accuracy/inaccuracy of the WCATT data.

**MON-T&E-01 Indicator 1:** Because the watershed classification data which are available to inform Indicator 1 were primarily developed in 2011 during a very rapid assessment, it would benefit the Forest if a more current and comprehensive assessment were completed of watershed condition.

## **ABOUT OUR FOREST PLAN MONITORING PROGRAM**

### **Roles and Responsibilities**

The Forest Plan Monitoring Program requires a coordinated effort of many people, from the people who collect the data, to the people outside the Forest Service who provide feedback and assistance, to the decision maker.

Forest Supervisor William A. Dunkelberger is the responsible official for the forest plan and this report will be provided to him for his decision on the proposed changes, and changes to management direction to address deficiencies that are identified in the plan area. The monitoring report was prepared by the following Forest Employees.

Name	Title	Contact Information
Kris Boatner	Forest Biologist	kristie.boatner@usda.gov
Marnie Bonesteel	Natural Resource Specialist	marnie.bonesteel@usda.gov
Randy Kyes	Forest Recreation/Wilderness Program Manager	randy.kyes@usda.gov
Rachel Van Horne	Fisheries Biologist	rachel.vanhorne@usda.gov
Cheri Howell	Forest Ecologist	cheri.howell02@usda.gov
Jim Hurja	Forest Soil Scientist	james.hurja@usda.gov
Rixey Jenkins	Range Program Manager	rixey.jenkins@usda.gov
Duncan Leao	Forest Vegetation Program Manager	duncan.leao@usda.gov
Teresa Dixon	Forest Archaeologist	teresa.dixon@usda.gov
John McCann	Forest Hydrologist	john.mccann@usda.gov
Dirk Netz	Forest Botanist	dirk.netz@usda.gov
Erik Newell	Fire Planner	erik.newell@usda.gov
James Winfrey	Forest Planner	james.winfrey@usda.gov

## HOW THE MONITORING PROGRAM WORKS

Monitoring and evaluation requirements have been established through the National Forest Management Act (NFMA) at 36 CFR 219. Additional direction is provided by the Forest Service in Chapter 30 – Monitoring – of the Land Management Handbook (FSH 1909.12).

The Humboldt National Forest monitoring program was updated in April 2016 for consistency with the 2012 planning regulations [36 CFR 219.12 (c)(1)]. The Humboldt National Forest Plan was administratively changed to include the updated monitoring program (Chapter 5). For a copy of the current monitoring program go to [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd541251.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd541251.pdf). Monitoring questions and indicators were selected to inform the management of resources on the plan area and not every plan component was determined necessary to track [36 CFR 219.12(a)(2)].

The monitoring evaluation implementation protocol (monitoring protocol) is part of the overall plan monitoring program and provides more specific direction for implementing the more strategic plan monitoring program and details monitoring methods, protocols, and roles and responsibilities. The Monitoring protocol is not part of the plan decision and is subject to change as new science and methods emerge. The Humboldt National Forest monitoring guide is available at [https://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fseprd541251.pdf](https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd541251.pdf).

Providing timely, accurate monitoring information to the responsible official and the public is a key requirement of the plan monitoring program. This summary, along with the full 2018 biennial

monitoring evaluation report for the Humboldt National Forest is the vehicle for disseminating this information. In the context of forest planning there are three main monitoring goals:

- Are we implementing the Forest Plan properly?
- Are we meeting our management targets and project guidelines? (implementation monitoring)
- Are we achieving our Forest Plan management goals and desired outcomes? (effectiveness monitoring)
- Does our hypothesis testing indicate we may need to change the Forest Plan? (validation monitoring)

Implementation monitoring is important for tracking progress and accomplishments. However, it is effectiveness and validation monitoring that drive and support the adaptive management process. Effectiveness monitoring evaluates condition and trend relative to desired conditions. Validation monitoring tests hypotheses and provides information that might necessitate changes to desired conditions in the plan (e.g. is what we think the desired state should be accurate?).

## NATIONAL DATABASES

The monitoring questions found in chapter five of the Humboldt National Forest Land and Resource Management Plan have been updated in compliance with the 2012 Planning Rule. Tracking and monitoring results for most of these questions has now moved to National Databases.

### Natural Resource Manager

Natural Resource Manager (NRM) is a national Forest Service organization that is responsible for coordinating software development activities for four application groups whose data are accessible through the NRM platform or the Enterprise Data Center (EDC):

- Forest Service Activity Tracking System (FACTS)
- Infra
- Natural Resource Information System (NRIS)
- Timber Information Manager (TIM)

These applications often intersect in how they collect and share data and in how they develop software and use technology. NRM finds ways to manage and grow these applications efficiently and has already begun to standardize the processes used to develop an integrated program of work. NRM also will be looking for effective ways to use resources to reduce duplication of effort and to maximize technology investments.

There are future plans to provide a public-facing interface for some of the national datasets housed in NRM.

### FACTS

The Forest Service Activity Tracking System (FACTS) is an activity tracking system for all levels of the Forest Service. It supports timber sales in conjunction with TIM Contracts and Permits; tracks and monitors NEPA decisions; tracks KV trust fund plans at the timber sale level, reporting at the National level; and, it generates National, Regional, Forest, and/or District Reports.

## INFRA

Infra is a collection of Web-based data entry forms, reporting tools, and GIS tools that enable Forests to manage and report accurate information about their inventory of constructed features and land units as well as the permits sold to the general public and to partners. This information is used by Forest supervisors for the effective management of their Forests and also by visitors, partners, and Congress. Infra is a valuable tool for:

- Forest-level management
- Forest analysis, planning, and budgeting
- Implementing core data layers such as trails, roads, cultural properties, recreation, and range allotments
- Monitoring financial accountability; capitalization, depreciation and deferred maintenance
- Collecting partnerships information such as grants, agreements, and leases
- Collecting information to be made available to the public; data warehouse, Wilderness use permits, e-government
- Administering Forest permits and billings, such as Range and Special Uses

Infra also interfaces with several external systems to meet data sharing and financial reporting goals. Infra transmits daily feeds of permit billing and grant and agreement financial information to the Foundation Financial Information System (FFIS). Infra also transmits real property information to the UDSA's Corporate Property Automated Information System (CPAIS).

## NRIS

The Natural Resource Information System (NRIS) combines a series of standard corporate databases and computer applications designed to support field-level users. NRIS databases contain basic natural resource and socio-economic data in standard formats built to run within the Forest Service computing environment. Some of the products available in NRIS include:

- Air Quality Information (AIR)
- Aquatic Surveys (AqS)
- FSVeg (Common Stand Exam, includes a geospatial component)
- Inventory and Mapping (Geology, Soils, etc.)
- National Visitor Use Monitoring (NVUM)
- Rangeland Inventory and Monitoring
- Threatened, Endangered, and Sensitive Plants
- Invasive Species
- Water Rights and Uses (WRU)
- Watershed Classification and Assessment Tracking Tool
- Watershed Improvement Tracking (WIT)
- Wildlife

## **Air**

The Air application helps air resource managers analyze the effects of air pollutants on natural, cultural, and social resources on lands managed by the Forest Service.

## **Aquatic Surveys (AqS)**

Aquatic Surveys (AqS) supports ecological and physical stream variables for three hierarchical levels of the riverine system on National Forest System (NFS) lands: valley segments, stream reaches and channel units. Data collected about aquatic fauna communities (fish, invertebrates, macroinvertebrates, amphibians, reptiles) in streams, lakes and spring environments are supported.

## **Field Sampled Vegetation Spatial (FSVeg Spatial)**

FSVeg Spatial manages spatial and tabular vegetation data in one place, at one time. It contains three types of data:

- The vegetation polygon feature class (required to use FSVeg Spatial),
- The vegetation point feature class, and
- Non-stand-exam vegetation data associated with the polygon feature class.

NRM is working to move vegetation data from forests into the FSVeg Spatial application.

## **National Visitor Use Monitoring (NVUM)**

National Visitor Use Monitoring (NVUM) software manages information gathered from on-site surveys of recreation visitors to lands managed by the Forest Service. For information about NVUM's statistical methodology, visit Recreation, Heritage & Wilderness Programs National Visitor Use Monitoring Program. Data collection is based on a stratified random sample methodology to develop sound estimates of visitor use, characteristics, satisfaction, and spending information for each national forest.

The NVUM Results software is now available to the public on the Internet. It delivers NVUM statistics at the national, regional and forest scales using 70 pre-defined reports and maps. Results from individual forests can be combined using the Results software to access multiple-forests, regional, and national estimates of the numbers and types of recreation visits. Reports are available for all years beginning with fiscal year 2005 (October 1, 2004 to September 31, 2005).

## **Rangeland Inventory and Monitoring**

Rangeland Inventory and Monitoring supports national protocols for vegetation and ground cover sampling, general site characterization and detailed soil pedon descriptions. The application supports site characterization, interpretations and classifications; it also accommodates casual point observations with basic attributes.

National vegetation sampling protocols supported by the application include: Tree/Snag, Ocular Macroplot, Line Intercept, Cover Frequency, Nested Rooted Frequency, Robel Pole, Density, Paced Transect, Macroplot, Riparian Greenline–Winward, Riparian Cross Section–Winward, and Riparian Woody Regeneration–Winward. Rangeland Inventory and Monitoring is a spatial application intended for defined projects with formal protocol- or program-driven inventories.

## **Threatened, Endangered, and Sensitive Plants, and Invasive Species (TESP/IS)**

*TESP/IS* support national data collection standards for combined TESP and invasive species surveys, TESP element-occurrences, and Invasive Species Inventories.

## **Water Rights and Uses (WRU)**

Water Rights and Uses (WRU) tracks state and federally recognized water uses and related information regarding the water source, beneficial uses, quantity, and periods of water use. The application also tracks core information about water rights that may be associated to the water use and the legal and administrative actions that occur. Data collected during site visits to water use system components includes descriptions and dimensions of the water use system as well as site maps, reports and digital photographs. Integration with other Forest Service corporate applications including Automated Lands Project (ALP) and Infra are also supported to provide for a variety of integrated reports.

## **Watershed Classification and Assessment Tracking Tool (WCATT)**

NRM developed the Watershed Classification and Assessment Tracking Tool (WCATT) application in support of the Watershed Condition Framework (WCF) to provide a nationally consistent approach for classifying watershed condition. The tool supports the entering, editing and reporting of classification and assessment data for watersheds that contain U.S. Forest Service lands. WCATT provides a Geographic Information System (GIS) approach to data input for tracking Watershed Classification by 12-digit hydrologic units by year. The Watershed, Fish, Wildlife, Air, and Rare Plants Directors area sponsor it.

## **WIT**

Watershed Improvement Tracking (WIT) manages data, observations and planning details about sites that need to be (or have been) restored or improved with the intent of benefiting watershed and aquatic ecosystem health and function. The application is a watershed restoration activity tracker that addresses site conditions, administrative plans and actions, and outcomes. The primary users of WIT are biologists and hydrologists; however, the reporting products deliver raw or summarized information valuable for project leaders, program managers, and public relations staff.

## **Wildlife**

Wildlife supports terrestrial animal observations and site inventories.

## **TIM**

The Timber Information Manager (TIM) supports the business of managing Timber Sales, Salvage Sales, Stewardship Contracts, and Forest Products Permits on National Forest lands. While TIM is used to complete the resource job at the field-level, it simultaneously captures information for service-wide reporting needs. TIM is integrated with other national systems, such as FACTS and PALS for project data, National Cruise applications (for timber volume), FMMI

for contacts and billing information, and ATSA for payments, interest, penalties, and contract bonding. Reports for many of these metrics are available upon request.

## **PIBO**

The PacFish/InFish Biological Opinion Monitoring Program (PIBO) monitors stream and riparian habitats within the PIBO study area, which within the Humboldt-Toiyabe National Forest includes streams which are part of the Columbia River Basin on the Mountain City, Ruby Mountains, and Jarbidge Ranger District. The goal of PIBO is to determine if the PacFish (Pacific Anadromous Fish) and InFish (Inland Fish) aquatic conservation strategies can effectively maintain or restore the structure and function of riparian and aquatic systems. Objectives of PIBO include: 1) Determine whether a suite of biological and physical attributes, and functions of upland, riparian, and aquatic systems are being degraded, maintained, or restored across the PIBO landscape; 2) determine the direction and rate of change in riparian and aquatic habitats over time as a function of management practices; and 3) determine if specific Designated Management Area practices related to livestock grazing are maintaining or restoring riparian vegetation structure and function.

## **Project Level Monitoring**

The Forest Monitoring Team did not complete any project monitoring in FY 2015-2018. However, Forest-wide and district level project monitoring was conducted for most resources, including watershed, wildlife, and fire. Reports are available upon request.

## **MONITORING AND EVALUATION REPORT TIMING**

The 2020 Monitoring and Evaluation report documents and discloses monitoring results from fiscal years 2018 through 2019. Each Forest Plan Monitoring and Evaluation report is intended to be a “living” document, meaning information displayed in the 2018, and 2020 report will be considered part of the 2022 report. Much of what is learned from monitoring and evaluation is based on how things evolve from year to year, rather than what is learned at a single point in time.