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Forest Service

2022 Biennial Monitoring and Evaluation Report

Humboldt National Forest Land and Resource Management Plan



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SUMMARY OF FINDINGS AND RESULTS

The following table summarizes the results and recommendations of the 2022 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? ²
(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 Functional-at-Risk or Non-Functional condition class.
(MON-AQH-01) What water bodies are not meeting desired water quality conditions?	No	No	N/A
(MON-SOIL-01) How are characteristics of soil health and productivity changing?	Yes	Yes	The indicator #3 identified as not relevant to management of NFS land. Recommend replacing with an indicator describing the health of Groundwater Dependent Ecosystems.
(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? ²
(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>There is a need to incorporate this data in next monitoring report and change</i> to include all annual invasive grasses.</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	Need to increase focused management on wild horses, elk and permitted livestock where there are impacts to vegetation condition.
(MON-FOCAL-SPECIES-01) How are <i>Populus tremuloides</i> (aspen) communities changing over time?	Yes	Yes	Need to increase aspen stand management to address effects from combined effects of all ungulates.
(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	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

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? ²
			<p>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.
(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

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? ²
(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	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?	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.
(MON-CLIM-02) How do recent temperature and precipitation trends (1-5 years) compared to long term averages (30+ years)?	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? ²
(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
(MON-FIRE-01) How is fire and fuels management being used for resource benefit?	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? ²
(MON-FIRE-02) Is the management of wildland fires accomplishing protection objectives for important Values at Risk (VAR)?	No	Yes	Need to remove this 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>¹Interval 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>² 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 to make the changes prior to Forest Plan Revision. The Forest Plan Revision process may start as early as 2024. Problems often arise during project planning resulting from the age of the plan and absence of measurable plan level desired conditions and objectives. These issues will also be addressed during plan revision. 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 2024 biennial report.

Forest Supervisor's Certification

This report documents the results of monitoring activities that occurred through Fiscal Year 2021 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

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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. This modified monitoring program is presented 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 third 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. This report and past biennial monitoring reports for the Humboldt-Toiyabe National Forest are 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. 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 Forest will use the results of this monitoring report to provide information regarding the “need for change” and to support the plan assessment process when it begins the Forest Plan revision.

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 watershed staff of projects completed on the Forest. In addition, USFS Natural Resource Manager (NRM) support staff ran a query for the Forest to confirm project status.

Monitoring Result

Indicator 1: Data show 10 sub-watersheds are in a Functional condition, 191 sub-watersheds are in a Functional-at-Risk condition, and 13 sub-watersheds are in a Non-Functional condition. Therefore, little change in condition has occurred in these sub-watersheds since the previous monitoring report.

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 as noted above with the change in condition class. The two most common indicators rated individually as Non-Functional were Aquatic Habitat and Riparian/ Wetland Vegetation.

Indicator 2: Data show that no essential projects were completed in any of the three Priority Watersheds currently identified in the planning area in the remainder of FY20 or FY21.

Finding

Indicator 1: Because the watershed classification data which are available to inform Indicator #1 were primarily developed in 2011 during a 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 2023 and that all watersheds will be reassessed in 2026 based on recent discussions. While current watershed condition data 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: Data were retrieved from spatial Integrated Water Quality Report data for Nevada (data collected in 2018). Nevada currently has a Draft 2020-2022 version that has not yet been completed and therefore was not accounted for in this report.

Indicator 2: Aquatic macroinvertebrate metrics (where sampled).

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

Monitoring Result

Indicator 1: Data show 165 miles of impaired streams and 60 acres of impaired lakes/reservoirs on USFS managed lands.

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 and there was an increase in 5 additional impaired stream miles on USFS managed lands from the previous monitoring report. 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.

Data Source: National Water and Climate Center:
<https://www.nrcs.usda.gov/wps/portal/wcc/home/>

Indicator 3: Depth to water at select locations.

Data Source: USGS Groundwater network:
<https://groundwaterwatch.usgs.gov/StateMap.asp?sa=NV&sc=32>.

Well log data for all wells in Nevada can be found at: water.nv.gov

Indicator 5: BMP implementation and effectiveness monitoring.

Data Source: USFS R04 BMP Monitoring database.

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.

Monitoring Results

Indicator 1, 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. Due to retirements long-term monitoring plots have not been revisited. Based of historic data OM conditions at the plots have remained static. Loss of OM has occurred locally within wildland fire locations. Older fire locations are seeing an increase in OM from the reestablishment of herbaceous vegetation.

Indicator 2: Soil temperature continues to be 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 17 years.

Indicator 3: No Forest Service data. Groundwater level monitoring is conducted by the state or USGS.

Indicator 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.

Indicator 5: BMP Monitoring is currently ongoing though none have been completed at this time.

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

Finding

Indicator 1 and 4: 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 have reduced soil health and productivity due to loss of surface organic matter, accelerated erosion and sedimentation.

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

Due to staffing vacancies long term monitoring plots have not been revisited and not additional monitoring data has been gathered. Based of historic data OM conditions at the plots have remained static. Loss of OM has occurred locally within wildland fire locations. Older fire locations are seeing an increase in OM from the reestablishment of herbaceous vegetation.

Indicator 3: Recommend removing this indicator as the Forest Service does not monitor groundwater levels. Groundwater level monitoring which is conducted through well monitoring is conducted by USGS through their network or by the states as part of the network of municipal and domestic well system associated with water rights. The network of wells monitored by the USGS are located on both public and private land. Some of the wells are located on NFS lands.

Recommend inserting a monitoring indicator describing the health of Groundwater Dependent Ecosystems across the forest.

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).

Data Source: Long term monitoring plot data from H-T GIS.

Indicator 2: Soil stability: Erosion and sedimentation.

Indicator 3: BMP implementation and effectiveness monitoring.

Data Source: USFS RO4 BMP monitoring database.

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. Burn Severity: <https://burnseverity.cr.usgs.gov/baer/>

Monitoring Results

Indicator 1: 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.

Due to staffing vacancies long-term monitoring plots have not been revisited. Based on historic data OM conditions at the plots have remained static. Loss of OM has occurred locally within wildland fire locations. Older fire locations are seeing an increase in OM from the reestablishment of herbaceous vegetation.

Indicator 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.

Indicator 3: BMP Monitoring is currently ongoing though none have been completed at this time.

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

Finding

Indicator 1: 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) but that are negatively affecting the health of those soils by outcompeting the establishment of native vegetation.

Indicator 2: 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.

Projects to facilitate the recovery of the fire effects from the South Sugarloaf fire have been implemented with more being planned. Initial results have shown positive effects on the landscape.

Indicator 3: 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 the 2020 monitoring report, changes in wetland vegetative communities where wild horses and burros (WHB) were present in active grazing allotments indicated a need to change monitoring protocols. Implementation of these protocols have been delayed due to position vacancies but are expected to begin in the summer of 2022.

Fir encroachment into other plant communities such as aspen, pine, and riparian have not changed.

In riparian meadows noxious weed occurrences have remained 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 now has some newer invasive species that have been identified during field monitoring over the past few years, such as littlepod false flax (*Camelina macrocarpa*), desert madwort (*Alyssum desertorum*), and several annual brome grasses (*Bromus* spp.). Most are treated with greater priority, but it is too soon to establish trends in those populations. 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.

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. It is too soon to establish population trends for these species since changing priority and strategies for treatment. Project partners at the University of Nevada Reno, Rocky Mountain Research Station, and program partners at Intermountain Regional Office continue studying 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. Work has been delayed due to pandemic restrictions but, 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.

Medusahead (*Tainiatherum caput-medusae*), found in a dry graminoid meadow community on the Santa Rosa District persists. 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 tumble 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* spp.) have been added to forest plan monitoring. Populations are treated and monitored but so far there is no discernable difference in size or density of infestations.

In past efforts to stabilize soils and increase forage, several areas across the Forest were seeded with introduced grasses, such as crested wheatgrass (*Agropyron cristatum*), wheatgrass (*Agropyron fragile*), Siberian wheatgrass (*Elymussibiricus*), 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 thereby decreasing over all diversity. 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 seedings with native species were planted in 2019 but no data has become available to describe success.

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 11,909 acres treated across the forest in 2020 and 2021 (8,799 and 3,110 acres respectively). This amount is lower than the forest 5-year average of acres treated annually.

Finding

Indicator 1: There are no recommendations at this time to change monitoring questions or indicators.

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.

Annual Invasive Grass Species on Humboldt National Forest as of 2019	Species Code	Acres
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
Total		5319.93

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

In general, streams and riparian meadows in most allotments are at desired condition or trending toward desired condition. Noxious weed occurrences have remained fairly stable, with areas being treated almost equaling areas being inhabited. Some allotments are not meeting desired condition and need improved allotment management strategies.

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.

Most sagebrush sites are in functional condition and stable and meeting desired conditions. However, Wyoming big sagebrush and low sagebrush sites with annual invasive grasses are at risk of conversion to annual grass dominated sites if they burn.

Wild horse populations are within AML for the two territories and should lead to improved upland and riparian communities in overlapping grazing allotments. Wild horse use still occurs in some areas outside of established wild horse territories and this additional use could lead to impacts primarily in riparian areas.

In the 2020 monitoring report, changes in wetland vegetative communities where wild horses and burros (WHB) were present in active grazing allotments indicated a need to change monitoring protocols. Implementation of these protocols have been delayed due to position vacancies but are expected to begin in the summer of 2022.

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. It is too soon to establish population trends for these species since changing priority and strategies for treatment. Project partners at the University of Nevada Reno, Rocky Mountain Research Station, and program partners at Intermountain Regional Office continue studying 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. Work has been delayed due to pandemic restrictions but, 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.

Finding

Indicator 1: Working with ranchers/permittees appears to have resulted in improved livestock management on most of the Forest. Recreation use is causing cumulative damage to some riparian areas. Wild horse populations are within AML for the two territories and should lead to improved upland and riparian communities in overlapping grazing allotments. Monitoring of wild horse impacts outside of established territories is needed.

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

Five aspen stands on the Humboldt Forest, three in the Ruby Mountains, one in Jarbidge and one in Ely District continue to be periodically monitored. Four of the Aspen stands remain in good to excellent condition. One stand in the Ruby Mountain Wilderness (McCutcheon Creek) appears to have been grazed heavily for some time and remains 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 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 indicated the wild horse population was beyond the capacity of the Forest to support. Due to a loss in personnel, in-depth monitoring is not expected to return to normal levels until the summer of 2022.

Finding

No changes in spatial extent, regeneration, disease, age classes, or understory.

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: 2021 Macroinvertebrate Report prepared by BLM/USU National Aquatic Monitoring Center, Logan, Utah.

PacFish/InFish (PIBO) monitoring group 2015-2019 report.

Monitoring Results

Monitoring has not indicated a need for change of the Humboldt National Forest Plan. For monitoring (2021) 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 of macroinvertebrate communities those 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 2020-2024 sampling period. The data from the new round of sampling has not yet been released. Looking at the 2015-2019 data, only seven sites have been sampled so far. The most recent macroinvertebrate sampling by PIBO of several streams indicate that these water bodies may have water quality conditions below that of what is desired. It is likely that land management activities are a contributing factor to these conditions. These results were reported in the 2020 monitoring report.

For Jerritt Canyon associated streams, baseline condition samples in the 1970s were dominated by mayflies. All but one site sampled in 2021 supported diverse and well-balanced communities of macroinvertebrates and had diversity values above the threshold indicative of streams with good water quality. All sites had at least some taxa present that are intolerant to poor water quality. Across all sites in 2021, the Ephemeroptera, Plecoptera Trichoptera (EPT) Index comprised between 12 and 45 percent of the taxa, and 11 of the 18 sites sampled supported at least one metals-intolerant heptageniid mayfly taxon.

The site with the most limited macroinvertebrate community in 2021 was the Gracie Dump Site GDSP-10 that had a diversity value of 2.27 and had few taxa intolerant to poor water quality. Though few intolerant taxa were present at Site GDSP-10, the presence of any intolerant taxa

indicates water quality is still sufficient to support at least some sensitive taxa. Habitat conditions at Site GDSP-10 are not suitable for many macroinvertebrate taxa, notably EPT taxa, with extremely shallow low flow and muddy substrate.

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 taxa to one that is dominated by a single taxa (Chironomidae) depending on the presence of water.

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 (*Caardus nutans*), Canada thistle (*Circium arvense*) and Scotch cotton thistle (*Onopardum 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?

All Indicators:

Indicator 1: Host plant (Spatial extent - acres)

Data source: Forest GIS layers of surveyed habitat, designated Critical Habitat layers. Ecological Condition Monitoring Plots

Indicator 2: Proximity to disease vector.

Data source: Term grazing permits for allotments at a higher risk of contact are also reviewed.

Indicator 3: Watershed Restoration Action Plan and associated projects completed.

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

Indicator 4: 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 5: Essential projects completed

Data source: Internal reports; Completed Endangered Species Act (ESA) Section 7 consultations.

Monitoring Results

Indicator 1: Threatened or Endangered species dependent on host plant densities or spatial extent do not occur on the Humboldt National Forest.

Indicator 2: Threatened or Endangered species dependent on being protected from an increased risk of disease transmission and domestic livestock as a disease vector are not present on the Humboldt National Forest.

Indicator 3: See results of MON-WTRSHD-01 Indicator 2 above. Data show that no watershed essential projects were completed in any of the three Priority Watersheds currently identified in the planning area in FY20 or FY21.

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.

Indicator 4: See results of MON-WTRSHD-01 Indicator 1 above.

Indicator 5: The Forest completed Endangered Species Act consultation for National Exploration Project for Lahontan cutthroat trout (LCT). The determination was that these actions would adversely affect LCT.

The Forest completed Endangered Species Act consultation for Newcrest Exploration Project for bull trout. The determination was that these actions would adversely affect bull trout.

The Forest completed Endangered Species Act consultation for Continued Rangeland Management on 15 Allotments on the Ruby and East Humboldt Mountain Ranges for LCT. The determination was that these actions would adversely affect LCT.

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 (Ruby Mountains), LCT were reintroduced into Brown Creek.

Finding

Indicators 1 and 2: Not applicable to the Humboldt National Forest Plan.

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.

Indicator 4: Because the watershed classification data which are available to inform Indicator 4 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 2023 and that all watersheds will be reassessed in 2026 based on recent discussions. While current watershed condition data 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 5: Monitoring results do not indicate a need for change of the Humboldt National Forest Plan, forest management, or the monitoring program.

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 5-year cycle. Data is not broken down by the Humboldt National Forest and the Toiyabe National Forest; 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 FY2016 NVUM data, Forest visitors report that developed recreation sites meet their expectations to a very high degree, with 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.

The Forest participated in Round 5 of the NVUM program during FY2021, with data collected from sites across the forest. However, updated NVUM data was not available as of the date of this monitoring report and will be reported during the next monitoring report cycle in 2024.

Indicator 2: At developed sites on the SMNRA in FY2016, visitors participated most in Nature Center Activities (15.0 percent) and Picnicking (15.6 percent) and least in Resort Use (2.2 percent). On the rest of the HTNF, visitors participated most in Downhill Skiing (21.1 percent) in developed sites and least in Visiting Historic Sites (0.5 percent).

The Forest participated in Round 5 of the NVUM program during FY2021, with data collected from sites across the forest. However, updated NVUM data was not available as of the date of this monitoring report and will be reported during the next monitoring report cycle in 2024.

Indicator 3: On the Humboldt NF in FY2020, pass/fail data was available for 8 of 9 water systems, with one water system not publicly available due to campground construction. There were 35 (79.5 percent) passing tests and 9 (20.5 percent) failing tests (total coliform present) during FY2020. All failing water test were subsequently retested with passing results.

In FY2021 on the Humboldt NF, pass/fail data was available for all nine active water systems. There were 38 (90.5 percent) passing tests and 4 (9.5percent) failing tests (total coliform present) during FY2021. All failing water test were subsequently retested with passing results.

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 2020. No changes to the number of water systems occurred in 2020 or 2021, and no water systems were decommissioned during this monitoring period.

One water system had a complete failure of the well pump system occurring during FY2021 and is currently still undergoing diagnostic testing and replacement during FY2022. It is unknown when this water system will be back online at this time.

Indicator 5: There are no permitted ski areas on the Humboldt NF. There is one permitted Heliski operation in the Ruby Mountains. According to special uses permit files, in FY2020, 722 client days were reported and in FY2021, 1,237 client days were reported for the Heli-ski operation.

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 FY2020 to FY2021. 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 1-year frequency and with NVUM data reported on a 5-year frequency. However, NVUM data from the FY2021 data collection period was not available for review or use at the time of this 2022 Monitoring Report. Data from the FY2021 NVUM will be available for reporting in the 2024 Monitoring Report, with the next round of data collection scheduled for FY2026.

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 5-year cycle. Data is not broken down by the Humboldt National Forest and the Toiyabe National Forest; 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 FY2016 NVUM data, visitors to undeveloped areas on the SMNRA feel that access, services, and feeling of safety met their expectations well (between 82.6 and 88.2 percent). However, visitors to undeveloped areas are disappointed with developed facilities, with only a 26.7 percent 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 percent for developed facilities and 99.9 percent for feeling of safety.

The Forest participated in Round 5 of the NVUM program during FY2021, with data collected from sites across the forest. However, updated NVUM data was not available as of the date of this monitoring report and will be reported during the next monitoring report cycle in 2024.

Indicator 2: Outside of developed facilities across the Forest, FY2016 NVUM data shows 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: One district on the Humboldt NF reported completing trail maintenance in FY2020 for a total of 29.3 miles. In FY2021, two districts reported completing trail maintenance on 24.2 miles of trail on the Humboldt NF.

Indicator 4: No districts reported completing trail improvements in FY2020 or FY2021 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 FY2020 and FY2021, no districts reported having trail miles meeting standard on the Humboldt NF.

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 1-year frequency and with NVUM data reported on a 5-year frequency. However, NVUM data from the FY2021 data collection period was not available for review or use at the time of this 2022 Monitoring Report. Data from the FY2021 NVUM will be available for reporting in the 2024 Monitoring Report, with the next round of data collection scheduled for FY2026.

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 5-year cycle. Data is not broken down by the Humboldt National Forest and the Toiyabe National Forest; 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 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.

The Forest participated in Round 5 of the NVUM program during FY2021, with data collected from sites across the forest. However, updated NVUM data was not available as of the date of this monitoring report and will be reported during the next monitoring report cycle in 2024.

Indicator 2: There were no miles of road reported as having been decommissioned in FY2020 and FY2021 on the HTNF.

Indicator 3: In FY2020, 181.5 miles of high clearance road were reported as having been maintained on the HNTF. In FY2021, 63.7 miles of high clearance road were reported as having been maintained on the HTNF.

Indicator 4: No miles of high clearance road were reported as having been improved, constructed, or reconstructed on the HTNF in FY2020. In FY2021, 6.3 miles of high clearance road were reported as having been improved, constructed, or reconstruction on the HTNF..

Indicator 5: In FY2020, 152.9 miles of passenger car road were reported as having been maintained on the HTNF. In FY2021, 144.1 miles of passenger car road were reported as having been maintained on the HTNF.

Indicator 6: No miles of passenger car road were reported as having been improved, constructed or reconstructed on the HTNF in FY2020. In FY2021, 4.7 miles of passenger car road were reported as having been improved, constructed or reconstructed on the HTNF.

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 1-year frequency and with NVUM data reported on a 5-year frequency. However, NVUM data from the FY2021 data collection period was not available for review or use at the time of this 2022 Monitoring Report. Data from the FY2021 NVUM will be available for reporting in the 2024 Monitoring Report, with the next round of data collection scheduled for FY2026.

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 5-year cycle. Data is not broken down by the Humboldt National Forest and the Toiyabe National Forest;

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 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.

The Forest participated in Round 5 of the NVUM program during FY2021, with data collected from sites across the forest. However, updated NVUM data was not available as of the date of this monitoring report and will be reported during the next monitoring report cycle in 2024.

Indicator 2: Based on the INFRA/NRM data Wilderness Stewardship Performance Scores have increased slightly since the 2020 monitoring report. Out of the 110 points possible, the average Wilderness stewardship Performance score for the 24 wilderness areas on the HTNF was 25 in FY2020 and 32 in FY2021. For the 12 wilderness areas located just on the Humboldt NF, the average score was 23 in FY2020 and 29 in FY2021.

Indicator 3: The following table presents data from INFRA/NRM on authorized emergency and administrative incursions into wilderness on the HTNF during FY2020 and FY2021. The emergency incursions were primarily related to wildfire response.

Unit	FY2020		FY2021	
	Emergency	Administrative	Emergency	Administrative
Humboldt NF	5	0	2	0
Toiyabe NF	3	0	1	1
Total	8	0	3	1

No information was available regarding unauthorized motorized or mechanical intrusions into wilderness on the HTNF during FY2020 and FY2021.

Indicator 4: There were no fires managed at less than full suppression within wilderness during fiscal years 2020 and 2021 on the Humboldt NF. All fires within wilderness were managed for full suppression.

Note: In 2020, The Chief issued direction for all fires to be managed for full suppression in light of on-going drought and the effects of the COVID-19 pandemic. These conditions continued into 2021.

Indicator 5: There were no acres treated by managing wildland fires in wilderness at less than full suppression to achieve land and resource management objectives in 2020 and 2021 on the Humboldt NF.

Note: In 2020, The Chief issued direction for all fires to be managed for full suppression in light of on-going drought and the effects of the COVID-19 pandemic. These conditions continued into 2021.

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 1-year frequency and with NVUM data reported on a 5-year frequency. However, NVUM data from the FY2021 data collection period was not available for review or use at the time of this 2022 Monitoring Report. Data from the FY2021 NVUM will be available for reporting in the 2024 Monitoring Report, with the next round of data collection scheduled for FY2026.

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 13,045 sites discovered.

Indicator 2: There are 707 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 707 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 been 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 2024 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 snowpacks 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 snowpacks 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: Temperature and precipitation data were retrieved from the Desert Research Institute (DRI) Western Regional Climate Center (WRCC), whereas snow water equivalent (SWE) and associated snow parameters along with precipitation data were retrieved from the USDA Natural Resources Conservation Service (NRCS) Nevada Water Supply Outlook Reports which are based on parameters collected as part of the Snotel network.

Monitoring Results

Indicator 1: Overall precipitation throughout the fall, winter, and spring was below the 30-year median (1981-2010 for 2020 and 2021, 1991-2020 for 2022) for 2020-2022. Above average (i.e. 100% of median) months were observed in December 2019, January 2020, February 2021, October 2021, and December 2021. Water year (October 1-September 30) to date precipitation in May 2020 and May 2021 was below average, while May 2021 was at or slightly below average.

Snow water equivalent (SWE) was below or well below average in May 2020-2022 representing consecutive years of drought cycles. Below average SWE also represents reduced snow cover days and potential earlier melt out dates when coupled with warmer temperatures. According to the WRCC, annual temperature departures in 2020 and 2021 were above normal with warmer than usual temperatures being recorded. To date similar temperature patterns have been observed in 2022.

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: Data were retrieved from the USDA NRCS Nevada Water Supply Outlook Reports and US Geological Survey (USGS) stream gage data and WaterWatch.

Monitoring Results

Indicator 1: Drier conditions have resulted in less precipitation and snowpack in the planning area which has in turn led to less overall discharge. As expected, and reflected in USGS gage data, the reduced snowpack and increases in temperature have resulted in earlier and smaller peak flows than normal. The USGS WaterWatch for water year 2020 reflected computed runoff in much of the planning area in the 25 to 75 percentile range with some areas as low as the 10 to 24 percentile range. In addition, the May 2020-2022 Water Supply Outlook Reports predicted average to below average stream flows from May through July.

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: Cherry Springs data is based on estimates of population growth following the 2019 Triple B Gather. The Monte Cristo population is based on surveys prior to the 2022 Pancake Complex gather and accounts for the number of excess horses removed during the gather.

Monitoring Results

Cherry Springs Wild Horse Territory estimated population is 60 horses. AML range is 42 to 68 horses. The Monte Cristo Wild Horse Territory estimated population is 72 horses. AML range is 72-96. Both territories are within the AML range.

Finding

Both territories are within the AML range.

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 885 and 889 cords in 2020 and 2021 respectively. This amount fits within previous year sales of public fuelwood and is slightly higher than the last couple years. 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 2020- 2022 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: Boundary miles posted is the end of the year report provided to the Regional Office from the Nevada Zone Lead Land Surveyor. Number of trespass cases identified is reported in 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 2020 and 2021 there were approximately 156 acres of aspen stands treated with 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

There was a combined 11,909 acres treated across the forest in 2020 and 2021 (8,799 and 3,110 acres respectively). Approximately 50 percent of the treatments were conducted outside of the WUI, and 50 percent occurred in the WUI. These treatments occurred in pinyon/juniper types for sage brush ecosystem restoration as well as mixed conifer forest types. In addition, 2465 acres (20 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 2020 and 2021 are lower than the forest 5-year average of acres treated annually, while prescribed fire was higher than the average amount of prescribed burning conducted.

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:

There was a combined 11,909 acres treated across the forest in 2020 and 2021 (8,799 and 3,110 acres respectively). Approximately 50 percent of the treatments were conducted outside of the WUI, and 50 percent occurred in the WUI. These treatments occurred in pinyon/juniper types for sage brush ecosystem restoration as well as mixed conifer forest types. In addition, 2,465 acres (20 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 2020 and 2021 are lower than the forest 5-year average of acres treated annually, while prescribed fire was higher than the average amount of prescribed burning conducted.

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 number of acres treated).

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

Data source: Not available

Monitoring Results

There is a consensus among managers that allowing wildland fire to be managed to help achieve land and resource management objectives would be a useful tool. During the monitoring period there were no natural ignitions in locations which provided the opportunity to utilize a management strategy.

Finding

Managing fires for multiple objective such as resource enrichment is a favorable idea within the wildland fire and land manager community but is not viewed in a positive light with the general public. This makes managing fires for multiple objectives a difficult decision to execute as it carries a high-political risk. The forest plan can do little to change this culture.

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-TESS-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.

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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. 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.

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 2022 Monitoring and Evaluation report documents and discloses monitoring results from fiscal years 2020 through 2021. Each Forest Plan Monitoring and Evaluation report is intended to be a “living” document, meaning information displayed in the 2018, and 2020 reports are considered as 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.