

**WASATCH-CACHE NATIONAL FOREST
FOREST PLAN
BIENNIAL MONITORING REPORT
2016-2017**

INTRODUCTION

The 2012 planning rule, which is found in the Code of Federal Regulations at 36 CFR 219, guides forest plan monitoring across the Forest Service. The Uinta-Wasatch-Cache National Forest (UWCNF) conformance strategy focuses on addressing the purpose of the forest plan monitoring program as described in 36 CFR 219.12(a)(1), which includes the need for monitoring information that enables the responsible official to determine if a change in plan components determine if a change in plan components or other plan content that guide management of resources on the plan area may be needed. The Biennial Monitoring Report evaluates new information gathered through the plan monitoring program and relevant information from the broader-scale strategy and makes this information available to the public. The monitoring evaluation report must indicate whether or not a change to the plan, management activities, or the monitoring program, or a new assessment, may be warranted based on the new information. The biennial monitoring evaluation report is used to inform adaptive management of the plan area. Any testing of assumptions, another rule-stated purpose of monitoring, would be addressed where relevant to one of the four determinations to be made.

This report presents monitoring information for 2016-17 and is organized in two main parts. The first part is a discussion of four determinations from the which include whether or not a change to the plan, management activities, or the monitoring program, or a new assessment, may be warranted based on the new information. The second part presents findings for each monitoring question in the monitoring plan and the data source and monitoring result for each indicator for each monitoring question. The monitoring questions and associated indicators address each of the eight requirements which are noted at 36 CFR 219.12(a)(5).

The Wasatch-Cache NF (WCNF) Forest Plan is 15 years old and revision is projected to occur in 10 years from now. The analysis of the management situation will be developed at that time. Over the past 15 years there have been several amendments and corrections to the Forest Plan that are presented in Appendix 1.

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 not indicated a need for changing the Wasatch-Cache National Forest Plan.
- ***NEED FOR CHANGING MANAGEMENT ACTIVITIES***
Monitoring has not indicated a need changing management activities.
- ***NEED FOR CHANGING THE MONITORING PROGRAM***
Monitoring has not indicated a need for changing the monitoring program.
- ***NEED FOR CONDUCTING AN ASSESSMENT TO DETERMINE PRELIMINARY NEED TO CHANGE THE PLAN***

Monitoring has not indicated a need for conducting an assessment to determine preliminary need to change the plan.

INFORMATION ON MONITORING QUESTIONS AND INDICATORS

Monitoring Question #1 Education-Information: Are we delivering key education/ enforcement messages to Forest employees and users? (Key Focus Areas are: OHV use, recreation user ethics, fire's role/hazardous fuels, noxious weeds, watershed health).

Finding: *No changes are needed. The Wasatch-Cache NF delivers key education/enforcement messages to the Forest employees and users.*

Indicator #1 - Number of key messages.

Data source: *Uinta-Wasatch-Cache NF Public Affairs Officer, forms completed by teachers at the Logan Canyon Children's Forest, responses of users of the WCNF to questions asked by Forest Service field personnel regarding whether users know the key messages that are on kiosks, and on Forest Service website and social media.*

Monitoring result: *Twenty five key messages were delivered. These messages come from the UWCNF Forest Communication plan that is tied to annual themes and key messages from the Forest Service Chief's office and from key messages developed for the Logan Canyon Children's Forest. Feedback from teachers at the Logan Canyon Children's Forest resulted in modifications to the original messages. A majority of users know the key messages and respond to messages that directly affect the user experience.*

Monitoring Question #2 What is visitor satisfaction on Forest Service lands?

Finding: *No changes are needed. Evaluation will be made for 2019 Forest Plan monitoring report.*

Indicator #1 - Level of visitor satisfaction.

Data source: *Information on level of visitor satisfaction is the National Visitor Use Program survey that was completed in 2017.*

Monitoring result: *The results are not yet available for the Forest to use. Information on this indicator is expected to be assessed in 2018 for the 2019 Forest Plan monitoring report. If the information is not completed by that time an assessment will be made from experiences that Forest Service employees have when they are in contact with the public.*

Monitoring Question #3 Is adequate access to and across the Forest being provided?

Finding: *No changes are needed. Access is adequate.*

Indicator #1 - Miles of classified road open for public use, miles of motorized trail, miles of non-motorized trail.

Data source: *Uinta-Wasatch-Cache NF Motor Vehicle Use Map.*

Monitoring result: *At the end of FY 2017, the miles of classified roads open for public use are 1,156, miles of motorized trails are 208, and miles of non-motorized trail are 1,008. No change occurred in the number of roads on the Wasatch-Cache Planning Area.*

Monitoring Question #4 Are vegetation conditions stable or moving toward desired future conditions?

Finding: *No changes are needed.*

Indicator #1 Forested Vegetation –Extent of insect/disease infestations.

Data source: *Forest Health Protection Annual Aerial Detection Survey 2016.*

Monitoring result: *Insects and disease have caused several thousand acres of conifers on the plan area to experience tree mortality. On average only 2.24 trees per acre have been killed by insects and disease with some areas experiencing mortality as high as 30 trees killed per acre. This equates to an average of 17% of the trees dying off to insects and disease. In some areas hit hard by insects, this figure is as high as 70% of the trees being killed by insects. The 2015 data shows that there are 101,244 acres that are being affected by insects and disease. This same data for 2016 shows that 164,520 acres are affected by insects and disease. In 2010 the data showed an average of 3.4 trees killed from insects and disease with approximately 192,815 acres being impacted.*

Monitoring Question #5 Fuels Reduction: Are fuels reduction projects protecting property, human health and safety, and reducing the potential for unwanted fire effects (in the Wildland Urban Interface (WUI) and non-WUI)?

Finding: *No changes are needed.*

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

Data source: *UWCNF Fuels treatment reports*

Monitoring result: *From 2016-2017, the Wasatch-Cache NF implemented 12,082 acres of fuels reduction treatment.*

Indicator #2 Fire behavior and opportunities for suppression.

Data source: *UWCNF Fuels treatment reports*

Monitoring result: *No wildfires entered into a fuels treatment within the last two years.*

Monitoring Question #6 Fire Management: Are natural ignitions being managed to accomplish resource management objectives?

Finding: *No changes are needed. Conditions must be favorable in order to manage fires for resource objectives, many of which are outside of our control (such as weather, available resources, and fire location). Therefore the percentage of natural ignitions that can be managed for resource objectives may vary significantly from year to year. However the goal is to see a long-term trend of increasing the percentage of fires with resource objectives.*

Indicator #1 Percent of natural ignitions with identified resource management objective.

Data source: UWCNF Fuels treatment reports

Monitoring results: In 2016-2017, 15% of natural ignitions were managed to accomplish resource management objectives on the WCNF.

<i>Data on natural ignitions that were managed to accomplish resource benefits.</i>			
	<i>2016</i>	<i>2017</i>	<i>Total</i>
<i>Number of Fires with Resource Objectives</i>	<i>2</i>	<i>1</i>	<i>3</i>
<i>Percent of Fires with Resource Objectives</i>	<i>15</i>	<i>14</i>	<i>15</i>

<i>Data on natural ignitions and resource benefits for 2016 and 2017.</i>			
	<i>2016</i>	<i>2017</i>	<i>Total</i>
<i>Number of Natural Ignitions</i>	<i>13</i>	<i>7</i>	<i>20</i>
<i>Acres of Natural Ignition</i>	<i>301</i>	<i>1</i>	<i>302</i>
<i>Acres with Resource Benefit</i>	<i>232</i>	<i>0</i>	<i>232</i>
<i>Percent of acres with Resource Benefit</i>	<i>77%</i>	<i>0%</i>	<i>77%</i>

Indicator #2 Percent of natural ignition acres with resource benefit.

Data source: UWCNF Fuels treatment reports

Monitoring results: In 2016-2017, 77% of natural ignition acreage was beneficial for natural resources on the Wasatch-Cache Planning Area.

Monitoring Question #7 Rangeland Management: What is the extent of the change of ecological conditions due to invasive species? Do rangeland plant communities have desired species composition and is ground cover adequate?

Finding: No changes are needed. Although weed infestations are increasing on parts of the Wasatch-Cache Planning Area, the Forest has been making efforts to control weeds on the plan area. Riparian and upland condition and trend are overall in satisfactory condition and are meeting desired conditions or trending towards desired condition. Overall, ground cover conditions are adequate on range allotments.

Indicator #1 Estimated acres infested with noxious weeds.

Data source: Comparison of 2016-2017 visual observations and/or treatment reports from seasonal USFS crews to noxious weed inventories that were conducted data from 2002 through 2009 on Salt Lake Ranger District (RD), on the Evanston/Mt. View RD, and a noxious weed re-inventory in 2015 on

the Logan and Ogden ranger districts by Utah State University (USU). Data for noxious weed treatment area is from Forest Service FACTS database.

Monitoring results: On the Salt Lake RD, previously inventoried and mapped noxious weed populations, (data from 2002 through 2009), when compared to current infestation data gathered during weed treatments conducted in 2017 indicate that weed populations appear to have grown exponentially. Small mapped 2009 infestations have increased in some cases to large acreages that are threatening entire watershed areas. Additional acres of yellow starthistle were inventoried and mapped by Salt Lake City workers in 2017, however verbal discussions indicate that the yellow starthistle continues to invade and is increasing in number of acres infested, (more than is shown on the 2016 inventory map), and so much so that the watershed is threatened.

<i>Acres of Noxious Weed Inventory and Treatments</i>				
<i>Ranger District</i>	<i>2015 USU Re-inventory</i>		<i>Weed Treatment Acres</i>	
	<i>Inventoried Acres</i>	<i>Weed Infested Acres</i>	<i>2016</i>	<i>2017</i>
<i>Salt Lake</i>	<i>N/A</i>	<i>N/A</i>	<i>770</i>	<i>1,107</i>
<i>Kamas</i>	<i>N/A</i>	<i>N/A</i>	<i>130</i>	<i>148</i>
<i>Evanston-Mt. View</i>	<i>N/A</i>	<i>N/A</i>	<i>1,693</i>	<i>2,097</i>
<i>Ogden</i>	<i>1,773</i>	<i>148</i>	<i>500</i>	<i>0</i>
<i>Logan</i>	<i>7,429</i>	<i>422</i>	<i>1,389</i>	<i>107</i>
<i>Totals</i>	<i>9,202</i>	<i>570</i>	<i>4,482</i>	<i>3,459</i>

On the Evanston/Mt. View RD, noxious weeds inventory and treatment by USFS crews indicate a small amount of noxious weeds, primarily along roads and trails.

The USU noxious weed re-inventory in 2015 on the Logan and Ogden ranger districts indicated differences in the number and extent of infestations. On the Logan RD, the number of infested acres in 2006-2007 was over three times the number of infested acres recorded in 2015. One explanation for the change in infestation numbers and area is difference in mapping. In the 2008 inventory area corresponding to the 2015 re-inventory, there were a total of 364 infestations, about one third of the number of infestations mapped in that same area in 2015. On the Ogden RD, The number of infested acres in 2008 was about twice that of the number of infested acres recorded in 2015. As in the Logan RD re-inventory, one explanation for the differences could be due to differences in mapping.

Indicator #2 Riparian and upland condition and trend.

Data source: In 2016-17, information for riparian and upland condition and trend is based on long-term monitoring studies established or reread on multiple cattle and sheep allotments of the Evanston/Mt. View RD, allotments include Humpy Creek, Gold Hill, Gilbert Creek, East Fork-Smiths Fork, West Fork-Smiths Fork, Burnt Fork, Beaver Creek and others. On the other ranger districts of the WCNF, no data and visual observations were reported for 2016-17.

Monitoring results: For the Evanston/Mt. View RD, the vegetative communities associated with the allotments are overall in satisfactory condition. Satisfactory condition is defined as meeting desired conditions or trending towards desired condition. Desired condition is defined as the 2003 Forest Plan Standards and Guidelines and having the desired plant communities. Trend and condition were and are determined from those studies that have been revisited at least once following establishment. Condition without trend is indicated from some studies with a single visit. Several monitoring methods are or have been used to gather data for condition and trend analysis. These include but are not limited

to repeat photography, photo plot, line intercept, line point intercept, vegetation ocular macroplot, nested frequency, and greenline. Older study types that provide background information but are not currently used include site analysis and Parker 3-Step. These methods are used to determine ground cover, plant community composition, forage utilization, riparian and stream bank conditions, water quality, compliance with grazing management practices or other grazing permit and/or annual operating instructions, and any other pertinent desired condition parameters.

Monitoring Question #8 Are Forest management activities and natural events affecting the ecological conditions indicated by the status of Focal species?

Findings: *No changes are needed. For conditions indicated by goshawk, the trend appears to be stable or increasing. No changes are needed. On the Ogden and Logan ranger districts, fishery habitat conditions remain good and in some instances have improved. Habitat and restoration projects completed over the last decade are having positive impacts to fish populations across the Logan RD.*

Indicator #1 Active Goshawk territories.

Data source: *Comparison to current inventory of territories based on survey protocols for the UWCNF that have been adapted from the Northern Goshawk Inventory and Monitoring Technical Guide (Woodbridge & Hargis, Northern goshawk inventory and monitoring technical guide, 2006). For fishery surveys, the overall trend in the ecological conditions is stable in the reaches that were surveyed.*

Monitoring results: *The annual focal monitoring objective is to monitor a subset (approximately 50%) of the known goshawk nesting territories. The number of known territories can fluctuate annually depending upon activity and discovery. Each district monitors at least 50% of their known territories. New territories and nests are generally discovered when new timber projects are proposed and wildlife biologists conduct biological clearances and surveys of the project area. Since 1999, the number of known territories within the Wasatch-Cache Planning Area has increased due to increased sampling effort and new nest discoveries. There were 59 known territories at the conclusion of the 2017 field season. No territories were added, but the Gourley Meadows territory of the Evanston-Mountain View RD was removed due to seven years of no occupancy. Of the 59 known territories, 50 (85%) were monitored and 15 (30%) were occupied.*

Management activities over the past 15 years were unlikely to cause significant population level impacts to goshawk fledgling success. Of the Wasatch-Cache Planning Area, almost half of the land area is designated as Wilderness and Roadless areas. Management of these lands requires increased approvals from the Forest Service Regional and Washington Offices; therefore, management does not often occur in these areas. An even smaller portion of the Wasatch-Cache Planning Area that can be managed, actually undergoes activities that could negatively affect the goshawks. These activities require environmental analysis, thereby reducing and mitigating negative effects.

The Wasatch-Cache Planning Area shows an overall upward trend in the number of focal and monitored territories but a downward trend in occupied territories (OT), active nests (AN), and fledgling success (FS) between the years of 2003 and 2017. A shift occurred around 2009. Before 2009, OT and AN had a flat trend line and FS was increasing. After 2009, OT, AN, and FS show a decreasing trend. When districts are individually examined, Evanston-Mountain View RD (EMVRD) shows a decreasing trend in OT, AN, and FS (Figure 8) while Ogden-Logan RDs (Figure 9) and Kamas RD (Figure 10) show stable to increasing trends. Salt Lake RD shows no change (Figure 11) because

OT, AN, and FS remained at zero. As shown in (Table 1), EMVRD includes about half the number of all focal territories in the Planning Area; therefore, data from this district has a significant impact on the overall monitoring results each year. While Ogden-Logan RDs and Kamas RD slightly increased in all indices since 2009, it was not enough to compensate for EMVRD's downward trends.

The peak of the pine beetle epidemic occurred between 2009 and 2013. Since the peak, there has not been any major changes in recreation, fuel, fire, or range management activities on the North Slope, but timber sale restoration (salvaging dead lodgepole pine) efforts in beetle-killed stands has increased three times prior to the beetle outbreak. The current estimate of beetle-killed lodgepole pine on the North Slope is approximately 80-90%.

Lodgepole pine is the most frequently selected nest tree on the Planning Unit and aspen follows closely behind. Since the beetle outbreak, the tree species goshawks choose for their nests has not changed (Figure 12), but more consistent field data is needed to determine if a change will occur in the future. A shift to an alternative tree is logical because as beetle-killed lodgepole pine trees decay and fall, goshawks will need to use an alternate tree species to build their nests, and aspens may be selected.

The 2017 EMVRD indices (OT, AN, FS) were exceptionally low, but indices for the Planning Area were average to slightly less than average. The EMVRD downward trends may suggest that the beetle epidemic on the EMVRD may be impacting fledgling success for the entire Planning area. Goshawks prefer to nest in mature, large diameter trees in closed canopy forests. The dead lodgepole trees no longer provide a closed canopy, thereby exposing goshawk fledglings to hawk and owl predation.

Additionally, the winter of 2016-2017 had abundant snow accumulation and could have affected goshawk fledgling success. The EMVRD showed exceptionally low OT, AN, and FS numbers. Other districts in the Planning Area showed lower than average indices, but were not exceptionally low. The Caribou portion of the Caribou-Targhee NF (CTNF) and the Ashley NF (South Slope of Uinta Mountains) experienced low fledgling successes as well (personal communications wildlife biologist Ashly Kula CTNF 09/13/2017 and Robert Christensen 09/15/2017). These low numbers could be due to heavy snow during the winter of 2016-2017. The longer the winter, the greater the energy expenditure required by goshawks in order to survive the weather. By expending a great amount of energy, the adult birds may become underweight which would reduce their fitness and in turn, lower their ability to reproduce in the spring. These snowy conditions also make it difficult for observers to access territories during the incubation stage and are unable to observe nests until later in the season. Observers may miss failed nesting attempts that were active early in the season but failed prior to monitoring or surveyors could miss the fledglings if they are unable to access the territory until well into the fledgling stage. In addition to the detrimental impacts the long winter can have on nesting success of goshawks, the winter could also have negatively affected the goshawk prey base, which could have resulted in decreased food availability and potentially lower successful fledgling rates.

The number of EMVRD active nests have been decreasing since 2009, but Kamas and Ogden-Logan are increasing. Salt Lake has had no change but no active nests since 2009 and no young fledged since 2007.

Indicator #2 Cutthroat Trout population estimates.

Data source: *In 2016, fish surveys were conducted on four streams located on the Ogden RD - Cold Canyon, Cutler Creek, South Fork Wolf Creek, and Wheeler Creek. These surveys repeated surveys conducted in 2006 to monitor Bonneville cutthroat trout (BCT) and Forest management activities. In 2017, fish surveys were conducted on streams located on the Evanston-Mt. View RD in the Burnt Fork*

Drainage – Beaver Meadows tributary, upper Burnt Fork, Thompson Creek, and Kabell Creek. These surveys repeated surveys conducted mainly in the 1990's and 2004 to monitor Colorado River cutthroat trout (CRCT) and Forest management activities.

Monitoring results: *For Cutthroat trout, Cutler Creek was the only stream that had a downward trend. However, the Cutler Creek population appears to be doing well. While the number of fish and biomass are down from 2006, numerous age classes were observed and habitat conditions remain good. The Cold Canyon Creek population of cutthroat trout is limited to just over one mile of stream but is isolated from other North Fork Ogden River populations by a diversion structure that prevents the movement of fish upstream. While this population appeared healthy with numerous age classes and good habitat conditions, any large scale event (fire, landslide, etc.) impacting this drainage could extirpate this population. The South Fork of Wolf Creek continues to support a strong population of cutthroat trout. In 2016, nearly 1,000 fish per mile were observed. The Wheeler Creek population of BCT appears to be doing well. The population size has increased since 2005, and habitat conditions have improved. No brook trout were observed in 2016, however, they are present higher in the drainage.*

In 2017, fish surveys on the Evanston-Mt. View RD in the Burnt Fork Drainage indicate the reach trend was stable on Beaver Meadows and Thompson Creek. Although the reach trend was down on upper Burnt Fork and Kabell Creek, it is expected that actual reach conditions are stable like Beaver Meadows and Thompson Creek and the reason for downward trend rating on upper Burnt Fork was because of only a single survey pass was able to be conducted because of high water flows and safety concerns.

Monitoring Question #9 Is there a change in species distribution across the Forest?

Finding: *No changes are needed.*

Indicator #1 **Change from cold water to warm water species, change in terrestrial vegetation and species distribution.**

Data source: *Field observations of aquatic habitat and fish population surveys*

Monitoring results: *From the results of fish population and habitat surveys, there is no indication of a change from cold to warm water species. The beetle epidemic primarily on the Evanston-Mt. View RD has resulted in a change in terrestrial vegetation from that conifer to aspen. There is no indication of a change in terrestrial species distribution.*

Monitoring Question #10 Are Forest management activities and/or natural events affecting ecological conditions that 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 concern?

Finding: *No changes are needed. For conditions indicated by goshawk and fish surveys and for other federally listed threatened and endangered species, conserve proposed and candidate species, the ecological and population trends appears to be stable or increasing.*

Indicator #1 **Mature forest conditions and population estimates (e.g, Northern goshawk).** *See Monitoring Question # 8, Indicator #1.*

Indicator #2 Aquatic and riparian condition: In-stream channel conditions and population estimates (e.g, Bonneville cutthroat trout and Colorado River cutthroat trout). *For fish abundance and condition surveys see Monitoring Question # 8, Indicator #2.*

Indicator #3 Habitat that contains other federally listed threatened and endangered species, conserve proposed and candidate species – Documentation of alterations in habitat due to management actions and natural events.

Data source: *Forest service Watershed Improvement Tracking database.*

Monitoring results: *Several forest management activities alter habitat to help other federally listed threatened and endangered species, conserve proposed and candidate species are vegetation treatments to enhance diversity for species such as lynx and screens for toilets to prevent migratory birds from getting trapped in them.*

Monitoring Question #11 Are Forest management activities and natural events affecting the ecological conditions of terrestrial and aquatic ecosystems?

Finding: *No changes are needed. Forest management activities and natural events in 2016 and 2017 that changed ecosystem conditions has occurred on a small percentage of the WCNF (fuels treatments – 12,082 acres or 1.4%, timber removal projects – 858 acres or 0.04%, natural fire ignitions -20,283 acres or 2.3%, insect and disease – several thousand acres). Timber lands are full stocked or will regenerate naturally, and wildfire has resulted in very little severe soil impact (12 acres). Very little impact to soil resources have resulted from these activities and these activities are sustaining the ecosystems on the WCNF. Most of these activities affected the terrestrial ecosystem by setting the seral stage of the vegetation to an earlier stage, improving watershed conditions by increasing ground cover, and improving sage grouse habitat. Aquatic ecosystems have been positively affected by improving the forest infrastructure such as replacing two culverts and removal of a small dam in Mill Creek on the Salt Lake RD that provides fish habitat connectivity. Natural events such as insect and disease and wildfire affected terrestrial ecosystems by setting back the seral stage of lodgepole pine stands.*

Data source for all indicators: *See Monitoring Question # 4, Indicator #1, Monitoring Question #5, Indicators #2, Monitoring Question # 6, Indicators #1 and #2, Monitoring Question # 7, Indicators #1 and #2, Monitoring Question # 8, Indicators #1 and #2 and the Utah 2016 Integrated Report (303(d) and 305(b) reports).*

Indicator #1 Aquatic habitat conditions.

Monitoring results: *For fish abundance and condition surveys see Monitoring Question # 8, Indicator #2. Water quality may indicate natural and/ or man-caused conditions that affect aquatic habitat. The Utah 2016 Integrated Report (303(d) and 305(b) reports) lists several streams that are classified as not supporting its beneficial use. Wyoming is currently compiling information for their 2016/2018 Integrated 303(d) and 305 (b) Report. Information from the 2014 Wyoming 303(d) list is used in the table below. The Utah 2016 Integrated Report states that high priority for assessment for Parleys Canyon Creek-1 and Provo River-6. The other streams listed as not supporting are rated as low priority for assessment.*

Information from the 2014 Wyoming draft Integrated 303(d) and 305 (b) Report states ”

Uinta County Conservation District (UCCD) monitored water quality at 12 sites in 2006 on the Blacks Fork as part of the Blacks Fork/Smiths Fork Watershed Section 319 Project Report. The goal of the project was to collect physical, chemical and biological data from several study sites along the Blacks Fork and Smiths Fork drainages. Data collected during this project showed that fecal coliform concentrations were above WDEQ's recreational criteria at several sites in both watersheds throughout the study. The report also noted that sedimentation was a concern in both watersheds. UCCD collected E. coli data in 2009 and 2010 that showed that bacterial concentrations on the Blacks and Smiths Forks were still exceeding WDEQ's recreational use criteria. UCCD has sponsored a watershed plan for the Blacks Fork and Smiths Fork Watersheds. WDEQ initiated TMDLs for the Smiths and Blacks Forks in 2013.

Willow Creek's headwaters are located in the northern foothills of the Uinta Mountains in the Wasatch-Cache National Forest near the Utah/Wyoming border and is a major tributary to the Smiths Fork. Data and other information collected during the mid-1990s by UCCD showed that Willow Creek was physically degraded due to eroding stream banks and sedimentation. Poor riparian vegetation cover was also noted as a concern. Willow Creek (WYGR140401070205_01) was added to the 303(d) List in 1998 as threatened because the cold water fishery and aquatic life other than fish uses were not supported for the entire watershed upstream of the confluence with the Smiths Fork. The cause of this threat was habitat alterations (i.e. sediment) and the source was identified as livestock grazing. UCCD completed a Section 319 Project for Willow Creek in 1999. The goals of this project were to improve the habitat condition and water quality of Willow Creek using several BMPs. BMPs included revising grazing management plans, planting riparian vegetation, improving and installing new upland stock watering ponds and fencing some riparian areas. WDEQ (2003) monitored Willow Creek at three sites in 2003 to determine whether the above BMPs were effective in improving the threat to the Willow Creek watershed. Elevated temperature, pH and algal and macrophyte cover were noted as concerns. Riparian condition was fair at all three study sites and streambed embeddedness was an issue within the middle reach. Results of macroinvertebrate sampling were inconclusive. The report concluded that the aquatic life uses on Willow Creek were still threatened, but that habitat condition may be improving. WDEQ's TMDL Program began monitoring Willow Creek again in 2013 to re-assess designated use support."

<i>303(d) listed water bodies from Utah Division of Water Quality 2016 303(d) list.</i>			
<i>Ranger District</i>	<i>Analysis Unit ID</i>	<i>Analysis Unit Description</i>	<i>Parameter</i>
<i>Salt Lake RD</i>	UT16020102-023_00	<i>Hardscrabble Creek</i>	<i>Temperature</i>
	UT16020102-026_00	<i>East Canyon Creek-2</i>	<i>Temperature; OE Bioassessment; Total Dissolved Solids</i>
	UT16020102-027_00	<i>Kimball Creek</i>	<i>OE Bioassessment; Arsenic, Dissolved</i>
	UT16020102-032_00	<i>South and Middle Fork Kays Creek</i>	<i>Copper, Dissolved</i>
	UT16020102-034_00	<i>Holmes Creek-2</i>	<i>Copper, Dissolved</i>
	UT16020102-038_00	<i>Farmington Creek-2</i>	<i>Aluminum, Dissolved; Copper, Dissolved</i>
	UT16020102-039_00	<i>Farmington Creek-1</i>	<i>E. coli.; Copper, Dissolved</i>
	UT16020102-043_00	<i>Barnard Creek</i>	<i>E. coli. ; Dissolved Oxygen; Copper, Dissolved</i>
	UT16020102-044_00	<i>Parrish Creek</i>	<i>Copper, Dissolved</i>
	UT16020102-045_00	<i>Stone Creek-2</i>	<i>Copper, Dissolved</i>
	UT16020102-049_00	<i>Mill Creek2-Davis</i>	<i>Copper, Dissolved</i>
	UT16020204-010_00	<i>City Creek-2</i>	<i>Cadmium, Dissolved</i>
	UT16020204-013_00	<i>Parleys Canyon Creek-2</i>	<i>Cadmium, Dissolved</i>
	UT16020204-020_00	<i>Big Cottonwood Creek-2</i>	<i>Cadmium, Dissolved; Copper, Dissolved</i>
	UT16020204-022_00	<i>Little Cottonwood Creek-2</i>	<i>Cadmium, Dissolved; Copper, Dissolved; pH</i>
	UT16020204-025_00	<i>Parleys Canyon Creek-1</i>	<i>OE Bioassessment; E. coli</i>
	UT16020203-026_00	<i>Heber Valley</i>	<i>Temperature</i>
<i>Kamas RD</i>	UT16020203-006_00	<i>Provo River-6</i>	<i>Aluminum, Dissolved; Zinc, Dissolved</i>
<i>Evanston-Mt. View RD</i>	UT14040106-003_00	<i>West Fork Beaver Creek</i>	<i>Aluminum, Dissolved</i>
	UT14040106-004_00	<i>Middle Fork Beaver Creek</i>	<i>Aluminum, Dissolved</i>
	UT14040107-001_00	<i>Blacks Fork</i>	<i>Aluminum, Dissolved; pH</i>
	UT14040107-005_00	<i>East Fork Smiths Fork</i>	<i>Aluminum, Dissolved; Zinc, Dissolved</i>
	WYGR140401070205_01	<i>Willow Creek</i>	<i>Habitat Alteration</i>
<i>Ogden RD</i>	UT16010101-007_00	<i>Big Creek</i>	<i>E. coli; pH; Temperature; Total Dissolved Solids</i>
	UT16020102-001_00	<i>Weber River-1</i>	<i>OE Bioassessment</i>
	UT16020102-002_00	<i>Weber River-3</i>	<i>OE Bioassessment</i>
	UT16020102-009_00	<i>Middle Fork Ogden River</i>	<i>Dissolved Oxygen</i>
<i>Logan RD</i>	UT16010201-001_00	<i>Bear Lake West</i>	<i>OE Bioassessment</i>
	UT16010201-002_00	<i>Laketown</i>	<i>Dissolved Oxygen; Temperature</i>
	UT16010203-020_00	<i>Blacksmiths Fork-1</i>	<i>E. coli.; Dissolved Oxygen</i>

303(d) listed water bodies from Utah Division of Water Quality 2016 303(d) list.			
<i>Ranger District</i>	<i>Analysis Unit ID</i>	<i>Analysis Unit Description</i>	<i>Parameter</i>
Pleasant Grove RD	UT16020201-015 00	Dry Creek-Alpine	pH
	UT16020203-013 00	Provo Deer Creek	OE Bioassessment ¹
Heber RD	UT14060003-019 00	North Fork Duchesne	Aluminum, Dissolved
	UT14060004-013 00	Strawberry-4	Dissolved Oxygen; pH
	UT14060004-015 00	Currant Creek Upper	Dissolved Oxygen
	UT16020203-009 00	Main Creek-1	OE Bioassessment; E. coli ¹
	UT16020203-010 00	Main Creek-2	E. coli
	UT16020203-026 00	Heber Valley	Temperature
Spanish Fork RD	UT16020201-005 00	Salt Creek-2	pH
	UT16020201-014 00	Currant Creek-Juab Valley	Temperature
	UT16020202-003 00	Hobble Creek-1	pH
	UT16020202-012 00	Soldier Creek-1	Temperature
	UT16020202-027 00	Beer Creek	OE Bioassessment; Total Ammonia
¹ OE means Observed versus Expected and E. coli. is a bacteria indicator species.			

Indicator #2 Riparian ecosystem conditions.

Monitoring results: *Very little change has occurred to riparian areas of the Wasatch-Cache Planning Area and most management activities have avoided impacts to these areas.*

Indicator #3 Forested Terrestrial ecosystem conditions.

Monitoring results: *In 2016, natural and human-induced regeneration events have occurred on the forest. Of the 75,016 acres that were identified in 2016 that were impacted by various insects, the WCNF treated 858 acres through various prescribed burning and timber removal projects. Natural caused wildfires burned 302 acres on the Wasatch-Cache Planning Area in 2016. Current treatment efforts are not of a size and scale to keep up with the current impacts of insects on the forest. Timber harvest on the Wasatch-Cache Planning Area occurs on lodgepole pine stands and there is no need for planting or other reforestation activities in these areas as regeneration are being achieved through the seeding in treatments areas by adjacent live standing trees. Stands are fully successful in meeting stocking requirements through this process.*

Indicator #4 Non-forested terrestrial ecosystem conditions. *See Monitoring Question #7, Indicator #2.*

Monitoring Question #12 Are Forest management activities and natural events affecting watershed conditions?

Finding: *No changes are needed. Regarding water quality, the UWCNF is working cooperatively to collect water samples and to provide information to the Utah Division of Water Quality on possible causes of water quality impairment. No lichen monitoring has occurred in 2016-2017. The next evaluation is scheduled in 2026 when another round of lichen monitoring should be complete. Past lichen monitoring indicates no change is needed. Regarding changes in soil properties, rest rotation on range allotments improve soil properties and reseeded with native seed species after wildfire occur in*

areas that have cheatgrass appears to reduce the amount of cheatgrass and provides denser understory vegetation. How long these conditions last is unknown and future monitoring is planned within in the next four years.

Indicator #1 Aquatic Habitat conditions.

Data source: *See Monitoring Question #8, Indicator #2 and Monitoring Question #11, Indicator #1.*

Monitoring results: *See Monitoring Question #8, Indicator #2 and Monitoring Question #11, Indicator #1.*

Indicator #2 Air Quality - Trends of lichen biomonitoring sites.

Data source: *The WCNF has seven lichen monitoring sites. Four sites are established in the High Uintas Wilderness Area, one site in the Lone Peak Wilderness Area, and two in the Deseret Peak Wilderness Area. A report on lichen surveys was completed in 2013 by Brigham Young University that included an assessment of 23 lichen monitoring sites on the Uinta NF as well as the seven on the Wasatch-Cache National Forest. General observations from this report are applicable to both forests along the Wasatch Front.*

Monitoring results: *Air quality bio-monitoring reference sites showed that there have not been any changes in species diversity, the number or abundance of sensitive indicator species, no air pollution-related response such as upper surface discoloration, bleaching, or necrosis was observed. This pattern supports the idea that the lichen communities in the forest generally remain healthy and un-impacted by air pollution. There have not been any significant (detectable) changes in the status of the lichen communities at each of the lichen air quality bio-monitoring reference sites in the Uinta-Wasatch-Cache National Forest. Across the Uinta NF sulfur concentrations in a high percentage of sensitive indicator species samples are elevated ($\geq .020\%$) particularly at sites closer to the Wasatch Front. However, there are a few reference sites where sulfur levels have declined.*

The elevated nickel and arsenic levels observed in the 1995 elemental analysis samples have come down to background levels (with few exceptions) over both the 2002-2003 and 2011-2012 sampling periods. Generally, lead levels are within background levels with some improvements across several reference sites. These patterns may be related to the closure and decommissioning of the Orem steel plant. Overall, percent nitrogen levels in the sensitive indicator samples are elevated across the forest with some trends of improvement at some sites. Most of the elevated percent nitrogen levels seem to be concentrated along the Wasatch Front – likely related to increasing population and concomitant vehicular activity along the heavily populated areas of the Front.

Indicator #3 Changes in soil properties (physical, chemical, and biological) that result in the loss of the inherent ecological capacity or hydrologic function of the soil resource.

Data source: *Soil resource condition surveys*

Monitoring results: *In 2016-17, monitoring for changes in soil properties were conducted in conjunction with timber harvest activities. See Monitoring Question #14.*

Monitoring Question #13 NFMA compliance: Are we complying with appropriate NFMA requirements?

Finding: *No changes are needed.*

Indicator #1 Stocking of lands.

Data source: *Uinta-Wasatch-Cache NF Annual Reforestation and Timber Stand Improvement Needs Report*

Monitoring results: *Currently management activities on the Wasatch-Cache Planning Area are focused in lodgepole pine cover types. The Wasatch-Cache Planning Area doesn't have a need for planting or other reforestation activities in these areas as regeneration is being achieved through the seeding in treatments areas by adjacent live standing trees. Stands are fully successful in meeting stocking requirements through this process.*

Monitoring Question #14 Are timber management activities impairing soil productivity of the land?

Finding: *No changes are needed.*

Indicator #1 **Changes in soil properties (physical, chemical, and/or biological) that result in the loss of the inherent ecological capacity or hydrologic function of the soil resource. Specific indicators are amount of soil disturbance, change inorganic matter, or change in Soil structure, soil temperature, A horizon depth.**

Data source: *Soil resource condition surveys conducted on timber harvest units.*

Monitoring results: *Currently management activities on the Wasatch-Cache Planning Area are focused in lodgepole pine cover types. The Wasatch-Cache Planning Area doesn't not have a need for planting or other reforestation activities in these areas as regeneration is being achieved through the seeding in treatments areas by adjacent live standing trees. Stands are fully successful in meeting stocking requirements through this process.*

Monitoring Question #15 Are goods and services being provided in accordance with Forest Plan goals and objectives?

Finding: *No changes are needed. The Wasatch-Cache NF is providing a variety of goods and services according to the Forest Plan.*

Indicator #1 Number of Lands Special Use Permits.

Data source: Forest Service Special Uses Data System (SUDS) database.

Monitoring results: *The number of lands and recreation special use permits are presented by ranger district in the table below. Lands SUPs are uses such as dams, water transmission lines, geophysical exploration. Recreation SUPs are uses such as recreation residences, outfitter and guides, and recreation events.*

Number of Lands Special Use Permits.			
<i>Ranger District</i>	<i>Number of Lands SUP</i>	<i>Number of Recreation SUP</i>	<i>Total</i>

<i>Supervisor's Office</i>	46	14	60
<i>Salt Lake</i>	158	176	334
<i>Kamas</i>	32	48	80
<i>Evanston- Mt. View</i>	43	49	92
<i>Ogden</i>	43	13	56
<i>Logan</i>	53	99	152
<i>Total</i>	171	209	380

Indicator #2 Number of Recreation Special Use Permits. *See indicator #1 and table above.*

Indicator #3 Acres leased for oil and gas exploration and development.

Data source: *US Bureau of Land Management LR2000 database.*

Monitoring results: *As of 11/28/17, there are 24 authorized oil and gas leases containing 46,631 acres within the Wasatch NF plan area.*

Indicator #4 Level of permitted livestock grazing.

Data source: Range Allotment Annual Operating Plans

Monitoring results: *The table below presents the permitted commercial livestock use levels in 2015-2016. Data for 2017 is not available at this time. The term AUM means animal unit months. The level of permitted livestock grazing has not changed from 2015 to 2017.*

Level of permitted livestock grazing.							
<i>Ranger District</i>	<i>Number of permittees</i>	<i>Cattle Numbers</i>	<i>Cattle AUM</i>	<i>Sheep & Goats Numbers</i>	<i>Sheep & Goats AUM</i>	<i>Total number</i>	<i>Total AUM</i>
<i>Salt Lake</i>	17	957	3,025	0	0	957	3,993
<i>Kamas</i>	12	989	5,146	0	0	989	5,146
<i>Evanston- Mt. View</i>	21	2,364	9,052	20,262	12,015	22,626	21,067
<i>Ogden</i>	17	2,549	4,549	9,915	6,242	12,464	10,791
<i>Logan</i>	31	5,132	23,760	11,029	9,826	16,181	33,586
<i>Total</i>	98	11,991	45,532	41,206	28,083	53,217	74,583

Indicator #5 Other Forest Products (Fuelwood and Christmas Tree Permits).

Data source: Forest Service PTSAR database.

Monitoring results: The table below presents other forest products produced from the Forest in 2016-17.

Other Forest Products		
<i>Ranger District</i>	<i>Product</i>	<i>Amount</i>
<i>Salt Lake</i>	<i>Firewood</i>	<i>26 cords²</i>
<i>Kamas/Heber¹</i>	<i>Firewood</i>	<i>4,882 cords</i>
	<i>Post & Pole</i>	<i>200 pieces</i>
	<i>Every Kid Free Xmas Tree</i>	<i>27 trees</i>
	<i>Christmas Trees</i>	<i>2,000 trees</i>
	<i>Transplants</i>	<i>77 trees</i>
	<i>Seed</i>	<i>2,500 pounds</i>
<i>Evanston- Mt. View</i>	<i>Firewood</i>	<i>2,939 cords</i>
	<i>Tribal Firewood</i>	<i>21 cords</i>
	<i>Post & Pole</i>	<i>1,685 pieces</i>
	<i>Teepee Poles</i>	<i>1,392 pieces</i>
	<i>Ornamentals</i>	<i>30 each</i>
	<i>Every Kid Free Xmas Tree</i>	<i>3 trees</i>
	<i>Christmas Trees</i>	<i>2,795 trees</i>
<i>Logan</i>	<i>Firewood</i>	<i>134 cords</i>
¹ Note that Kamas/Heber RDs data is the total for both ranger districts and is not broken out by separate districts. ² A cord is the amount of wood in a neat stack 4 feet wide by 4 feet high by 8 feet long (128 cubic feet).		

Indicator #6 Total Timber Sale Program Quantity.

Data source: Forest Service PTSAR database.

Monitoring results: In 2016, the total timber sale program quantity sold was 102,883 ccf (100 cubic feet of solid wood) from the Roughneck Timber sale area and from added volumes that occurred during harvest. In 2017, no new timber sales were sold but 1.57 ccf added volume was sold during harvest.

Monitoring Question #16 National Historic Preservation Act as amended: Are cultural resources being protected as the Forest Plan is implemented and are mitigation measures sufficient prevent damage to cultural resources from project activities? Are *Historic Properties* receiving adverse effects from project implementation, vandalism, looting, and/or neglect?

Finding: *No changes are needed.*

Indicator #1 Number of *Historic Properties* that received new adverse effects from looting, vandalism, and/or neglect.

Data source: *Forest archaeologist project reviews*

Monitoring results: *On the Salt Lake RD, one archaeological rock art site was vandalized by spray paint graffiti.*

Appendix 1: Amendments and corrections to the Wasatch-Cache NF Forest Plan.

WCNF Amendments	
Amendment #1 (2004)	- Bear Hodges II Timber Sale: Site-specific amendment to standard S2.7
Amendment #2 (2004)	- Snowqualmie Water Tank and Distribution Line: Site-specific exception to standard S3.1W
Amendment #3 (2006)	- Tony Grove-Franklin Basin Winter Recreation: Changes Winter Recreation Map for this area
Amendment #4 (2006)	- Millville/Logan Peak Road Relocation Project: Site-specific exception to standards S2.7 and S3.1W
Amendment #5 (2008)	- Wild and Scenic River Suitability– Identifies Ostler Fork and Stillwater Fork as rivers on Forest recommended for inclusion in the National Wild and Scenic River System. Errata to Amendment #5: Adds Main Fork Weber River as not recommended for inclusion in NWSRS.
Amendment #6 (2009)	- Stansbury Vegetation Treatment: Site-specific exemption for standard S2.6.
Amendment #7 (2009)	- Ogden City Access Road Amendment: Site-specific amendment for standard S3.1W.
Amendment #8 (2009)	- West-wide Energy Corridor Amendment: identifies energy transmission corridors and mandatory operating procedures for these
Amendment #9 (2010)	- Ruby Pipeline: site-specific waiver for sub-goal 12d.
Amendment #10 (2012)	- Kamas Valley Allotment. Corrections to Forest Plan FEIS tables for range suitability by alternative.
Amendment #11 (2016)	- Allows 2000' of transmission line outside of designated utility corridor east of Brigham City.
Amendment #12 (2015)	- Greater sage-grouse
Amendment #13 (2016)	- Forest Plan Monitoring
WCNF Corrections	
Errata #1 (2003)	- Regionally Significant Wildlife Corridor Map. Large landscape linkages across the Rocky Mountains
Errata #1 (2003)	- Text Errata: several text corrections in Chapter 4, Appendix VII, and Appendix B
Errata #1 (2003)	- Lynx Analysis Map. Primary and secondary lynx habitat, LAUs and linkage areas
Errata #2 (2009)	- Rangeland Capability/Suitability. Corrections to Forest Plan FEIS tables listing open/closed/livestock type by allotment
Errata #3 (2010)	- Timber Harvest Standard. Maximum harvest opening sizes