CFLR Project (Name/Number): Burney Hat Creek Basins 014

National Forest(s): Lassen

1. Match and Leveraged Funds:

a. FY19 Matching Funds Documentation

Fund Source – (CFLN/CFLR Funds Expended)	Total Funds Expended in Fiscal Year 2019
CFLN1419	$670,769.16

This amount should match the amount of CFLR/CFLN dollars obligated in the FMMI CFLRP expenditure report. Include prior year CFLN dollars expended in this Fiscal Year.

Fund Source – (Funds expended from Washington Office funds (in addition to CFLR/CFLN) (please include a new row for each BLI))	Total Funds Expended in Fiscal Year 2019
CFHF1419	$709,075

This value (aka "core funds" "in lieu of funds") should reflect the amount expended of the allocated funds as indicated in the program direction but does not necessarily need to be in the same BLIs or budget fiscal year as indicated in the program direction.

Fund Source – (FS Matching Funds (please include a new row for each BLI)	Total Funds Expended in Fiscal Year 2019
CFPR1419	$74,577
CFHF1419	$354,943
Unofficial Match*:	
CWKV – Planting, Fuels Reduction	$264,881
CMRD0597 – N49 aggregate supply and haul	$221,240
NFRW0619 – Badger Planning Enterprise	$60,000
The "unofficial match" line items above would have been matching dollars had we used CFLR match codes.	

This amount should match the amount of matching funds in the FMMI CFLRP expenditure report, minus the Washington Office funds listed in the box above and any partner funds contributed through agreements (such as NFEX, SPEX, WFEX, CMEX, and CWFS) listed in the box below.

Fund Source – (Funds contributed through agreements)	Total Funds Expended in Fiscal Year 2019
Mule Deer Foundation	$60,000
Great Shasta Rail Trail Assoc.	$12,283
Humboldt State University	$9,523
University of Nevada, Reno	$10,067
California Conservation Corps – Big Lake	$7,776
California Department of Transportation	$240,020
Sierra Institute – Socioeconomic Monitoring	$5,481
Sierra Institute – Facilitation	$5,444

Please document any partner contributions to implementation and monitoring of the CFLR project through an income funds agreement (**this should include partner funds captured through the FMMI CFLRP reports such as NFEX, SPEX, WFEX, CMEX, and CWFS**). Please list the partner organizations involved in the agreement. Partner contributions for Fish, Wildlife, Watershed work can be found in the WIT database.

Fund Source – (Partner In-Kind Contributions)	Total Funds Expended in Fiscal Year 2019
CA Central Valley Regional Water Quality Control Board	$950
California Conservation Corps – Big Lake	$22,659
Fall River RCD - Department of Conservation (DOC) Watershed Coordinator grant program	$200,000
Forestry Challenge	$27,860
Forestry Institute for Teachers	$14,964
Great Shasta Rail Trail (GSRT)	$4,000
Mule Deer Foundation – CCI Grant secured through Fall River RCD	$123,440
Pacific Crest Trail Association	$11,259
Symbiotic Restoration CCI/ SNC grant funds secured through Fall River RCD	$60,000
US Geological Survey	$107,000
USFS Pacific Southwest Research Station	$6,480
USFS Pacific Northwest Research Station	$9,000
Washington State University	$29,536
Water Resources Institute, California State University San Bernardino	$4,500

Total partner in-kind contributions for implementation and monitoring of a CFLR project on NFS lands. Please list the partner organizations that provided in-kind contributions.

Service work accomplishment through goods-for services funding within a stewardship contract (for contracts awarded in FY19)	Totals
Total revised non-monetary credit limit for contracts awarded in FY19	$

Revised non-monetary credit limits should be the amount in contract's "Progress Report for Stewardship Credits, Integrated Resources Contracts or Agreements" in cell J46, the "Revised Non-Monetary Credit Limit," as of September 30. Additional information on the Progress Reports is available in CFLR Annual Report Instructions document. Information for contracts awarded prior to FY19 were captured in previous annual reports.

b. Please fill in the table describing leveraged funds in your landscape in FY2019. Leveraged funds refer to funds or in-kind services that help the project achieve proposed objectives but do not meet match qualifications.

(Optional) Additional narrative about leverage on the landscape if needed:

Founded in 2009, the Burney Hat Creek Community Forest and Watershed Group (BHCCFWG) is a community-based collaborative of citizens, businesses, organizations, governments, and landowners who share a vision for a sustainable future of our communities and the surrounding landscape. BHCCFWG is a collaborative land management effort dedicated to improving social, environmental, and economic conditions in the Burney Creek and Hat Creek Watersheds. The collaborative footprint encompasses 364,250 acres of public, private, and tribal lands, and the communities of Burney, Johnson Park, Hat Creek, Cassel, and Old Station. Fifty eight percent of this land is within the Lassen National

Forest. Another 29 percent is owned by large private forestland owners, seven percent by Lassen Volcanic National Park, and four percent by large ranches.

In recent decades, local communities have experienced high rates of unemployment and increased risk of high-severity wildfires, issues the collaborative actively works to mitigate. The group's vision is to create a fire-resilient forest ecosystem with sustainable populations of wildlife, fisheries and habitat, functioning and restored watersheds and water quality, protected cultural resources and appropriate recreational opportunities while also helping to support quality of life, jobs for diverse community members, and economic benefits in local communities. BHCCFWG receives federal support through the U.S. Forest Service's Collaborative Forested Landscape Restoration (CFLR) Program which augment available local resources to advance landscape-scale fuels reduction, forest health, and ecological restoration projects through coordinated public-private efforts.
As of 2017, the total population of Shasta County was 178,918. In the period 2010 – 2017, personal income and employment, including forestry, have been trending upward. The unemployment rate in Shasta County in the same period between 2010 and 2017 has gone from 16.8% to 5.8%, a decrease of 11%. Of this population, 18.1% are living in poverty - an increase of 1.6% since 2010; 10.9 % receive public assistance – an increase of 3.9% since 2010; and 32.2% of the population from 16 to 64 years did not work – an increase of 1.1% since 2010. As mentioned, personal income and employment are trending upward. The current average earnings per job in Shasta County is $51,612 and per capita income is $45,764. Average earnings per job is an indicator of the quality of local employment, while per capita is a measure of economic well-being.

The following projects were completed this year by partners and support overall project goals within the CFLR boundary with leveraged funds. Total leveraged funds for FY 2019, $233,748.

California Department of Forestry and Fire (CAL FIRE)

CAL FIRE treated approximately 65 acres of the Burney Community Fuel Break, Johnson Park Fuel Break, and the Bunchgrass repeater facility protection projects ($38,000).

CAL FIRE, in cooperation with private landowners and the California Conservation Corps, is expanding a 135-acre shaded fuel break west of the community of Burney, CA. Additionally, a shaded fuel break on the westside of Johnson Park, CA was completed. There are three phases of the Burney Community Fuel Break.

- Phase I is located on the east to southeast side Burney,
- Phase II is on the south and Southwest sides of Burney, and
- Phase III is located on the west side of Burney.

The Johnson Park Fuelbreak runs along the westside of the community, from the CAL FIRE station on the south to Rocky Ledge, on the northside of the town.

The CCC re-treated (cutting resprouts), piled, and burned approximately 25 acres in Burney Phase II, and finished the last 15 acres in Burney Phase III. Approximately 20 acres of piles were burned on the Johnston Park Fuel Break and five acres where cut and chipped in place around the Bunchgrass repeater site.

The treatments associated with all three projects consist of the reduction and/or rearrangement of vertical and horizontal fuels through the methods of hand-cutting, cut/haul offsite, cut/pile/chip, cut/pile/burn, and lop and scatter. The timber understory varies from 2-10' tall deer brush, manzanita, small conifers, oaks, and other brush species. Timber stand age varies greatly as a result of fire history in the area, and timber overstory ranges from approximately 60-year-old mixed conifer forests to 4-year-old pine plantations.

Additionally, CAL FIRE assisted the Burney Falls State Park with two prescribed burns.

CalTrout

In FY19, CalTrout worked with Lomakatsi Tribal crews doing weed management on the Lower Hat Creek Project, primarily to address an infestation of yellow star thistle ($15,000). Additionally, morphologic monitoring of this reach was completed by UC Davis Center for Watershed Sciences to quantify the effects of the large woody debris structures, which were installed in 2015 ($25,000).

California Central Valley Regional Water Quality Control Board

The California Central Valley Regional Water Quality Control Board continued joint work with the Forest Service to assess cattle grazing impacts on water quality and design a monitoring protocol to aid in future assessments ($950).

California Conservation Corps (CCC)

The Corps did hand-thinning and piling within the Big Lake Restoration and Enhancement Project ($30,434). The timing and extent of this work was coordinated with the population monitoring of the long-toed salamander being conducted by Washington State University and the USFS Pacific Southwest Research Station.

Fall River RCD (FRRCD)

The Fall River RCD continued developing an advanced bioenergy facility. It will provide an essential future outlet for federal and private forest health projects. To date, the Hat Creek Bioenergy facility is the leading candidate to be the first small scale (e.g. 3-5 Megawatt) facility built in California. The Hat Creek facility both signed a 20-year Power Purchase Agreement (PPA) and secured financing in FY19. It will utilize cutting-edge technology, combining gasification and traditional boilers to create heat and biochar. The RCD signed draft feedstock agreements and is anticipating that future USFS projects will assist with providing these materials (33,000 bone-dry tons/year) for many years. In addition, two more small-scale facilities within the Basins CFLR region completed their system impact studies in FY19, which will allow them to enter the BioMAT bidding process to secure future PPAs. The three facilities, if built, would require a total of nearly 100,000 BDT/year, corresponding to an average treatment acreage of 10,000 acres. Such facilities are essential to accommodate the increased pace and scale that the agency is striving to fulfill.

The Fall River RCD continued to lead the effort of the Burney Basin Fire Safe Council (FSC) in 2019. Regularly meetings were held to revise the Community Wildlife Prevention Plan, including prioritizing projects and seeking grant funds to implement them. Three high priority projects (Tamarack Road Fuel Break, Jackrabbit THP, and Crossroads) were funded through the RCDs CCI grant to Cal Fire. These three projects secured approximately 1.6M. In addition, the RCD secured funds through the Department of Conservation (DOC) Watershed Coordinator grant program ($200,000) to fully fund new programs being developed by the FSC. Finally, a Community Meeting for Fire Safety was help by the FSC in Burney where project partners (e.g. Forest Service, Cal Fire, UC Extension) presented information to the public.
Fall River RCD and Cascade Resource Consultants completed resource reports on the Crossroads Project on the Lassen National Forest, with a decision expected by the end of the year. Additional work on the project included redefining existing property lines and working on northern goshawk surveys. This work was funded by a Watershed Improvement Grant (Proposition 1) from the Sierra Nevada Conservancy, which was reported last year.

Photo 1 - Shasta College HELO Program

It was identified in collaborative discussions that a major barrier to get work done on the ground was a lack of qualified equipment operators, so funding was applied for through California Climate Investment (CCI) and $3,000,000 dollars was

awarded. With funding secured, in cooperation with Fall River Resource Conservation District, Shasta College has developed a forest and logging workforce training program to build capacity within the California's forest products industry. Students may complete the Shasta College Heavy Equipment Logging Operations (HELO) program.

Forestry Challenge

Photo 2 - Westwood High School Student Whitney Diaz

The Forestry Challenge is an academic event technical forestry and current forestry topics, designed for high school students. Participants spent four days in the forest learning about the ecology and management of the forested landscapes, which provide communities with water, recreational opportunities, wood products, and wildlife habitat. Youth benefit by better understanding the relationship of the forested environment to their community, by exposure to natural resource management as a potential career option, and by undertaking a rigorous critical thinking exercise.

Eighty-nine students from 14 Northern California high schools participated in the 2019 Shasta Forestry Challenge. The event was September 25 - 28 at Mountain Meadows Camp, east of Shingletown, California.

One of the highlights for the students was the opportunity to collect data on a 120-acre parcel of mixed conifer forest owned by Shasta Forests Timberlands and managed by W.M. Beaty & Associates. Using a computer program called *Visual Forester Professional* created by Alpine Land Information Services, students were able to visually model various management options and recommend a silvicultural prescription for the future. During the Challenge, teams of students also completed a field test to assess their technical forestry knowledge and data collecting skills.

"The Forestry Challenge is an amazing opportunity for student to learn about the field of forestry through hands-on experiences," said Westwood High School teacher Cassie Anderson. Elliott Hamann, a junior at Mt. Shasta High School, summed it up as follows: "I didn't realize how interesting and educational this experience was. It opened my eyes to what forestry is and how it is so important in keeping our forests healthy." Volunteers contributed 733 hours ($27,860).

Forestry Institute for Teachers (FIT)

The Forestry Institute for Teachers (FIT) is a free residential program offered to Kindergarten through 12th grade educators in California. FIT brings educators into an immersive, week-long field experience with topic-specific training about California's forest ecosystems, human use of natural resources and environmental education curriculum. The knowledge, skills and tools provided enable educators to effectively teach about forest ecology and forest resource management practices while adopting Next-Generation Science Standards (NGSS) through Project Learning Tree (PLT) and Project WILD. FIT curriculum and sessions are directed by teams of University of California Cooperative Extension (UCCE) Natural Resources/Forestry Advisors and highly qualified K-12 education professionals.

This year, 30 teachers from across the state participated in the Shasta FIT session located at an outdoor field camp located near Shingletown, CA. This location provides close access to a diversity of forest management activity including timber

harvesting, lumber manufacturing, wildfire restoration, and wildlife enhancement. Throughout the week, participants learned from Lassen National Forest, Lassen National Park, private industry, and environmental advocacy staff about the varied approaches to landscape management in California.

Fourteen volunteers invested 303 hours of their time instructing and working with the teachers to help the teachers learn about forestry and train them on curriculum to take back to their classrooms ($14,964). Participants completed the program by developing a curriculum module that further extends their understanding of forest resource management to students in their local communities.

Fruit Growers Supply Company (FGS)

Fruit Growers Supply Company Lands (FGS) in Shasta and Lassen County were sold to Sierra Pacific Industries (SPI) in the fall of 2019. FGS encompassed 21.2% of the Burney-Hat Creek Project area, or 78,173 acres, and was the second largest land owner in the project area behind the Forest Service (54.2% or 200,003 acres). With the acquisition of FGS lands, SPI is now the second largest land owner within the project area, with 27.7% of the project area or 102,329 acres.

As the sale of the FGS lands were pending, many projects within the project area were placed on hold. In FY19, FGS completed 800 acres of biomass thinning within the Fountain Fire Footprint, 300 acres within the Burney Fire Footprint and the area around the Burney Forest Products and Shasta Green facilities.

Additionally, they completed herbicide treatments within three fuel breaks (Goose Valley Road, west side of Johnson Park, and Cassel) ($15,950).

Great Shasta Rail Trail (GSRT)

GSRT volunteers continued planning work and submitting grant applications. The GSRT Association entered into a Challenge Cost Share Agreement with the Hat Creek Ranger District of the LNF to brush 10 miles of trail as well as construct two parking areas and associated kiosks. As part of the agreement, the Forest Service will complete storm erosion work near the Cayton Siding, including the replacement of culverts.

The volunteer crews installed 30 signs, cleaned out three culverts, and repaired drainage structures at the south end of the Lake Britton Bridge ($4,000).

Humboldt State University (HSU)

In FY19, the LNF entered into an agreement with HSU to monitor the effects of management activities on Baker cypress reproduction and vigor within the Basins Area in order to fill a crucial knowledge gap regarding the effects of management on this rare, fire-adapted species. This agreement will provide monitoring data that will be used by land managers to guide future management decisions for Baker cypress on the Lassen National Forest and beyond. This species is rare and currently threatened by fire regime changes. HSU will assess the effects of thinning and mastication treatments on forest structure and fuel loading in Baker cypress stands, as well as tree vigor and reproduction. Specific tasks will include: establishment of permanent monitoring plots, collection of data prior to and following treatment, analysis of monitoring data, and preparation and presentation of a final summary report that includes specific management recommendations for Baker cypress. HSU developed sampling protocols, finalized sampling locations, and completed pre-treatment data collection in approximately one third of the Baker cypress field plots. The remainder of the pretreatment sampling will occur in the spring of 2020, prior to implementation. A post-treatment sampling will take place in the summer of FY20 ($9,523).

Lassen Volcanic National Park (LVNP)

LVNP continued land-management activities on their portion of the Basins CFLR Area.

These included:

- Prescribed fire on 85 acres in the Northwest Gateway Project ($10,000). The fire was completed in late autumn FY19 and saw excellent consumption of understory fuels remaining from the thinning project that had occurred in 2013. Fire effects monitors analyzed data taken immediately post-fire ($3,000) that saw consumption rates of 85% in some areas, indicating a fire well within prescription.

- Treatment of 80 acres of weeds ($8,000). This included treatment of cheatgrass (*Bromus tectorum*), bull thistle (*Cirsium vulgare*), Himalayan blackberry (*Rubus armeniacus*), and mullein (*Verbascum thapsus*). Funding was partially provided by the California Exotic Plant Management Team, a regional NPS division.

Continuation of the restoration of the Summit Lake Campground, which is of outsize importance since it is at the head of the Hat Creek Watershed. FY19 saw 12 acres of treatment by American Conservation Experience crew, which completed the 21-acre project. FY19 work included the removal of over 600 small-diameter trees and associated slash, as well as the spreading of over 50 pounds of native seed in order to begin the process of restoring understory communities. ($32,000 in FY19). The prescription was designed to promote resiliency in this late seral forest by removing dead and down timber. ($63,000)

McArthur-Burney Falls State Park

Cascade Resource Consultants (CRC) was instrumental in coordinating with contractors and assisting parks staff with the reduction of fuels and merchantable timber on approximately 200 acres within the Ppark. The South Clark Creek Project was about to enter its 10th year, with no logging having occurred. During the fall of 2018, CRC along with NorCal Forest Resources, Inc. (NFR) and Parks staff, finally completed 117 acres of thinning along South Clark Creek. Because of this work, Parks and CAL FIRE were able to complete a 20-acre prescribed burn in October & November 2019. This was the first time in 14 years the Park was able to have a controlled burn, and thus represents a major achievement. CRC and NFR were also able to remove six acres of trees for a PG&E/Parks group camp site, which is now in construction.

During the late summer in 2019, 16 acres of dead trees, resulting from beetle kill, were cleaned up into several large piles to be burned this winter. This work cleaned up the jack-strawed downed trees and fuel load. (41,798)

Mule Deer Foundation (MDF)

Throughout FY19, the Mule Deer Foundation was able to complete layout and start implementation of the Manzanita Chutes project (North 49 EIS). Jefferson Resources was contracted utilizing MDF dollars ($25,000) and CFLR funds to layout, mark, cruise, and assist with quality control for over 1300 acres. Kevin Zeman (MDF) and other project management utilized ($15,000) in-kind match to travel, work with contractors, work with the LNF, and collaborate on the Manzanita Project. Finally, MDF was able to secure a contract with GTS Forestry to start work on the mastication. 220 acres were accomplished this season utilizing over ($20,000) of MDF match and ($123,440) of California Climate Investment dollars. In FY20, implementation within Manzanita Chutes will focus on plantation thinning and mastication.

Pacific Crest Trail Association (PCTA)

The PCTA cleared all 70 miles of the PCT within the Basins Area of debris and fallen trees/logs, as well as brushing back overgrown areas. The entire section is now maintained to standard. Volunteers contributed 443 hours ($11,259) doing trail maintenance, stocking of the 550-gallon water tank, and creating a positive recreational experience.

Pacific Gas and Electric (PG&E)

PG&E continues to remove drought-stricken trees and fuel from their infrastructure, where tree mortality continues from the drought (No Cost Estimate).

Sierra Institute for the Community and the Environment

The Sierra Institute continued to facilitate the Burney-Hat Creek Forest and Watershed Group meetings ($5,444) The facilitation agreement through a neutral party facilitates group meetings and provides unbiased guidance during decision-making processes that lead to meeting the vision and mission of the group. Benefits of meeting facilitation and by having a functioning collaborative group include: Planning and the NEPA process are barriers for accomplishing projects across the landscape. The collaborative process and assistance in designing these projects, makes them more defensible. Drought conditions and climate change continue to worsen, and the Forest continues to have a high occurrence of large destructive fires. Our projects are burning in these fires before work can be done. The Lassen National Forest is very short staffed; the collaborative group helps provide the needed expertise to assist with moving collaborative projects forward.

The Sierra Institute entered into a second agreement with the LNF in FY19 to complete the 10-year socio-economic monitoring report ($5,481). Socioeconomic monitoring is integral to the success of the Burney-Hat Creek Basins CFLRP Project. Monitoring is used to measure progress toward socioeconomic goals, objectives, and desired conditions, and to assess the impact of CFLRP projects on local community sustainability. Monitoring is also an essential tool for demonstrating and communicating successes, as well as identifying areas in need of improvement, to stakeholders involved in the collaborative process.

Sierra Pacific Industries

No Report

Spring Rivers Foundation (SRF)

Photo 3 - Fall River High School Advanced Biology Class

SRF continued youth initiative educational programs, including: taking the Fall River High School Advanced Biology Class on ecology field trips, providing a summer internship, as well as reintroduction activities and project monitoring for the Rock Creek Meadow Restoration Project ($60,000). The Spring Rivers Outdoor Education Program provided annual fall field trips to Crystal Lake, Baum Lake, and Hat Creek for all 4th, 5th, and 6th grade students at Burney and Fall River Elementary Schools ($10,000).

Symbiotic Restoration Group (SRG)

Symbiotic Restoration Group regularly participates in meetings as a voice for recreation and outreach strategies as well as partnering with local agencies, Resource Conservation Districts, and private consultants to drive forest health, watershed, and recreation projects forward. Currently, SRG is taking the lead on monitoring for CCI forest health projects, fulfilling the role of Watershed Coordinator for a Department of Conservation grant to promote fire safety and awareness in Burney, managing the websites of the Fall River Resource Conservation District (FFRCD) and Burney Fire Protect District, partnering with the LNF to develop interpretive signs, promoting recreation through the Chamber of Commerce and local bicycle association, assisting the FRRCD with NEPA compliance (including recreation and soils specialist reports), presenting Talk about Trees programs to local elementary schools, developing a master recreation strategy for

the region, caretaking 11 miles of the PCT from Baum Lake to Burney Falls, and adopting a section of highway 299, from Four Corners to Castle Road. ($60,000)

University of California, Davis (UCD)

An agreement is in place with UC Davis to conduct post-treatment effectiveness monitoring within the CFLRP. No activities were completed (or funds expended) in FY19, due to the timing of treatment implementation. It is anticipated that UC Davis will initiate their monitoring in 2020 or 2021.

University of Nevada Reno (UNR)

Lassen National Forest is a core collaborator on the Sierra Nevada Adaptive Management Experiment (AMEX), a statewide, replicated experiment developing resilience, resistance, and adaptation capacity in California's Sierra Nevada mixed conifer forests. Four sites have been installed at Latour State Demonstration Forest, Mountain Home Demonstration Forest, Berkeley Forest's Grouse Ridge, and Stanislaus - Tuolumne Experimental Forest. Led by the University of Nevada Reno, this collaboration with UC Cooperative Extension, Lassen National Forest, the California Department of Forestry and Fire Protection (CAL FIRE), and the USFS's PSW Research Station is designed to monitor and build strategies that mitigate impacts from climate change. Ongoing and predicted impacts to forests include: regeneration failures, shifts in species' ranges, drought mortality, and increasing severity of disturbances, such as bark beetle outbreaks and/or fire. This cooperative, interagency plan has deployed a range of silvicultural tools to reduce carbon loss and enhance ecosystem services in stressed mixed conifer forests.

The northern core site encompasses over 400 acres of treatment on Latour State Demonstration Forest with a paired 400-acre control on the North 49 Project of Lassen National Forest. Treatment monitoring and plot establishment was completed during the summer of 2018 and will be maintained to assess the effectiveness of the three resilience, resistance, and adaptation treatments under a changing climate. ($10,067)

Furthermore, hydrologic monitoring and analyses of three different silvicultural treatments in the former Panner Timber Sale continued ($17,700). A third graduate student began working on it and has been analyzing data in preparation for his master's thesis. Work has expanded to include the creation of a tree ring chronology for the site and investigations of root water uptake. A professional publication to be submitted to the Journal of Hydrology was prepared. The results so far have been both relevant and useful for forest management.

USFS Pacific Northwest Research Station (PNW)

PNW researchers worked with UNR and LNF personnel analyzing hydrologic monitoring data for the Panner Timber Sale ($9000). See the final paragraph of the UNR section for additional information.

USFS Pacific Southwest Research Station (PSW)

Additional data collection occurred in 11 experimental treatment plots established in 2017 to assess the effect of different salvage and reforestation strategies on ground fuels, understory species, and the survival and growth of planted and naturally occurring seedlings.

Monitoring of southern long-toed salamander population dynamics associated with the Big Lake Restoration and Enhancement Project continued. PSW researchers worked together with Washington State University on population analyses of the newly-designated Forest Service sensitive species Long-toed salamander ($6,480). An agreement was developed with to continue data collection through 2021 and complete data analysis.

US Geological Survey (USGS)

Efforts have begun in earnest to understand the hydrogeology of the Hat Creek Graben and northern margins of the Lassen Volcanic Center. Three different USGS divisions are now involved in this work: The Geology, Minerals, Energy,

and Geophysics Science Center, The California Volcano Observatory, and The Geosciences and Environmental Change Science Center. A master's student has begun working on coupled hydrogeologic and thermal models of the graben system ($70,000). Additionally, water quality monitoring at Big Spring and flow monitoring of Hat Creek near Old Station continued ($37,000).

Washington State University (WSU)

Washington State University continued to collect information on upland habitat use by Long-toed salamanders. To date, they have collected three years of pre-treatment data, as well as one year of post-treatment data in the Big Lake Restoration and Enhancement Project. Monitoring of Long-toed salamanders, a newly designated Forest Service sensitive species, continued and a master's thesis is being prepared. A graduate student spent much of the summer at Big Lake completing fieldwork and was periodically joined by a professor ($29,536).

Water Resources Institute of California State University San Bernardino (WRI)

Building on the hydrologic work of the three graduate student interns that they provided in 2017 and 2018, a fourth was provided to perform additional hydrology monitoring and analysis in the Basins Area ($4,500).

2. Please tell us about the CFLR **project's progress to date in restoring a more fire-adapted ecosystem as described in the project proposal**, and **how it has contributed to the wildland fire goals in the *10-Year Comprehensive Strategy Implementation Plan***.

FY2019 Overview

FY19 Activity Description (Agency performance measures)	**Acres**
Number of acres treated by prescribed fire	710 326 (KV/BD Funded)
Number of acres treated by mechanical thinning	2302
Number of acres of natural ignitions that are allowed to burn under strategies that result in desired conditions	0
Number of acres treated to restore fire-adapted ecosystems which are maintained in desired condition	3337
Number of acres mitigated to reduce fire risk	3337

Please provide a narrative overview of treatments completed in FY19, including data on whether your project has expanded the pace and/or scale of treatments over time, and if so, how you've accomplished that – what were the key enabling factors? **How was this area prioritized for treatment?**

In FY19, the highest priorities were: critical need areas for hazardous fuels reduction, projects in the wildland urban interface, and forest restoration. This included prescribed burning in the Old Station WUI, reestablishing the DFPZ in the Butte Creek Area, and treating previously untreated Goshawk PAC's within the Plum Forest Restoration Project. These fuels reduction projects are of significant importance to future fire suppression efforts.

- **Please tell us whether these treatments were in "high or very high wildfire hazard area from the "wildfire hazard potential map"**

The Basins Area is rated in the range of moderate to very high on the *wildfire hazard potential map*. FY19 projects were located in *high* to *very high* potential areas.

- **What have you learned about the interaction between treatment prioritization, scale, and cost reduction? What didn't work?**

  The most important lessons learned on the Hat Creek Ranger District regarding treatments, scale, and cost reduction have occurred on lands adjacent to the Basins Area but have since been applied to Basins project area. The 2014 Bald Fire and the 2008 Peterson Fire have shown an inverse correlation between acres treated and fire intensity, even under severe weather conditions.

  The Peterson Fire was caused by lightning on private land. It burned under 90th percentile weather conditions, spreading from untreated private land into an area of the Pittville DFPZ (Defendable Forest Protection Zone). The forest land had been previously thinned, had brush masticated, and was then underburned. Limited fire suppression resources were available but were nevertheless able to successfully contain the Peterson Fire within treated areas. The timber stands were able to survive with low to moderate severity effects. The untreated area experienced high mortality stand-replacing fire effects.

  In 2014 the Bald Fire was also ignited by lightning, just west of the Pittville DFPZ. This was during a severe drought and under 97th percentile weather conditions, it made large runs through untreated areas and into the Pittville DFPZ. The fire did burn through some previously treated areas with high intensity, stand-replacing fire. However, in many other treated areas, it burned at the expected low to moderate intensity, causing substantially less timber stand mortality. The reason why there were any higher severity burns in the DFPZ was that pockets of untreated fuels created enough heat and energy to cause major runs into treated areas before the fire behavior moderated. Furthermore, areas that experienced fire suppression proved to have considerably less tree mortality. As weather conditions improved, fire behavior effects decreased in the treated area, thereby producing favorable conditions for fire suppression efforts.

  The Pittville DFPZ Project consisted of two large timber sales. Eastside pine stands were thinned to 120 sq. ft. of basal area. Prescribed burning under the Pittville DFPZ Project, and now under its successor Eastside Pine Underburn Project, has a desired 5 to 10 year burn interval in the project units. This results in open pine stands with little understory pine litter. Please see the visuals section below for pre- and post-treatment photographs.

  Fire behavior during the Bald and Petersons Fires, under extreme 90 to 97 percentile weather conditions, demonstrated that managed, open-canopied pine stands can experience significantly less mortality than untreated ones. These opportunities directly assist with safer and more cost-effective fire suppression efforts. For additional information, see Kennedy et al. (2019)[1].

Please provide visuals if available, including maps of the landscape and hazardous fuels treatments completed, before and after photos, and/or graphics from fire regime restoration analysis completed locally. You may copy and paste these below or provide a link to a website with these visuals.

[1] Kennedy, M. C., M. C. Johnson, K. Fallon, and D. Mayer. 2019. How big is enough? Vegetation structure impacts effective fuel treatment width and forest resiliency. Ecosphere 10(2):e02573. 10.1002/ecs2.2573

Photo 4 - An untreated stand in the vicinity of the Pittville DFPZ, typical of those in the area. This stand later burned in the Peterson Fire (2008).

Photo 5 - A similar stand in the Pittville DFPZ post-implementation. Treatments took place been 2005-2007. It also burned in the Peterson Fire (2008), but with substantially less stand mortality.

Expenditures

Category	**$**
FY2019 Wildfire Preparedness[2]	$2,831,359
FY2019 Wildfire Suppression[3]	0
The cost of managing fires for resource benefit if appropriate (i.e. full suppression versus managing)	0
FY2019 Hazardous Fuels Treatment Costs (CFLN)	$770,511
FY2019 Hazardous Fuels Treatment Costs (other BLIs)	$293,482

How may the treatments that were implemented contribute to reducing fire costs? If you have seen a reduction in fire suppression costs over time, please include that here. ***For projects finishing their tenth year***, if you have any additional insights from your cumulative work over the course of the project please share those here as well.

At this time, the forest has not seen a reduction in large fire costs in the treatment area. The only large fire that occurred in the Basins Area was the Eiler Fire in 2014. It impacted both private and NFS lands and took place under drought conditions. In fact, it was the third large fire to occur over several days in the inter-mountain area. The fire did not enter any major areas that had been treated.

Have there been any assessments or reports conducted within your CFLRP landscape that provide information on cost reduction, cost avoidance, and/or other cost related data as it relates to fuels treatment and fires? If so, please summarize or provide links here:

[2] Include base salaries, training, and resource costs borne by the unit(s) that sponsors the CFLRP project. If costs are directly applicable to the project landscape, describe full costs. If costs are borne at the unit level(s), describe what proportions of the costs apply to the project landscape. This may be as simple as Total Costs X (Landscape Acres/Unit Acres).

[3] Include emergency fire suppression and BAER within the project landscape. Describe acres of fires contained and not contained by initial attack. Describe acres of resource benefits achieved by unplanned ignitions within the landscape. Where existing fuel treatments within the landscape are tested by wildfire, summary and reference the fuel treatment effectiveness report.

No

When a wildfire interacts with a previously treated area within the CFLR boundary:

If additional assessments have been completed since the FY2018 CFLRP annual report on fires within the CFLRP area, please note that and provide responses to the questions below. ***For projects finishing their tenth year****, if you have any additional insights from your cumulative work over the course of the project please share those here as well.*

Each unit is required to complete and submit a standard fuels treatment effectiveness monitoring (FTEM) entry in the FTEM database (see FSM 5140) when a wildfire occurs within or enters into a fuel treatment area. **For fuel treatment areas within the CFLR boundary, please copy/paste that entry here and respond to the following supplemental questions. Note that the intent of these questions is to understand progress as well as identify challenges and what didn't work as expected to promote learning and adaptation.**

- *Please describe if/how partners or community members engaged in the planning or implementation of the relevant fuel's treatment.*
- *Did treatments include coordinated efforts on other federal, tribal, state, private, etc. lands within or adjacent to the CFLR landscape?*
- *What resource values were you and your partners concerned with protecting or enhancing? Did the treatments help to address these value concerns?*
- *Did the treatments do what you expected them to do? Did they have the intended effect on fire behavior or outcomes? Please include a brief description.*
- *What is your key takeaway from this event – what would you have done differently? What elements will you continue to apply in the future?*
- *What didn't work as expected, and why? What was learned?*
- *Please include the costs of the treatments listed in the fuels treatment effectiveness report: how much CFLR/CFLN was spent? How much in other BLI's were spent? If cost estimates are not available, please note and briefly explain.*

There has not been a recent fire within the CFLR boundary that required a fuels treatment effectiveness monitoring.

When a wildfire occurs within the CFLR landscape on an area planned for treatment but not yet treated:

- Please include:
  - *Acres impacted and severity of impact*
  - *Brief description of the planned treatment for the area*
  - *Summary of next steps – will the project implement treatments elsewhere? Will they complete an assessment?*
  - *Description of collaborative involvement in determining next steps.*

Please include acres of fires contained and not contained by initial attack and acres of resource benefits achieved by unplanned ignitions within the landscape, and costs.

- Include expenses in wildfire preparedness and suppression, where relevant
- Include summary of BAER requests and authorized levels within the project landscape, where relevant

There have not been any large fires in areas planned for treatment.

The only fires that occurred within the Basins Area in 2019 were all under one acre. Two were man-caused and a third, the Crest Fire, was due to lightning. The 2019 fire season was slow, with no significant lightning storms.

3. **What assumptions were used in generating the numbers and/or percentages you plugged into the TREAT tool**?

All numbers and percentages plugged into the TREAT tool were based on actual dollars and volumes pulled from acquisitions and Timber Information Manager (TIM).

FY 2019 Jobs Supported/Maintained (FY19 CFLR/CFLN/ WO funding):

	Jobs (Full and Part-Time) (Direct)	Jobs (Full and Part-Time) (Total)	Labor Income (Direct)	Labor Income (Total)
Timber harvesting component	26	31	1,429,755	1,991,546
Forest and watershed restoration component	1	2	17,561	30,595
Mill processing component	13	30	783,138	1,878,908
Implementation and monitoring	10	13	464,200	562,460
Other Project Activities	0	0	8,148	11,839
TOTALS:	51	77	2,702,802	4,475,348

FY 2019 Jobs Supported/Maintained (FY19 CFLR/CFLN/ WO and matching funding):

FY 2019 Jobs Supported/Maintained	Jobs (Full and Part-Time) (Direct)	Jobs (Full and Part-Time) (Total)	Labor Income (Direct)	Labor Income (Total)
Timber harvesting component	26	31	1,429,755	1,991,546
Forest and watershed restoration component	1	2	16,487	27,968
Mill processing component	13	30	783,138	1,878,908
Implementation and monitoring	21	26	1,018,373	1,233,938
Other Project Activities	0	0	8,718	12,877
TOTALS:	62	90	3,256,471	5,145,238

4. **Describe other community benefits achieved and the methods used to gather information about these benefits**. **How has CFLR and related activities benefitted your community from a social and/or economic standpoint?**

Indicator	Brief Description of Impacts, Successes, and Challenges	Links to reports or other published materials (if available)
Project partnership Composition	The Burney-Hat Creek Community Forest and Watershed Group (BHCCFWG) is a very diverse collaboration of over 35 stakeholders, representing a wide range of interests. Ongoing meetings and communication among partners enable the collective advancement of triple bottom line objectives across the Basins Landscape to achieve sustainable social and ecological outcomes. The collaborative has a vision that involves not just improving the landscape, but also outcomes for communities	

Indicator	Brief Description of Impacts, Successes, and Challenges	Links to reports or other published materials (if available)
	and people on both public and private lands. Momentum has been increasing this year. The year began with the signing of the decision notice for the LNF Plum Project, and continued as several smaller projects were planned. It was our first opportunity to have one of our partners contract work on NFS lands through a master stewardship agreement. Together with Jefferson Resource Company, the Mule Deer Foundation prepared approximately 1,400 acres of commercial thinning and mastication within the Manzanita Chutes Plantations. Mastication work began in FY19 and thinning activities are scheduled to start spring 2020. We welcomed the increased involvement of Sierra Pacific Industries, who purchased Fruit Growers Supply Lands in both Shasta and Lassen Counties and is now the second largest land owner in the project area with 102,329 (27.7 percent). We look ford to working with them in a greater capacity. Multiparty monitoring continued to yield important results, which will both directly improve adaptive management of the Basins Landscape and allow more effective stewardship of lands throughout the West. This included a new collaborative effort with the Sierra Institute to add qualitative socioeconomic reporting based on interviews with key members of the community to the existing quantitative methodologies. Together, BHCCFWG is committed to increasing the pace and scale of treatments on not only National Forest Lands, but the entirety of both basins. (we also added new partners such as Shasta College, 34 North, and Spatial Informatics Group ☺)	
Relationship building/collaborative work	The Burney-Hat Creek Community Forest and Watershed Group believes that collaboration is the key to success, trusts the process of working together, and is committed to sustaining the Basins Project into the future. Together, we value the uniqueness of working on a landscape that is only 58 percent managed by the Forest Service, a trait not common among other forest	

Indicator	Brief Description of Impacts, Successes, and Challenges	Links to reports or other published materials (if available)
	collaboratives in California. The group is "finding its stride" as it identifies new projects with an expansive vision of not only managing on a true landscape-scale, but identifying and restoring the essential gaps which hinder the symbiotic functions of the ecosystem. During the life of the Burney-Hat Creek Basins Project, the novel idea of talking to each other and building relationships has led to the blossoming of important synergies. Examples of these include: • Utilizing Master stewardship agreements with the Fall River RCD and Mule Deer Foundation to Plan and implement projects within the Basins project area. A vision of the collaborative group which had not been used in the past within the Basins project area to help increase pace and scale has come to fruition in FY19. The Mule Deer Foundation has begun implementation on the Manzanita Chutes project and the Fall River RCD has successfully competed for and received both Sierra Nevada Conservancy dollars as well as California Climate Investment dollars. The Fall River RCD is also close to producing a signed NEPA document for the Crossroads project on NFS lands within the project area. • "What if" conversations on two existing projects, one between LNF and the USGS and another where LNF was utilizing WRI Interns generated an entirely new collaboration between LNF, the USGS, and Burney Falls State Park to analyze the properties of the falls and use them as a lens to understand the lower reaches of both basins.	
Cross-institutional Agreements.	The Lassen National Forest is completing a new landscape analysis of the Badger Planning Area, which was partially burned in the Reading Fire of 2012. This project was being developed at that time, but then approximately one-third of the area burnt. It was determined that additional	

Indicator	Brief Description of Impacts, Successes, and Challenges	Links to reports or other published materials (if available)
	disturbance would cause adverse cumulative watershed effects, so the project was put on hold for five years. Since it is adjacent to their jurisdiction, when restarting the project was discussed in the collaborative, Lassen Volcanic National Park indicated that they would like to partner with us on it. As we have moved forward together on the project, the State of California became interested in it as a vehicle to extend the Hwy 44 fuel reduction project (one of the State's 35 priority fuel reduction projects). Through the Badger Project, their treatments will continue to the community of Old Station, an additional 20 miles.	
Economic dependency/sectors impacted/expanding market development	The Fall River RCD's partnership with the Hat Creek Bioenergy facility, which will provide future outlets for federal and private forest health projects, secured financing in 2019. It is the leading candidate to be the first small scale (e.g. 3-5 Megawatt) facility built in California. Furthermore, a 20-year Power Purchase Agreement (PPA) with PG&E was signed. The proposed facility will integrate new technology, combining gasification and traditional boilers to create heat and biochar. The Hat Creek facility signed draft feedstock agreements and is anticipating that future USFS projects can assist with providing the necessary feedstock (ca. 33,000 bone-dry tons/year). In addition, two more small scale facilities within the CFLR region completed their System Impact Studies in 2019, which will allow them to enter the BioMAT bidding process to secure future PPAs. The three facilities, if built, would require a total of nearly 100,000 BDT/year, corresponding to an average treatment acreage of 10,000 acres.	
Job training opportunities	It was identified in collaborative discussions that a major barrier to get work done on the ground was a lack of qualified equipment operators, so funding was applied for through California Climate Investment (CCI) and 3,000,000 dollars were awarded. With funding secured, in cooperation with Fall River Resource Conservation District, Shasta College has developed a forest and logging workforce	

Indicator	Brief Description of Impacts, Successes, and Challenges	Links to reports or other published materials (if available)
	training program to build capacity within the California's forest products industry. Students may complete the Shasta College Heavy Equipment Logging Operations (HELO) certificate in as little as two semesters or may choose to add a stackable Heavy Equipment-Construction certificate and finish in three semesters. The HELO certificate program has demonstrated tremendous success in its initial implementation. Within weeks of receiving award notification, Shasta College procured an entire conventional logging side (skidder, processor, feller buncher, log loader), hired instructors and staff, signed MOUs and entered into partnerships with private landowner Sierra Pacific Industries and logging contractors Creekside Logging and Peterson Timber Inc. Curriculum was approved in time to enroll the first cohort of student operators to begin training in the equipment on active Sierra Pacific Industries Timber Harvest Plans (THPs) in the 2019 fall semester. With this first semester just now coming to a close, students graduating in December have already been hired by industry partners and will be transitioning to full time logging operations after graduation. This program has immediately begun increasing workforce capacity in forest management and fuels reduction projects. In addition to mechanized logging equipment training, Shasta College has included curriculum to provide this next generation of forest and logging operators a foundational understanding of how the operations they conduct on the forest impact the entire landscape. This knowledge results in operators demonstrating a fuller understanding of how sustainable forest management provides long term global, societal and community benefits. The innovation and technology integrated in today's modern logging equipment means safer and more ergonomic work environments with climate-controlled operator cabs, improved visibility and joystick-controlled machinery that appeals to today's emerging workforce and serves a more diverse student population.	

Indicator	Brief Description of Impacts, Successes, and Challenges	Links to reports or other published materials (if available)
	Today, more women are exploring careers in heavy equipment fields such as logging. Also, through partnership with community programs such as local job training centers and organizations serving formerly-incarcerated and justice-involved individuals, forest and logging career pathways are gaining awareness with those men and women finding themselves unemployed, underemployed and/or needing to upskill or retrain to grow their skillsets. Another key component of the Shasta College HELO certificate program is truck driver training. To complete the HELO certificate, students are required to pass the Class A/B truck driving course. Once students complete the class, they are prepared to take their Class A/B licensing test with the California Department of Motor Vehicles. It is incumbent on the student to schedule the actual DMV licensing exam, but the course curriculum provides each individual the training and behind-the-wheel time necessary to qualify for license testing. Additionally, students are able to use Shasta College trucks and trailers for their DMV exam. In the 2019 American Trucking Associations Truck Driver Shortage Analysis, there is a predicted 1.1 million driver deficit in the United States by 2028. When looking at workforce capacity in the forest sector, the entire logistics and supply chain must be taken into account. A trained and safe truck driving workforce is vital in keeping wood fiber moving from the forest to sawmills, value-added manufacturing, biomass utilization, and beyond. One exciting new opportunity for students is the Registered Apprenticeship for Logging and Forest Workers. Beginning no later than Spring 2021, during a student's final semester in the HELO certificate program, he/she may be eligible to participate in this new Registered Apprenticeship. The State of California Department of Industrial Relations Division of Apprenticeship Standards, through the California Apprenticeship Initiative, granted Shasta College $500,000 in October 2019 to establish a Registered Apprenticeship with a	

Indicator	Brief Description of Impacts, Successes, and Challenges	Links to reports or other published materials (if available)
	goal of placing 25 apprentices over 3 years with logging and forest industry companies. This direct channel into employment complements the instructional work being done and provides students ample opportunities to find work in this field. The Shasta College HELO program is gaining attention throughout the entire Western US. New industry partners such as Miller Timber Services out of Oregon have demonstrated interest in the program, its students and the opportunities to continue growing the scope of the workforce to be developed through strategic partnership and planning on a wider scale.	

5. Based on your project monitoring plan, **describe the multiparty monitoring process.**

Monitoring Summary

In FY19, the Burney-Hat Creek Basins Multiparty Monitoring Working Group (MMWG) expanded their efforts to include socioeconomic monitoring. The Sierra Institute for Community and Environment collaborated with the MMWG to develop monitoring objectives, indicators, and measures, as well as refining the socioeconomic areas of interest. Sixteen interviews were completed with local community members, including: contractors and forest-related business owners; agency personnel; local business owners; and government and non-profit community health and social service providers. A preliminary analysis of quantitative demographic data was also completed, which provided an opportunity to compare changes in socioeconomic indicators within the Basins Area, since the initial baseline assessment was completed in 2010.

Ecological monitoring activities continued and were focused on addressing a subset of key questions identified in the Multiparty Monitoring Plan (MMP). Monitoring was conducted by Lassen NF staff, researchers from the USFS Pacific Southwest Research Station (PSW) and Washington State University (WSU), Humboldt State University, University of Nevada Reno, and interns from the Water Resources Institute of the California State University System. Their accomplishments, as well as those of other collaborators, are summarized below. The link to the Monitoring Question (MQ) being addressed is provided in parentheses. Data collected from these efforts continue to play a key role in both project design and assessment of treatment effectiveness, thereby allowing true adaptive management to occur.

Fire and Fuels

In 2014, the Eiler Fire burned over 33,000 acres within the Basins Area. This presented an opportunity to monitor the effects of various post-fire restoration management activities (e.g. salvage logging, reforestation, etc.) on soil erosion, fuel loads, rare species, and the survival and growth of planted conifers.

In FY19, LNF ecologists, UC Davis field crews, and PSW researchers collected the third year of data in 11 experimental treatment plots that were established to assess the effect of different salvage and reforestation strategies on ground fuels, understory species, and the survival and growth of planted and naturally occurring seedlings (MQ RF.1.). A final year of data collection also occurred at the Burney Springs Meadow Complex to assess the effects of the Eiler Fire on native perennial bunchgrass species in grassland and chaparral plots (MQ EC1.4). To understand the effect of salvage logging on soil erosion potential, LNF staff analyzed the second year of data from logged and unlogged (e.g. leave islands) units

within the Eiler Fire to evaluate the percent cover of bare soil, vegetation, and woody debris following treatment. (MQ SOIL 1.3)

Humboldt State University researchers collaborated with the LNF to examine the impacts of thinning and mastication treatments on potential fire behavior and Baker cypress growth and reproduction (MQ BOT 1.3). Sampling protocols were developed and sampling locations within three treatment types (thinning only, thinning and mastication, and untreated control) were finalized. Pretreatment sampling was completed in one third of the plots in FY19 but delays in treatment implementation postponed further sampling. The remainder of the sampling will occur in the spring of 2020, prior to treatment implementation. Post-treatment sampling will occur later in the summer. In addition to this study, LNF botanists established 13 Baker cypress avoidance plots in the Cypress Plantation to assess the ability of masticator operators to detect and avoid Baker cypress saplings that co-occur with montane chaparral.

Meadow Restoration and Aquatic Resources

The Big Lake Restoration and Enhancement Project provides an excellent opportunity to determine how meadow restoration treatments, such as thinning and pond obliteration, affect wetland-associated plant species, meadow water availability, and important aquatic dependent species like the southern long-toed salamander (*Ambystoma macrodactylum sigillatum*).

In FY19, monitoring efforts focused on data collection, both before and after hand thinning treatments, which were implemented by the California Conservation Corps in 12 of the 16 treatment blocks in July and August. The third year of baseline hydrologic data was collected using 12 soil moisture meters and four piezometers distributed throughout the project area (MQ EC.1.3). Preliminary analysis of this hydrologic data, as well as vegetation plot data collected in 2016 and 2017, were completed.

Partners from PSW and Washington State University continued to collect information on upland habitat use of amphibians. This included completing 36 time-constrained searches of upland habitat as well as conducting 16 visual encounter surveys to monitor larval development within the lake. To assess the effects of forest thinning on amphibians, 16 control and 16 treatment plots were established in the forest edge around the lake and pitfall trap arrays (n=96) were installed within the plots. Monitoring of pitfall traps, for three summers prior to treatment as well as in August-October of 2019 following treatment, helped determine upland dispersal of both adult and newly metamorphosed amphibians after treatment. Burn piles were inspected and left to dry within each treatment plot. In October, three burn piles will be inspected for use by salamanders. In addition, upland habitat characteristics were measured within 128 habitat plots and will help to compare pre-treatment and post-treatment habitat conditions around the lake.

Hydrologic Resources

In FY19, the Water Resources Institute of the California State University System provided another intern to assist with monitoring of hydrologic resources in the CFLRP Project Area.

Working closely with LNF hydrology staff, as well as the Central Valley Water Board, water quality samples were analyzed to determine whether routine water quality parameters could be used to estimate Escherichia coli (E. coli) abundance in ambient stream waters (MQ HYD.2.1.). Despite numerous equipment losses and/or failures, hydrologic data collection also continued in the two Lost Creeks, Hat Creek, Twin Ponds, and Coyote Spring. LNF hydrologists continued their collaboration with the USGS to collect key baseline information for Hat Creek, including analyses of data from FY18 thermal flights to map in-channel spring locations, ongoing collection of water quantity data in stream gauges, and coupled hydrothermal modeling of the Hat Creek Graben (MQ HYD.2.2). Additionally, for the first time, photo monitoring data from Burney Falls was analyzed using photogrammetry to assess the total discharge at the base of the falls (which is ungauged during the winter months) and determine how much of that has come over the falls vs. out of springs midway down.

Furthermore, a collaborative group of researchers led by the University of Nevada Reno completed analysis of data collected over a six-year period at a monitoring site situated in the southwestern portion of the Basins CFLR Project Area. Treatments at this site were implemented in 2011 and ranged from no treatment in a spotted owl home range core area

(HRCA), to radial thinning with retention islands, to near-complete overstory removal in a group selection. Continuous hydrologic monitoring has occurred at this site since late 2013 and includes wireless-linked hydrologic monitoring stations measuring air temperature, humidity, solar radiation, wind speed, soil moisture and soil temperature as well as tree sap flux measurements. Results from this monitoring effort suggest that thinning treatments can preserve soil moisture longer into the summer (as compared to unthinned forest), thereby improving drought resilience and reducing tree mortality in certain soil types and slope conditions. Results from this study were submitted to a special issue on forest hydrology in the Journal of Hydrology (MQ HYD 1.1. and HYD 1.2.).

A third graduate student from the University of Nevada Reno joined the CFLRP monitoring effort in FY19. His work focuses on investigating changes in tree growth in response to thinning and will look at the isotopic differences in root water uptake and establish a tree ring chronology to discern how treatments have affected the resilience of trees to water stress (MQ FOR 1.2).

Botanical Resources

Baseline surveys for noxious weeds and threatened, endangered, and sensitive plants were conducted on approximately 40 acres within the Black Ranch Project Area. Surveys for Survey and Manage lichen species were conducted on 100 acres within the Crossroads Project.
A habitat assessment for the Survey and Manage lichen species *Dendriscocaulon intricatulum* was conducted within the Crossroads Project Area. Host tree and stand attribute data was collected at 28 occupied oak trees. Resulting data on habitat preferences was used to inform the proposed action for the Crossroads Project and added significantly to knowledge about this lichen species in this part of its range.

Wildlife

In FY19, LNF wildlife biologists revisited previously occupied wildlife sites, collected wildlife-related habitat data in pre-treatment monitoring plots, and conducted baseline wildlife surveys within the Basins Area.

Between April and September of 2019, eight cameras were deployed in the North 49 and Plum Project Areas to collect information on American marten (MQ WL.2.2). Two martens were detected throughout the survey period. To assess whether treatments within spotted owl Protected Activity Centers (PACs) creates, retains, or enhances key habitat features (MQ WL.1.1.), 760 acres of common stand exams within the PACs that may be proposed for treatment under the Badger Project were established. Plots will be resampled after treatment to measure changes in key wildlife habitat variables.

To collect baseline data, nighttime call stations were used to complete spotted owl surveys within approximately 6,690 acres of suitable habitat in the 49er and Rails to Trails Project Areas. Spotted owl PACs were also monitored in the Whittington, Badger, and Claim Jumper Project Areas. Although individuals were detected (e.g. one individual in the Whittington Project), no active nests were located. Four detections were made for the invasive barred owl and LNF biologists continue to monitor the dispersal of this species into areas within and outside of Northern spotted owl critical habitat, as well as within areas of the CFLRP occupied by the California spotted owl.

Surveys and broadcast acoustical stations were also used to conduct surveys for northern goshawk within approximately 7,960 acres in the 49er, Sluice Box, and Black Ranch Project Areas. Goshawk PACs were also monitored in the Whittington and Plum Project Areas and four active nests were found. A survey of 28 wetlands and lakes for sandhill cranes confirmed reproduction at four different sites and a total of 28 adults.

6. FY 2019 Agency performance measure accomplishments:

Performance Measure	Unit of measure	Total Units Accomplished	Total Treatment Cost ($) *(Contract Costs)*
Acres of forest vegetation established FOR-VEG-EST	Acres	381.1	
Acres of forest vegetation improved FOR-VEG-IMP	Acres	15.6	
Manage noxious weeds and invasive plants INVPLT-NXWD-FED-AC	Acre	10.5	
Highest priority acres treated for invasive terrestrial and aquatic species on NFS lands. INVSPE-TERR-FED-AC	Acres		
Acres of water or soil resources protected, maintained or improved to achieve desired watershed conditions. S&W-RSRC-IMP	Acres	1,453.8	
Acres of lake habitat restored or enhanced HBT-ENH-LAK	Acres		
Miles of stream habitat restored or enhanced HBT-ENH-STRM	Miles		
Acres of terrestrial habitat restored or enhanced HBT-ENH-TERR	Acres	1,336.4	
Acres of rangeland vegetation improved RG-VEG-IMP	Acres		
Miles of high clearance system roads receiving maintenance RD-HC-MAIN	Miles	.2	
Miles of passenger car system roads receiving maintenance RD-PC-MAINT	Miles	158.6	
Miles of road decommissioned RD-DECOM	Miles		
Miles of passenger car system roads improved RD-PC-IMP	Miles		
Miles of high clearance system road improved RD-HC-IMP	Miles		
Road Storage *While this isn't tracked in the USFS Agency database, please provide road storage miles completed if this work is in support of your CFLRP restoration strategy for tracking at the program level.*	Miles		
Number of stream crossings constructed or reconstructed to provide for aquatic organism passage STRM-CROS-MTG-STD	Number		
Miles of system trail maintained to standard TL-MAINT-STD	Miles	90.7	
Miles of system trail improved to standard TL-IMP-STD	Miles	0.2	
Miles of property line marked/maintained to standard LND-BL-MRK-MAINT	Miles		
Acres of forestlands treated using timber sales TMBR-SALES-TRT-AC	Acres	919.2	
Volume of Timber Harvested TMBR-VOL-HVST	CCF	14,632.6	
Volume of timber sold TMBR-VOL-SLD	CCF	2,284.9	
Green tons from small diameter and low value trees removed from NFS lands and made available for bio-energy production BIO-NRG	Green tons	1,761.9	Actual Grn. Tons 16,546.8
Acres of hazardous fuels treated outside the wildland/urban interface (WUI) to reduce the risk of catastrophic wildland fire FP-FUELS-NON-WUI	Acre	2,328.3	
Acres of wildland/urban interface (WUI) high priority hazardous fuels treated to reduce the risk of catastrophic wildland fire FP-FUELS-WUI	Acres	400.5	
Acres mitigated FP-FUELS-ALL-MIT-NFS	Acres		
Please also include the acres of prescribed fire accomplished	Acres		

Performance Measure	Unit of measure	Total Units Accomplished	Total Treatment Cost ($) *(Contract Costs)*
Number of priority acres treated annually for invasive species on Federal lands SP-INVSPE-FED-AC	Acres		
Number of priority acres treated annually for native pests on Federal lands SP-NATIVE-FED-AC	Acres		

Units accomplished should match the accomplishments recorded in the Databases of Record.

7. **FY 2019 accomplishment narrative**

Plum Restoration Project

The decision notice and finding of no significant impact for the Plum Restoration Project EA was signed in May 2019. It was designed from its earliest stages as a true landscape-level, ecological restoration project. Through it forest health will be improved and hazardous fuels reduced, as in most USFS projects, but watershed condition will recover as specific treatments were crafted for meadows, wetlands, and even vernal pool buffers. The goal is to increase resilience to disturbances across the entire landscape, with a special eye to shifts from a climate that will produce both long-term drying and increased volatility.

Between the signing and the end of FY19:

- Approximately 800 acres of service contract work was completed. This included: the removal of juniper trees and thinning of pine trees within areas of low sage and within vernal pool buffers as well as thinning and burn preparation within goshawk protected activity centers. The Hat Creek District has been developing and testing our burn prep contract for several years, with the objective of removing and piling ladder fuels, cutting and piling some brush, and light pruning and thinning of understory trees in order to meet objectives. Piled material is burned and followed by underburning.
- The first integrated resource project (Road Runner) was developed. Through it, approximately 4,300 acres of wildlife habitat, aspen, meadow, pine, mixed conifer, and shrub and mahogany areas will be restored. Building upon our success in FY19 using a master stewardship agreement with the Mule Deer Foundation for Manzanita Chutes, it is anticipated that Mule Deer will partner with others to accomplish this work.

Badger Restoration Project

Photo 6 - Badger Project Silviculture Training

Planning of the 33,500-acre Badger Restoration Project progressed with 216 stand exams plots in 35 stands being completed, and the landscape analysis well on its way. The interdisciplinary team met several times this past summer to work through potential desired outcomes.

The team applied for Sierra Nevada Conservancy grant funds under Proposition l and Proposition 68. Grant funding would be used to fund an interdisciplinary team leader, a writer/editor, and a record manager.

Timber Sales

Treatments under the Whittington EA are moving forward. Preparation activities were completed on the Baker Multiproduct Timber Sale, which will be contracted in early FY20. Its companion Whittington Timber Sale is being prepared by LNF for contracting later in the fiscal year. (Whittington EA)

Other activity included:

- Preparation - The Mule Deer foundation has prepared 1,100 acres of plantations within Manzanita Chutes (North 49 EIS) to be contracted as part of their Master Stewardship Agreement in FY20.

- Sold - One timber sale Table Mountain was sold within the Burney - Hat Creek Basins Project Area in FY19, for a total of 2,284 CCF.

- Implementation - Four timber sales operated in FY19, for a total of 16,546 green tons of biomass and 6,297 CCF of saw logs. These included: Sluice Box (North 49 EIS); Claim Jumper (North 49 EIS); North 49 (North 49 EIS) and Redlock Decks (Redlock EA). All sales that were operated on in FY19 were sold to and processed locally by companies in Shasta County, fulfilling an important goal of the collaborative.

Service Contracts

Service contracts were awarded on 2,291 acres for reforestation, thinning, mastication, burn preparation, and piling of hazardous fuels. In addition to the work on Plum mentioned above, reforestation activities continued within the Eiler Fire Perimeter and the timber sales associated with the North 49 EIS (see above). Burn preparation, which includes cutting and piling of ladder fuel and light thinning of the understory, occurred within the South Station Project. Piling of hazardous fuel occurred within the Panner Timber Sale Area. Matching CFLR funds for these activities included appropriated, reforestation, and Knutson-Vandenberg trust funds. Plantation stocking surveys were completed on 5,067 acres.

Agreements

We entered into several new agreements to work with different groups on a wide variety of projects and monitoring efforts. These included:

- Baker Cypress Monitoring (Humboldt State University);
- Snow and Hydrologic Monitoring (University of Nevada Reno);
- Big Lake Amphibian Monitoring (Pacific Southwest Research Station);
- Big Lake Hand Thin and Pile (California Conservation Corps);
- Burney-Hat Creek Collaboration Facilitation (Sierra Institute);
- Eiler Reforestation Monitoring (Pacific Southwest Research Station);
- Great Shasta Rail Trail (Great Shasta Rail Trail Association); and
- Panorama Point Reconstruction (California Department of Transportation).

We also funded work orders with Forest Service Enterprise to design wells and water systems at Proctor Creek to provide for more economical forest health activities and fire prevention and at Big Lake to provide an alternative water source to allow for wetland restoration, and provide timber sale preparation work on the 49er project (North 49 EIS).

Fire and Fuels

As a result of an above average winter snowfall and a wet spring that extended into June, both underburning and project work opportunities were limited. Nevertheless, the district was able to burn 1704 acres, which were a combination of both machine and hand piles. This was comprised of 323 acres in the Eastside Underburn Project and 189 in the Old Station WUI. The latter was the first entry of fire into previously thinned stands.

Contract layout was completed on 980 acres of several North 49 EIS timber sales on which harvesting has been completed. This includes Panner (500 acres), Claim Jumper (500 acres), and North 49 (480 acres).

Fire crews were able to support CFLR objectives by:

- Cutting out rails in the Thousand Lakes Wilderness Area. The above average winter snowpack and the presence of standing dead from the Eiler Fire, the number of dead trees across the trail was much higher than normal.
- Hand thinning and piling small plantations (2-3 acres each) in the North 49 project area.
- Hazard tree removal in campgrounds.
- Routine maintenance on Burney Springs water tank and the two lookouts within the Basins Area.
- Roadside thinning along the 18 road and Rocky Jewel Mine Road.
- Precommercial thinning and piling in Bear Wallow (North 49 EIS).
- In 2018, the district was able to purchase a chipper. Instead of hand piling, this has allowed slash to be chipped and thereby increase acres of treatment. In FY19, many piles created in FY18 were chipped, which allowed them to be taken care of even though burn days were limited.

Additionally, district fuels employees supported contracting efforts for burn preparation, machine piling, and mastication.

Forest Transportation System

LNF engineering crews completed surface maintenance and ditch cleaning on approximately 159 miles of roads; heavy maintenance of the road system within Manzanita Chutes (North 49 EIS) to allow for thinning and mastication activities; and maintenance and surfacing of roads within North 49 (North 49 EIS) and Sluice Box (North 49 EIS) projects.

Botany
Forest botany crews completed 11 acres of noxious and invasive weed removal. Nonnative, invasive plant species continue to pose a significant threat to native biodiversity.

8. **The WO (EDW) will use spatial data provided in the databases of record to estimate a treatment footprint for your review and verification**.

Fiscal Year	Footprint of Acres Treated (without counting an acre of treatment on the land in more than one treatment category)
FY 2019	4,730 acres
Estimated Cumulative Footprint of Acres (2010 or 2012 through 2019)	37,529

If you did not use the EDW estimate, please briefly describe how you arrived at the total number of footprint acres: what approach did you use to calculate the footprint?

9. **Describe any reasons that the FY 2019 annual report does not reflect your project proposal, previously reported planned accomplishments, or work plan**

As shared in previous reports, projects planned in the original proposal were delayed significantly by the need for salvage and reforestation activities on the 2012 Reading Fire, 2014 Eiler and Bald Fires, and a 2015 windthrow event. These increased the planning workload and required compressed timelines in order to complete work before economic value was lost. Reforestation of the Reading Fire is now complete, and since the land has been allowed to rest, thereby reducing the likelihood of adverse cumulative watershed effects, the Badger Restoration Project is now moving forward in part of its footprint.

Plantation failure on the Eiler Fire Scar, as a result of competing vegetation, has hampered reforestation efforts. Therefore, the collaborative decided that before investing funds in replanting, site preparation should include the use of herbicides. This has the advantage of also allowing noxious weeds to be controlled in the area. The Fall River RCD was successful in competing for implementation funds, and together with the district, is working on the necessary NEPA. Public Scoping for the project has been initiated with a final decision expected in October 2020.

Prescribed fire operations were hampered in FY19 as a result of both the furlough and an abnormally wet winter which limited burn days.

Attempts to hire additional staff using several different authorities yielded mixed results, as Forest Service wages in California have not kept up with those of other, related job opportunities.

10. *Project selected in 2012 and 2013 ONLY* - Planned FY 2020 Accomplishments

Performance Measure Code	**Unit of measure**	**Planned Accomplishment for 2020** (National Forest System)	***Planned Accomplishment on non-NFS lands within the CFLRP landscape[4]***
Acres of forest vegetation established FOR-VEG-EST	Acres	1265	Unknown
Manage noxious weeds and invasive plants INVPLT-NXWD-FED-AC	Acre	10	Unknown
Miles of stream habitat restored or enhanced HBT-ENH-STRM	Miles		Unknown
Acres of terrestrial habitat restored or enhanced HBT-ENH-TERR	Acres	1500	Unknown
Miles of road decommissioned RD-DECOM	Miles		Unknown
Miles of passenger car system roads improved RD-PC-IMP	Miles		Unknown
Miles of high clearance system road improved RD-HC-IMP	Miles	15	Unknown

[4] As we shift to more emphasis on sharing results across all lands within the CFLRP projects – if relevant for your project area – please provide estimates for planned work on non-NFS lands within the CFLRP areas for work that generally corresponds with the Agency performance measure to the left and supports the CFLRP landscape strategy. Give your best estimate at this point; if it's unknown how much work will occur off NFS lands, simply state unknown.

Performance Measure Code	Unit of measure	Planned Accomplishment for 2020 (National Forest System)	*Planned Accomplishment on non-NFS lands within the CFLRP landscape*[4]
Volume of timber sold TMBR-VOL-SLD	CCF	35,541	Unknown
Green tons from small diameter and low value trees removed from NFS lands and made available for bio-energy production BIO-NRG	Green tons	35,000	Unknown
Acres of hazardous fuels treated outside the wildland/urban interface (WUI) to reduce the risk of catastrophic wildland fire FP-FUELS-NON-WUI	Acre	2500	Unknown
Acres of wildland/urban interface (WUI) high priority hazardous fuels treated to reduce the risk of catastrophic wildland fire FP-FUELS-WUI	Acres	400	Unknown

Please include all relevant planned accomplishments, assuming that funding specified in the CFLRP project proposal for FY 2020 is available.

11. ***Project selected in 2012 and 2013 ONLY***

Planning

LNF and the collaborative are currently planning several projects, which are in different stages of development. These include:

Badger Restoration Project

Working to complete the landscape analysis and public scoping document, as well as to continue surveys. The goal of the 38,500-acre Badger Restoration to implement forest health and hazardous fuels reduction activities as well as improve watershed condition, which would increase landscape level resilience to disturbances including fire, insects, disease, and drought. The timeline for the Badger Project currently calls for the completion of the NEPA environmental planning document, which we believe at this point will be an environmental assessment, in the fall of 2021 or spring of 2022.

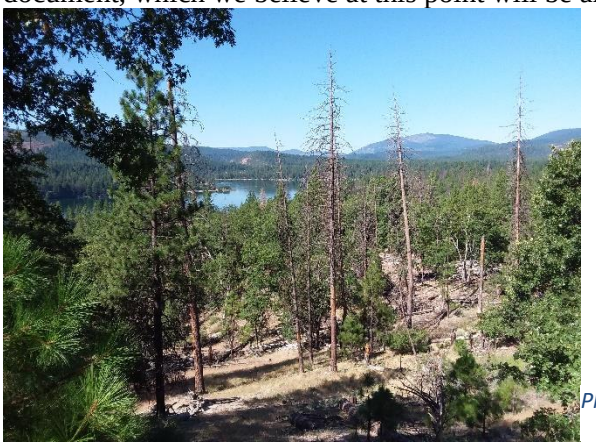

Photo 7 - Badger Project

Crossroads Project

Working to complete the decision memo for this HFRA 602 project in December 2019. The Crossroads Project is being completed in partnership with the Mule Deer Foundation and the Fall River RCD. Its goal is to achieve healthy and resilient landscapes and minimize the threat of natural disturbances such as fire around local communities. The Crossroads

Project would mitigate insect mortality in the forested stands, reduce fuel levels and increase fire resilience on approximately 2,646 acres within a Wildland Urban Interface (WUI) network close to the communities of Burney Johnson Park and Cassel.

Black Ranch Flood Plain Enhancement Project

Working to complete the decision memo for this project in the spring of 2020. The goal of the Black Ranch Project is to continue the enhancement effort on the NFS portion of the historic flood plain and address the issues caused by current and foreseeable periods of inundation and tree mortality.

Day Bench WUI Fuels Reduction

Working on completing a Supplemental Information Report (SIR) is to consider new information or changed circumstances associated with a second treatment of hazardous fuels on approximately 990 acres of National Forest system lands adjacent to private properties in the area known as Day Bench. The Day Bench Project is being worked on in partnership with the Lassen Fire Safe Council. The goal is to treat lands originally treated under the 2004 Day Bench Wildland Urban Intermix Fuel Reduction Project.

2014 Hat Creek Fire Restoration Project

This is a new partnership project with the Fall River RCD to help us successfully plant and replant the stands in the footprint of the Eiler and Bald fire areas.

Timber

Sales

Six timber projects are planned for FY20 – Baker Multiproduct Thin SBA (Whittington EA), Whittington Multiproduct Thin (Whittington EA), Eskimo Hill Settlement (Caltrans), Manzanita Chutes Multi-Product (under the MSA with the Mule Deer Foundation – North 49 EIS), Day Road Thinning (in conjunction with the Lassen Fire Safe Council – Day Bench EA/SIR), and Black Ranch (Black Ranch CE).

Additionally, ongoing timber sale operations within the Basins Area will continue in FY20 on timber sales within the North 49 and Table Mountain Project Areas. Most of the products harvested will continue to be processed locally in Shasta County, as both saw logs and bioenergy.

Service Contacts

In FY20, contracts will be awarded in the South Station, Plum, and North 49 Projects for a variety of work, including tree planting, mastication, burn prep, pre-commercial thinning, grapple piling, and meadow restoration.

Fire/Fuels

The Hat Creek Ranger District plans on accomplishing the following prescribed fire projects. All Accomplishments are depended upon both weather and air quality.

Underburning

Old Station WUI Project: continue burning in around the various sub-divisions in Old Station. This project has a narrow burn window because the wind direction is usually such that it will blow smoke on to Highway 44 and the community of Old Station, causing unacceptable air quality degradation. If windows are present, 200-300 acres are slated for burning.

Eastside Underburn Project: Many of the stands in this area have already had an entry with prescribed fire. Due to grass green up in the spring, burn windows are limited. Nevertheless, the plan is to burn 200-300 acres.

Machine Piles

There are over a 1,000 acres of machine piles in the Shooter and Panner Project Areas (North 49 EIS). These piles are a combination of site prep in groups and fuels reduction projects.

Hand Piles

The district currently has 200-300 acres of existing hand piles from various projects in the Basins Area.

Forest Transportation System

Roads within the Basins Area will continue to be improved by removing encroaching vegetation to allow for contract operations, and blading/surfacing where needed to resolve any drainage issues that arise which may impact watershed function.

12. **Please include an up to date list of the members of your collaborative if it has changed from previous years**.

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Sloat	Todd	Fall River RCD	trsloat8@gmail.com
Ladd	Trish	McArthur-Burney Falls SP	trish.ladd@parks.ca.gov

13. **Media recap**. Please share with us any hyperlinks to videos, newspaper articles, press releases, scholarly works, and photos of your project in the media that you have available. You are welcome to include links or to copy/paste.

https://www.adaptive-forest-management-experiment.com/

https://www.fallriverrcd.org/

http://forestrychallenge.org

https://www.forestryinstitute.org

Signatures:

Recommended by (Project Coordinator): Greg Mayer

Approved by (Forest Supervisor): Deb Bumpus

Draft reviewed by (collaborative chair or representative): Todd Sloat