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Forest Project, OR

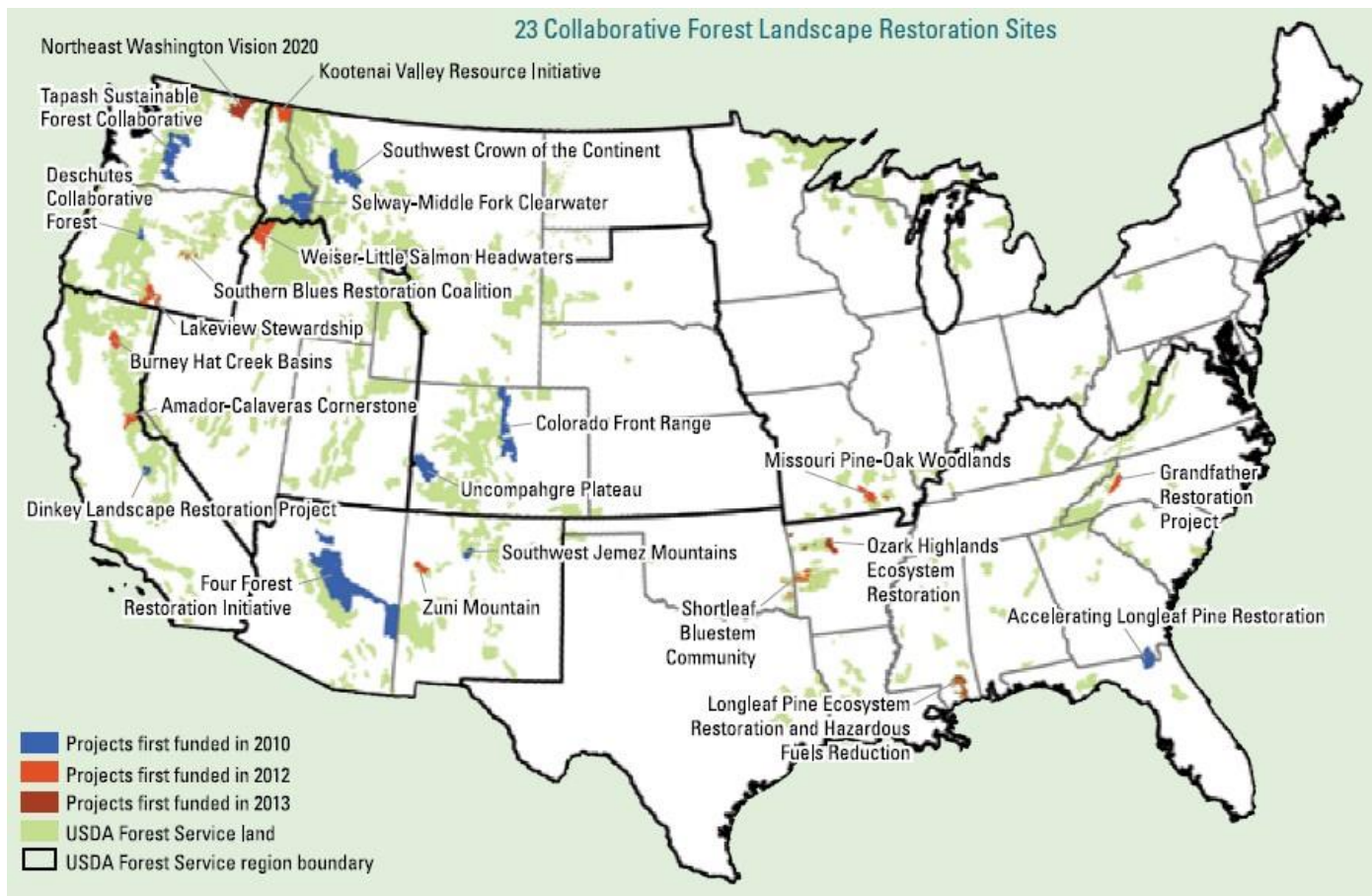
COLLABORATIVE FOREST LANDSCAPE RESTORATION PROGRAM: TEN YEARS OF RESULTS AND LESSONS LEARNED

A comprehensive
review of results and
lessons learned from
ten years of CFLRP
implementation

USDA Forest Service
Washington Office
CFLRP Staff

Introduction:

In 2019, the Collaborative Forest Landscape Restoration Program (CFLRP) celebrated ten years of Program implementation. Congress created the Collaborative Forest Landscape Restoration Program (CFLRP) in 2009 (P.L. 111-11) to enhance forest and watershed health, reduce risk from uncharacteristic wildfire, and benefit rural economies through collaborative, science-based approaches to forest management. All 23 CFLRP Projects were competitively selected to receive 10-year funding to restore landscapes ranging from 130,000 to 2,400,000 acres. These landscapes include a mix of ownerships and address cross-boundary needs, though CFLRP funds can only be spent on National Forest System lands.



As one of the first national efforts to encourage collaborative restoration at the landscape scale, CFLRP successes and challenges offer innovations and insights to inform restoration and shared stewardship on landscapes across the country. At this ten-year milestone, CFLRP staff and partners recognized an opportunity to identify the key lessons learned over the last ten years in order to share them both within and beyond the community of CFLRP practitioners.

To accomplish this learning review, CFLRP staff with the USDA Forest Service worked with practitioners and partners to identify the key questions to address about the program, and then reviewed the data and information available to address these questions. In doing so, important questions for additional investigation were also identified.

The purpose of this document is to describe the key results and lessons learned from the first ten years of CFLRP, identify areas for further inquiry, and provide links and references for where people can learn more. The intended audiences is collaborative restoration practitioners, researchers, and decision-makers. For a short summary of key results, see the [Collaborative Forest Landscape Restoration Program 10-year Report to Congress](#).

CFLRP: Ten Years of Results and Lessons Learned

This document is organized around six learning themes:

- Restoration of Priority Landscapes
- Wildfire Risk Reduction
- Community Socioeconomic Benefits
- Science-Based Restoration and Multi-Party Monitoring
- The Collaborative Approach
- Leveraging Resources

Each theme, or section of the report, includes Lessons Learned, Where to Learn More and Next Steps. The Lessons Learned of each section are organized around key questions, and you can navigate to the question that interests you using the Navigation Pane or linked questions at the beginning of each section.

Over its ten years, CFLRP has benefitted immensely from a network of researchers, academics, and partners who have completed analyses and evaluations of the Program. This document builds on that body of knowledge with information and data primarily collected and utilized by the USDA Forest Service. Readers are encouraged to visit the [CFLRP Resource Library](#) to access examples of this broader work.

The creation of this document was a collaborative effort, involving input and feedback from dozens of USDA Forest Service staff and partners. We are indebted to everyone who provided information, data, and stories about their CFLRP experiences over the years. The lead authors from the USDA Forest Service were charged with coordinating feedback and authoring the sections: Sarah Anderson (Ecologist, Washington Office, Forest Management, Range Management, and Vegetation Ecology), Lindsay Buchanan (CFLRP Coordinator, Washington Office, Forest Management, Range Management, and Vegetation Ecology), Tom DeMeo (Ecologist, Pacific Northwest, Natural Resources), Karen Dante-Wood (Formerly National Climate Change Coordinator, Washington Office, Office of Sustainability and Climate), and Jessica Robertson (Integrated Restoration Coordinator, Washington Office, Forest Management, Range Management, and Vegetation Ecology).

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Achieved Restoration of Priority Landscapes

The unique elements of the CFLR Program provide lessons learned for related programs and the agency when it comes to moving forward on ecological restoration at landscape scales.

The long-term funding provided by CFLRP is key to facilitating many aspects of the Program's success. It clearly communicates the agency's intentions and goals for a given landscape; it allows the Projects to invest in the necessary relationship and collaborative building; and it better matches the length of time that it takes to do large-scale restoration work.

Ecological challenges will only be solved when the scope of the solutions matches the scale of the problem. CFLRP Projects scale up restoration work and provide instances where the problem and the solution are now aligned in scope and extent. In other locations, it reveals how much more work may be needed to fully restore a given landscape. The need to understand the outcomes of the work accomplished by CFLRP highlights the importance and significance of the monitoring requirements in CFLRP legislation. Determining the effect of restoration work through monitoring will be the only way to determine if/when enough has been done, and CFLRP, at the very least, is getting closer to that goal.

The flexibility within CFLRP has been critical to its success across the country. The 23 Projects capture an array of ecosystems, communities, and socio-ecological contexts that diverge in their strengths, weaknesses, needs, and resources. Emphasizing the local context facilitates the engagement and ownership of the collaboratives in restoring ecosystems on public lands. Summarizing and synthesizing results across Projects becomes a challenge, and future work might find ways to maintain the local ownership while creating an element of standardization across new projects.

This section details the accomplishments of the first 10 years of CFLRPs, not only specific accomplishment measures, but an evaluation of how treatments were integrated, whether the appropriate scale was chosen, how planning was done, and other concerns detailing ecological outcomes.

The section is organized into Lessons Learned, Where to Learn More, and the Next Steps. A hyperlink to the subsections, and parts within each subsection, is provided here for easy reference.

- The [Lessons Learned](#) subsection addresses the following questions:
 - [What did the projects accomplish?](#)
 - [How we can better connect with the measures and metrics local collaboratives and partners are interested in and/or may already be measuring, and what do we know about the outcomes to date?](#)
 - [How were treatments integrated?](#)
 - [What were the benefits of integration?](#)
 - [What are the key challenges and limitations?](#)
 - [Was work completed at the appropriate scale to have the desired impact?](#)
 - [What did we learn about the scale of treatments needed?](#)
 - [Were CFLRP projects able to identify the desired conditions relative to what a functionally restored landscape looks like \(e.g. composition, function, structure, & scale\) as well as what types of indicators may have been most helpful to inform the monitoring to evaluate the attainment of those desired conditions?](#)
 - [What did we learn about gaining efficiencies \(or not\) by working at larger scales?](#)
 - [How did projects approach project planning?](#)
 - [What are the best practices of planning and implementing at a landscape scale?](#)
 - [What role do new and improved tools and approaches for assessment play in setting priorities and measuring progress for ecological outcomes?](#)
 - [What implementation tools and techniques were tried and how did they work?](#)
 - [What are common implementation barriers and challenges?](#)

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- [Where to Learn More:](#)
 - [Project Accomplishments](#)
 - [Restoration Outcomes](#)
 - [Integration](#)
 - [Challenges and Limitations to Landscape-scale Restoration](#)
 - [Scale of Restoration Work](#)
 - [Best Practices for Landscape-scale Restoration](#)
 - [Implementation Tools and Techniques](#)
 - [Approaches to Assessment and Tracking Progress](#)
- The [Next Steps](#) subsection gives a brief overview of how this information will be used moving forward
 - [NEPA Aspects of CFLRP Projects](#)
 - [Ecological Outcomes](#)
 - [Scale of Restoration Work](#)
 - [Assessment and Tracking Progress](#)

Lessons Learned

What did the projects accomplish?

How many acres/miles/etc. were treated?

In the first 10 years of the Program, the CFLRP Projects accomplished a significant amount of agency work and improved ecosystems across 5.7 million acres, an area larger than New Jersey. Between FY 2013 and FY 2019, CFLRP Projects comprised 11% of the National Forest System (NFS) treatable acreage and 8% of restoration-related spending while they accomplished 19% of the agency's total hazardous fuels treatments, 15% of the timber volume sold, 15% of terrestrial wildlife habitat enhanced, and 26% of vegetation improved.

Accomplishments are tracked through CFLRP reporting (Annual Reports and the 5-year Ecological Indicator Reports) as well as through standard agency reporting mechanisms and databases (e.g., Forest Service Activity Tracking System, FACTS): <https://www.fs.fed.us/restoration/CFLRP/guidance.shtml>

From CFLRP Annual Reports (available here: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>), several questions provide insight into the accomplishments of the individual CFLRP Projects:

- Question 2 reports on the restoration of fire-adapted ecosystems (a compiled file is available upon request),
- Question 6 reports on agency performance measures (a compiled file is available upon request), and
- Question 8 requires projects to verify the spatial footprint of the management activities accomplished. This provides insight into how big of an area was affected opposed to the individual management actions which can overlap and therefore may not represent the area affected when simply added together.

Example of accomplishment data summarized from all CFLRP Projects for Question 2 of the Annual Reports:

Reported Measure	Acres Accomplished
Acres mitigated to reduce fire risk	363,412
Acres of natural ignitions that are allowed to burn under strategies that result in desired conditions	21,118
Acres treated by fuel rearrangement, pruning, crushing, piling, and chipping	8,603
Acres treated by mechanical thinning	105,248
Acres treated by prescribed fire	338,081
Acres treated to restore fire-adapted ecosystems which are maintained in desired condition	313,532

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Example of data summarized from all CFLRP Projects for Question 6 of the Annual Reports

Accomplishment Measure	Accomplishment Name	Accomplished Units	Unit of Accomplishment
BIO-NRG	Biomass for bioenergy	3,145,930	Green tons
FOR-VEG-EST	Forest vegetation established	198,386	Acres
FOR-VEG-IMP	Forest vegetation improved	493,783	Acres
FP-FUELS-ALL	Treated to reduce the risk of catastrophic wildfire	450,236	Acres
FP-FUELS-NON-WUI	Fuels treatments in non-WUI areas	1,136,435	Acres
FP-FUELS-WUI	Fuels treatments in WUI areas	2,071,865	Acres
HBT-ENH-LAK	Lake habitat restored or enhanced	15,391	Acres
HBT-ENH-STRM	Stream habitat restored or enhanced	1,246	Miles
HBT-ENH-TERR	Terrestrial habitat restored or enhanced	3,022,111	Acres
INVPLT-NXWD-FED-AC	Invasive Plant Treatments on NFS lands	144,400	Acres
RD-DECOM	Miles of decommissioned roads, both authorized and unauthorized	456	Miles
RD-DECOM-NON-SYS	Miles of unauthorized roads decommissioned	263	Miles
RD-DECOM-SYS	Miles of authorized roads decommissioned	90	Miles
RD-HC-CNSTR	Miles of high-clearance road constructed	4	Miles
RD-HC-IMP	Miles of high-clearance road improved	640	Miles
RD-HC-MAIN	Miles of high-clearance road maintained	8545	Miles
RD-HC-RCNSTR	Miles of high-clearance road improved (not including new construction)	1066	Miles
RD-PC-IMP	Miles of passenger car system roads improved	616	Miles
RD-PC-MAIN	Passenger Car Roads System Maintained	11,831	Miles
RD-PC-RCNSTR	Miles of passenger car system roads improved (not new construction)	939	Miles
RG-VEG-IMP	Rangeland vegetation improved	333,615	Acres
S&W-RSRC-IMP	Water or soil resources protected, maintained, or improved	540,619	Acres
SP-NATIVE-FED-AC	Treated for native pests	276	Acres
STRM-CROS-MITG-STD	Road/stream crossings constructed, reconstructed, or removed to allow the passage of aquatic organisms	96.5	Number

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STWD-CNTRCT-AGR-AC	Areas covered by stewardship contracts or agreements	187,051	Acres
TL-IMP-STD	NFS trails improved	886	Miles
TL-MAINT-STD	NFS trails maintained	16,715	Miles
TMBR-BRSH-DSPSL	Harvest-related woody fuels treated	31,908	Acres
TMBR-SALES-TRT-AC	Forestlands treated using timber sales	235,599	Acres
TMBR-VOL-HVST	Timber volume harvested	1,043,468	Acres
TMBR-VOL-SLD	Timber volume sold	5,761,438	CCF

How we can better connect with the measures and metrics local collaboratives and partners are interested in and/or may already be measuring, and what do we know about the outcomes to date?

Each CFLRP Project developed and implemented their own monitoring questions and approaches to address key areas of concern in terms of outcomes achieved. The information available nationally to the CFLR Program regarding ecological outcomes is available in two tiers of reporting and a pilot project:

- Aggregated information captured in the Ecological Indicator Reports
- Individual CFLRP project monitoring reports
- Wildfire Risk Index pilot completed on 5 national forests and discussed in more detail in the Wildfire Risk section

Work remains to more effectively connect national indicators and reporting with locally relevant and valued monitoring questions and efforts. See the Science-Based Approach section for more on this.

Ecological Indicator Reports

The Ecological Indicator reports provide one measure of the ecological outcomes to date. Within their ecological indicator reports, each CFLRP Project collaborative defined its own objectives and desired conditions to fit the needs of the landscape. The ecosystems where Projects are located vary greatly in restoration needs, fire regimes, species composition, and management objectives, necessitating a local approach. Each collaborative selected ecological indicators to track progress related to fire regimes, fish and wildlife habitat, invasive species, and watershed condition. Generally, more progress towards desired conditions occurred at the project-scale than at the landscape-scale.

Commonly selected desired conditions included:

- **Fire Regime:** reduce wildfire risk; reestablish natural fire regimes; move landscapes towards historical or natural range of variability; increase use of prescribed fire
- **Habitat:** reestablish appropriate forest structure, tree density, & species composition; increase plant diversity & protections for sensitive ecosystems; increase stream habitat complexity and connectivity including aquatic organism passage
- **Invasives:** stabilize, reduce, prevent, and accurately map/inventory invasive species
- **Watershed Condition:** roads and trails (e.g. reduce density, improved maintenance) improve water quality; improve stream and riparian habitat; reduce sediment levels

Overall, the CFLRP Projects report progress towards their objectives. Over 80% of the Projects are achieving their objectives for fire regimes, over 95% for fish and wildlife habitat, over 56% for invasive species, and 85% for watershed condition. The record of monitoring at the landscape scale was mixed. A study by Esch and Waltz (2019) indicated a need to improve landscape metrics, capacity, and training in this area. See the Science-Based Approach section for more on this.

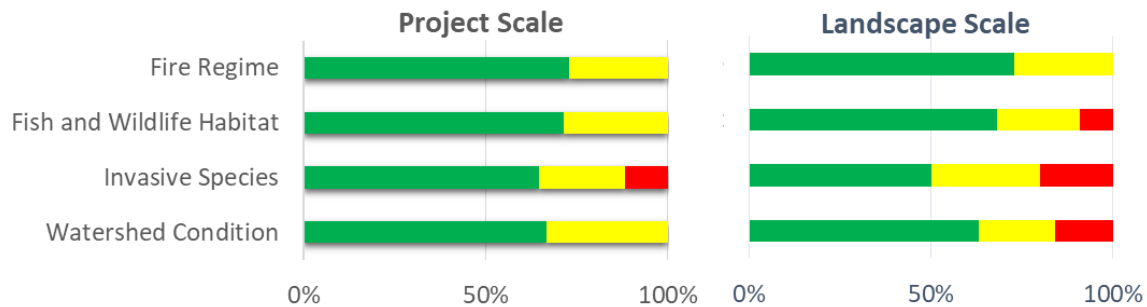


Figure: To assess progress, the CFLRP Projects used a “Green-Yellow-Red” rating representing progress on more (green) to less (red) of the landscape at both the project and landscape scales. Ratings are based on Project-specific indicators and track progress towards objectives and desired conditions.

Understanding outcomes must be done within the local context. Outcomes look different based on desired conditions which are determined by the Projects and their collaborates and by which ecological indicators were selected to emphasize and in what ways. The CFLRP Projects’ Ecological Indicator reports provide insight into how outcomes are being determined and tracked. There are also [various studies and reports](#) providing insight into measuring these outcomes, although this level of investigation is not consistent across all 23 Projects.

Qualitatively, ecological outcomes can be understood through prior surveys of CFLRP Project staff, collaboratives, and participants. These perspectives bring in local knowledge and understanding, in addition to documenting difficult to measure changes taking place within these landscapes. The Strategies for Success Under Forest Service Restoration Authorities found that 80% of CFLRP participants agree that treatments have reduced the threat of fire and improved ecological conditions (https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf). A recent 2020 survey conducted by the National Forest Foundation (NFF) of Forest Service personnel and partners found that:

- 86% of respondents agreed that CFLRP Projects are improving ecosystem resilience,
- 81% agreed that more restoration is happening on the ground as a result of CFLRP, and
- 87% agreed that CFLRP treatments align with their project objectives.

Surveys such as these provide insight into what the communities are observing and how they understand the changes taking place on the landscapes they use.

How were treatments integrated?

What were the benefits of integration?

The integrated restoration accomplished by the 23 Projects provides multiple uses and benefits. Nearly all treatments and management activities implemented were selected and accomplished for multiple purposes. For example, hazardous fuel treatments were done to protect wildlife habitat and water supply areas as well as restore more ecologically appropriate fire regimes, increase forest health and resiliency, and reduce opportunities for non-native plant invasions. One outcome of this integrated work was that across the 23 Projects, habitat was improved for 70+ species of animals and plants, 18 of which are threatened or endangered.

Integration is a key part of what allows CFLRP to centralize resources and subsequently scale restoration work to a broader level. Between FY 2013 and FY 2019, CFLRP Projects comprised 11% of the NFS treatable acreage and 9% of restoration-related spending while they accomplished 19% of the agency’s total hazardous fuels treatments, 15% of the timber volume sold, 15% of terrestrial wildlife habitat enhanced, and 26% of vegetation improved.

- Respondent to National Forest Foundation (NFF) 2020 Survey:
 - *CFLRP has advanced our ecosystem restoration head and shoulders beyond where it would have been otherwise.*

To our knowledge there is not a systematic review of all CFLRP projects looking at the level of integration in their projects, and most information relies on Project-level annual reporting, surveys, and site visit reports. As noted above, the range of accomplishments also speaks to integration.

Narratives from the Annual Reports (<https://www.fs.fed.us/restoration/CFLRP/results.shtml>) and WO CFLRP site visits provide insight into the integration of the restoration work across resource areas.

- Example from the Ozark Highlands Ecosystem Restoration 2019 Annual Report project:
 - *Prescribed burning improves the overall condition of the national forest for species that need a grass understory. We do all of our prescribed burning not just for fuel reduction but also to improve wildlife habitat conditions...establish and maintain native grass fields...create woodland conditions across the landscape...restore our native flowering plants that are utilized by native pollinators...creates and maintains foraging areas for threatened and endangered bat species, such as, the Indiana, gray, and northern long-eared bats.*
- Excerpt from 2016-2018 Site Visits Report (<https://www.fs.fed.us/restoration/documents/cflrp/SiteVisit/CFLRP-2016-2018-USFS-ProjectSiteVisits.pdf>):
 - *Achieving Multiple Restoration Objectives. Ecological restoration focuses on reestablishing the composition, structure, pattern, and ecological processes necessary to facilitate terrestrial and aquatic ecosystems sustainability, resilience, and health under current and future conditions...This involves addressing many different needs, from establishing a forest structure that will reduce catastrophic wildfire risk and allow for the reintroduction of natural fire regimes to restoring the vegetative structure, composition, and pattern needed to sustain diverse wildlife habitat at multiple scales.*

What are the key challenges and limitations?

Landscape-scale changes take time and investment. The CFLRP is a relatively new approach in scaling restoration work to the landscape level, leading to lessons learned, changes in process, and adaptation to unanticipated events while significantly improving ecological condition. The biggest challenge when it comes to achieving ecological outcomes seems to be the scope of the environmental problems facing the ecosystems managed by the Forest Service that stretch across into neighboring jurisdictions, and the myriad complexities that result from working at large, landscape scales with broad project scopes (e.g. making trade-offs at landscape scale, priority setting across jurisdictions).

- From the 2016-2018 Site Visits Report
 - *While many CFLRP projects are working at larger scales than what occurred in the past, project teams recognize the need to expand work at the landscape scale to address landscape-scale problems.*

The scale of the problems and of the restoration work often presented challenges for monitoring.

- Example from the Amador-Calaveras Cornerstone project 2019 Annual Report:
 - *Monitoring tools often used for watershed assessment...are typically not sensitive to changes across the watershed particularly when our treatments affected a small percentage of the watershed.*

Overall, the CFLRP Projects did adapt and make changes over the course of the 8-10 years of funding. Fourteen Projects modified their programs of work for various, appropriate reasons including:

- Shift project boundaries to better capture the area impacted by restoration work,
- Adjust timeframes and goals to match landscape-scale change processes,
- Change metrics to better reflect actual accomplishments, and
- Incorporate new information and technology.

Unanticipated developments arose for all but one CFLRP project according to the 2019 Ecological Indicator Reports.

- Natural phenomena were common and included wildfires (13 projects), flooding (2 projects), tree mortality events (2 projects), and hurricanes (2 projects).

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- Wildfires created positive outcomes such as restoring fire regimes and improved habitat as well as negative outcomes such as impaired habitat for certain species, increased presence of invasive species, damaged soils, and halted timber sales.
 - From the Tapash Sustainable Forest Collaborative, 2019 Ecological Indicator Report:
 - *Fires improved conditions for several woodpecker species and improved forage for elk and deer at a landscape scale*
 - From the Burney Hat Creek Basins Project, 2019 Ecological Indicator Report:
 - *In addition to the direct effects of these large wildfires, these events also reduced our ability to implement proactive restoration projects focused on improvement of existing wildlife habitat by redirecting agency efforts toward post-fire rehabilitation and recovery.*
- Other challenges included:
 - litigation and delays in the environmental review process,
 - new occurrences or faster spread of invasive species,
 - monitoring not matching the scale of work,
 - meeting burn windows, and
 - lack of qualified, consistently available contractors and workforce.
- Positive developments also occurred such as additional partner funding and new partners joining a collaborative and volunteering to assist in getting work accomplished.
 - From the Cornerstone Project, 2019 Ecological Indicator Report:
 - *Outside funding sources accelerated program goals. For example, in 2012 a local partner received a substantial grant...resulting in fast-track implementation of the restoration project.*

Despite unexpected developments and challenges, the 23 CFLRP projects have improved ecological conditions on 5.7 million acres in conjunction with partners across the country.

Was work completed at the appropriate scale to have the desired impact?

What did we learn about the scale of treatments needed?

The need to work at a broader scale is driven by the broad-scale risks, hazards, and problems facing the ecosystems managed by the Forest Service and partners on adjacent lands. The CFLRP is helping individual Projects to scale up their work to address larger landscapes than they have done before, and it has yet to reach the scale of the problem in some locations.

Time is a critical element here, and although CFLRP Projects are longer than standard agency projects, 10 years is still short on ecological time scales and represents a quick time frame in which to fundamentally change an ecosystem. While many CFLRP projects are working at larger scales (temporally and spatially) than what occurred in the past, project teams recognize the need to expand work at the landscape scale to address landscape-scale problems¹.

- From respondent to the 2020 National Forest Foundation Survey:
 - *We're making a difference and we're doing a little more than keeping pace with the ever-changing forest, slowly transitioning it to a more resilient ecosystem. We're moving at a pace, however, that will take some significant time to 'catch up' to ensure 'landscape scale' changes are made. The pace & scale of projects is on an upward trend, however, which is encouraging for the future.*

Work remains to more fully understand the connection between the scale of implementation and the desired outcomes.

¹ 2016-2018 US Forest Service Project Site Visits <https://www.fs.fed.us/restoration/documents/cflrp/SiteVisit/CFLRP-2016-2018-USFS-ProjectSiteVisits.pdf>

Were CFLRP projects able to identify the desired conditions relative to what a functionally restored landscape looks like (e.g. composition, function, structure, & scale) as well as what types of indicators may have been most helpful to inform the monitoring to evaluate the attainment of those desired conditions?

First, it's important to clearly distinguish between a metric of ecological resilience and sustainability, such as the natural range of variation (NRV), and desired conditions. Ecological metrics are modeled estimates reflecting our best understanding of what a fully functioning, sustainable landscape should look like. Desired conditions reflect the full range of ecological, social, and economic concerns for a planning area. Desired conditions and NRV can be the same but are often different. As an example, fuels treatments and thinning are often used to improve fire behavior metrics to protect the wildland urban interface. These will thus move the landscape towards a condition desired by society; however, this may or may not move the landscape towards a natural range or greater sustainability.

The CFLRP projects are directed by legislation to move landscapes towards a more ecologically sustainable condition. The record in the first round of CFLRP projects towards measuring this landscape metric has been mixed. There is a consensus it takes a long time to meaningfully change landscapes. Many CFLRPs do not have technical capacity in landscape assessment. And in contrast to other metrics, such as those of the Watershed Condition Framework, there is a lack of consensus in the ecology community on approaches to measuring landscape sustainability. More standardized approaches are under consideration for the next round of CFLRP projects. For more on this, see the Science-Based Approach section of this document.

Ecological Indicator Reports

The Ecological Indicator reports detail what the 23 CFLRP Projects identified as their desired conditions. Desired conditions were defined locally by the Projects and their collaboratives, and commonly selected desired conditions included:

- **Fire Regime:** Reduce risk of uncharacteristic wildfires, Reestablish natural fire regimes, Move landscapes towards the historical or natural range of variability, and Increase use of prescribed fire
- **Habitat:** Reestablish appropriate forest structure, tree density, and species composition, Increase plant diversity and protections for rare or sensitive ecosystems, Increasing stream habitat complexity and connectivity including aquatic organism passage, and Reduce sediment levels
- **Invasives:** Stabilize, Reduce, Prevent, and Accurately map/inventory invasive species
- **Watershed Condition:** Roads and trails (e.g. reduce density, improved maintenance), Improve water quality, Improve stream and riparian habitat, and Reduce wildfire risk at the landscape scale

Although common themes emerged among each of the ecological indicators, the scope of desired conditions varied. The metrics tracked for the desired conditions, goals, and objectives also varied with some Projects doing better at identifying and using indicators that would reflect restoration of functional ecosystems than others. Several projects often reported implementing management activities as how they determined progress towards desired conditions. This raises questions of efficacy and effectiveness which can only be answered through monitoring. Simply completing a list of management actions does not guarantee the intended effect.

Overall, CFLRP monitoring is on the right track. Collaborative stakeholders own the process and help build the questions. Monitoring was extensively implemented and reported. Improvements can be made in better matching the methods to what is desired, more consistent use of meaningful landscape metrics, and in frequent reporting and use by decision makers in adaptive management.

What did we learn about gaining efficiencies (or not) by working at larger scales?

Efficiencies were gained by integrating work on defined landscapes (see section on treatment integration). The commitment and long-term investment were repeatedly mentioned as key factors in supporting restoration. Commitment on behalf of the agency helps solidify investment by partners and engagement by collaboratives. The long-

term investment is key to matching the time it takes to plan, design, and implement restoration activities. The work of restoration cannot be done over-night and does not conform to annual budget-cycles. Matching the commitment and funding to the scope of the work improves efficiency and the odds for success.

- From “Strategies for Success Under Forest Service Restoration Authorities” report:
 - *The most valuable aspect of the CFLRP has been the 8 or 10-year funding commitment and prioritization of a landscape. These features incentivized collaborators to invest their time and effort, helped to leverage resources, and allowed for a coordinated program of work across the landscape.*
- From respondent to the 2020 National Forest Foundation Survey:
 - *The challenges of restoration are diverse; it takes a diverse set of stakeholders to get it done. The [Forest Service] can’t do it alone.*

How did projects approach project planning?

NEPA analysis at larger scales

Stakeholders said the larger-landscape focus and collaborative involvement gave their projects the social license to experiment and go big. On some projects, the scale of NEPA documents is unprecedented. 50% said it has allowed them to do broader-scale NEPA in faster timeframes² By focusing on building trust with communities and changing the social dynamic, CFLRP projects improve the overall operating environment for conducting environmental analysis and decision-making and shift how these units approach NEPA.

- One project reported getting more NEPA documents done annually, with an increase from one to three planning documents per year. At least two projects noted they are using more programmatic NEPA documents focusing on zones of agreement to plan at larger scales and altering treatments as they conduct field trips and begin on the ground implementation. On some projects, the scale of NEPA documents is unprecedented, but this has not always translated into accelerated implementation.
- 4FRI’s Phase One EIS, completed in 2015, analyzed one million acres and approved restoration activities on 580,000 acres. It demonstrated the ability of the Forest Service to successfully work through environmental analysis in collaboration with diverse stakeholders.
 - More detail on that process is available in the [4FRI Lessons Learned White Paper](#). Observations include the value of including the 4FRI Stakeholder Group in the objections process, despite challenges with this new approach. A second large-scale EIS is underway, which incorporates some of the learning through successes and challenges with the first process. Broad-scale NEPA has also burned in larger blocks and been using more aerial ignition with extensive use of shared resources across forests.
- Several efforts directly related to CFLRP provide examples as well:
 - Lakeview – Klamath Lake Forest Health Partnership used the Fremont Winema-NEPA Accelerated Restoration and Priority Landscapes to guide priority and selection of cross boundary landscape scale restoration projects.
 - Uncompahgre – Success with large scale NEPA - For example, the SBEADMR (Spruce Beetle epidemic and sudden aspen decline management response) project cost the GMUG approximately \$1.3 million to treat 120,000 acres. To cover the same number of acres across such a broad landscape would have required 20-25 NEPA documents costing \$325 thousand dollars each or a total of \$6.5 to \$8.1 million.

² “Strategies for Success Under Forest Service Restoration Authorities” https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf

What are the best practices of planning and implementing at a landscape scale?

Several best practices related to planning, project design, and implementation at the landscape scale have been identified³.

- Recognize that it takes time and investments to build up the capacity to plan, implement, and monitor at the landscape scale; it is often a “go slow to go fast” approach.
- Learn about all the tools in the toolbox—programs, grants, authorities, contracting mechanisms, and agreements within and beyond the US Forest Service—that may help get the work done on and beyond NFS lands.
- Understand that partners and other federal, state, tribal, and local agencies are critical to outreach and work with other landowners and community members to increase scale and work across boundaries.
- Think creatively about building capacity—are there non-traditional groups that may be interested in either immediate or downstream project outcomes and have new knowledge or capacity to contribute?
- Recognize investments in grant-writing and other capacity building efforts may take time but pay long-term dividends for project outcomes.
- Ask, “What does this landscape need to be healthy?” when putting projects together to integrate resource areas for the outcomes desired. Strive to understand what makes a landscape resilient and sustainable and develop practical metrics that are both scientifically defensible and easily communicated.
- Approach project planning in a way that best addresses the needs on the landscape and in the community, including landscape-scale approaches, condition-based management, adaptive management, focused environmental assessments, and categorical exclusions.
- Create a 5- to 10-year plan to help guide and prioritize your work. These plans help promote communication and coordination and allow for adaptability as unexpected barriers or opportunities arise.
- Recognize that there may be multiple, and sometimes competing objectives, and work together to create criteria for prioritizing tradeoffs.
- Engage across resource areas and staff internally to help develop a shared understanding and support for project goals and feasible timelines and plans for implementation, including fuels and timbers staff, hydrology, biology, engineering, contracting officers, and so forth.

What role do new and improved tools and approaches for assessment play in setting priorities and measuring progress for ecological outcomes?

The multi-party monitoring requirement has been a foundational element of the CFLRP for setting priorities, building rapport with partners and collaborative participants, providing justification for making modifications and adapting to changing conditions, and for documenting progress towards desired conditions and achieving ecological outcomes.

- From respondent to the 2020 National Forest Foundation Survey:
 - *[We] are adjusting as we gain new insight through monitoring.*
- From the 2016-2018 Site Visits Report:
 - *The monitoring requirements for CFLRP made the project teams define what they truly wanted, and the sustained funding allowed them to implement on a large enough scale to see real and tangible impacts on the ground.*

More information on innovative approaches used by CFLRP such as the multi-party monitoring can be found in the Science-Based Approach section of this report.

Several projects are experimenting with new technologies, tools, and approaches to better understand their landscapes, the impacts of CFLRP restoration work, and the broader ecological outcomes. Some examples include:

- *Missouri Pine Oak Woodlands:* On the Mark Twain Nation Forest (MTNF), they are combining point data collection, habitat characteristic measured through remote sensing, and a habitat model to assess high quality

³ 2016-2018 US Forest Service Project Site Visits <https://www.fs.fed.us/restoration/documents/cflrp/SiteVisit/CFLRP-2016-2018-USFS-ProjectSiteVisits.pdf>

brown-headed nuthatch habitat, its characteristics, and determining where restoration work will improve habitat to allow for bird reintroductions. They are doing this work across the CFLRP landscape and onto neighboring landscapes. This work will be applied to the newly modeled LIDAR data and Landis Outputs to estimate how many brown-headed nuthatches can be sustained currently and under the CFLRP management.

- *Colorado Front Range CFLRP* took a unique approach in 2010 by creating a subgroup within their collaborative to develop a CFLRP project monitoring plan, the Front Range Roundtable (FRRT). The plan was released initially in 2011 and is updated on a near annual basis and covers ecological, social, and economic monitoring. They consciously are planning for implementation monitoring, effectiveness monitoring (including surveillance and effects monitoring) and adaptive monitoring. (https://cfri.colostate.edu/wp-content/uploads/sites/22/2018/10/2017_FR_CFLRP_Monitoring_Plan_Typeset_2018.pdf)
- *Deschutes Collaborative Forest Project*: They have used multiparty monitoring efforts engage the collaborative and interested members of the public in pre- and post-implementation field trips to discuss projects before and after they have been executed. Pre-implementation field trips create a forum for participants to cross-walk DCFP's recommendations with proposed treatments in specific projects and to discuss with staff the intentions behind their recommendations as well as to identify any issues of concern prior to implementation. Post-implementation field trips offer an opportunity for the Forest to showcase what has been completed and to share any challenges encountered during implementation as well as how these were addressed. These multiparty monitoring field trips consistently engage a diverse breadth of stakeholder interests and membership across our Steering Committee, Adaptive Management and Implementation Subcommittee, Restoration Planning Subcommittee, and Prescribed Fire Subcommittee. This includes environmental interest, loggers and timber industry representatives, recreational interests, education and research, city and county government, fire and fuels reduction, and other interests.
- *Northeast Washington Forest Vision 2020*: In collaboration with Washington State University and the Washington Department of Fish and Wildlife, the Colville National Forest has been able to implement large-scale camera trapping survey across one landscape to monitor the effect of management activities on wildlife. Several species of conservation and management interest are being monitored intentionally including mule deer, white-tailed deer, Canada lynx, and snowshoe hare. Data has also been collected (incidentally) on many other sensitive or management indicator species including wolves, wolverines, pine martens, red-tailed chipmunks, and elk.
- *Four Forest Restoration Initiative (4FRI)*: Landscape pattern analysis of remote sensing imagery continues to be an area of active monitoring and stakeholder engagement. LiDAR data was collected across the entire southern zone of the Kaibab National Forest and portions of the Coconino National Forest scheduled for restoration with the next 5 years. This data will be essential to the evaluation of the spatial pattern created in restoration treatments. They have also partnered with Northern Arizona University and the Nature Conservancy to develop models that will individually segment trees from within the LiDAR data to create a forest stem map that will be helpful in treatment preparation and effects analysis.

What implementation tools and techniques were tried and how did they work?

The implementations tools and techniques utilized by CFLRP projects, while not always unique to CFLRP, reflect the increased capacity to try different approaches with partner support to confront the opportunities and challenges of implementing at a landscape scale. The deployment of these management activities in a concentrated, strategic way on defined landscapes in conjunction with a diverse array of collaborative partners is an innovation provided by the CFLR Program.

The demands of CFLRP for Projects to increase their scale and extent of work necessitated innovation on the part of Projects and their collaboratives. With new tools and technology, Projects innovated from the planning and implementation through the monitoring. Change can be hard and challenging, and often the collaboratives helped push the agency to test the waters and adopt new approaches.

- From a respondent to the 2020 National Forest Foundation Survey:

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- *Project prescriptions for resilient ecosystems have exponentially improved since our collaboratives convened. Early projects were significantly less progressive than the prescriptions our collaborative pushes for today, so this statement is truer with each passing project.*

Key Tools and Techniques

The following table is an initial list of examples of the key tools or techniques used by CFLRP projects to implement work:

Tool or Technique	Brief Description	Example(s)
Third party contracting	Recognizing capacity constraints internally, and recognizing the skills partners can contribute, several CFLRP projects are contracting out aspects of implementation.	The Amador Calaveras Cornerstone Project: Under a Master Stewardship Agreement, the Upper Mokelumne River Watershed Authority managed the contractors and contractors on a restoration project while the FS did prep work and prescriptions. CFLRP projects are also working with partners to conduct surveys and support marking crews. This CFLRP also worked with local tribal crews to implement restoration projects around cultural sites to reduce hazardous fuels and re-introduce aspen and other plants valued by local tribal members.
Leverage capacity of partners to provide/coordinate volunteers to accomplish work.	Through partner networks, CFLRPs accomplish implementation through volunteer hours.	With the 4FRI Long Valley Meadow project, AZ Elk Society and other partners secured funding and leveraged a volunteer force to help implement the project.
Engaging partners and the community around the role of fire on the landscape		The Grandfather Restoration Project brings partners together to educate the public on the role of fire on the landscape through the Fire Learning Trail, social media, and the strong partnership with the Southern Blue Ridge Fire Learning Network and Consortium of Appalachian Fire Managers and Scientists . In particular the Fire Learning Trail and #goodfire social media efforts offer best practices.
Assessing trade-offs to assist in implementation prioritization	Especially in working across a landscape for multiple objectives, there are tradeoffs that sometimes need to be made in planning implementation. An action that may maximize one desired outcome may not impact, or even negatively impact, another desired outcome. CFLRP projects are working through these challenges.	The 4FRI's use of the landscape treatment designer model helps provide a framework for understanding trade-offs and prioritizing treatment areas, especially in terms of restoring fire regime and economics, to help balance multiple desired economic and ecological outcomes.
Implementation planning	Creating a strategic vision and writing it down in a plan to revisit over time is a valuable best practice. Additional prioritization occurs every year across resource areas - coordinating needs on 106 compliance, surveys, sales prep, etc.	Longleaf Pine Ecosystem Restoration and Hazardous Fuels Reduction Project (DeSoto Ranger District) developed a five-year plan to guide what and where activities would occur.

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	This enables everyone to better understand the plan for what will be accomplished, and when - allowing for more effective coordination and an established order of operations (thinning, fire, etc.) across the landscape.	
Smoke management	Effective smoke management is critical to supporting public health and creating or maintaining the social license to implement prescribed fire or manage wildfire for resource benefit. CFLRPs work through partnership to manage smoke.	Longleaf Pine Ecosystem Restoration and Hazardous Fuels Reduction uses V-Smoke, Hysplit, and a locally developed fog checklist for pre-burn smoke modeling years prior to it becoming a requirement.
Designation by Prescription	Support for the use of Designation by Prescription, which received expanded authority in the 2014 Farm Bio, can decrease the time and costs of sale preparation.	For the Four Forest Restoration Initiative, overall, the pace and scale of preparation of timber sales has greatly increased in the last four years, primarily with the use of Designation by Prescription on all sales since the authority was expanded.
Stewardship contracting	Actively engaging partners and collaboratives in stewardship contracting can help improve how contracting can enhance social and economic outcomes.	The Southern Blues Restoration Coalition collaboratives supported a 10-year stewardship contract in 2013, including partners providing input on what “local” means and evaluation criteria for the contract. The process provided valuable learning on engaging with partners in this process. See https://drive.google.com/uc?id=0B_QX-GiwQraUZFYb1hqWEJ1OUk&export=download
Leveraging a range of tools, authorities and initiatives.	A common theme across CFLRP projects is the use of several implementation tools to get the work done across the landscape.	The Colville and Malheur National Forests are using stewardship contracting extensively to maximize efficiencies and matching funds for CFLR. The Okanagan-Wenatchee National Forest has made use of the Tribal Forest Protection Act (TFPA) to partner with the Yakama Tribe and support existing infrastructure. The GMUG is using many different tools and authorities, including stewardship agreement with Mule Deer Foundation; Integrated Resource Service Contract (IRSC); traditional timber sales; service contracts; veteran job corps; correctional crews; force account/agency crews; youth conservation corps. They noted the stewardship agreement was particularly helpful.

		Gave them more flexibility than an IRSC, especially for accessing markets over time.
Coordinate across resource areas	Engage across resource areas and staff internally to help develop a shared understanding and support for project goals and feasible timelines and plans for implementation, including fuels and timbers staff, hydrology, biology, engineering, contracting officers, and so forth.	On the Malheur National Forest (Southern Blues Restoration Coalition), the staff shared that their goal is for each individual, regardless of their resource backgrounds, to be able to speak for all the resource areas involved in a project. Several projects found that involving contracting officers and grants and agreements staff early in the collaborative process can support shared knowledge of goals, opportunities, and options for implementation.

What are common implementation barriers and challenges?

- **Forest Service employee turnover continues to be an internal and external collaborative challenge.** Internally, it takes new people time to understand the complexities of these collaborative projects. Externally, it takes time to build the needed relationships and trust for success.
- **Staffing and capacity.** Many CFLRP projects highlighted a lack of skilled staff, including contracting officers, certified sales prep, grants and agreement, and AQM support. Comfort levels and training are a challenge and a bottleneck that impacts implementation of integrated and complicated tools like Stewardship Agreements, Integrated Resource Service Contracts, and Designation by Prescription.
- **Forest products, markets, and infrastructure challenges** (*see Benefits to Communities section for additional information*). CFLRP was based on a principle that there is ample opportunity to off-set the cost of wildfire mitigation through the utilization of wood fiber. In some places where CFLRPs occurred, the woody fiber being removed is not of high value and with some exceptions, is not contributing much toward off-setting treatment costs. Challenges include lack of forest products infrastructure, marginal profits for contractors, budget and market uncertainty, equipment needs and costs, and local logger availability and capacity.
- **Contracts, grants, agreements: Determining the best approach, enhancing communication, and promoting efficient implementation.** With a suite of tools available, projects are learning about matching the best vehicle for the intended outcome to gain efficiencies and avoid slower implementation timelines. For example, the Grandfather Project shows excellent partnership work with the state, TNC and others on prescribed fire, managed fire, and suppression work. However, discussions showed different understandings between WO grants and agreements staff and the Region and Forest on what’s needed in cooperative fire protection agreements to adequately mitigate risk and capture the value of the partnership.
- **Unexpected developments** across the landscape, such as high severity wildfires and drought, can significantly impact the ability to effectively implement.
- **Collaboration in implementation.** There are opportunities to explore expanded collaboration in implementation as appropriate. Some partners expressed challenges around grant administration, contracts, and agreements for shared work. Staff involved in these functions may not be directly involved in collaborative efforts and this may result in lack of alignment in what’s needed and how partners can help.
- **Strengthening communication across Grants and Agreements staff, contracting officers, and administration** Bringing these staffs together to better understand sideboards and discuss interpretations can lead to more creative ways to ask “what if?”

- **Additional “external” delays** include timing restrictions and administration approvals and seasonal delays (e.g. weather and haul weight restrictions). Balancing the urgency with the importance of strong buy-in is a challenge.

Where to Learn More

Project Accomplishments

Accomplishments are tracked through reporting (Annual Reports and the 5-year Ecological Indicator Reports) as well as through standard agency reporting mechanisms and databases (e.g., Forest Service Activity Tracking System, FACTS): <https://www.fs.fed.us/restoration/CFLRP/guidance.shtml>

From Annual Reports (external link: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>), several questions provide insight into the accomplishments of the individual CFLRP Projects:

- Question 2 on the restoration of fire-adapted ecosystems (a compiled file is available upon request),
- Question 6 reports on agency performance measures (a compiled file is available upon request), and
- Question 8 requires projects to verify the spatial footprint of the work accomplished providing insight into how big of an area was improved opposed to agency accomplishments which provide insight into how much work was done and that allow for different management activities to have overlapping acreages (a compiled file is available upon request).

Restoration Outcomes

The 2014 and 2019 Ecological Indicator reports also provide the CFLRP Projects observations regarding outcomes regarding the four ecological indicators: fire regime, fish and wildlife habitat, watershed condition, and invasive species. A compilation of these results if available by request and will soon be posted

<https://www.fs.fed.us/restoration/CFLRP/results.shtml>

The Annual Reports (available on the CFLRP Results webpage: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>) also provide insight into ecological outcomes throughout numerous report questions, especially in the narratives. Projects report on monitoring outcomes every year in their annual reports, including links to the most recent papers and studies.

- See for instance Question 5 in the 2019 reports: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
- Key monitoring documents made available to the Washington Office are posted to the CFLRP Resource Library: <https://www.fs.fed.us/restoration/CFLRP/resource-library.php>
- Monitoring information includes site visits reports, individual monitoring reports, and selected compilations of annual report monitoring information are available on the CFLRP Results page (<https://www.fs.fed.us/restoration/CFLRP/results.shtml>), the CFLRP Resource Library (<https://www.fs.fed.us/restoration/CFLRP/resource-library.php>) of by request

Third party entities have also examined the ecological outcomes of the CFLRP. Some efforts have relied on surveys of Forest Service personnel and collaborative participants:

- “Strategies for Success Under Forest Service Restoration Authorities” https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf
- National Forest Foundation 2020 Survey in press and will be posted: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
- “Metrics of Landscape Restoration Success in Collaborative Forest Landscape Restoration Program Projects” <https://cdm17192.contentdm.oclc.org/digital/collection/p17192coll1/id/1015/rec/1>
- For these and other reference documents, see “Monitoring” Topic Area items on the CFLRP Resource Library: <https://www.fs.fed.us/restoration/CFLRP/resource-library.php>

In some places, there has been support for ecological studies that have provided a scientific analysis of ecological outcomes. Examples include:

- Colorado Front Range Landscape Restoration Initiative found that treatments returned landscapes to their historical range of variation:
 - Cannon, Jeffery B.; Barrett, Kevin J.; Gannon, Benjamin M.; Addington, Robert N.; Battaglia, Mike A.; Fornwalt, Paula J.; Aplet, Gregory H.; Cheng, Antony S.; Underhill, Jeffrey L.; Briggs, Jennifer S.; Brown, Peter M. 2018. Collaborative restoration effects on forest structure in ponderosa pine-dominated forests of Colorado. *Forest Ecology and Management*. 424: 191-204.
<https://www.fs.fed.us/rmrs/publications/collaborative-restoration-effects-forest-structure-ponderosa-pine-dominated-forests>
- Amador Calaveras Cornerstone which described increased resistance and resilience of forests post-restoration treatments:
 - Restaino, C., Young, D., Estes, B., Gross, S., Wuenschel, A., Meyer, M., and Safford, H. 2019. Forest structure and climate mediate drought-induced tree mortality in forests of the Sierra Nevada, USA. *Ecological Applications* 29(4): <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/eap.1902>
 - Young, D., Meyer, M., Estes, B., Gross, S., Wuenschel, Restaino, C., and Safford, H. 2019. Forest recovery following extreme drought in California, USA: natural patterns and effects of pre-drought management. *Ecological Applications* 00(00): <https://doi.org/10.1002/eap.2002>
- Missouri Pine Oak Woodlands worked with partners to model the outcomes of integrated restoration activities in shortleaf pine-oak woodlands
 - Jin, W., H.S. Hong, S.R. Shifley, W.J. Wang, J.M. Kabrick, B.K Davidson (2018). How can prescribed burning and harvesting restore shortleaf pine-oak woodland at the landscape scale in central United States? Modeling joint effects of harvest and fire regimes. *Forest Ecology and Management*, 410: 201-210.

Integration

Narratives from the Annual Reports (<https://www.fs.fed.us/restoration/CFLRP/results.shtml>) and WO CFLRP site visits (<https://www.fs.fed.us/restoration/documents/cflrp/SiteVisit/CFLRP-2016-2018-USFS-ProjectSiteVisits.pdf>) provide insight into the integration of the restoration work across resource areas.

Other reports synthesizing the findings from site visits are available on the CFLRP Resource Library <https://www.fs.fed.us/restoration/CFLRP/resource-library.php> and individual site visit reports are available upon request.

Challenges and Limitations to Landscape-scale Restoration

Challenges and limitations are numerous, and they are described in a few locations:

- The Ecological Indicator reports specifically ask projects about their challenges and barriers experienced for each ecological indicator. Some challenges, barriers, or limitation are the same for each type of indicator (e.g., frequent agency staff turnover) while others are more specific to a given ecological indicator. Challenges also arise in the annual reports each project submits.
- The open-ended responses in surveys of CFLRP collaborative participants, partners, and agency staff also provide insight into some of the challenges facing the 23 Projects. These responses have been synthesized in site visit reports available in the CFLRP Resource Library (<https://www.fs.fed.us/restoration/CFLRP/resource-library.php>) and in the “Strategies for Success Under Forest Service Restoration Authorities” report (https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf).
- Open-ended responses on surveys also provide some insight into challenges perceived by members of collaboratives. The NFF 2020 survey comments provide such insights (in press and will be posted): <https://www.fs.fed.us/restoration/CFLRP/results.shtml>

Scale of Restoration Work

The Annual Reports and Ecological Indicator Reports provide information on the scale of work being done as well as insights into the benefits, efficiencies gained, and challenges of scaling restoration work:

<https://www.fs.fed.us/restoration/CFLRP/results.shtml>

Other resources cited here to understand the scale of CFLRP include:

- “Strategies for Success Under Forest Service Restoration Authorities”
https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf
- National Forest Foundation Surveys
 - 2020 Survey in press and will be posted: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>

Best Practices for Landscape-scale Restoration

The activities planned for the next fiscal year are included in the Annual Reports. Anecdotal documentation of NEPA and planning processes are also included in the Annual Reports and Ecological Indicator Reports. Anecdotes often include methods and approaches that succeeded as well as challenges that arose (both anticipated and unforeseen). Reports are posted to the CFLRP website: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>

The benefits and challenges of broad-scale planning and NEPA often came to light during site visits. A synthesis of findings from Site Visit reports is available in the CFLRP Resource Library (2016-2018 US Forest Service Project Site Visits <https://www.fs.fed.us/restoration/documents/cflrp/SiteVisit/CFLRP-2016-2018-USFS-ProjectSiteVisits.pdf>), and individual site visit reports are available upon request.

Implementation Tools and Techniques

The CFLRP Resource Library includes an “implementation” tag to identify resources that include innovations in implementation: <https://www.fs.fed.us/restoration/CFLRP/resource-library.php>. It also includes several guides and tools that Projects tested and often implemented for the first time. See, for example, the 4FRI modernization workshop report: https://www.fs.fed.us/restoration/documents/cflrp/ModernizationWorkshopReportFINAL_20200211-508.pdf

The Site Visit Reports also highlight the innovations in implementation including new authorities, leveraging complementary programs, partner capabilities, and engaging the community:
<https://www.fs.fed.us/restoration/documents/cflrp/SiteVisit/CFLRP-2016-2018-USFS-ProjectSiteVisits.pdf>

Approaches to Assessment and Tracking Progress

More information related to innovative approaches can be found in the Science-Based Approach section and references cited therein. Monitoring methodologies are detailed for each project in the Ecological Indicator reports.

- Internal review files are available here: <https://usfs.app.box.com/folder/95785056116>
- 2014 Ecological Indicator Reports publicly available here: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
 - 2019 Ecological Indicator Reports will soon be available at the link above.
- Organizing landscape assessments:
 - Esch, B.E., and A.E.M. Waltz. 2019. Assessing Metrics of Landscape Restoration Success in Collaborative Forest Landscape Restoration Program Projects. ERI White Paper—Issues in Forest Restoration. Ecological Restoration Institute, Northern Arizona University. 12p.

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-- Nelson, M.L.; Brewer, C.K.; Solem, S.J., eds. 2015. Existing vegetation classification, mapping, and inventory technical guide, version 2.0. Gen. Tech. Rep. WO-90. Washington, DC: U.S. Department of Agriculture, Forest Service, Ecosystem Management Coordination Staff. 210 p.

--Winthers, E., D. Fallon, J. Haglund, T. DeMeo, D. Tart, M. Ferwerda, G. Robertson, A. Gallegos, A. Rorick, D. Cleland, W. Robbie, and D. Shadis. 2005. Terrestrial ecological unit inventory technical guide. Washington, DC: USDA For. Serv. Washington Office Gen. Tech. Rep. WO-68, 254 pp.

Next Steps

**These are the initial ideas identified by the CFLRP program staff. The next step is to engage with other Forest Service staff areas, field units, and partners to see how recommendations align with their perspectives and priorities. These discussions will clarify the needed change/improvement and help prioritize what warrants action. Some of these initial ideas would involve changes beyond the scope of CFLRP, and as such, may require further discussion and leadership engagement before action could be taken.*

NEPA Aspects of CFLRP Projects

Further explore CFLRP NEPA in partnership with Ecosystem Management Coordination (EMC) staff. The purpose of such an analysis would be to see what lessons there are to be learned from these project specific to their various NEPA approaches.

Such an analysis could look at:

- How innovative NEPA approaches were used specifically (e.g., adaptive management, condition-based management, iterative alternative development).
- CFLRP NEPA timelines compared to averages on each unit/region or by project purpose.
- Objection rates and other statistics before/after on units before/after CFLRP.

It would be valuable to do some more detailed analysis of how CFLRP has affected NEPA analysis on these units.

Project Accomplishments:

Analyzing Reporting Measures

Numerous questions can be asked regarding accomplishments of the required CFLRP reporting and reporting measures of the CFLR Program and of each Project. The work of the CFLRP Projects is also recorded in other Forest Service databases of record such as FACTS or Watershed Improvement Tracking (WIT). Mining these and other databases for the projects would provide a finer level of detail as to specific management activities accomplished and how they combine into the agency-wide performance measures. For example, breaking down the Forest Vegetation Established performance measure provides insight into the specific management activities of tree planting, seeding, and certification of natural regeneration with and without site preparation. This type of analysis could be of particular interest to specific NFS programs and partners.

Developing Context

Determining creative ways to provide more context around reporting measures and accomplishments is another area for development when requested. One way to develop more context for reported numbers could be to compare accomplishments to needs. For example, considering the engineering accomplishments in the context of the maintenance backlog to understand the impact of restoration. Developing the appropriate and meaningful context is helpful when communicating with different audiences, partners, and with Congress.

Alignment with National Efforts

Another avenue of future inquiry is how CFLRP and national policy changes can cross-pollinate. For example, what lessons does CFLRP have to offer for national efforts such as outcome-based reporting, Shared Stewardship, and Environmental Analysis and Decision-Making, (<https://www.fs.usda.gov/managing-land/eadm>) where appropriate?

How does CFLRP need to shift to align with the goals of those efforts, and in turn, influence them? At the national level, there is a major focus on understanding the outcomes of the outputs (e.g. acres, miles) of management activities. This is leading to the development and evaluation of new reporting and performance measures for the agency. Few cases have the monitoring in conjunction with accomplishment tracking that CFLRP projects do. The CFLRP projects and collaboratives could provide a unique test case or case study for experimenting with new measures and methods for moving reporting metrics from tracking outputs to also describing outcomes of restoration work.

Another nationally led effort is Shared Stewardship⁴ which strives to change the way the Forest Service works with States, Tribes, and partners to ensure priority work is done in the right place and at the right scale using strategic, cross-boundary approaches. The CFLRP projects have unique lessons learned about scaling up restoration activities and working collaboratively to inform Shared Stewardship work going forward.

Ecological Outcomes:

Continued Monitoring

The outcomes of CFLRP work will take years of monitoring to determine if the desired objectives were/are being achieved. This is discussed in more detail in the Science-based Restoration section of this report. Briefly, landscape scale work moves on different time scales than budget cycles, annual reporting, and even 5-year reporting. Ecological processes occur at a variety of spatial (small to big) and temporal scales (short as in days/weeks to long as in decades). Continued monitoring will be required to better capture the landscape scale impacts of CFLRP work, even after all the management activities have been implemented.

Additional suggestions of CFLRP monitoring approaches and suggested improvements moving forward are covered in the Science-based Restoration section. Briefly, related to this, future programmatic work may want to examine how to strike the best balance between standardization in how ecological outcomes are assessed and creating space for local decision-making and innovation. These are types of questions can continue to be explored and will likely continue to develop over time.

Efficacy and Effectiveness

Questions regarding efficacy (how well things can be done) and effectiveness (how closely the actions achieve the goal) are important for any management activities conducted by the Forest Service, especially at the scale of CFLRP work. It is only with appropriate monitoring that these types of questions can be answered, and the Science-Based Approach Section should be referenced for a closer examination of the roles of effectiveness monitoring in addition to implementation monitoring.

The local context of the ecosystem, its condition, its restoration needs, and the selected management actions are all highly variable properties that can complicate broad trends and expectations. Then, as time passes, the long-term effects of management work may not always be as expected as ecosystems continue to grow, respond to changing conditions, and develop along ecological successional pathways. Invasive species management provides a quintessential example of why doing the work that was planned cannot automatically serve as the metric for achieving desired conditions and outcomes at the landscape scale. An invasive species may grow more quickly than expected, expand faster than expected, or not respond to treatment in predictable ways. Invasive species management and monitoring raised the questions of efficacy and effectiveness, and these questions are relevant to all the work accomplished by the CFLRP Projects and the Forest Service more broadly and are worth exploring.

⁴ Shared Stewardship Strategy. <https://www.fs.usda.gov/sites/default/files/toward-shared-stewardship.pdf>

In-Depth Review of Monitoring Information

The monitoring reports are a trove of information that are deserving of future investigation and synthesis from which to glean the most knowledge. Future work may include additional focus on extended review of individual CFLRP monitoring reports for compilation of key outcomes and learning. Examples of this type of work include the compiled wildlife-related monitoring and description of outcomes (as of 2019), available in this Story Map:

<https://usfs.maps.arcgis.com/apps/MapSeries/index.html?appid=c8af09c0176b477d90ef9c704b7e15a1>.

Addressing Unforeseen Challenges

One avenue of future inquiry would be to take a deep dive into the CFLRP Projects that experienced unanticipated natural disasters, especially fire. Some of these projects seemed to be able to carry on without much of a challenge while others were completely derailed and had to nearly start over from scratch. Identifying the characteristics that made some projects more resilient and better able to adjust, adapt, and continue towards their restoration goals would be insightful for the entire agency and other restoration partners.

Additionally, to prepare future CFLRP Projects to be ready for potential natural disasters, annual reporting could add or modify questions to make projects consider unplanned events in their planning. Below are examples of questions that could help motivate those types of futuring exercises:

- A type of question that could be added to the next call for proposals:
 - What will you do if a large natural disaster occurs (e.g. fire, hurricane)?
- A question that could be added to annual reports:
 - How would you adapt to a natural disaster or unplanned event? or
 - Do you anticipate any changes to your workplan moving forward?

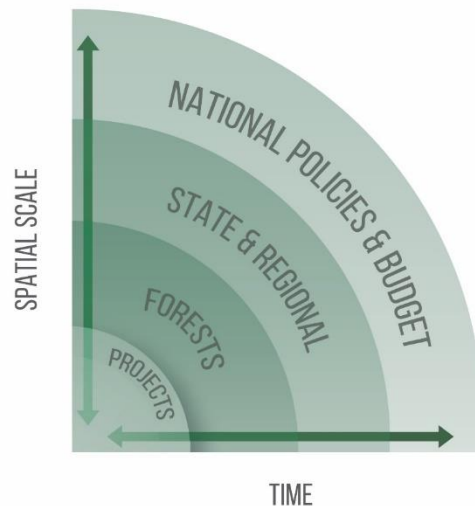
Deeper Understanding of Integration

Another avenue of inquiry to better understand integration of restoration work would be to return to the project proposals. A systematic review of the proposed work and its integration alongside a review of accomplishments would be insightful into how projects approach integration and evolve in their understanding of it. Selected project proposals are available:

- 2010: <https://www.fs.fed.us/restoration/CFLRP/2010selections.shtml>
- 2012: <https://www.fs.fed.us/restoration/CFLRP/2012selections.shtml>

Scale of Restoration Work

The CFLRP provides a unique opportunity to examine questions of scale regarding ecological challenges, implementation of restoration work, and working collaboratively and in partnership. Aspects of all of these factors operate in different ways at different spatial and temporal scales. The CFLRP has pushed the Forest Service and its partners to implement restoration work at larger scales, however there are limits to how big the mechanisms and way of conducting business will allow the Forest Service to go. This may or may not match the scale of the ecological problems facing a specific landscape or series of interrelated landscapes. Creating resilient ecosystems that also provide the goods, services, and benefits desired by people and society involves many tensions and tradeoffs across scales, and what works at one scale may not be effective at another. The CFLRP Projects can provide insight into the scale of work not typical of standard Forest Service projects, and they already have informed efforts to scale up restoration work in the agency.



Moving forward, it would be useful to think of CFLRP work as fitting into multiple scales, with different ecological structure, function, and composition. The Terrestrial Ecological Unit Inventory (TEUI) (Winthers et al. 2005) and Existing Vegetation Technical Guide (Nelson et al. 2015) may be useful tools in this regard. This would also support better landscape assessment, as recommended by Esch and Waltz (2019).

Assessment and Tracking Progress

New assessment tools and datasets are becoming available all the time or are improving in resolution and extent. Closer examination of those that align with CFLRP in scale (landscape) and scope (ecological, social, and economic benefits) are worth deeper exploration to determine where synergies may lie. One example of such a tool is the Terrestrial Condition Assessment which uses landscape-scale mapped units to assess ecological conditions with a data-driven, consistent methodology across the conterminous US⁵.

Future work by the program and relevant staff areas is needed to support the uptake of new tools, increase awareness of new tools and resources, and potentially policy changes to facilitate adopting new methods. The best way to achieve these outcomes is open for debate. Facilitating the uptake of new tools and information exchange may require:

- Webinars with informational presentations or more structured and interactive trainings,
- Different methods of information dissemination between groups that produce these tools and the CFLRP Regional coordinators and/or Projects, or
- Other approaches not yet considered

The sharing of tools and resources that are effective and work is a two-way street, and future work will also require the CFLRP Program, Projects, and collaboratives to share more widely the tools, resources, and information that helps them succeed for other projects and administrative units to emulate and adapt for their purposes and needs. The CFLRP has been a testbed and laboratory for many new techniques and approaches. It is critical to share both what works and what does not work with others within and beyond the Forest Service and CFLRP. There is a lot of motivation to increase the scale, scope, and extent of restoration work, and CFLRP has much to share about how to do that effectively.

Next steps for CFLRP and interested parties may include compiling the tools, techniques, and approaches used by CFLRP Projects and assessing their success by:

- Reviewing annual reports for this information as it is provided anecdotally

⁵ Cleland, David; Reynolds, Keith; Vaughan, Robert; Schrader, Barbara; Li, Harbin; Laing, Larry. 2017. Terrestrial condition assessment for national forests of the USDA Forest Service in the continental US. *Sustainability*. 9(12): 2144-. <https://doi.org/10.3390/su9112144>.

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- Crowdsourcing from the Projects to inform the next round of projects (being selected soon)
- Implement a section in the annual reports to have projects share their novel approaches, innovations, or new tools, information sources, or technologies

CFLRP and Wildfire Risk Reduction

Wildland fire management is a common and complex challenge across public and private lands. A principal goal of CFLRP is to reduce the risk of uncharacteristic wildfire and reestablish natural fire regimes. This section of the CFLRP Level 2 report examines the successes and challenges of the program in meeting these wildfire risk goals.

The National Wildfire Coordination Group defines fire risk as the chance of a fire starting. Fire hazard relates to the amount and complexity of fuels. So, in our fuels reduction treatments we actually seek to reduce hazard. For the purposes of this document, however, we will consider the terms synonymous.

Reducing ecological departure (restoring fire regimes) relates to the fire frequency and severity occurring in landscapes now versus what would happen in a functioning, sustainable system. Some ecological types burned rarely but severely in an historical setting. If they are still functioning this way, this is sustainable and characteristic of those systems, even though they may have high fuel loads and could be at high risk of fire.

Since most fuel treatment efforts occur in fire regimes with historically frequent or mixed severity fires, fire hazard, risk, and departure often loosely align. It is important, however, to remember the differences in these terms. Many fuel reduction treatments focus on protecting the wildland-urban interface, which may or may not align with improving ecological function.

The wildfire risk section is organized into three subsections and an Appendix. A hyperlink to the subsections, and parts within each subsection, is provided here for easy reference.

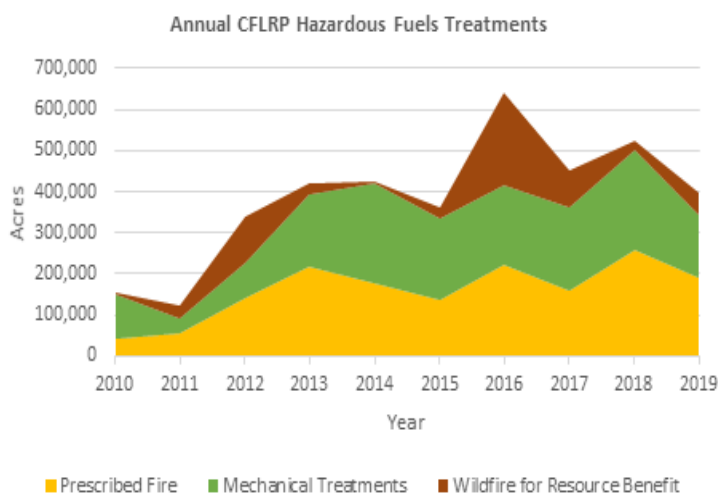
- The [Lessons Learned](#) subsection addresses the following questions:
 - [What did the projects accomplish? How many acres were treated? What were the trends over time?](#)
 - [How did projects reduce risk? What impacts did treatments have on restoring the role of fire on the landscape and/or other resources? Did treatments reduce suppression costs?](#)
 - [What prioritization approaches and treatment techniques were tried and how did they work? Was work completed at the appropriate scale?](#)
 - [What did we learn about the role of community engagement, and best practices for community engagement? What did we learn about the impact of smoke in communities and public reaction/support?](#)
 - [What were the most important challenges and limiting factors to prescribed fire? What are key innovations & best practices to share?](#)
 - [What were the most important barriers to increased use of wildfire for resource benefit? What were the innovations and best practices to share?](#)
 - [What did we learn from the 23 projects' ecological indicator reports that focused on restoring natural fire regimes?](#)
 - [What questions emerged that need more investigation?](#)
- The [Where to Learn More](#) subsection includes the following parts:
 - [CFLRP project data](#)
 - [Case Studies and Relevant Research](#)
- The [Next Steps](#) subsection gives a brief overview of how this information will be used moving forward.
- The [Appendix](#) provides detailed data referenced throughout the section.

Lessons Learned

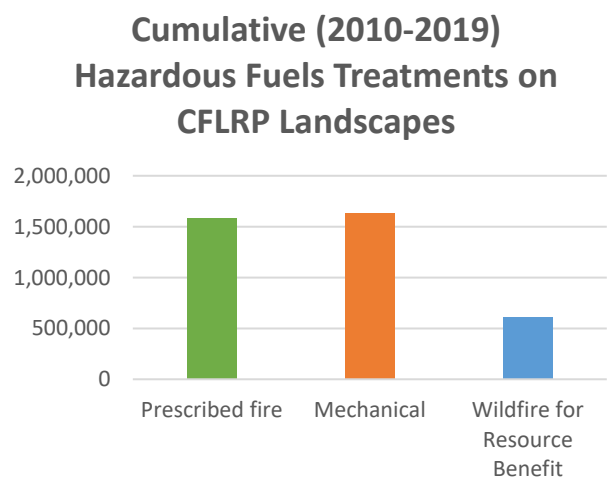
What did the projects accomplish? How many acres were treated? What were the trends over time?

Total Program Accomplishments

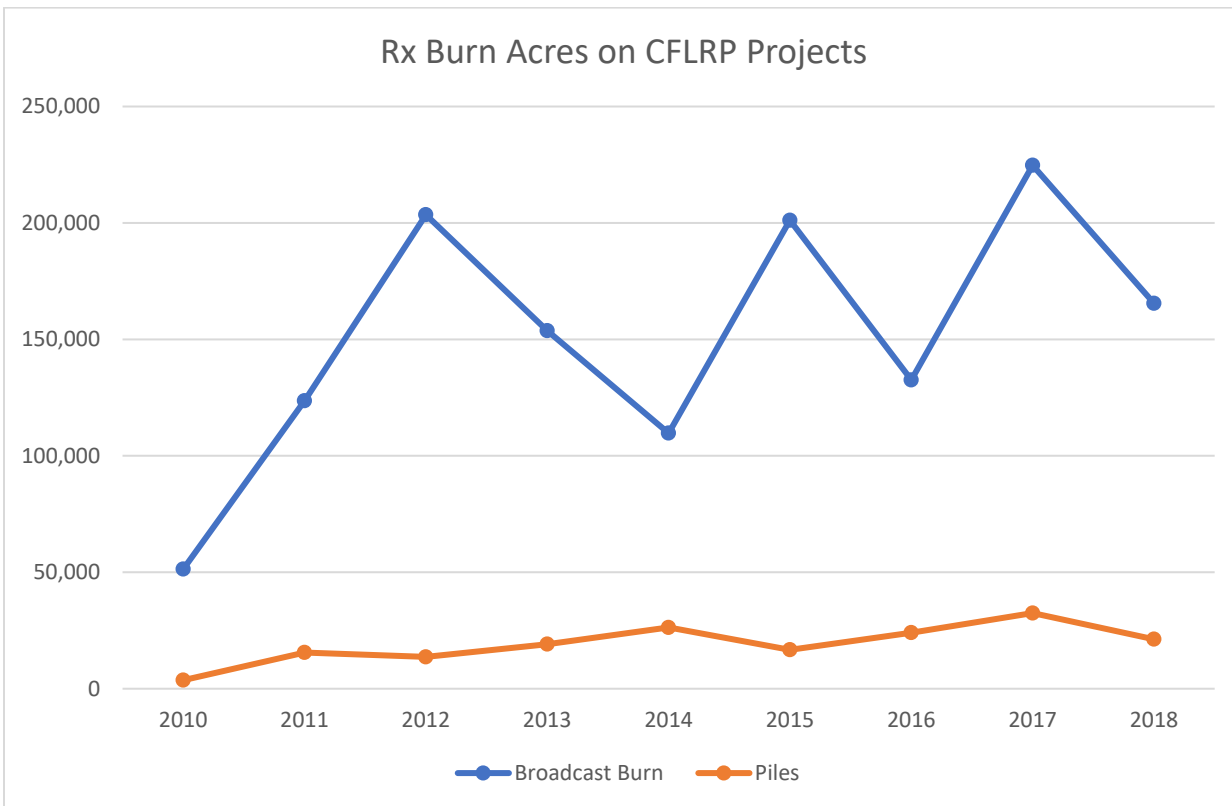
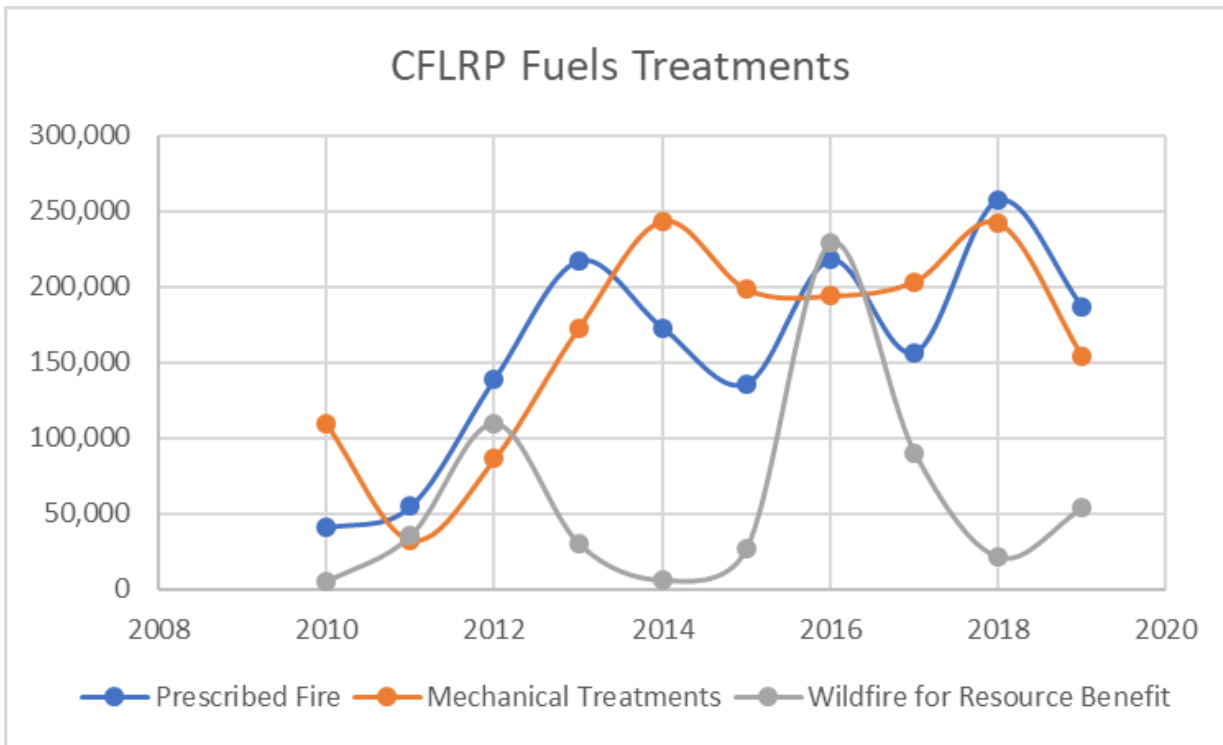
- Since 2010, CFLRP projects have treated close to 3.8 million acres of hazardous fuels.
- Of the 3.8 million acres, projects treated 3.2 million acres of CFLRP landscapes using prescribed fire and mechanical treatments (1.6 million acres each).
- Starting in 2018, the CFLRP projects began reporting more detailed accomplishments data for hazardous fuels to be better able to assess the impact of treatments. While two years of data is not sufficient for trends analysis, excerpts of the data are provided in [the Detailed Hazardous Fuels Annual Data part of the Appendix](#) for reference.



Hazardous fuels treatments (prescribed fire, mechanical treatments, and wildfire for resource benefit) on CFLRP landscapes from 2010 - 2019.



Hazardous fuels treatments in acres (prescribed fire, mechanical treatments, and wildfire for resource benefit) on CFLRP landscapes from 2010 - 2019.



- From 2010 to 2019, CFLRP hazardous fuels treatments showed an overall upward trend for mechanical treatments and prescribed fire. Note that in 2010 and 2011 there were 10 CFLRP projects; in 2012 13 additional projects began work.
- While there was fluctuation between years and variation across projects, in general projects reported the value of CFLRP for building increased capacity for their treatments and increased community support for prescribed fire overtime. This increased capacity led to the increase in annual accomplishments over time.
- As a reference point, between FY 2013 and FY 2019, CFLRP Projects comprised 11% of the NFS treatable acreage and 9% of restoration-related spending while they accomplished 19% of the agency's total hazardous fuels treatments. In 2019, CFLRP projects provided 15% of the agency totals for prescribed fire treatments.
- At the same time, many projects also reported a need to expand the scale of their prescribed fire treatments further and improve their ability to utilize wildfire for resource benefit.
- **These trends highlight the importance of working closely with communities and partners to strategically place treatments on wildfire prone landscapes.** See further discussion of this in [What did we learn about the role of community engagement](#), [What were the challenges and best practices for increasing Prescribed Fire](#), and [What were the challenges and best practices for use of wildfire for resource benefit](#).

How did projects reduce risk? What impacts did treatments have on restoring the role of fire on the landscape and/or other resources? Did treatments reduce suppression costs?

What do we know?

Treatments that contribute to reducing wildfire risk and could therefore contribute to reducing wildland fire management costs, include timber harvest, prescribed fire, mechanical treatments and managing wildfire for resource benefit. Results from CFLRP projects show the impacts of these various treatment types, both on wildfire risk and other natural resource benefits.

- [Survey responses](#) - Surveys of CFLRP practitioners found that 80% of projects said treatments reduced the threat of fire and improved ecological conditions⁶ and 75% said it allowed their forest to focus on highest priority work.
- A majority of those surveyed reported success in meeting all CFLRP goals, *except* reducing treatments costs with the utilization of restoration byproducts (biomass and small diameter materials)⁶. See further discussion of this in the [Community Benefits section](#).
- [Project reports](#) - Key themes from the narratives in annual project reports include:
 - Fuel treatments have been focused on creating and maintaining fire resilient stands to enable successful management of wildfires.
 - Fuels treatments and management of unplanned ignitions have been used to return the landscape to a condition that is more amenable to frequent, low to moderate severity fires, and to reduce the risk of wildfire causing the loss of life and property.
 - Restored and maintained forest conditions will enable broader use of prescribed fire and wildfire, providing more natural ecological functions.
 - Treatments that have been implemented will lead to reducing fire suppression costs by reducing the resistance to control.
- [Fuel Treatment Effectiveness Monitoring](#) - In 2019, eleven projects provided information on when a wildfire interacted with a previously treated area or an area planned for treatment within the CFLRP boundary. Observations showed wildfires impacted treated areas with dramatically less intensity than untreated areas. Previous treatments were extremely effective, allowing for reduced wildfire intensity, increased firefighter safety, reduced vegetation losses, and increased ecological gain. The treatments slowed fire spread and

⁶ “Strategies for Success Under Forest Service Restoration Authorities”
https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf

decreased fire behavior to allow for direct suppression, leading to successful initial attack in the wildland urban interface (WUI).

- Examples of these impacts are provided in the [Impacts of Fuels Treatments portion of the Appendix](#).
- Additional examples of the impacts of fuels treatments can be found in the annual reports on the CFLRP website and in compiled summaries (see [CLR Project Data below](#)).
- Progress towards Desired Conditions – Projects developed quantifiable desired conditions restoring natural fire regimes and reducing the risk of uncharacteristic wildfire at both the project and landscape scale. Over 80% of projects achieved their objectives for fire regimes. See more specifics in [the Ecological Indicator Reports summary](#).
- Impacts on other resource areas: Resource values that were protected through fuels treatments included timber resources, inholding property, T&E habitat, red cockaded woodpecker habitat, Dusky Gopher Frog habitat, Gopher Tortoise habitat, Black Pine Snake habitat, birds (some ground nesting) and other wildlife species, Louisiana Quillwort or other sensitive plant species, merchantable timber, pine plantations, Longleaf pine ecosystem, pitcher plant bog ecosystems, mesic slope ecosystems, Black Creek Wild and Scenic River, seed orchards, Harrison Experimental Forest, minerals and energy production facilities, soil and water values, and heritage resources.
- Wildfire Risk Index Pilot Project
 - In 2019, Forest Service researchers did a deeper analysis of fuel treatments on five CFLRP projects (Southwest Jemez (NM), Oregon Southern Blues (OR), Northeast Washington (WA), Missouri Pine and Oak Woodlands (MO), and Accelerating Longleaf Pine Restoration (FL)).
 - Analysts performed wildfire simulations and risk calculations on pre-treatment (2012) and post-treatment (2019) landscape conditions for these five areas. In general, all study sites showed a decrease in average burn probability and expected annual area burned, a decrease in predicted flame lengths, and decrease in flame lengths greater than 6 feet and 8 feet.
 - These results indicate management actions can reduce wildfire risk on treated landscapes.
 - The pilot study also examined changes in expected wildfire intensity in the treatment areas compared to the entire project area. This analysis found changes in expected wildfire intensity between 2012 and 2019 were spatially variable. In general, the concentration of major decreases in expected wildfire intensity were generally within the treatment area, and the percent change in expected wildfire intensity was smaller across the entire project area.
 - For more information, contact Greg Dillon (greg.dillon@usda.gov) or Jim Riddering (james.riddering@usda.gov).

What will take more time and/or analysis to assess?

- Theoretically, current treatments should lower suppression costs over time. In particular, many CFLRP projects reported that their treatments allowed firefighters to bring fires under control during initial attack and while still small.
- However, fuel treatments are one of many factors affecting suppression costs, such as wildfire season severity, fire terrain, proximity to the WUI, and suppression strategies.⁷ Whether overall costs decrease also depends on how these other factors change as well.
- Highlights of CFLRP results related to suppression costs include:
 - Projects reported that hazardous fuels reduction treatments contributed to reducing wildfire costs by creating a safer environment for firefighters by reducing flame lengths, fire intensities, and the potential for crown fire.
 - Additionally, projects reported that treatments reduced costs of fire suppression either by keeping fires small where safe and aggressive initial attack is successful or by giving firefighters a safe line of defense in front of a large wildfire to protect values at risk.

⁷ https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_53.pdf

- CFLRP Risk and Cost Analysis (R-CAT)
 - From 2010 to 2014 the Forest Service used Risk and Cost Analysis Toolkit (R-CAT) to improve our understanding of cost savings using fire modeling. The initial R-CAT results indicated the potential for CFLRP fuel treatments to reduce various fire management cost components.
 - The results of the modelling indicated that you could expect the various fire management program components, small fire costs, large fires costs and post fire costs to be reduced with the investment you make in fuel treatments.
 - Nearly all the 10 CFLRP projects analyzed had a treatment package modeled as having the ability to reduce total discounted (4% annually) suppression costs savings over the full duration of treatment effectiveness.
 - The model although robust, does not incorporate all factors that can influence the final costs of fire suppression efforts. Each wildfire receives an appropriate, risk informed and effective response. There is not one standard for how any one wildfire is responded too hence the significant range in costs for fires in similar areas and environmental/ecological factors. Additionally, the influence of WUI development, climate change and increased socio-political factors has and will continue to change the cost outcomes significantly from historical averages.
 - In addition, the R-CAT model captures only a small part of the return on the investments that forestry with a fuel treatments objective can provide.
 - Visit <https://www.fs.fed.us/restoration/CFLRP/guidance.shtml> for further information on R-CAT and results.
- More work is needed on understanding the full set of benefits and avoided costs achieved from fuel treatments within CFLRP projects. See the [“What questions emerged that need more investigation?” for further discussion.](#)

What prioritization approaches and treatment techniques were tried and how did they work? Was work completed at the appropriate scale?

What do we know?

- Projects’ annual reports stated that treatments were prioritized in high or very high fire hazard areas as well as maintaining desired conditions in low fire hazard areas
- High priorities listed by projects include: hazardous fuels reduction, projects in wildland urban interface and forest restoration, areas of high crown fire potential and watersheds, infrastructure, readiness for implementation, and alignment with partners and community network, areas adjacent to private inholdings, and alignment with other existing restoration strategies.
- Treatments were placed in wildland urban interface (WUI) areas, areas with high likelihood of crown fire, and areas where fires might negatively impact infrastructure and watersheds, with goals of reducing flame lengths and wildfire intensities.
- Prioritization of treatment was also based on potential windows of opportunity for spring or fall burn windows.
- Specific examples of prioritization approaches, treatment techniques and their impacts can be found in individual project annual reports. See [CFLRP Project Data](#) for where to learn more.
- CFLRP projects offer many examples of how projects designed their treatment scale and technique to reach project goals. See [Examples of Scale and Techniques of Treatment Impacts of the Appendix.](#)

What will take more time and/or analysis to assess?

- Many projects reported that the scale of WUI treatments has typically been smaller in acreage to avoid creation of large amounts of contiguous slash near values at risk, since the slash must also be treated to reduce risk and intensity of wildfire impacts.
- More work is needed to assess the long-term efficacy of the treatments and how CFLRP projects are set up for long-term maintenance of their fuels treatments.

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- The Wildfire Risk Index Pilot provided useful information of the expected impact of CFLRP fuels treatments on wildfire behavior. The ecological indicator reports on fire regime restoration show progress toward locally developed desired conditions. However, there is still more work needed to have common standards for quantifying reductions in wildfire risk at landscape scales. Further discussion of options for improving monitoring are available in the [Monitoring section](#).
- A common theme in many projects' reports was that they had expanded the scale of their work and they saw a need to expand their work even further, especially through prescribed fire and the use of wildland fire for resource benefit. See further discussion of these topics in the [prescribed fire](#) part and [use of wildfire for resource benefit](#) part below.

What did we learn about the role of community engagement, and best practices for community engagement? What did we learn about the impact of smoke in communities and public reaction/support?

- Projects reported that coordinated efforts with partners were key to the success of fuels reduction treatments. Treatments were coordinated with state agencies, federal agencies, tribes and other organizations.
- Partners were engaged in the planning and implementation of fuels treatments. Engagement included annual and coordination meetings where updates on progress and next steps on treatments were discussed.
- Shared values, strong relationships and open channels of communication resulted in strong partner engagement.
- In general, smoke in communities from prescribed fire and other fuels treatment have generated mixed reactions from the public. In many cases, this has restricted the use of prescribed fire treatments to certain seasons such as the fall and winter. In other places, communities have developed community response plans to address this issue through proactive fire adapted forest restoration treatments.
- Some examples of projects' community engagement and partnership strategies, including challenges and strategies for dealing with smoke in communities, are provided in the [examples of community engagement in the Appendix](#). Further examples are in the projects' annual reports; links to these are available in the [CFLRP Project Data section](#).

What were the most important challenges and limiting factors to prescribed fire? What are key innovations & best practices to share?

Barriers to prescribed fire across CFLRP projects included:

- In many places in the West the lack of wood processing facilities hampers the ability to implement cost-effective logging. This in turn means reduced capacity for thinning treatments and receipts to support stewardship improvements.
- Some projects reported the impact of limited staff capacity and/or unexpected impacts to staff resources, like the 2018/2019 federal furlough.
- Weather and climatic conditions (e.g., drought, flooding) are limiting factors in some parts of the country.
- Acquisition and purchasing difficulties were barriers for some projects.
- Due to NEPA and litigation, prescribed burning is sometimes intentionally made smaller when in fact it is cheaper at larger units.
- Limitations to increase the acres treated include smoke management, limited burn windows, and severity of fire season that limits resource availability.
- Capacity to implement prescribed burns, for example, having adequately trained and available personnel when needed.
- Logistics and policy considerations of implementing prescribed burns across boundaries.

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- Community perspectives and concerns around the role of fire on the landscape.
- Need for learning and adaptation as projects go from collaborative planning to implementation.

Best practices for dealing with these challenges included:

- Building a long-term and mixed program of work to support a diverse contractor pool
 - An example from the Northeast Washington CFLRP illustrates this point. The project reported emphasis and funding over the past several years has resulted in many of those projects achieving more complete fuels treatments through our contract activities and opportunities. In turn, the emphasis and amount of fuels reduction work has provided not only job opportunities for local workers, but drawn contractors into the area, ensured steady work 'in the woods' for 6-8 months of the year and benefited local businesses. The type of contracting being administered, the variety of fuels reduction activities, the funding and management support and breadth of ongoing projects are all vital to continuing the pace of activities being accomplished.
- Strong community outreach and education campaigns
 - See examples in [the examples of community engagement in the Appendix](#).
- Collaborative involvement in implementation – from zones of agreement to contract specifications
 - Some projects reported that ongoing adaptation is needed as they moved for the original collaborative vision of the project to implementation realities. For example, some found the treated stands were too dense. There was often a time lag between contract development and implementation monitoring and agreed to language may not be communicated well.
 - Some projects reported they could better navigate this challenge by having specific working groups focus on moving the overall desired conditions to contract specification language. It was important to close this loop from design to implementation.
- Prioritizing staff resources for critical burn windows
 - Projects reported the importance of strategic use of staff resources during burn windows. For example, one project said they've learned that short-term planning for burn execution must involve ground level burn area assessments with a quick response by the entire Forest (and even the Region) to support the burning of the prioritized landscape. In doing so, the highest priority areas that are ready to burn, based on site conditions, get the proper attention as the highest priority on the Forest.
- Learning and training networks for prescribed fire:
 - CFLRP projects both contributed to and benefited from communities of practice like Fire Learning Network (FLN) and Fire Adapted Communities Learning Network. See the [Appendix](#) for a list of overlap between CFLRP projects, FLN and FACLN.
 - Prescribed Fire Training Exchanges - Prescribed Fire Training Exchanges (TRES) and cooperative burns provide experiential training that builds robust local capacity for fire management and offers professional fire practitioners a more holistic perspective—while implementing treatments that support community and landscape objectives.
 - This is a [one-page](#) overview of Prescribed Fire Training Exchanges (TRES), innovative experiential trainings developed under the "Promoting Ecosystem Resiliency and Fire Adapted Communities Together" (PERFACT) cooperative agreement .
 - Prescribed fire capacity [solutions](#): A set of one-page handouts by TRES coaches covering some of the strategies they use to support prescribed fire capacity. These include youth crews, VFDs, PBAs and more.
 - [Case Study \(2019\): Building Collaboratives for On-the-Ground Results](#)
A two-page case study of the development of the Forest Steward Guild's All Hands All Lands Burn Team to support prescribed burning in northern New Mexico. TRES events and people played key roles in this process.
 - More TRES prescribed fire best practices [here](#)

What were the most important barriers to increased use of wildfire for resource benefit? What were the innovations and best practices to share?

- In general, projects reported that managing wildfires for resource benefit can be incredibly helpful for a landscape from an ecological standpoint and can lead to increased fire fighter health and safety. However, they also reported it requires extensive and advanced land management planning, building community understanding of the technique and often involves a change Forest Service business practices.
- Some CFLRP Projects have shown the effectiveness of past fuels treatments in creating more decision space for fire managers to utilize wildfire for resource benefits.
 - The Grandfather Restoration project (2019) and Selway Middle Fork (2018) found, “fuel treatments along with management of natural ignition wildfires have moved the fire-adapted vegetation closer towards the desired condition of fire resilient landscapes”.
 - Strategic placement of treatments is effective in controlling and managing unplanned ignitions, thereby reduce spread, reducing fire behavior and keeping flame lengths short. The Grandfather Restoration project also showed that managing unplanned ignitions for resource benefit are reducing both the cost and risks associated with fire suppression.
- These results are not unique to the CFLRP program and generally align with experiences from wildland fire use across the Forest Service.
- [Examples of wildfire use for resource benefit from several CFLRP projects in the Appendix](#) illustrate both the potential benefits of this tool and the challenges of aligning all the needed factors for it to be feasible. These examples, and more in the [annual project reports](#), provide a data source for more learning on this topic.

What did we learn from the 23 projects’ ecological indicator reports that focused on restoring natural fire regimes?

The goal of the ecological indicator report is to assess the ecological outcomes of CFLRP projects funded under the Collaborative Forest Restoration Act of 2009 in a way that is relevant to each individual collaborative group and its specific desired conditions, while also allowing for a national summary. Collaboratives developed ecological indicators to track progress related to fire regime at the project and landscape scale. For the purposes of the ecological indicator reports, project-scale refers to specific treatments like a prescribed fire and landscape scale refers to results across the entire CFLRP landscape. Scoring is conducted by a multi-party monitoring group. This section provides a summary of the fire regime indicator results; further details on individual project results and the national indicator guidance are available [in the CFLRP Project Data part](#).

Project-scale results:

- 16 out of 23 projects reported that they were making progress towards their desired conditions across 75% or more of their project areas. 7 projects reported that they were making expected progress across 26% to 75% of their project areas.
 - As one example, on the Short-leaf Bluestem project (AR), surveys of post-burn evaluations show that roughly 90% of the area treated with prescribed burning is obtaining the change desired.
- Most common quantifiable desired condition statements include – prescribed burn projects meeting prescription objectives as quantified in the burn plan (4 projects), treatments resulting in average predicted flame lengths of various feet (5 projects) and achieving desired or undesired conditions (5 projects).
- Common broader goals (cited in over 75% of projects) central to desired conditions include - reduce risk/likelihood of uncharacteristic wildfires, re-establish natural fire regimes and move landscape to historical

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range of variability and/or natural range of variability, restore/maintain fire dependent and tolerant species, restore/maintain native species, restore/maintain heterogeneity, increase use of prescribed fires.

- The Desired Conditions were highly variable across projects with % Change ranging from 20-100% and the % of Project Area ranging from 7.4 to 100%.
- Types of monitoring to assess Project scale progress towards fire regime desired conditions (cited in over 75% of projects) include - accomplishment reporting and effectiveness monitoring.
- Methodologies used to assess Project scale progress towards fire regime desired conditions (cited in over 50% of projects) include - field-based sampling/plots, treatments implemented, observation/expert opinion, fuels treatment effectiveness.
- Data used for monitoring project progress towards fire regime desired conditions is stored in FACTS and local databases, according to half of the projects.

Landscape-scale results:

- 17 out of 23 projects reported that they were making good progress towards their desired conditions at the landscape scale; 6 said they were making fair progress. The specific metrics for what qualified as good and fair is defined in the individual project reports.
- Many projects established 10-year goals and used those to create threshold ranges for progress for green, yellow, and red.
- The most common quantifiable desired condition statements referenced using fuel models (5 projects), and risk of crown fires on landscapes (6 projects).
- Common broader goals (cited in over 75% of projects) central to desired conditions are reduce risk/likelihood of uncharacteristic wildfires, re-establish natural fire regimes and move landscape to historical range of variability and/or natural range of variability, Increase use of prescribed fires.
- Key outcomes projects are hoping to achieve on the landscape:
 - All projects chose protect communities and high valued resources/reduce risk of loss and reduced fire suppression costs and avoid costs,
 - Most chose increased options/opportunities for managers to control/manage wildfires, protection of water quality/supply and public and firefighter safety.
- Desired Conditions were highly variable across projects with % Change ranging from 5-100%, % of landscape Area ranging from 5 to 100%.
- Accomplishment reporting was cited in over 75% of projects to assess Landscape scale progress towards fire regime desired conditions.
- Methodologies used to assess Landscape scale progress towards fire regime desired conditions (cited in over 50% of projects) include treatments implemented, and observation/expert opinion.
- Eighty percent of projects used data stored in FACTS to monitor landscape progress toward fire regime desired conditions.
- Evaluation metrics to monitor progress include but are not limited to fuels plots including effectiveness, fuel loading and structure, vegetation cover, fire return/prescribed burning, grid inventory plots, basal area, percent canopy cover, veg. composition, footprint acres treated, conditional flame length.

General observations and methodology

- Most difficult barriers and challenges cited in the reports included: short windows for prescribed fire (due to drought/other conditions), NEPA delays, objections, litigation, funding, lack of consistent staffing, difficulty creating timber markets, and the 2019 government shutdown.
- Unanticipated developments affecting project results were usually related to NEPA, litigation and fires in the project area.
- Methodology
 - Close to half (11) of the CFLRPs made changes to their respective desired conditions for fire regimes as compared to 2014 ecological indicator reports.

- Less than 40% of projects made changes to monitoring methodologies for fire regime as compared to the 2014 ecological indicator reports.
- Very few projects (9) used new or updated baseline data for evaluating fire regime progress.
- Less than half CFLRP projects (10) included the effects of treatments on areas adjacent to the active treatment area. The ones that did cited work on private lands.

What questions emerged that need more investigation?

- The risk reduction index pilot on five CFLRP projects provided a more comprehensive look at the impact of hazardous fuels treatments than the traditional CFLRP measures. CFLRP projects found the pilot a useful exercise that prompted deeper discussion and understanding of the impact of the fuels treatments. Broader use of the index pilot would allow for this type of learning across more projects, offering broader opportunity for gauging success and identifying options for improved treatments.
 - However, expanding this type of analysis would require a commitment to supporting fire analyst positions across the NFS. This capacity does not currently exist.
- How can CFLRP best contribute to building and sustaining capacity for increased prescribed fire over time? There is a broad community working on this challenge; how can CFLRP best add to this effort?
- Where and under what conditions are wildfires for resource benefits being utilized? Are the benefits similar to or different from prescribed fire? How can CFLRP help advance effective use of this tool moving forward?
- Further analysis is needed on the strategic placement of treatments across the landscape – are treatments occurring in the highest priority places for the biggest impact at the landscape scale?
 - What role can spatial planning tools like Potential Operational Delineations (PODs) or scenario investment planning play in promoting strategic treatments? What are the differences in results between CFLRP projects that use these tools compared to those that don't?
 - There are more resources coming out on spatial analysis tools for wildfire risk assessments (e.g. the Ecological Restoration Institute (ERI) plans to publish an assessment soon). What do these resources suggest for how CFLRP projects approach their work?
 - There is a broad community working on this challenge; how can CFLRP best add to this effort?
- What role can markets for low-value timber play in facilitating fuels treatments? How can local projects develop strategies specific to their local conditions?
- Are there improvements to consider in terms of coordination across vegetation management staff and hazardous fuels staff in terms of meeting necessary timelines for prescribed burning after thinning?
- What can we say about if and how projects will maintain wildfire risk reduction once their CFLRP project is completed?
- What can we say about quantifying avoided costs from fuels treatments within CFLRP projects?
 - CFLRP fuels treatment effectiveness monitoring indicates fuels treatments reduce negative impacts of wildfire and give fire managers improved decision space.
 - Some examples of more specific research on this question are provided in [the Relevant Research part below](#).
 - From 2010 to 2014 the Forest Service used Risk and Cost Analysis Toolkit (R-CAT) to improve our understanding of cost savings using fire modeling. The initial R-CAT results indicated the potential for CFLRP fuel treatments to reduce various fire management cost components. See discussion under [“How did projects reduce risk?”](#) for further details.
 - However, the model does not incorporate all factors that can influence the final costs of fire suppression efforts and only captures a small part of the return on the investments that forestry with a fuel treatments objective can provide.
 - More work is needed on understanding the full set of benefits and avoided costs achieved from fuel treatments within CFLRP projects.

Where to Learn More/Resources for More Information:

CFLRP Project Data

- CFLRP annual reports: The annual reports incorporate several reporting elements, from the performance measures in the databases of record, to TREAT economic analysis, to the narrative components. More than simply being a requirement, the annual reports are a critical opportunity to collect and consolidate success stories, themes, issue areas, and lessons learned from across the 23 CFLRP projects. 2019 Annual Reports here: <https://usfs.app.box.com/folder/96650709408> and on the CFLRP website at <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
 - The **2018 and 2019 CFLRP annual reports** included a revised question regarding fire risk reduction and restoration of desired fire regimes. The responses provide rich data and case studies regarding best practices and lessons learned through successes and challenges (Question 2): <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
- CFLRP ecological indicator reports: The goal of the ecological indicator report is to assess the ecological outcomes of CFLRP projects funded under the Collaborative Forest Restoration Act of 2009 in a way that is relevant to each individual collaborative group and its specific desired conditions, while also allowing for a national summary. Collaboratives developed ecological indicators to track progress related to fire regimes, fish and wildlife habitat, invasive species, and watershed condition. The ecological indicator report is *not* intended to capture all the monitoring work completed within a CFLRP project. Rather, it is intended to provide a better understanding of the extent to which the CFLRP project is progressing towards the desired ecological conditions outlined in its proposal.
 - 2014 and 2019 Ecological Indicator Reports are available on the CFLRP website at <https://www.fs.fed.us/restoration/CFLRP/results.shtml>.
 - A compiled summary of ecological indicator results is also available at the bottom of the list of 2019 reports on the same webpage.
 - National guidance for developing the reports is available at <https://www.fs.fed.us/restoration/CFLRP/guidance.shtml>
- Spreadsheet of annual accomplishments (2019): <https://usfs.app.box.com/folder/95422649301>. Available upon request.
- Spreadsheet of cumulative accomplishments: <https://usfs.app.box.com/file/570621924971>. Available upon request.

Case Studies and Relevant Research

- Expectation and evaluation of fuel management objectives (Finney [paper](#)) – Throughout the life of the program the projects have shared lessons learned and served to increase the use of applied science. Sometimes this takes the form of sharing relevant science in the field of wildfire risk management. Specifically, the success of fuel management in helping achieve wildland fire management goals is dependent first upon having realistic expectations. Second, realizing the benefits of fuel management is dependent on their application at the appropriate scale. Accomplishing the broad goals for fuel management requires understanding how proposed treatments directly contribute to solving specific problems. This process of finding solutions to fire problems is framed in terms of “fire risk management” or reduction of “expected loss”. This conceptually depicts the way that treatments can influence fire behavior and thus produce benefits by reducing losses and it avoids the unrealistic expectations that fuel management will stop wildfires and prevent homes from burning.
- Reduction of size and frequency of wildfires resulting from hazardous fuel treatments. Research has shown that when a wildfire encounters fuel treatments, wildfire size could be reduced by as much as 63%, depending on vegetation type, fuel treatment and wildfire conditions (<http://www.publish.csiro.au/wf/WF11079>). They have

also found that a hazardous fuel treatment programs can reduce wildfire occurrence by 12 to >50%, depending on the region, vegetation type, and the nature of the fuel treatment program (<http://www.publish.csiro.au/wf/WF14187>; <https://www.fs.usda.gov/treesearch/pubs/55535>).

- Project-level Literature – In 2019, three CFLRP projects (Amador Calaveras Cornerstone, 4FRI, and Grandfather Restoration) provided information on assessments/reports that were conducted in their respective landscapes on cost reduction, cost avoidance, and fire suppression costs. Studies came to similar conclusions of treatments being effective in reducing wildfire suppression and related costs.

1. Amador Calaveras (CA)

In 2014, The Nature Conservancy, Sierra Nevada Conservancy, and the US Forest Service completed the Mokelumne Watershed Avoided Cost Analysis. <https://sierranevada.ca.gov/mokelumne-watershed-avoided-cost-analysis/>

2. 4FRI (AZ)

- a) Thomas Combrink and Wade Rouse. 2019. The Economic Impact of Post Fire Flooding Bill Williams Mountain the Alliance Bank Economic Policy Institute The W.A. Franke College of Business Northern Arizona University. <https://in.nau.edu/wp-content/uploads/sites/212/The-Economic-Impact-of-Post-Wildfire-Flooding-Bill-Williams-Mountain.pdf>

Summary: Potential damages from a catastrophic wildfire and the post-fire flooding in the Bill Williams Mountain watershed are estimated to be between \$379 million and \$694 million. This study estimates the post-fire flood impacts on the City of Williams located directly north of the Bill Williams watershed. The impact as shown in this study to thin the forest on Bill Williams Mountain makes the case for such a restoration. It is estimated to cost between \$4 and \$8million to thin this forest. This seems like a small investment compared to even the low end of the potential damage estimate of \$379million

- b) Changes in potential wildland fire suppression costs due to restoration treatments in Northern Arizona Ponderosa pine forests. Forest Policy and Economics Volume 87, February 2018, Pages 101-114. <https://www.sciencedirect.com/science/article/pii/S1389934116302362>

Summary: We examine past fires across the Northern Arizona landscape to determine fire behavior characteristics that are significant in predicting wildfire suppression costs and capable of being modeled in fire simulations prior to wildfire events. We find burn severity metrics to be significant in predicting wildfire suppression costs. Three proposed treatment alternatives for the Four Forest Restoration Initiative (4-FRI) are analyzed to determine treatment effectiveness and policy implications in reducing burn severity metrics and wildfire suppression costs. The more aggressive treatments are more effective in reducing wildfire suppression costs except in the case of sever wind and weather events.

- c) Expected wildfire suppression costs for proposed 4FRI treatment areas. In the Colorado Plateau VI: Science and Management at the Landscape Scale (pp. 331-338). University of Arizona Press. <https://www.scopus.com/record/display.uri?eid=2-s2.0-84952332372&origin=inward&txGid=2bafcb4380443a44a5c3374c410cd5c5>

Summary: Our study compares current wildfire behavior conditions across the landscape to the predicted wildfire behavior conditions associated with the proposed treatments in an effort to determine the monetary changes between expected wildfire suppression costs under current

conditions and treated forests. Using the proposed treatment area on the Kaibab National Forest as a case study, we estimated total suppression costs range between \$1,439,091 and \$2,454,471 (2002 dollars) for areas classified with a risk of severe wildfire.

3. Grandfather Restoration Project (NC)
 - a. Bald Knob Fuel Effectiveness Report - https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd482844.pdf

Summary: A lightning strike started the Bald Knob fire on July 14th about 30 miles east Asheville, North Carolina on the Grandfather Ranger District of the Pisgah National Forest, part of the National Forests in North Carolina. The ignition point was situated in rugged, back country terrain, limiting firefighter access. Fortunately, the surrounding area received fuel treatments and had seen past wildfires. These changes in fuel loading, fuel structure, historic line construction and local knowledge of values at risk afforded managers the opportunity to manage the fire to meet resource objectives while minimizing risk and exposure of firefighters. The strategic placement of the fuel treatments along with the past wildfires allowed for the appropriate response to this wildfire to be one that focused on restoring fire-adapted ecosystems and reducing fuels while providing for fire fighter safety and community protection. Collaboration with adjacent landowners and partners through the Collaborative Forest Landscape Restoration Program (CFLRP) was as critical in the planning and implementation of the fuel treatments as it was to the successful management of the Bald Knob fire.

Next Steps

- CFLRP results illustrate the benefit of multi-year, multi-partner, landscape-scale investments to make meaningful progress in reducing the risk of uncharacteristic wildfire.
- Community participation and engagement, supported by multi-party monitoring, have been key factors for success in this work.
- Key areas for improvement moving forward include better use and implementation of strategic placement of treatments, coupled with appropriate management of wildland fire for resource benefit. More work is also needed to have common standards for quantifying reductions in wildfire risk at landscape scales.
- Program staff are assessing ongoing challenges, identifying opportunities to address those challenges, and carrying out next steps with colleagues and partners for each Level 2 theme and across them as well.

Wildfire Risk Appendix

Detailed Hazardous Fuels Annual Data

The numbers below were pulled from the most recent (2019) annual project reports as an example of the detailed annual treatment and expenditure data available. Further analysis is needed to see what questions this data can answer about hazardous fuels treatments and suppression costs. See further discussion of this topic in the [How did projects reduce risks and costs section?](#)

2019 Acres Data

Since 2018, the WO CFLRP Team has been collecting annual acres and expenditure data related to the use of treating and reducing wildfires on boundary landscapes.

Row Labels	Sum of Acres
Number of acres mitigated to reduce fire risk	339,466
Number of acres of natural ignitions that are allowed to burn under strategies that result in desired condi	36,668
Number of acres treated by mechanical thinning	90,825
Number of acres treated by prescribed fire	174,054
Number of acres treated to restore fire-adapted ecosystems which are maintained in desired condition	292,201
Grand Total	933,214

2018 vs 2019 Acres data

- less prescribed fire in 2019
- more acres mitigated to reduce fire risk in 2019
- fewer acres treated by mechanical thinning in 2019

2019 Expenditure Data⁸

CFLRP Project	(All)
Year	(All)

Row Labels	Sum of \$
FY2019 Hazardous Fuels Treatment Costs (CFLN)	10,825,864
FY2019 Hazardous Fuels Treatment Costs (other BLIs)	24,833,194
FY2019 Wildfire Preparedness	48,605,863
FY2019 Wildfire Suppression	73,135,285
The cost of managing fires for resource benefit if appropriate (i.e. full suppression versus managing)	15,914,000
Grand total – treatments and wildfire management	173,314,206

Examples of project-specific impacts from fuels treatments

CFLRP projects offer many examples of the impacts of fuels treatments. These can be found in the annual reports on the CFLRP website and in compiled summaries (see “[Where to learn more](#)” section for links). A few examples are included here for easy reference.

- Uncompahgre Plateau (CO) – Modelling indicates that completed treatments will not support active crown fire and have low to moderate fuel loadings so they should be available for use as strategic control points for wildfire suppressing (also known as “anchor points”) and natural barriers for detrimental fire behavior.
- Deschutes Collaborative (OR) –
 - Deschutes NF has inferred that continued investment in proactive, fuels reduction activities (especially prescribed burning) will lead to improved initial attack success, potential for alternative management strategies, and ultimately a decrease in suppression costs.
 - In addition, the Deschutes project also has evidence of decreased Rx fire costs over time. The cost per acre cost of implementing a WUI prescribed burn is usually 3-4x higher than a non-WUI prescribed burn. However, as more prescribed fires are implemented and public understanding increases through outreach efforts of the DCFP Collaborative, there has been a notable cost reduction. As an example, we conducted a reentry into the first prescribed burn unit within West Bend Project Area, a project adjacent to the urban growth boundary of the community of Bend. The first entry prescribed underburn conducted in 2014 resulted in an exceedance of the NAAQS 24hr PM2.5 standard and received numerous negative public comments. The 2019 reentry required considerably less staffing and resulted

⁸ These totals do not include expenditure data from the Dinkey project in California.

in a minimal 1-hour smoke intrusion, resulting in only positive public support. As treatments continue across the landscape the pace and scale of utilizing fire as a both a final restoration and maintenance mechanism is expected to increase with good results.

- 4FRI (AZ) – 4FRI has utilized larger burn blocks on prescribe fire to decrease costs over from the beginning of the Initiative. In addition, expanded use of wildfire to meet forest plan conditions have decreased costs over the lifetime of the 4FRI Initiative. The Coconino NF has a joint burn plan with the State of Arizona to allow prescribed fire to cross jurisdictional boundaries which decreases costs and increased the benefit of prescribed fire across all lands.⁹
- Southern Blues (OR) - The utilization of the treatment blocks as they were planned (to reduce fire behavior & flame lengths and improve resiliency) should allow us to utilize technological advances in resources and not require direct suppression tactics across the entire CFLRP landscape.
- Burney Hat Creek (CA) – 2008 Peterson Fire and 2014 Bald Fire showed an inverse correlation between acres treated and fire intensity. See further details in the Burney Hat Creek annual reports.
- Ozark Highlands (AR) – Vegetation monitoring has indicated that combined treatments for the CFLRP project have been effective at shifting the vegetation communities and increasing species diversity. Specifically, in areas where timber harvest or midstory removal is combined with multiple entries of prescribed fire, the treated vegetation community is meeting the project-scale objectives. Prescribed fire alone is slowly moving the vegetation conditions toward the desired condition, but it is not clear at this stage if multiple prescribed fire entries alone will completely return the stands to the desired condition or how long that may take.
- Kootenai Valley (ID) - Where fire met a past treatment unit, treatments allowed firefighters to bring these fires under control during initial attack and while still small. As a testament to fuels reduction effectiveness, we believe had this area not been treated, extended attack would have been likely, potentially driving suppression costs into the hundreds of thousands of dollars.



Photo depicting the burned and unburned areas and the ‘severity’, or lack thereof, of the Mount Hall fire. Notice the minimal surface fuels (mostly just live grasses), no ladder fuels, and spaced tree crowns. The intensity of the fire, following a treatment a few years prior (Borderline Stew #125), was so low that a small tree within the perimeter survived (see foreground, middle of photo).

⁹ The 4FRI landscape has limited State of Arizona lands within the 4FRI boundary, the bulk of the Arizona state lands are centered on the Coconino National Forest.

Examples of the prioritization approaches and techniques of project treatments

- Lakeview Stewardship (OR) - On the Lakeview Stewardship project in Oregon, treatments were strategically located and effective, reducing spread, reducing fire behavior and keeping flame lengths less than 4 feet. This treatment allowed fire fighters to successfully manage the fire for resource benefit.
- Southwest Jemez (NM) – Treatment prioritization has focused on areas closest to private inholdings initially, to help protect homes and infrastructure. The scale of the WUI treatments has typically been smaller in acreage to avoid creation of large amounts of contiguous slash near values at risk, since the slash must also be treated to reduce risk and intensity of wildfire impacts. The treatment of the smaller areas facilitates a future increase in scale of treatments. As the WUI has initial treatments, the risk nearby is reduced and larger thinning and burning projects can be implemented. The cost is reduced as the landscape is tied together with larger areas treated with fire only, or reduced thinning preparation needed prior to burning. The treatments have been very successful, and have generally garnered the support of local residents, except for the inevitable complaints about smoke.

Examples of community engagement and partnerships supporting fuels treatments and smoke management

- Southwest Jemez (NM) - In the Southwest Jemez, partners are engaged in planning and implementation of prescribed burning through participating agreements for implementation and monitoring.
- Shortleaf Bluestem (AR) – Agreements with The Nature Conservancy, Oklahoma Forestry Services, Arkansas Forestry Commission, National Park Service – Buffalo River, Choctaw Nation, U.S. Fish and Wildlife Service – Wichita Mountains, and the BLM continue to supplement our work force executing prescribed burns.
- CO Front Range (CO) – Smoke management in some airsheds along the Front Range is a limitation. Project reported needing help with the permitting process.
- Southwestern Crown (MT) - Smoke issues due to high pressure sitting over the area, and public involvement restricted the use of some prescribed fire in the fall of 2019.
- Deschutes (OR)
 - Expanded Prescribed Fire - The DCFP Prescribed Fire Subcommittee continued to be a critical collaboration space surrounding effort to increase pace and scale of prescribed fire treatments across the Deschutes NF. “In FY19, we completed another round of prescribed fires on Bend Parks and Recreation Lands as part of a strategic fuels break on the west side of Bend with great success. During this burn we also hosted two public tours during the operation to assist community leaders in understanding the operational and ecological considerations that go into prescribed fire implementation”.
 - Community Engagement – We are also dependent upon a strong outreach and education campaign before, during and following implementation of prescribed fires near communities to enhance public understanding and increase social license. The DCFP Community Outreach and Engagement Planning Subcommittee progressively invests a significant amount of time and resources in developing short videos about the benefits of active forest management and particularly the application of prescribed fire. The video “Restoration in a Fire Forest: The Benefits of Burning” highlights the historic context of fire suppression and the importance of reintroducing prescribed fire to restore ecological function in fire-adapted ecosystems.
 - Prescribed Fire Smoke Community Response Plan - The Deschutes Collaborative, Central Oregon Prescribed Fire, Smoke, and Public Health Collaborative, City of Bend, and Deschutes County worked together to craft a Prescribed Fire Smoke Community Response Plan for the City of Bend airshed.

Through enhanced community outreach, communications, and notification as outlined in this document, we will both increase the window of opportunity for these critical treatments while mitigating public exposure to smoke from all wildland fire sources (prescribed and wildfire) and better protecting public

health and safety in the near- and long-term” (Community Plan pg. 5). Some components of the Response Plan include –

- Providing timely, accurate, reliable, locally relevant, and advanced notification about planned prescribed fire and potential smoke impacts;
- Using clear, simple, and consistent messaging to improve recall, understanding, and compliance with public health recommendations to reduce smoke exposure;
- Preemptively identifying smoke-vulnerable populations and strategies to provide advanced warning so these individuals can take appropriate actions to reduce their exposure;
- Using multiple channels/methods of communication to optimize reach across a diverse public; Using innovative technologies, such as social media networks and text alerts, to complement and enhance traditional communication systems, and;
- Collaboratively developing and implementing communications plans to leverage the reach of partner organizations, ensure trust and credibility of messages and messengers, and thereby enhance communication effectiveness (pg. 5 – 6. see link below.)

https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=2ahUKEwia46C26cfoAhVRma0KHRrFAh4QFjAAegQIAxAB&url=https%3A%2F%2Fbend.granicus.com%2FMetaViewer.php%3Fview_id%3D9%26clip_id%3D499%26meta_id%3D30407&usg=AOvVaw2AAOArJTJ3jg9hlfK7eUck

Crosswalk of CFLRP Projects, Fire Learning Network and Fire Adapted Communities Learning Network

CFLRP Project Name	Fire Learning Network *	Fire Adapted Communities **
Longleaf Pine Restoration Ecosystem Restoration and Hazardous Fuels Project		
Northeast Washington Forest Vision 2020		X (Washington Fire Adapted Communities Learning Network)
Ozark Highlands	X (South Central FLN)	
Accelerating Longleaf Pine Restoration		X (Florida Forest Service, Baker County, FL)
Colorado Front Range Roundtable	X (Pike’s Peak FLN)	X (Coalition for the Upper South Platte)
Deschutes Collaborative Forest Project	X (Deschutes FLN part of the Northwest FLN)	X (Project Wildfire)
Dinkey Restoration Project		X (California Fire Safe Council)
Four Forest Restoration Initiative		X (Greater Flagstaff Forests Partnership)
Selway Middle Fork		
Southwest Jemez Mountains	X (Rio Grande Water Fund FLN)	X (Forest Stewards Guild)
Southwestern Crown of the Continent		
Tapash Collaborative	X (Washington Dry Forests Fire Learning Network)	X (Chumstick Wildfire Stewardship Coalition)

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		X (Washington Fire Adapted Communities Learning Network)
Uncompahgre Plateau		
Amador Calaveras Cornerstone		X (California Fire Safe Council)
Burney Hat Creek Basins		X (California Fire Safe Council)
Grandfather Restoration Project	X (Southern Blue Ridge FLN)	
Kootenai Valley Resource Initiative		
Lakeview Stewardship	X (Northwest FLN)	
Missouri Pine Oak Woodlands		
Shortleaf Bluestem	X (South Central FLN)	
Southern Blues Restoration Coalition		
Weiser Little Salmon Headwaters		
Zuni Mountains		

*The Fire Learning Network (FLN) is a system of landscape-scale collaborative projects that work to accelerate the restoration of fire-adapted ecosystems at local, regional and national scales. Collaborative planning, implementation, adaptive management and sharing lessons learned are at the core of the Network. Participants have a common desire to learn and to share their results and insights with one another; this allows landscape teams to more rapidly overcome barriers to sustainable and integrated ecological, social and economic solutions for the long-term conservation of these important lands. More here:

<https://www.conservationgateway.org/ConservationPractices/FireLandscapes/FireLearningNetwork/Pages/fire-learning-network.aspx>

**Launched in 2013, the Fire Adapted Communities Learning Network is stewarded by the Watershed Research and Training Center and The Nature Conservancy. Together with the U.S. Forest Service and the Department of the Interior, we share a vision of accelerating the adoption of fire adapted community (FAC) concepts across the nation using a tested learning network approach. More here: <https://fireadaptednetwork.org/>

Examples of wildfire use for resource benefit – successes and challenges

- Southwestern Crown of the Continent (MT) In 2018 there were a total of six wildfires which burned 2.4 acres within the CFLRP boundary. Of the six wildfires, only two were ignited by natural ignitions and possible candidates for resource benefit objectives. Of the two natural ignitions, one was within the WUI and the other was within the Mission Mountains Wilderness by a half mile. Due to the elevated fire danger rating and energy release component, the decision was made to suppress the Cold Lake wildfire as conditions were outside of the current operating plan for the Mission Mountains Wilderness.
- Grandfather Restoration Project (NC) –
 - o FY2015 saw 30 wildfires within the project area, totaling 2,935 acres (26 were human caused). The human-caused wildfires (which mainly originated on non-FS lands) were immediately suppressed, while the 3 of the 4 lightning-caused wildfires were managed for resource benefit using a “confine and contain” strategy (Blue Gravel- 521ac, Wolf Creek- 305ac, and Bald Knob- 1,200ac).
 - o In response to the March 2017 White Creek Fire on Shortoff Mountain in Linville Gorge Wilderness, a natural-ignition fire managed for resource benefit, the US Forest Service and collaborative partner Wild

South entered into a partnership agreement to include nonnative invasive species (NNIS) inventory and mechanical treatment work covering target zones within the wilderness portion of the burn area. Within the White Creek wildfire, the greatest risk of new nonnative plant species invasions was found to be in high fire intensity areas with total or partial canopy loss and moderate intensity areas that also occur in the open areas that resulted from a previous wildfire. Without treatment, these infestations would spread within the surrounding burned areas. If NNIS increased post burn, the critical values at risk would be the untrammelled nature of the native plant communities within Linville Gorge Wilderness and impacts to the two federally listed plant species, mountain golden heather and Heller's blazing star.

- As of FY19, there have been no formal reviews of suppression costs comparatively between areas treated with prescribed fire and unburned areas within the Grandfather CFLRP landscape. Regardless, the 2018 report noted that, "fire managers have demonstrated that the active management as well as the ability to manage unplanned ignitions for resource benefit are both reducing both the costs and risks associated with fire suppression.
- To date, the Grandfather Restoration Project fuel treatments have been integral to restoring more fire-adapted ecosystems and allowing for the appropriate fire management response to wildfires, leading to more fires being managed for resource benefits while allowing for public and firefighter safety over the life of the project.
- Fuel treatments along with management of natural ignition wildfires have moved the fire-adapted vegetation closer towards the desired condition of fire resilient landscapes.
- Kootenai Valley (ID) – The Parker Ridge Fire burned approximately 6,720 acres within the CFLRP project area in FY15 and 3,921 of those acres were managed for resource benefit. A monitoring plan has been developed and plots have been established to assess the effectiveness of this fire in meeting the landscape objectives of the CFLRP project.
- Lakeview Stewardship (OR) – In 2019, the Dairy Creek Fire was a natural ignition that was managed for resource benefit totaling 107 acres. A fuel treatment effectiveness monitoring (FTEM) report was completed for the Dairy Creek Fire and results indicated that 87 acres of the fire had previously been mechanically treated within the Deuce Pilot Project. The treatments were strategically located and effective in controlling and managing the fire, reducing spread, reducing fire behavior, and keeping flame lengths less than 4 feet. This treatment allowed fire fighters to successfully manage the fire for resource benefit.
- Selway Middle Fork (ID/MT) - The Selway Bitterroot wilderness has a long history of managed fire. In 2017 over 50,000 acres of wildfire were managed for resource benefit and to meet Forest Plan desired conditions.

Community Socioeconomic Benefits

CFLRP projects emphasize the connection between restoration, economic stability, and the social values communities hold. The community connection includes support for the forest products business and infrastructure, recreation and tourism, and engaging youth and the public in the management of their public lands. CFLRP participants commonly cite relationship building, locally retained contracts, partnership composition, job training opportunities, and cross institutional agreements as key community benefits. CFLRP Projects create positive shifts in local support and provide capacity for restoration work.

The community socioeconomic benefits section is organized into subsections. A hyperlink to the subsections, and parts within each subsection, is provided here for easy reference.

- The [Lessons Learned](#) subsection addresses the following questions:
 - [What economic and social benefits did CFLRP projects provide for, or encourage, in local communities?](#)
 - [Does CFLRP have long-term community social and economic impacts?](#)
 - [What kinds of restoration and related activities provided benefits?](#)
 - [Did CFLRP increase social capacity and infrastructure in local communities?](#)
 - [What did we learn about expanding markets for biomass/small diameter woody material and building local industry capacity?](#)
- [What questions emerged that need more investigation?](#)
- [Where to Learn More](#)
- The [Next Steps](#) subsection gives a brief overview of how this information will be used moving forward.

Lessons Learned

What economic and social benefits did CFLRP projects provide for, or encourage, in local communities?

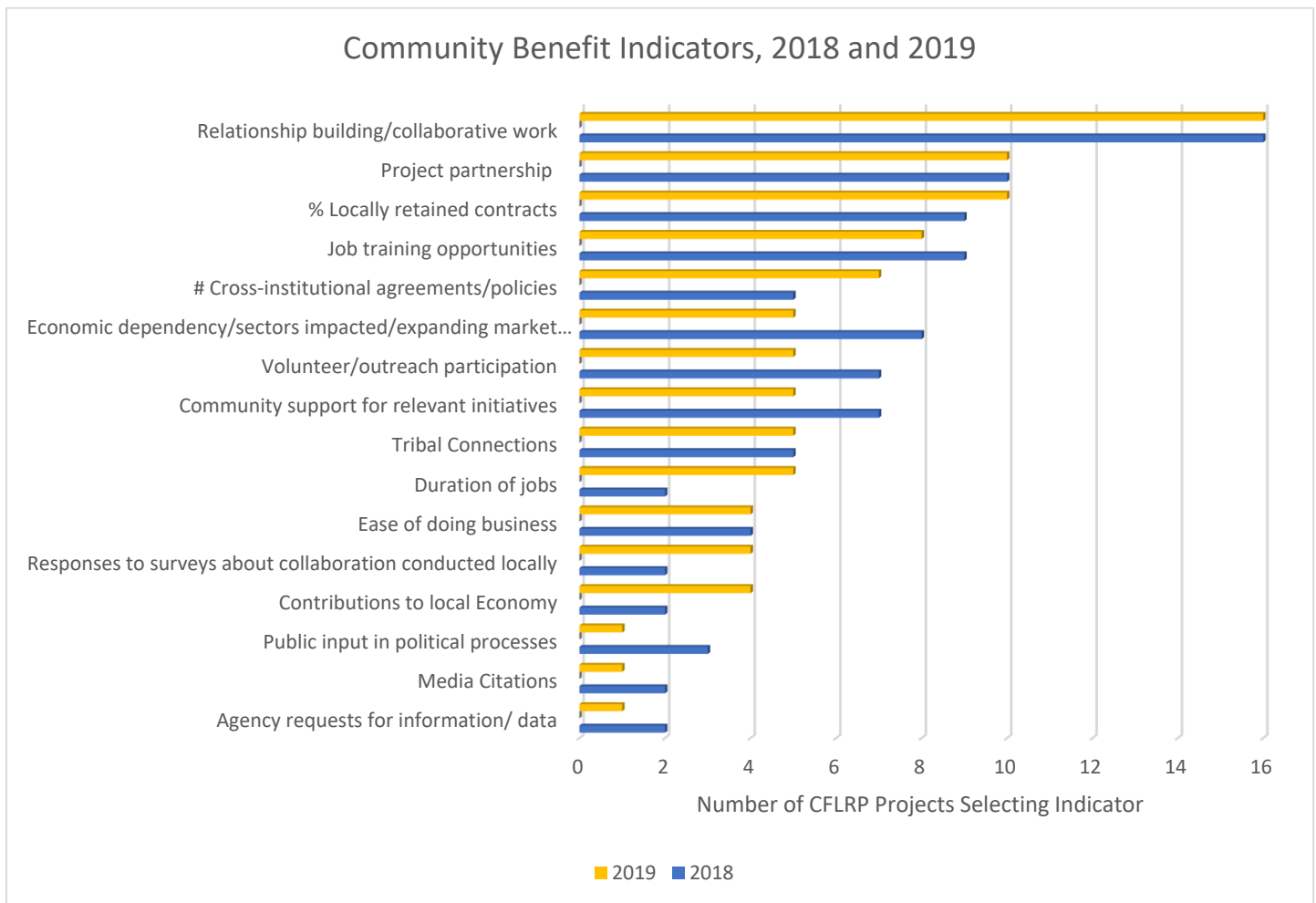
Background:

In 2011, the National Forest Foundation led a process with collaborative partners and Forest Service representatives from each of the first 10 CFLRP projects to develop a set of national indicators. One of the resulting five indicators was economic impact. The main source of data to tier to this indicator across all 23 CFLRP projects (the minimum national reporting requirement) was TREAT – the Treatment for Restoration Economic Analysis Toolkit. It is an economic tool developed by the Forest Service to estimate employment and labor income impacts from proposed restoration activities.¹⁰

In their 2018 and 2019 CFLRP annual reports, the 23 CFLRP projects were asked to identify key indicators from a menu of options for tracking and describing community benefits.¹¹

¹⁰ See User Guide and additional TREAT information here: <https://www.fs.fed.us/restoration/CFLRP/guidance.shtml>

¹¹ For 2018 and 2019 CFLRP annual reports: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>



Lessons Learned

Relationship Building and Collaboration

- The **most common community benefit selected in the [2019 Annual Reports](#) was relationship building and collaborative work**. This was cited by 16 projects (about 70%) as an important indicator for their CFLRP.
 - See the *Collaboration* section of the *Level 2* document for more on this theme.
- **Five CFLRP projects (22%) cited public support for relevant initiatives as a community benefit**. Examples of engagement that have led to good public understanding of processes and treatments include showing progress on the ground, conveying the project as an investment not a cost, keeping the management structure simple, managing expectations regarding NEPA requirements and timelines, etc.
 - *CFLRP Project Examples:*
 - Tapash members helped to engage private landowners and other organizations to educate and organize around fire-wise practices with the Kittitas Fire Adapted Communities Coalition (KFACC).
 - Lakeview Stewardship: Key partners have worked closely to provide the resources for private landowners to manage their properties based upon the landowner’s objectives. With the integration of resources, the partners have been successful in finding opportunities to implement private land treatments concurrently with adjacent federal timber sales or prescribed fire.
- **Cross institutional agreements/policies have allowed CFLRP projects to accomplish various types of restoration treatments with cooperators** – 7 projects (30%) selected this indicator as important for their CFLRP. Partners with whom agreements have been established include universities (summer intern programs), state

agencies, federal agencies, county agencies, non-government partners. Types of agreements include Challenge Cost Share Agreement (Missouri Pine Oak Woodlands), Shared Stewardship MOU (Shortleaf Bluestem), cooperative agreements, Wyden Amendments Participating Agreement (Missouri Pine Oak) and tapping into other authorities such as Good Neighbor Authority projects in the CFLRP landscape (Northeast Washington).¹²

- *CFLRP Project Examples from 2019 annual reports:*

- Southwestern Crown of the Continent - With FY2019 funding, the CFLRP added \$1,044,340 to new and existing partnership agreements. Partners matched this with an additional \$264,297 in funding and \$89,548 of in-kind support. Cooperators included Montana Conservation Corps, Big Blackfoot Chapter of Trout Unlimited, Blackfoot Challenge, Clearwater Resource Council, Swan Valley Connections, Bob Marshall Wilderness Foundation, Montana Discovery Foundation, Missoula County, Ecosystem Management Research Institute, USGS Northern Rocky Mountain Science Center, and University of Montana. Tasks to be accomplished included work on weed eradication, fish and wildlife monitoring, bear education, trail work, tree planting, native fish restoration, citizen science stream monitoring, aquatic invasives inspections, wilderness rangers, and carnivore monitoring.
- Shortleaf Bluestem – The Ouachita worked with the Arkansas Department of Agriculture – Forestry Division throughout the FY to develop a Supplemental Project Agreement for starting a Good Neighbor Authority timber sale program. This SPA is nearing completion, and along with a modification to the Master GNA, will allow the Forest and Shortleaf – Bluestem Project to efficiently prepare, advertise, sell, and administer timber sales as well as potentially get other service work completed.
- Two projects (Selway Middle Fork and Deschutes Collaborative Forest Project, 9%) cited using social media as a community outreach and community strategy in 2019. The Deschutes uses both paid and earned media as a primary community engagement strategy. This includes stories the collaborative works on as well as media attention on events.
 - Deschutes Collaborative Forest Project tracks viewership characteristic, capturing that followers tend to reside in Deschutes county, have seen a 30% increase in web visitor since the previous year, and 89% are visiting the website for the first time. New in 2019 was a set of videos available to address FAQ's around prescribed fire (see [DCFP YouTube channel](#)).
 - The Selway Middle Fork Facebook and Instagram pages include job opportunities posted through the summer which has helped with program recognition across a large area. Posts are often cross-posted to other partners' social media sites.

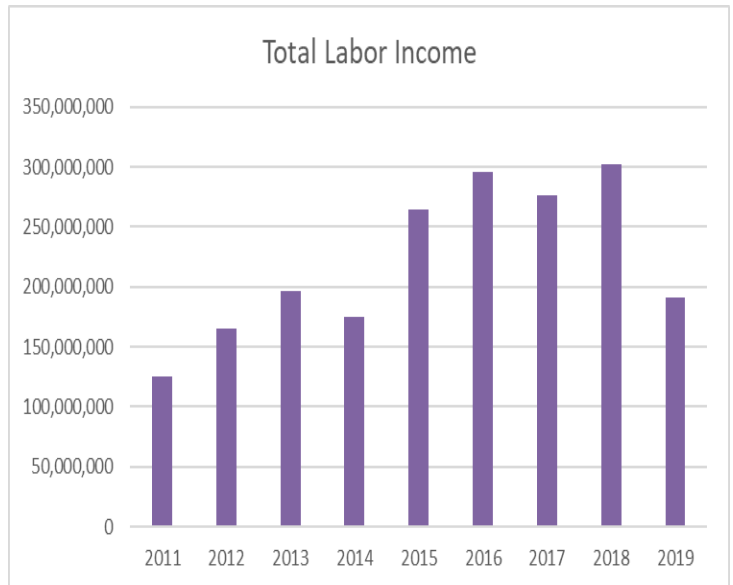
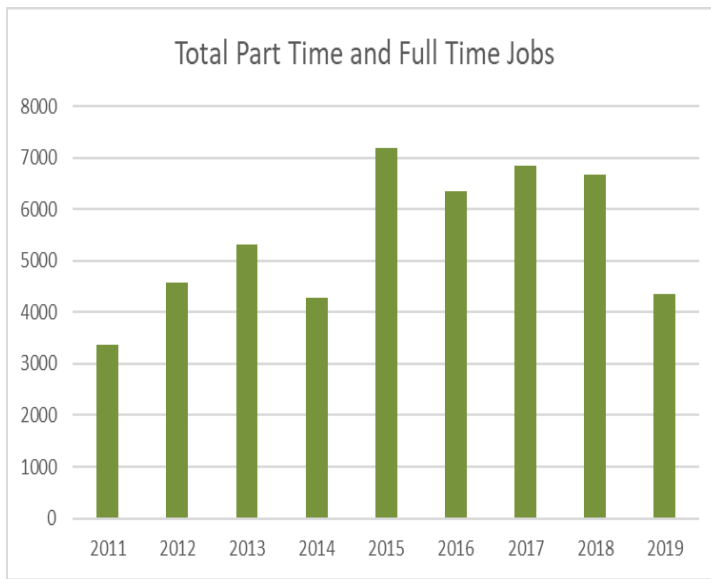
Supporting Jobs and Job Training

- **Many collaboratives identified job enrichment and community stability as key desired outcomes for their CFLRP Projects.** Eight projects (35%) selected job training opportunities as a key community benefit in 2019.
 - An area for further inquiry is to understand the context of impacts with a range of communities in different social and geographic environments.
- TREAT modelling shows that CFLRP Project activities supported about \$200 million total local labor income (2011-2019) and an average 5,440 jobs annually (full and part time jobs).¹³

¹² See relevant CFLRP annual reports for details: For 2018 and 2019 CFLRP annual reports: <https://www.fs.fed.us/restoration/CFLRP/results.shtml>

¹³ Data from the Forest Service's Treatment for Restoration Economic Analysis Tool (TREAT). See link in footnote above or individual project results.

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- **CFLRP Project Example:**
 - Accelerating Loblolly Pine Restoration CFLRP on the Osceola National Forest – Overall, from 2010 through 2012, \$6.7 million was spent by the Osceola CFLR Program. These expenditures created a total of 137 jobs across the U.S. This program has also contributed over \$10 million to Gross Domestic Product, over \$1 million in state and local tax revenue, \$1.2 million in federal tax revenues were returned to the federal government, and \$7 million in salaries and wages were generated. In economic output, which is the sum of all personal and business spending resulting from the CFLR Program, over \$16.6 million in activity has been stimulated by this project over the past three years. For every \$1 invested in this program, \$0.20 is returned to the federal government in tax revenues, \$1.50 in GDP is created, and \$2.40 in total economic activity is generated.¹⁴
- Most of the **job training opportunities** were geared towards students, recent graduates and veterans through partnerships with programs such as Youth Conservation Corps and Student Conservation Association.
- **CFLRP Project Examples:**
 - Amador-Calaveras Consensus Group works with CHIPS–Calaveras Healthy Impacts Product Solutions—to create forest restoration and products job training and other opportunities for local people in Calaveras County.
 - The Uncompahgre Plateau project team hires local high school students to do monitoring. Supporting local training and job opportunities helps engage the community, supports desired economic objectives, and expands capacity to get work done.

Supporting the Local Forest Products Industry

- **Ten of the CFLRP projects (44%) selected locally retained contracts** as a key community benefits indicator in 2019.
- **CFLRP Project Examples:**
 - A study found that between fiscal years 2012 and 2015, the Northeast Washington Forest Vision 2020 CFLRP resulted in the investment of over \$4 million dollars via service contracts and the sale of roughly 140 million board feet. The portion of contracts going to local businesses was greater for non-CFLRP

¹⁴ <https://www.fs.fed.us/restoration/documents/cflrp/results/AcceleratingLoblolly/EconomicAnalysisCFLRPPreprint.pdf>

contracts. However, for *stewardship* contracts, 41% went to local businesses compared to 22% for non-CFLRP stewardship contracts.¹⁵

- Monitoring on the Lakeview Stewardship found that, with a number of outreach activities to enhance local contractor awareness, such as a seminar for local businesses, local contractors captured 100% of CFLRP work *that was material-intensive* in FY 2014 and 2015, but only 5% of total service contracts¹⁶.
- An area for further inquiry is to better distinguish between stewardship and timber sales contracting, and, what “local industry” means in the range of contexts and places where CFLRPs are doing work.
- **Local jobs at mills and subcontracting jobs have been created and/or sustained through CFLRP contracts.** The logs coming off timber sales within the CFLRP area help support loggers, log truck drivers, mechanics, and mill workers to name a few. A single project may result in multiple timber sales and the sales may take several years to complete. This steady flow of timber from Forest Service sales combined with timber coming from other ownerships is critical to maintaining the local timber infrastructure and supporting local timber jobs. Typically, contracts in support of timber sales involve road maintenance, road reconstruction, timber harvest, log hauling, and slash treatment.
 - *CFLRP Project Examples:*
 - Southern Blues Restoration - The Malheur 10-year stewardship contract awarded to Iron Triangle, LLC, a locally based contractor, generates employment in the private forestry sector, Forest Service, and the local community. Monitoring indicates that, from 2015 through 2017, an estimated 268 jobs were supported each year in Grant and Harney counties by work under the 10-year contract.¹⁷
 - Weiser-Little Salmon – A total of 12,787 MBF of timber volume has been produced and delivered to three different mills over the course of FY19. The Forest awarded two timber contracts in FY19 to a local purchaser who is utilizing a local contractor to complete the work. The timber value sold in these contract totals \$1,000,275. The total value of contracts awarded from 2012 through 2019 is \$14,090,291. Of this revenue, \$13,028,000 is from stewardship contracts and has been or will be used to complete restoration work on the forest, including non-commercial thinning, road decommissioning, aquatic organism passage installation, road maintenance, and recreation improvements.
- **However, lack of wood products contractors or markets is commonly cited as one of, or the, most important external factors that limited CFLRP success.**¹⁸ See [section below for further discussion of challenges](#).

Contributions to the Recreation and Tourism Economy

- *Note: the TREAT results above do not include employment and labor income from recreation and tourism.*
- **In some cases, CFLRP projects reported that their work helped support recreation and tourism opportunities.** Project teams continue to work toward further integrating a range of values and desired outcomes into restoration projects, including recreation issues. For example, many are actively working with partner groups, including Oregon Youth Conservation Corps, AmeriCorps, Calaveras Healthy Impact Product Solutions, and Powder Creek Correctional Facility, to complete trail maintenance that reduces sedimentation and enhances recreation resources. Through these and other partnerships, project teams are broadening participation in the project, engaging youth in the natural resources field, and completing work that supports multiple objectives.
- **Looking forward, it may be important to emphasize local connections with Agency recreation and special uses staff,** particularly when restoration goals may be different than recreation goals. Leveraging their expertise may help identify positive changes to make to the approach.
- It is also challenging to disentangle impacts – unpacking local versus out of town users, for example, and how CFLRP specifically impacts tourism.

¹⁵ https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd507971.pdf

¹⁶ http://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_83.pdf

¹⁷ http://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/FS_13.pdf

¹⁸ https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf

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- *CFLRP Project Examples:*
 - In the Zuni Mountains for example, events such as the 24-hours in the enchanted forest, the Quartz Crusher, and the Zuni Mountain 100 draw cyclists from around the Southwest.
 - The counties where the Grandfather Restoration Project is located have experienced a 43% growth in travel and tourism industries between 1998 and 2016 (Headwaters Economics 2019).

Tribal Connections

- **Five projects (22%) cited tribal connections as an important community benefit indicator in their respective project areas** . These include the Dinkey, 4FRI, Northeast Washington, Shortleaf Bluestem and Southwest Jemez. Types of engagement with tribal members include identification, documentation, and future management of culturally important plants, species, areas and intern career mentoring.
 - **An area for additional exploration is understanding the adjacency of CFLRP projects with tribal lands.** How many CFLRPs would we expect to have some engagement with tribes?
- *CFLRP Project Examples:*
 - 4FRI - The Forest Service and the San Carlos Apache, Tonto Apache, White Mountain Apache and Zuni tribes have signed a Master Participating Agreement (MPA) to partner on a wide range of restoration activities within the 4FRI footprint. Using the MPA the Apache-Sitgreaves entered into a \$1,000,000 partnership with the White Mountain Apache Tribe through the DOI Reserve Treaty Rights Lands to conduct fuels reductions activities on culturally important sites on NFS lands using Tribal labor supervised by Forest Service employees.
 - Southwest Jemez – The Forestry Crew from the Pueblo of Jemez continued thinning and piling operations on Forest Service lands adjacent to Pueblo lands. 35 acres were thinned to reduce the risk of stand-replacing fire. In addition to the non-monetary benefits of fire risk reduction, this project contributed around \$84,000 of in-kind contributions (RTRL funding from the Bureau of Indian Affairs) to the SW Jemez CFLRP.
 - Northeast Washington Forest Vision 2020 – Multi-party monitoring efforts bring together the Forest Service, Colville Confederated Tribes, Conservation Northwest, Rocky Mountain Research Station, and others to carry out this monitoring plan. One monitoring component focused on engaging with tribal elders to map plants of social and cultural importance and understand the impacts of treatment activities on those plants.

Volunteer participation

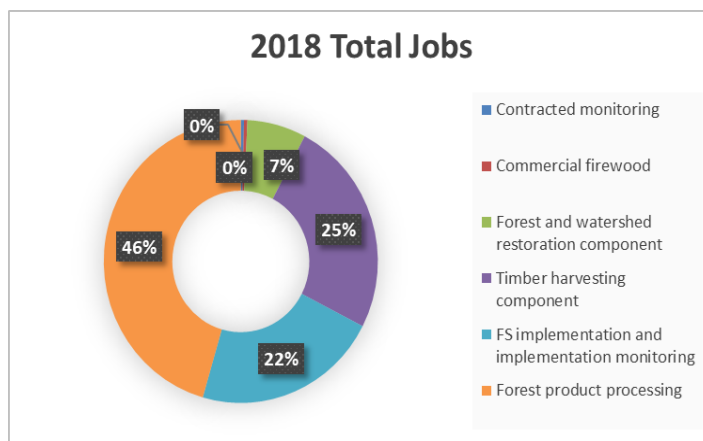
- **Five projects (22%) cited volunteer participation as an important community benefit indicator.** Activities with volunteers have led to trail maintenance and improvements, litter clean up, public education, campsite inventory, monitoring. Monitoring was a key activity cited by CFLRP projects for volunteer engagement – volunteers assist in monitoring through citizen science projects.
- Expanded volunteer opportunities in the community support career mentoring and education while delivering results.
- *CFLRP Project Example:*
 - Southwestern Crown of the Continent -Through citizen science aquatic invasives and stream monitoring, the CFLRP project estimates that 993 hours were contributed by 95 students and 38 community members in 2019. Partners spent approximately 655 hours (paid) in outreach, training, and coordination for these efforts. The data collected from these efforts have improved community discussions and knowledge around management of natural resources, especially water quality and invasives prevention.

Does CFLRP have long-term community social and economic impacts?

- A majority of surveyed staff said they expect some negative effects on the community when funding ends, noting that without the funding, they would not be able to continue the work and support jobs.¹⁹
- [Additional longitudinal work](#) is needed to track and understand the continued social and economic impacts of CFLRP.

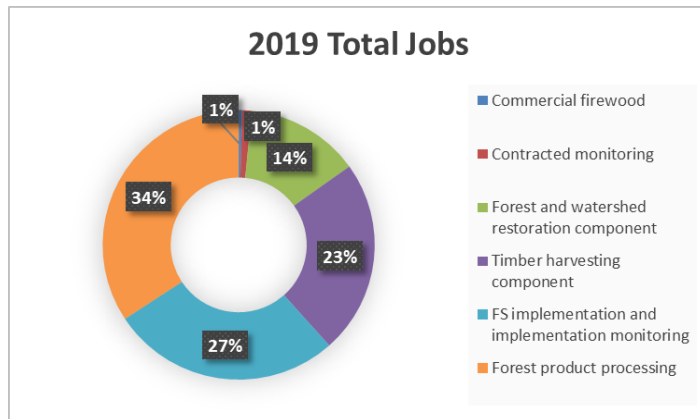
What kinds of restoration and related activities provided benefits?

- **CFLRP supports jobs in multiple sectors, including forest product harvesting and processing, commercial firewood, contracted restoration implementation and monitoring.**
- Restoration activities include non-commercial thinning, road decommissioning, aquatic organism passage installation, road maintenance, recreation improvements, weed eradication, fish and wildlife monitoring, trail work, tree planting, native fish restoration, citizen science stream monitoring, aquatic invasives inspections, and carnivore monitoring.
- Some restoration projects are heavily dependent on work accomplished by volunteers and partners.
- CFLRP Project Examples:
 - The Four Forest Restoration Initiative is working through partnership to expand involvement in project implementation. For example, through its Long Valley Meadow project, 4FRI partners including Arizona Elk Society brought together well over one hundred volunteers for riparian restoration activities in a headwater meadow, including tree thinning, shaping stream channels, and constructing fences. In 2019, the Four Forest Restoration Initiative benefited from 7,680 hours of volunteer time to implementation restoration and perform monitoring across the landscape.
 - In 2019, Agency staff, contractors, and volunteers maintained over 215 miles of trails on the Grandfather Restoration Project.
- Forest restoration projects like the CFLRP can be important to the growing tourism industry and recreational opportunities for local residents.
- It's also important to note that there is limited tracking on non-timber, non-tree aspects for restoration, and benefits.



Commercial firewood includes jobs from the sale of firewood harvested. Contracted monitoring includes jobs from private business. Forest and watershed restoration jobs includes contracted restoration activities. Timber harvest contributions include jobs from logging and removal of commercial products. FS implementation and monitoring includes contributions from Agency implementation and monitoring. Forest product processing includes jobs from processing of commercial harvest.

¹⁹ Strategies for Success Under Forest Service Restoration Initiatives - https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf



Did CFLRP increase *social* capacity and infrastructure in local communities?

- **Sixteen projects (70%) cited relationship building and collaborative work as their highest community benefit from the CFLRP program.** Local relationships were key to the success of the collaboratives. Trust in the process of working together and commitment to sustaining the project were also cited as key parameters of success. Talking to each other and building relationships leads to important synergies. Field trips and regular meetings are key forms of engagement.
 - *CFLRP Project Examples:*
 - With the impending end of CFLRP funding, the Southwestern Crown Collaborative took stock of their existence, purpose, and direction. All of the members unanimously agreed that the collaborative should continue after CFLRP. This is a testament to the relationships that have been built both within the collaborative and with Forest Service partners.
 - Uncompahgre Plateau – The local relationships developed through the CFLRP collaborative process over the past 10 years continue to thrive and help the project succeed. The Uncompahgre Plateau collaborative began its work before the start of funding in 2010 and was well poised to hit the ground running. Field trips and citizen science activities offered to the public through academic involvement provided learning opportunities and garnered support for the project and US Forest Service. The collaborative process used on this CFLRP project has been a model for other large-scale projects on the forest.
 - Southern Blues: The two collaborative groups tied to the CFLRP project have been very successful at bringing together different interests to work together using ‘Common Ground’ and ‘Zones of Agreement’ to increase the pace a scale of forest resiliency treatments.
- **Ten CFLRP projects (44%) indicated diverse project partner composition as a key community benefit.** Partners cited include state agencies, county agencies, federal land management agencies, NGOs, tribes, timber industry partners, private landowners, etc. Types of engagement include ongoing meetings and consistent communication, field trips, multiparty monitoring. These actions and activities enable collaboratives to achieve social and ecological outcomes. Collaboration among diverse partners is a cornerstone of forest restoration work. Leveraging investments from partners has yielded significant restoration accomplishments.
 - *CFLRP Project Examples:*
 - Northeast WA: The Recreation Program used a variety of partners to reduce impacts from recreation users. They reconstructed or maintained 179 miles of trail to reduce effects to aquatic species across the NEW Forest Vision 2020 area. Partners, including hikers, mountain bikers, horsemen, OHV riders and Curlew Job Corps forestry program students. Participants in the Ferry County Therapeutic Court community service program completed an additional four acres of fuel reduction work at Ferry Lake Campground and the Curlew Job Corps forestry program students completed 32 acres of fuel reduction work at Swan Lake, Ferry Lake, Long Lake, and 10 Mile Campgrounds and the Snow Peak Rental Cabin.

- Burney Hat Creek – 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 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.

What did we learn about expanding markets for biomass/small diameter woody material and building local industry capacity?

- **Forest industry capacity and markets is an important consideration** for landscape-scale restoration. Through a collaborative approach, CFLRP Projects can create a social license and expanded capacity to explore new opportunities and technologies. Five projects (22%) cited economic dependency/sectors impacts/expanding market development as a community benefit.
- While CFLRP Projects helped maintain and, in some cases, expand existing industry, **projects reported a lack of infrastructure and markets for low-value wood products as a continuing challenge.**
 - Forest Service survey respondents selected a lack of wood products contractors or markets as the most important external factor that limited CFLRP success.²⁰
 - Excess supply and pricing may limit competitiveness.
 - Transportation-haul costs can be a major barrier: for the Tapash Collaborative, for example, the average haul distance is 250 miles.
- **Several CFLRP projects worked to assess new opportunities and technologies to expand markets and infrastructure, including new products and processing approaches.**
- *CFLRP Project Examples:*
 - As a potential and partial answer to the beneficial disposal of, especially, the excess small dead trees, Amador-Calaveras Cornerstone project partner CHIPS has been actively working to establish a business incubator forest products site that would include a heat-and-power biomass plant, native plant greenhouse, and other businesses, all in close proximity to NFS lands.
 - Burney Hat Creek –
 - 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).
 - 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 training program to build capacity within the California's forest products industry. The Heavy Equipment Logging Operations (HELO) certificate program has demonstrated tremendous success in its initial implementation. 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

²⁰ Strategies for Success Under Forest Service Restoration Initiatives - https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf

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.

- 4FRI –
 - A team of researchers from the Ecological Restoration Institute at NAU has worked closely over the past year with the Arizona Department of Forestry and Fire Management (DFFM), DEMA, Hyundai Merchant Marine, BNSF Railway and the U.S. Forest Service to launch a pilot project that Chips and Ships woody biomass to South Korea. The first phase of the project took place at the Department of Emergency and Military Affairs (DEMA) Camp Navajo Training Center over the course of eight days. It includes chipping 1,300 tons of small-diameter logs extracted from forest restoration at Chimney Springs, which has struggled to find markets for the low-value wood removed from its thinning efforts. The wood chips will then be loaded onto 60 shipping containers bound for South Korea via railway and cargo ships.
 - The Four Forest Restoration Initiative CFLRP project in Arizona is working with the 4FRI Stakeholder Group, including local industry partners, to support and develop biomass utilization infrastructure and markets in and around the project area. Creating and stabilizing industry partners in a restoration economy will allow for the ability to get more acres treated through mechanical harvests, thus increasing forest resiliency across the initiative. Energy generated through wood products includes both cogeneration as well as wood pellets, and biomass is also going to soil amendments, decorative, horse bedding, and other uses. In 2016, the Forest Service and 4FRI Stakeholders built a new relationship with White Mountain Apache Tribe that added an additional 5,000 acres of wood product material to existing industries in the White Mountains on the east side of the projects. An all lands approach to management has brought additional materials to existing industries. Also, in 2016 two offerings on the Coconino National Forest were bought by a new purchaser who is looking to build a small mill that will add to the capacity to achieve mechanical restoration on the west side of the initiative.
 - 4FRI also identified that there are areas where efficiencies can be found on the FS implementation end, and has also been piloting a number of other modernization approaches to improve implementation efficiency - <https://sweri.eri.nau.edu/4fri-modernization-workshop/>.
- **CFLRPs used a suite of tools and approaches to support local forest products industry and expand markets, including offering multiple scales and contract types.** Stewardship grants and agreements may be a path forward for many projects to keep the work – and local industry- viable, along with defining “local” community benefit appropriately when awarding contracts. However, one size doesn’t fit all. For some contexts, a long-term, 10-year stewardship contract may provide needed stability. For others, tying up most of the work with one contractor may reduce overall capacity. In determining the best approach for a project, it’s important to work with partners and local industry to understand shared interests and capacities.
- At the same time, **a robust forest products industry does not guarantee success.** Other challenges include unexpected events and limited agency capacity, such as contracting capacity.
- The Agency’s [Forest Products Modernization Effort](#), which is designed to better align culture, policies, and procedures with current and future forest restoration needs, is a key connection point for exploring efficiencies and innovations moving forward.

What questions emerged that need more investigation?

- How has the project revealed clues to [reduce the risk of no bid sales](#)?
- What did we learn about wildfire risk and the [social acceptance of prescribed fire](#)?
- What are communities’ experiences in terms of [environmental justice](#) (e.g. community risk/social vulnerability)?

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- What is the additive effect of CFLRP? Would work have happened anyway, or not? Can we quantify the impacts of CFLRP?
- An area for further inquiry is to understand the context of impacts with a range of communities in different social and geographic environments. For example, did CFLRP provide opportunities for independent contracts to operate within shadow of large industry? Provide for recreation and water opportunities in more urbanized communities?
- Is there data about how local forest products factors vary geographically? Which regions struggle most and why? Which regions are most successful and why?
- An area for further inquiry is to better distinguish between stewardship and timber sales contracting.
- What “local industry” means in the range of contexts and places where CFLRPs are doing work. Every CFLRP has a different combination of infrastructure across operators, hauling, etc, and a mix of tools they may use. A real benefit may be directing opportunities to small businesses that wouldn’t normally compete for federal opportunities.
- An area for additional exploration is understanding the adjacency of CFLRP projects with tribal lands. How many CFLRPs would we expect to have some engagement with tribes?
- What are the non-timber, non-tree aspects of restoration, and related benefits?
- Who benefits from the socioeconomic benefits generated through CFLRP? Beyond tracking of local contract capture, we are not aware of analyses that captured the flow of social and economic benefits to groups and individuals *within* the community.
 - In considering local contract capture, we are not aware of a regional or cross-CFLRP analysis of trends for contract capture.
- Regarding jobs, is there data on the kinds of jobs, or how they are distributed across CFLRPs? Were some areas more successful than others?
- What are the more comprehensive benefits, resources, services, and values communities receive through CFLRP? While TREAT captures coarse national-level modelling of jobs and labor income impacts – and several CFLRP projects have additional, local socioeconomic monitoring in place (mostly about economic benefits) - we do not know of a systematic analysis of the range of benefits, especially cultural and social benefits.
- What are the socioeconomic impacts of CFLRP to recreation and tourism, which – especially for some CFLRP projects – are key drivers of the local economy?
- Are the socioeconomic impacts of CFLRP long term? What longitudinal effects does CFLRP have on the local economy, for example?

Where to learn more/links to more data

- Information on the Treatment for Restoration Economic Analysis Toolkit (TREAT), a modeling tool used to estimate jobs supported and local labor income across CFLRP projects is available here: <https://www.fs.fed.us/restoration/documents/cflrp/TREAT/TREAT-UserGuide-October2018.pdf>
- Individual TREAT data captured in Annual Reports here (Question 3): <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
- Compilation of TREAT results available on the (currently internal-only) Box site here: <https://usfs.app.box.com/file/570634806059>
- Description of community benefits captured in Annual Reports here (Question 4): <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
- Additional project-level social and economic monitoring reports are posted to the CFLRP Resource Library: <https://www.fs.fed.us/restoration/CFLRP/resource-library.php>

Next Steps:

- Forest restoration and community benefits are closely linked. CFLRP projects provide a variety of benefits to communities in a variety of ways.
- Additional work is needed to fully contextualize community benefits across communities and better understand and monitor social and economic benefits. There is an opportunity to improve socioeconomic information about the program.
- Recognizing that the lack of wood products contractors or markets is commonly cited as one of, or the, most important external factors that limited CFLRP success, additional work and focus is needed to address the challenges and barriers.
- Program staff are assessing ongoing challenges, identifying opportunities to address those challenges, and carrying out next steps with colleagues and partners for each Level 2 theme and across them as well.

The CFLRP approach: Science-Based Restoration (Monitoring)

The CFLRP statute requires multi-party monitoring. Collaboratives develop and implement multi-party monitoring plans to examine questions of collective interest to their stakeholders. Additionally, every 5 years collaboratives report on a consistent set of five national indicators (fire regime, watershed condition, fish and wildlife habitat, invasives, and socioeconomic). The results of CFLRP projects to date offer key lessons on the value and challenges of multi-party monitoring, provide a robust set of data for further analysis, and show areas of needed improvement moving forward.

Done right, monitoring is a very powerful tool not only for tracking progress on the ground, but also for building trust and fostering adaptive management in a learning process. It becomes what we find out together to address questions of common interest, and helps break down “us versus them” thinking.

This section details monitoring accomplishments of the first 10 years of CFLRPs, successes and challenges, approaches to monitoring and adaptive management, and recommendations going forward.

The section is organized into Lessons Learned, Where to Learn More, the Next Steps, and an Appendix with possible core monitoring questions going forward. Hyperlinks are provided for easy access.

- The [Lessons Learned](#) subsection addresses the following questions:
 - [What are the benefits of multi-party monitoring? What successful strategies emerged?](#)
 - [What are the challenges or limiting factors?](#)
 - [What role do scientific requirements \(e.g. multi-party monitoring and adaptive management approach\) play in achieving restoration goals?](#)
 - [How did projects approach multi-party monitoring?](#)
 - [How did projects use science in a collaborative context – what were the benefits and the challenges?](#)
 - [What is the role of science-based landscape assessments? How were they used by the projects?](#)
 - [How well did CFLRP projects practice adaptive management?](#)
 - [What was the role of Research and Development \(R&D\)?](#)
- [Where to Learn More](#)
 - [CFLRP Monitoring Plans and Reports](#)
 - [CFLRP Resource Library](#)
 - [Selected Third-party Research](#)
- The [Next Steps](#) subsection gives a brief overview of how this information will be used moving forward.
 - [What does this information suggest for improving CFLRP and/or related programs moving forward?](#)
 - [What can we learn from the CFLRP monitoring process that could apply to other monitoring efforts \(like forest plan monitoring\)?](#)
 - [Opportunities for Improvements to Restoration Monitoring](#)
 - [The Role of the Research Community](#)
- [Appendix](#) – Potential set of core monitoring questions going forward.

Lessons Learned

What are the benefits of multi-party monitoring? What successful strategies emerged?

- In general, multiparty monitoring is working. All 23 projects developed and implemented multi-party monitoring plans. 15 of the 23 were developed by a true integration of the stakeholders. Of the others, five appeared to be led primarily by the Forest Service, one by The Nature Conservancy, and two by universities. At least 13 of the collaboratives showed development and ownership by a wide array of stakeholders.

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- Monitoring is worth doing. It validates the value of thinning and prescribed burning, wildlife and aquatic habitat improvement, invasive species reduction, and helps change course on Desired Conditions, at least in some cases. In a larger sense, it validates the social contract among stakeholders in the collaborative.
- Monitoring efforts have been crucial in the collaborative process by improving engagement, legitimacy, transparency, learning, conflict resolution, confidence, trust, and cooperation between stakeholders and the USFS (Uncompahgre Plateau project).

We move at the speed of trust.

--Pam Hardy, Blue Mountain Forest Partners

What are the challenges or limiting factors?

- The relative nature of accomplishment (percentage of target reached) makes it very difficult to collate and average results among the 23 collaboratives. When individual collaborative reports are compared, however, it becomes possible to see the absolute accomplishment of each.
- We remind everyone even 10 years is a relatively short time period for ecological processes in environments like forests, and it may take much longer for certain effects to become evident. Despite that, integrating knowledge on ecosystems from research (e.g., experimental forests or other R&D forest dynamics investigations) expands the relevance of 10-year monitoring to inform management decisions and restoration priorities.
- Monitoring, particularly multiparty monitoring, provides a setting for common language and developing an understanding by stakeholders of what is possible and not possible on the ground. The insights regarding barriers and possible options can be profound and influence the ability of line officers to make difficult decisions.
- Use of monitoring results by decision-makers in a truly adaptive management process remains a challenge. Line officer engagement can be encouraged by stressing monitoring as a way to build social license with stakeholders. Reporting on monitoring results also needs to be frequent and timely in order to be useful.
- At least one collaborative stressed the importance of mobilizing and integrating the monitoring process early.
- For 10 projects, monitoring results were clearly used to adjust Desired Conditions and/or operational objectives as the project progressed through its 10-year lifespan.
- Turnover in personnel was a challenge over 10 years. In some cases data were lost, or methodologies had to be recreated.
- Turnover also led to inadequate maintenance of data over time. The importance of a consistent database was stressed.
- Not all of the four ecological indicators (fire regime, wildlife habitat, invasive species, and watershed condition) were well represented on projects or in monitoring teams. In some cases these led to neglect or poor monitoring of an attribute. (This was particularly true with invasive species.) The lesson learned is to make sure disciplines representing all these attributes are consistently involved, in addition to involving the full range of stakeholders.
- A number of collaboratives pointed out how attributes are related and integrated with each other. For example, treatments to reduce invasive species can also improve watershed condition.
- Collaboratives also gained an appreciation for the sheer amount of time needed to see changes in some ecological variables. They gained an awareness of the need for long-term monitoring efforts and support in data management and reporting.

What role do scientific requirements (e.g. multi-party monitoring and adaptive management approach) play in achieving restoration goals?

- Monitoring plans serve to identify what is working, what is not, and when to change course. They are key ingredients for data-driven decision making.

- EXAMPLE: Burney Hat Creek – 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.
- Monitoring is a critical support to adaptive management, supporting data-driven decisions.
- Monitoring can validate progress, essential for maintaining funding in the long run.
 - EXAMPLES:
 - The Colorado Front Range project validated progress in increasing native plant abundance and minimizing expansion of invasive species.
 - The Southwest Jemez Mountains collaborative holds an annual “all hands” meeting with stakeholders to report on progress and seek feedback.
 - Pushing forward despite uncertainties in funding, an unprecedented wildfire, and a reduced summer workforce, the Dinkey Project in the California Sierras was nevertheless able to document progress in prescribed burning, invasive species reduction, and reducing soil erosion
- Monitoring shapes our understanding of landscapes.
- Social license and social contracts are built and maintained in part by multi-party monitoring.
 - EXAMPLE: Southwestern Crown - Through our citizen science aquatic invasive species and stream monitoring, we estimate that 993 hours were contributed by 95 students and 38 community members in 2019. Partners spent approximately 655 hours (paid) in outreach, training, and coordination for these efforts. The data collected from these efforts have improved community discussions and knowledge around management of natural resources, especially water quality and invasives prevention.
- Multiparty monitoring fosters ownership in outcomes and defuses conflict among stakeholders
 - EXAMPLE: Citizen science efforts involve the community in monitoring. Monitoring crews of high school age youth provide employment, training, and career direction for local students. This both builds an appreciation of monitoring in the local community and provides badly needed local employment and engagement to maintain communities. Examples include the Southwestern Crown of the Continent and Selway Middle Fork projects in Region 1 and the Lakeview project in Region 6.
- Monitoring for a 15-year horizon encourages stakeholders (and National Forests) to take a longer view of projects. Challenges remain here, however—there is still a tendency to fall back on short-term monitoring of treatment effectiveness.
- Projects report the CFLRP multi-party monitoring requirement was essential to the monitoring results achieved and there is more work to be done.
 - Project-scale vs. landscape scale monitoring – Projects were generally more successful with project-scale monitoring vs. landscape scale monitoring, and many projects identified a need for more guidance and technical capacity to develop and implement landscape-scale metrics. This issue is a common theme in the sections below and is explored further in the Recommendations Going Forward section.
 - Implementation vs. effectiveness monitoring – Monitoring reports showed this is a complex issue, with a lack of clarity on implementation versus effectiveness monitoring, a wide variety of monitoring methods, and in some cases a lack of expertise and monitoring methods. A deeper analysis of monitoring results across all 23 projects would advance our understanding of CFLRP in practice and Forest Service monitoring in general.
 - In fire regime monitoring, more projects actually reported more effectiveness than implementation monitoring. At project scale, 17 reported implementation monitoring and 20 reported effectiveness

monitoring. At landscape scale, 11 reported implementation monitoring and 12 reported effectiveness monitoring.

- In watershed (aquatic) monitoring, a variety of metrics were used, making it difficult to draw conclusions on implementation vs. effectiveness monitoring. Many projects (15 at project scale and 13 at landscape scale), however, reported using treatments implemented as a proxy for monitoring outcomes.
- In fish and wildlife habitat monitoring, 11 CFLRPs reported implementation monitoring at the project scale and six at the landscape scale, and only two projects reported effectiveness monitoring. (In contrast, 16 projects provided accomplishment reporting at the project scale and 17 at landscape scale.)
- With invasives, 19 projects reported ground inventory or mapping at the project scale and 18 at landscape scale. There remain to be convincing examples of true landscape monitoring, however.

How did projects approach multi-party monitoring?

- The collaboratives decided on the monitoring questions to be addressed. These represent the full range of interests affecting the projects.
- A diverse set of personnel and organizations conducted the actual monitoring, including National Forest System personnel, Forest Service Research, The Nature Conservancy, other non-governmental organizations, and academia.
 - The relative involvement and respective roles of each of these organizations varied across projects.
 - For example, sometimes The Nature Conservancy had a leadership role, and sometimes it was academia. Organizations tended to focus on their area of expertise, but in general, oversight and guidance was maintained by the collaboratives collectively.

How did projects use science in a collaborative context – what were the benefits and the challenges?

- The primary benefit is broader ownership in project processes and outcomes. Monitoring sites were often used as demonstrations of treatments for field trips of stakeholders.
- Collaborative monitoring also “sets the table” for adaptive management. Adaptive management—using monitoring results to validate or change course as indicated—is not yet fully realized, however. In some cases, projects reported it was not clear how monitoring results were being used.
- Coordination challenges developed; sometimes there was a sense National Forest staff were not fully engaging in the process.
- Results of the 10-year report showed mixed success at monitoring at landscape scale. It was also challenging to show progress in moving landscapes in a more sustainable direction because of the short timeframe involved. A loose consensus has emerged that truly changing landscapes will take decades, not years. This needs to be communicated clearly, and methods explored for changing landscapes more effectively.
- Moreover, the effects of large fires can significantly alter a CFLRP strategy, and a sense developed this must be better planned for in the future—“expecting the unexpected.”
- A key challenge was the inherent complexity of monitoring complex ecological processes such as watershed function and fire dynamics. This also relates to the lack of skilled personnel in some cases.
- Collaboratives are also finding methods developed for a snapshot in time are inadequate in dynamic landscapes changing rapidly through disturbance. Many collaboratives are using sets of fixed plots and measuring them before and after treatments (e.g., Zuni Mountains, Uncompahgre Plateau, Colorado Front Range, 4FRI Projects). This approach has strengths and weaknesses—data are quantitative but expensive to collect over time and may not answer broader landscape questions, unless coupled with a remote sensing technique. There was also a

sense that the vast majority of measurements were for current conditions (4FRI project), and not change over time or effectiveness of treatments.

What is the role of science-based landscape assessments? How were they used by the projects?

- As Esch and Waltz (2019) demonstrated, CFLRPs ability to monitor at landscape scale were mixed.
 - Of the 19 projects reviewed, nine integrated questions, metrics, indicators, or potential approaches for assessing landscape-scale change. Projects appeared more comfortable monitoring at local, project scale than across landscapes.
 - The first 10 years of CFLRPs provided insight on the challenges facing landscape-scale monitoring, including 1) a relatively short timeframe to show progress; 2) lack of agreement on methods and approaches; 3) lack of expertise and direction on landscape assessment; and 3) differing approaches to landscape metrics that in turn addressed different aspects of landscape composition and function (Esch and Waltz 2019).
- A more focused and directed approach for landscape-scale monitoring is needed, with a clear understanding of objectives and how to measure progress. This should be based on consensus, and respect local control of CFLRPs while honoring the need for consistent, relatively simple metrics of landscape progress. This is further explored in the Recommendations Going Forward section below.

How well did CFLRP projects practice adaptive management?

The collaborative's 'citizen science' and ongoing collaborative monitoring has definitely improved decision-making -- more transparent, evidence-based, and collaborative dialogue based.

--from NFF 2020 Survey

- Qualitatively CFLRP project reports and third-party reviews report many instances where monitoring helped the decision process and resulted in improved project implementation. At the same time, CFLRP monitoring reports indicate much remains to be done to consistently achieve adaptive management across CFLRP projects.
- Some notable challenges CFLRPs reported were
 - The need for consistent approaches and maintained databases (Accelerated Longleaf Pine Restoration);
 - Turnover in personnel meant datasets and methodologies had to be rebuilt (Southwest Crown of the Continent); and
 - Underrepresentation of non-timber and fire involvement and thus metrics (Colorado Front Range).
 - The 10-Year Reports in aggregate show a wide variety of monitoring methods, often leading to muddled conclusions about progress. These all point to needs for the future, which are addressed in the Recommendations Going Forward section.
- To improve adaptive management, monitoring findings must be used to shape management decisions. This in turn requires frequent reporting to stakeholders and to line officers, and ownership of the process by line officers. Line officer engagement may most likely be secured by a realization that monitoring is how social license is built. It may be useful to survey line officers and ask them what would be most useful to them from the monitoring effort.
- Cheng et al. (2019) provided a review of adaptive management results on three CFLRP projects that highlights progress made and continued challenges in achieving adaptive management. The review offers recommendations moving forward, which are also discussed in the Recommendations Going Forward section.
- The 2020 National Forest Foundation (NFF) survey reported 82% of respondents agree that collaborative participation improves Forest Service decision-making, however the survey didn't specify whether people attribute this to monitoring and adaptive management or to collaborative involvement in project planning. This should be further explored. As the collaborative approach becomes more mature perhaps stakeholders, having

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achieved collaborative involvement in project planning, will focus more on the effectiveness of outcomes, and hence monitoring.

- There were many comments in the NFF survey (and also in 10-year monitoring reports) that if project goals were being met then landscape goals were being met. It is difficult to support this statement in a landscape context and indicates the need for more robust landscape metrics. See the Recommendations Going Forward for more discussion of this topic.

What was the role of Research and Development (R&D)?

- In the NFF Survey (2020), 68% of CFLRP stakeholders reported work from a third party collaborator (academia, FS Research and Development, or NGOs) contributed to their science needs.
- The science/research and development component of our agency/partnerships provides an underpinning to support monitoring work over time, and is a critical asset. Science/management partnership around CFLRP informs both sides of agency.
- The role of research and development (both FS Research and Development and the larger research community) in CFLRP monitoring varied. Sometimes academia had a leadership role, as in the Southwestern Crown of the Continent and Four Forest Restoration Initiative projects. Sometimes a Forest Service Research Station played a key role, as in the Colorado Front Range project. Given limited financial resources, R&D involvement was often focused on a limited number of monitoring questions where high precision is needed, and collective interest is high. An example of this is the white-headed woodpecker monitoring conducted by the Forest Service Rocky Mountain Research Station in eastern Oregon and Washington. This addressed a high-profile issue of interest to multiple stakeholders and collaborative projects.

Where to Learn More

CFLRP Monitoring Plans and Reports

- Annual Project Reports - <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
- 2019 and 2014 Ecological Indicator Reports - <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
Includes the spreadsheet summary 2019 Ecological Indicator Report Responses.xlsx
- Site Visit Reports - <https://usfs.box.com/s/2symgdyprtdt3mz6rckwslwxamqcifrg>
 - These are reports from Washington Office site visits to CFLRP projects.
 - Detailed reports currently saved on FS internal folder. Available on request to external audiences.
- Local project monitoring plans - <https://usfs.box.com/s/2symgdyprtdt3mz6rckwslwxamqcifrg>
 - These are the detailed project-specific monitoring plans developed at the local level.
 - Currently saved on FS internal folder. Available on request to external audiences.
- Local project monitoring reports - <https://usfs.box.com/s/w8wq2v5ltdiji3kx65ow2t8ohwb3yly>
 - These are the detailed project-specific monitoring reports developed at the local level.
 - Currently saved on FS internal folder. Available on request to external audiences.
- CFLRP monitoring folder - <https://usfs.app.box.com/folder/49116856052>
 - Includes much of the above, but also key documents such as the Esch and Waltz review of CFLRP landscape monitoring

CFLRP Resource Library

- The CFLRP Resource Library includes a mix of publications, webinars, outreach materials, success stories, and other resources associated with the Collaborative Forest Landscape Restoration Program.
- Available at <https://www.fs.fed.us/restoration/CFLRP/resource-library.php> (Open to all)

Selected Third-party research

Cheng, A.S., G.H. Aplet, and A.E.M. Waltz. 2019. Challenges and opportunities for collaborative adaptive management in forest landscape restoration. *in* W.H. Butler and C.A Schultz, eds. A new era for collaborative forest management. New York: Routledge, 242 p.

DeMeo, T., A. Markus, B. Bormann, and J. Leingang. 2015. Tracking progress: The monitoring process used in Collaborative Forest Landscape Restoration projects in the Pacific Northwest. Eugene, OR: Univ. of Oregon Ecosystem Workforce Program Working Paper 54, 16 p.

Esch, B.E., and A.E.M. Waltz. 2019. Assessing Metrics of Landscape Restoration Success in Collaborative Forest Landscape Restoration Program Projects. ERI White Paper—Issues in Forest Restoration. Ecological Restoration Institute, Northern Arizona University. 12p.

Markus, A., E.J. Davis, T. DeMeo, and B. Bormann. 2015. Lakeview Collaborative Forest Landscape Restoration (CFLR) project monitoring plan. Eugene, OR: Univ. of Oregon Ecosystem Workforce Program Working Paper 60, 54 p.

National Forest Foundation monitoring page at <https://www.nationalforests.org/collaboration-resources/learning-topics/collaborative-forest-landscape-restoration-program-cflrp/cflrp-monitoring>

Schultz, C.A., D.L. Coelho, and R.D. Beam. 2014. Design and governance of multiparty monitoring under the USDA Forest Service’s Collaborative Forest Landscape Restoration Program. *J.For.* 112(2):198-206.

Next Steps

What does this information suggest for improving CFLRP and/or related programs moving forward?

Best practices

The following best practices worked well and were generally adopted by most CFLRPs.

In the next round of projects, we recommend the Regions provide more consistent direction and support of the following best management practices through increased training, troubleshooting, and maintaining focus (DeMeo et al. 2015).

1. Monitoring is set up to foster and support adaptive management (Cheng et al. 2019).
2. Collaborative stakeholders own and commit to monitoring questions.
3. Time is taken to insure questions are carefully vetted and reduced to a list that can be accomplished with the resources available.
4. Questions are carefully screened with a set of criteria. Does the question:
 - a. Meet a core objective of the CFLRP project?
 - b. Meet goals agreed on collectively?
 - c. Facilitate adaptive management and leadership decisions?
 - d. Address something new; i.e., the data are not already available in some form?
 - e. Match the appropriate scale?
 - f. Facilitate cost-effectiveness and practical implementation?
 - g. Focus on outcomes rather than simple metrics of production?
 - h. Adequately represent the range of social, economic, and ecological issues?
 - i. Reflect the involvement of the entire collaborative?
5. The continuum of evidence is a broad spectrum, and questions are addressed with an appropriate level of rigor. Used appropriately, CFLRPs have found that field trips and photo monitoring are effective monitoring tools.

What can we learn from the CFLRP monitoring process that could apply to other monitoring efforts (like forest plan monitoring)?

The CFLRP monitoring process is effective because of stakeholders owning the monitoring process, and because this in turn facilitates adaptive management. These processes could in turn inform Forest Plan monitoring, notably the Biennial Monitoring Evaluation Reports (BMERs), becoming a standard for Plan reporting, and the Broader Scale Monitoring Strategy. Guidance for the 15 Year CFLRP Monitoring reports will recommend coordinating work, where practical, with the BMER reports.

The key lesson seems to be that multiparty monitoring frames the monitoring environment as one of mutual learning to support adaptive management. There's value in exploring using this same approach to Forest plan monitoring and other efforts. In this way we can avoid an "us versus them" mentality and the weaponizing of science.

The CFLRP monitoring process has also helped collaboratives focus on the efficient allocation of scarce resources, and avoid "wish lists" of monitoring work that are unattainable.

- On the Selway-Middle Fork project Nez Perce-Clearwater Staff and Clearwater Basin Collaborative worked jointly to develop the indicators with assistance from the Monitoring Advisory Committee.
- The five collaboratives in Region 6 each engaged collaborative members in carefully developing and vetting monitoring questions, so that the monitoring workload was feasible and owned by the stakeholders.
- The Burney-Hat Creek project in California involved a wide array of stakeholders in developing their monitoring plan.

CLFRP work has fostered the partnership of NGOs, academia, Forest Service Research, and the National Forest System in getting the work done. It has developed a habit of joining and leveraging resources that will set a good precedent for the future.

CFRLP monitoring identified needed areas of improvement for monitoring, which have applications to other Forest Service and partner monitoring as well. Initial ideas on these areas for improvement are described below.

Note these are the initial ideas identified by the CFLR Program staff. The next step is to engage with other staff areas, field staff and partners—particularly representatives of the CFLRPs themselves-- to see how recommendations align with their perspectives and priorities. These discussions will clarify the needed change/improvement and help prioritize what warrants action. Consensus and engagement will be critical to success.

Opportunities for Improvements to Restoration Monitoring

1. Monitoring strategies realistically reflect the time scales involved. Realize that changing landscapes often takes decades and not a few years. This must be communicated clearly at all levels, monitored with clear, consistent metrics, and used to maintain and develop new strategies over time for moving landscapes toward a more sustainable condition.
2. Educating and promoting the value of monitoring—answering the "so what" question so monitoring is valued as something useful. This is particularly true for landscape scale metrics (Esch and Waltz 2019). Training and support for the value of monitoring, led by the Regions, would pay dividends over time. Coordinated efforts keeping monitoring as simple as possible to meet objectives, with frequent reporting and good data management, would support the adaptive management process.
3. Monitoring "closes the loop" on adaptive management by frequent reporting and use by leadership in making decisions. Data collected from monitoring efforts needs to be reported on promptly. Line officers need to be

engaged and interested in monitoring information to inform decisions. Standardization and institutionalizing of processes is needed to maintain progress and avoiding restarting or duplicating efforts.

4. Take turnover in positions, both within the Forest Service and among the stakeholders, into consideration when designing monitoring strategies.
 - Stakeholders in the first round identified this as a top concern, and rapid turnover in Forest Service positions, particularly among line officers, undermines agency credibility.
 - Some collaboratives reported delays when key personnel moved, as they lost time in regrouping.
 - Rather than try to change this, a better strategy is to adapt to it by designing monitoring plans so they are less dependent on individual personalities, and are hence more institutionalized.
5. Develop some standardization across CFLRPs so that resulting data can be managed collectively. In this way monitoring better reflects the limited capacity of Forests to maintain good monitoring programs over time. Engage Forest Service Regions in leading and coordinating monitoring to foster efficiency and more frequent reporting. See the Appendix with an initial list of possible core questions, presented only as a starting point for discussion.

These changes will help us advance our collective monitoring practice, improve adaptive management, and tell a more complete story of our results at a socially and ecologically meaningful scale. Regions are therefore encouraged to strengthen their data management and reporting capacity at the Regional level in order to find efficiency of scale, and to address lack of capacity at the local level.

Centralizing and standardizing would take some capacity burden off the Forests. It would also promote consistency and comparability across landscapes. It could also lead to some institutionalization which would help alleviate turnover concerns.

6. Institutionalize data management and reporting. A number of CFLRP practitioners have recommended better maintenance and coordination of datasets to support frequent reporting and address losses through turnover. Provide a structure for long-term data management and reporting, to avoid problems with turnover and continuity. Maintain this for a core set of questions and not all possible questions. Some monitoring questions would still be managed locally.
7. Develop better landscape-scale metrics through improved guidance and technical assistance to projects.
 - We need better assessment of how landscapes change over time based on our treatments, i.e. what is the landscape-scale evidence of movement towards a more sustainable, resilient condition, as called for by Esch and Waltz (2019). This is a core objective of collaborative landscape legislation. While 86% of CFLRP stakeholders agreed or strongly agreed with the statement “Project implementation is moving the landscape towards more resilient ecosystems (NFF Survey 2020),” there is a general lack of quantitative evidence to support this using accepted landscape assessment methods. Many respondents to this survey question followed up with comments that things were moving in the right direction, but not fast enough and maybe not on a sustainable basis over time.
 - The CFLR Program staff has begun work on potential guidance for landscape metrics and will invite other Forest Service staff and partners to engage in this work as well. Interested parties should contact Tom DeMeo at tom.demeo@usda.gov.
 - Working with their Regional staff, units and stakeholders should choose from a menu of landscape suitability metrics for measuring landscape scale change that will best suit their local needs. Terrestrial landscape metrics tend to fall in one of these four categories: 1) Ecological Departure, 2) Fragmentation, 3) Fire behavior, or 3) Plots extrapolated to the landscape. We recommend standardizing one of these approaches within a Region.

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8. Pilot select nationwide metrics. This could be a small set of fire-related metrics be reported for all CFLRPs. One option would be to use the Terrestrial Condition Assessment (TCA), a method of assessing resilience to disturbance. This set of metrics is already in place nationwide and will be updated at regular intervals (1 to 5 yrs). Doing so in the context of CFLRP would pilot the TCA and its implementation in a new setting. We recommend use of these TCA metrics: 1) Vegetation departure, 2) Uncharacteristic fuel buildup; and 3) fire regime fire severity and frequency, measured by missed fire cycles.
9. Continue locally-developed monitoring questions and approaches. While the CFLRPs would all select metrics to address Regional monitoring questions, each CFLRP will continue to have space to use CFLRP resources and funds to address locally-relevant multi-party monitoring questions that may fall outside of the scope of the Regional questions.
10. In the next round CFLRPs should consider more emphasis on social and economic monitoring. As one Forest specialist commented, “How much more do we need to know about thinning ponderosa pine?”
11. An online monitoring community of practice has been established and is holding monthly discussions on pertinent topics. Participation is open to all; to join please email John Souther (john.souther@usda.gov) or Tom DeMeo (tom.demeo@usda.gov).

We emphasize these are in response to concerns from field CFLRP projects regarding capacity and coordination going forward. We further stress any monitoring strategies will be developed collaboratively and honor the local and place-based spirit of the CFLRP approach.

The Role of the Research Community

- The role of the research community (USFS research stations, universities, and some NGOs) should be carefully thought out. Specific best practices observed through CFLRP include:
 - The development of monitoring questions should be developed by the stakeholders collectively, and addressed appropriately using the continuum of evidence.
 - The implementation of monitoring, data management, and reporting of results can be done by others, but with the full engagement and oversight of the collaborative’s stakeholders.
 - Monitoring is not only a process to track ecological, social, and economic changes but also a process to build trust and social license.
 - As such, it’s critical that the collaborative and Forest Service leadership stay engaged.
 - Research organizations can play an important role, from helping to design the monitoring to analysis of data, but the collaborative and local Forest Service leadership need to direct the process and be engaged throughout.
- Research-grade monitoring resulting in rigorous, peer-reviewed publications is expensive and should be reserved for cases in which there is 1) strong interest from an array of stakeholders; 2) compelling, complicated issues best addressed by a rigorous, data-intensive approach; and 3) preferably wide application on a planning and/or resource management issue.
 - An example of this was the white-headed woodpecker habitat and viability monitoring in eastern Oregon conducted by Vicky Saab and colleagues at the Rocky Mountain Research Station. This species is an important indicator of late-seral ponderosa pine habitat, in deficit and of concern across a range of National Forests. In this case, the investment in research-grade monitoring was warranted.
 - In other cases monitoring can be less rigorous statistically but just as valid, as through field trips, annual meetings (such as the “All Hands” meeting in the Southwest and Sustainable Northwest’s annual spring meeting of collaboratives in the Northwest).

The key challenge of CFLRP monitoring going forward is to develop common, respected metrics of landscape improvement to show progress, while maintaining local control reflecting the social, economic, and cultural diversity of a vast, decentralized country.

As mentioned above, the CFLR Program staff has begun work on improved monitoring guidance to better strike this balance. Interested parties should contact Tom DeMeo at tom.demeo@usda.gov.

Science Based Approach Appendix

- Potential Set of Core Monitoring Questions Going Forward

These are a draft only. At this writing we are working in earnest with CFLRP monitoring coordinators and other interested parties to craft a list everyone owns and agrees on. A monitoring strategy for the next round of CFLRP projects is under development; completion is expected in November 2020.

Question	Indicator	Discussion	Capacity Needed
What is the effect of the treatments on moving the Forest landscape toward a more sustainable condition that includes scale and intensity of historical disturbances?	Vegetation departure OR Missed fire cycle OR Fragmentation metric <i>This is the ecological departure metric.</i>	Standardize this by Region. Discussions with the CFLRPs show much discussion and education on this is still needed.	TCA metrics will be a pilot of this nationally, but an effort within Regions is also needed.
What are the site specific effects of restoration treatments on focal species habitat across the CFLRP Project Area?	Habitat suitability indices or individual focal species monitoring	Challenge is not to become unwieldy.	Consider the opportunity to obtain state wildlife agency data on wildlife populations through shared stewardship agreements.
How are projects (road closures, upland and riparian treatments, etc.) impacting water quality?	Water quality and quantity metrics from Watershed Condition Framework		Shared Stewardship opportunity
Are Forest prevention practices effective in minimizing impacts of vegetation management treatments	Herbicide use factor	A measure of effectiveness— better than acres treated	

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(including prescribed fire) on invasive plant species (new and/or existing)?			
Socioeconomic context	2020 CFLRPs described the current socioeconomic context in their proposals. The idea is to collect key baseline data, “core” data relevant nationally, and track over time.	<p>We could provide a “menu” of options for CFLRPs to consider.</p> <p>Options could include “Economic Profile System” at https://headwaterseconomics.org/tools/economic-profile-system/about/, Demographic data associated with counties can be found at https://headwaterseconomics.org/dataviz/forest-indicators/, Information on populations at risk available here: https://headwaterseconomics.org/tools/populations-at-risk/</p> <p>Additional considerations, depending on the local context, could include Poverty rate, Number of students eligible for free and reduced lunch, School enrollment, School dropout rates, crime rates, etc.</p>	Guidance, template, and examples would be helpful. Could develop a menu of options and provide support on characterizing and tracking. Proposed frequency: Every 5 years
Total and matching CFLRP funds	Use of direct CFLRP funds; matching funds provided by the agency; contributed funds by partner organizations; leveraged funds	Demonstrates the extent to which strategic federal investments attract partner investments	This has been tracked in annual reports since 2010. Support needed for ongoing tracking/reporting with partners (see, for example, use of tracking template). Proposed frequency: Annually
Overall economic impact	Job and labor income creation and retention; direct/indirect/induced effects	Provides a national-level, coarse look at jobs and income supported by CFLRP	This has been tracked in annual reports since 2010 using TREAT. Proposed frequency: Annually
How much and what kinds of work are	Project dollars (timber sales, contracts, agreements, etc.)	See examples including: Lakeview Stewardship	<i>Need to have better understanding of what capacities/data would be required for each CFLRP to complete.</i>

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<p>captured locally, or not</p>	<p>captured by local businesses; types of work captured and not captured (technical/equipment-intensive/labor-intensive/supplies/stewardship).</p> <p>Jobs and income associated with local companies (e.g., detailed site specific studies utilizing surveys of local firms).</p> <p>The importance of CFLRP in the work of local businesses such as outfitter and guides, hunting, fishing, recreation and recreation resources, such as trails, developed facilities, and access.</p>	<p>Northeast WA Forest Vision 2020</p> <p>Shortleaf Bluestem</p>	<p>Consider USFS Research & Development researcher time for capacity</p> <p>Consider framing this around a <i>contextual explanation</i> of TREAT inputs (e.g. partner fund descriptions, types of local industry utilizing materials, etc) if capacity/funding for detailed studies are not available.</p> <p>Each collaborative self-defines “local” (could use TREAT guidance on what local means)</p> <p>Regarding recreation: One option is to link to forest wide recreation economic contributions. Using the jobs and income AAG results: https://www.fs.fed.us/emc/economics/at-a-glance/jobs-income.shtml</p> <p>Propose frequency: TBD</p>
<p>Addressing underserved communities</p>	<p>Contracts to Tribes, minority-, and women-owned businesses – <i>who</i> benefits?</p>	<p>See Forest Guild-collected information in SW Jemez CFLRP annual reports</p>	<p>Need to determine how to define and track these categories of interest. Is there a central database where this information is reported? Not aware of a national database that would have this information. Consider information the Forest Contracting Office would have.</p> <p>Propose frequency: Uncertain</p>
<p>What are the costs, local capture, and treatment outcomes of different project implementation mechanisms?</p>	<p>Type of work completed through different implementation mechanisms; number of acres treated; amount of stewardship receipts reinvested in restoration; local capture of work implemented with different mechanisms.</p>	<p>Connect with Forest Products Modernization MUT (Market Utilization Team) for ongoing work they are doing nationally in this area.</p> <p>Standardize the qualitative responses into scaled responses.</p>	<p><i>Need to have better understanding of what capacities/data would be required for each CFLRP to complete.</i></p> <p>NOTE: contractors can be surveyed without Paperwork Reduction Act clearance.</p> <p>Proposed frequency: Uncertain</p>

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	<p>Qualitative responses from the Forest Service about the benefits and drawbacks of different mechanisms and why they were used.</p> <p>Qualitative responses from contractors that are satisfied with how CFLRP projects are implemented.</p>		
<p>Collaborative health and resilience</p>	<p>How is the collaborative functioning over time? Could use all or part of NFF CFLRP Collaborative Survey as a basis (and/or SWERI collaborative resilience worksheet in development)</p>	<p>Recommend one standardized approach to this for all CFLRPs</p> <p>NFF CFLRP Collaborative Survey</p> <p>SWERI collaborative resilience worksheet (see for reference: https://cfri.colostate.edu/wp-content/uploads/sites/22/2020/08/CFLRP-Developing-and-sustaining-collaborative-resilience.pdf)</p>	<p>Proposed frequency: (Currently, survey every 5 yrs – received feedback more consistent monitoring desired)</p>

The Collaborative Approach

The CFLRP's requirement for and focus on collaboration contributes directly and significantly to outcomes on the ground and in communities. It brings people with diverse interests together to work towards solutions that go beyond what would be possible without their collaboration. It creates opportunities for businesses, organizations, citizens, landowners, and local, state, tribal, and federal agencies to influence decision-making and affect outcomes on the ground and in communities. Bringing people together augments our shared capacity to get work done and builds support for implementation of restoration projects. Fostering relationships through collaboration is an investment in the future of rural communities and the Forest Service that pays dividends in results within and beyond the CFLRP boundaries.

Key survey sources used in this review:

- To address the questions highlighted in the outline for this section, we pulled from a number of sources cited in the text below. There are two main survey references:
 - **“Strategies for Success Under Forest Service Restoration Authorities”**
https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf. In 2017, investigators surveyed participants in CFLRP and the Joint Chiefs Landscape Restoration Program – 425 agency staff and 143 interviews with agency staff and external stakeholders to understand the value added by these programs, identify factors that support success and persistent challenges, and inform future implementation and design of approaches.
 - **“National Forest Foundation CFLRP 2020 Collaboration Indicator Survey Results”**
<https://www.nationalforests.org/assets/pdfs/Collaboration-Indicator-Survey-Results-2020-publish.pdf>
In 2020, NFF administered a survey of CFLRP practitioners (agency staff and external stakeholders). There were 106 respondents.

The collaboration section is organized into three subsections and an Appendix. A hyperlink to the subsections, and parts within each subsection, is provided here for easy reference.

- The [Lessons Learned](#) subsection addresses the following questions:
 - [What are the benefits of collaboration?](#)
 - [What role does collaboration play in achieving restoration goals \(planning and implementation\)?](#)
 - [What key challenges/limitations to collaboration did we observe?](#)
 - [What are the best practices, especially in dealing with common challenges?](#)
 - [What have we learned about how to structure successful collaboration?](#)
 - [What have we learned about who participates?](#)
- [What questions emerged that need more investigation?](#)
- [Where to Learn More](#)
- The [Next Steps](#) subsection gives a brief overview of how this information will be used moving forward
- The [Appendix](#) provides a table linking key challenges, best practices identified, and relevant resources

In reflecting on these questions, the reader is encouraged to review *Developing and sustaining collaborative resilience in the face of change: A review of the Collaborative Forest Landscape Restoration Program* for a more in-depth exploration of many of the topics above. The report was a third-party assessment conducted by the Southwest Ecological Restoration Institutes (SWERI), which was intended to supplement the Level 2 summary/synthesis herein. The report is currently available in draft form here: <https://cfri.colostate.edu/wp-content/uploads/sites/22/2020/08/CFLRP-Developing-and-sustaining-collaborative-resilience.pdf>.

Lessons Learned

What are the benefits of collaboration?

- *Collaboration creates opportunities to generate more and multiple benefits and increase the impact of our shared work for shared benefits.* It expands capacity, improves trust, allowing for shared ownership of risk and increased innovation, and improves decision making.
- **Expanded innovation and outcomes.** The relationships forged through collaboratives provide critical capacity in terms of acres treated, finding process efficiencies, scientific expertise, traditional knowledge, community engagement, and securing additional funding. This expanded capacity can benefit the Agency as well as partners in working towards their goals. According to the 2020 NFF survey, 77% agreed that the collaborative group's participation improves the Forest Service's project implementation²¹
 - o Between 2010 and 2019²², projects have attracted more than \$470 million in partner investments across the CFLRP landscapes; \$159 million of which supported work on National Forest Systems lands through grant funding, stewardship agreements, job training for youth crews, monitoring, and more. The additional public-private partnership funding includes work on private and State lands within the CFLRP landscape.
 - o *CFLRP Project Examples from 2019 Annual Reports:*
 - In 2019, partners on the Grandfather Restoration CFLRP Project in North Carolina supported wildlife restoration activities across the CFLRP landscape. These activities included creating 144 acres of wildlife openings and conducting habitat surveys. Trout Unlimited assessed 74 stream crossings for potential barriers and completed sedimentation surveys along three miles of trails. Agency staff, contractors, and volunteers maintained over 215 miles of trails. MountainTrue helped design the Lover's Branch Restoration Project, mapping out streams and invasive plant species? over 50 acres ([2019 annual report](#))
 - In 2019, the Four Forest Restoration Initiative benefited from 7,680 hours of volunteer time to implementation restoration and perform monitoring across the landscape. Major partners in soliciting for and providing volunteers included Grand Canyon Trust, Arizona Elk Society, Friends of Northern Arizona Forests, and Trout Unlimited. ([2019 annual report](#))
 - The Northeast Washington Forest Vision 2020 benefited from \$908,020 in funding and support from the Colville Confederated Tribes for prescribed burning across 3,941 acres and pile burning across 780 acres in 2019. ([2019 annual report](#))
 - o Additional work is needed to understand the role of collaboration in achieving restoration results.
- **Enhanced trust.** Trust, between partners and between partners and the Forest Service, enables shared ownership of risk, increases support for restoration activities, and enables innovation. Echoed both in the third-party literature about trust and through CFLRP project examples, trust is a key driver for collaboration, conflict resolution, and performance.²³ Building trust, especially in the context of collaboratives that bring together former adversaries, is essential to success. 70% of CFLRP projects cited relationship building and collaborative work as the most important community benefit from the CFLRP program.²⁴ These improved relationships are a benefit in and of themselves. Trust is difficult to earn and easy to lose. As CFLRP sunsets for projects, an area for more exploration is how to maintain trust when the funding is gone.

²¹ National Forest Foundation CFLRP 2020 Collaboration Indicator Survey Results -

<https://www.nationalforests.org/assets/pdfs/Collaboration-Indicator-Survey-Results-2020-publish.pdf>

²² 2019 Annual Reports - <https://www.fs.fed.us/restoration/CFLRP/results.shtml>

²³ <https://www.tandfonline.com/doi/full/10.1080/08941920.2014.945062> (linked to on CFLRP Resource Library)

²⁴ 2019 Annual Reports - <https://www.fs.fed.us/restoration/CFLRP/results.shtml>

- **Shared risk.** Projects also reported that increased trust allows for more shared risk-taking and innovation in project design and implementation. Understanding the mechanisms and impacts of shared risk across partners is an area for further exploration.
 - o *CFLRP Project Examples:*
 - Cultivating and maintaining diverse membership is a success of Deschutes Collaborative Forest Project, (DCFP), ensuring our collaborative solutions are robust and socially supported because they integrate a multitude of perspectives and values. Diverse membership also enhances and expands our social capital, increasing connectedness and understanding among DCFP participants who otherwise would be unlikely to work together toward a common vision. Anecdotally, members report developing trust-based relationships that support effective working relationships inside and outside of DCFP. ([2019 annual report](#))
 - The Southern Blues Restoration Coalition anticipates decreased fire suppression costs over time as they build social license and gain trust. Through this trust-building, they continue to complete larger treatment blocks outside the immediate adjacency or private property, and under the right conditions, we have more opportunity to utilize alternative suppression strategies. ([2019 annual report](#))
- **Decreased conflict over management decisions.** Stakeholders reported seeing a decrease in conflict, litigation, or objections throughout their forest due to CFLRP. According to the 2017 survey of Agency staff, 61% said they had decreased litigation.²⁵ Respondents to the 2020 NFF survey shared that they used the collaborative group to engage litigants and objectors; however, a few mentioned that key parties remain unwilling or unable to participate. Litigation primarily focused on salvage sale opposition and wildlife conservation issues. It is important to note that collaboration does not necessarily prevent litigation, especially suits brought by entities operating outside of the collaborative.
 - o Approximately 4% of all CFLRP decisions were challenged in Federal Court from FY2010 to FY2017. All analyzed CFLRP decisions were either EIS's or EA's, and most were vegetative management projects. Seven percent of all Forest Service vegetative management projects analyzed through an EIS or EA were challenged FY10 to FY17. Nationally, 2.1% of all Forest Service decisions (CEs, EAs and EISs) across all resource areas were challenged over the same time period. Regional litigation rates vary considerably, suggesting the local litigation context plays a role as well.
 - o *CFLRP Project Examples:*
 - *"They filed amicus briefs for us on projects. And so, it's really cut down our deliberation time, our objection process that we're in now. But litigation has been essentially non-existent, because of the collaborative."* – Forest Service CFLRP Participant²⁶
 - For the Southwest Jemez Mountains CFLRP: The key to our success has been the collaborative nature of everyone involved, and the contributions of people with expertise, knowledge and passion who have participated in this 10-year program. We have not spent any funds on attorneys or court litigations but have devoted all financial resources to implementation and monitoring. This is clearly the track to follow for future successes in forest restoration. ([2019 annual report](#))
 - The Weiser Little Salmon Headwaters CFLRP in Idaho has experienced litigation on their second large landscape project, Lost Creek Boulder Creek. Partner groups did serve as interveners (Adams County and the American Forest Resource Council). ([2019 annual report](#))

²⁵ "Strategies for Success Under Forest Service Restoration Authorities"

https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf

²⁶ Ibid

- **Better decision-making.** As noted in the section below on the role of collaboration in achieving restoration goals, 82% of CFLRP practitioners surveyed agreed that collaborative participation improves Forest Service decision-making process.²⁷
 - o The survey did not include an explicit definition of “better’ Decision making. Comments related to this prompt characterized “better decision-making” in terms of impacts to improved NEPA processes and outcomes, changes to how contracting and prescriptions are developed, more balance in the final Records of Decision, and inclusion of more perspectives. Better decision-making is also defined around ability to leverage knowledge and information transparently through multi-party monitoring and citizen science. Some note that “better” didn’t mean faster, but rather more effective long-term outcomes.
 - o Comments from respondents highlight that “the stakeholders have formed strong consensus on key restoration priorities, which betters the NEPA process and outcomes” and that “input from the collaborative informs how contracting and prescriptions can be written to see the on-the-ground results that have been agreed upon (social license) through the collaborative.” The collaborative’s involvement leads the Agency to consider questions they didn’t before, and partners help identify potentially problematic issues up front. Additionally, the outside data, experience, and scientific expertise provided through the collaborative can enhance Forest Service decision-making.
 - o At the same time, practitioners also indicate that the improved decision-making varies from line officer to line officer, and in some places, projects are still moving forward without the collaborative’s participation. Several practitioners have also noted that while the decision-making process is better and more effective in the long run, it isn’t fast.

What role does collaboration play in achieving restoration goals (planning and implementation)?

- The collaborative approach is linked to the ecological and socioeconomic outcomes and community benefits described in other sections.
- 2020 NFF survey results from CFLRP agency staff and stakeholders indicate CFLRP practitioner perspectives on the role of collaboration and restoration goals:
 - o 81% of surveyed CFLRP participants agree that there is more restoration happening on the ground as a result of collaboration²⁸
 - o 82% agreed that collaborative participation improves Forest Service decision-making process²⁹
 - o 77% agreed that the collaborative group's participation improves the Forest Service's project implementation³⁰
- *How the collaborative approach specifically links to these results is an [area for further focus and research](#).*

What key challenges/limitations to collaboration did we observe?

Please see the Appendix for a table detailing key challenges, best practices identified to address these challenges, and resources to learn more.

- According to interviews conducted as part of the 2017 Strategies for Success work, interviewees also said collaboration had improved, but to various extents, **depending on the historical level of conflict or trust, the receptivity of local Forest Service managers to collaborative input, and the degree of contention about**

²⁷ National Forest Foundation CFLRP 2020 Collaboration Indicator Survey Results - <https://www.nationalforests.org/assets/pdfs/Collaboration-Indicator-Survey-Results-2020-publish.pdf>

²⁸ Ibid

²⁹ Ibid

³⁰ Ibid

restoration goals on a landscape³¹. Stakeholder groups with a history of conflict or distrust among stakeholders or with the agency reported less progress, although they often still reported improved relationships.

- Stakeholder groups involved in project planning were more satisfied with collaborative efforts and their overall influence on CFLRP projects.
- **It's important to recognize that it takes time and investment to support effective collaborative relationships - and continued attention to maintain those relationships over time.**
- **Project partners acknowledged that all of the time and energy spent in collaboration doesn't necessarily protect them from litigation.** While many project teams shared that litigation or objections have indeed decreased dramatically thanks in part to collaboration, litigation can still occur.
 - o Project teams are focusing on how collaboration can strengthen proposed projects and how partners provide important support and strengthen the Forest Service's case if litigation does occur.
- For the Forest Service, strong line-officer support for collaboration is critical for creating a shared vision and expectation for collaboration. In places that do not have this **line-officer support**, there may be disagreements about the vision and the role of the collaborative in informing decision-making.
- Because trust and working relationships are critical, **transitions and turnover** in agency personnel and individuals involved in the collaborative can impact project progress. Staff turnover is a widespread and consistent challenge.
- Project teams shared that **bringing in new partners** can be challenging, and it can also be **hard to sustain involvement**, especially for those participating on a volunteer basis. Effectively carrying out CFLRP can require a large commitment of time and resources from engaged collaborative groups.
- **Collaboration in planning, monitoring, AND implementation.** Project teams are interested in encouraging additional participation in the collaboratives and expanding the scope of engagement throughout the project cycle, especially an increasing focus on collaborative implementation.
- **Translating the collaborative vision into mechanics of contracts and agreements.** Knowing how to navigate this process, and inconsistency in policy or guidance interpretation, is challenging.
- **FACA-phobia.** Forest Service staff and/or partners worry about violating FACA, which prevents them from fully engaging in or supporting collaborative groups.
- **Lack of capacity** to support Projects is a widespread challenge. Strategic planning at the beginning to help ensure adequate capacity is in place is critical.
- **Creating and implementing a shared vision.**
- **Extending the work across ownerships for all lands restoration.** More work could be done to determine how to support work on non-NFS lands adjacent to CFLRP projects, especially given funding uncertainties.
- **Accountability and review Program-wide**, including reviews, possible additional FACA committee engagement, and/or third party reviews to help support transparency, evaluation, and trouble-shooting.

What are the best practices, especially in dealing with common challenges?

It's important to note that, while we have learned much about best practices for practitioners, there are also broader or higher level considerations that may incentivize or hinder effective collaboration. Some of these ongoing challenges are unpacked in the "Potential next steps" section below.

- Over 80% of survey respondents said a **history of collaboration** between the agency and among partners and an **effective communication strategy** with stakeholders were factors that supported project success.

³¹ "Strategies for Success Under Forest Service Restoration Authorities"
https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf

- Similarly, over 80% of people pointed to other aspects of collaboration, like **science capacity among stakeholders, facilitation, limited conflict, and a history of working together** as the most important external factors for success.
- There are common best practices for supporting effective collaboration, including clearly defined roles, third-party facilitation, documenting agreements, shared expectations, and approaches to managing turnover in participation.
 - o **Clear communication.** Seventy-four percent of agency respondents said clear communication protocols within the group also were key to success. Participants generally desire more active, timely, and transparent venues for sharing out on budgets, work plans, performance, measures, and planning.
 - o **Establish a shared vision and shared expectations.** Start with what you have in common—the shared vision for desired (or undesired) objectives for the landscape.
 - o **Recognize that it takes time and investments** - and continued attention over time - but pays dividends. Furthermore, some areas involve more contentious resource management issues than others and had to acknowledge that it would take more time to build trust. As one participant put it, the CFLRP approach “isn’t faster, but it’s better.” According to a Northeast Washington Forest Vision Coalition partner, “the hours spent in collaboration are worth it; better than spending those hours in litigation.”
 - o **Recognize and invest in the skills needed to support effective collaboration.** There is a basic level of partnership capacity on the Forest that must be maintained to be effective in leveraging partner resources. It takes time and skills around communication and partnership approaches to coordinate across groups and partners effectively.
 - o **Sharing risk.** Collaborative partners share successes and risk. In one instance, when a prescribed fire burned hotter than anticipated, NGO and local government partners stood up with Agency partners to accept shared ownership and risk of the results. The transparency and leveraging the positive relationships these organizations had with the community led to a positive outcome.
 - o **Start small.** Start with smaller projects to build trust, expectations, and capacity before tackling more difficult projects. As noted in [Restoring Forests and Communities: Lessons from the Collaborative Forest Landscape Restoration Program](#) a Forest Service employee at the Kootenai Valley Resource Initiative site said that, without the slow build-up, “We would not have been able to be at the point where we could have implemented something like this” and a collaborator there said they took “intentional, small steps” because, “had we jumped into something like CFLRA on year two, three, four, it would have just been a bomb.”
 - o **Strong Line Officer support** is critical for creating a shared vision and expectation for collaboration.
 - o **Forest Service engagement at arm’s length.** Recognize that partners can take the lead in carrying out key aspects of CFLRP implementation. Recognize and leverage everyone’s skills and interests to encourage shared ownership and increase capacity. Additional exploration of this concept can be found in *Collaboration at Arm’s Length: Navigating Agency Engagement in Landscape Scale Ecological Restoration Collaboratives* (Butler, 2013)
 - o **For collaborative groups, consider organizational structures and processes to support success.** Developing structures and processes for how the collaborative will work together at the beginning helps support group resilience and effectiveness. Develop expectations with the group for how it will function at the beginning, including ground rules, a charter, and organizational structure and revisit to adapt, as needed. Every group will be different, but proactively discussing the structure and processes of the group upfront can support success.

- Consider establishing and documenting the “**zones of agreement,**” or consensus, where partners and stakeholders agree on a shared vision for restoration outcomes, to help clarify where the collaborative is in agreement on a particular issue.
- **Subcommittees or working groups** that focus on different projects or topics can help spread out the workload and engage more stakeholders in issues of interest to them.
- **Use a third-party, neutral facilitator** to start the group off on the right foot or navigate contentious issues. Over 80% of survey respondents said strong facilitation is key.
- **Field trips** play an important role in facilitating communication during planning, implementation, and monitoring as well. The opportunity to discuss issues of concern out in the woods can help overcome impasses.
- **Let science be your guide.** Use best available science and site-specific monitoring as your guide for working through controversial issues. Consider engaged trusted science liaisons or advisors.
- **Invest in monitoring.** Not only can the results of monitoring inform and improve decisions and implementation of restoration activities moving forward, it also builds transparency, accountability, and trust amongst partners.
- **Build on government-to-government relationships with Tribes.** Consulting and working with tribal governments and members have helped these projects ensure that restoration efforts move toward mutually beneficial outcomes.
 - The Northeast Washington Forest Vision 2020 project team is working with Confederated Tribes of Colville tribal elders to map plants of social and cultural importance and to understand the impact of treatments on those plants. The Amador-Calaveras Cornerstone team worked with local tribal crews to implement restoration projects around cultural sites to reduce hazardous fuels and re-introduce aspen and other plants valued by local tribal members. The Burney-Hat Creek Basins team has a partnership with the Pit River Tribe to assess and monitor hydrological impacts of CFLRP projects to improve the design of subsequent projects.
 - Walatowa Timber Industries (WTI), LLC, is a joint venture that started in 2012 between the Jemez Community Development Corporation—which supports economic development within the traditional community of Jemez Pueblo, a federally recognized tribe—and TC Company, a local logging and milling business. This partnership supports better integration of tribes and tribal interests into the Southwest Jemez Mountains wood products supply chain.
- **Recognize that collaboration is by no means easy.** Bringing people with very different perspectives on landscape management together to work toward a shared vision and expectations requires time, energy, and tough conversations.
- **Recognize it doesn’t necessarily protect from litigation.** By investing more time upfront to involve local communities and partners, this approach builds relationships, trust, and support for long-term success. Project partners acknowledged that all of the time and energy spent in collaboration doesn’t necessarily protect them from litigation. While many project teams shared that litigation or objections have indeed decreased dramatically thanks in part to collaboration, litigation can still occur. Project teams are focusing on how collaboration can strengthen proposed projects and how partners provide important support and strengthen the Forest Service’s case if litigation does occur.
- **Evaluate, and reevaluate who is at the table.** It’s important to continuously look at who’s at the table and what perspectives, stakeholders, and potential partners might be missing at various points in the project cycle (planning, implementation, and monitoring). Project teams shared that bringing in new partners can be challenging. It’s important to include participants with different perspectives, skills, resources, and networks. Continue to ask, “Who’s not at the table?”

- **Sustaining momentum.** It can also be hard to sustain involvement, especially for those participating on a volunteer basis. It's also important to recognize that not all stakeholders are built for the "marathon." Larger organizations with paid staff may be able to withstand burnout easier than interested, but unpaid, stakeholders. It's important to provide engagement opportunities across the spectrum.
- **Collaboration in planning, implementation, and monitoring.** Project teams are interested in encouraging additional participation in the collaboratives and expanding the scope of engagement throughout the project cycle, especially an increasing focus on collaborative implementation. Explore creative ways to work together in project planning, implementation, and monitoring. Can partners be involved in writing NEPA documents? Completing surveys? Marking trees?
 - *See CFLRP Project Examples provided above, and additional examples below:*
 - The Four Forest Restoration Initiative is working through partnership to expand involvement in project implementation. For example, through its Long Valley Meadow project, 4FRI partners including Arizona Elk Society brought together well over one hundred volunteers for riparian restoration activities in a headwater meadow, including tree thinning, shaping stream channels, and constructing fences.
 - The Amador-Calaveras Cornerstone CFLRP team has a partnership with the Upper Mokelumne River Watershed Authority with a focus on watersheds and the link between healthy forests and healthy water supply. The project team successfully competed for a grant through the Sierra Nevada Conservancy to implement treatments that enhance watershed health. Project teams are recognizing the value of better understanding and communicating the link between their work and ecosystem services, especially clean and abundant water.
- **Creating resilience through transition.** Because trust and working relationships are critical, transitions in agency personnel and individuals involved in the collaborative can impact project progress. Projects were clear about this issue and shared some of their innovations to help address it. Recognize the importance of continuity in building and maintaining effective working relationships and communication. When a turnover in personnel must occur, consider ways to involve partners in bringing in key new staff, including devoted time to meet with partners and using the handover memo (link below).
 - For example, the Malheur National Forest works with the Southern Blues Resource Coalition collaborative to host regular workshops focused on onboarding and orientation for new employees involved in work with the collaborative.
 - The Burney-Hat Creek Basins team includes multiple Forest Service staff in meetings with the collaborative to promote broad participation and maintain continuity if an employee leaves and someone new is brought in. The collaborative shared that, although the previous ranger left, they are less concerned about the impact to their work, as there is a more collaborative orientation from the Agency in general.
- **Documenting meetings and agreements is critical for continuity and institutional memory.** Take good notes at meetings and field trips and share them. Notes can serve as a valuable reference and establish accountability and transparency. Determine who is responsible for these roles.
- **Remember to have fun and spend time building social connections. Celebrate your achievements.**

Best Practice Summary:

- **Invest in building trust and working relationships** with partners and community members, and recognize it takes time to do so.
- **Start with what you have in common**—the shared vision for desired (or undesired) objectives for the landscape.
- **Develop expectations with the group for how it will function** at the beginning, including ground rules, a charter, and organizational structure and revisit to adapt, as needed. Every group will be different, but proactively discussing the structure and processes of the group upfront can support success.
- Consider **establishing and documenting the “zones of agreement,”** or consensus, where partners and stakeholders agree on a shared vision for restoration outcomes, to help clarify where the collaborative is in agreement on a particular issue.
- **Subcommittees** that focus on different projects or topics can help spread out the workload and engage more stakeholders in issues of interest to them.
- Use a **third-party, neutral facilitator** to start the group off on the right foot or navigate contentious issues.
- **Take good notes at meetings and field trips and share them.** Notes can serve as a valuable reference and establish accountability and transparency.
- **Go out into the field** to help resolve conflicts. It is nearly always the best way! Remember to have fun and spend time building social connections.
- Recognize that the Forest Service doesn't need to run everything; **partners can take the lead.**
- **Start with smaller projects** to build trust, expectations, and capacity before tackling more difficult projects.
- Continue to ask, “Who's not at the table?”
- **Explore creative ways to work together** in project planning, implementation, and monitoring. Can partners be involved in writing NEPA documents? Completing surveys? Marking trees?
- **Recognize and leverage everyone's skills and interests** to encourage shared ownership and increase capacity.
- Use **best available science and site-specific monitoring** as your guide for working through controversial issues.
- **Seek strong line-officer support for collaboration.** It is critical for creating a shared vision and expectation of approaching work collaboratively.
- **Partnerships expand what the Forest can accomplish, and they require investment from the Forest.** There is a basic level of partnership capacity on the Forest that must be maintained to be effective in leveraging partner resources.
- **Recognize the importance of continuity in building and maintaining effective working relationships and communication.** When a turnover in personnel must occur, consider ways to involve partners in bringing in key new staff, including devoted time to meet with partners and using the handover memo.

What have we learned about how to structure successful collaboration?

- **The form that collaboration takes varies across projects.** Some collaboratives have more formal structured committees and functions, while others are more informal network groups.
 - o **More formal collaboratives have a charter, MOU, operating principles, or other guidelines for how they structure their work together.** By creating mutually agreed upon and acknowledged operations for their purposes, structure, function and how they make decisions, they establish clear communication channels and roles.
- **General approaches include:**
 - o In a Quorum, it's flat organizationally. For example, the [Southwest Crown of the Continent](#) asks members to sign a letter confirming their support for the CFLRP proposal and willingness to abide by the charter. After that everyone can be a voting member after their third meeting.
 - o With a Steering committee, there's a subset of collaborative nominated or elected by general collaborative. For [Deschutes Collaborative Forest Project](#), for example, there are 1-2 slots for each interest group perspective, elected to represents broader interests in making recommendations.

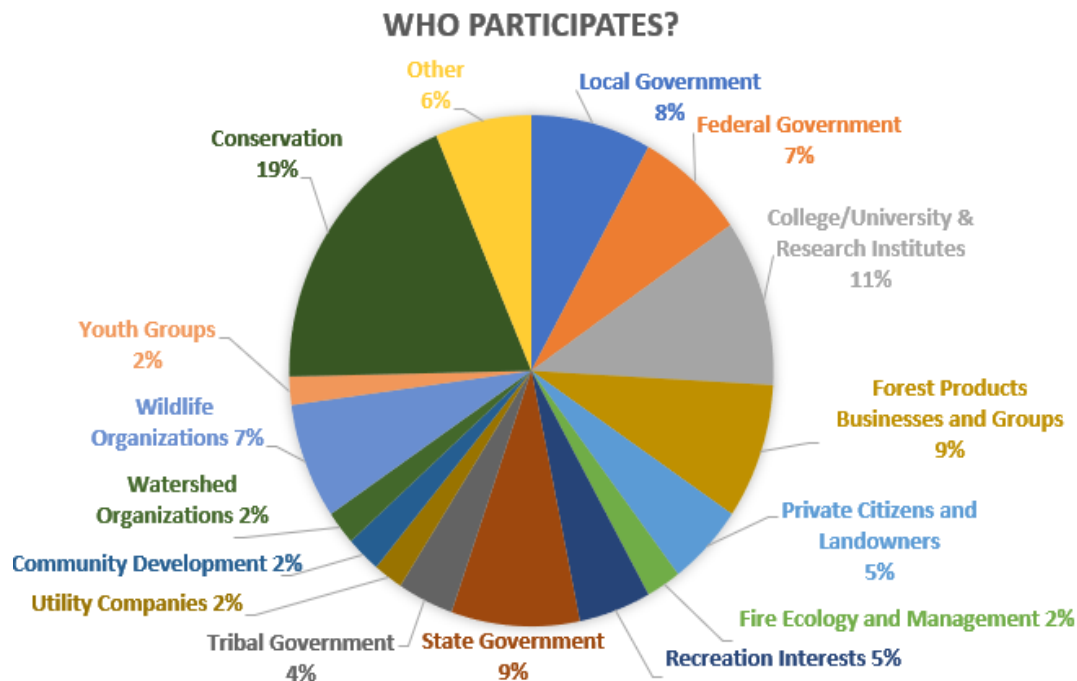
- There may also be an Executive Committee. This is unique to [Tapash Collaborative](#), which has an Executive Committee based on 5 landowning or managing entities, Federal, State, Tribal governments within the CFLRP.
- Multi-level organizations – have several working groups and committees focused on specific issues.
- In terms of what they **produce or provide**, they may:
 - **Create specific recommendations** for specific treatment proposals in specific areas
 - **Respond to FS developed proposals** and provide a thumbs up, thumbs down, or recommendations
 - **Develop [zones of agreements](#)**, where the group has essentially agreed on how to best treat or approach particular
- They also have various **decision-making processes**. **Consensus with a back-up** option when consensus can't be reached is a popular model.
 - For example, the **Payette** Forest Coalition in Idaho strives for full consensus (e.g., everyone can live with it). If it's not unanimous and it's not a final issue going to the Forest Service, they move to a back-up method, needing 80% agreement instead, noting the minority position. If it's for a final decision going to the Forest Service, they work towards a **unanimous decision minus one**.
 - For the Deschutes Collaborative Forest Project Steering Committee, they strive for consensus. However, if consensus cannot be reached after extensive discussion then a **2/3 majority** of voting Steering Committee members is required.
- **Some CFLRPs are informal networks of partners that do not have formal structures in place**. This approach seems to work best in places with a strong shared vision for goals on the ground and minimal contention, with individuals who have worked together for a long time. We have seen some risk in this approach, if an unexpected change or conflict arises, they do not have a process for addressing it or making decisions in place.
 - Understanding the characteristics of places where informal structures work is a valuable area for further exploration.
- **However, while the unique characteristics of a place impact success, there are considerations that apply across a range of contexts** (*see also the best practices described above*)
 - As the collaborative evolves over time, it is recommended that groups **continually evaluate their processes to make sure they are serving the group**.
 - Having a **dedicated liaison or coordinator** to help set agenda and connect internal and external partners is important.
 - **Over 80% of survey respondents said a history of collaboration between the agency and partners supported project success**. It takes time to build effective working relationships.³²
 - As groups continue to work together, they build the trust and relationships needed to move beyond established agreements and tackle more contentious issues. They can expand capacity and bring in new voices with additional perspectives that can help address gaps in skills or expertise. Two examples include:
 - The Southern Blues Restoration Coalition is evolving its approaches to prescriptions on the landscape from recommending plantation-style treatments to “skips and gaps.”
 - The Blue Mountains Forest Partners are now developing zones of agreement for increasingly contentious issues. The Forest Service and partners have moved from “traditional” approaches of marking individual trees to designation by prescription as a relationship has developed with the contractor.

³² “Strategies for Success Under Forest Service Restoration Authorities”

https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf

What have we learned about who participates?

- Over **420 unique organizations** and **560 individuals** participated across the 23 CFLRP projects
- 88% said that organizations with a stake in their CFLRP project are engaged in the collaborative³³ and 44% of CFLRP projects identified the partnership composition as a top community benefit.



Participants in the 23 CFLRP Projects span multiple sectors, organizations, governments, and interests.

Example: Amador Calaveras Cornerstone CFLRP has 33 core participating stakeholders organized into work groups from planning to monitoring: Alpine Biomass Committee, Amador County Veterans Organization, Amador Fire Safe Council, Amador-Calaveras Cooperative Association for Biomass Utilization, Blue Mountain Community Renewal Council, CA Department of Fish and Wildlife, CA Indian Manpower Consortium, Calaveras Foothills Fire Safe Council, Calaveras Healthy Impact Product Solutions, CALFIRE, CALFAUNA, Central Sierra Environmental Resource Center, Central Sierra Resource Conservation and Development Council, Ebbetts Pass Forest Watch, Foothill Conservancy, Heissenbuttel Natural Resource Consulting, Mother Lode Job Training, Natural Resource Conservation Service, Pacific Gas and Electric Company, Sierra Forest Legacy, Sierra Nevada Conservancy, Sierra Pacific Industries, Smith's Grinding, Calaveras County District Supervisor, The Nature Conservancy, Trout Unlimited, Bureau of Land Management, Vicini Brothers Green Material Recycling, West Point Fire District, and community members.

Based on data from the 23 CFLRP projects, participants tend to be local and regional organizations and entities, rather than national groups. However, certain organizations do participate in multiple CFLRP projects across the country:

³³ National Forest Foundation CFLRP 2020 Collaboration Indicator Survey Results - <https://www.nationalforests.org/assets/pdfs/Collaboration-Indicator-Survey-Results-2020-publish.pdf>

<i>Organizations involved in more than 2 CFLRPs</i>	<i>Number of CFLRP Projects</i>
NRCS	6
National Park Service	5
National Wild Turkey Federation	7
Rocky Mountain Elk Foundation	4
The Nature Conservancy	14
The Wilderness Society	4
Trout Unlimited	6
US Fish and Wildlife Service	7
US Geological Survey	3

Additional Resources for Practitioners:

Initial Resources:

- National Forest Foundation’s collection of tools, best practices, and peer learning sessions developed to aid collaborative groups, Forest Service staff, and community partners in the practice of collaboration is available on the [National Forest Foundation Practice of Collaboration Website](#)
 - o Resources include Peer Learning Sessions, recorded webinars on topics including [FACAPhobia](#)
- Best practices on creating resilience through transition of Forest Service staff are available in the USFS Handover Memo on the [Partnership Resource Center, The Art of Collaboration Website](#)
- The National Collaboration Cadre is a network of people from around the country who work with National Forests, communities, interested stakeholders, and/or collaborative groups to help them engage in effective collaboration. [Collaborative Planning, USDA Forest Service National Collaboration Cadre Website](#)
 - o [Building a Solid Foundation for Collaborative Efforts, The 4P Foundation: Purposes, People, Processes, and Products](#)
 - o [Maintaining the Foundation of Collaborative Groups](#)
- Community Collaboration Academy - <https://www.partnership-academy.net/>
- [Collaboration at Arm’s Length: Navigating Agency Engagement in Landscape Scale Ecological Restoration Collaboratives Website](#) (Butler, William)
- The Ecosystem Management Coordination (EMC) staff of the Washington Office has developed a [catalogue of resources on engaging underserved communities](#) that offers ideas for expanding participation and diversity.
- [Example “zones of agreement”](#) developed by Blue Mountain Forest Partners in Oregon for project and landscape-scale work
- The [US Forest Service Partnership Capacity Assessment Tool](#) provides an approach to assessing current and potential partnership and collaboration opportunities.
- [“From Personality-Driven to Institutionally Driven Collaboration by the US Forest Service”](#) – DuPraw et al, 2015. Conflict Resolution Quarterly.
- [“Making and Breaking Trust in Forest Collaborative Groups”](#) – Davis et al 2018, Humboldt Journal of Social Relations.
- [“The Multidimensionality of Trust: Applications in Collaborative Natural Resource Management”](#) – Stern and Coleman 2013, Society and Natural Resources.
- [“Collaborative Capacity and Outcomes from Oregon’s Federal Forest Restoration Program”](#) – Davis, Santo, and White, 2019. Ecosystem Workforce Program Working Paper Number 92.
- The [CFLRP Resource Library](#) includes links to Forest Service and partner resources to support collaboration, partnership, and community engagement

What questions emerged that need more investigation?

- Additional work is needed to understand the role of collaboration in achieving restoration results
- Understanding the mechanisms and impacts of sharing risk across partners is an area for further exploration.
 - o What actions are perceived as risks, by whom, and why?
 - o What are the metrics of shared risk (e.g., shared resources, social/political investments)
- Understanding the characteristics of places where informal structures work is a valuable area for further exploration.
- Related to this, what do we know about organizational learning? What are the ways people need to learn and absorb?
- What are the unspoken elements needed for certain groups to come to the table?
- Trust is difficult to earn and easy to lose. As CFLRP sunsets for projects, an area for more exploration is how to maintain trust when the funding is gone. What are the barriers to trust?
- How do we help nascent groups build sufficient collaborative capacity to successfully work at the scale of a CFLRP project?
 - o We've learned that CFLRP works well when there is already strong collaborative capacity in place, and that CFLRP typically strengthens and expands that capacity. We need more research (or better connections to existing research) on how to catalyze and nurture collaborative capacity to start with.
- How do we support the collaborative groups after the 10-year funding is over? How do we help support collaborative groups during the 10 year period? Check ins at the 5 year mark?
- How well do CFLRP collaboratives reflect the diversity of the communities in which they operate? Where there are gaps, how can collaboratives better connect with underrepresented communities?
 - o We need more research (or better connections to existing research) to understand the current diversity within collaboratives and how to increase diversity where needed.
 - o We don't have data currently available regarding the demographics of participation in terms of gender, ethnicity, economic class, and other measures for inclusivity.
- We have indications that collaborative structure (MOU, charters, etc.) help create clear communication and processes for addressing contentious issues – we don't have a definitive link between structure and successful outcomes. Can we begin to link different characteristics of collaboratives to social, ecological, and economic outcomes over time?
- Did local collaboration address local needs and context, while fitting into larger regional, state, and national efforts?
- What are the long-term benefits of collaboration? If/how does the investment lead to benefits for years to come?
- We have not updated the environmental analysis and decision-making results since 2017. That may help expand our sample size for, possibly, more statistically significant results.
- We have a huge body of literature, both from the research community and each invidiously CFLRP project, on best practices and lessons learned. Beyond making available on the CFLRP Resource Library – what additional work is needed to compile it?

Where to Learn More/Resources for More Information:

Major data sources supporting this section and resources to learn more:

- [CFLRP site visit report](#) (2016-2018)
- [CFLRP annual reports](#) (see question 12 for lists of collaborative members)
- Compiled collaborative member data (available upon request)

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- Data from PALS database on NEPA timelines and scale for CFLRP Projects (available upon request)
- CFLRP site visit reports for each Region (available upon request)
- Collaboration surveys (third party)
 - o [Strategies for Success Under Forest Service Restoration Initiatives](#) National Forest Foundation CFLRP 2020 Collaboration Indicator Survey Results - <https://www.nationalforests.org/assets/pdfs/Collaboration-Indicator-Survey-Results-2020-publish.pdf>
 - o Research on CFLRP and collaboration on the [CFLRP Resource Library](#), including:
 - o Collaboration at Arm's Length: Navigating Agency Engagement in Landscape Scale Ecological Restoration Collaboratives (Butler, 2013)
 - o Visions of Restoration in Fire-Adapted Forest Landscapes: Lessons from the Collaborative Forest Landscape Restoration Program (Urgenson et al, 2017)
 - o Responding to a policy mandate to collaborate: structuring collaboration in the collaborative forest landscape restoration program (Monroe & Butler, 2015)
- [A New Era for Collaborative Forest Management: Policy and Practice insights from the Collaborative Forest Landscape Restoration Program](#) (The Earthscan Forest Library) (Butler & Schultz, co-editors) ⁱ
- (Draft) [Developing and sustaining collaborative resilience in the face of change: A review of the Collaborative Forest Landscape Restoration Program](#) (this assessment conducted by the Southwest Ecological Restoration Institutes is currently in draft form)
- If any of the links included in this document are not accessible please contact Lindsay Buchanan for access.

Next Steps:

- CFLRP offers valuable insights into common challenges in effective and meaningful collaboration over time and offers best practices to address many of these challenges.
- At the same time, important barriers remain to supporting effective collaboration within and across units and individuals. Investments in time and skills related to collaboration are essential to success. Institutionalizing practices and agreements is part of the solution.
- Program staff are assessing ongoing challenges, identifying opportunities to address those challenges, and carrying out next steps with colleagues and partners for each Level 2 theme and across them as well.

Collaboration Section Appendix

Collaboration Challenge Area	Collaboration Best Practices	Resources
Historical level of conflict or distrust is high and/or lack of agreement about shared restoration goals on a landscape	<p>Clear communication. Seventy-four percent of agency respondents said clear communication protocols within the group also were key to success. Participants generally desire more active, timely, and transparent venues for sharing out on budgets, work plans, performance, measures, and planning.</p> <p>Establish a shared vision and shared expectations. Start with what you have in common—the shared vision for desired (or undesired) objectives for the landscape.</p> <p>Recognize and invest in the skills needed to support effective collaboration. There is a basic level of partnership capacity on the Forest</p>	<p>National Forest Foundation Practice of Collaboration Website</p> <p>Building a Solid Foundation for Collaborative Efforts, The 4P Foundation: Purposes, People,</p>

	<p>that must be maintained to be effective in leveraging partner resources. It takes time and skills around communication and partnership approaches to coordinate across groups and partners effectively.</p> <p>Start small. Start with smaller projects to build trust, expectations, and capacity before tackling more difficult projects. As noted in Restoring Forests and Communities: Lessons from the Collaborative Forest Landscape Restoration Program a Forest Service employee at the Kootenai Valley Resource Initiative site said that, without the slow build-up, “We would not have been able to be at the point where we could have implemented something like this” and a collaborator there said they took “intentional, small steps” because, “had we jumped into something like CFLRA on year two, three, four, it would have just been a bomb.”</p> <p>Forest Service engagement at arm’s length. Recognize that partners can take the lead in carrying out key aspects of CFLRP implementation. Recognize and leverage everyone’s skills and interests to encourage shared ownership and increase capacity. Additional exploration of this concept can be found in <i>Collaboration at Arm’s Length: Navigating Agency Engagement in Landscape Scale Ecological Restoration Collaboratives</i> (Butler, 2013)</p> <p>For collaborative groups, consider organizational structures and processes to support success. Developing structures and processes for how the collaborative will work together at the beginning helps support group resilience and effectiveness. Develop expectations with the group for how it will function at the beginning, including ground rules, a charter, and organizational structure and revisit to adapt, as needed. Every group will be different, but proactively discussing the structure and processes of the group upfront can support success.</p> <p>Consider establishing and documenting the “zones of agreement,” or consensus, where partners and stakeholders agree on a shared vision for restoration outcomes, to help clarify where the collaborative is in agreement on a particular issue.</p> <p>Subcommittees or working groups that focus on different projects or topics can help spread out the workload and engage more stakeholders in issues of interest to them.</p> <p>Use a third-party, neutral facilitator to start the group off on the right foot or navigate contentious issues. Over 80% of survey respondents said strong facilitation is key.</p> <p>Field trips play an important role in facilitating communication during planning, implementation, and monitoring as well. The opportunity to discuss issues of concern out in the woods can help overcome impasses.</p>	<p>Processes, and Products</p> <p>Collaborative Planning, USDA Forest Service National Collaboration Cadre Website</p> <p>Community Collaboration Academy</p> <p>Collaboration at Arm's Length: Navigating Agency Engagement in Landscape Scale Ecological Restoration Collaboratives Website Example “zones of agreement”</p> <p>US Forest Service Partnership Capacity Assessment Tool</p> <p>A Framework for Assessing Collaborative Capacity in Community-Based Public Forest Management</p> <p>Making and Breaking Trust in Forest Collaborative Groups</p> <p>The Multidimensionality of Trust: Applications in</p>
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	<p>Let science be your guide. Use best available science and site-specific monitoring as your guide for working through controversial issues. Consider engaged trusted science liaisons or advisors.</p> <p>Invest in monitoring. Not only can the results of monitoring inform and improve decisions and implementation of restoration activities moving forward, it also builds transparency, accountability, and trust amongst partners.</p> <p>Build on government-to-government relationships with Tribes. Consulting and working with tribal governments and members have helped these projects ensure that restoration efforts move toward mutually beneficial outcomes. The Northeast Washington Forest Vision 2020 project team is working with Confederated Tribes of Colville tribal elders to map plants of social and cultural importance and to understand the impact of treatments on those plants.</p> <p>The Amador-Calaveras Cornerstone team worked with local tribal crews to implement restoration projects around cultural sites to reduce hazardous fuels and re-introduce aspen and other plants valued by local tribal members.</p> <p>The Burney-Hat Creek Basins team has a partnership with the Pit River Tribe to assess and monitor hydrological impacts of CFLRP projects to improve the design of subsequent projects.</p> <p>Walatowa Timber Industries (WTI), LLC, is a joint venture that started in 2012 between the Jemez Community Development Corporation—which supports economic development within the traditional community of Jemez Pueblo, a federally recognized tribe—and TC Company, a local logging and milling business. This partnership supports better integration of tribes and tribal interests into the Southwest Jemez Mountains wood products supply chain.</p> <p>Remember to have fun and spend time building social connections.</p> <p>Recognize that collaboration is by no means easy. Bringing people with very different perspectives on landscape management together to work toward a shared vision and expectations requires time, energy, and tough conversations.</p>	<p>Collaborative Natural Resource Management</p> <p>Visions of Restoration in Fire-Adapted Forest Landscapes: Lessons from the Collaborative Forest Landscape Restoration Program</p> <p>Restoration of pine-oak woodlands in Missouri: Using science to inform land management debates and decisions</p>
<p>Receptivity of Forest Service managers to collaborative input. Line officer support for collaboration critical for creating</p>	<p>Recognize and invest in the skills needed to support effective collaboration. There is a basic level of partnership capacity on the Forest that must be maintained to be effective in leveraging partner resources. It takes time and skills around communication and partnership approaches to coordinate across groups and partners effectively.</p>	<p>National Forest Foundation Practice of Collaboration Website</p> <p>Collaborative Planning, USDA</p>

<p>a shared vision and expectations.</p>	<p>Sharing risk. Collaborative partners share successes and risk. In one instance, when a prescribed fire burned hotter than anticipated, NGO and local government partners stood up with Agency partners to accept shared ownership and risk of the results. The transparency and leveraging the positive relationships these organizations had with the community led to a positive outcome.</p>	<p>Forest Service National Collaboration Cadre Website</p>
<p>It takes time and investment to support effective collaborative relationships – and continued attention to maintain those relationships over time</p>	<p>Recognize that it takes time and investments - and continued attention over time - but pays dividends. Furthermore, some areas involve more contentious resource management issues than others and had to acknowledge that it would take more time to build trust. As one participant put it, the CFLRP approach “isn’t faster, but it’s better.” According to a Northeast Washington Forest Vision Coalition partner, “the hours spent in collaboration are worth it; better than spending those hours in litigation.”</p> <p>Recognize and invest in the skills needed to support effective collaboration. There is a basic level of partnership capacity on the Forest that must be maintained to be effective in leveraging partner resources. It takes time and skills around communication and partnership approaches to coordinate across groups and partners effectively.</p> <p>Start small. Start with smaller projects to build trust, expectations, and capacity before tackling more difficult projects. As noted in Restoring Forests and Communities: Lessons from the Collaborative Forest Landscape Restoration Program a Forest Service employee at the Kootenai Valley Resource Initiative site said that, without the slow build-up, “We would not have been able to be at the point where we could have implemented something like this” and a collaborator there said they took “intentional, small steps” because, “had we jumped into something like CFLRA on year two, three, four, it would have just been a bomb.”</p> <p>As the collaborative evolves over time, it is recommended that groups continually evaluate their processes to make sure they are serving the group.</p> <p>Celebrate your achievements.</p>	<p>National Forest Foundation Practice of Collaboration Website</p> <p>Maintaining the Foundation of Collaborative Groups</p>
<p>Collaboration doesn’t necessarily protect projects from litigation</p>	<p>Recognize it doesn’t necessarily protect from litigation. By investing more time upfront to involve local communities and partners, this approach builds relationships, trust, and support for long-term success. Project partners acknowledged that all of the time and energy spent in collaboration doesn’t necessarily protect them from litigation. While many project teams shared that litigation or objections have indeed decreased dramatically thanks in part to collaboration, litigation can still occur. Project teams are focusing on how collaboration can strengthen proposed projects and how partners provide important support and strengthen the Forest Service’s case if litigation does occur.</p>	

<p>Because trust and working relationships are critical, transitions and turnover in agency personnel and individuals involved in the collaborative can impact project progress. Staff turnover is a widespread and consistent challenge.</p>	<p>Creating resilience through transition. Because trust and working relationships are critical, transitions in agency personnel and individuals involved in the collaborative can impact project progress. Projects were clear about this issue and shared some of their innovations to help address it. Recognize the importance of continuity in building and maintaining effective working relationships and communication. When a turnover in personnel must occur, consider ways to involve partners in bringing in key new staff, including devoted time to meet with partners and using the handover memo (link below).</p> <p>For example, the Malheur National Forest works with the Southern Blues Resource Coalition collaborative to host regular workshops focused on onboarding and orientation for new employees involved in work with the collaborative.</p> <p>The Burney-Hat Creek Basins team includes multiple Forest Service staff in meetings with the collaborative to promote broad participation and maintain continuity if an employee leaves and someone new is brought in. The collaborative shared that, although the previous ranger left, they are less concerned about the impact to their work, as there is a more collaborative orientation from the Agency in general.</p> <p>Documenting meetings and agreements is critical for continuity and institutional memory. Take good notes at meetings and field trips and share them. Notes can serve as a valuable reference and establish accountability and transparency. Determine who is responsible for these roles.</p>	<p>USFS Handover Memo on the Partnership Resource Center, The Art of Collaboration Website</p>
<p>Challenging to bring in new partners, and/or sustain involvement, especially for those participating on a volunteer basis.</p>	<p>Evaluate, and reevaluate who is at the table. It’s important to continuously look at who’s at the table and what perspectives, stakeholders, and potential partners might be missing at various points in the project cycle (planning, implementation, and monitoring). Project teams shared that bringing in new partners can be challenging. It’s important to include participants with different perspectives, skills, resources, and networks. Continue to ask, “Who’s not at the table?”</p> <p>Sustaining momentum. It can also be hard to sustain involvement, especially for those participating on a volunteer basis. It’s also important to recognize that not all stakeholders are built for the “marathon.” Larger organizations with paid staff may be able to withstand burnout easier than interested, but unpaid, stakeholders. It’s important to provide engagement opportunities across the spectrum.</p>	<p>Catalogue of resources on engaging underserved communities</p> <p>National Forest Foundation Practice of Collaboration Website</p> <p>Maintaining the Foundation of Collaborative Groups</p>
<p>Collaboration in the implementation phase of the process</p>	<p>Collaboration in planning, implementation, and monitoring. Project teams are interested in encouraging additional participation in the collaboratives and expanding the scope of engagement throughout the project cycle, especially an increasing focus on collaborative implementation. Explore creative ways to work together in project planning, implementation, and monitoring. Can partners be involved in writing NEPA documents? Completing surveys? Marking trees?</p>	<p>National Forest Foundation Practice of Collaboration Website</p>

	<p><i>See CFLRP Project Examples provided above, and additional examples below:</i></p> <p>The Four Forest Restoration Initiative is working through partnership to expand involvement in project implementation. For example, through its Long Valley Meadow project, 4FRI partners including Arizona Elk Society brought together well over one hundred volunteers for riparian restoration activities in a headwater meadow, including tree thinning, shaping stream channels, and constructing fences.</p> <p>The Amador-Calaveras Cornerstone CFLRP team has a partnership with the Upper Mokelumne River Watershed Authority with a focus on watersheds and the link between healthy forests and healthy water supply. The project team successfully competed for a grant through the Sierra Nevada Conservancy to implement treatments that enhance watershed health. Project teams are recognizing the value of better understanding and communicating the link between their work and ecosystem services, especially clean and abundant water.</p>	
<p>Lack of capacity to support Projects is a widespread challenge. Strategic planning at the beginning to help ensure adequate capacity is in place is critical.</p>	<p>Recognize and invest in the skills needed to support effective collaboration. There is a basic level of partnership capacity on the Forest that must be maintained to be effective in leveraging partner resources. It takes time and skills around communication and partnership approaches to coordinate across groups and partners effectively.</p> <p>Having a dedicated liaison or coordinator to help set agenda and connect internal and external partners is important.</p> <p>Forest Service engagement at arm’s length. Recognize that partners can take the lead in carrying out key aspects of CFLRP implementation. Recognize and leverage everyone’s skills and interests to encourage shared ownership and increase capacity. Additional exploration of this concept can be found in <i>Collaboration at Arm's Length: Navigating Agency Engagement in Landscape Scale Ecological Restoration Collaboratives</i> (Butler, 2013)</p>	<p>Collaborative Capacity and Outcomes from Oregon’s Federal Forest Restoration Program</p>
<p>Extending the work across ownerships for all lands restoration. More work could be done to determine how to support work on non-NFS lands adjacent to CFLRP projects, especially given funding uncertainties.</p>		<p>Peer Learning Session: Maintaining Collaboration and Coordinating Different Entities on CFLRP Projects</p>

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<p>It can be challenging to translate the collaborative vision into mechanics of contracts and agreements. Knowing how to navigate this process, and inconsistency in policy of guidance interpretation, is challenging.</p>		<p>Collaboration and the Malheur Ten-Year Stewardship Contract (Fact Sheet 8)</p>
<p>FACA-phobia. Forest Service staff and/or partners worry about violating FACA, which prevents them from fully engaging in or supporting collaborative groups.</p>		<p>Recorded webinar FACAPhobia</p>

Leveraging Resources

CFLRP funding has been effectively used to leverage multiple local, regional, and national funding streams – including public and private funding – for restoration work on both Forest Service and private lands, to support the multi-party monitoring program, and provide employment and training opportunities to local youth. The strategic, place-based and long-term funding invested through CFLRP, leveraged with Forest Service funding and in-kind contributions, incentivized partners to contribute significant local funding to support restoration efforts on CFLRP landscapes. This leveraged funding not only expands our ability to create results together, it also reflects shared ownership in the results.

The leveraging resources section is organized into subsections. A hyperlink to the subsections, and parts within each subsection, is provided here for easy reference.

- The [Lessons Learned](#) subsection addresses the following questions:
 - [To what extent does strategic federal investment in priority landscapes leverage partner resources?](#)
 - [What kinds of partners tend to provide leveraged capacity? What best practices emerged?](#)
 - [What are common agreements with partners?](#)
 - [Are CFLRP projects more competitive for other funding sources?](#)
- [What, if any, new questions emerged that need more investigation?](#)
- [Where to Learn More](#)
 - The [Next Steps](#) subsection gives a brief overview of how this information will be used moving forward.

Lessons Learned

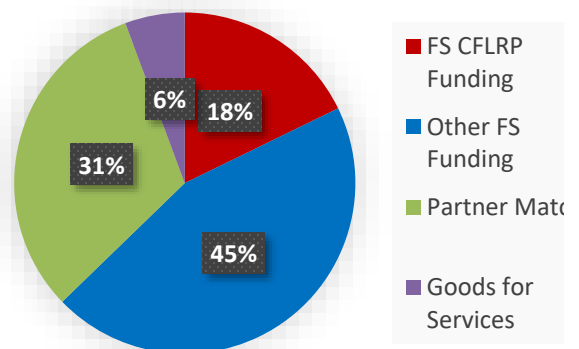
To what extent does strategic federal investment in priority landscapes leverage partner resources?

- Between 2010 and 2019³⁴, projects have attracted more than \$470 million in partner investments across the CFLRP landscapes; \$159 million of which supported work on National Forest Systems lands through grant funding, stewardship agreements, job training for youth crews, monitoring, and more. The additional public-private partnership funding includes work on private and State lands within the CFLRP landscape.
- For every dollar of CFLRP funding spent, we attracted \$1.80 from partner investments.
- Partner match for CFLRP Projects exceeds the Agency’s minimum standard for agreements (20% match).

Types of funds

- Types of funds ranged from the Collaborative Forest Landscape Restoration Fund budget line item (CFLN and CFLRP funds), partner funds contributed through agreements, partner in kind contributions, other Forest Service appropriated dollars, and goods for services funding.

Total CFLRP Project Funding Expended (FY 2010 - 2019)



FS CFLRP funding are funds authorized by Congress and can be spent on implementation and monitoring on NFS lands. Other FS funding includes Agency funds to support CFLRP Projects across all lands. Partner match includes funding and in-kind contributions from partners to support CFLRP projects across all lands. Goods for Services represents the value of goods traded for services in stewardship contracts to implement treatments and monitor CFLRP projects on NFS lands.

³⁴ Need project confirmations to include FY19 data

What kinds of partners tend to provide leveraged capacity? What best practices emerged?

- Contributions came from **NGOs** such as National Fish and Wildlife Foundation, Sierra Institute for Community and Environment, National Wild Turkey Federation, The Nature Conservancy, Trout Unlimited; **youth educational programs** such as Student Conservation Association, California Conservation Corps, Montana Conservation Corps ; **federal agencies** such as US Geological Survey, Natural Resource Conservation Service, Bureau of Indian Affairs, National Park Service ; **state agencies** such as California Department of Forestry and Fire Protection; Washington State Department of Transportation; **universities** such as Washington State University, California State University; **municipal watersheds** such as Upper Mokelumne River Watershed Authority and **timber industries** such as Iron Triangle Logging.
- Project partners continued to successfully leverage multiple funding sources to accomplish important restoration projects, support the multi-party monitoring program, and provide employment and training opportunities to local youth.
- Projects reported the value of leveraging multiple local, regional, and national funding streams—including public and private funding—to **sustain future capacity**.
- To sustain future capacity, it's also critical to continue to **invest in partner relationships and collaboration among all involved parties** with meetings, field trips, outreach and technology transfer.

Common agreements with partners

- Projects were executed through **mechanisms**, including but not limited to service contracts, stewardship agreements, Challenge Cost Share Agreement, Master Participating Agreements and Supplemental Project Agreements for reforestation, thinning, mastication, burn preparation, piling of hazardous fuels and other treatments.
 - Challenge cost share example – Burney Hat Creek: The Great Shasta Rail Trail 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.
 - Facilitation agreement example – Burney Hat Creek: 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.
 - Stewardship agreement example – Amador Calaveras - Working through a Stewardship Agreement with the National Wild Turkey Federation (NWF) the Amador Ranger District was able to complete biomass removal of slash piles left from the View 88 Fuels Reduction and Forest Health project.
 - Supplemental Project Agreement (part of Good Neighbor Authority Agreements) – Amador Calaveras: In 2016, National Fish and Wildlife Foundation (NFWF) and the ENF entered into a Supplemental Project Agreement (SPA). The purpose of the SPA was to restore ecological integrity and healthy functioning of watersheds and ecosystems affected by the Power Fire. By 2017, NFWF and ENF established a Restoration Strategy (http://www.nfwf.org/norcal/Documents/NorCal_RestorationStrategy.pdf) to identify the areas and projects in which would provide the highest return on our conservation investments.
 - Master Participating agreement – 4FRI: Using the MPA the Apache-Sitgreaves entered into a \$1,000,000 partnership with the White Mountain Apache Tribe through the DOI Reserve Treaty Rights Lands to conduct fuels reductions activities on culturally important sites on NFS lands using Tribal labor supervised by Forest Service employees.
 - Challenge Cost Share agreement – Missouri Pine Oak Woodlands - The Forest has a Challenge Cost Share Agreement with Missouri State University and has financial arrangements with the Northern Research Station for assistance in monitoring.

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- Wyden amendments participating agreements – Missouri Pine Oak Woodlands - The Forest has had over 20 executed Wyden Amendments Participating Agreements to conduct prescribed fire on private lands adjacent to Forest Service lands.
- Cross institutional agreements -Longleaf Pine - We have agreements in place with the University of South Alabama, University of Southern Mississippi, and Mississippi State University for cultural resource surveys, soil & plant monitoring, summer intern programs.

CFLRP Project Examples:

- CFLRP funding has been effectively used to leverage more funds and structuring funds/contracts to increase total capacity for restoration work on both Forest Service and private lands. Public-private funds expand the pace and scale of implementation through volunteer hours to complete trail work or implement prescribed fire, through direct implementation of treatments, and for monitoring, job training, and critical expertise.
 - Weiser Little Salmon: Utilizing Designation by Prescription (DxP) allows the Payette National Forest to leverage the contract purchaser to complete this work through a subcontractor. During FY19 a total of 176 DxP acres were completed on Bear Claw Timber sale. This equates to approximately \$7,000 dollars (\$38-40/acre) in work that the contractor completed in the WLSH CFLRP area. This is an increase in production above and beyond the Forest’s current capacity. ([2019 Annual Report](#))
 - Lakeview: In total, approximately \$4 million was gained for forest restoration on private lands and \$5 million for federal lands. To date, thinning has been implemented on approximately 21,292 acres of private and 15,249 acres of federal land within the project area using all available funding sources. ([2019 Annual Report](#))
 - Burney Hat Creek: 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 CFLRP 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. ([2019 Annual Report](#))
 - Tapash: The Forest Service, in partnership with The Nature Conservancy, obtained Land and Water Conservation Fund dollars to acquire 4,815 acres of former cutover land from the Plum Creek Timber Co. for \$6,609,000. The acquisition consisted of many privately owned “checkerboard” parcels surrounded by the Okanogan-Wenatchee National Forest (OWNF). Permanent conservation in a national forest means these parcels will never again be harvested at an industrial scale. They will again join seamlessly with neighboring stands as they progress through unfettered stages of succession and disturbance. ([2019 Annual Report](#))
 - Amador Cornerstone: In FY19, National Fish and Wildlife Foundation awarded over 2.5 million dollars to eight projects that will contribute over \$690,000 in non-federal match for a total conservation investment of over 3.2 million dollars over the next two years. ([2019 Annual Report](#))
 - 4FRI: The City of Flagstaff continued their work and progress on the Flagstaff Watershed Protection Project (FWPP) as another highlight of 2019. Using funds from the FWPP bond, the City of Flagstaff contributed \$2.2 Million to helicopter and steep slope logging contracts that continue to reduce the fire risk on the steep slopes directly adjacent to the City of Flagstaff. This example of shared stewardship displayed on this project can be a model for other collaborative to look at alternative funding sources to meet restoration goals. ([2019 Annual Report](#))
 - Partnerships and other initiatives contributed significantly to matching treatments in the CFLRP footprint in 2019. Example – CO Front Range – Partnerships with water providers, focused on watershed

health and fuels reduction, contributed \$500,000 to accomplish 1300 acres of restoration work and an additional \$60,000 to accomplish 750 acres of noxious weed treatments. ([2019 Annual Report](#))

- Grandfather Restoration: our partners are able to effectively leverage their available funds to increase public understanding of fire management and how good fire leads to healthy forests, while also helping to build more resilient communities within fire-adapted landscapes. ([2019 Annual Report](#))
- Zuni Mountains - Future of CFLRP and Projects: Regardless of whether they receive additional funding, a majority of interviewees and survey respondents reported they will try to continue to work with their stakeholders on collaborative restoration, and agency staff said they have developed an improved ability to work at larger scales and leverage funds from partners. ([2019 Annual Report](#))

Are CFLRP projects more competitive for other funding sources?

- Reflections from [Strategies for Success under Forest Service Restoration Initiatives](#)³⁵
 - According to agency and stakeholder interviewees, partners were more willing to invest in the landscape with an initial investment and ongoing commitment from the Forest Service. Stakeholders said CFLRP funding made both the collaborative group and agency more competitive for additional outside funding sources. Many stakeholders noted they will rely on their increased competitiveness and landscape-focus initiated by CFLRP to continue identifying and competing for outside funding streams.
 - The multi-year commitment to a place gives a landscape credibility and incentivizes partners to focus their capacity and leverage funding in a specific place.
- **CFLRP Project Examples:**
 - Deschutes Collaborative - A key benefit of having a CFLRP project on the Forest is the predictability of funding to chart out treatments on a high priority landscape over a full 10-year period. This level of fiscal predictability is uncharacteristic of any other funding type (competitive, base NF allocations or perms and trusts) in the National Forest System. It affords us and our collaborative partners the time to focus on strategic restoration issues and monitoring, as well as the space necessary to address and integrate all of the social and economic complexities associated with it. The significance of this benefit cannot be overstated. Other competitive funding sources available in the National Forest System require proposals be developed annually but expect the same rigor around match/leveraged funding, use of new tools to improve efficiencies and well-developed partnerships. Resources invested in drafting these proposals are significant and there is no certainty a Forest will be successful in receiving those funds, creating an environment of uncertainty and risk in planning a program of work and the associated staffing to get it done. Alternatively, CFLRA legislation timelines (5-10 years) align with the realities of implementing holistic restoration over a large footprint (pace and scale) in partnership with our collaborative and communities.
 - Northeast Washington –In more recent years (and in part due to a robust timber market) CFLRP funding has complimented other funding sources to support various contracts and fuels activities that help complete a suite of treatments that are necessary across many of our project areas. Further, an indirect result of CFLRP work has been an improved ‘integration’ of the fuels, timber and reforestation programs where there is common overlap- all with CFLRP responsibilities, and all striving to connect each other’s projects in pre-appraisal evaluations, contract preparation and inspection and post activity evaluations.

What questions emerged that need more investigation?

- As it relates to obtaining funding, [are CFLRP projects more competitive for other funding sources](#) or do forests that are better functioning and organized lend to better stewardship and coordination and therefore obtain funding for projects from multiple sources? (Chicken or the egg question)
- What is the [role of the private sector](#) and their involvement in contracts?

³⁵ https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf

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- Future of CFLRP and Projects: Regardless of whether they receive additional funding, a majority of interviewees and survey respondents reported they will try to continue to work with their stakeholders on collaborative restoration, and agency staff said they have developed an improved ability to work at larger scales and leverage funds from partners. Follow up on progress of restoration activities of prior CFLRP projects will be key to see success post funding.

Where to Learn More/Resources for More Information

- Compilation of leveraged funding available on the (currently internal-only) Box site here: <https://usfs.app.box.com/file/570634094605>
- Description of local resources leveraged captured in Annual Reports here (Question 1): <https://www.fs.fed.us/restoration/CFLRP/results.shtml>
- Additional project-level examples of leveraging local resources are posted to the CFLRP Resource Library: <https://www.fs.fed.us/restoration/CFLRP/resource-library.php>
- If any of the links included in this document are not accessible please contact Lindsay Buchanan for access.

Next Steps:

- Partnerships associated with CFLRP have been instrumental in accomplishing additional acres of treatment by giving us the opportunity to leverage appropriated fund to increase effectiveness across larger scales.
- Multi-year funding enables projects to leverage partner dollars and work at the needed scale to make an impact. Commitment maintains projects as a priority. It is a powerful “carrot” for getting to agreement and implementation. In addition to the funding, leadership support, staff capacity, and collaborative and partnership skills are important.
- Program staff are assessing ongoing challenges, identifying opportunities to address those challenges, and carrying out next steps with colleagues and partners for each Level 2 theme and across them as well.

