Science Survey

of Oregon Forest Collaboratives

The Nature Conservancy

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June 2017

The Nature Conservancy

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Photos by**:** Josemaria Toscano (front cover), Blueeyes (Sitka spruce needles), Tamara Kulikova (Douglas-fir pine cone), itakdalee (fall larch), Nataliia Politova (Port Orford cedar), Christopher Boswell (ponderosa pine bark), Jeff Goulet (ponderosa pine needles and cone), and Srekap (back cover) from Shutterstock. We also thank the many Oregon forest collaboratives in addition to the Oregon Department of Forestry, Sustainable Northwest, and The Nature Conservancy field staff for their time in helping us with our surveys and interviews.

Report by: Trent Seager, Forest Collaborative Science Advisor, and Mark Stern, Forest Conservation Director, The Nature Conservancy, Portland, OR. Report date: 30 June 2017.

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The Nature Conservancy

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Executive Summary

In September 2016, The Nature Conservancy (TNC) launched a project to better understand the biophysical science support needs of the diverse forest collaboratives around Oregon. We reached out to 27 forest restoration collaboratives across Oregon to assess their Science Needs and Requests, interviewed 44 individuals and received input from 21 of 27 forest collaboratives. The current funding cycle of the Oregon Department of Forestry's (ODF) Federal Forest Restoration Program (FFRP) was in a biennium that ends in June 2017. The findings were used to support the development of projects within this current biennium and also set the stage to help identify the science support needs of collaboratives that could potentially be addressed under the next biennium slated to start in July 2017. We note that this effort and outreach was focused on the biophysical/ecological science needs that would help collaboratives inform their efforts to increase the pace and scale of ecologically based forest restoration thinning.

This document captures both the process and the outcome of this science survey. For ease of use, we break this document into six sections. We offer an **Overview of the Outreach** with a list of the collaboratives and key field staff we interviewed for this survey. We then compile these surveys into four sections of science support in Oregon: (1) **Statewide Science Survey**; (2) **Overarching Themes**; (3) **Strategic Science Needs Assessment**, and (4) **Science Support Services**. These are followed by the final section, the **Appendices**.

In the Statewide section, we offer an overview of the current state of collaboratives in regards to science engagement. This includes the context and trends of why some collaboratives are actively engaged with scientists while others are not. We also include suggestions on science support and delivery at the statewide level as informed through discussions from the: collaboratives, Governor's Federal Forest Working Group, staff from the USFS Pacific NW Research Station, and University colleagues.

In the Overarching Themes section, we focus on what came out of the interviews and surveys within the context of each region. Here we offer the specifics gathered from collaboratives and field staff who work with them. We note that some collaboratives offered many projects, topics, and ways in which science support might help them to better achieve their goals. We did not include an exhaustive list here, but rather captured the main themes knowing that they might serve multiple collaboratives by informing the conversations with science.

In the Strategic Science Needs Assessment, we identified strategic science needs that could address key issues or question that have emerged through discussions at statewide forums, and or topics that may either catalyze or leverage existing work to break through barriers that may allow movement towards increasing the quality, pace and scale of restoration and management of forests in Oregon.

In the final statewide section, we review the Science Support Services offered through TNC to collaboratives around Oregon. This provides a list of the all projects funded in this biennium, including partners, goals, and dollar amounts for each project.

We note here that this science survey is a snapshot of a moment in time of what forest collaboratives and field staff who work with them identified as science needs. It is important to recognize that those science needs, and the leadership and membership of the collaboratives, shift across time. This dynamic nature of collaboratives does not lend itself to a static list of science needs. However, we offer that the general trends, overarching questions, and requests for science technical assistance that were shared among collaboratives are a good starting point.

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Overview of the Outreach

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In September 2016, TNC reached out to 27 forest restoration collaboratives across Oregon (see map below) with an email (Appendix A) asking each collaborative about their Science Needs and Requests, including a survey form (Appendix B). In addition to collaboratives, field staff for TNC, Oregon Department of Forestry (ODF), and Sustainable Northwest (SNW) were contacted. In total, 44 people were emailed. We heard back from eight collaboratives, and we interviewed people from those collaboratives. For areas of the state where we still did not have an interview from at least one collaborative, we reached out directly to a collaborative leader from the region by phone or email and set up an interview. Additionally, we interviewed nine key contacts from TNC, ODF, and SNW that collectively work with collaboratives across the state. In total, we interviewed people from 21 of the 27 collaboratives.

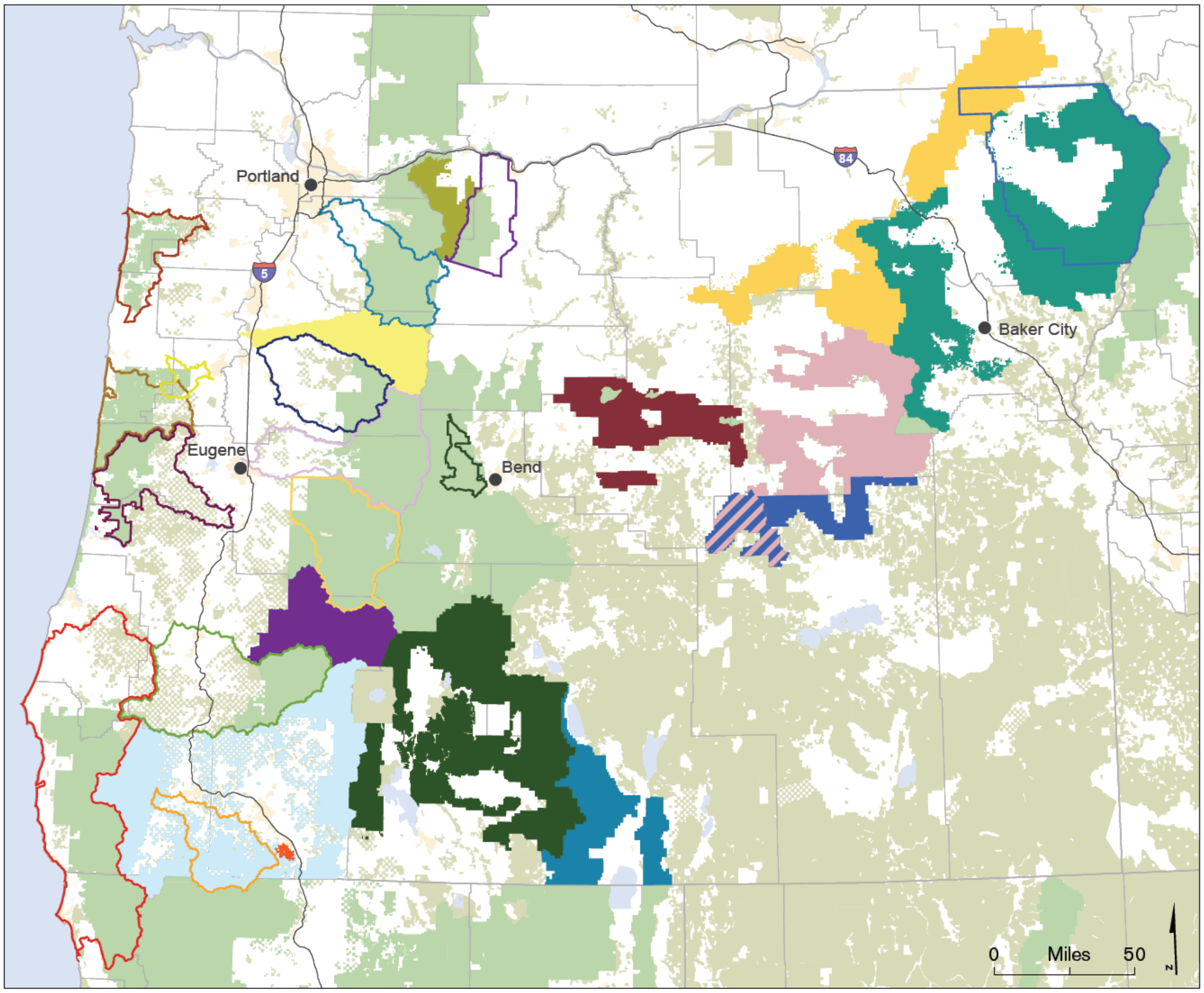
List of collaboratives represented through surveys:

1. Ashland Forest Resiliency MSA
2. Ashland Forest All Lands Resiliency
3. Alsea Stewardship Group
4. Blue Mountains Forest Partners
5. Clackamas Stewardship Partners
6. Deschutes Collaborative Forest Project
7. Harney County Restoration Collaborative
8. Hebo Stewardship Group
9. Hood River Collaborative Stewardship Crew
10. Lakeview Stewardship Group
11. Marys Peak Stewardship Group
12. McKenzie Watershed Stewardship Group
13. MSA on the Fremont-Winema NF
14. Ochoco Forest Restoration Collaborative
15. Siuslaw Stewardship Group
16. South Willamette Forest Collaborative
17. Southern Oregon Forest Restoration Collaborative
18. Umatilla Forest Collaborative Group
19. Wallowa-Whitman Forest Collaborative
20. Wasco County Forest Collaborative Group
21. Wild River Coast Forest Collaborative

Key Interviews and Surveys with Organizational Staff working with Collaboratives:

1. Tyson Bertone-Riggs (Oregon Department of Forestry)
2. Craig Bienz (The Nature Conservancy)
3. Mike Billman (Oregon Department of Forestry)
4. Darren Borgias (The Nature Conservancy)
5. Pete Caligiuri (The Nature Conservancy)
6. Kerry Kemp (The Nature Conservancy)
7. Kendal Martel (Sustainable Northwest)
8. Katie Morrison (Oregon Department of Forestry)
9. Andrew Spaeth (Sustainable Northwest)

Oregon Forest Collaborative Groups



	Public Lands Collaboratives	All Lands Collaboratives
Deschutes NF		Deschutes Collaborative Forest Project
Fremont-Winema NF	Lakeview Stewardship Group	
	MSA on the Fremont-Winema NF	
Malheur NF	Blue Mountains Forest Partners	
	Harney County Restoration Collaborative	
Mt. Hood NF	Hood River Collaborative Stewardship Crew	Wasco County Forest Collaborative Group
		Clackamas Stewardship Partners
Ochoco NF	Ochoco Forest Restoration Collaborative	
Rogue R.-Siskiyou NF	Ashland Forest Resiliency MSA	Applegate Partnership
	Southern OR Forest Restoration Collaborative	Wild Rivers Coast Forest Collaborative
Siuslaw NF		Alsea Stewardship Group
		Hebo Stewardship Group
		Marys Peak Stewardship Group
		Siuslaw Stewardship Group
Umatilla NF	Umatilla Forest Collaborative Group	
Umpqua NF	Umpqua Forestry Coalition	South Umpqua Rural Community Partnership
Wallowa-Whitman NF	Wallowa-Whitman Forest Collaborative	Wallowa County NRAC
Willamette NF	North Santiam Forest Collaborative	McKenzie Watershed Stewardship Group
		South Santiam All Lands Collaborative
		Southern Willamette Forest Collaborative

US Forest Service lands

BLM and other federal lands

Forest Collaborative Groups

Collaborative groups build agreement by engaging diverse stakeholders in fostering natural resource management and economic development. There are at least 25 collaborative groups in Oregon.

Created: 12/28/2015 Emily Jane Davis, Oregon State University and Ecosystem Workforce Program, University of Oregon (2015). Oregon forest collaborative groups, available online at: http://ewp.uoregon.edu/publications/infographics

Statewide Science Survey

Statewide Science Survey

Overview:

1. **ACTIVELY ENGAGING IN SCIENCE**
   During our survey, we found collaboratives that are actively engaging in science. These collaboratives tend to: be more mature (formed >8 years ago), already be connected to scientists (universities, organizations, USFS PNW Research Station), and have funding to support those efforts. The National Forests and collaboratives with collaborative forest landscape restoration programs (CFLRP) are more engaged with scientists. Oregon has CFLRPs on three Forests: Deschutes, Fremont-Winema, and Malheur National Forests with four collaboratives: Deschutes Collaborative Forest Project, Lakeview Stewardship Group, and the Blue Mountains Forest Partners and Harney County Restoration Collaborative, respectively. CFLRPs come with funding directed at monitoring, which can include outside scientists. The collaboratives already engaged with science and scientists had very clear requests for science synthesis to answer specific questions.

2. **NOT READY FOR SCIENCE SYNTHESIS**
   Our survey found that a few collaboratives are not ready for science synthesis or tackling their current disagreements or issues through scientific information. Specifically, these collaboratives shared that environmental stakeholders were uncomfortable because the science seemed to challenge their perspectives and they did not see the science as providing a platform to inform further discussions. Additionally, environmental stakeholders felt that if some scientists were invited to their collaborative, then it should be open for all stakeholders to invite the scientists they prefer to work with on forest restoration. During interviews, collaborative shared that they are working on building trust and clarity of social values and language. These collaboratives felt they would be in a better place after that process to be clear on what they wanted from science and scientists.

   During our survey, some collaboratives reported that they have not yet worked directly with scientists. They requested an introduction to science and collaboratives. Specifically, they would like to learn science framework in the context of social values, science language use in collaboration, and how to effectively work with scientists. These collaboratives might be better served by science process and engagement through workshops, such as: collaborative participation in multi-party monitoring, science language separate from social values, or building a relationship with Forest Service specialists and/or neutral third party scientists.

3. STATEWIDE DELIVERY

The Nature Conservancy

The largest science delivery comes from The Nature Conservancy (TNC), which provides science support directly through field staff as science liaisons to 10 collaboratives in central, eastern, and southern Oregon[1] in addition to regional and statewide support. TNC also provides science support by contracting with professional experts as consultants and/or University researchers who are able to fulfill specific science requests. While TNC receives requests from individual or a small group of collaboratives, the resulting science documents are made available to all collaboratives. Two such examples are the TNC science synthesis papers that were subsequently downloaded over 850 and 1410 times.[2]

Oregon Department of Forestry

Oregon Department of Forestry field staff is connected to 20 collaboratives across northwestern, central, and eastern Oregon[3] and provides science engagement support including connections to scientists.

Sustainable Northwest

Sustainable Northwest staff is directly connected to seven collaboratives in central, eastern, and southern Oregon.[4] Additionally, they provide networking, training, and workshops for forest collaboratives at regional, statewide, and multi-state levels.

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[1] Ashland Forest Resiliency MSA, BMFP, DCFP, HCRC, Klamath-Lake Forest Health Partnership, LSG, MSA on the Fremont-Winema, OFRC, SOFRC, and UFCG.

[2] The Northern Goshawk in the Southern Blue Mountains and Aspen Restoration and Social Agreements, respectively, as of 19 June 2017.

[3] BMFP, DCFP, HCRC, HRSC, Klamath-Lake Forest Health Partnership, LSG, MSA on the Fremont-Winema, OFRC, UFCG, WCFC, and WWFC.

[4] Blues Network (BMFP, HCRC, OFRC, UFCG, WWFC), UFCG, WCFC, WRCFC and WWFC.

Science Support

1. Workshops, field trips and trainings delivered to multiple collaborative groups or possibly at a statewide scale would be an efficient means to organize around and deliver science to these stakeholder groups. Some suggested topics from collaboratives were:
   - How to integrate science into collaboration:
     - language, social values, and scientists as guest speakers
   - Multi-party monitoring trainings for collaboratives
     - accessing and understanding Forest Service monitoring data
     - field trips and monitoring by collaboratives
     - assessing monitoring needs, including 3rd party monitoring
     - using adaptive management in collaborative recommendations
     - lessons learned from projects before collaboration

2. Science review and citations for Forest Service partners working with collaboratives: current and updated science citations for resource specialists working on NEPA documents.

3. Some collaboratives are struggling with how to find common ground among disparate social values. The collaboratives requested science presentations and/or scientists to present on where there is overlap and potential trade-offs among clearly stated stakeholder social values around: forest restoration, wildlife habitat, logging, economics, and resiliency for their landscape and forest types.

4. More mature collaboratives, ones with facilitators and collaborators, and some tackling a project did identify specific needs (listed below).

Overarching Themes

Overarching Themes

Eastside

1) **The 21” Rule (Region 6 US Forest Service Eastside Screens)**
We received multiple requests for science support and help with Forest Plan Amendments for analysis of large trees and old trees. The requests were around the flexibility to allow collaboratives and Forest Service partners to implement restoration activities that include removal of non-old growth trees that are ≥21” dbh (diameter at breast height) when they are impeding restoration of old growth trees and/or forest processes and functions. Collaboratives want ecological context and a scientific understanding of the role of different tree species that are young and large versus old and large. The Eastside Screens chose the 21” rule as an intermediate measure to protect remnant late and old seral live trees. Since 1996, many young conifers (primarily firs) have grown larger than 21” dbh. Collaboratives want to remove young large trees to protect old trees. To comply with Forest Plan standards under the current legal framework, a Forest-wide amendment must be made on each National Forest. Collaboratives requested science synthesis that would help with for such analysis. While most eastside groups mentioned the 21” rule, some of the collaboratives do not have agreement to address this. However, those collaboratives would be interested in seeing how other groups move forward and address this issue. One collaborative asked that the review include any documentation or support for removal of ≥21” DBH old growth trees, specifically Ponderosa Pine that are >150 years old so as to restore historical range of variation for open pine savannah grasslands.

2) **Wildlife Corridors, Roads, and Landscape Connectivity-Permeability**
The Blues Network (BMFP, HCRC, OFRC, UFCG, WWFC) expressed interest in having a science review of this issue. Other eastside collaboratives specifically listed this as an important issue and noted that there was no clear understanding of the terms and concepts. Additionally, this topic was listed as a shifting of science and understanding, therefore outside the ability of the collaboratives and their Forest Service partners to tackle. The collaboratives that have tackled similar issues, such as wildlife habitat fragmentation, would like to know more about connectivity versus permeability and how to analyze effectively based on current science.

3) **Landscape-Level Scale**
Many eastside collaboratives are interested in knowing if they are making an effective difference when the project level is tied into the landscape level scale. This question could be addressed by working with one of several different landscape level modeling efforts and working to factor in change over time based on treatments. These models include but are not limited to: Paul Hessburg's landscape level tool[5] being used in Washington, Envision,[6] the Rogue Basin Cohesive Strategy,[7] or using Landscape Treatment Designer.[8] The goal would be the development of metrics that provide a consistent and transparent assessment of the effects of restoration activities when scaling from cumulative project-level to landscape-level.

4) **Post-Fire Salvage**
The collaboratives on the Fremont-Winema, Ochoco, and Malheur NFs have addressed this within the past few years as part of post-fire management options, including on-going research on area salvage and woodpeckers as part of the Canyon Creek Complex on the Malheur NF.[9] Other collaboratives are interested, but not there is not agreement to address this topic until more information is available that moves it out of the historical framework of environmental impact versus economic gains. Collaboratives requested a document that brings together current scientific understanding for post-fire management. Beyond DecAID,[10] and in addition to the post-fire salvage woodpecker research happening on the Malheur NF, collaboratives are interested in an understanding of post-fire management options that includes: soils, snag fall and retention across time, and food webs. Collaboratives also reported an interest in economic analysis, specifically a review of the options in creating restoration dollars through salvage that has minimal ecologically impact. Post-fire environments offer a short opportunity (1 year) to capture any economic gains for the next 80-100 years. Decisions made for harvest during that 1-year should be put into the context of the ecological trajectory for the fire and harvest areas for the next 80-100 years.

[5] Hessburg et al. 2014. Landscape Evaluation and Restoration Planning.
[6] Envision is free software by the Forest Service. It provides the ability to model landscapes and use the Stand Visualization System or the Forest Vegetation Simulator to grow or simulate management in units of the landscape.
[7] Rogue Basin Cohesive Forest Restoration Strategy: A Collaborative Vision for Resilient Landscapes and Fire Adapted Communities (PDF, 2015)
[8] Ager et al. 2012. Overview and example application of the Landscape Treatment Designer. PNW-GTR-859. (PDF, 3.9MB)
[9] Canyon Creek Complex Fire Salvage Project (PDF Final EA, July 2016)
[10] DecAID: the decayed wood advisor for managing snags, partially dead trees, and down wood for biodiversity in the forests of Washington and Oregon. (January 2012)

5) **Moist Mixed Conifer - Patterns and Extent of Disturbance Events**
Moist mixed conifer (MMC) is considered a forest type but expresses itself across a broad ecological and elevational gradient that connects dry mixed conifer to moist forest. The increase in moisture and carrying capacity in MMC increases the options for management and stakeholder objectives in this forest type when compared to dry mixed conifer. However, the history of disturbance (primarily fire) varied, allowing some stands to function as a dry mixed conifer site with a productive understory. While recent science synthesis[11] offered a review of the literature, collaboratives are interested in how to link local fire and disturbance history with social values across the gradient of MMC. What did the increase in productivity of MMC stands offer for ecosystem function and food web complexity? How did that differ in the MMC stands that burned less frequently or missed a fire return interval?

6) **Ecological Role of Large Trees versus Old Trees**
The Eastside Screens[12] requires National Forests within Region 6 on the eastside of the Cascades to maintain all remnant late and old seral and/or structural live trees ≥21" dbh (diameter at breast height). However, new research shows that some species of fir trees can be ≥21" dbh and not be ≥150 years. Still yet, some old growth trees are ≥150 years and yet have a smaller diameter (<21" dbh). Some land managers and collaboratives have focused on removing large diameter young fir to preserve old growth pine, larch, and fir. This has been met with opposition based on the interim standards. Yet the scientific understanding of large trees, late and old structural stages, and conifer species dynamics has changed in the past 20 years. How can that inform the conversations happening now? What is the ecological context of large young trees versus large old trees? What are their different processes and functions? Does that vary by tree species? What are the short-term and long-term trade-offs specific to wildlife habitat and stand resistance and resilience to drought, insect, disease, and fire under climate change?

[11] Stine et al. 2014. The Ecology and Management of Moist Mixed-Conifer Forests in Eastern Oregon and Washington: a Synthesis of the Relevant Biophysical Science and Implications for Future Land Management. PNW-GTR-897. (PDF)

[12] USFS 1995. Revised interim direction establishing riparian, ecosystem and wildlife standards for timber sales; Regional Forester's Forest Plan Amendment #2 (PDF, 14p.)

Westside and Southwest Oregon

1) **Moving <80-year-old Stands toward Complex Habitat & Late Succession**
Forest collaborative groups within the Coast Range and the Cascades (including some of the Siuslaw and Mt. Hood collaboratives) wondered if the restoration projects they are collaborating upon really do help change the trajectory of younger stands to become late succession or complex habitat suitable for the Northern Spotted Owl (NSO) and/or Marbled Murrelet (MAMU). The collaboratives had additional questions about potential negative impacts not being captured when managing young stands (<80 years) that are adjacent to old growth or late successional stands. How are impacts measured for different species, such as migratory passerines and prey species of NSO? When young stands are opened up, do they become less permeable to NSO prey species movement? Does managing young stands next to nest stands for the NSO and MAMU negatively impact nest success by increasing predator (e.g., corvids) access into closed stands? With the emphasis on treating stands <80 years old across the landscape, are there cumulative effects?

2) **Role of Openings and Unique Habitat**
The forests of the west Cascade Mountains are considered to be part of Fire Regime V[13] (return interval of 200 to 1200 years, replacing, any severity). Yet recent science[14] shows that fire may have played a more diverse role in keeping opening areas within stands and creating important habitat types. Specific to collaborative efforts, stands of dry pine, meadow systems, and other habitat types are converting into fir or mixed conifer forest. What is the ecological context of these habitat types? Should they be restored? In their historical state, did these special habitat types offer benefits to land managers and stakeholders, such as increased biodiversity or diversified prey for listed species such as the Northern Spotted Owl (NSO)? Or should the habitats be allowed to convert into viable habitat for listed species and/or late successional areas? Specifically, the Willamette and Southern Oregon groups asked about dry forest components within the NW Forest Plan and landscape of Fire Regime V forest types. If collaboratives are to consider restoring special habitat types within or adjacent to LSRs, what is the scientific framework to help inform those conversations? Does restoration of special habitat types (pine, oak, dry forest) help NSO by increasing prey base? Does restoring these habitat types on the landscape play a role in interrupting fire, insect, disease, or climate change threat? What are the trade-offs involved, including potential negative effects?

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[13] Wolf et al. 2015. Not All Fires Are Wild: understanding fire and its use as a management tool. OSU Extension (PDF)

[14] 2017 Westside Fire Regime Summit. Fire in the Pacific Northwest - Past, Present, & Future: implications for ecology, operations, and restoration west of the crest of the Cascade Mountains (PDFs of the presentations)

3) **Restoration Effects on Water**

While the emphasis of dry forest restoration has been on decreasing fire risk, collaboratives and land managers expressed a need for more information on restoration effects on increase in water flow and moisture in soils and streams. Water use in trees is driven by leaf area, and some conifers (e.g., firs) have much greater leaf area and water demand than others (e.g., ponderosa pine). Decreased tree density and associated leaf area can increase snow capture and subsequent water flow. Recently, scientists have called for more emphasis on water availability as part of forest restoration and landscape-level planning in the PNW[15] and forested landscapes globally.[16] What is the current science synthesis of forest restoration and thinning on increased water flow at the local and watershed scale (by forest type or region)? For westside forests, how does this interact with riparian restoration? For southwest Oregon dry forests, what effect would this have during drought years?

4) **Economic Analysis (using the Rogue Basin Strategy)**

The Ecosystem Workforce Program (EWP) has provided economic assessments and analyses for different collaboratives and National Forests around Oregon[17]. Collaboratives expressed a need for an economic analysis of restoration areas with a breakdown of what stands/areas: pay for themselves, add dollars, or needs subsidized. The SW Oregon collaboratives requested that in addition to the monetary analysis of timber volume and restoration needs around wildlife habitat and forest processes and functions, a larger economic analysis should include savings around: fire risk, firefighting, risk to homes, and avoidance costs associated with the protection of municipal water supplies. Specifically, collaboratives on the Rogue-Siskiyou NF wondered if the Rogue Basin Strategy[18] could be used for an example economic analysis. This extensive strategy includes fire, fuels, wildlife, and administrative layers. An economist could analyze it by pixel to see what pays for itself, what adds dollars, and what needs subsidized.

[15] Hessburg et al. 2016. Management of mixed-severity fire regime forests in Oregon, Washington, and Northern California (Tamm Review)

[16] Grant et al. 2016. Watering the forest for the trees: an emerging priority for managing water in forest landscapes (PDF)

[17] See EWP Working Papers; recent examples: Willamette NF (PDF), Ochoco NF (PDF), NE Oregon Forests (PDF)

[18] Rogue Basin Cohesive Forest Restoration Strategy: A Collaborative Vision for Resilient Landscapes and Fire Adapted Communities. August 2015 (PDF)

Strategic Science Needs Assessment

Strategic Science Needs Assessment

In addition to the Overarching Themes listed above that highlight science needs from different regions of Oregon, we offer the following list. From a statewide perspective, we've identified science needs that can catalyze and/or leverage the collective understanding of stakeholders, forest collaborative members, Forest Service staff, and other policy leaders who have the shared vision of advancing the pace and scale of forest restoration. These are listed in categories but are not prioritized or listed in any particular order:

FIRE:

1. **MERGING LOCAL DATA AND SCIENCE SYNTHESIS**
   Field research and science synthesis to document fire history and size, frequency, and patterns of disturbance regimes and history in NE Oregon Forests. There is an absence of fire history study and information in the Umatilla and Wallowa Whitman National Forests; a fire history and stand reconstruction assessment across these two national forests would greatly enhance a shared understanding of disturbance patters for fire, as well as insect and disease, and facilitate an informed understanding of what landscape scale processes and changes may have occurred over the past 300+ years.

   This might lead to a summary of and evaluation/comparison of landscape modeling efforts (potentially use: Hessburg's model, Envision, Landscape Treatment Designer, Rogue Basin Cohesive Strategy model, Marxan) to inform how to identify and prioritize project sites based on multiple desired future conditions (wildlife habitat, stand resistance, changing fire behavior and affect).

2. **WILDFIRE RISK ASSESSMENTS**
   Delivery of work on Wildlife Risk by Rick Stratton and Joe Scott (Pyrologics).

3. **MONITORING TREND BURN SEVERITY**
   Use Monitoring Trend Burn Severity (MTBS) data to evaluate trends and patterns of patch size by fire severity and forest type. This could inform conversations at the individual National Forest and collaborative level.

4. **FIRE LEARNING NETWORK TRAINING EXCHANGES**
   Use Fire Learning Network Training Exchanges (TREX) to provide workshops/practicums for Forest Service, collaboratives, and partner entities on the Application of Ecological Benefits in the use of prescribed fire individually and in conjunction with restoration activities.

WIDLIFE:

5. **PERMEABILITY MODELS**
   Work with researchers already creating and using wildlife permeability and habitat models. Use or create ones for key species of interest to be shared with different collaboratives and Forest Service partners.

6. **HABITAT MODELS**
   With the emphasis on wildlife habitat models in Forest Service project planning in lieu of surveying for species presence, look at empirical data that supports habitat for species of interest. For species that share general habitat types, synthesize science research that supports shared habitat with empirical research. With the advance of modeling and large amounts of data, look at habitat models based factors in addition to current vegetation type or stand structure, such as soil type (using FS Soil Resource Inventories merged with NRCS SSURGO and STATSGO data), slope, aspect, heat-loading, surrounding stands, and other factors that could affect the hang-time of habitat under impacts of climate change.

ALL LANDS:

7. **MODEL RESTORATION AND MANAGEMENT SCENARIOS**
   Model restoration and management scenarios for an all lands outcome. Consider a larger landscape look across NE Oregon, including the Umatilla and Wallowa Whitman National Forests. The Klamath Lake Forest Health Partnership offered their all lands project as an example of a 150,000 acre landscape being successful. Within forest and habitat restoration, use principles of National Cohesive Wildland Fire Management Strategy with integration of high value resource assets, fire risk, fuels reduction, roads, and harvest techniques.

ECOSYSTEM SERVICES:

8. **HYDROLOGICAL MODEL**
   In addition to #3 above on Westside and Southwest Oregon (Restoration Effects on Water), develop hydrological modeling options to evaluate effects of restoration thinning in dry forests on surface flows. The regulatory agencies (USFWS, NMFS) do not currently account for increase in flow for effects on stream temperature. Consider hydrological model in combination with NetMAP analysis of which streams will see increased summer temperatures from effects of climate change in addition to potential forest restoration activities.

9. **CARBON**
   Carbon and Forests Readily Explained: status of carbon sequestration and carbon emissions relative to management practices and wildfire by ecoregion and by forest type. Include an understanding of the different fire severity and post-fire response based on climate and region on: non-tree vegetation, dead wood losses, and below ground or soil C.

METRICS OF SUCCESS:

10. **METRICS**
    Expand upon or modify metrics used in the CFLRP annual reports and the Federal Forest Dashboard Project to develop a consistent and transparent set of metrics upon which to measure progress towards increasing the pace and scale of ecologically based treatments and overall goal of landscape resiliency.

11. **COLLABORATIVE PROJECTS**
    Capture the data from collaborative projects from around Oregon for analysis of differing social values: wildlife habitat, fuel reduction, forest economics, stand resistant and resilience to climate and disturbances (drought, insect, fire).

Science Support Services

Science Support Services

Oregon Department of Forestry's Federal Forest Restoration Program Technical Assistance and Science Support Services with The Nature Conservancy

2015-2017 Biennium		
Project	**Partners and Goals**	**Amount**
Science Support – Coordination & Project Management Science Needs Assessment Synthesis	The Nature Conservancy & Dr. Trent Seager	$38,480
The Ecological Function for Spatial Patterning in Dry Forest Restoration	Dr. Derek Churchill, Stewardship Forestry LLC	$51,327
Forest Restoration Implementation Efficiencies Workshop	Central Oregon Forest Stewardship Foundation	$48,892
Implementation Efficiencies Workshop Proceedings	Dr. Trent Seager	$11,870
Atlas of Historical Forest Landscape Photos for Oregon National Forests – Osborne Panoramas	John Marshall Photography	$18,375
Pre & Post Treatment Monitoring Analysis for Riparian Habitat and aquatic/macro invertebrates as an indicator of water quality for the Ashland Forest Resiliency Project	Dr. Pete Schroeder, Entomologist	$8,025
Fire History and Landscape Scale Analysis on the west portion of the Fremont-Winema NF	Andrew Merschel, Dr. Keala Hagman, Dr. Tom Spies; Oregon State University, Applegate Forestry, USFS PNW Research Station	$45,540
	TOTAL	**$222,509**

Appendices

Appendix A:

Email sent to 27 Forest Collaboratives

Date: Mon, Sep 12, 2016
Subject: TNC science support for Collaboratives

Greetings {{contact person}} and {{forest collaborative name}} -

We are reaching out to all the Forest Collaborative Groups in Oregon to update everyone on The Nature Conservancy's role in working with the Oregon Department of Forestry's Federal Forest Health Program to deliver Science Support to collaboratives. We are launching a short-term (2-3 month) effort to get a snapshot and better understanding of the current science needs of collaboratives. In this email, you'll find key information listed below on: how to let us know how we can help you (**Science Support Needs & Requests**), our process for selecting projects to fund (**Criteria and Prioritization**), and how ODF funding works and how we've used it to work with collaboratives (**History and Background on ODF Funds**).

To assist in this outreach effort, we are working with Trent Seager; Trent has worked extensively with the Blue Mountains Forest Partners collaborative as a science advisor, is finishing up his PhD in forest ecology, and is working on a couple other state-wide projects for collaborative groups. As you may know, last year Trent helped author two TNC synthesis papers as part of our science support to collaboratives: Aspen Restoration and Social Agreements and The Northern Goshawk in the Southern Blue Mountains.

This email provides an invitation to you and other leaders of {{forest collaborative name}} to contact Trent or myself for a follow up dialogue. As part of The Nature Conservancy's delivery of this science support service from ODF's Federal Forest Restoration Program, Trent will be in touch with you (and each of the forest collaborative groups in Oregon) within the next few weeks. He will follow up with phone calls and potential in-person visits in late September and October for those groups that may have interest and opportunity to further discuss and develop projects addressing a "science need".

Science Support Needs & Requests
We would like to know what science support needs your collaborative may have, or ones you feel would help at a regional or statewide level to advance forest restoration. We may have an opportunity to recommend funding for one or two more projects this biennium (ending June 30, 2017). Concurrently, we want to compile a list of projects that would potentially be ready and "ripe" for funding in the next biennium (begins July 1, 2017). To help with that, we have attached a simple form to guide you, including

examples. If you would like help to identify your science needs and to fill out the form, feel free to email or call Trent.

Criteria and Prioritization

From The Conservancy's perspective, we prioritize science support on based on several criteria including but not limited to:

1. fulfilling a science need identified by a collaborative group that if fulfilled, would inform development of a specific restoration project (with a preference for science that would inform other collaboratives too)
2. fulfilling a statewide science need that addresses a barrier or limitation to advancing agreement on restoration and project development/implementation at the state or regional level
3. science support that generally raises the collective knowledge of important aspects of forest ecology, forest management, project implementation and relevant policies/protocols in support of increasing the quality, pace and scale of forest restoration on Oregon's federal forest lands

History and Background on ODF Funds:

As many of you know, beginning in summer of 2014 the Oregon Department of Forestry developed a program to provide Technical Assistance and Science Support (TASS) to Forest Collaborative Groups in Oregon. As part of this process, ODF selected several contractors to help provide these services. More specifically, ODF awarded a contract to The Nature Conservancy to help deliver Science Support that would advance the quality, pace and scale of restoration on federal forests and support forest collaborative groups to that goal. To date we have worked closely with a number of groups and have worked with ODF to fund various projects. The projects have included research on fire history and historical stand reconstruction in Central Oregon, a fire history studies in Deschutes National Forest, a landscape assessment in the Rogue Basin, a science synthesis of Aspen Restoration and Habitat needs of the Northern Goshawk in dry forests of Oregon, a Restoration Implementation Efficiencies Workshop, support for developing and implementing a Stewardship Agreement, and upcoming workshops on the ecological function of spatial heterogeneity in forest restoration, to name a few. Funding is provided from the State of Oregon via the legislature to ODF on a biennium basis. Many of you may be aware of this, as it is the same funding cycle that OWEB uses to make awards to collaboratives. The current biennium ends on June 30, 2017. The next biennium begins July 1, 2017 but is dependent on funding that will be determined in the 2017 legislative session in Salem.

We offer all of this to help you understand our role in supporting collaboratives with their science needs - and to hear from you on what your science needs are. We appreciate hearing from you by email or phone (use the attached form if that helps). If you have additional questions, please feel free to email or call me or Trent (contact info below). If your collaborative has already clearly identified a particular interest or science need, and you are ready to discuss it, please let us know so we can schedule a call or visit in September or October.

Thanks for filling out the attached form, replying by email, or requesting a phone call so we can know what your science needs are. Trent will be in touch with you to follow-up in the coming weeks.

Regards,

Mark

cc: Trent Seager

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The Nature Conservancy

Appendix B:

The Nature Conservancy's Science Support Form for Oregon Forest Collaboratives

The Nature Conservancy

*[**Note**: This form is made to be easily filled out. You can tab between boxes to answer the next question. The bubbles will fill-in when clicked. If it is easier, you can email us a note about your science support needs and/or request to do this by phone. Examples are given at the bottom of this survey.]*

Forest Collaborative Name: Click here to enter text.
Contact Person's Name: Click here to enter text.
Contact Information: **Phone** Click here to enter text. **Email** Click here to enter text.

1. **Science Support Needs identified by your collaborative** (click on all that apply):

    ○ Science synthesis (succinctly cover what science knows) on a specific topic/issue

    ○ Workshop/Presentation on a specific topic/issue

    ○ Research on topic specific to a project being developed (fire history, stand structure)

    ○ Monitoring (outcome monitoring, implementation monitoring, multiparty monitoring)

    ○ Landscape scale assessments

    ○ Other (please list here: Click here to enter text.)

2. **Has your collaborative identify specific science support needs** (chose one and provide further information if possible)?

    ○ **Yes,** we have worked to clearly identify specific science support needs for our collaborative. Here are our top three:

    1. Click here to enter text.
    2. Click here to enter text.
    3. Click here to enter text.

    In addition, we have identified other science support needs. They are: Click here to enter text.

- ○ **Not yet,** we have discussed some general science support needs for our collaborative. Here are some of our ideas Click here to enter text.
- ○ **We're in early discussions,** and we would like your help as we identify our top science support needs.

3. **The Blues Coalition of Collaboratives has identified seven topics of potential interest to forest collaborative groups in eastern/central Oregon. We'd be interested to know if your collaborative has discussed any of these topics, and or what other topics might be of interest to your group.**

   - ○ Of these science support topics, our collaborative lists them in the following order of priority:
     Order # Moist Mixed Conifer
     Order # Northern Goshawks
     Order # Prescribed Fire and Smoke Management
     Order # Post-fire Management and Logging
     Order # Restoring Aspen Ecosystems
     Order # Riparian Areas and Aquatic Food Webs
     Order # Roads and Wildlife Habitat & Movement

   - ○ Additionally**,** these science topics are of interest to our group: Click here to enter text.

4. **Is there anything else you'd like us to know about your science needs?**
   Click here to enter text.

5. **Would you like us to call you to talk about your collaborative's science needs?**

   - ○ **Yes,** the name and number at the top are best
   - ○ **Yes,** and here's the best person and contact info: Click here to enter text.
   - ○ **No thanks,** this survey captures our needs

Examples from TNC Criteria and Prioritization

Criterion #1: *Fulfilling science need to inform a specific restoration project (that would inform other collaboratives too)*

Examples:

A. The Deschutes Collaborative Forest Partners were working on the KEW Project and recognized that the forest types (mixed conifer), landscape and historical fire frequency for that area were both uncertain and potentially also specific to the aspect, slope and terrain of the project site. The collaborative engaged researchers from OSU and PNW Research Station which led to a research project designed to determine the historical stand structure and fire history frequency in the project area. Results helped to inform the scope and scale of the project.

B. The Blue Mountains Forest Partners (BMFP) applied for science support on the Northern Goshawk noting that Forest Service districts were each handling the issue a different way on current restoration projects. Since this topic affects all eastside forests and collaboratives (through the USFS Regional Office eastside screens), it was prioritized. BMFP outlined their specific needs on policy and ecology. TNC contracted the work to raptor biologists/forest ecologists to create a goshawk technical review document. A workshop was held with BMFP and was open to other interested parties. The TNC technical review document was then distributed across all collaboratives in Oregon's eastside forests and posted online for access to everyone.

Criterion #2: *Statewide science to address a barrier or limitation to advancing agreement on restoration at the state-regional level*

Examples:

1. Representatives from multiple collaboratives in Central and Eastern Oregon approached TNC for science support to help with regional learning and social agreements. The representatives suggested using aspen ecosystems as an example due to the controversy around the removal of large diameter conifers (>21" dbh) and larger clearings around the aspen (150-200'). TNC contracted social and biophysical scientists to create a document on aspen and social agreements. The TNC document was presented during a workshop with the Blues Coalition of Collaboratives (five regional collaboratives), then distributed to all collaboratives in Central and Eastern Oregon and posted online for access to all.

2. Collaborative Partners in southern Oregon expressed interested in developing a basin-wide approach to the Rogue Basin, expanding and building off success of the Ashland Forest Resiliency Stewardship Project. Subsequently, The Nature Conservancy convened a group of forest ecologist, modelers and forest managers to devise an assessment process, looking at High Valued Resources, and fire risk/potential, overlaid by an economic assessment that factored in road systems, haul distances, logging techniques/practices and economic value of the harvested materials – generating a twenty-year Rogue Basin Cohesive Strategy.

Criterion #3: *Science support to raise the collective knowledge on ecology, management or implementation that supports the pace & scale of forest restoration*

Example: Separately, multiple collaboratives asked for specific scientific information on spatial heterogeneity as it relates to trees and stands ability to persist during disturbances (drought, insects, fire) and provide wildlife habitat. Groups also wanted to better understand the function and ecological value ascribed to prescriptions that attempted to mimic historical spatial patterning in dry mixed conifer forests. To that end, three products are being developed: (1) a peer reviewed manuscript that details the ecological function and supporting science that outlines the effects/benefits of spatial heterogeneity; (2) an informational short paper/summary for wider distribution; and (3) a workshop to discuss and demonstrate these techniques in the field, including use of innovated hand held "app."


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