



National Park Service Southern Cascades Network Fire Ecology Annual Report Calendar Year 2015

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A. Summary

Work in the South Cascades Network in 2015 focused on four main areas: 1) completing post-treatment monitoring of the large Northwest Gateway mechanical treatment, 2) some triage fire effects work with our limited resources, 3) a continued emphasis on cooperative fire effects research with collaborating universities and government agencies (USGS, USFS), and 4) network park support for project planning and evaluation. This was our first year without a Lead FEMO or fire effects crew in the network, so the typical fire effects monitoring work load was not completed. We did have the assistance of one GS5 seasonal during much of the summer though, who worked primarily on completing immediate post-treatment plots in the Northwest Gateway (phase 1) silvicultural project (the source of the funding for the seasonal, as this project is intended to serve as a flagship for similar projects elsewhere). These were mostly rapid assessment and/or custom protocols for monitoring of silvicultural prescription effectiveness, and related research questions in the project area (i.e., meadow recovery, aspen response, tree growth rates). In between, and with some help from park resource staff, we were also able to read several legacy sagebrush monitoring habitats at Lava Beds, which now represent one of the longest, continuously running sagebrush-fire datasets available (data from these plots will be featured in a section of the newly revised *Fire in California Ecosystems* book, in review).

Aside from the normal workload of supporting parks with fire and vegetation planning and project development, much of our work in 2015 consisted of collaborating on several cooperative fire research projects in the network and across the region. The fire ecologist is currently working in various capacities on 9 projects that involve one or more network parks and 4 projects that involve parks in other parts of the Pacific West and Intermountain Regions.

Our Incident Management support workload was very light compared in 2015 compared to past years due to lack of seasonal staffing and medical leave by the ecologist in the summer.

However, we provided pre-season support to parks by helping to plan and implement WFDSS training and conduct pre-planning exercises. The fire ecologist performed some fire behavior and long term analysis on the National Creek Fire at Crater Lake, along with some general WFDSS support to parks and nearby national forests. No off-network assignment work was done in 2015, which is very unusual but probably the norm in the future. Only one 90 acre Rx burn was conducted in the network parks, but nobody was available to support it.

Table 1. Fire Effects Plot Workload (2015) and Total Plots Installed

Park	Monitoring Unit	Plot Type (FMH Forest/Brush/Grass plot, photo point, Rapid Assessment, CBI, etc.)	Pre-burn 2015	Immed. Post 2015	Postburn (1-20 yrs) 2015	Annual Total (2015)	Total Plots
Lava Beds	Sagebrush Steppe	FMH Brush plot	-	-	12	12	90
Lava Beds	Perennial Bunchgrass	FMH Brush plot	-	-	0	0	24
Lava Beds	Ponderosa Pine	FMH Forest plot	-	-	2	2	18
Lava Beds	Juniper	FMH Forest plot	-	-	-	-	9
Lava Beds	Aspen	Modified FMH Forest plot	-	-	1	1	1
Lava Beds	Mahogany tree girdle	Individual tree assessment	-	-	1	1	1
Lava Beds	Jack Fire	Photo point	-	-	-	-	7
Crater Lake	Lodgepole Pine	FMH Forest plot	-	-	-	-	9
Crater Lake	Mixed Conifer (White Fir)	FMH Forest plot	-	-	-	-	24
Crater Lake	Ponderosa Pine	FMH Forest plot	-	-	-	-	14
Crater Lake	Mountain Hemlock	Modified FMH Forest plot	-	-	-	-	18
Crater Lake	Lodgepole Pine	Modified FMH Forest plot	-	-	-	-	4
Crater Lake	Mixed Pine	Fixed radius forest plot	-	-	-	-	21
Crater Lake	Whitebark Pine	Modified FMH transect	-	-	-	-	16
Crater Lake	Red Cone Fire	Photo Point	-	-	-	-	6
Lassen Volcanic	Mixed Conifer (White Fir)	FMH Forest plot	-	-	0	0	36
Lassen Volcanic	Lodgepole Pine	FMH Forest plot	-	-	0	0	3
Lassen Volcanic	Jeffrey Pine	FMH Forest plot	-	-	0	0	2
Lassen Volcanic	Red Fir	FMH Forest plot	-	-	0	0	9
Lassen Volcanic	Ponderosa Pine	FMH Forest plot	-	-	-	-	5
Lassen Volcanic	Greenleaf Manzanita	FMH Brush plot	-	-	9	9	17
Lassen Volcanic	Mixed Meadow	FMH Grass plot	-	-	-	-	4
Lassen Volcanic	Aspen	Modified FMH Forest plot *	-	-	23	23	63
Lassen Volcanic	Aspen deer enclosure	Aspen sucker heights - Read 3x this year	-	-	0	0	10

Lassen Volcanic	Mixed Conifer	Modified FMH Forest plot *	-	-	15	15	39
Lassen Volcanic	Riparian Meadow	Modified FMH Forest plot **	-	-	5	5	30
Lassen Volcanic	Campground thinning monitoring	FMH Brush plot	-	-	-	-	24
Total			-	-	58	58	504

* Rapid assessment modification.

** Research plots

Table 2. Fire Ecology Staffing 2015

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Calvin Farris (Fire Ecologist)	1/1/15	12/31/15	26	Yes	workshop/conference at NAU
Christy Frenzen (part time; shared monitor)	5/20/14	10/1/15	12 (shared)	Yes	

Table 3. 2015 Management Objectives and Monitoring Results

Crater Lake NP programmatic FMH monitoring results through 2015. For percent-change objectives, Confidence Intervals were calculated using a nonparametric bootstrapping (n = 1000 simulations) of the Ratio of Means Statistics, except for paired plots in mountain hemlock which were from the Mean of Ratios bootstrap. Other CIs were derived from distributions of individual values (unless reported as SE). Fuels reduction measurements were assessed using 01Post data, unless otherwise noted.

Monitoring Unit	Resource Management Objective (Restoration)	Monitoring Results (sample sizes)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
Interior Ponderosa Pine	Reduce surface fuel load to 60-90% of existing load	Total fuel reduction = 9% (CI ₈₀ %; +5% to 24%) (n=16plots, 10 yrs)	NO	2014 (2002-2013 years)
	20-50 trees/acre > 12" dbh*	98 trees/ac > 12" (SE +/- 11.4)	NO	
	< 400 trees/acre 2-6" dbh	366 trees/ac 2-6" (SE 104) (n=16 plots)	YES	

Monitoring Unit	Resource Management Objective (Restoration)	Monitoring Results (sample sizes)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
	Limit post-fire mortality of <i>Pinus</i> >18" (45 cm) dbh to <25% within 2-years post-treatment	2-year mortality = 4% (CI _{80%} : 2% to 7%) (Note: 10 year mortality = 11%, CI _{80%} : 3-24%) (<i>n</i> =16 plots)	YES	
	Increase low-mixed severity burn occurrence to MFRI of 9-15 years	Unable to calculate MFRI ^a NFR ₍₁₉₃₃₋₂₀₁₃₎ = 66-85 yrs ^b NFR ₍₁₉₇₈₋₂₀₁₃₎ = 33-42 yrs ^b	NO	
Lodgepole Pine	Reduce surface fuel load to 35-55% of existing load	Total fuel reduction = 54% (CI _{80%} : 43.2 to 64.7%) ^c (<i>n</i> =30 plots, 4 fires, 5 years)	YES	2014 (2006-2013)
	Total tree density = no metric	Tree/acre =993 (SE +/- 364) Note: tree density reduction was 48% (CI _{80%} 35%-61%)	N/A	
	Composition 80-90% pine, 0-10% fir, 0-10% hemlock	$\bar{x}$ = 94% pine (SE +/-9%) $\bar{x}$ = 1% fir $\bar{x}$ = 9% hemlock	YES	
	Increase occurrence of low/mixed severity burns to MFRI 60-80 yrs	NFR ₍₁₉₃₃₋₂₀₁₃₎ = 912 yrs ^b NFR ₍₁₉₇₈₋₂₀₁₃₎ = 457 yrs ^b	NO	
Mixed Conifer	Reduce 60-90% of existing dead & down fuels	Total fuel reduction 79% (CI _{80%} :75% to 86%) ^c (<i>n</i> = 4 plots, 2 fires, 3 years)	YES, but insufficient sample size	2015 (2003-2014)
	30-80 trees/acre > 12" dbh < 600 trees/acre 2-12" dbh	94 trees/ac >12" (SD +/-27) 128 trees /ac (SE +/-56)	YES, but insufficient sample size	
	Composition: 40-80% fir 15-40% pine, 0-20% other	$\bar{x}$ = 97% fir $\bar{x}$ = 12% pine $\bar{x}$ = 1% other	NO, but insufficient sample size	
	Constraint: Limit post-fire mortality of <i>Pinus</i> >18" (45 cm) dbh to <25% within 2-years post-treatment	2-year mortality = 14% (CI _{80%} : 0% to 43%)	YES, but insufficient sample size	
Mountain Hemlock	Reduce 35-55% of existing dead & down fuels	Total fuel reduction = 43% (CI _{80%} : 26 to 54.7%) (<i>n</i> = 14 plots, 1 fire, 5 years)	YES	2014 (2006-2011 years)

Monitoring Unit	Resource Management Objective (Restoration)	Monitoring Results (sample sizes)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
	Composition (15-60% hemlock, 0-40% fir, 0-10% pine)	$\bar{x}$ = 77% hemlock $\bar{x}$ = 32% fir $\bar{x}$ = 13% pine	YES (if CI intervals are included)	
Red Fir	Insufficient data available for stand metrics (patch data currently being analyzed from dNBR)			2014
	Increase occurrence of fires to a MFRI of 40-65 years	$NFR_{(1933-2013)} = 725 \text{ yrs}^b$ $NFR_{(1978-2013)} = 387 \text{ yrs}^b$	NO	
Whitebark Pine	No fire activity			

^a The MFRI in the FMP is described as the mean interval for all pine sites. This can't be calculated with the relatively short time frame and lack of overlapping fires unless it is as a composite, but the NFR serves as an approximation (time required to burn area of PIPO in park for a given time period, equating roughly to a mean interval for each pixel). The first time period (1933-2014) is the entire park history; the second period (1978-2014) represents the era of managed fires (lightning and Rx).

^b Dates in parentheses indicate the time period used for the calculation to determine the average. The period of data availability is 1933-2014; the period 1978-2014 spans the fire management era when restoration burns began. For PIPO, the low range given includes all acreage in 1980 Sharp Peak polygon, and the high range includes only 10% of it (most of this huge Rx polygon never burned, but records are lacking to determine exactly how much did).

^c No Post1 fuels data was available for any PICO plots for various reasons, so 01Yr01 data is used here. This is a conservative estimate of fuels reduction given that there is often input of new fuels after the first winter, but objectives were still met.

NOTES:

PICO Monitoring Type Data are from Bybee WFU, Cornerstone Rx, and Phoenix Wildland Fire, and UMN research plots

PIPO Monitoring Data are from Timber Crater Burn Units (TC, TC2, TC3), and UMN research plots

Mixed Conifer Data are from Phoenix Wildland Fire and Panhandle3 Rx Burn. An additional 20 mixed conifer plots in the park have not been burned yet.

Mtn Hemlock Data are from Bybee WFU and UCB research plots.

Lassen Volcanic NP programmatic FMH monitoring results through 2015. For percent-change objectives, Confidence Intervals were calculated using a nonparametric bootstrapping (n = 1000 simulations) of the Ratio of Means. Other CIs were derived from distributions of individual values (unless reported as SE)

Monitoring Unit	Resource Management Objective (Restoration)	Monitoring Results (sample sizes)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
Ponderosa / Jeffrey Pine	Fuel Load: Reduce surface fuel load to 30-80% of existing load	Total reduction = 52% decrease (CI _{80%} : 32% to 99%) (n=7 plots)	YES small sample size	2014 (1995-2011) All but one

Monitoring Unit	Resource Management Objective (Restoration)	Monitoring Results (sample sizes)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
	Tree density: 40-250 trees/ha all sizes	131 trees/ha (CI _{80%} : 82 to 181) Note: reduction from pre-fire was 60% (CI _{80%} : 45-81%)	YES	plot burned 2X
	10-80 trees/ha >80 cm dbh	16 trees/ha (CI _{80%} : 10 to 27) Note: reduction from pre-fire was 33% (CI _{80%} : 10-74%) (<i>n=7 plot,</i>)		
	Composition: 60-90% Jeffrey pine 10-30% Other Species	$\bar{x}$ = 70% Jeffrey pine (CI _{80%} : 51 to 90) $\bar{x}$ = 30% Other spec. (CI _{80%} : 10 to 48) (<i>n=7 plots</i>)	YES	
Lodgepole Pine	Fuel Load: Reduce surface fuel load to 35-55% of existing load	1X Fires (plots burned just once) Total fuel reduction = 35% (CI _{80%} : 30 to 47%) (<i>n=3 plots, 11 years</i>) 2X Fires (plots burned twice) Total fuel reduction = 78% (CI _{80%} : 58 to 89%) (<i>n=3 plots</i>)	Insufficient Sample Size	2015 (2002-2014) All plots burned 2X (Data includes 2012 Reading Fire)
	Tree density (all sizes): No target specified for Trees per Hectare	General Information Unburned: $\bar{x}$ = 1143 (575-1711) Burned 1X: $\bar{x}$ = 993 (127-339) Burned 2X: $\bar{x}$ <10 TPH (0-9) (<i>n=3 plots</i>)	Insufficient Sample Size	
	Composition: 80-90% lodgepole 0-10% fir, 0-10% hemlock	$\bar{x}$ = 97% PICO (CI _{80%} : 92-100%) $\bar{x}$ = 3% Fir $\bar{x}$ = <1% Hemlock (<i>n=3 plots</i>)	Insufficient Sample Size	
Mixed Conifer	Fuel Load: Reduce 60-75% of existing dead & down fuels	63% reduction (CI _{80%} : 57% to 68%) (<i>n = 27 plots</i>)	YES	2015 (1994-2012)

Monitoring Unit	Resource Management Objective (Restoration)	Monitoring Results (sample sizes)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
	Tree Density: 50-300 trees/hectare all sizes	406 trees/ha (CI _{80%} : 338 to 475) Note: reduction from pre-fire was 60% (CI _{80%} 56%-65%) (<i>n</i> = 34 plots).	NO (but much closer after burning)	
	< 10-80 trees/hectare >80 cm dbh	16 trees/ha (CI _{80%} : 12 to 19) Note: reduction from pre-fire was 9% (CI _{80%} 0%-19%) ^c (<i>n</i> = 34 plots)	YES	
	Composition: 40-60% fir 15-40% pine, 0-20% other	$\bar{x}$ = 80% fir (CI _{80%} : 76-84%) $\bar{x}$ = 18% pine (CI _{80%} : 14-22%) $\bar{x}$ = 2% other (CI _{80%} : 0.5-3%) (<i>n</i> = 34 plots)	NO , (but much closer after burning)	
Mountain Hemlock and	Fuel Load: Reduce 35-55% of existing dead & down fuels	No Data at LAVO (see CRLA for data from this type)	N/A	N/A
	Composition 15-60% hemlock, 0-40% fir, 0-10% pine (inc. PILA)	No Data at LAVO (see CRLA for data from this type)	N/A	
Red Fir / White Pine	Fuel Load: Reduce 60-75% of existing dead & down fuels	40% reduction (CI _{80%} : 10% to 66%) (<i>n</i> = 5 plots, 2 years)	YES small sample size	2014 (2004-2012)
	Tree Density: 60-350 trees/ha all sizes	248 trees/ha (CI _{80%} : 84 to 411) Note: reduction from pre-fire was 76% (CI _{80%} : 34-85%)	YES small sample size	
	10-100 trees/ha $\geq$ 80 cm dbh	48 trees/ha (CI _{80%} : 26 to 69) Note: reduction from pre-fire was 14% (CI _{80%} : 7-29%)		
	Composition: 30-70% fir 20-50% <i>Pinus</i> 0-20% other	$\bar{x}$ = 78% fir (CI _{80%} : 69-88%) $\bar{x}$ = 21% pine (CI _{80%} : 12-31%) $\bar{x}$ = ~1% other (<i>n</i> = 5 plots)	YES small sample size	

NOTES:

PICO Monitoring Type Data are from the Hole Rx and subsequent Reading Wildland Fire

PIJE/PIPO Monitoring Data are from Butte Lake Rx, Hole Rx, and Warner Rx units

Mixed Conifer Data are from Butte Lake, Flume, Hole, Knob, Raker, Roadside, Shack and Warner Valley Rx Units.

Red Fir data reea from

Lava Beds National Monument programmatic monitoring results for fuels reduction objectives through 2015. Other ecological objectives are currently being assessed using newly obtained mapping data from a

recent reserve project and ancillary aerial photo analysis (see report citation below).

For percent-change objectives, Confidence Intervals were calculated using a nonparametric bootstrapping (n = 1000 simulations) of the Ratio of Means. Other CIs were derived from distributions of individual values (unless reported as SE)

Monitoring Unit	Resource Management Objective (Restoration)	Monitoring Results (sample sizes)	Objective Achieved?	Year Analysis Completed (Range of Data [Yrs] Included in Analysis)
Ponderosa Pine (FPIPO)	Fuel Load: 50-90% total fuel load reduction	40% reduction (CI _{80%} : 22% to 54%) (n=16 plots)	YES	2015 (9-23 years)
Sagebrush Steppe (BRUSH)	Fuel Load: 30-70% total fuel load reduction	1% reduction (CI _{80%} : -1% to 7%) (n=13 plots)	NO (doesn't include standing shrub biomass)	2015 (8-25 years)
Perennial Bunchgrass (BGRAS)	Fuel Load: >70% total fuel load reduction	Biomass Calculations in Progress	N/A	2014
Juniper Woodland (FJUOC)	Fuel Load: All plots still unburned	N/A	N/A	2014

B. Program Information

Please complete the tables below which contain additional information that we feel is valuable to compile on an annual basis to help assess the fire ecology program workload. Everglades National Park is used as a fictitious example in the tables.

Table 4. Planning - 2015

Park	Does Park have written DFCs? (yes or no)	Date Park-level Monitoring Plan completed (or revised)	Total # of Project- or Community-level Monitoring Plans (not just 2015)	Assisted with how many BAER plans in 2015?
Lassen Volcanic	Yes	2007 #	3	0
Lava Beds	Yes	2007 #	3	0
Crater Lake	Yes	2007 #	2	0

Original completion date listed, but plans are revised periodically with FMP reviews and revisions.

Table 5. Monitoring - 2015

Park	% 2015 Data Entered	% 2015 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Lava Beds	100%	100%	4	1	0	0
Crater Lake	n/a	n/a	0	0	0	0
Lassen Volcanic	98% **	98%	0	2	0	0

* Number of treatment units with treatment effects monitoring conducted. Include pre-burn and post-burn monitoring but not burn-day monitoring. (Labe cele, CRLA ribbon/phoenix, lavo NWAG/Reading)

** Prism basal area data; will be entered by HSU grad student to use for his research

Table 6. Communicating Results - 2015

Park	# of Project Monitoring Reports completed in 2015	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
Lassen Volcanic NP	0	3	1	Yes (I have one of the offline licenses)
Crater Lake NP	0	2	0	
Lava Beds NM	0	2	1	
Klamath Network	0	n/a	1	

* This information will help to assess Minitab multi-user license needs.

Table 7. Research - 2015

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2015	# of Proposals Funded in 2015	# of Research Projects Supported in 2015	Additional Comments
Lassen Volcanic NP	Yes	See network		2	Included in funded network proposal
Crater Lake NP	Yes	See network		3	
Lava Beds NM	Yes	See network		1	
Klamath Network wide	n/a**	2	1	2	LAVO/WHIS/RED W/CRLA/LABE
Non-network parks	n/a**	1	1	1	
Other federal units	n/a **	1	1	1	Sierra Nevada, Southwest
Parks in other regions	n/a**	2	1	1	SAGU, GRCA, Bandelier

*Number of funded research projects, new or ongoing, supported by the fire ecology program including logistical info or support, staffing, etc.

** Not a park I am responsible for FMP planning.

Reserve Fund Research - If your park(s) received Reserve Fund Research funding or completed a previously-funded project in the last year, please provide the following:

Ongoing Projects:

- *Project Title:* Using LiDAR to Guide Restoration in the Crater Lake Panhandle (with *Cooperator:* Jerry Franklin and Van Kane, University of Washington
Goal: To develop LiDAR tools to facilitate mechanical restoration planning and monitoring, and compare field inventory methods with LiDAR derived methods.
Expected Completion: Work completed in Dec 2015 (Final Report due May 2016)
Deliverables: Final report, raw data, gap and patch classification maps, legacy tree classification maps, sampling design, recommended prescriptions, cluster map, visualization tools for planning/scoping.
- *Project Title:* Relationship Between Fire History and Forest Structure Using LiDAR, with Jerry Franklin and Van Kane, UW.
Goal: Quantify the influence of biophysical environmental parameters on forest structure and fire severity using LiDAR.
Expected Completion: Final report currently in Review; to be revised in February
Deliverables: Final report, raw data, TAO and structure maps park planning, revised fire severity atlas
- *Project Title:* Does forest management promote forest resistance and resilience to drought?
Cooperator: Phil van Mantgem, USGS).
Goal: To determine if stand conditions created by NPS forest management encourages forest resistance and resilience to severe drought and how this varies across the diverse conditions in the Klamath region.
Expected Completion: 2018 (funded in 2014). Field work to be done in 2016. One M.S. Thesis project under this project (with matching HSU funds) also underway

Other NPS related research publications forthcoming (using some data from reserve fund projects completed previously):

- Airey Lauvaux, C., C.N. Skinner, and A.H. Taylor. 2015 (online; 2016 print). High severity fire and mixed conifer forest-chaparral dynamics. *Forest Ecology and Management* 363 (2016) 74–85.
- Riegel, G.M. et al (including Farris). In Review. Northeastern Plateaus Bioregion. In, Sugihara, Neil G. *Fire in California's Ecosystems*, 2nd Edition. Univ of California Press, 2006. (includes FMH data and completed Reserve Fund Research from Lava Beds and Lassen Volcanic National Park)
- Stevens J.T., et al. (with Farris). 2016 (in press). Average Stand Age From Forest Inventory Plots Does Not Describe Historical Fire Regimes in Ponderosa Pine and Mixed-Conifer Forests of Western North America. *PLOS ONE*. Volume TBD
- Farris, C.A. et al. 2016 (in press). Comparison of historical and contemporary area burned based on a calibrated time series in two Southwest wilderness areas. *Forest Ecology and Management*.

- Fulé, P.Z., T.W. Swetnam, P.M. Brown, D.A. Falk, D.L. Peterson, G.H. Aplet, M.A. Battaglia, D. Binkley, C.A. Farris, R.E. Keane, E.Q. Margolis, H. Grissino-Mayer, C. Miller, C.H. Sieg, C. Skinner, S.L. Stephens, A.H. Taylor. 2014. Unsupported inferences of high severity fire in historical western United States dry forests: Response to Williams and Baker. *Global Ecology and Biogeography*. 23(7): 825–830
Link: <http://onlinelibrary.wiley.com/doi/10.1111/geb.12136/full>

C. Fire ecologist accomplishments and areas of focus

Table 8. Fire Ecologist 2015 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning and Project Support	25%	Field review and delineation of Northwest Gateway Phase II units; Analysis and development of silviculture prescriptions for Phase II; coordination of inventory and analysis work for Panhandle Restoration; field delineation of treatment units and objective development; participate in EA planning and scoping for Panhandle; Field collaboration with foresters. Assist with fuels treatment and project planning in networks parks; FMP review; Assist with WFDSS training
Research	35%	Proposal writing and new project collaboration; Manuscript preparation and peer review revisions; collaboration with universities and agencies on research in parks and other units; data analysis and syntheses; journal peer reviewer; field work; meetings and workshop
Fire Fx Monitoring Field Work and Analysis	10%	• Planning and oversight of fire effects field work • Deer browse and field enclosure monitoring • Assisting seasonal in various tasks
Fire Assignments	5%	WFDSS and fire modeling support for National Creek Fire
Training	0%	No amount of training can help me at this point.
Presentations and Workshops and Field Trips (including prep time)	15%	NAU fire-drought research workshop presentation; UC Davis seminar presentation; Oregon Tech lectures and field trips
Administrative/Supervisory,	10%	Administrative paperwork and reporting; budget; supervision of seasonal field assistant

D. Fire effects crew accomplishments and areas of focus

This section deals with roles and functions of the fire effects crew. Identify accomplishments and/or focus areas along with a rough estimate of the amount of time spent in these areas (see table format and example below).

Table 9. Fire Effects Crew 2015 Accomplishments/Focus Areas

Category	Percent Time	Notes
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FMH plots	20	Mostly shrub plots in LABE and LAVO; two forest plots
WUI plots	0	
CBI plots	0	
Other plot work	10	soil moisture monitoring, aspen enclosure browse data
Wildfire assignments	0	
Prescribed fire projects	0	
Non-fire fuels projects	35	Northwest Gateway Phase I work. Includes meadow and aspen research plots and modified FMH plot work
Travel out-of-park for plot or project work	10	Include <u>travel time only</u> for distant, multi-day plot/project work requiring a travel authorization (Note: include data collection or project time associated with these trips in the plot or project categories above)
Data entry	20	Estimated amount of time spent entering data from paper to PC
Data analysis	0	This is expected to be very low number or zero for fire effects crew/lead monitor
Supervision/Admin	5	Payroll, travel authorization/voucher, etc.
Training	0	List all training courses attended including in-park, NPS/interagency, and non-government
Miscellaneous	0	Things that don't fit in other categories – search and rescue, assisting other work groups/projects (e.g. natural resources), etc.

E. 2016 Direction

One major challenge for 2016 and beyond is how to maintain the rich network of legacy fire effects monitoring/FMH plots. We're trying to coordinate a joint USGS/NPS field crew that can work on the highest priority fire effects needs. The model for that will be an integrated crew in 2016 funded through research dollars for network research, but which will also do fire effects work with supplemental NPS project funding. We've adapted to other fire effects monitoring needs by bringing in a fair amount of research funding, but such funds don't usually help fund crews devoted to FMH work. It's been three years since we had a crew.

With the lack of significant Rx burn acreage, our burned acreage in the network comes almost entirely from wildland fires these days. We've done a good job of utilizing comprehensive research to assessing ecological questions and objectives for wildland fires, but this is an ongoing challenge and funding is competitive. However, mechanical treatments are gaining interest in dense forests with heavy fuels around WUI or boundaries. We have three large mechanical treatments that require monitoring due to the high level of interest and controversy, and the lack of historical mechanical effects data from parks. Like with fire, we've picked a subset of 'representative' treatments to monitor, which reduces workload and still provides site-specific information. We've gotten project funding for support, but once those become 'legacy' projects and are not eligible for project funding, they'll present the same challenge to maintain as our FMH network.

Finally, my health situation will continue to hamper my ability to do some types of work activities, such as on-ground incident support and field work. As the only permanent fire ecology employee in the network, we'll have to continue to figure out ways to meet those needs.

F. Overall Data Entry Status and FFI suggestions

Program Data - In an effort to ensure the longevity of NPS fire effects monitoring data, please provide the following:

- Essentially 100% of NPS fire effects field data has been entered, almost all into FFI, with a small percentage (<5%) entered into spreadsheets or databases like FVS (those were custom projects, generally research but not considered part of the core fire effects monitoring). Post-treatment stand exam data collected in 2015 for Northwest Gateway have not been entered, but will be this spring by Humboldt State graduate students into FVS. Everything else is entered.
- Do you have a need for migration of any data to FFI? Possibly. There was a research project at Crater Lake in 2010 with the University of Minnesota. They collected tree data from 23 gridded plots as part of a demography study. I wanted to incorporate and utilize that grid into our Fx program, so we collected fuels and understory data from the plots using FMH protocols. We currently maintain the tree data in excel and the understory/fuels data in FFI, and I've thought about just converting the excel tree data to FFI. It is low on my priority list now, especially since I don't have a Lead FEMO or seasonals.

FFI Feedback – I don't have any at this time, as I've admittedly done very little data entry and management and have exported data into Statistics programs for analyses. This will change now that I'm on my own.

G. Optional Information