



North Pacific/ Columbia Basin Fire Ecology Annual Report Calendar Year 2013

**Karen Kopper, Fire Ecologist
Cedar Drake, Lead Fire Effects Monitor
North Cascades National Park**

A. Summary

The North Pacific/ Columbia Basin (NPCB) Fire Ecology program had another productive and efficient year. The NPCB Fire Effects Monitoring crew completed a total of fifty-six plot reads within North Cascades National Park (NOCA), San Juan Island National Historic Park (SAJH) and Lake Roosevelt National Recreation Area (LARO). Additionally, crew members contributed countless hours assisting wildland/ prescribed fire operations and NPS resource management projects. The fire ecologist made substantial progress in fire history research at NOCA, and wrote final reports for the NOCA and Mount Rainier National Park (MORA) Natural Resource Conservation Assessments (NRCA), and analyzed data for the MORA fuel mapping with LiDAR project.

In 2013 the NPCB crew conducted the bulk of FMH fieldwork at Lake Roosevelt NRA. During four visits, crewmembers completed twenty-one post-burn and twenty-three 1st, 2nd and 5th year post-burn plot reads. The crew also participated in prescribed burning operations in the Kettle Falls Admin and North Gorge units. NPCB staff supported LARO resource management in conducting a rare plant survey in the Kettle Falls district.

At SAJH the NPCB crew performed two 2nd year post-burn reads and four 10th year post-burn reads.

At NOCA the crew completed six 10th year post-burn reads.

Two SCA Fire Effects Monitoring interns assisted the NPCB crew with FMH plot work at LARO, SAJH and NOCA during the 2013 field season. These individuals, Jade Thomason and Bethany Murphy, provided invaluable assistance in completing the plot workload, assisting with

data entry, processing fire ecology research samples, installing temperature monitors, and providing logistical support for wildfire suppression operations at NOCA.

The NPCB crew contributed substantial support to a variety of collateral duty operations. Crew members participated in approximately 160 “person-days” of wildfire/ prescribed fire assignments and hazardous fuel reduction details between April and November. These roles ranged from helicopter crewmember, resource advisor, squad boss, and incident commander in Washington, Idaho, Nevada, and California. These opportunities enabled the crew to extend their field seasons and make huge strides in attaining valued qualifications. During the 2013 season NPCB crewmembers achieved Resource Advisor, Helicopter Crewmember, and Firefighter Type 1 IQCS qualifications. In a future of ever-shrinking budgets, these qualifications will provide vital local support to NOCA/LARO/SAJH wildland and prescribed fire management operations.

The remainder of the season was devoted to administrative tasks, data entry, database management, processing fire ecology samples, GIS support, field testing FFI Lite software and training. The crew also supported the NOCA/LARO fire crew in initial attack incidents, search and rescue response related to Cascade River flooding, and hazardous fuel reduction projects at LARO.

Table 1. Fire Effects Plot Workload 2013

Park	Vegetation Monitoring Type	Plot Type	Pre-burn	Immed. Post-burn	Post-thin	Postburn (1-20 yrs.)	Annual Total (2013)	Total Plots
John Day Fossil Beds NM	Big Sagebrush/Bunchgrass	FMH Brush	0	0	0	0	0	21
	Western Juniper Shrubland	FMH Forest	0	0	0	0	0	16
Lake Roosevelt NRA	Ponderosa Pine/ Common Snowberry Forest	FMH Forest	0	18	0	20	38	40
	Ponderosa Pine/Bitterbrush	FMH Forest	0	3	0	3	6	3
North Cascades NP	Stehekin Valley FFRA: Mixed Conifer	FMH Forest	0	0	0	6	6	40
	Stehekin Valley Contours (Open/Mid/Closed Canopy Mixed Conifer)	FMH Forest	0	0	0	0	0	23
Olympic NP	East-side Mixed Conifer (permanent RAPS plots)	Rapid Assessment	0	0	0	0	0	5
San Juan Island NHP	Garry Oak Woodland	FMH Forest	0	0	0	6	6	12
	Douglas Fir/ Lodgepole (permanent RAPS plots)	Rapid Assessment	0	0	0	0	0	4
	Annual Brome Grasses	FMH Grass	0	0	0	0	0	10
Whitman Mission NHS	Giant Wild Rye – Meadow Restoration	FMH Grass	0	0	0	0	0	5
Total			0	21	0	35	56	179

Pilot sampling plots*

Table 2. Fire Ecology Staffing 2013

Ecologist and Monitors	Start Date	End Date	# Pay Periods	READ Qualified?	Training	Development
Karen Kopper Fire Ecologist	1/01/13	n/a	26	No	Fire Refresher	UW fire severity and fire history research in pursuit of PhD,
Cedar Drake Lead Fire Effects Monitor	3/25/13	12/14/13	19	Yes	Fire Refresher, University of Washington GIS training, Wilderness First Responder	HECM and FFT1 assignments. Completed FFT1 taskbook.
Sheah Mucci Assistant Lead Fire Effects Monitor	5/22/13	10/31/13	12	Yes	Fire Refresher	HECM assignments, READ assignment, GRBA hazardous fuel reduction detail. Completed READ and HECM taskbooks.
Robbie Andrus Fire Effects Monitor	5/22/13	6/28/13	3	No	Fire Refresher	GRBA hazardous fuel reduction detail
Jade Thomason SCA-Fire Ecology Intern	6/7/13	8/21/13	6	No	Fire Refresher	Fire Effects and botany training with NPCB crew
Bethany Murphy SCA-Fire Ecology Intern	6/19/13	9/4/13	6	No		Fire Effects and botany training with NPCB crew



**2013 NPCB Fire Effects Monitoring crew
(l. to r. Robbie Andrus, Cedar Drake, Sheah Mucci)**



SCA Intern Jade Thomason



SCA Intern Bethany Murphy

Table 3a. Management Objectives and Monitoring Results

North Cascades National Park



**FPSME2-17 Q1-Q4
Douglas Fir / Ponderosa Pine Forest
PRE Treatment (1998)**



**FPSME2-17 Q1-Q4
Douglas Fir / Ponderosa Pine Forest
POST Treatment (2012)**



**FPSME2-19 Q1-Q4
Douglas Fir / Ponderosa Pine Forest
PRE Treatment (1997)**



**FPSME2-19 Q1-Q4
Douglas Fir / Ponderosa Pine Forest
POST Treatment (2013)**

Stehekin Forest Fuel Reduction Areas Douglas fir / Ponderosa pine forest			
Management Objective	Monitoring Results (90% confidence interval)	Objective Achieved ?	Year Analysis Completed (Range of Data Included in Analysis)
POST= 10 years after the 1st broadcast burn of a thinned unit			
Trees			
Reduce the density of saplings and pole size trees (2.5-14.9 cm dbh) to 10-30 trees/acre as measured 2 years after final treatment prior to maintenance.	Orchard Rainbow Unit: n=4 PRE=108.3 (76.7) trees/acre POST= 8.1 (3.3) trees/acre	No	2013 (1997-2013)
	Company Ck. Unit: n=3 PRE= 45.9 (62.0) trees/acre POST= 4.1 (7.0) trees/acre	No	2013 (1998-2013)
Reduce the density of small and medium sized overstory trees (15-60 cm dbh) to 25-75 trees/acre as measured 2 years after final treatment prior to maintenance.	Orchard Rainbow Unit: n=4 PRE=108.3 (41.6) trees/acre POST= 54.6 (20.0) trees/acre	Yes	2013 (1997-2013)
	Company Ck. Unit: n=3 PRE= 122.8 (41.3) trees/acre POST= 58.0 (23.7) trees/acre	Yes	2013 (1998-2013)
Maintain the density of large overstory trees (>60 cm dbh) at 1-20 trees/acre as measured 2 years after final treatment prior to maintenance.	Orchard Rainbow Unit: n=4 PRE=5.1 (2.0) trees/acre POST= 6.1 (2.3) trees/acre	Yes	2013 (1997-2013)
	Company Ck. Unit: n=3 PRE= 5.4 (6.2) trees/acre POST= 9.4 (8.4) trees/acre	Yes	2013 (1998-2013)
Reduce basal area to an average of 70 ($\pm$ 35) ft ² / acre as measured 2 years after final treatment prior to maintenance.	Orchard Rainbow Unit: n=4 PRE=101.6 (24.9) feet ² /acre POST= 83.4 (27.8) feet ² /acre	Yes	2013 (1997-2013)
	Company Ck. Unit: n=3 PRE=148.1 (46.4) feet ² /acre POST= 120.8 (61.0) feet ² /acre	No	2013 (1998-2013)
Increase canopy base height to 2 meters as measured 1 year post-treatment.	Orchard Rainbow Unit: n=4, POST= 6.4 (4.3) m	Yes	2013 (1997-2013)
	Company Ck. Unit: n=3, POST= 7.9 (5.7) m	Yes	2013 (1998-2013)
Vegetation			
Maintain a minimum of 30 percent cover of native understory vegetation (shrubs and herbaceous) 2 years after the initial treatment.	Orchard Rainbow Unit: n=4 PRE=22.7 (11.2) % cover POST= 26.1 (13.6) % cover	No	2013 (1997-2013)
	Company Ck. Unit: n=3, PRE=41.4 (0.5) % cover POST= 33.1 (3.1) % cover	Yes	2013 (1998-2013)
Report percent cover of non-natives per species. Alert managers to the presence of new exotic species, and work with them to determine critical thresholds.	Orchard Rainbow Unit: n=4 PRE= 0.2 (0.2) % BRTE cover POST= 0.8 (1.3) % BRTE cover	n/a	2013 (1997-2013)

Stehekin Forest Fuel Reduction Areas Douglas fir / Ponderosa pine forest			
Management Objective	Monitoring Results (90% confidence interval)	Objective Achieved ?	Year Analysis Completed (Range of Data Included in Analysis)
	Company Creek Unit: Total non-native cover: n=3, PRE= 0% non-native cover, SD=0, POST= 0% non-native cover, SD=0	n/a	2013 (1998-2013)
Fuel Load			
Maintain an average small diameter (1-100 hour) fuel load of 2-6 tons/acre 2 years after final treatment prior to maintenance.	Orchard Rainbow Unit: n=4, PRE= 2.5 t/ac, SD=1.7, POST=2.6 t/ac, SD=0.6	Yes	2013 (1997-2013)
	Company Creek Unit: n=3, PRE= 3.8 t/ac, SD=0.9, POST= 4.2 t/ac, SD= 0.3	Yes	2013 (1998-2013)
Maintain an average large diameter (1000 hour) fuel load of 4-12 tons/acre 2 years after final treatment prior to maintenance.	Orchard Rainbow Unit: n=4, PRE= 4.8 t/ac, SD=2.2, POST=6.6 t/ac, SD=3.6	Yes	2013 (1997-2013)
	Company Creek Unit: n=3, PRE= 2.5 t/ac, SD=2.5, POST=6.7 t/ac, SD=6.0	Yes	2013 (1998-2013)
Maintain an average litter and duff load of 3.5-14 tons/acre 2 years after final treatment prior to maintenance.	Orchard Rainbow Unit: n=4, PRE= 14.5 t/ac, SD=4.0, POST=10.8 t/ac, SD=3.4	Yes	2013 (1997-2013)
	Company Creek Unit: n=3, PRE= 23.0 t/ac, SD=10.7, POST= 11.2 t/ac, SD=2.3	Yes	2013 (1998-2013)

Ten years after one prescribed burn on a thinned unit

Trees: Selective reduction of live trees is one of the primary objectives of the forest fuel reduction program in Stehekin. Ten years following a single prescribed burn of a thinned unit, the density of overstory trees was within the targeted range, although more thinning of small and medium overstory trees (6 – 24 inches dbh) is needed to meet the desired basal area reduction. The sapling trees (less than 6 inches dbh) were thinned beyond the desired amount, and have still not recovered.

Vegetation: The native vegetation was within the desired range of 30 percent cover at Company Creek. Although the desired cover was not achieved at Orchard Rainbow, the cover had increased from 23 to 26 percent cover. An acceptable density or cover of non-native species has not been identified for NOCA; it varies from species to species, and cannot be monitored effectively by the fire effects monitoring program. However, the presence of non-natives is reported to the NOCA Plant Ecologist.

Fuel Load: The dead and downed woody fuel and litter and duff load are within the desired range.

Lake Roosevelt National Recreation Area



FPIPO1-30 P1-O
Ponderosa Pine/ Snowberry Forest
PRE Treatment (2010)



FPIPO1-30 P1—O
Ponderosa Pine/ Snowberry Forest
POST Treatment (2013)



FPIPO1-34 Q2-Q3
Ponderosa Pine/ Snowberry Forest
PRE Treatment (2010)



FPIPO1-34 Q2-Q3
Ponderosa Pine/ Snowberry Forest
POST Treatment (2012)

Lake Roosevelt National Recreation Area Ponderosa Pine / Snowberry Forest		
Management Objective (Restoration)	Monitoring Results (90% confidence interval)	Objective Achieved?
POST= 1 year after 1 st pile burn		
Trees		
Reduce the density of live pole size trees (1-6 in. = 2.5-14.9 cm dbh) to 2-20 trees/acre as measured 2 years after final treatment prior to maintenance.	Bradbury Beach Unit: n=6, PRE=210.4 (122.2), POST= 11.5 (14.4) trees/acre	Yes
	Clark Lake 1 & 2 Units: n=6, PRE= 357.5 (360.0), POST= 43.8 (19.4) trees/acre	No
	Fort Spokane Unit: n=3, PRE= 138.9 (105.3), POST= 4.1 (7.0) trees/acre	Yes
	Gifford Ferry Unit: n=3, PRE= 101.2 (99.4), POST= 9.4 (13.0) trees/acre	Yes
Reduce the density of live small and medium sized overstory trees (6-20 in = 15-60 cm dbh) to 25-75 trees/acre as measured 2 years after final treatment prior to maintenance.	Bradbury Beach Unit: n=6, PRE= 162.6 (43.8), POST= 139.6 (42.7) trees/acre	No
	Clark Lake 1 & 2 Units: n=6, PRE= 100.5 (69.1), POST= 97.1 (64.9) trees/acre	No
	Fort Spokane Unit: n=3, PRE= 147.0 (72.0), POST= 68.8 (24.6) trees/acre	Yes
	Gifford Ferry Unit: n=3, PRE= 102.5 (88.9), POST= 47.2 (20.8) trees/acre	Yes
Maintain or increase the density of live large overstory trees (> 20 in = > 60 cm dbh) to 1-8 trees/acre as measured 5 years after final treatment prior to maintenance.	Bradbury Beach Unit: n=6, PRE= 2.7 (3.3), POST= 2.7 (3.3) trees/acre	Yes
	Clark Lake 1 & 2 Units: n=6, PRE= 4.7 (4.7), POST= 4.7 (4.7) trees/acre	Yes
	Fort Spokane Unit: n=3, PRE= 5.4 (6.2), POST= 4.1 (7.0) trees/acre	Yes
	Gifford Ferry Unit: n=3, PRE= 4.1 (4.1), POST= 4.1 (4.1) trees/acre	Yes
Reduce live mean basal area (poles+overstory) to an average of 70 (±35) ft ² / acre as measured 2 years after final treatment prior to maintenance.	Bradbury Beach Unit: n=6, PRE=156.0 (37.8), POST=140.3 (43.7) feet ² /acre	No
	Clark Lake Units 1 & 2: n=6, PRE=103.7 (28.4), POST= 98.3 (29.8) feet ² /acre	Yes
	Fort Spokane Unit: n=3, PRE=121.9 (20.2), POST=73.7 (18.5) feet ² /acre	Yes
	Gifford Ferry Unit: n=3, PRE=127.2 (25.1), POST=126.5 (28.5) feet ² /acre	No
Increase live canopy base height (poles+overstory) to 2 meters as measured 1 year post-treatment.	Bradbury Beach Unit: n=6, PRE= 6.4 (5.5), POST=9.7 (5.6) meters	Yes
	Clark Lake Units 1 & 2: n=6, PRE=5.4 (5.4), POST=6.6 (5.6) meters	Yes
	Fort Spokane Unit: n=3, PRE= n/a, POST=7.9 (4.2) meters	Yes
	Gifford Ferry Unit: n=3, PRE= 6.1 (5.1), POST=8.4 (5.0) meters	Yes
Vegetation		
Maintain a minimum of 30 percent cover of native understory vegetation (shrubs and herbaceous) 2 years after the initial treatment.	Bradbury Beach Unit: n=6, PRE= 11.8 (8.0), POST= 9.8 (7.1) % cover	No
	Clark Lake Units 1 & 2: n=6, PRE= 84.5 (56.9), POST= 71.4 (47.7) % cover	Yes
	Fort Spokane Unit: n=3, PRE= 64.0 (7.6), POST= 64.9 (17.0) % cover	Yes
	Gifford Ferry Unit: n=3, PRE= 35.0 (10.6), POST= 33.6 (12.4) % cover	Yes

Maintain <20% cover of non-natives relative to total cover by 5 years following treatment.	Bradbury Beach Unit: n=6, PRE= 5.8 (7.6), POST= 10.2 (6.1) % cover	Yes
	Clark Lake Units 1 & 2: n=6, PRE= 20.1 (15.2), POST= 26.1 (10.7) % cover	No
	Fort Spokane Unit: n=6, PRE= 22.8 (8.9), POST= 26.5 (12.5) % cover	No
	Gifford Ferry Unit n=3, PRE= 58.0 (4.5), POST= 32.7 (9.1) % cover	No
Fuels		
Maintain an average small diameter (≤ 3 inch) woody fuel load of 2–6 tons/acre 2 years after final treatment prior to maintenance.	Bradbury Beach Unit: n=6, PRE= 3.3 (1.2), POST=4.4 (2.3) tons/acre	Yes
	Clark Lake Units 1 & 2: n=6, PRE= 3.8 (1.4), POST=3.1 (1.8) tons/acre	Yes
	Fort Spokane Unit: n=3, PRE= 1.9 (0.6), POST=4.4 (2.3) tons/acre	Yes
	Gifford Ferry Unit: n=3, PRE= 1.6 (0.9), POST=1.3 (0.7) tons/acre	No
Maintain an average large diameter (≥ 3 inch) woody fuel load (no litter and duff) of 1-10 tons/acre 2 years after final treatment prior to maintenance.	Bradbury Beach Unit: n=6, PRE= 11.6 (6.1), POST=11.8 (8.0) tons/acre	No
	Clark Lake Units 1 & 2 n=6, PRE= 14.0 (14.4), POST= 10.0 (7.7) tons/acre	Yes
	Fort Spokane Unit: n=3, PRE= 4.6 (6.1), POST=1.1 (1.4) tons/acre	Yes
	Gifford Ferry Unit: n=3, PRE= 8.4 (12.2), POST=5.5 (9.1) tons/acre	Yes
Maintain an average litter and duff fuel load of 3.5-14 tons/acre 2 years after final treatment prior to maintenance.	Bradbury Beach Unit: n=6, PRE= 23.3 (7.4), POST=22.5 (4.5) tons/acre	No
	Clark Lake Units 1 & 2: n=6, PRE= 17.8 (8.4), POST=11.6 (4.6) tons/acre	Yes
	Fort Spokane Unit: n=6, PRE= 8.5 (1.6), POST=8.2 (1.5) tons/acre	Yes
	Gifford Ferry Unit: n=6, PRE= 12.8 (2.8), POST= 10.8 (2.8) tons/acre	Yes

One year after Pile-burning: Bradbury Beach, Clark Lake, Fort Spokane, Gifford Ferry

Trees: The pile-burn treatments are moving all of the units towards the desired densities and basal areas, and none of the desired reductions have been exceeded. Tree density objectives have been achieved, except for small to medium sized overstory trees (6 to 20 inches) at Clark Lake and Bradbury Beach, and pole trees (less than 6 inches dbh) at Clark Lake that need additional thinning. There is room for additional thinning to achieve basal area objectives that are above target at Bradbury Beach and Fort Spokane, and to meet density objectives at Clark Lake.

Vegetation: Vegetative cover was substantially lower at Bradbury Beach than at the other units. The minimum native cover requirement of 30 percent was met at all but Bradbury Beach, whereas Bradbury Beach was the only unit with less than the maximum allowable cover of non-native species.

Surface Fuels: Fuel loads are within their desired ranges in all cases except small diameter (less than 3 inches) fuels at Gifford Ferry, and large diameter (greater than 3 inches) fuels and litter

and duff at Bradbury Beach. At Gifford Ferry the small diameter fuels were lacking before and after pile-burning, whereas further treatment is needed at Bradbury Beach.

San Juan Island National Historic Park



FQUGA1-8 Q4-Q1
Garry Oak Woodland
Young Hill Unit
PRE Rx Fire (2004)



FQUGA1-8 Q4-Q1
Garry Oak Woodland
Young Hill Unit
POST Rx Fire (2008)



FQUGA1-9 P1-O
Garry Oak Woodland
Young Hill Unit
PRE Pile Burn (2007)



FQUGA1-9 P1-O
Garry Oak Woodland
Young Hill Unit
POST Pile Burn (2011)

San Juan Island National Historic Park Garry Oak Woodland Monitoring Unit (FQUGA1D02)				
Management Objective <i>Revised Objectives</i>	Broadcast Burn Monitoring Results (90% confidence interval) (1999-2008) n=7 (2n-2003, 3n-2005, 2n-2006)		Pile Burn Monitoring Results (90% confidence interval) (2007-2013) n=4 (2n-2009, 2n-2012)	
Trees	2 years POST Broadcast Burn	Achieved ?	2 years POST Pile Burn	Achieved ?
Maintain less than 5% mortality of overstory (≥ 15 cm dbh) QUGA trees/acre.	x=13.0 % mortality 90% CI: (-4.5<x<30.6) PRE=13.3 t/ac, SD=10.9 POST=11.6 t/ac, SD=10.0	No	x= 6.7 % mortality 90% CI: (-9.0<x<22.3) PRE=15.2 t/ac, SD=11.1; POST= 14.2 t/ac, SD=10.7	No
Shrub Cover	2 years POST Broadcast Burn	Achieved ?	2 years POST Pile Burn	Achieved ?
Maintain 5-40 % shrub cover	PRE=27.8 % cover, SD=23.4 POST= 32.4 % cover, SD=26.8	Yes	PRE= 41.9 % cover, SD= 37.5 POST= 54.9 % cover, SD=48.3	No
Fuel Load	2 years POST Broadcast Burn	Achieved ?	2 years POST Pile Burn	Achieved ?
Maintain total fuel load of 4-12 tons/acre	PRE= 20.4 t/ac, SD= 16.7 POST= 24.0 t/ac, SD=26.7	No	PRE=15.8 t/ac, SD= 7.1 POST=20.4 t/ac, SD=3.0	No
Maintain one-hour fuel load of 0.1-2.0 tons/acre	PRE=1.9 t/ac, SD=1.6 POST=0.2 t/ac, SD=0.1	Yes	PRE= 0.8 t/ac, SD=0.4; POST=0.8 t/ac, SD=0.2	Yes
Maintain ten-hour fuel load of 0.1-2.0 tons/acre	PRE=0.9 t/ac, SD=0.7 POST=0.3 t/ac, SD=0.2	Yes	PRE=0.6 t/ac, SD=0.3; POST=0.7 t/ac, SD=0.3	Yes
Maintain hundred-hour fuel load of 0.1-2.0 tons/acre	PRE=2.9 t/ac, SD=1.9 POST=2.2 t/ac, SD=2.1	No	PRE=2.0 t/ac, SD=1.9 POST= 2.4 t/ac, SD= 1.2	No
Maintain thousand-hour fuel load of 2-6 tons/acre	PRE=7.4 t/ac, SD=10.3 POST=18.5 t/ac, SD=25.7	No	PRE= 6.7 t/ac, SD=6.3 POST=12.2 t/ac, SD=3.4	No
Maintain litter and duff load of 2-6 tons/acre	PRE=7.8 t/ac, SD=4.2 POST= 2.8 t/ac, SD=1.1	Yes	PRE=5.9 t/ac, SD= 2.5 POST= 4.5 t/ac, SD= 1.3	Yes

Herbaceous Cover	2 years POST Broadcast Burn	Achieved ?	2 years POST Pile Burn	Achieved ?
<i>Increase and maintain the absolute cover of native perennial grass at 20 percent cover</i>	X=112.5% increase 90% CI: (-22.6<x<247.6) PRE= 3.4 % cover, SD=7.1 POST= 7.1% cover, SD=8.4	No	x= 39.8% increase, 90%CI:(- 76.1<x<155.6) PRE= 11.7 % cover, SD=10.4 POST= 16.4 % cover, SD=19.0	No
<i>Reduce and/or not exceed the absolute cover of non-native perennial grass compared to the pre-treatment cover</i>	x= 102.9 % increase 90%CI:(68.4 <x<137.5) PRE= 31.1 % cover, SD= 20.9 POST=63.2 % cover, SD=32.9	No	x= 428.3 % increase 90%CI:(-113.0<x<970.0) PRE= 4.0 % cover, SD=6.7 POST= 21.1% cover, SD=16.3	No
<i>Increase and maintain the absolute cover of native herbaceous species at 30 percent cover</i>	x= 34.6% increase 90% CI: (0.2<x<69.1) PRE=31.6 % cover, SD=10.8 POST= 42.5% cover, SD=17.2	Yes	x= 5.7% increase, 90%CI: (-66.4<x<77.8) PRE= 52.7 % cover, SD=25.2 POST= 55.7% cover, SD=21.1	Yes
<i>Reduce and/or not exceed the absolute cover of non-native herbaceous species compared to the pre-treatment cover</i>	x=87.1% increase, 90%CI: (60.8<x<113.3) PRE= 51.2% cover, SD=38.2 POST= 95.8% cover, SD=51.8	No	x= 190.7% increase, 90%CI: (-145.7<x<527.8) PRE= 15.1 % cover, SD=13.5 POST= 44.0 % cover, SD=38.9	No

Comparison of broadcast burns and pile burns using revised objectives

The monitoring objectives in italics were discussed and revised during the 2014 Spring Fire Management meeting at SAJH. Changes were proposed before the meeting and agreed upon. The analysis uses the new objectives to compare the effects of broadcast burns to pile burns.

Trees: This objective, to maintain less than five percent mortality of overstory oaks, is the only objective that was not revised. In retrospect it should be revised to reflect a desired density of live overstory oaks. The objective failed with both treatment types.

Shrubs: Although shrub densities were greater after both types of treatments, the units that were broadcast burned had less than 40 percent cover, whereas pile-burned areas exceeded this objective.

Surface Fuels: Broadcast burns and pile burns both had the same results; successful reduction of one-hour, ten-hour, and litter and duff fuel loads, and lack of success in reduction of one-hundred-hour, thousand-hour, and total fuel loads. Broadcast burning was more effective at reducing all fuel classes except for thousand-hour fuels.

Vegetation: Absolute cover of native species increased after both treatments. The objective to maintain or increase native herbaceous species cover was achieved, but the increases were not enough to reach the desired cover of native grass. Unfortunately, the absolute cover of non-

native species increased following both treatments; especially non-native grass cover after pile-burning.



**Robbie Andrus and Sheah Mucci completing a forest plot at
Lake Roosevelt National Recreation Area**



Bethany Murphy and Sheah Mucci navigating to a forest plot at Lake Roosevelt National Recreation Area

B. Fire ecologist accomplishments and areas of focus

Table 4. Fire Ecologist 2013 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	5	New LARO fire effects monitoring plan for LARO FMP & EA
Presentations	5	FX-reports NOCA, LARO, SAJH, Seasonal Orientation, UW lab
NPS Meetings/ task groups	5	NOCA wilderness committee, NOCA housing committee
Interagency work	2.5	Interagency PNW Climate Change Assessment
Wildfire assignments	1	Arctic Dan FEMO
Prescribed fire projects	2.5	GIS work – shape files for treatment areas
Non-fire fuels projects	5	GIS work – shape files for treatment area documentation
Research	50	NOCA and MORA NRCA reports, MORA Lidar Fuel Mapping research, NOCA fire history and severity research
Data collection	3	NOCA fire severity plot revisits
Data entry	1	NOCA fire history data
Data analysis	9	Fire effects YER, MORA fuel mapping and NOCA & MORA NRCA report analyses
Supervision/Admin	9	Hiring, supervision, payroll, travel authorization/vouchers, purchasing, etc.
Training	1	Estimated amount of time spent in training (include time for all training courses attended including in-park, NPS/interagency, and non-government)
Travel out-of-park for plot or project work	1	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)
Miscellaneous		Things that don't fit in other categories – BAER, BAR plans, etc.

C. Fire Effects crew accomplishments and areas of focus

Table 5. Fire Effects Crew Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	39%	The NPCB crew conducted 56 FMH plot reads at 3 different sites in 2013. Includes logistical prep time and foot travel to plots.
Wildfire and Detail Assignments	24%	FFT1, HECM, ICT5(t) and READ duties on a variety of wildfire assignments in WA, ID, and CA.
Data entry	9%	Completed all data entry for 2013. Database cleanup.
Supervision/Admin	7%	Travel, payroll, credit card statements, logistics planning, vehicle maintenance, purchasing, hiring, performance evaluations
Travel out-of-park for plot or project work	5%	Travel from Marblemount to LARO, SAJH, NOCA (Stehekin)
RX Fire Assignments	4%	FEMO and FFT2 duties on LARO RX burns

Miscellaneous	4%	FFILite field testing, training SCA intern, LARO rare plant survey, search and rescue support
Training	3%	Fire Refresher, Wilderness First Responder
Non-Fire Fuels Treatments	3%	Cross training with Fuels crew (assisting with thinning)
Data analysis and YER completion	2%	Data analysis and completion of 2013 Year End Report

D. Additional Program Information

Table 6. Planning - 2013

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 2013)	Assisted with how many BAER plans in 2013?
John Day Fossil Beds NM	yes	2000	1	0
Lake Roosevelt NRA	yes	2013, revision in progress	1	0
North Cascades NP	yes	2005, revision in progress	3	0
San Juan Island NHP	yes	1998	1	0
Olympic NP	no	unknown	n/a	0
Whitman Mission NHS	yes	2001	1	0

Table 7. Monitoring

Park	% 2013 Data Entered	% 2013 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
John Day Fossil Beds NM	100%	100%	0	0	0	0
Lake Roosevelt NRA	100%	100%	36	6	0	0
North Cascades NP	100%	100%	6	0	10	0
San Juan Island NHP	100%	100%	8	0	0	0

* Number of treatment units with treatment effects monitoring conducted. Include pre-burn and post-burn monitoring but not burn-day monitoring.

Table 8. Communicating Results - 2013

Park	# of Project Monitoring Reports completed in 2013	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
John Day Fossil Beds NM	0	1	0	n/a
Lake Roosevelt NRA	1	1	1	Yes
North Cascades NP	1	1	2	Yes
San Juan Island NHP	1	1	1	Yes
Olympic NP	0	1	0	n/a
Whitman Mission NHS	0	0	0	n/a

Table 9. Research - 2013

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2013	# of Proposals Funded in 2013	# of Research Projects Supported in 2013*	Additional Comments
John Day Fossil Beds NM	no	0	0	0	
Lake Roosevelt NRA	no	0	0	0	
North Cascades NP	yes	0	1	1	Fire ecology research
San Juan Island NHP	yes	0	0	0	
Olympic NP	no	0	0	0	
Whitman Mission NHS	no	0	0	0	
Mount Rainier NP	n/a	1	1	1	Lidar Fuel mapping

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

E. 2014 Direction

The fire program can no longer support the long-term monitoring of fire effects plots at JODA. We have given a copy of our dataset and field folders to the Columbia I & M program, and will work together to visit high priority plots. No other changes are anticipated for the fire effects program in 2014.