



**North Pacific / Columbia Basin
Fire Ecology Annual Report
Calendar Year 2005**

Summary

The North Pacific / Columbia Basin fire ecologist and fire effects monitoring crew accomplished everything that they set out to do during the field season of 2005, and this was no minor feat. They installed six new forest plots in Stehekin of the North Cascades, monitored fire behavior on twelve plots in three prescribed burns (Stehekin, Young Hill of the San Juan Islands NHS, and Rock Creek of John Day Fossil Beds NM) and revisited thirty-four previously installed plots. The ecologist converted all of the data from the historic database (FMH) into the new fire effects assessment tool (FEAT) database. This enabled the crew to test data entry in the field using PDAs (pocket PCs) and to enter all of this year's data into the new desktop program.

In addition to their regular duties, one of the fire effects monitors, the student conservation assistant, and ecologist went out on a two-week fire assignment in Oregon that helped each to develop new fire management and interpretive skills. An escaped campfire threatened Stehekin during the time that they were gone (the Shady Fire), which the remainder of the fire effects crew assisted in suppressing. Both of these events helped to bring the fire effects monitoring and fire crew closer in their understanding of the methods involved in fire management and the importance of monitoring.

Monitoring Results

This section of the report is intended to provide managers with a summary of results of the fire effects monitoring data. Management objectives for each unit have been identified and agreed upon by the managers and ecologists involved in each prescribed burn project. They are intended to provide a means for determining whether results from the burns are adequate or require adjustment. Active treatments are suspended when the objectives are achieved unless the associated fire intervals cannot be maintained through naturally occurring fire, or until the next stage of the project is implemented (e.g. when the restoration phase is complete at NOCA then the plan moves to the maintenance phase).

Table 1. Management Objectives and Monitoring Results 2005

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (XX% confidence interval)	Objective Achieved?
JODA: John Day Fossil Beds National Monument			
Western Juniper Forest (FJUOC1D06)	1) Reduce density of junipers 10 – 40 % by 1 year post-burn	1) 13% reduction in trees/acre (significant) where $x = -6.3$ (80% CI: $-12.3 < x < 0.2$), $n=11$ plots, Pre=48.2, YR01=42.0 trees/acre	1) yes
	2) Reduce shrub density by 20 – 60 % by 1 year post-burn	2) 66% reduction in shrubs/acre (significant) where $x = -2497$ (80% CI: $-4328 < x < -667$), $n=11$ plots, Pre=3772, YR01=1274 shrubs/acre	2) over achieved
	3) *Reduce or maintain non-native grass cover within 10% of pre-burn cover by 2 nd year post-burn.	3) 59% increase in cover (significant) where $x = +8.6$ (95% CI: $1.9 < x < 15.2$) $n=9$ plots, Pre=14.6 %, YR02= 23.2 %Cover	3) no
Big Sagebrush Shrubland (BARTR1D02)	1) Reduce shrub density by 1 – 60 % by 1 year post-burn	1) 84% reduction in shrubs/acre (significant) where $x = -135.8$ (80% CI: $-168.9 < x < -102.7$), $n=17$ plots, Pre=161.5, YR01=25.7 shrubs/acre	1) over achieved
	2) *Reduce or maintain non-native grass cover within 10% of pre-burn cover by 2 nd year post-burn.	2) 2% increase in cover (not significant) where $x = +1.4$ (90% CI: $-6.1 < x < 8.8$) $n=14$ plots, Pre=57.1 %, YR02=58.4 %Cover	2) yes

- It is understood that prescribed burning may increase non-native grass cover. Therefore, non-native grass reduction is not a stated management goal.

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (XX% confidence interval)	Objective Achieved?
LARO: Lake Roosevelt National Recreation Area			
Ponderosa Pine - Snowberry Forest (FPIPO1D10)	1) Reduce mean basal area to 40 - 60 sq. ft ² / acre as measured 2 years after treatment.	1) 29.4 ft ² /acre 1 year post thin & burn 74% reduction from pre where $x = -82.8$ (80%CI: $-40.1 < x < -125.4$), n=4 plots, Pre=112.2, YR01=29.4 ft ² /acre.	1) over achieved*
	2) Maintain an average dead and downed fuel load of 2–6 tons/acre 2 years after treatment.	2) average load of dead and down woody fuel, $x = 5.8$ tons/acre one year post-treatment (80% CI: $4.0 < x < 7.6$), n=6 plots, Pre=4.0, YR01=5.8 tons/acre	2) yes*
	3) Maintain a minimum of 30 percent cover of native understory vegetation 2 years after the initial treatment.	3) 0.9% increase in cover (not significant) where $x = +0.30$ (80% CI: $-7.4 < x < 8.0$), n=6 plots, Pre=32.3 %, YR01=32.6 %Cover	3) yes*
	4) Accept <20% increase of non-natives from the pre-treatment condition by 2 years following treatment.	4) 356% increase in cover (significant) where $x = +24.5$ (80% CI: $16.1 < x < 32.9$), n=6 plots, Pre=6.9 %, YR01=31.4 %Cover	4) no*

*These are preliminary 1st year post-burn results which may differ significantly from the 2nd year post-burn.

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (XX% confidence interval)	Objective Achieved?
SAJH: San Juan Islands National Historical Park			
Garry Oak Woodland (FQUGA1D02)	1) ≤5% mortality of overstory oaks all within 5 years of the first prescribed burn.	1) 13% mortality where $x = -2.0$ (80% CI; $-5.3 < x < 1.3$), $n = 4$ plots Pre=15.18, Post= 13.15 trees/acre	1) no
	2) Reduce the total fuel load by at least 50% immediately post-burn.	2) 26% reduction of total fuel load where $x = -2.89$ (80%CI; $-8.7 < x < 2.9$), $n = 6$ plots, Pre=11.1, Post=8.2 tons/acre	2) no
	3) Decrease the percent cover of shrubs by 30% after two years post-burn.	3) 2.1% reduction of shrub cover where $x = -0.3$ (80%CI; $-1.2 < x < 0.6$), $n = 2$ plots, Pre=14.8%, YR02=14.5%	3) no
	4) Increase the percent cover of native grasses by ≥30% after two years post-burn.	4) 62.1% increase in native grass cover where $x = 21.7$ (80% CI; $-8.0 < x < 51.4$), $n = 2$ plots, Pre=34.9%, YR02=56.6%	4) yes
	5) Accept up to a 20% increase in cover of exotic species from preburn levels after two years post-burn.	5) 37.7% increase in exotic species cover where $x = 18.1$ (80%CI; $-22.7 < x < 58.9$), $n = 2$ plots, Pre=47.9%, YR02=66.0%	5) no

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (XX% confidence interval)	Objective Achieved?
NOCA: North Cascades National Park			
Douglas fir / Ponderosa Pine Forest (FPSME2D08)	1) Decrease pole tree density by 50-85% by 1 year post-burn and post-thin.	1) 71% reduction where $x = -54.86$ (80%CI; $-71.04 < x < -38.67$), $n=18$ pre=77.57, yr1=22.71 trees/acre.	1) yes
	2) Reduce overstory tree density by 30 – 60% by 1 year post-burn and post-thin.	2) 40% reduction where $x = -50.81$ (80%CI; $-61.50 < x < -40.12$), $n=18$ pre=125.90, yr1=75.09 trees/acre	2) yes
	3) Reduce total basal area by 40 - 60% by 1 year post-burn and post-thin.	3) 15% reduction where $x = -21.01$ (80%CI; $-39.96 < x < -2.06$), $n=18$ pre=139.50, yr1=118.49 ft ² /acre	3) not yet
	4) Individual numbers of exotic species to increase by no more than 20% by 2 nd year post-burn.	4) a. Bromus tectorum -17.6% $n=20$, pre=0.26, yr2=0.21 %Cover	4) a. yes
		b. Festuca bromoides +256% $n=20$, pre=0.00, yr2=0.26 %Cover	b. no
		c. Hieracium cynoglossoides +30 $n=20$, pre=0.00, yr2=0.03 %Cover	c. no
		d. Lactuca muralis +30 $n=20$, pre=0.00, yr2=0.03 %Cover	d. no
	<i>Please note that the percent cover of each individual species is extremely small, and thus, even a very small increase will appear as a very big impact.</i>		
	5) Increase native vegetative ground cover by 10-30% by 2 nd year post-burn.	5) 18% increase where $x = 5.98$ (80%CI; $1.87 < x < 10.9$), $n=20$, pre=33.10, yr2=39.08 %Cover	5) yes
	6) Reduce total fuel load by 30-75% by 2 nd year post-burn and post-thin	6) 34% reduction where $x = -7.65$ (80%CI; $-10.36 < x < -4.94$), $n=9$ pre=22.68, yr2=15.03 tons/acre	6) yes
	a) 1-hour fuels 55-90%	a) 35% reduction where $x = -0.012$ (80% CI; $-0.017 < x < -0.006$) pre=0.033 yr2=0.022 tons/acre	a) not quite
	b) 10-hour fuels 45-65%	b) 22% reduction where $x = -0.019$ (80% CI; $-0.035 < x < -.002$) pre=0.084, yr2=0.066 tons/acre	b) not quite
	c) 100-hour 15-35%	c) 3% reduction where $x = -0.004$ (80%CI; $-0.027 < x < 0.018$) pre=0.150, yr2=0.146 tons/acre	c) not quite
	d) 1,000-hour fuels 0-20%	d) 62% increase where $x = +2.35$ (80%CI; $0.605 < x < 4.099$) pre=3.823, yr2=6.175 tons/acre	d) no
	e) litter and duff 40-85%	e) 54% reduction where $x = -9.96$ (80%CI; $-13.48 < x < -6.45$) pre=18.59, yr2=8.63 tons/acre	e) yes

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (XX% confidence interval)	Objective Achieved?
WHMI: Whitman Mission National Historic Site			
Giant Wild Rye – Meadow Restoration (GTHPO1D01)	1)Relative cover of restoration grassland species is $\geq 40\%$ of all species by the 2 nd year postburn. 2)Relative cover of cheatgrass, chervil, poison hemlock, and thistle is $\leq 40\%$ of all species by the 2 nd year postburn.	1) Relative cover $x = 47.8\%$ (80%CI: $42.3 < x < 53.2$) by the 1 st year post-burn. N=5 plots, Pre=55.1 %, YR01=47.8 % Relative Cover 2) Relative cover $x = 37.9\%$ (80% CI: $29.1 < x < 46.7$) by the 1 st year post-burn. N=5 plots, Pre=34.1 %, YR01=37.9 % Relative Cover	1) yes* 2)yes*

* These are preliminary 1st year post-burn results which may differ significantly from 2nd year postburn.

Table 2. Fire Effects Plot Workload 2005

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn	Immed. Post	Postburn (1-20 yrs)	Total Plots
John Day Fossilbeds	Western Juniper	FMH forest plot	0	0	2	16
	Big Sagebrush	FMH brush plot	0	2	2	21
Lake Roosevelt	Ponderosa Pine	FMH forest plot	0	0	6	9
North Cascades	Douglas fir / Ponderosa pine Stehekin Valley Forest Fuel Reduction	FMH forest plot	6	6	17	40
San Juan Islands	Garry Oak Woodland	FMH forest plot	0	4	2	8
Whitman Mission	Giant Wild Rye – Meadow Restoration	FMH grass plot	0	0	5	5
Total			6	12	34	99

Table 3. Fire Ecology Staffing 2005

Complete or devise a staffing and personnel development table for fire ecologist and monitors. Include fire training (e.g. S-290, RX-310), distance learning or on-campus college credit, technology training, NWCG taskbooks initiated or completed, conferences attended, etc.

Monitor	Starting Date	Ending Date	# Pay Periods	Training and Development
Kieron Weidner SCA Fire Effects Monitor	06/20/05	11/25/05	11	RX-110/190
Richard Barich Fire Effects Monitor	04/04/05	10/01/05	13	S-290, initiated FEMO taskbook, S-215

Monitor	Starting Date	Ending Date	# Pay Periods	Training and Development
Joel Silverman Fire Effects Monitor	04/04/05	10/01/05	13	S-290, initiated FEMO taskbook, S-215
Heather McCarthy Asst Lead Fire Effects Monitor	04/17/05	10/29/05	14	S-211, S-215, ESRI Online GIS Course, Wildland Fire GIS Training
Bob Dellinger Lead Fire Effects Monitor	04/17/05	11/26/05	16	S-271, S-211, S-215
Karen Kopper Fire Ecologist	01/01/05	12/31/05	26	S-271, initiated FEMO taskbook, Stats Workshop

Table 4. Fire Ecologist Accomplishments/Focus Area

Category	Percent Time	Accomplishments/Focus Areas
General Planning	30%	- Finished Fire Ecology and Vegetation sections of NOCA FMP. - Finished Vegetation and Fire Ecology Chapters for NOCA EA - Participated in meetings with FWS for NOCA Biological Assessment
Monitoring Plans	1%	Began NOCA fire effects monitoring plan for new prescribed burn units.
Presentations	4%	- Presented Meta-analysis at Fire Ecology Statistical Workshop, Fort Collins, CO - Presented FEAT Data Conversion techniques to NPS fire effects / fire ecologist using Sametime web conference. - Presented FEAT Summary Builder Demonstration to NPS fire effects / fire ecologists using Sametime web conference. - Presented data-analysis reports to JODA and SAJH managers.
NPS Meetings/ Task Groups	25%	- Member of FEAT working group, - Member of FMH to FEAT data conversion working group - Member of North Coast and Cascade Network Vegetation Group - Member of Vegetation Mapping effort for OLYM, NOCA, MORA
Interagency Work	3%	Attended two LANDFIRE workshops and developed several PNW models in collaboration with other PNW ecologists
Fire Assignments and Fuels Projects	5%	3 shifts as FEMO on SAJH rx-fire 14 shifts as FFT2 on wildfires
Research	1%	- Revised and submitted meta-analysis manuscript for publication. - Planning cheatgrass mapping effort with researchers at Western Washington University.
Monitoring Field Work	5%	Collecting field data/working in the field (assisted in fire effects monitoring at NOCA, SAJH, JODA and WHMI).
Data Entry	0%	Data entry from paper to pc accomplished by fire effects monitors
Data Management and Conversion	10%	Converted all 5 park databases from FMH to FEAT (includes managing monitoring data, preparing species lists, error checking, and learning conversion program).
Data Analysis	10%	Analyzed all park datasets for annual reports and presentations.
Supervision/Admin	5%	Hiring, supervision, travel, payroll, etc.
Training & Professional Development	1%	Online Access database course

Table 5. Fire Effect Crew Accomplishments

Category	Percent Time	Notes
FMH plots	60%	Estimated amount of time spent collecting plot data; includes any preparation time.
Mechanical Treatment plots	5%	Estimated amount of time spent collecting plot data; includes any preparation time.
CBI plots	0%	No CBI plots read this year.
Other plot work	0%	None
Fire Assignments and Fuels Projects	7%	70 shifts (all member hours combined) as FEMO/FFT2 on rx-fire at SAJH, NOCA, JODA, LARO. 40 shifts (all member hours combined) as FFT2 on wildfires.
Data Entry	20%	Estimated amount of time spent entering data from paper to PC
Data Management and Conversion	0%	Data conversion and set up into FEAT performed by the ecologist.
Data Analysis	0%	No data analysis performed.
Supervision/Admin	3%	- All crew members submit travel and timesheets - Lead fire effects monitor purchases supplies. - Lead fire effects monitor manages crew documentation (training forms, evaluations, hiring/termination forms).
Training & Professional Development	5%	- PT (3hrs per week for each crew member) - Online GIS Course – Assistant lead - Fire Trainings for all members listed in Table 3.