



**National Park Service
Fire Ecology Annual Report
Calendar Year 2005**

Summary

The purpose of the National Park Service Alaska Region Fire Ecology program is to provide effective evaluation of Alaska park lands' fire management program and understand the ecological effects of fire on the landscape, as well as to document any unexpected consequences of wildland fire occurrences. The objectives of the program are to obtain baseline data on the natural variability of fire on the landscape, to monitor the effects of fire or fuels treatments on vegetation, fuels, soil and wildlife habitat, and to provide fire ecology information to fire managers, other park staff, and the public.

The fire ecology program for the NPS Alaska Region was initiated in the fall of 2002. Since that time several fire effects and fuels monitoring projects have been initiated and some completed (Appendix 1). The development, implementation and analyses of these projects are primarily the responsibility of the regional fire ecologist. This includes protocol development, compliance, database management, field instruction and field work.

Accomplishments this year included the establishment of 40 wildland fire effects plots (Denali NP) and 42 mechanical treatment plots (YUCH), re-measurement of 26 mechanical treatment plots (DENA) (figure 1), 12 wildland fire effects plot (YUCH and NOAT), and 11 historic fire effects plots (YUCH and NOAT). The AK Eastern Area NPS fire management area coordinated the re-measurement and analysis of fire effects plots with the Eagle school. A poster for the Eagle School plots was developed and a success story about the Denali hazard fuels monitoring was written. In addition to program development and monitoring, the regional fire ecologist is involved in 9 NPS and Interagency committees and task groups. Other work has included, reviewing Fire Management Plans, ID team member on EA's, assisting with Burned Area Emergency Response (BAER) teams, and collaborating on Joint Fire Science Program proposals.



Figure 1. Monitoring plots of hazard fuels thinning around Denali front country buildings, pre and post 1yr thinning. (NPS photos)

Table 1. Management Objectives and Monitoring Results 2005

The results from the YUCH and DENA hazard fuels removal monitoring are presented in table 1. Results from YUCH-Hazard Fuels Reduction project are from cabins that have been cleared from 1-10 years prior to measurements. Control plots were established adjacent to thinned areas around the cabins or structures. There was increased grass cover in the thinned areas at Yukon-Charley cabin sites. This study informs fire management that grass fuel types prevail which could increase fire ignition potential and require more frequent maintenance (mowing), but the reduction in tree density reduces the crown fire potential. The Denali Hazard Fuels Reduction monitoring results are shown for pre-thinning and 1-yr post thinning. The preliminary results indicate that we thinned less than planned; fire behavior modeling results are still being analyzed.

Table 1. All results shown are 80% confidence intervals of the mean. Results from YUCH-Hazard Fuels Reduction project are shown for control and treated remote cabin sites. The results from the DENA HZF front country project are shown for pretreatment and 1-yr post treatment for zones 2 and 3. Control plots are not shown.

Monitoring Unit	Management Objectives	Monitoring Results (80% confidence interval)	Objective Achieved?												
YUCH- HZF: Mechanical thinning, White spruce/ Deciduous	No significant increase in grass cover	Control: 18-31% cover grass, <i>n</i> =21 Treated: 50-80% cover grass, <i>n</i> =21 ANOVA: <i>F</i> = 10.78, <i>P</i> = 0.002 (<i>n</i> =42 plots, 7 cabin sites)	No												
	Treated spruce density: <110 spruce trees/acre	Control: 465-741 spruce trees/acre Treated: 38-201 spruce trees/acre (<i>n</i> =42 plots, 7 cabin sites)	YES, high variability												
DENA-HZF: Mechanical thinning, White spruce/ Deciduous															
	Treated spruce density:	<i>Density of Spruce Trees/Acre</i>	No, preliminary data analysis												
	Zone 2: < 50 spruce tree/ac	<table><tr><td></td><td><i>Pre-</i></td><td><i>1-yr Post</i></td></tr><tr><td><i>Treatment</i></td><td><i>n</i></td><td><i>Thinning</i></td></tr><tr><td>Zone 2</td><td>7</td><td>518-997</td></tr><tr><td>Zone 3</td><td>9</td><td>612-990</td></tr></table>			<i>Pre-</i>	<i>1-yr Post</i>	<i>Treatment</i>	<i>n</i>	<i>Thinning</i>	Zone 2	7	518-997	Zone 3	9	612-990
		<i>Pre-</i>		<i>1-yr Post</i>											
<i>Treatment</i>	<i>n</i>	<i>Thinning</i>													
Zone 2	7	518-997													
Zone 3	9	612-990													
Zone 3: <110 spruce tree/ac															

Table 2. Fire Effects Plot Workload 2005

Table 2. The number of fire and fuels treatment plot workload in 2005. Most of the monitoring units are established by projects

Park	Monitoring Unit Project Vegetation Types	Type of Plot (FMH, photo point, other)	Pre- burn	Immed. Post	Postburn (1-20 yrs)	Total Plots
Denali	White spruce	HZF Mechanical thinning			26	27
Denali	Black Spruce	WFU monitoring (Videography)			40	40
Noatak	Tussock tundra	WFU monitoring			6	6
Noatak	Tussock tundra	WFU monitoring (1980's Racine plots)			8	8
Yukon-Charley Rivers	White spruce/Deciduous	HZF Mechanical thinning			42	42
Yukon-Charley Rivers	Black spruce & Deciduous (BEPA)	WFU monitoring			6	7
Yukon-Charley Rivers	White & Black spruce	WFU monitoring (1980's paired plots)			6	55
Total					135	185

Table 3. Fire Ecology Staffing 2005

The Alaska NPS fire ecology program is unique in that there are no formal fire effects monitoring positions. However, the NPS Western and Eastern Area Fire Management Zones include multi-disciplinary forestry technicians and fuels technicians that provide a part of their time to fire ecology projects. Table 3 provides the staffing of the fuels and forestry technicians that were involved in the fire ecology project work.

The sharing of resources has worked well in general. 2005 was an ambitious field season for both areas. We accomplished all of our goals and were able to get most of the data entered, although we needed to extend the season of two seasonals to accomplish this.

Table 3. *Estimated time allocated by fuels and forestry technicians from Eastern and Western Area fire management programs for Fuels and Fire Ecology work. Time includes field prep, field work, and data entry.*

Fuels/Forestry Technicians	GS-Level	#PP on for 2005
Western –Supervisory Forest Tech - Weddle	PLFT GS-7	2.5
Western- Helicopter Manager - Reynar	PLFT GS-6	2.5
Western – Fuels tech - Ostmann	Temp GS-5	3
Western – Fuels tech- Olson	Temp GS-5	2
Western – Fuels tech - Parker	Temp GS-5	4
Western – Fuel tech - Stinchfield	Temp GS-5	2.5
Eastern – Helicopter manager – Bullock	PLFT GS-7	2.5
Eastern – Fuels - Savage	PLFT GS-6/7	2
Eastern – Bio tech - Mocnik	Temp GS-5/6	10

Tables 4 and 5. Regional Fire Ecologist Focus Areas/Accomplishments

The following two tables provide summaries of the Regional Fire Ecologists focus areas and accomplishments.

Table 4. *Regional fire ecologist focus areas generalized.*

Category	Percent Time	Accomplishments/Focus Areas
Planning	15%	RM-18, CE, research permits, monitoring plan, field logistics, contracts, BAER reports and requests
Presentations	10%	Scientific meetings, park staff, public, publications
NPS Meetings/ task groups	15%	Park, regional or national – FESC, FEAT, Adaptive Management, RM-18 Chapter 11, I&M tech committee
Interagency work	10%	LANDFIRE, AWFCG Research Committee, AWFCG Fire Effects Task Group
Fire Assignments	2%	RESL, Plans3
Research	10%	JFSP, NASA
Data entry	6%	Estimated amount of time spent entering data from paper to PC
Data Conversion	1%	Estimated amount of time to convert FMH data to FEAT; No FMH data, but species lists
Data analysis	6%	Data entry was completed by end of Nov, analysis has just begun.
Supervision/Admin	15%	Training field crew, field logistics, field work
Training	10%	S-490, S-493, PC-ORD, Helicopter manager refresher
Miscellaneous		

Table 5. Examples of Fire Ecologist Accomplishments/Focus Area

Category	Percent Time	Accomplishments/Focus Areas
Planning	15%	• Developed YUCH and DENA project level monitoring plans/protocols • Wrote cooperative agreement for fire effects monitoring in NOAT. • Submitted compliance and research permits for 7 projects • Reviewed and prepared portions of draft EA for hazard fuels thinning - YUCH • Reviewed and made comments on RM-18, Chapter 10 • Drafted portions of FESC – 2006 Action Plan
Presentations	10%	• DENA Hazard Fuels monitoring success stories submitted to InsideNPS, elsewhere • Burn severity/fire history of ARCN I&M parks, Scoping Workshop ARCN • Alaska Interagency Fall Fire Workshop – Fire research summary • BAER Assessment report for YUCH • RX-510 unit leader, presenting AK monitoring
NPS Meetings/ task groups	15%	• NPS Fire Ecology Steering Committee • NPS Adaptive management task group • NPS FEAT review task group • NPS Effectiveness monitoring task group (Task group leader) • NPS RM-18 Chapter 11 re-write task group • I&M Arctic Network technical committee • I&M Central Alaska Network – advisory role
Interagency work	10%	• AWFCG Fire Research Committee (Chair) • AWFCG Fire Effects Task Group • Alaska LANDFIRE committee • Burn Severity meetings/trainer
Fire Assgn.	2%	• Plans 3/RESL on fire assignment in AK
Research	10%	• Assisted with development of 2 JFSP proposal • Collaborator/Co-PI on 2 JFSP projects and 2 NASA proposals
Data entry	6%	• Time spent developing templates and instructions for data entry
Data Conversion	1%	• No FMH data, but time spent developing species lists.
Data analysis	6%	• Data entry was completed by end of Nov, analysis has just begun.
Supervision/Ad min	15%	• Training field crews • Determined field logistics • Travel and time paperwork
Training	10%	S-490, S-493, PC-ORD, Helicopter manager refresher, Firefighter refresher

Appendix 1

A list of current and past fire monitoring projects in the Alaska region since 2002. Progress in analyzing and reporting on the projects are indicated with an X for completed.

Title	Purpose	# Plots	Data Entry	Analysis	Report	Repeat Monitoring
DENA hazard fuels plots	Effectiveness and effects of fuels thinning	27	X	Started		Yes
YUCH hazard fuels plots	Effectiveness and effects of fuels thinning	36	X	Started		No
DENA fire effects & moose	Vegetation mapping, succession, moose browse	40	X	Started		Selected plots
YUCH historic fire effects (Paired Plots)	Succession, fire effects	5	X			Yes
YUCH pre/post fire effects	Succession, fire effects, fuel moisture	6	X			Yes
NOAT pre/post fire effects	Succession, WFU fire effects	6				Yes
NOAT Racine fire plots	Succession, WFU fire effects	8	Racine	Racine	Racine	Yes
Burn Severity	Field validation of burn severity mapping: NOAT, BELA, YUCH, DENA	286	X	X	X	No