



National Park Service Fire Ecology Annual Report Alaska Region Calendar Year 2010

A. Summary

Overview

During 2010 the NPS Alaska Fire Ecology program re-measured hazard fuel reduction plots in Wrangell-St. Elias NPPr (WRST), measured burn severity CBI plots and fire effects monitoring plots in the 2009 Chakina Fire in WRST, established pre-fire monitoring plots for the Carl Cr Prescribed fire in WRST, and monitored burn severity on permanent vegetation plots in association with Central Alaska I&M Network in the 2009 Bear Cr fire in Denali NPPr. We participated in several NPS and interagency meetings, attended trainings, instructed classes, and had a Regional Fire Program Review in November of 2010. The final report on tundra fire regimes was completed and submitted to Joint Fire Science Program and two papers were submitted to the Alaska Park Science journal.

Purpose Statement

In 2010 the Alaskan NPS Fire Ecology program reviewed and updated its programmatic purpose statement and focus areas to better reflect the overarching goals of the program and to specifically highlight climate-change in relation to fire ecology in Alaska. The new purpose statement of the Alaska NPS Fire Ecology program reads as follows:



The 2010 Walker Lake #1 Fire in Gates of the Arctic National Park

The purpose of the Alaska NPS Fire Ecology program is to provide science based information to guide Alaska NPS fire and land management planning, decisions and practices in order to maintain and understand fire adapted ecosystems. The primary focus areas of the program are to:

- Participate in *planning* activities for the Fire Management and Park Land Management Programs and develop strategies to accommodate fire management issues as a result of climate change
- Provide effective evaluation of Alaska NPS fire management program activities and fire on the landscape through *monitoring*
- Coordinate *research* and facilitate the use of scientific data, modeling and technology to enhance the fire management program
- Provide fire ecology *information and outreach* to fire managers, other park staff, and the public
- *Collaborate* with other NPS programs, interagency partners, and other entities.

2010 Fire Season

The 2010 fire season in Alaska was unusually long. It began with warm and dry conditions in May which resulted in multiple early-season fire starts. Additionally, several fires carried over from 2009, including the Foraker Fire in Denali NPPr. Although some early-season fires were dampened by rain mid-summer, others continued to burn into October.

In 2010 there were a total of 689 fires recorded in the state of Alaska which burned 1,125,419 acres. This was an average year for the area burned in Alaska. The NPS units in Alaska had a total of 56 wildland fires, with 112,290 acres burned within six park boundaries (DENA, NOAT, KOVA, BELA, GAAR, WRST, and YUCH). Most notably for the NPS, a record high number of fire starts fires started in Noatak NPr in early July; thirty-seven fires started due to lightning and burned over 106,000 acres in the preserve.



The Kaluktavik Fire (#561); one of 37 fires in the Noatak National Preserve in 2010.

Monitoring & Inventory

The following monitoring projects were conducted in 2010, Table 1 provides a list of the number of plots measured in 2010.

Denali I&M Bear Creek Mini-grid

In 2006 the Central Alaska Network I&M Vegetation Monitoring Program established a grid of 25 permanent vegetation plots near Bear Creek in Denali NPPr where detailed botanical and environmental data were collected. The plots were located in highly-flammable black spruce lowland forests. A portion of the plots was burned in 1997. Later, in 2009, a number of the plots in the grid were burned in 50,897 acre Bear Creek Fire. In 2010, the Regional Fire Ecology program recorded levels of burn severity at the recently burned plots for later correlation to post-fire vegetation recovery patterns. The standardized method of assessing burn severity (Composite Burn Index [CBI]) was used in addition to ocular cover estimates of post-fire vegetation and substrates. The CAKN I&M vegetation monitoring program will be provided the 2010 burn severity data and will resume responsibility for long-term vegetation monitoring of the Bear Cr mini-grid. This project



An example of post-fire recovery in a severely burned black spruce forest after the 2009 Bear Creek Fire.

is an excellent example of a co-operative effort between the Alaska Regional Fire Ecology Program and an Inventory and Monitoring Program.

WRST Carl Creek Proposed RX Burn Monitoring Plots



Landscape View of the Carl Creek area in Wrangell-St. Elias NPPr, site of NPS-proposed prescribed fire.

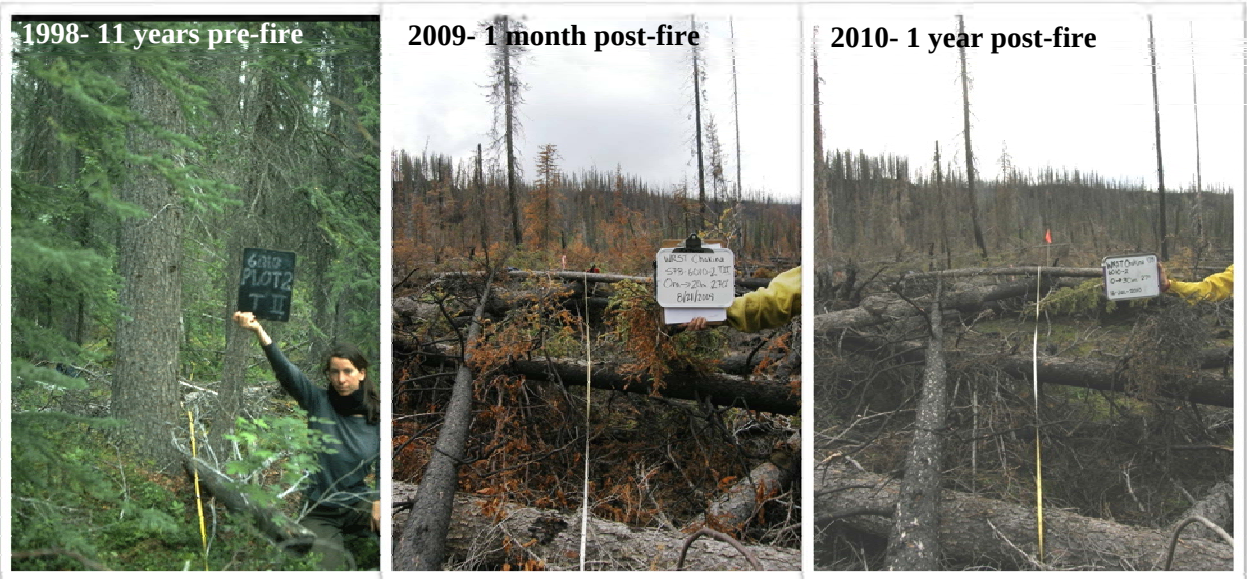


Example of low shrub dwarf birch tundra vegetation community typical of Carl Creek area.

Wrangell-St. Elias National Park and Preserve (WRST) and the NPS Eastern Area Fire Management Program have proposed a prescribed fire in a subalpine shrub tundra area near Carl Creek in WRST. The proposed fire perimeter includes 5,345 acres in a shrub tundra mosaic dominated by Dwarf Birch and Low Shrub Willow vegetation types. The management objectives for the proposed prescribed fire include: 1) increasing grass/sedge cover by 20%, 2) determining changes in dominant plant species cover post-fire, 3) decreased shrub cover (willow, alder and birch) within the burn unit by 30-50%, and 4) duff depth reduction of .25 inches across the unit. In 2010, the Regional Fire Ecology program established 29 pre-fire monitoring plots within the proposed Carl Creek Rx Fire perimeter. The monitoring objectives are to quantify prescribed fire effects including: 1) changes in shrub and graminoid cover, 2) other changes in dominant vegetation cover, and 3) duff consumption. Monitoring results will be used to provide adaptive feedback to fire managers pertaining to the success of the prescribed fire implementation.

WRST Chakina Fire Monitoring: CBI, Spruce Bark Beetle and Pre/Post Fire Effects Plots

In 2009 the Chakina Fire burned 56,413 acres in WRST; the largest recorded fire in WRST since park establishment. Eight Spruce Bark Beetle Forest Inventory plots (established in 1997 & 1998) and a single AKR Fire Ecology Pre-Post Fire Effects plot (established in 2009) were burned in the Chakina Fire. The availability of pre-fire data from these spruce forested plots provided a unique opportunity to both 1) monitor post-fire vegetation recovery patterns in various pre-fire forest community types and 2) compare fire effects in stands that have been affected by spruce bark beetle to those unaffected. Accordingly, the Chakina Fire monitoring project was designed as a long-term study with the objectives of: 1) monitoring rates of vegetation re-colonization and successional stand-replacement, 2) evaluating fuel types and extent for fire management purposes, and 3) evaluating burn severity and measuring changes in soil active layer depth. In 2010, at each of the 9 plots, measures of forest structure, tree density, vegetation cover, active layer depth, photo documentation and burn severity (CBI) were recorded. Additionally, 56 burn severity plots were established. At each plot CBI data, ocular estimates of pre- and post-fire vegetation, fire behavior and spruce bark beetle activity were collected. Ground-based CBI data from the Chakina Fire will be used for comparison to satellite-derived measures of burn severity. Plot revisits are tentatively scheduled for five years post-fire in 2014. Preliminary analyses have been conducted for presentation to fire managers.



One of eight Forest Inventory plots (used to document spruce bark beetle infestation in a 1997 & 1998 NPS study) which burned in the 2009 Chakina Fire in Wrangell- St. Elias NPPr.

WRST Susan Smith Fuels Reduction Monitoring

One of the functions of the Alaska NPS Fire Management program is to create defensible space in parkland areas adjacent to private property. Susan Smith's private property is located immediately adjacent to a thickly wooded area of Wrangell St. Elias National Park. Therefore, a 4 acre area of parklands adjacent to this property was selected for mechanical thinning to reduce wildfire threat to this

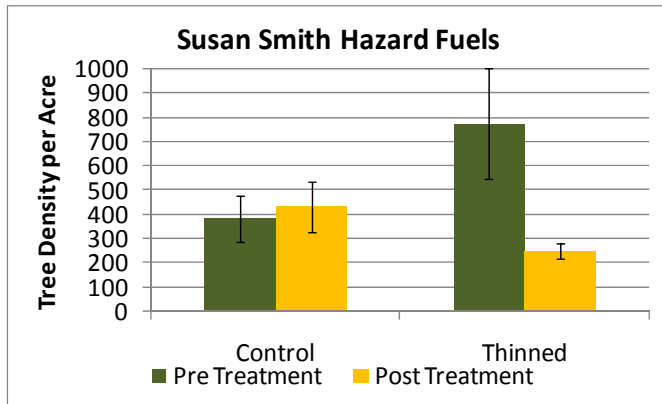


Figure 1. Tree density at Susan Smith Project before and after mechanical thinning treatment implementation.

property. The purpose of this monitoring study was to document whether thinning treatment objectives were met by: 1) measuring tree density reductions, 2) documenting trees with insect and disease damage, 3) measuring down-woody biomass reduction, and 4) providing repeatable photo point documentation. The monitoring project commenced early in the growing season of 2009 when 10 treatment and 3 control plots were established 2 months prior to the thinning treatment implementation. In June 2010, approximately one year after the fuels treatment, the monitoring plots were revisited and the same measures repeated. Preliminary results, which have been presented to fire managers, suggest that the prescribed 5' crown spacing (which would result in approximately 540 trees/acre) was exceeded. The post-treatment crown spacing was closer to 10'; the treated plots trees were reduced from an average of 773 trees/acre to 248 trees/acre after thinning (Figure 1).

Table 1. Fire Effects Plot Workload (2010) and Total Monitoring Plots Installed 2002-2010

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn 2010	Immed. Post 2010	Postburn (1-20 yrs) 2010	Total Plots
Wrangell-St. Elias	Carl Cr RX	AKR Carl Cr Plots	29			29
Wrangell-St. Elias	Chakina Fire	CBI			56	56
Wrangell-St. Elias	Chakina Fire	AKR Fire & Fuels Plots			9	9
Wrangell-St. Elias	Susan Smith – Hazard Fuels Plots (HZF)	AKR SS Hazard Fuels Plots			13	13
Wrangell-St. Elias	Headquarters – HZF	AKR Hazard Fuels Plots				18
Wrangell-St. Elias	Fire Effects – Paired Plots	AKR Paired Plots				2
Yukon-Charley R	2004 Woodchopper Fire	AKR Fire & Fuels Plots				7
Yukon-Charley R	1999 Witch Fire	Other				15
Yukon-Charley R	2004 Fire – Paired Plots	AKR Paired Plots				5
Denali	Bear Cr I&M Minigrid	CBI			21	21
Denali	Headquarters – HZF	AKR Hazard Fuels Plots				27
Denali	VDM Highpower Reburns	AKR Fire & Fuels Plots				10
Denali	Landcover-CBI	AKR Fire & Fuels Plots				55
Noatak	2004 Uvgoon Fire	AKR Fire & Fuels Plots				6
Noatak	1977 Fires Racine Plots	Racine Plots				8
Bering Land Bridge	1977 Fire Racine Plots	Racine Plots				8
Total			29		99	289

Fire Ecology Staffing 2010

The Alaska NPS Fire Ecology Program does not have a designated fire effects monitoring crew. Therefore, fire ecology monitoring fieldwork is largely accomplished by NPS Fire/Fuels seasonal technicians and permanent staff, under the guidance of the Regional Fire Ecologist and the term-funded Assistant Regional Fire Ecologist. This is readily accomplished since the NPS Western and Eastern Fire Management Areas select multi-disciplinary technicians and allocate an appropriate amount of their time to fire ecology projects. In general this sharing of resources has worked well. In 2010 supplementary funding from Wrangell-St. Elias NPPr allowed for the seasonal hire of a biotechnician who participated in multiple projects. Table 2 provides an overview of the use of personnel that assisted with fire ecology project work in 2010.

Table 2. Fire Ecology Staffing 2010

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Jennifer Mitchell (AKR Fire Ecologist- Term)	5/28/2008		26	No	ArcGIS, Facilitative Unit Leader
Elizabeth Kramer (funded Biotechnician)	5/17/2010	8/13/2010	7	No	S-130/190
3 EAFM Fire Crew			2		
3 WAFM Fire Crew			1		

Table 3. Management Objectives and Monitoring Results

All results shown are 80% confidence intervals of the mean. Fuel reduction objectives/results are mean percent reduction from pre-treatment to immediate post-treatment. An underlined number of plots indicates that the minimum sample size has been attained for that variable.

Monitoring Unit	Management Objective	Monitoring Results (80% Confidence Interval)	Objective Achieved?	Year Last Analysis Completed
WRST Susan Smith Hazard Fuels	Reduce tree density to 538 trees/acre (+/- 80% confidence interval). 5' crown spacing, assuming 2' crown radius.	Stand density Pre-treatment: 773 (457-1089) trees/acre Post-treatment: 248 (206-290) trees/acre (<u>n=10 plots</u>)	YES (over-thinned)	2010
	Reduce 100 hr and 1000 hr woody fuel loading by 50%	Total 100hr & 1000hr fuel reduction = 60% (<u>n=10 plots</u>)	YES	2010

B. Fire ecologist accomplishments and areas of focus

Fire Ecologist Accomplishments/Focus Areas in Table 4 provides a summary of the Alaska Regional Fire Ecologist focus areas and accomplishments for the calendar year of 2010.

Table 4. Fire Ecologist Accomplishment/Focus Area

Category	Percent Time	Accomplishments and/or areas of activities
Planning	26%	- WRST Fire Monitoring Plan - FMP review– WRST, LACL, KATM - Compliance for all field work - I&M Network Fire Monitoring Protocols - Climate change planning - Field prep/logistics
Presentations	15%	- AKR Fire Ecology presentations (FMLB, AK Regional/Park Staff) - JFSP Fire Tundra Regime – Final Report - AK Park Science Articles - Interagency meeting presentations
NPS Meetings/ task groups	6%	- AKRO Regional and Park Fire Meetings - Climate change scenario planning workshop - AKRO Regional Fire Program Review - FESC conference calls - I&M Technical Committee meetings & 3-yr review
Interagency work	6%	- AWFCG Fire Research, Development & Application Committee (Chair) - Alaska Fire Science Consortium (JFSP funded) - Alaska Interagency Fall Fire Review - Instructor: RX-510 and I-Suite training
Wildfire assignments	1%	- FEMO – GAAR Ernie Cr Fire - Instructed GIS fire mapping - Noatak Fires
Prescribed fire projects	2%	- Monitoring plan implementation for RX fire in WRST - Review of RX planning
Non-fire fuels projects	5%	- Monitoring plan implementation for Hazard Fuels projects in WRST - Analysis and review of hazard fuels reduction projects in WRST,

<i>Category</i>	<i>Percent Time</i>	<i>Accomplishments and/or areas of activities</i>
		DENA and LACL
Research	6%	• Review of fire research needs for NPS and interagency (FRDAC) • Writing and analysis support for JFSP Fire Tundra Regimes • Proposals for PMIS (Spruce Beetle and Fire Risk) • Proposals for Reserve Fuels Research call
Data collection	5%	• Field supervisor on two projects
Data entry	2%	• Data entry supervision and database assistants • QC of data
Data analysis	6%	• DENA Bear Cr CBI • WRST Chakina Fire Monitoring and CBI • DENA Hazard Fuels fire behavior analyses • BELA Fire Effects analyses
Supervision/Admin	15%	• Supervision/Hiring biological technician • Paperwork and administrative (time, travel, email) • Budget & agreements

C. Fire effects crew accomplishments and areas of focus

Assistant Fire Ecologist Accomplishments/Focus Areas in Table 5 provides a summary of the Alaska Assistant Regional Fire Ecologist focus areas and accomplishments for the calendar year of 2010.

Table 5. Assistant Fire Ecologist's Accomplishments/Focus Areas (Mitchell)

<i>Category</i>	<i>Percent Time</i>	<i>Accomplishments and/or areas of activities</i>
Planning	30%	• Prepared WRST & LACL Fire Monitoring Plan • Consolidated AKR Fire Ecology Fire and Fuels Monitoring Protocol • Gear Purchase and Inventory • I&M collaboration- ARCN Fire/Bird/Habitat-use Monitoring Protocol • Designed monitoring protocol for Carl Cr RX Fire
Presentations	<5%	• Prepared annual PowerPoint presentation for AK Regional Fire Staff • Prepared posters for Eagle School fire and flood education program
NPS Meetings/ task groups	<5%	• AK Regional Fall Fire Review • Monthly Fairbanks Administrative Center Meetings
Interagency work	<5%	• Member of JFSP Fire Consortium Advisory Board • Member of Interagency Fire Research Committee
Prescribed fire projects	5%	• Field Leader for Carl Cr RX Pre-Treatment Monitoring • Planning and data entry QC
Non-fire fuels projects	5%	• Data compilation and report draft for 1 hazard fuels reduction project
Research	<5%	• Contributions to Interagency Fire Research Committee • Contributions to JFSP Fire Consortium Advisory Board
Data collection	15%	• Collected data as field crew member • Lead field crews
Data entry	15%	• Entered data into FFI and MS Access Databases • Revised AKR Fire Ecology FFI Data Entry Manual
Data analysis	15%	• Completed data summary for 1 hazard fuels reduction project.

Category	Percent Time	Accomplishments and/or areas of activities
Supervision/Admin	<5%	• Travel, credit card and time paperwork • Individual Development Plan
Training	<5%	• Facilitative Instructor • ArcGIS
Miscellaneous	<5%	• Co-ordinated Fire Ecology Outreach Program for Eagle Community School • Fire Ecology Program Discussion • Fire Ecology Document Editing

D. Additional Information

Table 6. Data Entry and Projects Monitored

Park	% 2010 Data Entered	% 2010 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Denali NPPr	100%	100%	0	0	1	0
Wrangell St. Elias NPPr	100%	100%	1	1	1	0
Gates of the Arctic NPPr	N/A	N/A	0	0	0	0
Yukon-Charley Rivers NPr	N/A	N/A	0	0	0	0
Noatak NPr	N/A	N/A	0	0	0	0

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

E. Optional Information

Collaboration, Outreach and Research

Eagle School- Ecology Program

2010 was the 6th consecutive year that the NPS Fire Ecology Program orchestrated a field-based education program for the Eagle Community School in Eagle, Alaska. In September of 2010 the combined 7th through 12th grade class of 8 students was accompanied by NPS staff to revisit several ecology plots. The outreach program was highlighted as an NPS Fire Success Story in 2010 (http://www.nps.gov/fire/public/pub_fir09_yuch_plots.cfm). Early this year, the combined information from 2009 and 2010 fieldtrips was presented as a poster to participating students and community residents. The poster will also be showcased at the NPS Visitor's Center in Eagle.



Alaska Inventory and Monitoring Networks & the Alaska Regional Fire Ecology Program

Fire is the most significant disturbance factor in Alaska's boreal forest and tundra ecosystems, a significant portion of which is encompassed by NPS park units including the Arctic Network Inventory

and Monitoring Program (ARCN) Parks and Preserves. Hence “Fire Extent and Severity” was selected as a ‘Vital Sign’ for long-term monitoring by ARCN. The Regional Fire Ecologist serves as an ARCN Technical Committee member and is responsible for the producing and presenting of the long-term fire monitoring protocol which will be implemented for decades to come. To date, a substantial amount of effort has been allocated to the protocol development by the AKR Fire Ecology program. For instance, historic tundra fire-effects plots have been revisited by the Regional Fire Ecologist verify their applicability for inclusion in the monitoring protocol. Additionally, the Assistant Fire ecologist has been actively working to develop wildlife habitat assessment methods which dovetail into the established fire effects monitoring methodology. Final ‘Fire Severity and Extent’ long-term monitoring protocols will be presented in 2011 and implementation will commence in 2012. See the ARCN web page for additional information: <http://science.nature.nps.gov/im/units/arcn/index.cfm?rq=12&vsid=27>.

Alaska Fire Science Consortium: Funded

In 2010 the Alaska Fire Science Consortium (AFSC) received funding from the Joint Fire Science Program (JFSP). The purpose of the AFSC is to enhance on-going fire science delivery by developing new mechanisms for outreach across the state of Alaska and to stimulate communication among researchers and managers to bridge the gap in information sharing (see the AFSC webpage at: <http://akfireconsortium.uaf.edu/>). As the chairperson of the Alaska Wildland Fire Coordinating Group (AWFCG) Fire Research, Application and Development Committee the AK NPS Regional Fire Ecologist has played an important role in promoting the Consortium. Both the Regional and Assistant Fire Ecologists continue to play an active role in the Consortium as members of the AFSC interagency Advisory Board ‘which meets periodically to help guide and evaluate the direction of Consortium activities, communicate and prioritize the needs of the research and management communities, and assist in organizing and implementing Consortium events’.

AKR Fire Ecology program contributions to the AFSC this year included a high level of involvement in the 2nd Annual Alaska Fire Science Consortium Workshop. The Workshop was held in conjunction with the Statewide Interagency Fall Fire Review in Fairbanks, Alaska in October 2011. AKR Fire Ecologists played a lead role in organizing the resulting Research Needs and disseminating them as surveys to various audiences to identify the highest priority Research Needs. The results of the Alaska Fire Science Research Needs surveys were submitted to the Joint Fire Science Program for potential selection in January 2011.

Planning, Compliance, and Reporting

Each year planning activities, compliance documents for fieldwork, reports and presentations require a significant effort on the part of the AKR Fire Ecology program. Noteworthy planning efforts, reports and presentations by the AKR Regional Fire Ecology program in 2010 are described below:

Planning

Planning achievements in 2010 include the completion of the Wrangell St. Elias (WRST) Fire Monitoring Plan and the development of a monitoring protocol for the Prescribed Carl Creek Fire in WRST. The WRST Fire Monitoring Plan is the first completed Alaska NPS Fire Monitoring Plan. Fire Monitoring plans are required documents for all park units that apply prescribed fires, resource benefit fires, or fuels treatments. The WRST Fire Monitoring Plan provides useful summaries of the current monitoring projects as well as an overview of the fire history of the area. The Carl Creek Prescribed Fire monitoring protocol was developed for the first-ever proposed NPS in Alaska. Also, as climate change becomes an area of increased focus for the NPS, the AKR fire ecology program has begun participating in Climate Change Scenario Planning workshops and other planning venues. All projects require completed compliance documents prior to implementation.

Reports

Reports completed and submitted this year include annual reports, brief scientific articles and scientific publications. These include a final report for the JFSP-funded Tundra Fire Regime project, a summary of the Bering Land Bridge (BELA) Tundra Effects Monitoring Study in the NPS Alaska Park Science publication, two articles submitted to Alaska Park Science pertaining to the Tundra Fire Regime and Fire and Future Climate modeling, and finally, a Fire Success Story was written about the Eagle Community School Fire Ecology Outreach Program. See Appendix A for a list of all reports and presentations prepared in 2010.

Presentations

In addition to multiple annual-update PowerPoint presentations to a number of leadership committees (Alaska Regional Fire Staff, ARC�, Fire Leadership Management Board) the Regional Fire Ecologist has presented the results from several NPS (WRST Headquarters Hazard Fuels Reduction) and JFSP-funded (e.g. Tundra Fire Regime) projects to a variety of agency, interagency and public audiences. In addition to the Eagle School Poster (see above), a highlight public education presentation this year is the Regional Fire Ecologist's contribution to the Virtual Landscape "Learning Kiosk". The kiosk is being developed for presentation at the Denali Murie Science Learning Center.



Example page from Fire Ecology section of Virtual Landscape presentation at Denali NPPr 'Learning Kiosk'

Programmatic Successes and Challenges

Overall, the AKR fire ecology program is meeting expectations and progressing well. The current AKR fire ecology staff, which includes a permanent Regional Fire Ecologist and a term-funded Assistant Fire Ecologist who are aided intermittently by NPS fire staff, is a good working model for an appropriate staffing level for a successful fire ecology program in Alaska. Notably, in recent years the responsibilities of the AKR fire ecology program have increased substantially primarily in response to a combination of the following factors: 1) the Fire Management program in Alaska has increased substantially in complexity and scope, 2) Fire has been selected as a 'vital sign' for two NPS Inventory and Monitoring Programs (ARC� and CAKN) which include all of the parklands most affected by fire activity in Alaska, and 3) climate change is expected to have substantial impacts on fire-adapted northern ecosystems. All of these factors result in the need for increased planning and monitoring efforts on the part of the fire ecology program. Based on the current and projected workload of the program, it is uncertain if the current permanent staffing level of a single GS-12 Fire Ecologist will meet the growing needs of the NPS Alaska Fire and Resource Management programs.

FFI suggestions

The AKR Fire Ecology program is currently utilizing FFI for data entry and data sharing of new monitoring projects as well as working to transfer multiple older datasets stored in other database programs to FFI. The FFI database program has thus far worked as a good tool for data management and storage.

Efforts to continue to improve FFI are very much appreciated. Our suggestions for increased FFI usefulness are largely centered on user-friendliness and many of these have been mentioned to program developers either by AKR fire ecologists or been posted by other users. A few remain outstanding or warrant repeating: 1) user-ability to sort on fields within columns would decrease the time spent on data cleanup, 2) user-ability to search and replace one or more data fields 3) user-ability to make custom protocols developed in the Protocol manager editable, even after they have been used in a database, and 4) improvements in reports for the CBI and Fuel Loading.

Appendix A. Reports, publications, and presentations completed in 2010 in conjunction with the Alaska Region Fire Ecology Program.

Barnes, J. and Mitchell, J. 2010. Fire Ecology & Fuels Monitoring Program (Presentation). Alaska NPS Fire Seasonal Training, Fairbanks, AK, May 2010.

Barnes, J. 2010. Burn severity, spruce beetle and fire effects: Chakina Fire (Presentation). Alaska Interagency Fall Fire Review, October 2010.

Barnes J. and Mitchell, J. 2009. NPS Alaska Region Fire Ecology Program (Presentation). NPS Alaska Fall Fire Review, Anchorage, AK. September 2010

Barnes, J. 2010. Vital sign: Fire Extent, Severity, and Effects (Presentation). ARCN Technical Committee Meeting. Fairbanks, AK, October 2010.

Hu, F.S., Higuera, P., Barnes, J.L., Rupp, T.S., Chipman, M., and Duffy, P.A. 2010. Reconstructing fire regimes in tundra ecosystems to inform a management-oriented ecosystem model. (Presentation by J Barnes). Joint Fire Science Program Board Meeting. Fairbanks, AK, August 2010.

Hu, F.S., Higuera, P., Barnes, J.L., Rupp, T.S., Chipman, M., and Duffy, P.A. 2010. Reconstructing fire regimes in tundra ecosystems to inform a management-oriented ecosystem model. Final Report, JFSP Project Number 06-3-1-23, CESU Agreement J979106K153/001, April 2010.
https://www.firescience.gov/projects/06-3-1-23/project/06-3-1-23_hu_et_al_finalreport_jfsp_06-3-1-23.pdf

Kasischke, E., D. Verbyla, T.S. Rupp, A.D. McGuire, K.A. Murphy, R. Jandt, J.L. Barnes, E.E. Hoy, P.A. Duffy, M.Calef, and M.R. Turetsky. 2010. Alaska's changing fire regime- implications for the vulnerability of its boreal forests. Canadian Journal of Forest Research 40: 1313-1324

Mitchell, J. What happened after the flood? (Poster Presentation). Eagle Community School and NPS Eagle Visitor's Center. Eagle, AK, January 2011.

Mitchell, J., J.Vorachek, and J. Barnes. 2010. Fire and Fuels Monitoring Plan: Wrangell-St. Elias National Park and Preserve Alaska. Draft (in Review).

Racine, C., Barnes, J., Jandt, R., and Dennis, J. 2010. Long-term monitoring of 1977 tundra fires in the Northwest Alaska Parks. Alaska Park Science, Volume 9, Issue 1: 24-25.
<http://www.nps.gov/akso/AKParkScience/2010Vol9-1/Long-Term-Monitoring-of-1977-Tundra-Fires-Racine.pdf>