



National Park Service Alaska Region Fire Ecology Annual Report Calendar Year 2015

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A. Summary

Overview

The National Park Service (NPS) Alaska region fire ecology program provides science-based information to guide fire and land management planning, decisions and practices in order to maintain and understand fire-adapted ecosystems in Alaska.

During the 2015 field season, the Alaska NPS fire ecology program conducted monitoring at the Wrangell-St. Elias Headquarters fuels reduction site (Fig. 1), re-measured plots at a two year old burn in Lake Clark, and assisted the USFWS with monitoring burn severity at the 2014 Funny River fire on the Kenai National Refuge. The regional fire ecologists were involved with preparing monitoring protocols, agreements and research proposals, instructing classes, and participating on several agency and interagency committees. Communication and outreach continued to be a focus for the program. This



Figure 1. Fire Ecologist collecting plot data at the Wrangell-St. Elias Headquarters fuels reduction project (NPS photo 2015).

annual report provides a brief summary about the NPS Alaska 2015 fire season, fire ecology monitoring results, fire research projects, and fire ecology program activities and outreach.

2015 Fire Season

The second largest fire season on record (since 1939) for Alaska occurred in 2015. The fire season ramped up early with two large urban interface fires occurring in South Central Alaska (Sockeye and Card Street) and fires in the parks starting in late May. A warm and very dry spring followed by a thunderstorm pattern with a significant amount of lightning in mid-June started at least 295 fires over a seven day period. By the end of the season, a total of 770 fires were reported and 5,146,541 acres burned statewide for Alaska in 2015 (AICC Situation Report Oct. 13, 2015, <http://fire.ak.blm.gov/>).

National Park Service in Alaska had a very active fire season, with 8 parks having wildfires during the summer of 2015. There were 39 fires that burned within the park boundaries and a total of 280,369 acres burned within and adjacent to the park boundaries (Table 1). Of the area burned, 114,201 acres were on NPS owned lands. Yukon-Charley Rivers had the earliest fires, starting on May 24th. In early June additional fires started in Lake Clark and Wrangell-St. Elias (Fig. 2). The mid-June lightning bust in interior Alaska ignited numerous fires in Denali. Denali had the most fires with 17 fires, burning 67,872 acres on NPS lands, with a total of 172,025 acres burned within and adjacent to the park. Even with the busy fire season, the fire management staff carried out prescribed fire pile burns in Denali, Lake Clark and Wrangell-St. Elias during 2015 at 5 sites (Table 1) and accomplished fuels reduction projects at several sites in the parks.



Figure 2. A lightning ignited wildfire in Wrangell-St. Elias NP/Pr – Chisana River 2 fire on June 16, 2015. (NPS Photo).

Table 1. Wildfires and prescribed fires in Alaska park units from 2015

Park Unit	Number of Wildfires ¹	Total Acres Burned ¹	Number of Wildfires started on NPS Lands ²	Acres Burned NPS Lands ²	Number of Prescribed Fire Units	Acres of Prescribed Fires
Bering Land Bridge National Preserve	2	1,595	1	315		
Denali National Park & Preserve	17	172,025	15	67,872	3 (Admin Rd, Toklat, Kantishna)	5.7
Gates of the Arctic National Park	1	79	1	79		
Kobuk Valley National Park & Preserve	1	15,740	1	15,585		
Lake Clark National Park & Preserve	4	50,659	2	2,019	1 (Telaquana)	1.0

Park Unit	Number of Wildfires ¹	Total Acres Burned ¹	Number of Wildfires started on NPS Lands ²	Acres Burned NPS Lands ²	Number of Prescribed Fire Units	Acres of Prescribed Fires
Noatak National Preserve	1	299	1	299	-	-
Wrangell-St. Elias National Park & Preserve	9	39,640	3	27,762	1 (WRST HQ)	1.0
Yukon-Charley Rivers National Preserve	4	332	2	271	-	-
Total for Region	39	280,369	26	114,202	5	7.7

¹ Includes total number of fires and acres of all fires that burned within or partially within the boundaries of the park unit. NPS boundaries include inholdings of lands not owned or managed by NPS. ² Number of fires started and acres burned on NPS owned lands (WFMI stats).

B. Monitoring & Inventory

Monitoring and inventories are utilized by the fire ecology program to provide feedback to the NPS fire management program on activities such as fuels treatments and to continue to gain a better understanding of the effects of wildfire on the landscape. Table 2 provides a list of the number of plots measured in 2015 and the total number of fire/fuels monitoring or inventory plots established in Alaska parks since 2003.

During 2015 the NPS Alaska fire ecology program re-measured mechanical fuels reduction plots in Wrangell-St. Elias and established fire effects monitoring plots at the 2013 Currant Creek fire in Lake Clark. Brief descriptions and preliminary results from the two monitoring projects are provided below.

Table 2. Fire effects and fuels treatment (TX) plot workload (2015) and total monitoring plots Installed 2003-2015

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn/TX 2015	1yr Post 2015	Post (2-20 yrs) 2015	Annual Total	Total Plots
Lake Clark	Currant Cr Fire 2013	CBI, AKR Fire & Fuels Plots			10		43
	Kristin Cr Fire 2013	CBI & Cover					7
Wrangell-St. Elias	Carl Cr RX	AKR Carl Cr Plots					29
	Chakina Fire 2009	CBI & Cover					56
	Chakina Fire 2009	AKR Fire & Fuels Plots					9
	Susan Smith – Hazard Fuels Plots - TX	AKR SS Hazard Fuels Plots					13
	Headquarters – TX	AKR Hazard Fuels Plots			19		19
	Fire Effects – Paired Plots	AKR Paired Plots					2
	McCarthy University Subdivision - TX	AKR Hazard Fuels Plots					27
Yukon-Charley Rivers	2004 Woodchopper Fire	AKR Fire & Fuels Plots					7
	1999 Witch Fire	Fire effects - other					15

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-burn/TX 2015	1yr Post 2015	Post (2-20 yrs) 2015	Annual Total	Total Plots
	2004 Fire – Paired Plots	AKR Paired Plots					5
	1999 Fires Landcover-CBI	AKR Fire & Fuels Plots					30
Denali	Headquarters – TX	AKR Hazard Fuels Plots					27
	VDM Highpower fire reburns	AKR Fire & Fuels Plots					10
	Landcover-CBI	AKR Fire & Fuels Plots					55
	BeaverLog Fire 2013	CBI & Cover					13
	Toklat R. East Fire 2013	CBI & Cover					25
Noatak	2010 Fires	CBI & Cover					34
	2004 Uvgoon Fire	AKR Fire & Fuels Plots					6
	2012 Uvgoon/Kungiakrok Fires	CBI & Cover					22
	1977 Fires Racine Plots	Racine Plots					8
Bering Land Bridge	1977 Fire Racine Plots	Racine Plots					8
	Fairhaven Ditch Cabins- TX	AKR Hazard Fuels Plots					4
Total					29		474

Wrangell-St. Elias Headquarters Mechanical Fuels Reduction Monitoring

The Wrangell-St. Elias (WRST) headquarters, visitor center and seasonal housing areas are located in a natural setting of boreal forest in south central Alaska. The area has a variety of forest types, including closed canopy (>60% cover) dense small diameter white spruce (Fig. 3), open canopy (30-



Fig. 3. Dense white spruce along the road into the Wrangell St. Elias headquarters and visitor center were thinned and limbed in 2010 to provide a fuel break in the event of a wildfire. Photos from a monitoring plot (TX-06) show from left to right, pre-treatment (2009), 1 year post treatment (2011) and 5 years post treatment (2015).

60%) larger diameter white spruce, and open canopy aspen-white spruce forests (Fig. 4). The area has an abundance of old fire history evidence on the ground (burned logs and stumps), indicating the area burned in the past 100-150 years and has a good potential to burn again. In 2009 the fire management program worked with the park to develop a mechanical fuels treatment project around the headquarters and visitor center and the road into these areas. A fuel break of a 100 foot (ft) buffer around the headquarters, visitor center and road was intended to reduce the number of highly flammable spruce trees and increase the ladder fuel height to minimize the likelihood of a crown fire. The thinning treatment was planned to be completed in several phases. The goals for the first phase were as follows and were implemented in 2010 and 2011:

1. 3 to 5 foot crown spacing in spruce (approximately 681-1210 spruce/acre)
2. Maintain a mixed age stand
3. All sizes of healthy deciduous trees remain
4. Average height to ladder fuels will be approximately 4 feet

The fire ecology program worked with the fire managers to develop a monitoring program to 1) document the pre- and post-treatment condition of the vegetation and fuels at the fuels treatment site, 2) assess if prescriptions were met, and 3) model changes in fire behavior for the site. Nineteen monitoring plots were established in 2009, prior to implementation of the fuels treatments in 2010 and 2011. Thirteen treatment plots and six control plots were established. One year post measurements were taken in 2011 and 2012, and 5 year post treatment measurements were taken in 2015.



Fig. 4. Open canopy white spruce – aspen forests near the Wrangell St. Elias headquarters and visitor center were thinned and limbed in 2010 to provide a fuel break in the event of a wildfire. Photos from a monitoring plot (TX-10) show from left to right, pre-treatment (2009), 1 year post treatment (2010) and 5 years post treatment (2015).

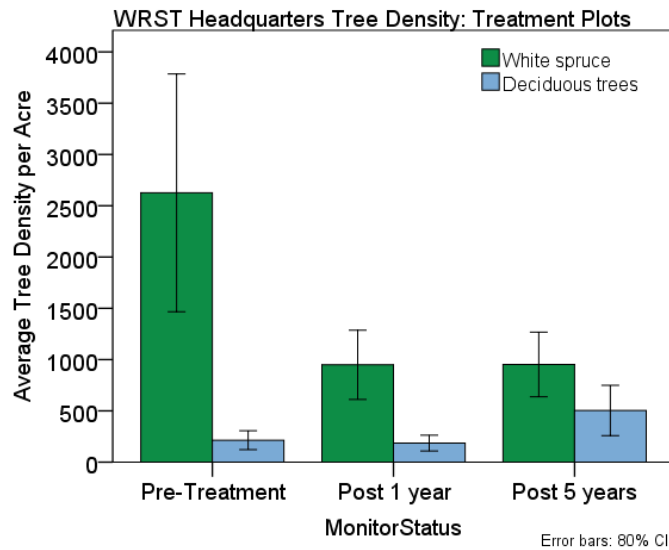


Figure 5. Average density (trees per acre) of spruce (green bars) and deciduous trees (blue bars) at treatment plots for pre-treatment (2009), 1 year post-treatment (2011), and 5 years post-treatment (2015) at the Wrangell-St. Elias Headquarters mechanical fuels site. (80% CI error bars).

Healthy deciduous trees (aspen and balsam poplars) were retained on site and there was minimal change in deciduous tree density at the plots one year after the treatment (Fig. 5). However some aspen and balsam poplars were cut during the treatment if decay was evident, and small aspen and balsam poplar re-sprouts were observed 1 year post treatment. By 5 years post treatment the aspen and poplar suckers were tall enough to be tallied as trees (>4.5 feet height) in many of the plots. The density of deciduous trees increased from an average of 50 trees/acre pre-treatment and one year post treatment, to 503 trees/acre (80% CI 258-748) five years after the treatment (Fig. 5). In general aspen and balsam poplar are less flammable than spruce, so this change will likely contribute to creating a better fuel break.

The fuels treatment significantly improved the ladder fuel heights at the site. Prior to treatment the average height from the ground to the lowest dead branches on spruce trees was less than 1 inch (1.5 cm) above the ground. In 2015 the average height to the lowest dead branches on spruce trees was 4.9 feet (143 cm), which achieves the objective of the 4 ft limbing height prescription (Figure 6, Table 3).

The fuels treatment successfully met the objective of increasing the crown spacing between spruce trees to reduce crown fire potential. The 3-5 foot crown spacing prescription would result in approximately 680-1210 spruce trees/acre. The spruce tree density was reduced from an average of 2626 spruce trees/acre prior to thinning to 949 spruce trees/acre 1 year after thinning, with minimal change in 5 years (952 spruce trees/acre) (Figure 5, Table 3). A majority of the spruce were removed from the closed canopy spruce forests (see Fig 3), which were the most flammable sites. The treatment opened up the canopy which should reduce the potential for crown fire.

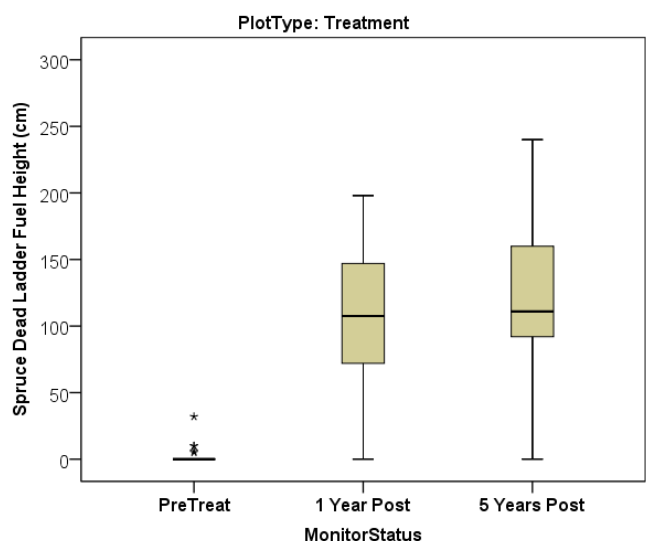


Fig. 6. Boxplots of spruce dead branch height above ground in centimeters show a significant increase in limb heights after the fuels treatment at Wrangell-St. Elias Headquarters site.

Table 3. Management Objectives and Monitoring Results. A summary of the management and ecological objectives for 2015 projects are presented in this table. All results shown are 80% confidence intervals of the mean. 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 & Years included in analysis
WRST Headquarters Hazard Fuels	Reduce spruce tree density to 3 to 5 foot crown spacing in spruce (681-1210 spruce/acre) (+/- 80% confidence interval).	Spruce Tree Density (<u>n</u>=13 plots) Pre-treatment:: 2626 (1467-3785) trees/acre 1 yr Post-treatment: 949 (611-1287) trees/acre 5 yrs Post-treatment: 952 (636-1268) trees/acre	YES	2015 (2009-2015)
	Limb spruce to 4 ft (122 cm)	Dead Ladder Fuel height Pre-treatment (n=42 trees): 1.50 cm (0.4 - 2.6 cm) 1 yr Post-treatment (n=41 trees): 101.2 cm (89.3 – 113.2 cm) 5 yrs Post-treatment (<u>n</u>=41 trees): 143.1 cm (113.6 – 172.6 cm)	YES, average was 4.7 ft	2015 (2009-2015)
LACL Currant Creek Fire Effects	Detect changes in vascular plant cover with varying burn severity and over time. (See Fig. 8)	Total Lifeform Vascular %Cover Low Severity (n=2 plots) 1 yr post: 64.2% (-65.8 - 194.3) 2 yrs post: 91.7% (-36.6 - 219.9) Moderate Severity (n=4 plots) 1 yr post: 53.6% (5.6 - 101.6) 2 yrs post: 92.9% (41.0- 144.9) High Severity (n=4 plots) 1 yr post: 3.7% (2.8 - 4.7) 2 yrs post: 23.8 (17.0 - 30.5)	YES, but variance high	2015 (2014-2015)

I&M and Fire Work Together to Monitor Fire in Lake Clark

As the 2015 fire season was heating up, the South-West Alaska Inventory & Monitoring (SWAN) program and NPS fire program teamed up to monitor a fire in Lake Clark National Park & Preserve. The NPS fire ecologist and SWAN plant ecologist were interested in monitoring the long term effects of fire in Lake Clark. In 2014, forty-three plots were measured for burn severity, vegetation composition, and organic soil consumption at the 2013 Currant Creek fire in Lake Clark. The Currant Creek fire was only 15 miles via boat from Port Alsworth, and provided a good opportunity to follow the effects of fire utilizing the work that was completed in 2014.

In 2015, random plots were selected for intensive measurement and potential long term monitoring from the Currant Creek burn severity plots sampled in 2014. The plots were selected to include a range of burn severities and within a reasonable walking distance from the lake. The following plots types were sampled: 1 low severity, 2 moderate severity and 4 high severity black spruce sites (pre-fire), and 1 low severity and 2 moderate severity white spruce-deciduous sites. No high severity white spruce stands were available for sampling.

Monitoring goals for the Currant Creek fire monitoring included:

- Monitor tree seedling establishment
- Document changes in tree densities by diameter size class
- Document vascular and non-vascular plant cover changes
- Document wildlife browse use

Two years after the fire, the plots measured had more vegetation cover than was observed the first year after the fire (Fig. 7 and 8). Preliminary results showed that the average cover of forbs, graminoids, and shrubs increased 2 years after the fire in all burn severity classes. The high severity black spruce plots (n=4) had less vegetation cover in both years, but still had an increase in vegetation cover by the second year after the fire (Fig 8, Table 3). Note, the methods for estimating plant cover varied between the two years; the first year ocular estimates were made and the second year point intercept was used.

During the first year post-fire primarily black spruce “seedlings” (trees less than 4.5 ft tall) were detected at many of the plots. By the second year, 50% of the plots had paper birch seedlings detected, occurring in all severity type plots. Additional analyses will be completed in 2016.



Fig. 7. A high burn severity black spruce site 1 year after the Currant Creek fire in Lake Clark (top photo) has abundant willow re-sprouting and fireweed 2 years after the fire (bottom).

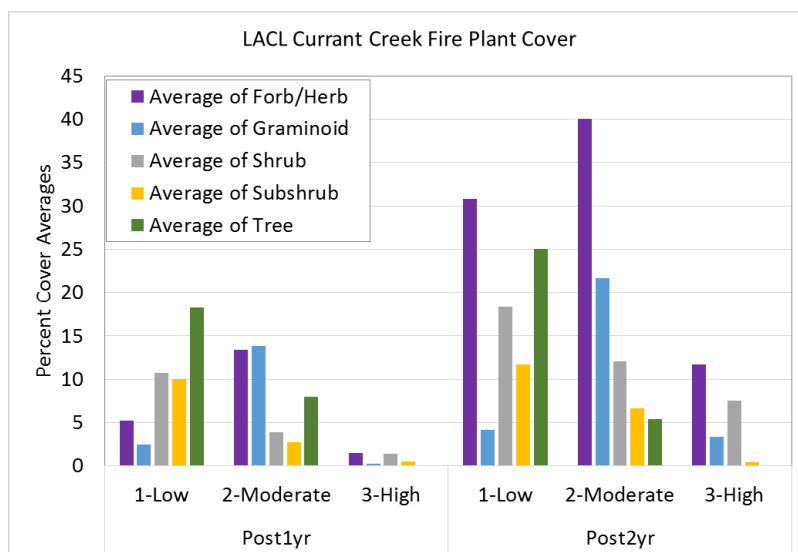


Fig. 8. Average cover of vascular plants by life form from the Currant Creek fire monitoring plots in Lake Clark. A general increase in plant cover was found 2 years after the fire for all severity classes.

Data Management

Data for all recent monitoring projects have been entered into FFI (FEAT/FIREMON Integrated) - a plot-level monitoring sequel server software tool designed to assist managers with collection, storage and analysis of ecological information (<http://www.frames.gov/partner-sites/ffi/ffi-home/>). Digital archives and metadata for the AK databases were uploaded to the NPS Data Store IRMA in Jan 2016. The Alaska Eastern Area fire ecology data set is located here and includes data for YUCH and WRST: <https://irma.nps.gov/DataStore/Reference/Profile/2227293> and the Alaska Western Area fire ecology data set includes data for DENA, NOAT, BELA, and LACL: <https://irma.nps.gov/DataStore/Reference/Profile/2227297>. The updated FFI databases reflect the recent data additions and QC to the AK NPS fire ecology databases (Table 4).

Table 4. Monitoring Data Entry and Number of Treatment Units Monitored for 2015

Park/Project	% 2015 Data Entered	% 2015 Data Quality Checked	# Prescribed Fires Monitored	# Non-fire Fuels Treatments Monitored	# Wildfires Monitored	# BAER Treatments Monitored
Lake Clark CBI and Fire Plots	100%	80%	0	0	1	0
Wrangell St. Elias Headquarters Fuels Project	100%	100%	0	1	0	0

C. Research & Technology

The AKR fire ecology program coordinates *research* and facilitates the use of scientific data, modeling and technology to address the needs of the fire management program. In 2015 three fire research proposals were submitted to NPS and other funding organizations (see Table 5). A tree ring study in Wrangell-St. Elias (WRST) with NPS Reserve Funds was funded in FY15 (see below for more information).

Both fire ecologists are part of the interagency Fire Research, Development and Application Committee (FRDAC) for the Alaska Wildland Fire Coordinating Group (AWFCG) and are on the board for the JFSP Alaska Fire Science Consortium. The regional fire ecologist finished up her chair position for the Alaska AWFCG Fire Modeling and Analysis Committee in October. Both ecologists participated in workshops and meetings for an interagency effort to update the Alaska Fuel Model Guide Book.

Table 5. Research workload in 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 ¹	Additional Comments
Wrangell-St. Elias NPPr	yes	2	1	1	NPS FY15 Reserve Fund and JFSP
Denali NPPr	Under revision	2	0	0	2 PMIS proposals

¹Number of funded research projects, new or ongoing, supported by the fire ecology program including logistical info or support, staffing, etc.

WRST Fire History and Tree Ring Research

In 2011 a 36 acre fuels treatment project was conducted in Wrangell-St. Elias National Park and Preserve (WRST) adjacent to the remote community of McCarthy, Alaska. The pre-thinning monitoring plots revealed significant evidence of a previous old fire – burned stumps and snags. The fuels project happened to occur in an area that was presumably burned in a very large (estimated 380,000 acre) fire from 1915 (Lutz 1956). During the fuels treatment over 100 cross sections of trees cut during the thinning project were collected for aging the stand, and preliminary tree ring counts indicated the stand was younger than 1915 (Barnes and Northway 2015).

In 2015 a research proposal was funded through the NPS Reserve Funds to study the tree ring growth patterns to infer growth release and suppression at the site to potentially relate to climate and weather parameters that may lead to large fire growth in this region of Alaska. In 2015 the Cooperative Ecosystem Study Unit Agreement was created with the University of Montana (PI: Dr. Phil Higuera). The collected tree cross sections that were collected previously were mailed to the University. During the summer of 2016, an undergraduate student will join the fire ecology program at the McCarthy University Subdivision fuels treatment project to collect additional tree cross sections and validate age/height relationships of previously collected cross-sections.

D. Communicating Results

Communicating results of projects or research is an important aspect the fire ecology program in order to provide **information and outreach** to fire managers, park staff, and the public. Table 6 lists the number of monitoring reports and presentations completed by park.

This year's fire ecology outreach had a train-the-trainer theme. In May a presentation was given to the Wrangell-St. Elias interpretation staff. In June and July the regional fire ecologist worked with teachers from the Denali Borough as part of the Teachers Intensive Workshop in Denali National Park & Preserve and participated in a week long teacher workshop in Yukon-Charley Rivers National Preserve. The teachers in Denali took a fire ecology walk and learned to use their smart phones to document and map evidence of historic fires along the front country trails of Denali Park (Fig. 9). The NPS Fire Communication and Education grant funding allowed seven students enrolled in a July 2015 University of



Fig. 9. Denali area teachers learn to identify spruce species on a fire ecology walk. NPS Photo 2015.



Fig. 10. Fairbanks area teachers learn about fire ecology monitoring in Yukon-Charley Rivers during the Wild Side of Education teacher workshop. NPS Photo 2015.

Alaska Fairbanks teacher professional development workshop to learn from and work with NPS Alaska Regional Fire Ecologist during field and classroom sessions at Coal Creek Camp in Yukon-Charley Rivers (Fig. 10). The class learned about the natural role of fire in Alaska and participated in re-measuring fire ecology plots at Coal Creek from the 2004 Woodchopper fire.

The 2014 fire ecology annual report was developed into a NPS Natural Resources report for more public consumption and was made available on IRMA and the NPS AKRO fire management web page (<http://www.nps.gov/akso/nature/fire/documents/2014-AKR-Annual-Report-Fire-Ecology-Final-NRDS.pdf>). See Appendix A for a list of reports, presentations, and other forms of communication completed in 2015.

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?*
Yukon-Charley Rivers	1	0	1	No
Denali	1	0	1	No
Noatak	0	0	0	No
Lake Clark	1	0	0	No
Wrangell-St. Elias	0	0	1	No

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

E. Planning and Compliance

The fire ecology program participates in **planning** activities for the Fire Management and Park Land Management Programs. Table 7 has a list of parks with fire management plans and the status for fire monitoring plans and Desired Future Conditions within the plans or other planning documents (<http://www.nps.gov/policy/DOrders/draftDO2-1.html>).

Table 7. Fire Management Plan - Fire Monitoring Plan Status as of 2015

Park	Does Park have written Desired Future Conditions (DFCs)? (yes or no)	Date Park-level Monitoring Plan completed (or revised)	Total # of Project- or Community-level Monitoring Plans	Assisted with how many BAER plans in 2014?
Denali	Yes in RSS	Planned for 2015	4	0
Gates of the Arctic	Yes - Interim Fire Desired Conditions in FMP	2014	1	0
Katmai	Yes – Suggested Fire Desired Conditions in FMP	2012	0	0
Lake Clark	No - Fire Management Objectives in FMP	2010	1	0
Western Arctic National Parklands	Yes - Interim Fire Desired Conditions in FMP	2012	4	0
Wrangell-St. Elias	No - Fire Management Objectives in FMP	2010	5	0
Yukon-Charley Rivers	No - Fire Management Objectives in FMP	2010	2	0

F. Fire ecology accomplishments and areas of focus

Fire Ecology Staffing 2015

The Alaska NPS Fire Ecology Program has a regional fire ecologist and a subject-to-furlough assistant regional fire ecologist. In general the fire ecology fieldwork has been accomplished with the assistance of the NPS fuels seasonal technicians or fire staff under the guidance of the regional fire ecologists. Over the past twelve years this has worked well, since the NPS Alaska Western Area (AWAFM) and Eastern Area Fire Management (EAFM) programs have generally hired multi-disciplinary fuels seasonal staff and allocated some of their time to fire ecology projects. Table 8 provides an overview of the personnel that work on or have assisted with fire ecology projects in 2015.

Table 8. Fire Ecology Staffing 2015

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Jennifer Barnes (Regional Fire Ecologist)	1/1/2015	12/31/2015	26	No	
Jennifer Hrobak (Assistant Regional Fire Ecologist)	1/26/2015	12/31/2015	23*	No	S490 Fire Behavior CFFDRS S290
1 AWAFM Fire Crew Members/Staff			1	-	-
1 EAFM Fire Crew Members/Staff			1	-	-

*13 pay periods on base funding, additional pay periods on I&M funds, fire and other project funds.

Regional Fire Ecologists Accomplishment/Focus Areas

The Alaska regional fire ecologist facilitates planning, monitoring, research and outreach for the *region* and *park* programs. This position is responsible for monitoring plans, protocol development, compliance, administration, field instruction, field work, data analysis, and reporting on projects for the parks and region. In 2015, the regional fire ecologist worked on the Arctic Network Inventory & Monitoring (ARCN) fire monitoring protocols; prepared and taught an online and class lesson for S-495 Geospatial Fire Analysis, Interpretation and Application course; planned and implemented two field projects; prepared a cooperative agreement for a research project; detailed with the USFS Wildland Fire Research Development and Application group; and worked on fire assignments in Alaska and Idaho. Table 9 provides a summary of the Alaska Regional Fire Ecologist focus areas and accomplishments for the calendar year of 2015.

Table 9. Fire Ecologist 2015 Accomplishments/Focus Areas (Barnes)

Category	Percent Time	Accomplishments and/or areas of activities
Planning	15%	CESU agreement preparation for WRST tree ring study Compliance for field work Climate Change AKR work group
Presentations/ Reports	15%	I&M Network Fire Monitoring Protocols – ARCN NRDS report preparation for 2014 Fire Ecology Annual Report Teacher education classes – DENA and YUCH

Category	Percent Time	Accomplishments and/or areas of activities
		Presentations: NPS, Public, Interagency Meetings Annual reports for Fire Ecology program and I&M network
NPS Meetings/ task groups	5%	AKRO Regional and Park Fire Meetings Regional Fire Ecologist conference calls I&M Technical Committee meetings
Interagency work	10%	S495 Geospatial Analysis - Cadre – Lesson Plan preparation AWFCG Fire Research, Development & Application Committee AWFCG Fire Modeling and Application Committee (Chair/Vice-chair) Alaska Fire Science Consortium (Board member) LANDFIRE calls
Wildfire assignments	7%	GSAN assignments (Alaska and Idaho)
Prescribed fire projects (implementation)	0	
Non-fire fuels projects (implementation)	0	
Research	7%	NOAT research paper reviews WRST Tree Ring project coordination Proposals for PMIS (Fire Regime DENA) and JFSP WRST Beetle Proposal reviews and letters of support
Data collection	7%	LACL Curren Creek Fire Effect Monitoring WRST Headquarters Fuels Treatment Monitoring FWS Kenai Refuge Funny River CBI assistance Fuel Moisture Sampling
Data entry	2%	Data entry supervision and database assistance QC of data
Data analysis	10%	NOAT Tundra fire carbon LACL and DENA CBI/Veg Burn severity and fire history stats
Supervision/Admin	7%	Supervision STF GS-9 Fire Ecologist Paperwork and administrative (time, travel, email) Budget
Training	2%	CAN491 – Intro to CFFDRS Rapport Leadership course Annual NPS Spring Training (RT-130, etc.) Bear & Shotgun Safety Training
Travel out-of-park for plot or project work	2%	All field work requires a travel authorization, multi-day trips away from duty station.
Miscellaneous	11%	30 day detail with USFS RD&A group, misc

Assistant Fire Ecologist Accomplishments/Focus Areas

The subject-to-furlough assistant regional fire ecologist works for the regional fire ecologist in Alaska. This position helps plan and implement fire effects and fuels monitoring projects. This position also assists in the development of park fire management plans, fire monitoring plans, and compliance for fire ecology activities. A majority of work this year focused on planning for field work, preparing a draft fire risk model, preparing ARCN fire monitoring protocol SOPs, inputting data collected into the FFI database, and working on fire assignments. Table 10 includes the percent of time and accomplishments by the assistant regional fire ecologist during the calendar year of 2015.

Table 10. Assistant Fire Ecologist Accomplishments/Focus Areas 2015 (J. Hrobak)

Category	Percent Time	Accomplishments and/or areas of activities
Planning	20%	Risk Analysis Model Development & Application LACL, KENAI – Funny River CBI Project Planning (Logistics, Sampling Locations, Gear Prep, Maps, Coordinating with Field Staff, etc.) Updating Monitoring Protocols (e.g., Alaska CBI forms) Annual Spring Training Preparation (Presentation materials, handout, meeting logistics, etc.) Annual Field Project Preparation (Trimble setup & upgrades,
Presentations/ Reports	5%	ARCN Standard Operating Procedures for Fire Reporting Requirements (WFMI), GIS Analysis, and Summaries. Risk Analysis Model Update Reports Reviewer NPS Reports Extreme Fire Behavior Events & Watchout Situations (Spring Training)
NPS Meetings/ task groups	5%	AKRO Regional Staff Meetings (weekly) AK Region Fire Management Meetings (monthly) AKRO Fire Annual In-Person Staff Meeting
Interagency work	5%	AK Fuel Model Guide Book Revision Meetings Alaska Fire Science Consortium – Advisory Board Panelist for S-339 Discussion (Logistics Section) Statewide Fire History Data & Interpretation Assistance AWFCG Fire Research, Development & Application Committee AWFCG GIS Committee Alaska Incident Management Team Meetings Alaska Fire Science Consortium Workshops Reviewer Interagency Reports
Wildfire assignments	22%	Multiple fire assignments in Alaska as a Support Dispatcher GIS Assignment processing and distributing Landsat Imagery for current fires L-48 Assignment in Idaho as Ordering Manager
Prescribed fire projects	0%	
Non-fire fuels projects	0%	
Research	0%	
Data collection	4%	Fuel Moisture Sampling WRST Hazardous Fuel Treatment Plots
Data entry	15%	Building Project Data Dictionaries (Trimble GPS) Updating Research Plots Database FFI Data Entry (WRST and LACL) ARCN WFMI QC Project Fuel Moisture Sampling Data
Data analysis	0%	
Supervision/Admin	3%	Time, Travel, Fire Physical, Email, etc.
Training	10%	S-490 Aviation Courses (IAT) Introduction to Remote Sensing for Wildfire Applications CAN491 – Intro to CFFDRS Annual NPS Spring Training (RT-130, etc.) Bear Safety Training

Category	Percent Time	Accomplishments and/or areas of activities
		Operational Leadership NPS Story Map Workshop/Training ESRI ArcGIS III: Performing Analysis
Travel out-of-park for plot or project work	3%	Travel to WRST & DENA for projects and training Travel to L-48 for S-490 training Travel to L-48 for Fire Assignment
Miscellaneous	8%	

G. 2016 Fire Ecology Program Direction

The major focus for 2016 will be to complete the draft Arctic Network I&M fire protocols, work with development fire risk modeling, and work towards completing reports for past projects. Field work expected for 2016 include re-measuring fuels reduction plots at the Wrangell-St. Elias McCarthy University Subdivision site, re-measuring twice burned plots in Denali and possibly re-measuring 40 year old burn plots in Noatak with the Arctic Network Alaska I&M plant ecologist. See lists below for the proposed direction of the AKR fire ecology program for 2016.

Planning

- ARCN Fire Protocols & SOPs
- Alaska Region - Fire Risk and Fuels Planning project
- Compliance for field work
- Environmental Assessment & FMP reviews for Alaska Coastal Park Fire Management Plans

Monitoring Field Projects and Data Entry

- WRST McCarthy University Subdivision fuels reduction plot re-measurements (4-5 yr post-treatment)
- DENA 2015 fires and repeat fire plots
- Fuel moisture monitoring – DENA and Fairbanks

Reports/Outreach

- Report: DENA HZF Monitoring – FINAL
- Report: WRST Headquarters and McCarthy Subdivision HZF

F. Overall Data Entry Status and FFI suggestions

Data Entry Status

Table 11 estimates the number of fire ecology or fuels plots and number of projects since the mid-1980s that have data in FFI or another database format for the Alaska region parks. A majority of the plots and projects that are not in FFI are from projects prior to 2003. These projects include CBI plots from 2000-2003, and other fire effects projects that were implemented prior to 2003, with the exception of the 1980s NPS Alaska Region Fire Paired Plots project which includes over 500 plots.

The Paired Plots were entered into an Access database and then converted to FFI. Only one known project has not been entered into any database, this includes fire behavior, weather and vegetation observations from a 2007 fire in Yukon-Charley Rivers.

Table 11. Number of known fire ecology or fuels plots and number of projects from the Alaska NPS Region and database formats.

Database Type	Number of Plots	Number of Projects	% Plots	% of Projects
Access	570	9	38%	29%
Excel	23	2	2%	6%
FFI	901	20	60%	65%
Totals	1494	31		

It would be desirable to convert some of the Access database projects into FFI, particularly the CBI plots. A higher priority would be to have global fixes for some of the current data entered into FFI. Over time, some of the projects data were entered with different units of measurements and also with issues on density calculations (see below) data needs to be fixed to calculate density correctly for some of the AKRO datasets in FFI.

FFI Feedback

The following are some suggestions to improve FFI, additional suggestions may be sent later. The Alaska Region has not used FFI-Lite.

- Provide for alternative or circular plot dimensions in density protocols (and likely other protocols). The current protocols only allow for square or rectangular plot dimensions (length and width).
- Clearly identify what fields are used for density calculations in reports in the FFI User Guide or within the system itself.
- Update the FFI User Guide to give definitions of data fields and their intended uses. It is very unclear within the individual tree protocol what the data fields are intended for, particularly the canopy and ladder fuel fields.
- Allow the user to define the plot size and dimensions for a projects protocol. Make the data of plot metadata (size and dimensions) available for each new sampling event; e.g. have it auto-populate with the predefined dimensions. Provide the opportunity for the user to modify it on a plot by plot or sampling event basis if needed. A huge amount of time is wasted entering the field headers on the data entry forms over and over again, and there is no global replace when something was entered incorrectly.
- Improve the output for the CSV exports. Having the plot meta data headers above each row of data for a plot makes very little sense and always needs to be cleaned up for use of the data. Possibly export the plot meta data headers as one sheet and the data as another CSV.

- Improve the query format so it is more user friendly or provide clear instructions in the FFI User Guide on how to create queries.
- Make FFI-Lite available on iPADS

Appendix A. Reports, publications, or presentations completed in 2015 in conjunction with the Alaska Region Fire Ecology Program.

- Barnes, J. L., and J. L. Northway. 2015. Alaska region fire ecology annual report for 2014. Natural Resource Data Series NPS/AKRO/NRDS—2015/781. National Park Service, Fort Collins, Colorado. <http://www.nps.gov/akso/nature/fire/documents/2014-AKR-Annual-Report-Fire - Ecology-Final-NRDS.pdf>
- Barnes, J.L., Saperstein, L. and Ziel, R. 2015. WFDSS Fire Behavior in Alaska: Ready for the season? (Presentation). Alaska Fire Science Consortium – Fire Modeling and Analysis Webinar. Fairbanks, AK. May 2015. (<https://www.frames.gov/catalog/20210>)
- Barnes, J.L. 2015. Fire Regimes, Fire Ecology and Fire Risk in Wrangell-St. Elias. (Presentation). Copper Center, AK. May 2015.
- Barnes, J.L. 2015. Fire in Alaska – Past, Present and Future. (Presentation) Denali Teacher Intensives. Denali Park, AK. June 2015.
- Barnes, J.L. 2015. Fire in Alaska – Past, Present and Future and Fire Ecology. (Presentation) Yukon-Charley Rivers Teacher Workshop – Wild Side of Education. Coal Creek Camp, AK. July 2015.
- Barnes, J.L. and Hrobak, J.L. 2015. Staying Safe: Entrapment and fire behavior in Alaska. (Presentation) NPS Alaska Fire Refresher, Fairbanks, AK. April 2015
- Hrobak, J.L. 2015. Fire Ecology and Fuels Monitoring Program. (Presentation). AKR Fire Seasonal Training, Fairbanks, AK. April 2015.