



**Glacier National Park
Fire Ecology Annual Report
Calendar Year 2012**



Avalanche Fire Glacier National Park (160 acres) 9-1-2012

A. Summary

The summer started off extremely moist. The winter's snowpack was 125% of normal on June 1st and was followed by a West Glacier record (1949-present) for total June precipitation (8.03"/average is 3.4"). July followed with above average moisture, and as is common in the Northern Rockies, the weather pattern completely switched, and we experienced an extremely dry August and September. We received less than 25% of average moisture over those two months. ERC's hovered around the 90 percentile from about August 15th until early October. Not surprisingly with all the early moisture, it was a very slow year for fire starts, but one, the Avalanche Fire started on September 1, and kept us busy for over six weeks. It was initially aggressively suppressed because it was in a location that was in proximity to the very popular Avalanche Visitor Complex and it could have easily spilled into the Going to the Sun Road corridor. It was located in very steep and rocky terrain that was not conducive to total control. After a significant rain/snow event on day six, park management decided to cease suppression efforts and the fire was closely monitored until it finally went out in early November. This involved numerous site visits to update the perimeter, collect fuel samples, and monitor fire activity. We also heavily supported two major SAR events, one each in July and August, each of which kept most of the fire staff busy for about one week. We supplied searchers and members to the Type III Incident Command Team. We had two prescribed burns planned, one in Glacier and one at Big Hole, but both were cancelled due to the very high fire indices throughout September and early October.

Big Prairie Project

A project in Big Prairie that proposed fuel manipulation in lodgepole pine thickets took a significant amount of time to work through the compliance issues. Divoky and Harris represented Fire Management on the ID Team. Fire Monitors collected additional information outside of the FMH plots to monitor and assess the results.

Background: in the Big Prairie burn units that were prescribed burned in the 1990's to reduce encroachment of lodgepole pine (*Pinus contorta*, var. *latifolia*) into the meadows, the initial results had reduced the tree component dramatically, but subsequently had vastly increased the seedling and pole density over the intervening years. We had inadvertently set up the seedbed for what lodgepole pine are exceptionally well adapted to do, regenerate dramatically. Due to a variety of factors over the years; burn windows that were ultimately too wet or too dry, extended extreme fire seasons, and large wildfires elsewhere in the park, we did not burn the units in a timely manner, allowing the pine to produce numerous tall well shaded thickets. We subsequently did not meet fire management objectives when attempting to run low to moderate intensity fire through the lodgepole pine poles. In many cases, we found that we could not get fire to run through the thickets at all, due to the shading that they provided to the pinegrass (*Calamagrostis rubescens*) and kinnikinnick (*Arctostaphylos uva-ursi*) which tends to stay green and moist throughout all but the most severe fire seasons. We also found that due to limited ground fuels, where and when we could get fire to enter the thickets, we were only able to essentially limb up the pole and overstory sized trees. We were trying to achieve a 40-70% in the poles and 10-40% mortality rates in the overstory. This limbing further complicates meeting our objectives in the future.

Fire Management proposed a partial slashing/thinning project that would open up these thickets to the sun and wind and provide sufficient dry fuels at the base of the remaining standing trees to better meet our objectives. Although the project area is adjacent to a park road, it is located in proposed wilderness. Functioning under the Minimum Requirement Decision Guide (MRDG) was new to us, and working to a solution proved to be a challenge. Brad Harris, the Fuels Specialist, was the lead through this process. Any powered mechanical treatments were initially ruled out, but then it was offered that a trial of three treated plots of various cutting levels of about .1 acre each, could be treated with chainsaws. In addition, it was approved that we could experiment with girdling overstory, pole, and seedling trees within separate plots with propane torches. The logic behind using propane torches to girdle the trees rather than using draw knives or chainsaws was to limit the visual impact in the wilderness. If girdling proved feasible, it was thought that it would be the best solution for wilderness to first broadcast burn, and then “clean up” with torches where we did not meet objectives. We photographed and tagged trees within the plots to track the subsequent mortality within both types of plots. It is hoped that a broadcast burn will occur this spring or next fall of 2013 within this burn unit to compare the treated and non-treated plots and the results will be evaluated over the next three years. It is hoped that if the thinning is successful and is approved in the future, this cutting will be a onetime event, and if the units are burned on a tighter and timely schedule, it will not be required again.



Untreated thicket; notice the lack of curing in late August of a typically dry summer. This location, prior to the initial 1996 prescribed burn, was a stand of 70-90 year old trees.



Mechanically treated plot



Brad Harris girdling a tree with a propane torch.

Divoky continued working with Tom Rodhouse, an Ecologist with the NPS Upper Columbia Basin Inventory and Monitoring Network, preparing for a prescribed burn at Big Hole National Historic Trail, to increase the vigor of Lemhi penstemon (*Penstemon lemhiensi*). The battlefield contains the largest reported population of this geographically restricted species and is therefore a globally-significant reserve. The I&M Network has over 200 extensive plots and 40 permanent intensive plots. These plots are 2 x 50 meters and capture only the penstemon. We have five FMH vegetation transects with brush belts in the burn unit to better capture a fuller picture of species change.

We had hoped to burn a unit this past fall, but an increase in Spotted knapweed (*Centaurea stoebe* L.) was noted in this summer's I&M plotwork. Presently, the knapweed is found in low numbers, hundreds of plants, but it was found to have increased slightly over that previous three years. Although the weed is found in the park unit along the road, it was not found in the burn units until relatively recently. In addition, a very significant fire season was occurring in close proximity in that part of Idaho and Montana, which caused us to defer to 2013. We felt it would not have been sociologically acceptable to add more smoke and fire after the region had just gone through 50-70 days of smoke inversions. We also felt that if we gave IPM crew another year to spot treat the weed with herbicides we should have a better handle on it, and hopefully would not inadvertently favor it within the burned unit.

Divoky procured the use of soil temperature sensors from Jim Reardon at the Missoula Fire Lab and coordinated with Tom and Jim to work out the protocol. Tom is interested in the heat pulse into the soil and what that may mean to penstemon regeneration. We have assurance we can borrow the sensors again this year.

Alison Lay was able to detail to the Flathead IA Helicopter Module for two weeks and completed her HECM taskbook. Mike McClellan had a three week assignment to the Sandy Hurricane Recovery at Gateway NRA as a crewleader of a park saw crew of thirteen. No travel occurred this year to workshops or symposiums.

Table 1. Fire Effects Plot Workload (2012) and Total Plots Installed

Park	Monitoring Unit	Plot Type (FMH Forest/Brush/Grass plot, photo point, Rapid Assessment, CBI, etc.)	Pre-burn 2012	Immed. Post 2012	Postburn (1-20 yrs) 2012	Annual Total (2012)	Total Plots
GLAC	North Fork Grasslands (Forest)	FMH				0	13
GLAC	North Fork Ponderosa (Forest)	FMH				0	18
GLAC	Long Term Monitoring Parkwide	LTM				0	54
GLAC	Post Fire Composition	PFC			75	75	380
GLAC	North Fork Grasslands	Non-native grassland Daubenmire			24	24	24
GLAC	Fuel Reduction North Fork Grasslands	Modified Tree Belt	3*			3*	3*
GLAC	Fuel Reduction Parkwide	Photo Points			24	24	86
GLAC	Fuel Moisture Plots Parkwide	Fuel Moisture Collection				4	4
GLAC	North Fork Grasslands	Ponderosa Pine Genetic sampling				30	30
Total			3		123	160	612

* Pilot sampling plots

Table 2. Fire Ecology Staffing 2012

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified (Yes or No)	Training and Development
Dennis Divoky	1/1/12	12/31/12	26	Yes	Annual Fire Refresher Numerous Future Forest Webinars
Mike McClellan	4/9/12	12/13/12	18	Yes	Annual Fire Refresher GIS Training and Development
Scott Lang	5/7/12	11/15/12	14	Yes	Monthly Structural Fire Training Annual Fire Refresher RXB2 taskbook work GIS Training and Development Supervisory training
Alison Lay	6/4/12	9/27/12	8.5	No	Annual Fire Refresher Intro to GIS training S-271 and completed HECM Taskbook
Ciara Ahrens	6/4/12	9/27/12	8.5	Yes	Annual Fire Refresher Intro to GIS training Worked on FFT1 taskbook

Table 3. 2012 Management Objectives and Monitoring Results

All results shown are 80% confidence intervals of the mean.

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (90% confidence interval)	Objective Achieved?	Year Last Analysis Completed
Ponderosa pine	Limit overstory ponderosa pine mortality to $\leq 20\%$ at year 05.	Mortality = 36% ($n=18$ plots, 4 unique fires*)	No Two units burned under a hot wildfire condition	2010
	Reduce ladder fuels (pole and seedling conifers other than P-pine) $\geq 40\%$ at year 5	Mortality = 35% ($n=18$ plots, 4 unique fires*)	Yes	2010
	Maintain 95% relative cover by native herbaceous species 5 years postburn.	Non-native species = 3.9% ($n=18$ plots, 4 unique fires*)	Yes	2010

*This monitoring type was burned under prescribed fires (2 burn units), a wildfire, (1 unit), and a wildfire with resource benefits (1 unit), and all with greatly varying fire severities.

B. Fire ecologist accomplishments and areas of focus

Table 4. Fire Ecologist 2012 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	10	- Reviewed Fuels Plan and NFORS requests - FMP Annual Review - Zone NFDRS Plan review - Sibold and Assal – <u>Fire regimes and fire-climate relationships of forest ecosystems in Glacier National Park: Assessing the potential ecological consequences of fire suppression and climate change.</u> - Naficy - <u>Cross-scale assessment of spatiotemporal patterns and drivers of fire effects in mixed-severity fire regime forests of Larix occidentalis, Glacier National Park.</u> - Prato - <u>Collaborative research: A spatial decision support system for assessing and adaptively managing future wildfire risk in the Interior Pacific Northwest.</u> NSF funded.
Presentations and Training provided	5	- Taught a two hours of fire ecology/ history to the entire Interpretation staff - Taught one 8 hr fire refresher; assisted with 3 others
NPS Meetings/ task groups	5	- Weekly V&RP supervisors meetings (monthly; June – September), 1-2 hrs - Bi-annual Division meetings - Safety Committee; bi-monthly - Ranger/Warden Meeting – 2 days - Board of Review Committee – monthly meetings - Represented park along with Resource Management when Flathead NF requested the use of park waters for CL-215's scoopers.
Interagency work	3	Park representative on the Interagency Northwest Montana Zone NFDRS Plan writing team
Fire & SAR Assignments	5	- Duty Officer; rotated a week at a time throughout summer - Acting FMO twice when FMO was on two fire assignments (~20 days) and during the Avalanche Fire. - SAR's; 2 major week long events, Sit Unit Leader and GIS Tech Support - Assisted with pile burning
Research	7	- Worked closely with Jason Sibold with three separate research funding processes, planning the projects, and data mining support - Assisted Tim Assal with IMR funded research - Fire Atlas geodatabase manager – provide data and assistance to researchers and national staff converting it to NPSMap
Data entry and management	5	GNP COOP (3 stations), WIMS (4 stations), and Weather Pro 3 database manager
Data Conversion	3	Occasional Data checking FFI
Data analysis	5	Additional work on FESC and PIPO
Supervision/Admin	15	- Directly supervise two permanent employees and indirectly two seasonal - Managed project accounts and acquired supplies and materials for fire monitoring.
Training	15	- Future Forest Webinar series - GNP Bear Refresher - Park Supervisors Safety Training - Annual Fire Refresher - Multitude of mandatory training; OSHA Safety, Federal Information Systems Hiring Reform for Supervisors, Managers and HR Professionals, Uniformed Services Employment and Re-employment Rights Act (USERRA), Security Awareness, Quicktime, Credit Card Approving Official, Discrimination and Whistleblowing in the Workplace, Records Management Awareness, IT Security Awareness, NPS Responsibilities for Computer Use,

		Travel/Purchase Business Lines, DOI Diversity Training, Orientation to the Privacy Act, DOI Integrated Charge Card Holder
Miscellaneous	23	• Managed four NFDRS RAWs and three park COOP stations • Produced GIS map products (lightning, fire, LE, Interp. and SAR maps) for fire management and other divisions • READ updates for park • Error checking and managing GNP Fire Atlas Geodatabase and WFMI database; 40+ hours. • Coordinating with the Skip Edel to convert the GNP Fire Atlas to NPSMap • Attended “Returning Fire to the Land”, a Northern Rockies Fire Science Consortium Workshop • Wrote fire and weather summaries for annual park summary reports for Concessions, Backcountry, North Fork Subdistrict, and Re-vegetation monitoring reports. • Park coordinator for “Adopt a Highway” Roadside cleanup - twice annually • Glacier Employee Association member

C. Fire effects crew accomplishments and areas of focus

Table 5. Fire Effects Crew 2012 Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	0%	Could not burn due to Fire Severity in Montana (BIHO)
WUI plots	2%	Photo point plots taken at fuel reduction projects
CBI plots	0%	None read in 2012
Other plot work	35%	75 GLAC-Post Fire Composition (PFC) plots read / photos. Fuel Moisture sampling at 4 sites in the Park. 6 fuel reduction/ thinning monitoring plots created in North Fork Grasslands. Ponderosa Pine genetic study.
Wildfire assignments	20%	Assisted with Fire Suppression and Fire Monitoring on 2 fires in Glacier National Park with multiple assignments. Also, 1 crewmember completed a two week Handcrew assignment out of state. Another crewmember completed a two week HECM assignment with the Forest Service. Two off Park engine responses by crew members and leads. Provided parkwide initial attack (for a 1 million acre Park) two days a week during the fire season. Provided backup support parkwide the rest of the week.
Prescribed fire projects	2%	Assisted with RX fire monitoring pre-planning for BIHO which is linked to a possible RX burn in 2013.
Non-fire fuels projects	10%	Lang and McClellan assisted with piling and burning piles. Crew assisted with Fuel reduction around Park facilities in numerous locations. READ activities during fuel reduction projects at GLAC.
Travel for plot or project work	0%	Could not burn due to fire severity in southwestern Montana (BIHO).
Data entry	10%	Completed 100% of data entry/error checking from 2012 field season.
Data analysis	3%	Some minor analysis/GIS work of GLAC- Post Fire composition plots (PFC).
Supervision/Admin	10%	Lang supervised (Directed; trained; time management; career development; mentored; evaluated; and counseled) two seasonal monitors.
Training	3%	• McClellan instructed S-212 and assisted with Fire Refreshers. • Lang assisted with Fire Refreshers. • Monthly Structural Fire Refreshers. • All attended Basic Fire Refresher. • All attended CPR/First Aid; Also-Orientation, Bear, Safety, All Employee, etc.
Miscellaneous	7%	• Performed maintenance and repair of the park's three NFDRS RAWS stations and three COOP stations. • Assisted other park divisions in clearing roads and trails. • Office maintenance work. • Assisted with numerous Search and Rescue missions in Park. • McClellan continued work on Wind Wizard analysis .

D. Additional Program Information

Table 6. Planning - 2012

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 2012)	Assisted with how many BAER plans in 2012?
Glacier National Park	no	2011	0	0
Big Hole National Battlefield	no	-	0	0

Table 7. Monitoring - 2012

Park	% 2012 Data Entered	% 2012 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Glacier National Park	100%	100%	0	0	1	0
Big Hole National Battlefield	N/A	N/A	0	0	0	0
Grant-Kohrs Ranch Historic Site	N/A	N/A	1	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 - 2012

Park	# of Project Monitoring Reports completed in 2012	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
Glacier National Park	0	2	1	No
Big Hole National Battlefield	0	1	0	
Grant-Kohrs Ranch Historic Site	0	0	0	

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

Table 9. Research - 2012

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2012	# of Proposals Funded in 2012	# of Research Projects Supported in 2012*	Additional Comments
Glacier National Park	no	1	1	3	Sibold/Assalt Naficy Prato
Big Hole National Battlefield	no	0	0	1	Rodhouse
Grant-Kohrs Ranch Historic Site	no	0	0	0	

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

Reserve Fund Research: None in 2012, but Naficy had made a 2013 request, and did not make it through the selection process, but he is hopeful of IMR money becoming available later this summer.

E. 2013 Direction

Continue to work with the present group of researchers by writing letters of support for funding and helping with feedback, review and logistics. Continue working with Brad Harris and Tom Rodhouse at BIHO on penstemon prescribed fire project. Hopefully, we will receive a burn window for Big Prairie project and begin monitoring and analysis. With travel caps as they are, I very much doubt any travel to workshops or symposiums will occur this year. Provide park WFDSS leadership and support. See GNP Fire Atlas through to conversion to NPSMap.