



Glacier National Park Fire Ecology Annual Report Calendar Year 2011



Quartz Creek Fire – North Fork area of Glacier National Park. (10-3-2011)

A. Summary

The 2010/2011 snowpack was well above average (175%) and persisted later into the summer following an exceptionally cool Spring and early Summer. The Going to the Sun Road saw its latest opening ever – July 13th. This persistent snowpack was a large reason for the fire indices remaining below average until mid-August. It is not unusual in the Northern Rockies to have weather patterns switch 180 degrees. August saw only .22” of precipitation and the early part of September continued very dry with ERC’s reaching the 90 percentile and climbing. Lightning proved to be limited throughout the summer and only four starts occurred during this dry period. Surprisingly, lightning did cause the Quartz Creek Fire, which started on 10/2, which is extremely late in our fire season. It persisted until the fourth week of the month despite a wet spell that began shortly after the start. Altogether, the park and the region had a quiet fire season. Seven starts were recorded in Glacier, with Quartz Creek being managed for resource benefits. All were less than .1 of an acre except the May 23rd Dover Peak Fire (6.5 acres), which

was man caused and occurred in the northern end of Big Prairie in a predominantly grass fuel type. In a more typical year, the grass would have been greened up by late May in this area of the park. It was a limited fire season, but it was a long one.

The monitoring crew read 18 FMH plots and continued with the Post Fire Forest Composition plot work. Fuels work filled some of the gap by lending a hand helping in project areas and especially with pile burning. Monitoring work was highlighted by a trip to Big Hole NHP, where in conjunction with Tom Rodhouse, an Ecologist with the Upper Columbia Basin Network, we are helping them study fire effects on Lemhi penstemon (*Penstemon lemhiensis*,) a regional and rare endemic plant. It is found in only four counties in Montana and one in Idaho. It is estimated that 10% of the total population resides within the battlefield. Fire suppression is detrimental to the species by allowing for canopy closure. One small population has disappeared in the last 25 years on the battlefield. This monitoring will attempt to study the anecdotal evidence that fire in a grassland environment stimulates flowering and plant vigor. We are pooling our monitoring efforts with the Network to get a fuller picture. They are focusing only on the penstemon while we will monitor our five brush plots to capture any general trends or changes. Approximately one half of the Horse Pasture Burn Unit will be burned in 2012 allowing the other half to serve as a control. Glacier Fire Management will write the burn plan and coordinate the burn operation in the Fall. To learn more about the project visit

http://www.nps.gov/biho/naturescience/upload/BIHO_PenLem_ResourceBrief_20090729.pdf

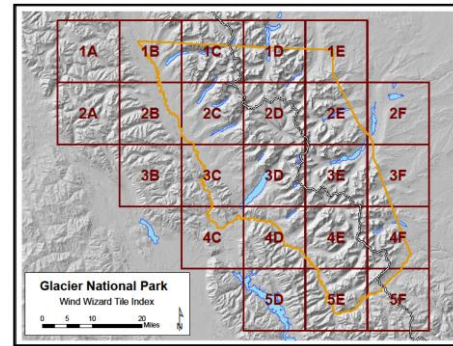


Mike McClellan and Scott Lang spent a significant amount of time clearing up some FFI tree data issues for Jonny Nesmith, who is working on a fire severity/prescribed fire project with the national office.

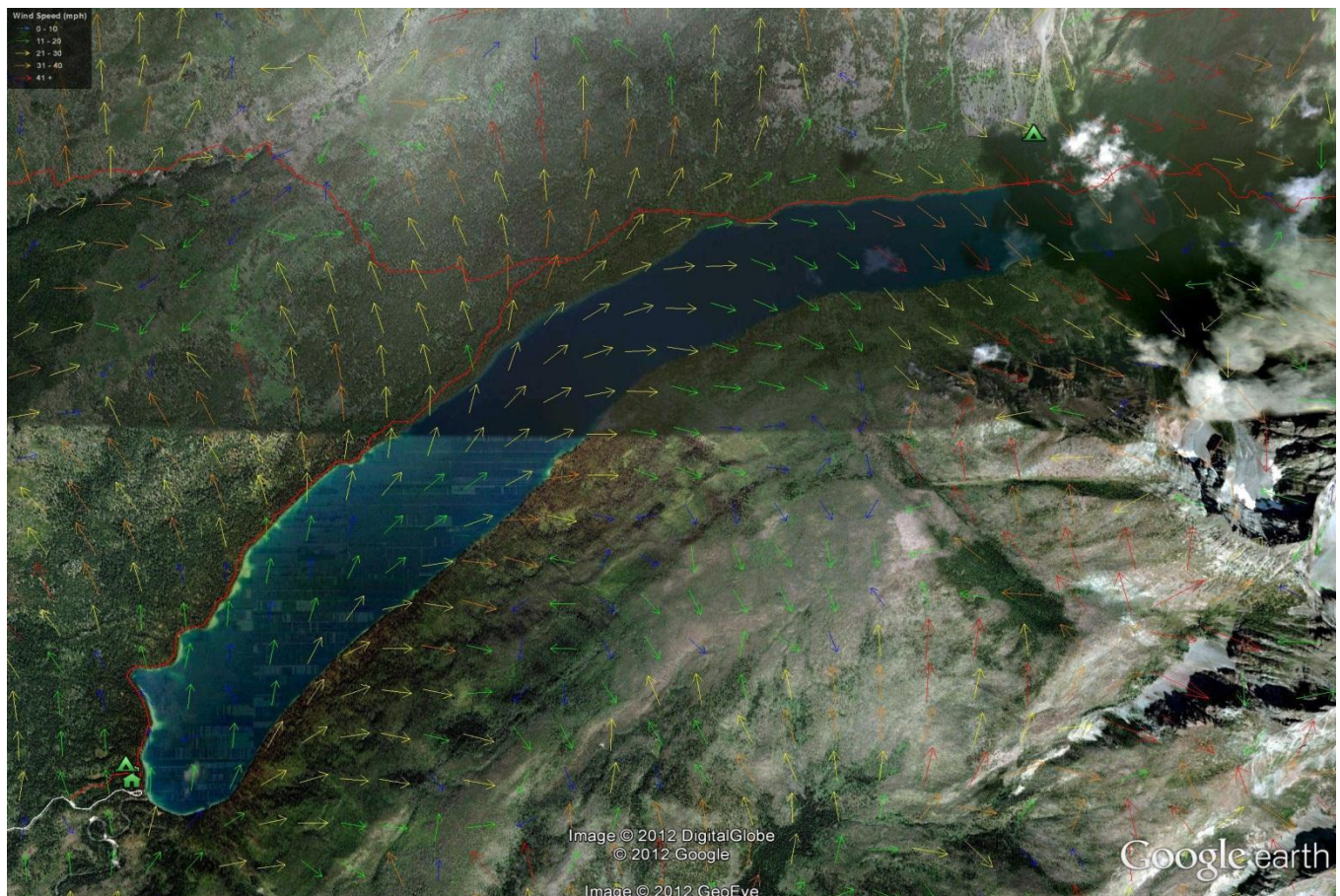
Dave Soleim and Dennis Divoky had two separate meetings with the new Deputy Superintendent and the newly arrived Resources Management Chief to discuss Glacier Fire Management and program direction.

Divoky worked with Carl Key, USGS Fire Researcher, and received numerous maps, reports, documents, data sheets, computer printouts, etc. as he was preparing to retire in late December. Carl had been a NPS employee in the Research Division during a time when a tremendous amount of park plant ecology studies and fire research was accomplished. He was instrumental in the production of the park's fire history data layer. He and Nate Benson developed the Normalized Burn Ratio method of accurately mapping fire severity on a landscape level and the development of the Composite Burn Index of ground truthing the results. Divoky is now the temporary keeper of a number of seminal works by Kessell, Armour, Barrett, Kilgore, Habeck, Pfister, Daubenmire, and others.

Mike McClellan has continued the Wind Wizard work that Mitch Burgard had begun by continuing to build wind files for all of Glacier NP (with ample buffering around the park boundary) that fire behaviorist can use to better model fire behavior. He has greatly refined the methodology for producing the files. Mike so far has crunched 5, 10, and 20 mph winds from six of the most common fire weather cardinal wind directions at 100 meter resolution and continues to work on the 300 meter resolution. To give a scale to this project, it takes hours on a PC (usually the computer is allowed to run overnight) to run one wind speed with one wind direction for one of 23 tiles that cover the park.



Thus, 3 wind speeds x 8 cardinal directions x 2 resolutions x 23 tiles = 1,104 separate computer runs. He has also converted the ArcMap shapefiles to .kmz files so that anyone with Google Earth can easily import the file(s) and use them to better predict local winds for wildland fires and for helicopter operations for Medivacs, SAR's, and projects. Mike has done an excellent job of writing up directions and creating scripts to facilitate the whole project. If interested in further information, be sure to contact Mike.



Example - Kintla Lake area with winds out of the south at 20 mph with 300 meter resolution. The angle and color of the arrows refer to how the south wind will be converted by the local terrain in both speed and direction. Notice how the south wind gets converted to east, west, and even north wind direction in certain locations. This information can be vital for firefighters and air operations briefings .

Seasonal hiring again proved to be a challenge for the second year in a row with a previously hired employee backing out in May. A STEP hire was used to fill the slot, and fortunately it worked out well, although the employee was only available for 3.5 payperiods. Fire Ecology presentations/walks were provided to the University of Montana, Glacier NP Interpreters, Flathead Valley Community College Forestry class, and to a Continuing Education for biology teachers hosted by the Crown of the Continent Learning Center. The park hosted a two day national READ training in June. All fire staff were heavily involved in the six day Rigby SAR; a search for a Glacier NP employee who fell to their death on a challenging route. Scott Lang has maintained his Structural Fire Qualifications, while Dennis Divoky has retired from the West Lakes Fire Brigade as a FF1, but may continue as a FF2.

Table 1. Fire Effects Plot Workload (2011) and Total Plots Installed

Park	Monitoring Unit	Plot Type (FMH Brush plot, photo point, CBI, etc.)	Pre-burn 2011	Immed. Post 2011	Postburn (1-20 yrs) 2011	Annual Total (2011)	Total Plots
GLAC	North Fork Grasslands (Forest)	FMH Forest plot		1	8	9	13
GLAC	North Fork Ponderosa (Forest)	FMH Forest plot			4	4	18
GLAC	Post Fire Composition	PFC			30	30	305
GLAC	Fuel Reduction Parkwide	Photo Points				5	62
GLAC	Fuel Moisture Plots	Fuel Moisture Collection				4	4
BIHO	Big Hole Brush Plots	FMH Brush plot	2		3	5	26
Total			2	1	45	57	428

* Pilot sampling plots

Table 2. Fire Ecology Staffing 2011

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qualified	Training and Development
Dennis Divoky	1/1/2011	12/31/2011	26	Yes	Annual Fire Refresher Instructor for Basic Fire School S-482 Advanced Fire Management Applications - Missoula ArcGIS 10 Training BAER/RAVG/MTSB Training IMR/MWR Ecologist Meeting - Denver Managing the Lost Person Incident
Mike McClellan	4/25/2011	12/22/2011	18	Yes	Instructor and Field Certifier for S-212/GNP Chainsaw Safety Course Instructor for Basic Fire School Annual Fire Refresher READ Training-two days BAER/RAVG/MTSB Training
Scott Lang	4/25/2011	11/17/2011	15	Yes	Instructor for Basic Fire School Monthly Structural Fire Training Live Fire Structural Fire Refresher Annual Fire Refresher READ training RXB2 taskbook work BAER/RAVG/MTSB Training
Alison Lay	6/6/2011	9/28/2011	8.5	No	Annual Fire Refresher
Trevor Poser	7/11/2011	8/25/2011	3.5	No	Annual Fire Refresher

Table 3. 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	2005
	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	2005
	Maintain 95% relative cover by native herbaceous species 5 years postburn.	Non-native species = 3.9% ($n=18$ plots, 4 unique fires*)	Yes	2005

*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 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning	5	- Reviewed Fuels Plan and NFPORS requests - Sibold and Assal research planning – IMR funded research. - Naficy, Cansler, and Kemp research planning - FMP Annual Review
Presentations and Training provided	10	- Taught a two hour fire ecology and history to the entire Interpretation staff - Taught a fire ecology session to an undergraduate /graduate level class from the University of Montana. (2 hour presentation, 3 hour field trip and 3 hours travel) - Taught one 8 hr fire refresher; assisted with 3 others - Taught S-190 for Basic Fire School - Provided a 2 hour fire ecology session for a Continuing Ed Course for High School Biology teachers
NPS Meetings/ task groups	5	- Fire Monitoring handheld computer software Task Group - Denver - Met with new Deputy Superintendent and Resource Mgmt. Specialist helping FMO describe the parks fire program - Weekly V&RP supervisors meetings (monthly; June – September), 1-2 hrs - Bi-annual Division meetings - Safety Committee; bi-monthly - Ranger/Warden Meeting – 1-2 days - Board of Review Committee – monthly meetings
Interagency work	3	Park representative on the Interagency Northwest Montana Zone NFDRS Plan writing team
Fire & SAR Assignments	5	- Duty Officer, 2 days a week throughout summer - Assisted with pile burning - Rigby SAR-NPS employee fatality; GIS Tech
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
Data entry and management	5	GNP COOP (3 stations), WIMS (4 stations), and Weather Pro 3 database manager
Data Conversion	3	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	- GNP Bear Refresher - West Lakes Fire Brigade, monthly training – 2 hours per month until Sept - Assorted NPS and National WFDSS Online Webinar Training - S-482, Advanced Fire Management Applications, 5 days - Park Supervisors Safety Training - 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 and helped to maintain four NFDRS RAWs and two park COOP

		stations • Produced GIS map products (lightning, fire, and SAR maps) for fire management and other divisions • Error checking and managing GNP Fire Atlas Geodatabase and WFMI database; 100+ hours. • Coordinating with the National Center for Landscape Fire Analysis to ensure the GNP Fire Atlas is compliant with the NPS GIS data layer standard • Worked (phone calls, email, meetings, field trip) with Christopher White, a published professional writer and naturalist, on an article intended for Nature or Smithsonian on fire occurrence and ENSO/PDO and the Robert Fire. • 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 2011 Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	20%	18 FMH FESC, PIPO, and ARTR plots read in 2011
WUI plots	1%	Photo point plots taken at fuel reduction projects
CBI plots	0%	None read in 2011
Other plot work	28%	30 GLAC-Post Fire Composition (PFC) plots read / photos. Fuel Moisture sampling at 4 sites in the Park. 6 Long Term Monitoring Plots (Moose)
Wildfire assignments	10%	Assisted with Fire Suppression and Fire Monitoring on three fires in Glacier National Park with multiple assignments. Also, 1 crewmember completed a two week severity assignment in New Mexico. 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 our work week.
Prescribed fire projects	2%	Assisted with a fuels reduction project at BIHO which is linked to a RX burn in 2012.
Non-fire fuels projects	5%	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 and BIHO.
Travel out-of-park for plot or project work	2%	FMH plot and fuel reduction work at BIHO.
Data entry	10%	Completed 100% of data entry/error checking from 2011 field season.
Data analysis	2%	Some minor analysis/GIS work of GLAC- Post Fire composition plots (PFC).
Supervision/Admin	10%	McClellan hired two seasonal monitors with one being a STEP or student hire. Lang supervised (Directed; trained; time management; career development; mentored; evaluated; and counseled) two seasonal monitors.
Training	5%	• McClellan instructed S-212 and assisted with Basic Fire School and Refreshers. READ Training. • Lang assisted with instructing Basic Fire School and Refreshers. • Monthly Structural Fire Refreshers. 24 hr Live Fire Structure Fire Refresher. READ training. • Lay attended Basic Fire Refresher. • Poser attended CPR/First Aid; Also-Orientation, Bear, Safety, All Employee, etc.
Miscellaneous	5%	• Performed maintenance and repair of the park's three NFDRS RAWs stations and three COOP stations. • Provided all geo-referenced plot photos to LANDFIRE with spreadsheet • Corrected errors in Fire Atlas Geodatabase • 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 - 2011

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 2011)	Assisted with how many BAER plans in 2011?
Glacier National Park	No	2010	0	0
Big Hole National Battlefield	No	-	0	0

Table 7. Monitoring - 2011

Park	% 2011 Data Entered	% 2011 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	100%	100%	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.

Table 8. Communicating Results - 2011

Park	# of Project Monitoring Reports completed in 2011	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
Glacier National Park	0	2	0	No
Big Hole National Battlefield	0	1	0	No

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

Table 9. Research - 2011

Park	Are research needs identified in FMP or Monitoring Plan? (yes or no)	# of Proposals Submitted in 2011	# of Proposals Funded in 2011	# of Research Projects Supported in 2011*	Additional Comments
Glacier National Park	Yes	1	1	3	Sibold, Assal, Stine
Big Hole National Battlefield	No		0	1	Rodhouse

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

E. 2012 Direction

We will have start up monitoring at Grant Kohrs Ranch. This is a project to reduce some very hazardous fuels that is very decadent and mostly dead willow along or adjacent to the Clark Fork River. This is an area that is adjacent to a EPA Superfund site due to slickens in isolated locations along the river that are a toxic remnant of the late 1800's and early 1900's copper smelting up river.

A continuing project will be working with Tom Rodhouse, of the Upper Columbia River Basin I&M Network, in monitoring the Lemhi penstemon at BIHO. If things line up, we could be burning this Fall and monitoring the response in 2013.

Big Prairie Fuel Manipulation and Burn will hopefully make it through compliance and the Fall will cooperate with completing the burn. This involves some study blocks within a burn unit where we will slash ~30-50% of the poles to provide an improved fuel bed. Previous burns in the 1990's limbed up many surviving pole sized trees and also provided a seedbed for lodgepole pine seedlings to reestablish. Subsequent burns have either not penetrated the thickets or do not burn hot enough to cause the desired mortality. It is hoped that the limited slashing will provide enough heat to reach the mortality objectives.

Three Graduate students and two PhD candidates have applied for grants with the George Wright Climate Change Fellowship Program and one with the Jerry O'Neal Fellowship to implement fire related research in the park. It is not likely that all five will get funded, and that some will change plans. This is an unknown workload at this time.

As time allows, we will continue the Post Fire Forest Composition project. This is a rapid inventory of tree seedlings and dominant shrub species along the trails in the 2001-2006 burn perimeters to identify which species are becoming established.

Continue work with the IMR Regional GIS staff on importing the Glacier Park Fire Atlas (1910 to present) into the IMR geodatabase and possibly WFMI.

Continue working with the National Center for Landscape Fire Analysis in modifying the GLAC Fire Atlas geodatabase to incorporate the national fire standards for fire reporting.

F. Optional Information

FFI issues

I have a Windows 7 computer, and do not have FFI running on it. I do have my old Windows XP computer that runs FFI, but IT is requiring that I turn it back in before the \$500 charge is required. Keeping up with SQL has its challenges; our IT staff does not have time, nor the skills to help us with issues in regards to FFI. We (Mike) spend a lot of time keeping it running on all the computers, and we luckily have Admin rights. With Windows 7 it could be even more difficult; presently I am the only one with it, but all computers are being upgraded in the next month or so.

A significant challenge this year could very well be maintaining full staffing. We have had the situation for two years in a row where a new hire resigns in May, and both times we were able to hire a STEP to fill the position for a part of the summer. Our HR Office is informing us that there will be major changes in the STEP and SCEP programs in going to Pathways. Trying to initiate hiring in early May or later would more than likely be too late to advertise. There would not be sufficient time to get the normal pre hire procedures (background check, medicals, etc.) completed and have the student/employee with enough “season” to fulfill the required DOI/NPS training and to be trained for their position before they would be required to return to school.