



Glacier National Park Fire Ecology Annual Report 2007 Calendar Year



Lee Ridge Fire with Chief Mountain in the background – Belly River area.

Summary

The Glacier Fire Effects Crew started the 2007 field season in late June by re-reading 24 non-native Butter and Eggs (*Linaria vulgaris*) and Sulphur Cinquefoil (*Potentilla recta*) plots within the Big Prairie North Fork Grassland Burn Units in the North Fork Subdistrict of the Park. Eleven (11) Long Term Monitoring plots spread throughout the Middle Fork Complex Fires of 2003 in the park were also re-read. Five new Long Term Monitoring plots were installed in the 2006 Red Eagle Fire on the east side of the park. Four (4) FMH FESC monitoring type plots were also re-read in the Big Prairie Burn Units in Glacier. The Fire Monitors took precise plot measurements and produced digital tree maps in ArcMap for PIPO and the FESC monitoring units in Glacier. The crew also attempted to relocate the 1999-2001 Eastside Grassland Project plots that fell within the 2006 Red Eagle Fire perimeter. Unfortunately, although the plots were GPS'ed and marked with large spikes, only one was relocated after a significant effort. All plot work was completed as scheduled, which is remarkable given that the ERC's (Energy Release Component – a drought and fire severity indicator) was above the 90 percentile from July 4th through September 18th.

In addition, the crew repeated photo points following mechanical treatment last summer at Park Headquarters, Logging Creek Ranger Station, and at Two Medicine. The crew also collected fuel moisture samples bimonthly throughout the season starting in May and produced reports for our fire staff, and provided them to the local zone cooperators.

We continued to monitor exotic weeds in the Big Prairie burn units in the North Fork Grasslands of the park this summer. This project was first started in 2002 to monitor Butter-and-Eggs (*Linaria vulgaris*) after it was noted that the thirteen FMH plots failed to capture its presence. In 2004 Sulphur cinquefoil (*Potentilla recta*) was added to the monitoring, as it too arrived in the burn units, but not in any of the plots. We re-read 24 Daubenmire transects, 4 of which burned in the Fall of 2005 in a prescribed fire. A preliminary report has been produced.

Fire suppression activity was very high in and around Glacier this year. Glacier received severity funding on July 18th, which of course, changes everything, and it was not until the 18th of September, when the Fall rains arrived, that fire danger fell. The most significant fire of 2007 was the Lee Ridge Fire, see cover photo. Mike McClellan, Lead Fire Effects Monitor, responded as the ICT4 along with most of the Glacier Fire staff including all of the fire monitors. This was a critically important suppression event given the recent 2006 Red Eagle Fire that started in the park and quickly burned onto Tribal Lands burning about 15,000 acres of Timber Trust Lands. The very real possibility of the Lee Ridge Fire becoming an escaped fire due to the close proximity and continuous fuels to the Blackfoot Tribal Boundary (~2.75 miles) and to Chief Mountain (~2 miles), which is a sacred religious site, can not be over emphasized. The political fallout of yet another fire exiting the park onto the Tribal Lands might have led to extremely tenuous park/tribal relations. The fire complexity was closer to a Type III Incident with McClellan coordinating Waterton Lakes NP Helitak, Alberta Provincial air tankers, USFS air tankers, BIA firefighters, and many park resources for the initial 24 hours. The fire was caught due to excellent coordination by all fire management staff, but especially the work performed on the fireline. It was held to approximately 4 acres.

The Fire Effects crew assisted with fire management actions on nine suppression fires within the park and zone. The crew also assisted the suppression crew with Initial Attack coverage and with fuel reduction projects primarily on the days off with fire severity funding.

The crew received valuable training opportunities this season from courses offered through the local NW Montana Zone and Northern Rockies Training Center in Missoula. The crew taught and assisted with annual fireline refreshers, while McClellan instructed units at S-244 - Field Observer and Fire Effects Monitor, and one sessions of S-212 – Wildland Fire Chainsaws and helped with follow-up certification.

The crew performed annual maintenance and repair of the park's three NFDRS RAWS stations throughout the summer.

All of Glacier's permanent staff attended the FEAT/FIREMON Integrated (FFI) Beta training in Missoula, MT and will assist Nate Benson by being a beta testing park. Workload is undetermined at this time, but may include not only Glacier, but assisting other parks with getting their data integrated.

The permanent staff assisted park Roads and Trails Divisions with approximately 6 days of cleanup after a windstorm in early November laid thousands of trees down throughout the park closing roads and making numerous trails impassable. The fire ecology staff also assisted in fuels work and spent upwards of 20 person days burning piles.

Table 2. Fire Effects Plot Workload 2007

Park	Monitoring Unit	Type of Plot (FMH, photo point, other)	Pre-	Immed. Post	Postburn (1-20 yrs)	Total Plots
Glacier	NF Grassland	FMH Forest plot			4	4
Glacier	NF Grassland	Daubenmire non-native plots			24	24
Glacier	2003 Fires	Long Term Monitoring			11	11
Glacier	2006 Red Eagle Fire	Long Term Monitoring			5	5
Glacier	Fuel reduction park-wide	Photo Point	12		28	40
Total			12		72	84

Table 3. Fire Ecology Staffing 2007

Monitor	Starting Date	Ending Date	# of Pay Periods	Training and Development
Dennis Divoky	1/1/07	12/31/07	26	Zone Coordinator and Lead Instructor for S-244 Field Observer and Fire Effects Monitor, coordinator for park Resource Advisor course, Online Sec 7 Training, Structural Firefighter II Refresher (3 days), Forest Disease and Insect Training (local), FFI Beta Training
Mike McClellan	4/1/07	12/31/2007	19	FFI Beta Training
Scott Lang	4/30/07	11/10/07	14	RX-410, L280, Structural Fire Refresher, Monthly Structural Fire Training, Annual Fire Refresher, FFI Beta Training. Worked for Carl Key for the month of April (CBI). FFI Beta Training
Jason Stoffer	5/29/07	9/20/07	8.5	S-130, S-190, L-180, I-100, B3, GIS, S-244
Matthew Heinz	5/29/07	9/27/07	9	S-130, S-190, L-180, I-100, B3, GIS, S-244
Carrie Gibadlo	5/29/07	9/27/07	9	S-130, S-190, L-180, I-100, B3, GIS, S-244

Table 4. Management Objectives and Monitoring Results 2007

Monitoring Unit	Management Objective (Restoration)	Monitoring Results (90% confidence interval)	Objective Achieved?
Ponderosa pine	Limit overstory Ponderosa pine mortality to $\leq 20\%$ at year 5.	Mortality = 36% ($n=18$ plots, 4 unique fires*)	No
	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
	Maintain 95% relative cover by native herbaceous species 5 years postburn.	Non-native species = 3.9%	Yes

Initial analysis resulted in a 36% reduction for overstory (dbh > 15.1cm) Ponderosa pine across all 18 of the plots in the monitoring type. The fire management objective was to limit mortality to 20%. The 20% target was an agreed upon desired condition among the Vegetation Ecologist (Carolyn), Fire Ecologist (Divoky), Fire Management Officer (Vanhorn) and the Regional FMO at the time (Dan O'Brien). It was a sociological limit rather than a science based limit. Various burn units in this pine monitoring type were burned wholly and partially by prescribed fire, wildfire, and fire use with a wide gamut of resultant fire severities. The prescribed burned plots

did meet the $< 20\%$ mortality, but not surprisingly, the wildfire and fire use did not, skewing the overall results. Poles (2.5 – 15.0cm dbh) were reduced by 35% with the fire management objective looking for a reduction of 30-80%. The almost 4% increase in non-natives would be alarming if not for the fact that all of the species were exclusively naturalized non-natives such as dandelion, timothy, and the various clovers. None of the non-natives were noxious weeds. Further analysis will be performed on the Ponderosa pine Monitoring Type the winter of 2007/2008.

*There is a significant challenge in analyzing and presenting this five year data. Two plots were burned only by prescribed fire, 6 plots burned in a WFU, 2 plots burned in a prescribed fire and subsequently reburned in a WFU, and finally 4 were burned entirely in a wildfire. This does provide a unique opportunity to compare and contrast the various fire entries, but it also eliminates any solid statistical analysis due to limited plot numbers in any one fire type.

Table 5. Fire Ecologist Accomplishments/Focus Area

Category	Percent Time	Accomplishments/Focus Areas
Planning	5	• Worked with Fuels Specialist on multiple projects within the park at Two Medicine and Goat Haunt. Assisted with Burgard's Google Earth Fire Information project. • FMP Annual Review; 1 day • FPA planning; 3 meetings
Presentations and preparation	10	• GNP Interpretation Staff Training – 12 hours (11 hrs prep and 1 hr presentation) on Fire Ecology and Management • Provided fire ecology training to St Mary Interpretive staff for a half day Red Eagle Fire Nature walk. (2 hours prep, 4 hrs on the trail) • Taught a one hour fire ecology session to a graduate level class from the University of Montana. • Advanced (long term employees) Park Concessions Training - Fire Ecology and Management training, 8 hours (7.5 hr prep and .5 presentation) • Taught S-190 at Basic Fire School, assisted with 8 hr refreshers; 12 hrs • GAO Global Climate Change Meeting; .5 hour presentation • Glacier Institute Class – cancelled due to high fire severity • Provided Fire Effects Training for Lewis and Clark FUM; 2 days
NPS Meetings/ task groups	15	• Participated in Ranger Warden Meeting, Waterton Lakes NP; two days • Participated in the Red Eagle Fire AAR; one day • Participated in the GNP Division Meetings; two all day • Participated FNF/GNP Fire Management Pre + Post season Review Meetings; 1 day • Participated GNP Public Information Review • Participated the Stratton LANDFIRE/FPA Planning Meeting • Participated the Vital Signs Rocky Mountain Network Technical Committee Meeting held at GNP, 1 day • Attended FFI Beta Training in Missoula; 3 days
Interagency work	10	• Hands Across the Border Annual Meeting; one day. Canadian and US counterparts preseason fire planning meeting. • FPA meetings; 3, Kalispell, MT • Wildland Fire Use Conference - Lubrecht Forest, 3 days • Bob Marshall Wilderness Complex Fire Meeting; one day
Fire Assignments	10	• Park WIMS and WeatherPro3 Manager • Duty Officer throughout fire season; two days a week • Park BAER Liaison for the Red Eagle Fire • Burn Boss at Goat Haunt pile burning.
Research	<5	• Reviewed one NSF proposal - Assessing and Adaptively Managing Wildfire Risk in the Wildland-Urban Interface for Future Climate and Land Use Changes at Glacier National Park and Flathead Valley, Montana; Anthony Prato. • Assisted David McKensie Landscape Ecology Masters project - Early post-fire successional trajectories in Glacier National Park, Montana with his first field season. • Assisted Karen Riley Red Eagle Fire Remote Sensing Project. • Worked with Kathy Tonneson in regards to fire research needs.
Data analysis	7	• Familiarization with FEAT/FFI Summary Builder and PIPO and FESC monitoring types analysis
Supervision/Admin	10	• Hiring, supervision, travel, payroll. Training; ethics, computer security supervisory, Smart Card, driver safety, and Government CC Supervisor. • Managed project accounts and acquired supplies and materials for fire

		monitoring.
Training	15	• Zone Coordinator for S-244 Field Observer/FEMO Course; 24 hours with 40+ hours prep • NPS Structural Firefighter Level 2 Live Fire Refresher, 3 days • Monthly Structural Fire Training, 2 hours • Taught GPS skills to Wilderness Rangers and Fire Staff, 8 hours
Miscellaneous		• Spent one day with Brad Hawkes, Canadian Fire Researcher who specializes in forest insects and their relationship to fire. • GIS Map products for fire management and other divisions. • Co-wrote the Divide Creek Flood Mitigation Project Report with Compliance Officer Mary Riddle for the 2007 GNP Tribal Relations Report. • Attended Science and History Day; WLNP and GLAC research and resource presentations. • Error checking GNP Fire Atlas Geodatabase; 150+ hours. • Participated in GNP Vegetation Mapping handoff meeting • Wrote fire and weather summaries for park yearly summary reports for Concessions, Backcountry, North Fork Subdistrict, and Re-vegetation reports.

Table 6. Fire Effects Crew Accomplishments

Category	Percent Time	Notes
FMH plots	1%	• Post re-reads of 4 FMH plots at Glacier.
CBI plots	2%	• 9 CBI plots completed in 2006 Red Eagle Fire
Other plot work	25%	• Daubenmire – Exotic plant monitoring in prescribed fire units (<i>Linaria vulgaris</i>) (<i>Potentilla recta</i>) • Long Term Monitoring – Completed 11 re-reads of plots from the 2003 fires. Put 5 Long Term Monitoring plots in the 2006 Red Eagle Fire. • Photo Point re-takes of plots in West Glacier, Logging Ranger Station, and Two Medicine Fuel Reduction Projects.
Fire Assignments	20%	• Assisted with Fire Suppression on nine (9) fires in and around Glacier National Park with multiple assignments. Two months of severity overtime and extended hours.
Fuels Project work	5%	• Assisted Fire Crew as part of IA stand by.
Data entry	10%	• Completed entry of all data from 2007 field season. • Utilized FEAT to enter data from Daubenmire plots.
Data analysis	7%	• Lang pulled together some early analysis on the FESC Monitoring Unit Daubenmire Non-native plots.
Supervision/Admin	10%	• McClellan hired three seasonal monitors. • Lang supervised seasonal employees.
Training	5%	• McClellan instructed units in S-244, S-212, GPS Class and Basic Fire School. • Lang assisted with instructing S-244, GPS Class, and Basic Fire School. • Fire effects crew (all were new) attended Basic Fire School. • Orientation, Bear, All Employee, Aviation Safety, etc. • McClellan/Lang FEAT/FFI Beta Training
Miscellaneous	15%	• Collected fuel moisture samples every two weeks throughout season and reported to neighboring agencies. • Performed maintenance and repair of the park's three NFDRS RAWS stations. • Checked and entered fire history data in the park's Fire Atlas geodatabase. • Assisted other park divisions in clearing roads and trails after a major blow down event in November.

Over the next 6 to 12 months what do you anticipate to be your primary areas of focus? Provide a rough break out of how much time you anticipate to spend in these areas and a short description of what you will be doing.

- Perform analysis and report on Five Year Ponderosa pine data; 20%.
- Convert Long Term Monitoring database (Access) to FFI; 10%.
- Continue work on Glacier Fire Monitoring Plan; 10%.
- Attend Supervisory and Fire meetings to provide input; 5-7%?
- Work on Glacier Fire Atlas Geodatabase. Complete the truthing of historic fire locations and perimeters with the Individual Fire Reports; 15%.
 - Prepare and Coordinate Zone S-244, Field Observer and Fire Effects Monitor Course; 7%.
- Structural Fire Brigade; 3-5%.
- Work with Fuels Specialist on the Two Medicine and Many Glacier Fuel Reduction Project; 3%.