



**National Park Service
Fire Ecology Annual Report
Colorado Front Range and Northwest Colorado Park Clusters
Calendar Year 2010**

A. Summary

The 2010 field season was an interesting one for the Rocky Mountain fire effects crew. Both Rocky Mountain National Park (ROMO) and Great Sand Dunes National Park and Preserve (GRSA) experienced the largest fires recorded since the parks were established. Monitoring efforts focused on ROMO and Dinosaur National Monument (DINO). Monitoring efforts at DINO focused on plots in the East Cactus, Dry Woman, West Cactus I, West Cactus II, Lower Disaster Falls, Disappointment Draw, and Zenobia Basin project areas as well as plotwork in the headquarters housing area evaluating cheat grass (*Bromus tectorum*) eradication work. In July and again in September/October the crew was heavily involved in supporting the Cow Creek incident in a number of different capacities from monitoring and decision support to logistical support. The remainder of the summer was spent at Rocky establishing FMH plots, conducting post-burn plot reads, entering data, conducting exotic and rare plant surveys, monitoring live and dead fuel moistures, participating in fire assignments, and taking advantage of local training opportunities.

Plot work

ROMO	8 Pre-burn Installs
	5 Year 01 Post-burn reads
	11 Year 02 Post-burn reads

Year-1 plot visits were conducted in 4 plots in the Big/Common Sagebrush type (FARTR1D05) these plots were burned in the Estes Valley prescribed burn in the fall of 2009; one year-1 plot was read in the Front Range Ponderosa Pine type (FPIPO1T09), also burned in the Estes Valley prescribed burn. Year-2 plot visits were conducted in 2 Big/Common Sagebrush plots, 3 Front Range Ponderosa plots, 5 Ponderosa Savanna plots and 1 Lower Montane Mixed Conifer plots. All Year-2 plots were burned in the first phase of the the Estes Valley prescribed burn in the fall of 2008. Eight plots were installed (or previously installed plots were revisited) in the Front Range Ponderosa Pine type (5 plots), Lower Montane Mixed Conifer type (2 plots) and Ponderosa Savanna type (1 plot). These plots were established within the North Lateral Moraine project area. Post-burn plot visits were conducted following the Upper Beaver Meadows

prescribed burn. Despite the demands of large wildfires at 2 of our parks, all scheduled plots visits were completed in 2010.

DINO 20 YR07+ visits
 48 YR20+ visits

The fire effects crew resampled monitoring plots associated in the East Cactus, Dry Woman, West Cactus I, West Cactus II, Lower Disaster Falls, Disappointment Draw, and Zenobia Basin prescribed burns and the Headquarters housing area cheat grass project. Data were collected following existing protocols developed by DINO resource management personnel. The crew was able to catch up on the backlog of plotwork that has existed at DINO for many years. Additionally, DINO staff was able to enter all historical plot data into Excel from hardcopy datasheets. It is hoped that FFI developers will be able to take this electronic data and convert it into a format suitable for FFI.

Fuel moisture monitoring

The crew continued live fuel moisture monitoring on both sides of the park (ROMO) in established locations as well as onsite during the Cow Creek incident. Species monitored throughout the fire season were ponderosa pine (*Pinus ponderosa*), lodgepole pine (*Pinus contorta*), sagebrush (*Artemisia tridentata* ssp. *vaseyana*), and bitterbrush (*Purshia tridentata*). Additional monitoring of duff, litter, 100-hour, and 1000-hour fuels also was conducted. See graphs of seasonal trends in Appendix A.



Cow Creek Fire, Rocky Mountain National Park June 25, 2010

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

Park	Monitoring Unit	Type of Plot	Pre-treatment	Immediate Post	Post-treatment (1+ yrs)	Total Plots
Black Canyon of the Gunnison	Green Grizzly	Transect				8
Total						8

Park	Monitoring Unit	Type of Plot	Pre-treatment	Immediate Post	Post-treatment (1+ yrs)	Total Plots
Dinosaur	Bear Fire	Transect				6
	Bighorn Basin Rx	Transect				10
	Buster Flats	Transect				10
	Chew Basin	Transect				15
	Disappointment Draw	Transect			10	10
	Dry Woman	Transect			10	10
	East Cactus	Transect			10	10
	Green Mountain Slope	Transect				9
	Iron Mine Draw	Transect				5
	Iron Springs Bench	Transect				11
	Lower Disaster Falls	Transect			10	10
	Pearl Park Rx	Transect				10
	Peterson	Transect				6
	Pot Creek	Transect				10
	Ruple Ranch	Transect				8
	Slaugh Wall Rx	Transect				10
	Split Mountain	Age analysis				20
	Success	Transect				9
	Thanksgiving	Transect				8
	Triple C	Transect				9
	West Cactus I	Transect			10	10
	West Cactus II	Transect			10	10
	Zenobia Basin	Transect			8	8
Total			0	0	68	224

Park	Monitoring Unit	Type of Plot	Pre-treatment	Immediate Post	Post-treatment (1+ yrs)	Total Plots
Colorado	Liberty Cap	Transect				7
	Monument Mesa	Transect				2
	Red Canyon	Transect				4
	Ute Mesa	Transect				15
Total						28

Park	Monitoring Unit	Type of Plot	Pre-treatment	Immediate Post	Post-treatment (1+ yrs)	Total Plots
Rocky Mountain	Front Range Ponderosa Pine	FMH Forest plot	5		4	19
	Ponderosa Savanna	FMH Forest plot	1		5	14
	Eastside Lodgepole Pine – Manual Treatment	FMH Forest plot				6
		Photo point				73
	Big/Common Sagebrush	FMH Forest plot			6	8
	Lower Montane - Mixed Conifer	FMH Forest plot	2		1	21
		Photo point				3
	Grand Lake HFR	Rapid Assessment				8
	Lodgepole Pine – West Slope	FMH Forest plot				14
	Deer Mtn HFR	Rapid Assessment				12
Total			8		16	178

Park	Monitoring Unit	Type of Plot	Pre-treatment	Immediate Post	Post-treatment (1+ yrs)	Total Plots
Great Sand Dunes	Pinyon Flats HFR	Photo point				7
	San Luis Valley - Ponderosa Savanna	FMH Forest plot				6
	San Luis Valley - Rabbitbrush Prairie	FMH Brush Plot				19
	San Luis Valley - Rabbitbrush Prairie	FMH Forest plot				2
Total						34

Park	Monitoring Unit	Type of Plot	Pre-treatment	Immediate Post	Post-treatment (1+ yrs)	Total Plots
Florissant Fossil Beds	Mixed Conifer - Manual Treatment	FMH Forest plot				4
	Mixed Conifer - Manual Treatment	Photo point				70
	Ponderosa Pine	FMH Forest plot				2
	Ponderosa Pine - Manual Treatment	FMH Forest plot				3
	Ponderosa Savanna	FMH Forest plot				3
Total						82

	Pre-treatment	Immediate Post	Post-treatment (1+ yrs)	Total Plots
Total all Parks	8		84	554



Cow Creek Fire, Rocky Mountain National Park, August 5, 2010

Table 2. Fire Ecology Staffing 2010

Monitor	Starting Date	Ending Date	# of Pay Periods	READ Qualified	Training and Development
Sam Coffin (lead)	5/10/2010	11/19/2010	14 (last 3 pay periods funded through project work)	No	Refresher; Hazardous Materials; Bloodborne Pathogens; Chainsaw Refresher; Grass Identification; First Aid/CPR; detail with Alpine IHC; detail with Black Hills WFM
Frank Szajko	5/10/2010	10/7/2010	11	Yes	Refresher; Hazardous Materials; Bloodborne Pathogens; Chainsaw Refresher; Grass Identification; First Aid/CPR
Nathan Williamson	N/A	N/A	26	Yes	Refresher; S-495 (Geospatial Fire Analysis, Interpretation, and Application); READ training (Resource Advisor); WFDSS (Wildland Decision Support System (workshop and online); Long-Term Analyst (LTAN) mentee assignment with Type 2 Team; ROMO Resources Stewardship Retreat; Portable Repeater training; First Aid, CPR; chainsaw refresher; S-491 instructor; S-290 instructor/ coordinator

Table 3. Management Objectives and Monitoring Results

Monitoring Unit	Management Objective	Monitoring Results (80% C.I.)	Objective Achieved?
Front Range Ponderosa Pine	40-80% total fuel reduction	36.3% reduction in total fuel load (n=9; 4 burns)	NO , but minimum sample size not achieved
	Limit overstory PIPO mortality to 5% within 5 years post-burn	28.6% reduction in overstory PIPO (n=1; 1 burn)	NO , but data only from one plot
	generate 5-35% mortality in pole-sized trees within 5 years post-burn	100% reduction in pole-sized trees (n=1; 1 burn)	NO , but data only from one plot
Ponderosa Savanna	40-80% total fuel reduction	1.1% reduction in total fuel load (n=7; 4 burns)	NO
	Limit overstory PIPO mortality to 5% within 5 years post-burn	5.9% reduction in overstory PIPO (n=4; 2 burns)	NO , but minimum sample size not achieved
	generate 5-30% mortality in pole-sized trees within 5 years post-burn	12.5% reduction in pole-sized trees (n=4; 2 burns)	NO , but minimum sample size not achieved
Lodgepole Forest Westside	40-80% total fuel reduction	54.1% reduction in total fuel load (n=4; 2 burns)	YES , but minimum sample size not achieved
	generate 10-45% mortality in overstory trees within 5 years post-burn	1% increase in overstory trees (n=3; 1 burns)	NO
Eastside Lodgepole Pine Manual Treatment	80-100% woody fuel reduction	24% reduction in woody fuel load (n=5; 1 treatment)	NO , but minimum sample size not achieved (<i>Note: when considering fuels > 1", fuels reduction is 69.2%</i>)
		24.1% reduction in overstory trees (n=5; 1 treatment)	N/A (<i>objectives not specifically tied to overstory density</i>)
		73.3% reduction in pole-sized trees (n=5; 1 treatment)	N/A (<i>objectives not specifically tied to pole-sized tree density</i>)
Lower Montane Mixed Conifer	40-80% total fuel reduction	52.2% reduction in total fuel load (n=8; 2 burn)	YES
	generate 10-25% mortality in overstory trees within 5 years post-burn	42.6% reduction in overstory trees (n=2; 1 burn)	NO , but data only from two plots
	generate 10-25% mortality in pole-sized trees within 5 years post-burn	30.3% reduction in pole-sized trees (n=2; 1 burn)	NO , but data only from two plots

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	25%	- Continued writing EA, BA for ROMO FMP - USFWS consultation for ROMO FMP and FMP EA - Participated in development of fuels plans, review of burn plans for ROMO, FLFO, GRSA
Presentations	5%	- NPS RAWs presentation at Fire and Aviation Management Workshop: San Antonio, TX - Canopy burning project presentation (poster) at Fire and Aviation Management Workshop: San Antonio, TX - Canopy burning project presentation (poster) at ROMO Research Conference: Estes Park, CO - NPS fire management planning presentation at Front Range Fuels Treatment Roundtable Implementers meeting: Lakewood, CO - Fire ecology presentation to student group from Northwest College: ROMO
NPS Meetings/ task groups	5%	- IMR RAWs Coordinator - Attended NPS Fire and Aviation Management workshop - Attended National STARFire workshop - Attended ROMO Resource Stewardship Retreat
Interagency work	5%	- Assisted in data development/entry/analysis of interagency FPA data - Attended Front Range Fuels Treatment Partnership meetings, conference calls as a core team member
Wildfire Assignments	10%	- FARS/LTAN mentee with Rocky Mountain Area IMT2A on Medano incident: GRSA - Decision support on Cow Creek incident: ROMO - Portable RAWs maintenance on Cow Creek incident: ROMO - In-park (ROMO) initial attack
Prescribed Fire Assignments	<5%	Lead FEMO on ROMO prescribed burn operations
Non-fire Fuels Projects	0%	
Research	5%	- Assisted with JFSP proposal (federal collaborator, fiscal representative) - Collaborated with Colorado State University researchers on canopy reduction project at ROMO - Collaborated with USGS researchers on mountain pine beetle project at ROMO
Data collection	<5%	Monitors completed bulk of data collection
Data entry	5%	Monitors completed bulk of data entry
Data analysis	5%	Completed annual report, continuing analyses of previous season's data
Supervision/Admin	20%	- Hired, supervised, trained monitoring crew, completed evaluations - Developed work schedule, priorities - Travel and time paperwork

Training	5%	• S-495 (Geospatial Fire Analysis, Interpretation, and Application) • READ (Resource Advisor) • Firefighter refresher • Chainsaw refresher • WFDSS webinars, workshop • Portable repeater set up and use • First Aid, CPR
Miscellaneous	10%	• Rural Fire Assistance/Community Assistance grant administration/coordination • Attended Arthur Carhart Wilderness workshop • DINO RAWS maintenance, first responder duties • GRSA RAWS maintenance, first responder duties • S-491 Cadre member • S-290 coordinator/instructor • Acting Fire Management Officer duties • Field tested particulate monitoring equipment with Colorado Air Pollution Control Division staff



Medano Fire, Great Sand Dunes National Park & Preserve, June 23, 2010

C. Fire effects crew accomplishments and areas of focus

Table 5. Fire Effects Crew Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	20%	Estimated amount of time spent collecting plot data; includes any preparation time.
WUI plots	<5%	
CBI plots	0%	
Other plot work	20%	DINO fire effects monitoring plots, rare plant surveys
Wildfire assignments	20%	FEMO, FFT2, FFT1/ICT5 trainee assignments
Prescribed fire projects	<5%	Estimated amount of time spent assisting with prescribed fire projects; include project preparation, fire assignments (e.g. FEMO, FFT1) and READ activities
Non-fire fuels projects	5%	Estimated amount of time spent assisting with non-fire fuels projects; include READ activities
Data entry	20%	Estimated amount of time spent entering data from paper to PC
Data analysis	<5%	This is expected to be very low number or zero for fire effects crew/lead monitor
Supervision/Admin	5%	Payroll, travel authorization/voucher, etc.
Training	5%	• Refresher • Hazardous Materials • Defensive Driving • Saw Refresher • Grass Identification • First Aid/CPR
Miscellaneous	5%	Things that don't fit in other categories – search and rescue, assisting other work groups, etc.

D. Additional Information

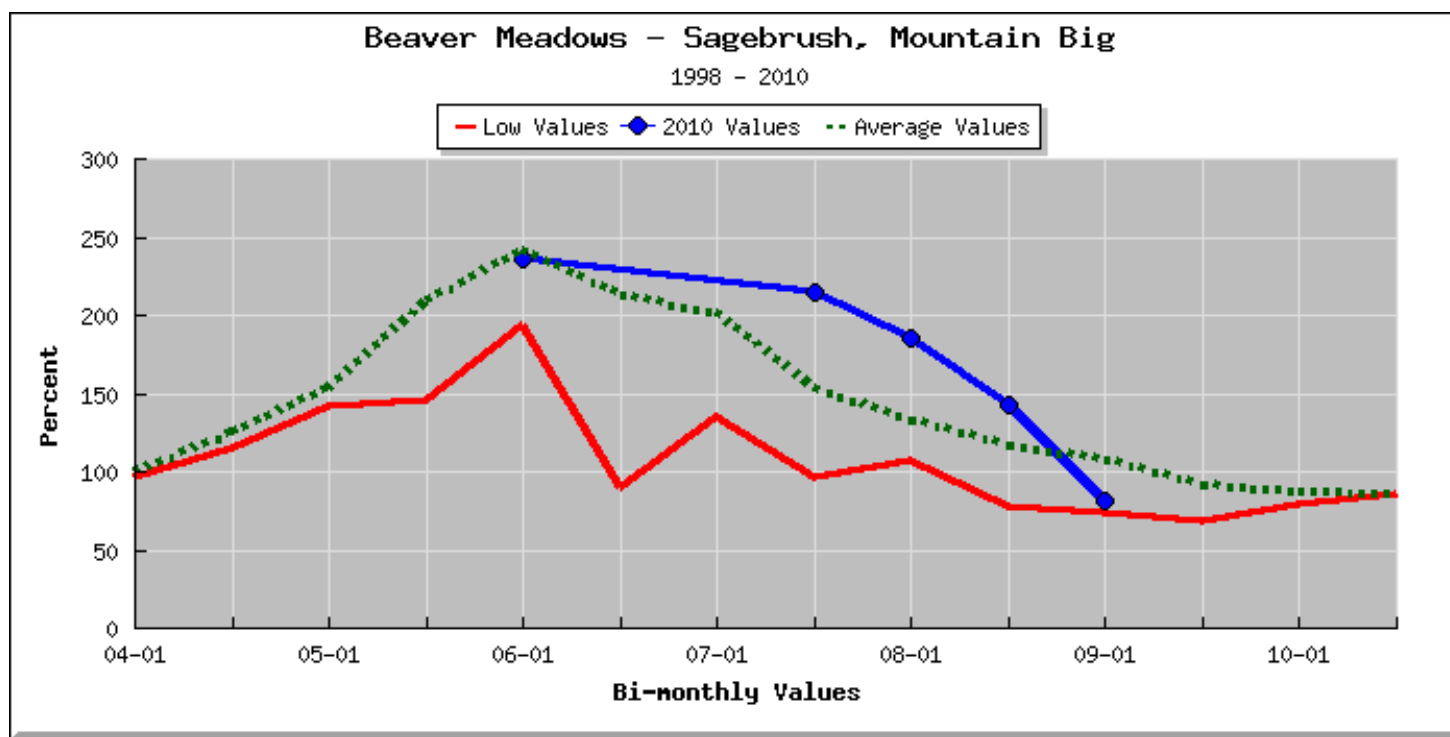
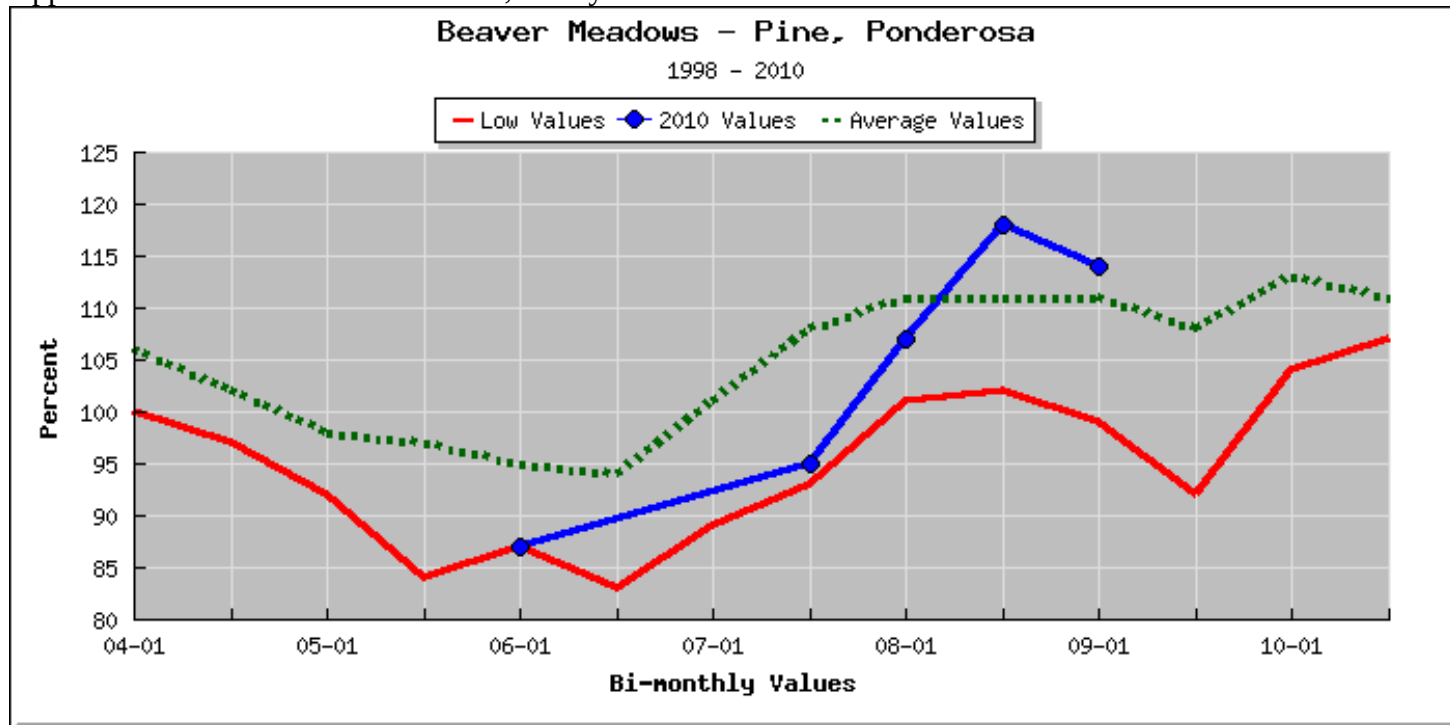
Table 6. 2010 Data Entry and Projects Monitored

Park	% 2010 Data Entered	% 2010 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Black Canyon of the Gunnison National Park	N/A	N/A	0	0	0	0
Dinosaur National Monument	80%†	80%†	8	2	0	0
Rocky Mountain National Park	80%	80%	1	0	1	0
Great Sand Dunes National Park and Preserve	N/A	N/A	0	0	1	0
Colorado National Monument	N/A	N/A	0	0	0	0
Florissant Fossil Beds National Monument	N/A	N/A	0	0	0	0

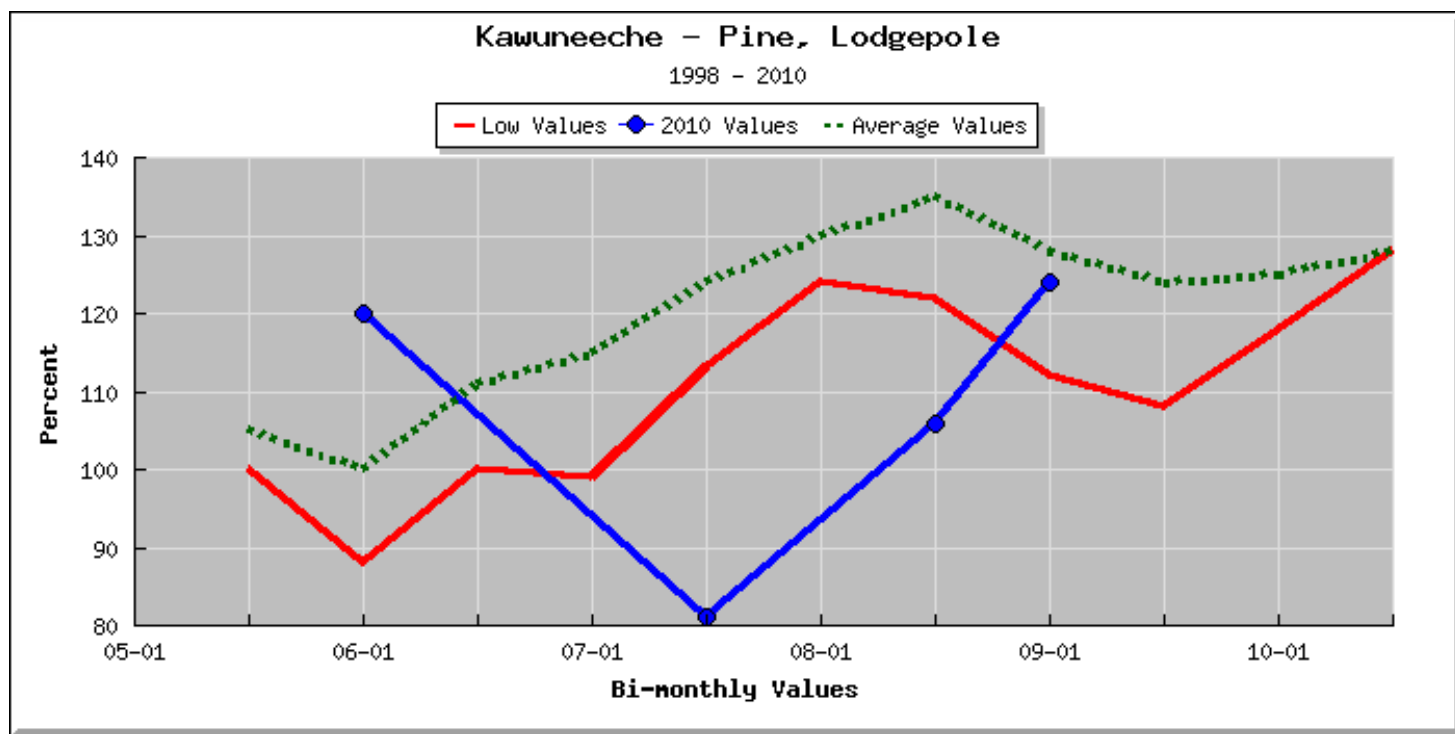
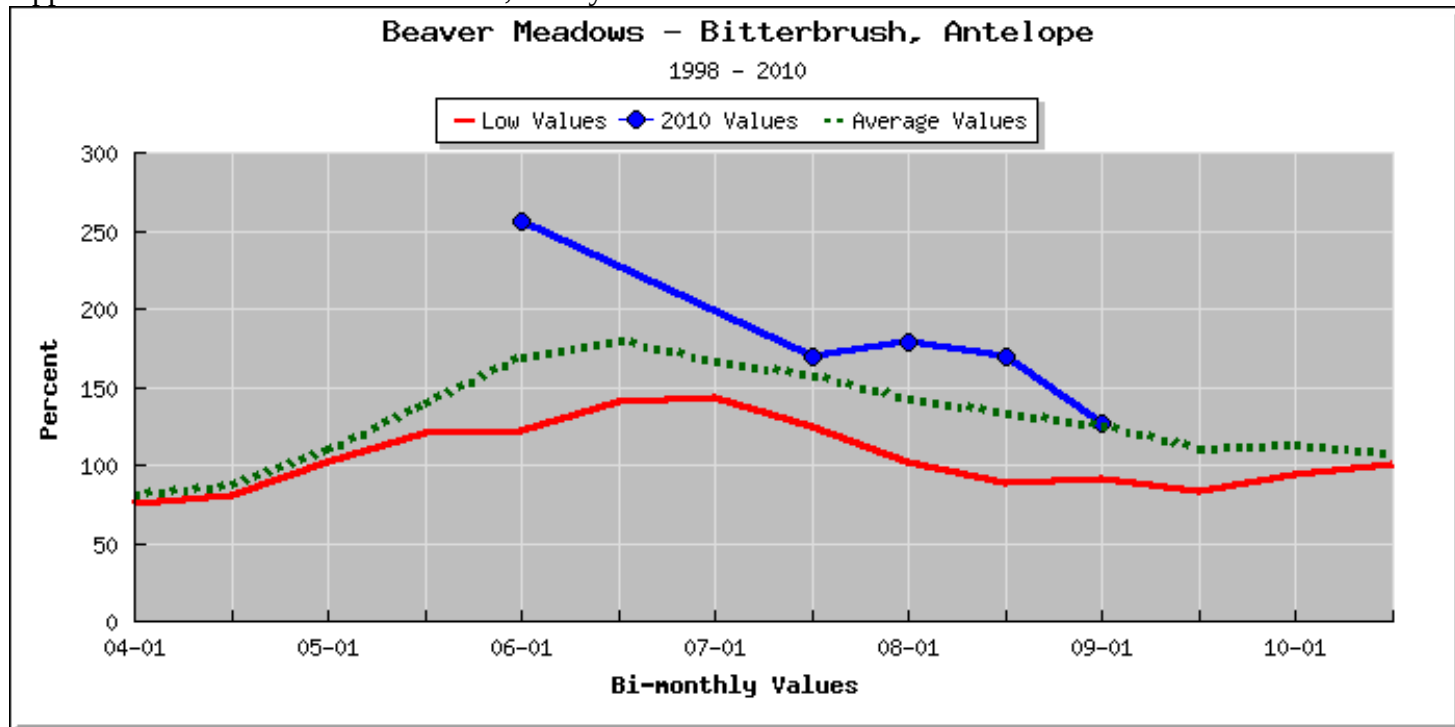
* Number of treatment units with treatment effects monitoring conducted. Include pre-burn and post-burn monitoring but not burn-day monitoring.

† Figures represent percent of data collected in 2010 that has been entered and quality checked. Does not include pre-2003 data that exists in Excel only.

Appendix A. Live fuel moisture trends, Rocky Mountain National Park 2010



Appendix A. Live fuel moisture trends, Rocky Mountain National Park 2010



Pine Beetle (in orange): 2001 – 2008

2001

2003

2005

2008

Map Credit: Ray Thomas (2008)

A photograph showing a large fire burning in a forest. Thick black smoke rises from the fire, and the flames are visible at the base of the trees. The fire appears to be consuming a large area of the forest floor and possibly some of the lower branches of the trees.



Lodgepole Crown Status	Number of trees	% of crown that carried fire
alive, not attacked	5	0%
attacked, still green	3	0%
mixed red and green needles	1	100%
80-100% needles remaining	3	100%
60-79% needles remaining	2	50%
40-59% needles remaining	3	0%



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