



National Park Service Teton Interagency Fire Fire Ecology Annual Report Calendar Year 2015

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Summary

The Teton Interagency Fire Ecology Program is dedicated to supporting wildland fire management for Grand Teton National Park and the Bridger-Teton National Forest in northwest Wyoming. The Ecology team accomplishes this mission through fire and fuels treatment effects monitoring, fire intelligence (weather and fuels), and planning analysis. They also serve as wildland firefighters for local, GACC, and national incidents. Finally, teaching is a special emphasis for the staff, who participate as instructors in numerous fire classes and committees. The Fire Ecology program has been in place for more than 15 years, with financial and leadership support from both the NPS and US Forest Service.

Table 1. Fire Ecology Program Personnel Summary with 2016 Experience and Training

Ecologist and Monitors	Starting Date	Ending Date	# of Pay Periods	READ Qual? (Yes or No)	Training and Development
Diane Abendroth Fire Ecologist	1/1/15	12/31/15	26	YES	2 LTAN trainee assignments 4 PIOF Assignments 1 GISS trainee assignment 1 shift ICT5 Women in Leadership Conference Yellowstone Fire Ecology Field Trip
Ron Steffens Fire Monitor	5/23/15	9/9/15	5.5	NO	1 Extended ICT3 Assignment 1 IA as ICT4 Detail to WASO International Assistance Program Duty Officer numerous times
Alex Spannuth Lead Fire Effects Monitor	4/6/15	11/1/15	18	NO	1 Aviation Fire Assignment 1 Aviation Detail to Yosemite NP 1 ICT5(T) Assignment

					2 Rx Burns 1 Managed Fire 33 Fire Operational Periods S-215, L-380, M-410, S-490 Completed TOLC Taskbook
Mary Lee Assistant Lead Fire Effects Monitor	5/13/15	10/15/15	11	YES	Lead Fire Effects Detail in Sept. 1 Teton Crew Assignment 1 Saguaro Wildland Fire Use Assignment 1 ARCH/READ Assignment 1 Rx 51 Fire Operational Periods S-215
Ruby Siegel Fire Effects Monitor	5/26/14	10/8/15	9.5	NO	1 Teton Wildland Fire Module Assignment 1 local IA 1 Managed Fire S-215, S-290 19 Fire Operational Periods Worked on FEMO S-215, S-290
Drew Narduzzi Fire Effects Monitor	5/26/15	10/15/15	10	NO	2 Teton Module Assignments (1 was 21 day) 1 Fire Use 37 Operational Periods Worked on FEMO S-215
David Rosas SCA NPS Academy Intern	5/26/14	8/7/15	5	NO	NPS Intern accomplished all monitoring and fire assignments above expectation. 1 Teton Crew Assignment 14 Fire Operational Shifts S-130/190

Fire Effects Program:

The 2015 Teton Interagency Fire Effects Crew had a dynamic and productive season in the field and on fires. They accomplished all scheduled plot work, data entry, and data checking in a timely manner while contributing the most possible effort and time to local and national fire needs. Over the course of four months and four out of park trips they were able to successfully read a total of 565 plots across a large geographic section of NW Wyoming (Table 2). In addition to their typical Teton Interagency Fire monitoring areas they were able to collaborate with Fossil Butte National Monument. Officially retired (but still active) botanist Clay Kite assisted with 10-YR Post Rx reads for the Rock Creek prescribed burn.

Fire Effects crewmembers contributed to local and national fire operations, ranging from ICT5 (T) and monitoring GTNP's only Fire Use of the season for a total of none different national assignments. This included two Teton Type II crews, three assignments with the Teton Wildland Fire Module, one detail with Saguaro Wildland Fire Module, two HECM details with Bridgeport Helitack and Yosemite Helitack, one fall prescribed burn Rx, and a single resource ARCH/READ assignment. Locally they did ICT5 (T) and monitoring of the River Bottom Fire in various capacities and supported the Matilda Rx and were on scene for initial attack on the Wolff fire. This amounted to a total of 153 fire operational periods for the 2015 season (Table 1).

The fire effects crew also participated in several training opportunities including S-130/190, S-215, S-290, L-380, M-410, and S-490). Alex contributed to the GRTE Scuba Dive team, and trained and mentored an SCA / NPS Academy Intern. He also was able to arrange for cross training work details with people from other departments within GRTE including revegetation technicians and weed crew members.

Table 2. Monitoring Workload for 2015

Park/Forest	Monitoring Unit	Plot Type	Pre-Burn/ MX 2014	Immed. Post 2014	Post (1-20 yrs) 2014	Total 2014
Grand Teton National Park	Signal Mountain BOR Gully Mechanical Thinning	Photopoints Stand Exams Chip Depth Plots	2 10	10		22
	Colter Bay Log Cabins MX	Stand Exams Photo Points			10 2	12
	Matilda Prescribed Burn	Photo Points Aspen Circles	2 30	5		37
Bighorn Canyon NRA	N/A – No projects monitored in 2014					0
Fossil Butte NM	Rock Creek Prescribed Burn	FMH Shrub Macroplots			6	6
North Zone Bridger-Teton NF	Heart 6 Rx	Stand Exams Photopoints	10 1			11
	Lower Palmer Rx	Shrub Intercept transects Photo Points			30 2	32
	Diamond L Rx	Aspen Circles Photo Points			90 6	96
	Dry Quad Rx	Aspen Circles Photo Points			60 2	62
	South fall Creek RX	Photo Points Shrub Intercepts Weed Transect	5 30 1			36
	Lower Gros Ventre RX Phase III	Photopoints Aspen Circles			13 60	73
	Rec Trails Mechanical Units 2 and 3	Photopoints Stand Exams	2 10			12
West Zone Bridger-Teton NF	Spring Creek RX	Shrub Transects Photo Points			5 2	7
	Blind Trail Fire	Photopoints			3	3
	Bug Creek RX	Species Comp & Cover Ground Cover Transects Photopoints	2 20 9			31
East Zone Bridger-Teton NF	Monument Ridge II RX	Ground Cover Transects Aspen Circles Photo Points			20 30 3	53
	Half Moon Rx	BFH Macroplots Photopoints			2 2	4
	Willow Rim Rx	Aspen Circles Photopoints			30 2	32
	Red Cliff MX	Stand Exams Photopoints		6 2		8
	Fremont II RX	BFH Macroplots Photopoints			4 4	8

	Red Cliff Slash RX	Browns Transects Photopoints	10 10			20
						TOTAL: 564

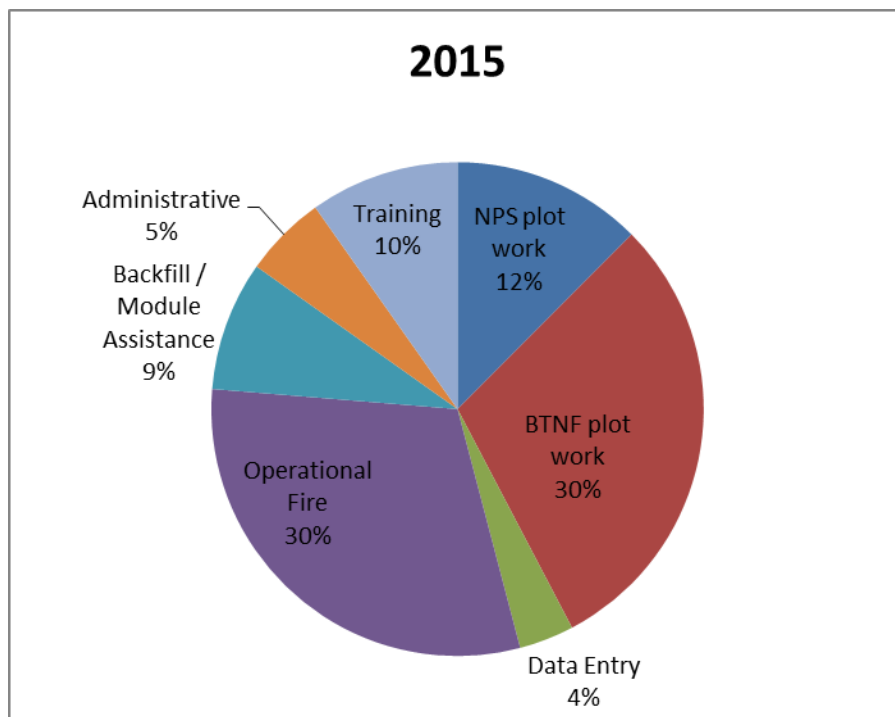


Figure 1. Fire Effects Crew Summer Time Summary

Table 3. 2016 Management Objectives and Monitoring Results. *All results shown are 80% confidence intervals of the mean if they are in **bold**.*

Park/Forest	Monitoring Unit	Management Objective	Monitoring Results	Objective Achieved?
Grand Teton National Park	Matilda Rx – Pre / Post	Reduce fuel loading to < 15 tons/acre Reduce average fuel bed depth to < 2" Reduce probability of torching trees by 50% in 90 th fire Wx Reduce visual obscurity to < 20% below 1.5 m Monitor exotic spp. pre and 2 YR post	Blackened 26% Photopoints show various fire effects from unburned to moderate severity	YES
	Colter Bay Log Cabins - Post	Reduce average visual obscurity to less than 30% (20%?) below 2 meters Reduce density of 3" and under trees to less than	Average Visual Obscurity is below 20% Pole and Seedling Trees remain above 200 per acre because small seedlings were not treated but pole size trees met objectives.	YES NO BUT YES

		200 TPA Reduce snags to 1 TPA	Snags were removed and overstory tree density was unchanged (already very wide spacing 24 x 24')	YES
	Signal Mountain BOR Gully Chipping – Immediate Post Mountain BOR Gully Mx - Pre	Reduce average visual obscurity to <20% under 2 m Reduce density of 3" and under trees to less than 200 TPA Reduce fuel loading to < 10 tons/acre Track initial depth of woodchip deposits and subsequent decomposition Detect changes in understory plant composition and cover	Pre Treatment: Visual obscurity was between 15% at 1.5m and 33% at the ground level. Average seedling density was 1499 per acre; pole density was 550/acre. Total woody fuel loading was 18.5 T/A Mode of Chip Depth was 0-2 mm. Max was 24 mm Very light residue Pre data on Vegetation	PRE ONLY YES PRE ONLY
	Signal Mountain Summit Mx Chipping – Yea r2 Post	Track initial depth of woodchip deposits and subsequent decomposition Detect changes in understory plant composition and cover	No significant change in chip depth from Immediate Post Apparent reduction in shrub community – reduced leaf cover in huckleberry and grouse whortleberry	YES NO
Park/Forest	Monitoring Unit	Management Objective	Monitoring Results	Objective Achieved?
North Zone Bridger-Teton NF	Lower Gros Ventre Phase III – YR05	Attain at least 1000 stems per acre 10 ft. + within 15 yrs. post Maintain aspen browse of terminal leader at < 30% Photopoints	Year 5 aspen sucker density was 3583/ac in Stand 1 and 2003/ac in Stand 2 Aspen browsing was 25% in stand 1 and 19% in Stand 2	YES SO FAR
	Lower Palmer Rx – YR01	Reduce live sagebrush cover to less than ???% Photopoints	Sagebrush was reduced to ,1% cover in monitoring stand	YES
	Diamond L Rx – YR10	Attain 2000-5000 aspen suckers/acre at 10 feet over 70% of the aspen cover type within 15 years post treatment with 80% statistical certainty Photopoints	One of three monitoring stands achieved this objective at Year 10 post (1393+/- 555)	SO FAR YES and NO
	Heart 6 Rx – Pre	Reduce dead and down woody fuel loading by 20-40% within identified treatment stands. Kill between 30% and 40% of the seeding and	PRE BURN: Total Woody Fuels 11.5 – 15.9 Tons/ac 340-740 seedlings/ac, 70-270 poles/ac	PRE DATA ONLY

		pole size conifer trees within targeted stands. Preserve live conifer trees >15" diameter breast height.	101 – 115 overstory trees/ac	
	Rec Trails Mx - Pre	Reduce total woody fuel loading to 7 tons/ac Create a canopy base height > 10 ft. Thin to a 15 x 15' spacing of overstory trees	PRE TREATMENT Stand 2 total woody fuels 9.6 tons/ac. Stands 1,3,and 4 8.7 tons/ac Stand 2 CBH 13 ft., Stand 1,3,4 CBH 9 ft. Canopy spacing 18' x 18'	PRE DATA ONLY
Park/Forest	Monitoring Unit	Management Objective	Monitoring Results	Objective Achieved?
West Zone Bridger-Teton NF	Spring Creek Rx – YR20	Enhance vegetation health Improve wildlife habitat	Recovery of sagebrush and bitterbrush has been very slow, different than anticipated in the 1990's. Grass and forb dominance with resprouting shrubs from rose family	YES
	Bug Creek Rx - Pre	Objectives still in development	Pre Burn sagebrush community with 18% Bare soil	PRE DATA ONLY
	Blind Trail Fire – YR15	Visually document vegetation response	15-year-old photopoint retakes show impressive aspen recovery	N/A
Park/Forest	Monitoring Unit	Management Objective	Monitoring Results	Objective Achieved?
East Zone Bridger-Teton NF	Monument Ridge Rx Unit II – YR05	Reduce sagebrush height and canopy cover Return ground cover to less than 40% bare ground in burned sage/grass communities one year post burn, and less than 20% in Year 5 Attain 3000 aspen stems/acre at 6 feet in height over 70% of the treatment areas within 5 years post-burn	Post burn 66% decline in Mountain big sage and 38% decline in silver sage cover Less than 20% bare ground observed in Year 5 (17.0 +/- 2.6%) Currently 5146 stems per acre, but the 6-10 ft. height class is not at the objective level (only 960/ac).	YES YES NO
	Freemont II Rx – YR10	Increase aspen suckering from 100-200 stems/acre to at least 5,000 stems/acre three years post-burn. Attain >80% ground cover in sagebrush/grass communities and aspen communities within 5 years post-burn. Within all burned aspen communities, attain 10 foot tall aspen sucker density of at least 1000/ac at or before 10 years post-	Aspen not monitored in 2015 – Protocol needs redesign in 2016 Sagebrush and bitterbrush slowly returning to the site. Native communities look great. 29% bare ground remains in burned sage communities, while control areas are only 2-7%.	UNK. YES NO

		burn.		
	Half Moon Rx / Fayette Fire – YR20	Improve age class diversity in shrub communities Increase the percent cover of grasses and forbs Maintain suitable ground cover	Young sagebrush and bitterbrush very slow to recover but are on site. No significant difference in herbaceous cover but these species clearly dominate the site. Cheatgrass has appeared. One burned plot is 31% bare ground, the other only 4%	YES MAYBE Yes and NO
	Willow Rim Rx – YR10	Attain 60% ground cover in burned aspen areas within 2 years post burn and 80% within 5 years post burn Attain 1000 stems per acre in burned aspen areas ≥10 feet tall within 15 years post burn.	Less than 10% bare ground in Year 10 post burn. 3886 +/- 721 suckers per acre in Year 10 post. Of this 263 +/- 96 stems are already over 10' in height.	YES Preliminary
	Red Cliff Mx – Pre / Post	Reduce Woody Fuel loading Reduce canopy fuels	Total down woody fuels reduced from 51.8 tons/ac to a still high 35.4 tins/ac Canopy base height drastically reduced with near total tree removal Canopy Bulk density reduced from .129 kg/m3 to 0.014 kg/m3.	NO YES YES
Park/Forest	Monitoring Unit	Management Objective	Monitoring Results	Objective Achieved?
Fossil Butte National Monument	Rock Creek	Achieve resprout density of 70% for serviceberry and snowberry two year post burn. Achieve 50% resprout density of bitterbrush 2 years post burn Achieve at least 1000 sagebrush stems per acre five years post burn	Serviceberry and snowberry did not achieve this objective in Year 2, but did by Year 5 Post Burn. Bitterbrush density was roughly 50% of preborn levels year 2 post burn. This was likely due to both mixed severity fire and resprouting. Bitterbrush cover has reached pre-burn levels in Year 10. Achieved in Year 2 due to mixed severity effects (Unburned areas). Burned areas have not recovered less than 30% of preborn sagebrush	NO AND YES YES YES and NO

Fuels Monitoring and Fire Outlooks

In 2016 Fire Monitor Ron Steffens continued to provide fire danger intelligence support for the park and forest. He provided monthly fire outlooks customized for the Tetonfires community that pull together predictive services material, drought and weather forecasts, and local fuels and weather sampling. These outlooks support local decisions on staffing and unplanned fire responses. Ron also completed an analysis of wildfire risk for the Teton County Fourth of July fireworks event.

Ron manages the fuels data collection program for Grand Teton National Park, which is now over 20 years old. This data is uploaded to the National Fuels Management Information Database.

In the early part of the summer Ron worked in Washington DC for the Department of Interior International Assistance Program doing website management and publicity. He also led a field trip in Montana for international visitors to show them how fire is managed in the US.

Ron's Type III Incident Management Team travelled to eastern Oregon in August to support several small fires in a remote part of the state during a particularly severe fire season. The Team was very well received by the local unit.

In spring and fall Ron's international fire outreach work took him to Malawi Africa and South Korea.

Monitoring Program Information

Table 4. Planning for NPS Units - 2016

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 2015)	Assisted with how many BAER plans in 2015?
Grand Teton National Park and JD Rockefeller Parkway	Yes, vague and potentially outdated	2009	45	0
Bighorn Canyon NRA	No	-	5	0
Fossil Butte NM		-	1	0

Table 5. Monitoring for NPS Units - 2016

Park	% 2016 Data Entered	% 2016 Data Quality Checked	# Prescribed Fires Monitored*	# Non-fire Fuels Treatments Monitored*	# Wildfires Monitored*	# BAER Treatments Monitored*
Grand Teton National Park and JD Rockefeller Parkway	100%	100%	2	3	1	0
Bighorn Canyon NRA	N/A	N/A	0	0	0	0
Fossil Butte NM	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 6. Communicating Results – NPS Units 2016

Park	# of Project Monitoring Reports completed in 2015	# of Annual meeting(s) with Park staff	# of Formal presentations of results	Do you use Minitab?*
Grand Teton National Park and JD Rockefeller Parkway	5	2	0	No
Bighorn Canyon NRA	0	0	0	No
Fossil Butte NM	1	1	0	No

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

Table 7. Research - 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*	Additional Comments
Grand Teton National Park and JD Rockefeller Parkway	yes	3	2	3	Supported two proposals by collaborators and one proposal for our own research.
Bighorn Canyon NRA	no	0	0	0	
Fossil Butte NM	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 - If your park(s) received Reserve Fund Research funding or completed a previously-funded project in the last year, please provide the following:

- Fire History Research Project: Phase I complete, Phase II underway, to be finished in early spring 2017. Two presentations have been given, 1 paper completed, and one RX Effects article submitted. Future deliverables include peer reviewed manuscript, two more presentations, GIS data, and two kinds of student curricula (youth and grad student level).

C. Fire ecologist accomplishments and areas of focus

D. Fire Planning

Aside from fire effects data analysis and reporting, Fire Ecologist Diane Abendroth was involved in two ID teams for fire and fuels treatments on the Bridger-Teton National Forest. These are both for large landscape scale projects that involve mechanical thinning and prescribed fire. For

the Teton to Snake EIS, she responded to a series of public concerns about the fire regimes and fire history of the Teton and Snake River Ranges. The Reserve Fund research projects Diane has developed are tied to understanding the fire regimes of these areas as well as GRTE. For the Skyline EA, Diane wrote the Sensitive Plants technical report and assisted with fuels data analysis and mitigations for weeds, whitebark pine, and aspen.

Diane is a faculty member on several national and regional NWCG cadres and assists with a variety of local fire effects and fire behavior classes as well. She is on the Wilderness Committee and GRTE, and belongs to the Interagency Aspen Management Working Group which has successfully launched community outreach programs and grant proposals that have been funded.

Table 8. Fire Ecologist 2015 Accomplishments/Focus Areas

Category	Percent Time	Accomplishments and/or areas of activities
Planning		• Skyline WUI Fuels Project ID Team and Specialist report. • Teton to Snake EIS specialist report, public meetings, response to comments. • GRTE Prescribed Fire and Mechanical Fuels Planning • Teton Interagency Fire Danger Rating Plan Revision Group
Presentations		• Northern Arizona University “Beyond Black Acres” Forestry Forum Presentation February 2015 • Aspen Days field trip leader, August 2015 • Fire Effects Results – Formal presentations for each zone on the BTNF.
NPS Meetings/ task groups		• GRTE Wilderness Committee • GRTE Fire Management Committee
Interagency work		Extensive with USFS, State of Wyoming, BLM, Teton County
Wildfire assignments		LTAN – T – 2 assignments PIOF – 3 Assignments ICT5 - 1 Assignment RXB3 – 1 Pile burn GISS-T – 1 Assignment
Prescribed fire projects		Planning projects with Park and USFS colleagues, formulating firing plans, objectives, exclusion areas, pre-treatment needs, fund raising
Non-fire fuels projects		Weed spraying plans for past and future RX burns, negotiating debris chipping prescriptions with SRM.
Research		• Fire History of the Jackson Hole Area with the Teton Science School • Fire Regimes of Douglas-fir forests – TSS and CSU • Aspen research with WGFD – using Fire Effects data • Effects of low severity small fires with U of Wisconsin (Hansen) • Resilience in the face of climate change in GYE with U of Wisconsin (Turner et al).
Data collection		• Support Lead fire effects monitor while he is on fire assignment • Assist with Feld work during shoulder seasons when crew is out of pay status
Data entry		Just for a few obscure protocols

Category	Percent Time	Accomplishments and/or areas of activities
Data analysis		Extensive for GRTE, FOBU, and BTNF
Supervision/Admin		Hiring, Recruiting, Re-hiring Lead Monitor. Assist with USFS Hiring panel. Assist with GRTE Law Enforcement Specialist hiring panel.
Training		Fire Classes: Taught RX310, RX510, S495, Safety refresher Units, S290 Took: S590
Travel out-of-park for plot or project work		A few times during the 2015 field season – Fossil Butte and BTNF
Miscellaneous		Grant Administration for RMEF funding for the Matilda RX Burn

D. Fire effects crew accomplishments and areas of focus

Table 9. Fire Effects Crew 2015 Accomplishments/Focus Areas

Category	Percent Time	Notes
FMH plots	0%	No FMH plots scheduled 2015
NPS plots	12%	Aspen circles, brown's lines, stand exams, shrub intercepts, and photopoints. Scheduled reads and new installs.
USFS plots	30%	Aspen circles, brown's lines, stand exams, shrub intercepts, and photopoints. Scheduled reads and new installs.
Wildfire assignments	28%	2 T2IA hand crew assignments, 4 Wildland Fire Module (WFM) assignments, 2 Helitack assignments, 1 Single Resource assignment, 1 in park FX crew support fire.
Prescribed fire implementation	2%	1 RX (Matilda), w/ pre and post assistance.
Module Support	8.5%	Fuels reduction projects, backfill/step up staffing (E3, Module, Helitack), SAR, Signal MT dogpile, Matilda weed spray, GRTE Dive Team. -excludes weekend/lieu day staffing
Data entry	3.6%	FFI, FVS, Excel
Data analysis	0.5%	FFI, FVS, Excel
Supervision, Administration	5.4%	Timekeeping, travel, conferences/presentations/meetings, evaluations, gear/vehicle maintenance and upkeep
Training, Teaching	10%	S-130/190, S-212, S-215, S-290, L-380, M-410, EMS Refresher, fire operations, misc. NPS training, teaching Browns / stand exams to E. Zone personnel and TWFM.

New projects 2015: E Zone -Red Cliff (Browns -20), N. Zone - South Fall Creek (photo points, weed transects, shrub transects). Added protocols to existing prescriptions: N. Zone - T2S / Rec Trails (stand exams, photopoints), GRTE – Matilda (photo points, stand exams).

E. 2016 Direction

Fire Effects 2016 Direction:

- Continue to pursue needed career Assistant Lead Monitor
- improve weed mapping protocols to enhance accuracy

- Implement field tested .shp files into GRTE/BTNF computer database
- Improve photographic monitoring consistency (board size, camera quality, pixel/frame size)
- Maintain if not improve communication with other agencies and modules
- Provide internship for NPS/ SCA diverse student
- Improve training with Teton Fire Module in fireline and immediate post burn monitoring protocols for managed fire monitoring.
- Continue to provide trained, skilled and enthusiastic firefighters to assist in Park and Forest operations
- Participate in and provide high quality fire and fire effects education/training
- Collaborate with YELL or GRCA
- Excel in electronic data collection

F. Overall Data Entry Status and FFI suggestions

Program Data - In an effort to ensure the longevity of NPS fire effects monitoring data, please provide the following:

- Estimate of the percentage of your park/network **total** monitoring program data (including past and present data) that has been entered into FFI, or another application, and quality checked (e.g. Are there any non-digital, hard copies of data still floating around out there?) *70% is in FFI – one of our protocols does not fit with FFI's plot administration process*
- Do you have a need for migration of any data to FFI? (if so, briefly describe the dataset, e.g. *20 Excel spreadsheets with fuels data*) *We do need to migrate our USFS FFI data to FSVeg so our partners can use it for other purposes....*

FFI Feedback - To help in the ongoing effort to improve FFI, please include any feedback or suggestions here based on your experiences using FFI or FFI-Lite.

- *We store our FFI database and server on a virtual machine that we can all access, only the limitation is only one user at a time can be on there. It seems to be working.*
- *Making the query process easier would be very helpful.*