United States
Department of
Agriculture

Forest Service

BEAVERHEAD-DEERLODGE NATIONAL FOREST

FOREST PLAN MONITORING AND EVALUATION REPORT

Fiscal Year 2009

Cover Photo: Aspen Restoration, Conifer Slashing, Madison District, Jay Frederick, 2009

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INTRODUCTION

Forest Land and Resource Management Plans (Forest Plans) are intended to provide long-range management direction for each National Forest. Forest Plans provide guidance for balancing the physical, biological and social components of forest management in the form of goals, objectives, and standards.

The purpose of monitoring the Forest Plan is to evaluate, document and report how well the Forest Plan is applied (**Implementation Monitoring)**, how well it works (**Effectiveness Monitoring**), and if the purpose and direction remain appropriate (**Validation Monitoring**). For some resources, **base line monitoring** establishes a basis for comparing current conditions to future conditions. Our integrated stream reach monitoring is one example of baseline monitoring. **Tracking** is also a useful way to report on activities we are engaged in, such as acres of noxious weed treatment or acres of aspen treated.

While the monitoring determines actual conditions and circumstances and compares them with assumptions and desired results, evaluation examines conditions as a result of management and identifies the reason desired conditions are not met and proposes alternative solutions.

The current Beaverhead-Deerlodge Forest Plan was approved by the Regional Forester in February 2009. The 2009 Monitoring and Evaluation Report is the first report based on new monitoring requirements described in Chapter 5 of the Forest Plan. Annual reporting is required by the Plan to monitor implementation of objectives and standards. Only those items which require an annual measurement and report are included in this year's report. A Comprehensive Evaluation Report will be published in 2014, five years after implementation of the 2009 Forest Plan, to report on effectiveness of the goals and objectives and validate assumptions made by the Plan.

For each resource discussed in this report we present the objective of the monitoring, the data source, frequency, results and evaluation for the fiscal year (i.e. FY2009) which runs from October 1 through September 30th. The item number following most resource titles refers back to the Forest Plan monitoring item, found in Table 15 on page 274 of the Forest Plan.

The Monitoring and Activity Highlights section that precedes the actual report is additional information we provide as a matter of general interest but is not required Forest Plan monitoring.

MONITORING AND ACTIVITY HIGHLIGHTS

Summary

Beaverhead-Deerlodge National Forest (Acres) 3,380,000
Anaconda-Pintler Wilderness (BDNF Portion). 117,598
Lee Metcalf Wilderness (BDNF Portion) 102,064

Budget $18,400,000

Payments to Counties (total 2009) . . . $3,625,359
Beaverhead. $1,498,701
Jefferson $311,114
Silverbow $148,215
Deer Lodge $294,356
Powell $184,710
Madison $598,001
Granite $590,262

Resource Advisory Committees (RAC) 2
Southwest Montana RAC $300,000
Tri-County RAC $300,000

Employees (Permanent) 167
Senior Community Service Program (Dillon) 1

Recreation
Developed Campgrounds 78
Campgrounds under Concessions 11
Picnic areas 18
Rental Cabins 37
Developed Trailheads 28

Trails (Total miles) 3,216
Trail construction/reconstruction (miles) 21
Trail maintenance (miles) 1,326

Roads and Facilities
Miles of roads throughout Forest 4,700
Road Maintenance conducted . . . . . 733 miles
FAO Buildings 194
Quarters 46
Dams. 53
Water Systems 83
Waste Water Systems 46

Heritage Resources
New Sites Discovered (prehistoric/historic sites). . 44
Acres surveyed 2,937
Site monitored 19
National Register Sites 5

Fire
Number of wildfires 73
Area burned in wildfires (acres) 9,674.34
Prescribed fire application (acres) 1,366.80
Mechanical thinning (acres) 1871.00

Range
Rangeland monitored/evaluated (acres) . . . . 1.9 MM
Grazing allotments administered 259
Total A.U.M.'s (Animal Unit Months). 228,000

Noxious Weeds
Number of Treatment Acres 7,295
Chemical Control 7,195
Biological Control 100

Soil & Water
Soil and watershed rehabilitation (acres). 81
Water Quality Monitoring Stations 32

Fisheries and Wildlife
Stream enhancements (miles) 24
Terrestrial habitat enhancements (acres). 5,086

Lands
Special Use permits for land use administered . 485
Special Use permits for recreation use administered 538
Trail Right-of-Way easements acquired 1

Forest Management
Reforestation (acres planted) 91
Seedlings planted 47,000
Regeneration monitoring (acres). 2,621
Mortality reduction actions w/various pheromone treatments . . . . . 475 acres
Total timber volume sold (ccf) 69,900
Total timber volume sold (mmbf)
Christmas tree permits sold @ $3.00 each 1,391
Commercial Mushroom Permits 371
Personal Use Mushroom Permits. 606
Personal use firewood permits sold 609
Personal use post and pole permits sold 11

Law Enforcement Data
Warnings 175

Incidents . . . . . 420 Violations 206

SUSTAINABLE OPERATIONS: ACCOMPLISHMENTS

All government agencies are required to meet goals in the areas of energy efficiency and renewable energy under the Energy Policy Act of 2005 and the 2007 Executive Order 13423, "Strengthening Federal Environmental, Energy and Transportation Management". These policies are a reflection of general interest government wide in reducing costs, dependence on petroleum, and reducing greenhouse gas emissions. The BDNF, in 2009, reduced energy costs and contributed to renewable energy sources, primarily through fleet fuel reduction and installation of three more photo-voltaic systems. A Forest Green Team was chartered in 2009 to develop and coordinate Forest efforts to operate more sustainably. Between the Green Team projects and efforts already afoot, the Forest accomplished a wide range of activities from education to water conservation.

EDUCATION:

- 6-week GREEN CHALLENGE Forestwide designed to encourage all employees to try various sustainable practices and increase knowledge. Sixty percent (114/186) of Forest employees participated and 76 of them received awards. Permanent changes resulting from the green challenge: at least 50% of employees have permanently reset their printer preference to double-side copy, most offices have reduced temperature on hot water heaters, many offices reduced catalogues (Wisdom RD reduced 2/3) and phonebooks (Pintler District reduced from 25 to 15) by contacting distributors.
- Earth Day energy conservation/recycling presentations to 29 students in the Wisdom School sponsored by Wisdom Ranger District.
- Recycling/energy conservation presentation to 50 Anaconda Job Corp students by Pintlar District.
- Recycling/energy conservation/fuel reduction presentations at District Orientations on all Districts across the Forest in June..

WASTE REDUCTION AND RECYCLING:

- A Forest-wide Recycling Guide (where, what and how) was developed by the Green Team. The Guide includes contact information for fire incident teams.
- 300# of batteries were captured from the waste stream through the "battery bucket" recycling campaign
- Over 1000 CDs were recycled through a collection box in the Supervisors Office.
- Paper recycling is in place in all Beaverhead-Deerlodge facilities. Pintlar District measured 66 cubic yards recycled.
- Recycling in fire camps was strengthened, using Bielenberg Fire as a pilot. We included a recycling requirement in our Fire Business Plan and are developing more resources and contact material for fire team use with an emphasis on recycling plastic water bottles.
- Plastic Recycling was initiated on the Madison Ranger District in collaboration with Madison County. A plastic baler was installed at the Ennis solid waste site. Twenty-one

bales of plastic were recycled by the County in the few months of FY09 the baler operated.

- Propane canister recycling program continued at Madison Ranger District and Wade Lake Campground to gather canisters from campers and other forest users.

Figure 1. Plastic baled for recycling in Ennis

Figure 2. Propane canisters from camping recycled at Ennis

ENERGY CONSERVATION AND GENERATION:

- Photo voltaic systems increased production of renewable energy by the BDNF. Four kilowatt/hour installations were designed and contracted for Wisdom, Wise River and Pintlar Ranger Districts. Along with the existing 4 kilowatt system at Madison District, all FS owned District offices will now generate renewable energy. Based on Madison District monitoring, generation is expected to provide about 5 -10% of the facility electrical needs. Madison District generated 5,345 kilowatts in FY 2009, 11% of the total 47,690 kilowatts used by the facility.

Figure 3. Wisdom Ranger District photovoltaic panel

Figure 4. Wise River Photo-Voltaic Installation

- District Green Plans were developed and implemented for each unit. Along with facility improvements, Green Plans emphasized energy conservation habits of individual employees: turning off computers, copiers, lighting, unplugging appliances, space heaters, adjusting thermostats.
- Monitoring of energy consumption data began at each facility. The Forest Facilities Engineer provided data to units to aid in identifying opportunities for conservation and monitor progress.
- Solar "sink wall" at Wise River District was evaluated by an engineer to improve its effectiveness.
- Ceiling insulation was supplemented in the historic Sheridan office.
- Cellular blinds were installed on older windows in the Madison District office using a Regional Office micro-grant.
- New T8 lamps and energy efficient ballasts replace old T12 fluorescent lighting on the Madison District.
- New energy efficient tree cooler condenser on Pintler District replaced an old model and refrigerant was changed from Freon (R12) to '404' to reduce greenhouse gas emissions.

FLEET and FUEL REDUCTION

- Improved fuel economy was achieved for 4 of the 15 Forest owned (WCF) vehicles replaced in FY09. These were downgrades or shift to hybrid for the purpose of improved fuel economy. The result was a 25% increase in fuel economy for those vehicles.
- Calculated fuel consumption dropped 3.5% since 2008 on the BDNF, excluding increased miles driven by law enforcement. This is on top of a 1.8% reduction in fuel consumption reported in 2008. Law enforcement work is directed by the Washington Office and out of the control of the Beaverhead-Deerlodge Forest. When law enforcement fuel is included, calculated fuel consumption only dropped 1.3%. A review of our success in meeting the Fleet Action Plan is available in Forest records at *J:\fsfiles\office\ems\4.6_Management_Review.doc.*
- Use of the BDNF Video Conferencing Technology jumped from 211 meetings in 2008 to 728 meetings in 2009 (data from Digital Visions). Early in FY 2009, the Northern Region of the Forest Service provided Video conference machines at every office except Sheridan on the BDNF and most offices across the Region. A report titled "Video Conferencing Technology as a Tool to Save Travel and Fuel Costs" estimates the impact of Forest employee use of this technology (available electronically at J/fsfiles/office/Green Team/VCT_B-D_savings.doc). While employees report "most" VTC meetings saved travel, if only half of the video conferences saved travel salary and fuel expenditures, the Forest saved $621,000 and 9,700 gallons of fuel. It is estimated most of the travel savings were day trips from District offices to Dillon or Butte though we know of multiple trips to Missoula, Portland, or Denver that were avoided.

WATER CONSERVATION

- A xeri-scape pollinator Garden replaced lawn at the Madison Ranger District, funded by a Native Plant Society grant.
- 27 low flow showerheads installed at Wisdom and Wise River facilities. Toilet water-saving kits were purchased for future installation, all funded by a Regional Office micro-grant.

SUSTAINABLE AQUISTION/GREEN PURCHASING

- New Janitorial contracts required use of green cleaning products at Pintler, Wisdom and Butte. Pintler and Wisdom contracts specify the Forest Service will provide those.

BEAVERHEAD SETTLEMENT AGREEMENT

The Beaverhead-Deerlodge National Forest amended riparian management direction within the Beaverhead Forest Plan in October of 1997. A subsequent lawsuit sponsored by the National Wildlife Federation was settled in collaboration with several parties. As part of the Beaverhead Livestock Grazing Settlement Agreement, compliance with grazing standards are monitored and reported annually. Actions taken to implement the Settlement Agreement have only applied to the Beaverhead Districts (South Zone) of the Beaverhead-Deerlodge National Forest. The 2009 grazing season was the twelfth year that allotments were monitored for compliance with the Beaverhead Forest Plan standards and guidelines as amended in October of 1997.

Beginning in 2010, we will monitor compliance with riparian standards and guidelines in the 2009 BDNF Forest Plan. The new Forest Plan incorporates all the direction from the riparian amendment and refined the direction for riparian standards in westslope cutthroat streams. This direction applies to the entire Forest. The 2009 Forest Plan also formally closed allotments or vacated pastures analyzed in previous NEPA documents. This reduced allotment acreage forest-wide by 223,000 acres.

Results – Most allotments on the Beaverhead zone were inspected (117 of 151). Most allotments were inspected numerous times prior to, during, and after the grazing season.

Table 1. Compliance with Grazing Standards by District

District	Total Allotments	Allotments That Met Standards	Allotments That Did Not Meet Standards	Unknown
Dillon	**60**	**38**	**2**	**20**
Wise River	**17**	**13**	**0**	**4**
Wisdom	**21**	**16**	**2**	**3**
Madison	**53***	**43**	**3**	**7**

Total	**151**	**110**	**7**	**34**

*The Madison Ranger District had 68 allotments. Of these 51 are active, 2 are vacant, and 15 are closed by the 2009 Forest Plan. Compliance reports were not done on closed allotments.

Table 1. Forest Plan Standards Exceeded on Noncompliance Allotments

Forest Plan Standards Exceeded	Number of Allotments Exceeding Standard From Total of 7 Allotments
Management. System	6
Streambank Vegetation and Structural Damage	3
Upland Utilization	2
Riparian, Fisheries	3
Winter Range	0
Transitory Range	0

Of the 7 allotments where Forest Plan standards were exceeded, only one was non-compliant two years in a row. The allotment on Dillon Ranger District is not located in a key fish watershed. The remaining 6 allotments were non-compliant for the first time in the last 3 years. Contrary to most years, the majority of our non-compliance was from not following grazing management systems. Non-compliance in riparian areas occurred on only 3 allotments.

WILDFIRE SUPPRESSION OR MANAGEMENT:

The 2009 summer and fall were active for wildfires. Forty five wildfires burned, including 4 wildfires managed to benefit resources. Wildfires on BDNF lands are summarized below.

Class	Size	Ranger District	# Fires	Acres
A	<.25 acres		35	3
B	.26-9.9 acres		6	4
C	10-99 acres		0	0
D	100-299		0	0
E	300-999	Pintler	1(Sand Basin)	305
F	1000-4999	Wisdom	1 (Lily Lake)	2,120
		Pintler	1 (Bielenburg)	1,950
G	5000+	Pintler	1 (Table Mountain)	5,280
	TOTAL		45	9,662

PROJECT DECISIONS – National Environmental Policy Act (NEPA)

Decision makers on the BDNF issued 9 decisions in 2009: The table below compares the project analysis and decisions made for the last four years, 2006-2009.

Fiscal Year	Record of Decision (EIS)	Decision Notice (EA)	Decision Memo (CE)	Project Analysis Underway*
2006	1	0	31	40
2007	1	6	20	28
2008	0	2	18	55
2009	2	7	13	30

*Project analysis numbers are from the BDNF Schedule of Proposed Actions

Project decisions fell under the following resource areas:

Special Uses	5
Timber/Veg/Fuels	7
Recreation	2
Land Mgmt Planning	1
Wildlife/Fish	2
Grazing Mgmt	3
Minerals	2

APPEAL AND LITIGATION.

Seven of the above project decisions were appealed in 2009. Of those, 1 decision was withdrawn because of the tenuous nature of the Roadless Rule, 1 was informally resolved, 2 resulted in objection agreements, and 3 were affirmed by the Regional Office in FY10.

The Chief of the Forest Service received 56 appeals of the Decision to Revise the Beaverhead Forest Plan (Section 217 of NEPA). Those appeals were all affirmed early in FY 2010.

Active Litigation in 2009 included the following:

Project Name	Legal Action
Basin Creek -	Favorable 9th Circuit Decision
Bradley/Noble Lake	Quiet Title - Complaint Filed in District Court
Cow Fly Salvage	Appealed to 9th Circuit
Barton Springs Thinning	Complaint Filed in District Court & Decision Withdrawn (changed condition from insect infestation)
West Pioneers	
Snowmobile Trail Grooming -	Notice of intent to file complaint
Rat Creek Timber Salvage	Complaint Filed in District Court, Prelim. Injunction denied

REPORT BY MONITORING ITEM

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Watershed Restoration

Item 3

Monitoring Question: Are restoration and conservation activities focused in key (priority) watersheds?

Performance Measure: Number of watershed plans completed, number and type of projects completed in key and other watersheds.

Data Sources: Forest annual accomplishment reports and project accomplishment reports

Measurement Period: Annual **Reporting Period:** Annual

Results:

(1) Watershed Assessment

A Watershed Assessment was completed in 2009 for the Fleecer Mountains located southwest of Butte and just north of Wise River, Montana. The Fleecer assessment area is roughly 99,000 acres and includes parts of 12 6th field hydrologic units or sub-watersheds. That includes two fish key watersheds: Upper Jerry and German Gulch. The Watershed Assessment is posted on the BDNF Forest web at www.fs.fed.us/r1/b-d under land and Resource Management, Planning. The assessment resulted in a comprehensive list of recommendations and opportunities for improving resource conditions in the Fleecers.

Preliminary work on a Watershed Assessment in the Boulder-Galena area of Jefferson Ranger District began in 2009. Completion is expected late in 2010 with a large restoration based NEPA analysis in FY11.

(2) Projects Completed in key watersheds

In 2009, noxious weeds were treated in the Sand Basin area of West Fork Rock Creek. No improvement projects were completed yet in the other areas with Watershed Assessments (East Deerlodge, Birch/Willow/Lost). A large scale vegetation project is proposed and currently under NEPA analysis in East Deerlodge watersheds. A large scale restoration project will begin analysis in FY11 in the Birch/Willow/Lost area.

Additional noxious weed treatment in 2009 focused in priority watersheds in German Gulch and the Fleecers. A Watershed Assessment is currently underway for those areas.

Also see the list of stream restoration projects under Item 23, page 82.

Evaluation:
It is premature to evaluate trend or effectiveness in the first year of impementing this monitoring requirement.

Mayfly Population Abundance

Item 5

Monitoring Question: Are management activities effectively maintaining conditions for native species reproduction?

Performance Measure: Changes in abundance of populations of the mayfly (*drunella dodsii*) as an indication of changing sediment levels.

Data Sources: Sampling points on response reaches of sub-watersheds selected to represent potential sediment producing activities or restoration activities.

Measurement Period: Annual **Reporting Period:** Annual

Background:

The most widespread impact to aquatic resources and biological communities across the forest are from management actions and related sediment introduction. The mayfly, *Drunella dodsii,* was selected as a Management Indicator Species in the 2009 Forest Plan. The mayfly is widespread and occurs at elevations generally consistent with the forest boundary. It responds quickly to changes in the aquatic environment from management activities like sediment introductions, and is easily monitored (FEIS, p. 572).

(A) PACFISH/INFISH Effectiveness Monitoring - The primary source of mayfly (*drunella dodsii*) population data on the BDNF currently comes from the multi-Region PACFISH/INFISH Effectiveness Monitoring (PIBO-EM) Program for aquatic and riparian resources. *Drunella doddsi* was quantified in samples collected between 2003 and 2009. PIBO was developed in 1998 in response to monitoring needs addressed in the Biological Opinions for bull trout (USFWS 1998) and steelhead (NMFS 1995). The primary objective of the PIBO-EM program is to determine whether priority biological and physical attributes, processes, and functions of riparian and aquatic systems are being degraded, maintained, or restored in the sampled area. The program initially sampled within the Interior Columbia River Basin on lands managed by U.S. Forest Service and the Bureau of Land Management (BLM). This initial sampling included streams on the Pintler and Butte Ranger Districts, starting in 2003. In 2006, the PIBO EM study design was applied to National Forests within the Upper Missouri River basin in Montana. This includes the Beaverhead-Deerlodge National Forests.

The BDNF contracted with the Rocky Mountain Research Station to intensify the PIBO sampling, locating monitoring sites in the response reach of the 15 key restoration watersheds and a portion of the 56 key fish watersheds identified by the 2009 Forest Plan. The PIBO surveys report a combination of 18 commonly measured in-channel, 11 riparian vegetation, 6 stream temperature, and 9 macro-invertebrate variables for each integrator site (Kauffman et al. 1983,

Platts et al. 1983, Myers and Swanson 1991 and 1992, Karr and Chu 1997, Winward 2000). Macroinvertebrates were sampled using the protocol recommended by the Center for Monitoring and Assessment of Freshwater Ecosystems, Utah State University (Hawkins et al. 2003). Samples were analyzed and summarized by the BLM/USU National Aquatic Monitoring Center using 10 metrics (Karr and Chu 1997).

There are 3 ways aquatic insect communities at the PIBO sites are described:

1) community attributes - example: number of different species
2) disturbance attributes - example: some types of insects 'go away' as sedimentation increases
3) functional attributes - example: many different types of aquatic insects may do the same 'job' in a stream, for instance, some eat algae and diatoms and other eat live matter off of rocks.

Table 2. Meta Data Descriptions for Aquatic Insect PIBO EM Sampling Strategy

Aquatic marcroinvertebrates	Rich	Taxa richness	Total number of taxa collected within a reach. Taxa richness normally decreases with decreasing water quality, although organic enrichment can cause an increase in the number of pollution tolerant taxa.
Aquatic marcroinvertebrates	Cling	Number of clinger taxa	Number of "clinger" taxa. These taxa typically cling to the tops of rocks and may be impacted by sedimentation or abundant algal growths.
Aquatic marcroinvertebrates	LongLvd	Number of long lived taxa	Number of "long-lived" taxa. Long-lived taxa typically have 2-3 year life cycles and respond negatively to human disturbance.
Aquatic marcroinvertebrates	CTQd	Community tolerance quotient	This index was developed by Winget and Mangum (1979)[1] and has been widely used by the USFS and BLM throughout the western United States. Taxa are assigned a tolerant quotient from 2 to 108. Taxa assigned low tolerance quotients are found only in high quality unpolluted water and taxa assigned large tolerant quotients are found in severely polluted waters. The CTQD is a dominance weighted community tolerance quotient (CTQD).
Aquatic marcroinvertebrates	Ephet	Number of Ephemeroptera taxa	Number of mayfly taxa
Aquatic marcroinvertebrates	Plect	Number of Plecoptera taxa	Number of stonefly taxa
Aquatic marcroinvertebrates	Trict	Number of Trichoptera taxa	Number of caddisfly taxa
Aquatic marcroinvertebrates	Intol	Number of Intolerant taxa	Number of "intolerant" taxa. The number of intolerant taxa normally declines with decreasing water quality. The number of taxa or individuals that are tolerant or intolerant to pollution was determined based on the Hilsenhoff Biotic Index values. Intolerant taxa are those taxa given a HBI score of 0 or 1 (out of 10). Tolerant taxa are those taxa given a HBI score of 9 or 10 (out of 10).
Aquatic marcroinvertebrates	RIVPACS	RIVPAC's score of observed / expected taxa	RIVPACS employs a predictive model that compares the number of macroinvertebrate taxa expected in high quality habitat to the number observed at a site. Big and rare taxa are excluded. Values can range from 1 (no difference between observed and expected) to 0 (none of the expected taxa were observed). (Scores > 0.78 indicate good quality habitat whereas scores < 0.78 indicate poorer quality habitat.

The table above is an excerpt from the PIBO meta-data and describes the nature of the 9 aquatic insect attributes. Besides the number of mayfly taxa, the 4 attributes in yellow are of primary interest to the Forest and included in the reported results below.

The PIBO data will be compared every 5 years against data collected across the region to answer the broader strategic monitoring question in Item #2. Similarly, the PIBO data will provide a 5 year comparison of *drunella doddsi* abundance at established sites. This will be referenced against a sample set of 20 to 30 sites across the Forest (which includes a portion of the PIBO sites along with others) sampled annually. All data will be used to respond to monitoring question, Item #5.

(B) Youth Forest Monitoring Project Data In addition to PIBO EM data, aquatic insect data was collected in 2009 by the Deerlodge Team of the Youth Forest Monitoring Project (YFMP). YFMP was established in 1998 to: encourage high school students to pursue an interest in the sciences, promote community awareness and involvement, monitor various aspects of forest health, and expand the monitoring data available for Forest Plans. The YFMP began in Helena and has expanded to Broadwater, Lincoln and Powell County High School in Deer Lodge. This year is the 3rd year a crew functioned out of Deer Lodge.

Results:

(A) PIBO Mayfly Data

Ninety two measurements have been taken on 77 different PIBO sites on the BDNF between 2003 and 2008. Twenty five sites in the Columbia River Basin project, 37 sites in the Missouri River Basin project, and 15 additional sites contracted by the BDNF. The nine 2003 sites were re-measured in 2008. One site in Rock Creek has been measured annually as a benchmark since 2002. Five more contracted sites were added in 2009 to complete coverage of key watersheds.

Macro-invertebrate samples were collected on PIBO sample sites and analyzed by BLM/USU National Aquatic Monitoring Center at Utah State at a later date. The first 500 bugs are counted. If there are more, a subsample is taken. The lab split column indicates how much of the sample was sorted to get the 500 bugs. The BDNF requested additional analysis of mayfly taxa (*ephemeroptera)* data to display population data for *drunella dodsii* specifically. Table 3 below shows the population data for sites on the BDNF from 2003-2008, many of the sites contained *drunella dodsii.* The table indicates under column 4 if the sites are part of the Columbia River Basin project (CRB), Missouri River Basin project (MRB), or were contracted by the BDNF to track restoration of key watersheds (CONT) and if the sub-watershed is managed or used as a reference reach.

Table 3. Mayfly (*drunella dodsii)* population data from PIBO sample sites on the BDNF from 2003-2008.

SiteID	Stream	Yr	Project	Distrct	Mgmt	Rich	Cling	CTQD	*Drunella dodsii* Data Counts				RIVPACS
									Big Rare Count	Split Count	Lab Split	Density	
235	Beefstraight	2003	CRB	Butte	Managed	36	19	52	7	9	50	33.60	0.78
235	Beefstraight	2008	CRB	Butte	Managed	43	26	39	0	41	50	110.81	
236	NF. Dry Cottonwood	2003	CRB	Butte	Managed	29	12	68					0.92
236	NF. Dry Cottonwood	2008	CRB	Butte	Managed	40	16	58	0	1	100	1.35	
237	Browns Gulch	2003	CRB	Butte	Managed	46	18	61					1.11
237	Browns Gulch	2008	CRB	Butte	Managed	40	20	66					
239	Norton	2003	CRB	Butte	Managed	36	20	69					0.71
239	Norton	2008	CRB	Butte	Managed	38	20	68					
2262	Curly Gulch	2007	MRB	Butte	Managed	22	11	59					0.61
1931	Eunice	2006	MRB	Dillon	Managed	43	21	62	0	1	25	5.38	1.02
1932	Horse Prarie	2006	MRB	Dillon	Managed	28	20	57	0	10	25	53.76	0.91
1933	Black Canyon	2006	MRB	Dillon	Managed	40	24	48	0	11	50	29.57	1.11
1935	Bear	2006	MRB	Dillon	Managed	31	16	64					0.79
1936	C L	2006	MRB	Dillon	Managed	32	16	72					0.75
1937	Buffalo	2006	MRB	Dillon	Managed	33	15	57					0.91
1938	Fox	2006	MRB	Dillon	Managed	34	18	59	0	2	50	5.38	0.91
1942	Thayer	2006	MRB	Dillon	Managed	37	17	52	1	22	25	119.62	1.03
1944	Bull	2006	MRB	Dillon	Managed	32	16	65	1	1	50	4.03	0.86
2619	Birch	2008	MRB	Dillon	Managed	59	29	61	0	15	37.5	54.05	
2649	Grasshopper	2008	MRB	Dillon	Managed	40	18	65					
2660	Willow	2008	CNTRCT	Dillon	Managed	58	36	61	0	18	31.25	77.84	
2661	Rock	2008	MRB	Dillon	Managed	44	21	52	0	6	62.5	12.97	

SiteID	Stream	Yr	Project	Distrct	Mgmt	Rich	Cling	CTQD	*Drunella dodsii* Data Counts				RIVPACS
									Big Rare Count	Split Count	Lab Split	Density	
2674	Willow	2008	MRB	Dillon	Managed	47	31	50	0	38	100	51.35	
2677	Painter	2008	CNTRCT	Dillon	Managed	45	23	49	1	49	75	89.64	
2241	Little Pipestone	2007	MRB	Jefferson	Managed	33	16	70					0.89
2277	Fish	2007	MRB	Jefferson	Managed	42	23	48	0	24	87.5	36.87	1.11
2620	Hells Canyon	2008	CNTRCT	Jefferson	Managed	43	28	54	0	19	75	34.23	
2630	N.F. Little Boulder	2008	CNTRCT	Jefferson	Managed	48	24	66	0	3	37.5	10.81	
2631	Little Boulder	2008	CNTRCT	Jefferson	Managed	50	28	66	0	2	21.87	12.36	
2633	Beaver	2008	CNTRCT	Jefferson	Managed	13	2	98					
2165	E.F. Granite	2007	MRB	Madison	Managed	33	19	68	0	3	100	4.03	0.76
2212	Leonard	2007	MRB	Madison	Managed	22	5	64					0.76
2220	S.F. Warm Springs	2007	MRB	Madison	Managed	51	23	64	0	1	100	1.34	1.24
2227	Arasta	2007	MRB	Madison	Managed	36	14	77					0.97
2284	Warm Springs	2007	MRB	Madison	Managed	36	19	77					0.81
2600	Narrows	2008	MRB	Madison	Managed	29	12	59					
2601	Gazelle	2008	MRB	Madison	Managed	42	18	60	0	70	100	94.59	
2602	Horse	2008	MRB	Madison	Managed	40	21	44					
2625	Indian	2008	MRB	Madison	Managed	36	22	49	5	16	62.5	41.35	
2632	South Willow	2008	CNTRCT	Madison	Managed	33	20	42	2	37	43.7	116.99	
2662	Wolf	2008	MRB	Madison	Reference	31	17	44	1	4	50	12.16	
2663	Ruby	2008	MRB	Madison	Managed	31	17	63	3	7	18.7	54.50	
2664	Indian	2008	CNTRCT	Madison	Managed	44	25	50	0	50	50	135.14	
2665	Freezeout	2008	CNTRCT	Madison	Managed	39	19	58	1	33	6.25	714.86	
2673	Burnt	2008	CNTRCT	Madison	Managed	44	20	63	0	4	18.7	28.83	
223	N.F. Lower Willow	2004	CRB	Pintler	Managed	38	18	50	1	15	75	28.23	0.99
224	S.F. Douglas	2004	CRB	Pintler	Managed	10	7	46					0.35
225	Sawmill	2004	CRB	Pintler	Managed	19	9	95					0.42

SiteID	Stream	Yr	Project	Distrct	Mgmt	Rich	Cling	CTQD	*Drunella dodsii* Data Counts				RIVPACS
									Big Rare Count	Split Count	Lab Split	Density	
226	Foster	2004	CRB	Pintler	Managed	38	22	45	0	1	50	2.69	1.06
227	Warm Springs	2004	CRB	Pintler	Managed	48	30	45	0	2	62.5	4.30	1.41
229	Twin Lakes	2004	CRB	Pintler	Reference	26	7	67					0.85
234	Rock	2002	CRB	Pintler	Reference	44	24	60	0	19	9.38	272.26	1.10
234	Rock	2003	CRB	Pintler	Reference	59	33	55	0	4	37.5	14.34	1.34
234	Rock	2004	CRB	Pintler	Reference	43	28	55	0	2	62.5	4.30	1.10
234	Rock	2005	CRB	Pintler	Reference	46	30	50	7	8	37.5	38.08	1.26
234	Rock	2006	CRB	Pintler	Reference	43	28	48	1	1	75	3.14	1.26
234	Rock	2007	CRB	Pintler	Reference	48	29	51	0	4	100	5.38	1.42
234	Rock	2008	CRB	Pintler	Reference	55	31	51	0	23	100	30.91	1.38
238	Tin Cup Joe	2003	CRB	Pintler	Managed	38	22	45	1	9	25	49.73	1.23
238	Tin Cup Joe	2008	CRB	Pintler	Managed	34	18	42	0	19	100	25.68	
240	Lost	2003	CRB	Pintler	Reference	54	26	61					1.29
240	Lost	2003	CRB	Pintler	Reference	42	20	54	1	13	25	71.24	1.04
240	Lost	2008	CRB	Pintler	Reference	33	14	63					
241	Racetrack	2003	CRB	Pintler	Managed	42	26	54	0	12	50	32.26	0.93
241	Racetrack	2008	CRB	Pintler	Managed	37	19	58	0	2	32.5	8.32	
242	Dempsy	2003	CRB	Pintler	Managed	38	17	72					1.03
242	Dempsy	2003	CRB	Pintler	Managed	37	21	64					0.99
242	Dempsy	2008	CRB	Pintler	Managed	31	14	64					
243	Scotchman Gulch	2004	CRB	Pintler	Managed	23	11	72					0.81
245	Moose Meadows	2004	CRB	Pintler	Managed	34	20	58					0.91
246	E.F. Rock	2004	CRB	Pintler	Reference	23	10	52					0.64
247	Upper Willow	2004	CRB	Pintler	Managed	29	17	56					0.95
249	Stony	2004	CRB	Pintler	Managed	40	24	47	0	13	100	17.47	1.00
251	Copper	2004	CRB	Pintler	Managed	15	8	56	0	1	100	1.34	0.52

SiteID	Stream	Yr	Project	Distrct	Mgmt	Rich	Cling	CTQD	*Drunella dodsii* Data Counts				RIVPACS
									Big Rare Count	Split Count	Lab Split	Density	
253	M.F. Rock	2004	CRB	Pintler	Reference	27	17	40	0	4	100	5.38	0.81
254	Ross Fork Of Rock	2004	CRB	Pintler	Reference	16	8	55	0	17	100	22.85	0.36
2146	N.F. Gold	2007	CRB	Pintler	Managed	35	14	52	0	6	100	8.06	1.02
1934	Pioneer	2006	MRB	Wisdom	Managed	41	22	65	0	3	25	16.13	1.11
1939	Bear	2006	MRB	Wisdom	Managed	35	15	80					0.80
1940	Little Lake	2006	MRB	Wisdom	Managed	36	18	60	0	5	75	8.96	1.00
1941	Hamby	2006	MRB	Wisdom	Managed	40	17	54	0	7	100	9.41	1.07
1943	Big Lake	2006	MRB	Wisdom	Managed	37	17	65	0	7	50	18.82	0.98
2272	Canyon	2007	MRB	Wisdom	Managed	37	24	57	1	0	50	1.34	0.82
2648	Wise	2008	MRB	Wisdom	Managed	47	20	63	0	7	100	9.46	
2652	Wyman	2008	MRB	Wisdom	Managed	47	21	62	1	9	18.7	66.22	
2653	Seymour	2008	CNTRCT	Wisdom	Managed	43	28	58	0	32	37.5	115.32	
2655	Ruby	2008	CNTRCT	Wisdom	Managed	48	29	62	0	12	75	21.62	
2675	Cherry	2008	CNTRCT	Wisdom	Managed	44	22	59					
2676	Doolittle	2008	CNTRCT	Wisdom	Managed	37	21	47					
2678	Johnson	2008	CNTRCT	Wisdom	Managed	44	22	56	0	15	75	27.03	
2196	Trapper	2007	MRB	Wise River	Managed	38	24	49	0	62	100	83.33	1.03
2265	Jerry	2007	MRB	Wise River	Managed	29	14	67					0.69

(B) Youth Forest Monitoring Project Data:

The YFMP collected macro-invertebrate samples from 4 sites each along 5 different streams using a Surber Sampler, counting the first 100 specimens. Calculations of EPT ratio, diversity field index and pollution tolerance score are made. Different macro-invertebrates are in different taxa and have different pollution tolerance. The more invertebrates in taxa one or two (the low pollution tolerant group) the healthier and less polluted the stream is. Table 4 displays the results by Creek for 2009. The Figures below display a comparison of 2008 and 2009 results for each sampled stream.

- EPT ratio is the= # mayflies (*ephemeroptera*) + caddisflies (*plecoptera*)+ stoneflies (t*richoptera*)/ total # of organisms. Values closer to 1.0 indicate higher quality habitat.

- Pollution tolerance score = # of individuals in each taxa x the group score/ total # of taxa. In this case, a value < 2.5 indicates good water quality. A value > 2.5 is fair, a value >3.6 is poor.

Table 4. YFMP Stream Survey Results For Macro-Invertebrates In East Deerlodge Watersheds, Summarized From 4 Sample Sites Per Stream

Stream	# Mayflies from 4 sites	EPT Ratio	Pollution Tolerance Score	Pollution Tolerance Rating
Orofino	38	.67	1.3	Excellent
SFk Cottonwood	132	.90	2.3	Good
Middle Fork Cottonwood	69	.91	2.7	Fair
Perkins	32	.82	2.1	Good
Baggs	76	.94	2.2	Good

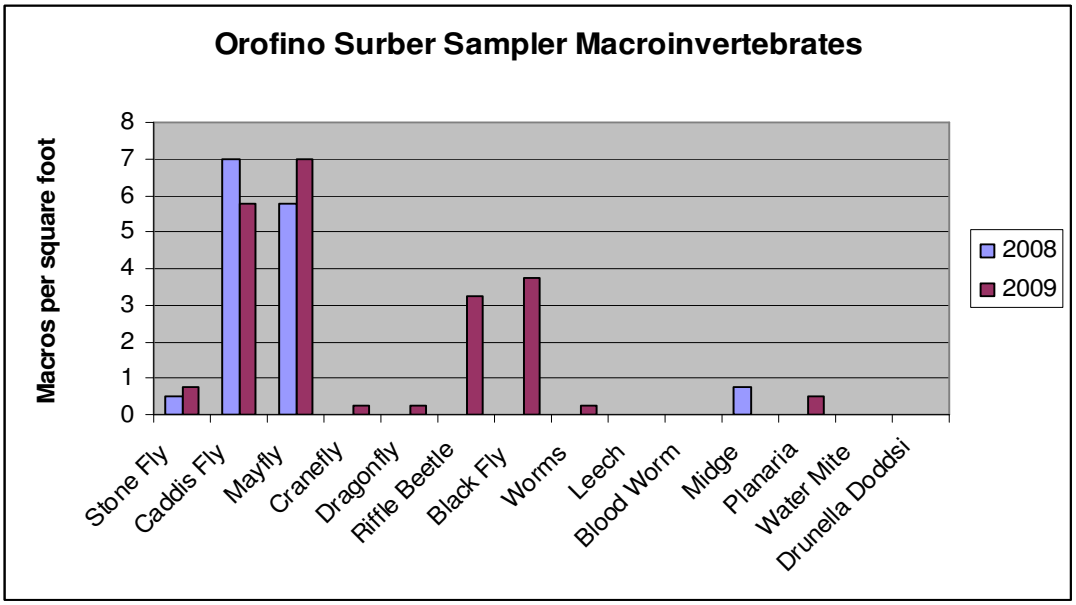


Figure 5. Comparison of FY08 to FY09 Orofino Creek Macro-invertebrates, YFMP Monitoring

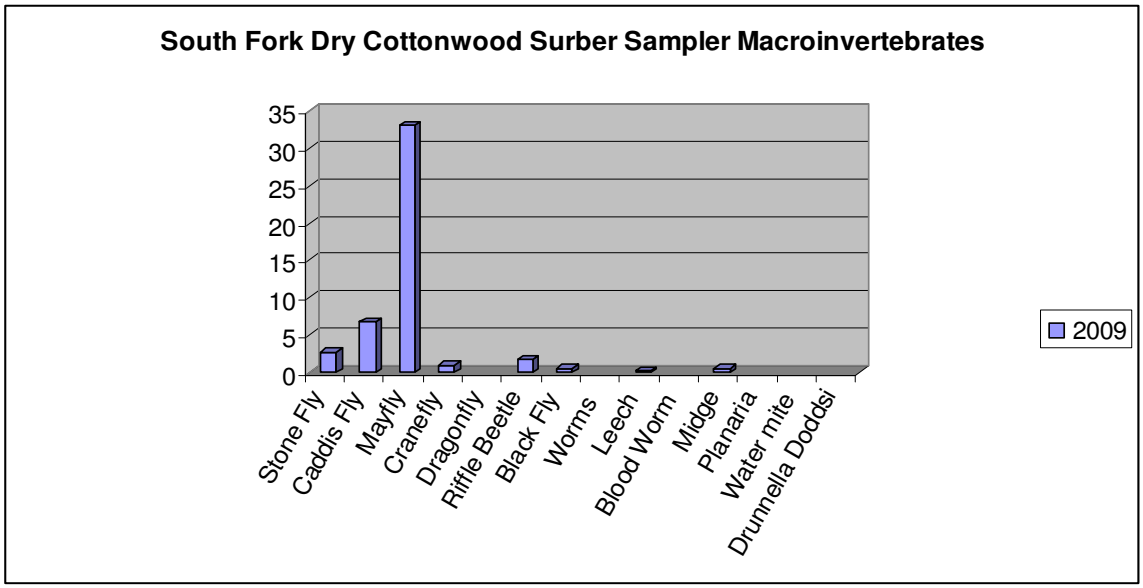


Figure 6. FY09 South Fork Dry Cottonwood Creek Macro-invertebrates, YFMP Monitoring

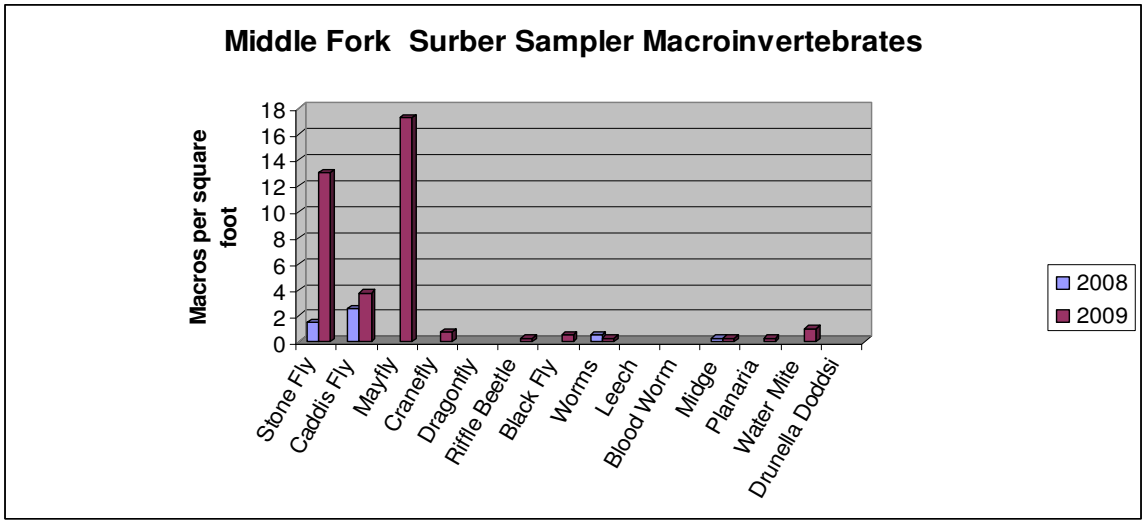


Figure7. Comparison of FY08 to FY09 Middle Fork Macro-invertebrates, YFMP Monitoring

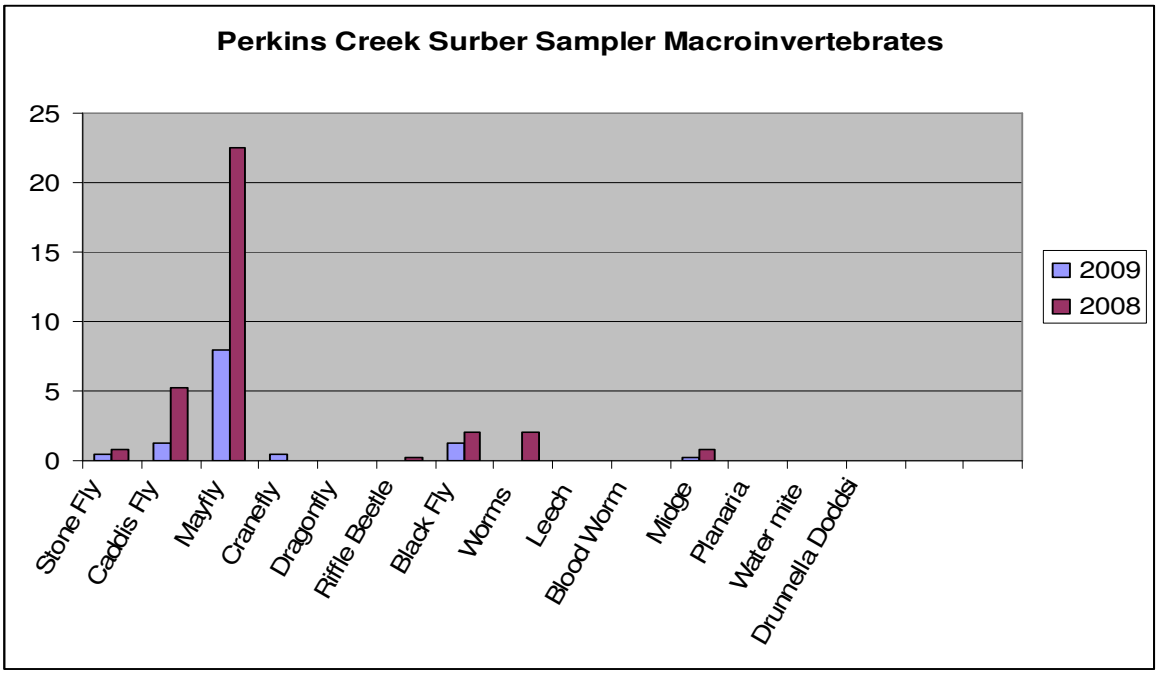


Figure 8. Comparison of FY08 to FY09 Perkins Creek Macro-invertebrates, YFMP Monitoring

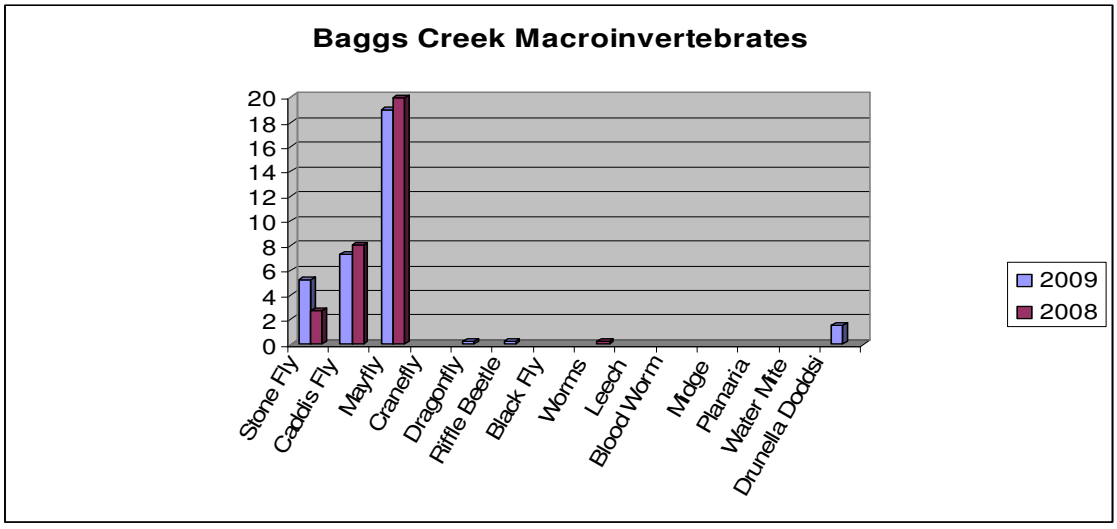


Figure 9. Comparison of FY08 to FY09 Baggs Creek Macro-invertebrates, YFMP Monitoring

Evaluation:

PIBO-EM sampling points are located on 62 response reaches of sub-watersheds, 54 sites represent potential sediment producing activities or restoration activities (managed watersheds). Another 8 sample sites are located on response reaches of sub-watersheds which

represent unmanaged natural conditions (reference watersheds).In 2008 the Forest Service contracted installation of another 15 sample sites on streams within key restoration watersheds and key fish watersheds, all in managed sub-watersheds. In 2009, another 5 sites were contracted. The Forest now has a total of 82 PIBO baseline sample sites.

As of 2009, repeat sampling had only been done on 9 sites, those installed initially in 2003. During the 2009 field year, 15 sites measured in 2004 will be sampled again. That data will not be available until 2010. The YFMP sampling is also confined to two sets of readings, one year apart.

In 2009, only baseline data is available for sample sites so it is too early to make meaningful interpretation of the data. By 2014, a third data set will be available for 2003 sample sites and a second data set will be available for sample sites installed between 2004-2008.

Soil and Water Conservation Practices

Item 6

Monitoring Question: Are soil and water conservation practices (also referred to as Best Management Practices or BMPs) being implemented during project work and are they resulting in protection of water quality and beneficial uses?

Performance Measure: BMPs implemented and percent rated effective.

Data Sources: Annual project review. Compare BMPs prescribed by EA, EIS or contract, to see if BMPs were followed and were effective.

Measurement Period: Annual

Reporting Period: Annual

Introduction:

Soil and water mitigation measures are established to comply with the Forest Service Soil and Water Conservation Practices (SWCP) Handbook 2509.22. Those SWCPs are comparable to "best management practices" or BMPs. During environmental analysis, interdisciplinary teams select appropriate soil and water conservation practices based on water quality objectives, soils, topography, geology, vegetation and climate. These final selected practices are translated into project plan specifications, contract clauses, and other tools.

The BDNF annually conducts an integrated review of one project on the Forest to determine if practices or mitigation measures identified during environmental analysis by the ID Team are implemented on the ground and if those measures are effective in accomplishing the intended land management objective. On August 20, 2009, an interdisciplinary team of 18 Forest and District specialists, Staff Officers, and a District Ranger reviewed the implementation and success of a roadside salvage project along selected roads on the Butte and Jefferson Ranger Districts. This sale was an outcome of the **Roadside Safety Tree Removal Project** Decision Memo, approved in January 2008, implemented under 3 separate contracts in 2008 and 2009: Delmoe-Radar, Lime Kiln, and Highlands Roadside Salvage. Harvest operations were complete for the review but some contract work remained.

Mitigation requirements listed in the Decision Memo (DM) are presented here with the associated soil and water protection requirements (SWCPs), the objective of the SWCP, results of implementing the SWCP, and in a final section, evaluation of the effectiveness of the SWCP.

Results*:*

(a). SWCP 14.04 - Operating period is limited to frozen or snow covered ground between 12/2-3/15.

Objective: minimize soil erosion, sedimentation and loss of soil productivity by limiting periods of operation.

Finding: A contract provision limiting operations to 12/2-3/15 was included in all 3 contracts under C6.316. Lime-Kiln sale was harvested on frozen ground in the winter of 2008. In July 2008, the contractor requested the Forest Service allow summer and fall harvest with the stipulation that logging be accomplished with a Yoder/Excaliner operating from existing roads in conjunction with a feller-buncher to fall the trees on slopes less than 25 percent. In July, the BDNF Forest Soil Scientist authorized this change with a caution that approval be accompanied by "*careful operators and close sale administration" "to prevent detrimental soil displacement". "Soil moisture should be less than 12 percent when the feller-bunchers are operating on unfrozen soil*". Delmoe-Radar sale was subsequently harvested from September through November 2008 on dry but not frozen ground. Highlands Sale was harvested beginning in fall after a significant snow event. Along Camp Creek Road, on soils overlaying impermeable granitic bedrock, soils were still wet.

Figure 10. Delmoe-Radar Sale Fall Logged on Dry Ground

Figure 11. Camp Creek Road (Highland Sale) Fall Logged with High Moisture

Prior to the field review, soil scientists monitored post operation disturbance and compaction on harvest units along the Delmoe Lake Road (FSR #222), Camp Creek Road (FSR #8520), Lime Kiln Road (FSR #8492) and Soap Gulch Road (FSR #599). Soil disturbance was recorded in 6 harvest units. See detailed results under "Monitoring Item 7. Soil Productivity".

All units monitored met Regional Soil Quality Standards. However, units located along the Camp Creek Road came close to exceeding standards at 15% detrimental soil disturbance. This is due to two things: 1) on Camp Creek and Soap Gulch roads, tracked equipment (D5H grapple skidder) was used to skid the trees and pile the slash since the operator's rubber tired skidder broke down, 2) work in Camp Creek and Soap Gulch took place in fall. The soils were too wet for harvest activities. Much of the detrimental disturbance in these units took place when the tracked equipment turned abruptly, causing displacement and mixing. The sale administrators recognized this and began having operators drive the tracked equipment straight in, and back it straight out. This practice effectively reduced the soil disturbance in subsequent harvest units.

(b) SWCP 14.06 - Hand fell hazard trees in Stream Management Zones (SMZs) and archaeological sites and leave trees on site

Objective: To minimize the adverse effects on Riparian Areas with prescriptions that manage nearby logging and related land disturbance activities.

Finding: Contract item C6.5 prohibits equipment in SMZs. Because these are marked sales, unless we mark trees in the S Z the contractor has no cause to be in there. This was clarified to contractors in pre-work meetings. Hazard trees in the SMZs are scheduled to be felled by Forest Service crews. Felling had not taken place yet at the time of the review.

(c) SWCP 14.08 - Multiple pass skid trails are designated by the sale administrator, spaced 85-100 feet apart.

Objective: To minimize erosion and sedimentation and protect soil productivity by designing skidding patterns to best fit the terrain.

Results: This requirement is difficult to measure given the configuration of the roadside harvest units. For this project, hazard trees were individually marked for harvest in a corridor which varied from 0 to 150 feet from the roadway, depending on the slope and height of the trees. Patches of remaining unmarked trees presented obstacles to equipment movement and limited operating space, particularly where the corridor was narrower than 100 feet. Typically, we observed that one main skid trail was designated towards the back (furthest away from the road) of the unit, running parallel to the road. This practice appears to have effectively limited disturbance as the mitigation measure was intended.

This SWCP is irrelevant in winter logging operations where snowpack protects soils from erosion. In larger summer/fall logged units, skidding patterns approximated the requirements. On narrow roadside units, individual tree marking made this difficult to implement. Leaving residual trees in patches forces some skid trails closer together

than the prescribed 85-100 feet. Species designation resolves this problem because equipment has more options for maneuvering. Equipment like the Jewell loader, which can be used from the road, is another solution and recommended for future roadside salvage projects.

(d) SWCP 14.09 - Trees are whole-tree yarded, slash is chipped and removed or burned.

Objective: To protect the soil from excessive disturbance and accelerated erosion and to maintain the integrity of the Riparian Area and other sensitive watershed areas.

Finding: Contract requirements (C6.4) for whole tree yarding were found only in the Highland contract but trees were whole tree yarded on all 3 sales as evidenced on site and witnessed by the sale administrator. Slash was piled for FS disposal on Lime Kiln and Delmoe-Rader sales. Highlands has not been slashed yet. Large slash was absent, small slash from breakage off dead trees following falling and dragging was abundant. Chipping or burning by the Forest Service has not yet taken place.

(e) SWCP 14.10 - Log landings will be located in noxious weed free areas or treated prior to use.

Objective: To locate landings in such a way as to avoid soil erosion and water quality degradation.

Finding: Didn't have noxious weed problems along the roadsides involved in any of the 3 sales – these are main arterials for the Butte Ranger District and are usually a high priority for District weed crews. They are kept fairly clean of noxious weeds. Sale administrator did approve landing site locations.

(f) SWCP 14.11 - Landings will be reseeded following harvest and slash disposal.

Objective: to reduce impacts of erosion and subsequent sedimentation from log landings through the use of mitigating measures.

Results: Reseeding disturbed sites is unnecessary on winter logged sites. On summer and fall logged sites on Delmoe-Radar and Highland Sales, the sale administrators will follow up the contract with reseeding (Forest Service activity). Highland Sale slashing has recently been completed. It was too early to tell during review if any bare soil on landing sites would fill in naturally or not.

Figure 12. Slash piles on Highland Sale (Fall Logged)

Figure 13. Slash piles on Lime-Kiln (Winter Logged)

(g) SWCP 14.14 - Disturbed areas will be monitored to insure soil stabilization occurs through natural revegetation from the soil seed bank

Objective: To establish a vegetative cover on disturbed sites to prevent erosion and sedimentation.

Results: Money is collected from the contract for seed purchase. The FS will seed disturbed areas. On review, it was too recent to see natural vegetative response. The team ecologist predicts lodgepole pine will come back in thickly onto any of the disturbed sites (outside of landings) observed.

(h) SWCP 15.21 - Maintenance of Roads

Objective: To maintain all roads in a manner providing for soil and water resource protection by minimizing rutting, failures, sidecasting, and blockage of drainage facilities.

Results: This SWCP was not identified in the DM mitigation, it was identified during contract issuance and enforced through contract measures T-101 surface blading, T-301 ditch cleaning, T-310 drainage structures, C5.316 snow removal, and C6.6 erosion prevention. All contract measures were implemented. The maintenance provisions were not included in Limekiln Sale Contract because the Forest Service road crew had the area on its spring maintenance schedule. All roads inspected were in good condition, culverts and ditches were functioning. The Forest Soil Scientist notes that distributing slash on trails is preferable to constructing berms on skid trails.

(i) Heavy equipment will be washed and inspected to reduce spread of noxious weeds (no SWCP attached).

Objective: Reduce spread of noxious weeds.

Results: Contract clause C6.351 was included in all three contracts. Sale administrators verify that inspections were conducted. No new weed infestations have shown up yet.

(j) Operations affecting cultural resources discovery will be curtailed until evaluated (no SWCP attached).

Objective: Protect cultural resource discoveries from damage by equipment.

Results: Contract clause B6.24 and C6.24 were included and implemented on all three contracts. A cultural site was found during work on Limekiln Sale. Further work by the contractor was approved by Forest Archaeologist, Tammy Cherullo. She reported being satisfied with the process and outcome of supervised contractor operations.

(k) Cut stumps within 100 feet of Roads #84 and #222 to 6 inches or less (No SWCP attached).

Objective: Protect visual quality as viewed by drivers on main arterial roads.

Results: Contract clause C6.7 (b) requires low stump cuts on Roads #84 and #222. Occasionally stumps are visible which are greater than 6 inches (some as high as 2 feet). These are stumps left by firewood cutters who harvested trees marked to leave which died after the contract was let. On Delmoe sale, the contractor went back and recut the firewood gatherer stumps as well.

Figure 14. Flush cut stumps on Highlands Road #84

Figure 15. Leave trees dying along Highland Road 84

(l) Meandering edges will be created and smaller trees retained where feasible (No SWCP).

Objective: Protect visual quality as viewed by drivers on main arterial roads.

Results: Meandering edges and variable depths of units were designed into sale layout. The Forest Landscape Architect was pleased with the visual results of layout on all three sales in this first roadside hazard reduction project. Uneven terrain, diverse stands and single tree marking resulted in variable appearing unit boundaries. Many of the retained trees are now dead, however, and will have to be removed to meet the intent of providing for public safety along these routes.

Evaluation: Soil and Water Conservation Practice evaluation is based on (a) was the SWCP implemented, (b) was it effective (c) did a departure from the SWCP occur, (d) was corrective action needed.

(a). SWCP 14.04 - Limiting periods of operation to frozen or dry ground is effective. This SWCP was fully implemented on Lime Kiln sale. Limiting operations to frozen ground in winter is very effective for limiting detrimental soil disturbance. Other effective requirements are limiting soil moisture or limiting to rubber tired equipment.

An exception to the SWCP was authorized for the Delmoe-Radar and Highlands Sales as described above. Limits of the modified SWCP (dry soils) were complied with on Delmoe-Radar Sale. By operating with dry soils and good contract administration, disturbance and compaction was held between 3 and 7%. The modified SWCP was effective.

Changing the season resulted in a departure from the SWCP and subsequent authorized season adjustment on the Highland Sale, Camp Creek Road Unit. Equipment began sale operations along the Camp Creek Road Unit in the fall on soils that apparently exceeded 12% moisture content. Detrimental disturbance was measured at 15%, barely within acceptable standards. The problem was resolved quickly when the sale administrator identified the problem and the contractor adopted a new practice of driving the clippers straight in and then back straight out to reduce soil displacement.

While no corrective measures on site were required but the Camp Creek Unit was discussed by the review team as a lesson learned. The review team agreed that operating on frozen or snow covered ground as the DM initially required would have resulted in less than the 15% disturbance on the unit. Sale administrators point out that winter operations are harder on contractor's equipment and employees but they seem generally willing to bid on winter sales. Problems occur if it's a large sale that can't be completed in a single winter season, units that can be worked in other seasons need to be available then.

The problem could also have been partially resolved by a change in equipment. This would have reduced some of the soil mixing seen in the unit, but likely would not have

prevented rutting and puddling seen due to overly wet soils. Based on this sale, the BDNF has been allowed by the Region to restrict track machines (D5H grapple skidders) from use under contract provision c6.4 (conduct of logging). We have also learned that equipment like the Jewell loader can do this kind of work without ever leaving the road. ***The Forest has now applied for and received authorization from the Regional Office for a "Non-recurring "C" provision for Soil and Water Protection under SWCP 14.21 to use specialized equipment able to skid logs while remaining on the road (Excaliner, Jewell Loader).*** Going to species designation allows us to use this more specialized equipment and avoid some of these soil disturbance issues. This would require contractors are authorized to use road surfaces for moving logs.

In conclusion, detrimental soil disturbance was well within the Northern Region Soil Quality Standards. The vast majority of the skid trails observed during the review had slash cover sufficient to protect the soil from erosion. From the standpoint of limiting soil disturbance and protecting disturbed areas such as skid trails from erosion, it appears that the SWCPs have protected water quality and beneficial uses over the vast majority of the project area.

(b) SWCP 14.06 – Riparian Area Designation. This SWCP was implemented under the direction to hand fell hazard trees in SMZs. It was effective in protecting the riparian habitat and riparian function. No departures occurred, no correction was required. However, the hazard trees in SMZs were still standing, a result of a Forest Service crew not being available to do the work. These trees continued to pose a potential safety threat to the public.

(c) SWCP 14.08 – Tractor Skidding Design. This SWCP was implemented with difficulty. Designated skid trails at the back of the unit, paralleling the road appear to have effectively limited disturbance as the mitigation measure was intended. This SWCP is less effective in narrow marked tree roadside salvage than it may be in other applications. Recommendations from the review team included using a Jewell loader which operates strictly from the roadbed or going to a size designation for trees which would leave fewer patches of trees to dodge equipment around.

(d) SWCP 14.09 - Suspended Log Yarding in Timber Harvesting. This SWCP was implemented under the direction to whole tree yard and was effective on all sales. No departures occurred, no correction was required.

(e) SWCP 14.10 – Log Landing Location. This SWCP was implemented to prevent noxious weed establishment on landings. Sale administrators did approve landing location, but It turned out to be an unnecessary requirement because the main arterial roads scheduled for harvest are a treated annually by the District weed crews and fairly clean of weeds. No departures occurred, no correction was required.

(f) SWCP 14.11 - **Log Landing Erosion Prevention and Control.** This SWCP appears to be an unnecessary requirement on sites where winter logging took place, see Figure 13. Implementation of SWCP 14.04 precludes the need to include this SWCP. On areas logged in summer or fall, it is too early to tell if response of native vegetation where soil was disturbed on landings will preclude the need to seed. Effectiveness of the SWCP 14.11 cannot be evaluated yet on this sale.

(g) SWCP 14.14 – Revegetation of Areas Disturbed by Harvest Activities. This SWCP appears to be an unnecessary requirement on the sites reviewed. Soil disturbance at the scale which would require reseeding or mulching was not observed on either winter logged or dry summer/fall logged sites. Restocking by lodgepole pine seedlings appears favorable. Sale administrators will monitor the Camp Creek Road Unit for natural revegetation and seed if necessary.

(h) SWCP 15.21 – Maintenance of Roads. This SWCP was implemented and effective. No departures occurred, no correction was required.

(i) Heavy equipment will be washed and inspected to reduce spread of noxious weeds (no SWCP attached). This mitigation was implemented through contract item C6.351 and appears was effective, based on the lack of new weed infestations appearing.

(j) Operations affecting cultural resources discovery will be curtailed until evaluated (no SWCP attached). This mitigation was implemented through contract items B6.24 and C6.24 and was effective. The sale administrator notified the archaeologist, the site was reviewed, contract work was able to proceed, and the site was protected.

(k) Cut stumps within 100 feet of Roads #84 and #222 to 6 inches or less (No SWCP attached. This mitigation was implemented through contract item C6.7 (B) and was effective as far as contracting action goes, see Figure 14. A problem arises when dead and dying trees are individually marked for sale the year prior to contract issuance. The beetle cycle is moving quickly through live trees in this area, infesting ever younger trees. Many trees that were live during the marking period are now dead. On the Delmoe-Rader Sale, the marking crew returned more than once to remark new dead trees. Dead trees that appeared during or after the sale are attracting firewood cutters. Even when the contractor cuts stumps to requirements, there is no control over firewood cutters in the area leaving high stumps.

(l) Meandering edges will be created and smaller trees retained where feasible. This mitigation was implemented through sale layout and is effective in reducing visual impacts of salvage operations. Marking individual trees for sale, which creates problems for skidding layout and high cost of return marking as trees continue to die, is the primary reason this mitigation is effective.

Additional evaluation of Roadside Safety Tree Removal project:

As the Forest continues to schedule roadside safety tree removal projects across the Forest, the ID Team is eager to improve on the success of this first salvage effort. The following issues were discussed in search of continual improvement.

(a) Trees continue to die in treatment areas post-sale. Since dead trees still remain along the road, did we accomplish the purpose regarding public safety and road maintenance? The definition of dead trees has not changed between this first project and Roadside Salvage #2 and Roadside Salvage #3, "dead and mountain pine beetle infested (showing evidence of beetle activity such as pitch tubes, pitch runners, boring dust) and lodgepole pine trees that might fall into the road right of way over the next 3 years". For Delmoe-Radar, Homestake, and Lime Kiln Sales, dead and dying trees were individually marked for cutting. Trees that are now dead were live during the marking period. The beetle cycle is moving quickly through live trees in this area infesting even younger saplings. On the Delmoe-Radar Sale, the marking crew had to go back more than once to remark new dead trees. This makes the sales costly. In the picture below, blue marking paint was used the first round, yellow was used the second round.

Figure 16. Blue and yellow marking paint on harvested trees, Delmoe Road

There are three options for felling hazard trees that remain on these three sale areas. (1) Issue a service contract and use KV dollars to pay for it, (2) use a force account crew or (3) issue a small timber sale contract. The third option would be a problem because wood values are too low now to bring equipment in for small volumes.

Lessons learned: On Roadside Salvage #2 and #3, sales were set up using species designation rather than individual tree marking. All lodgepole within the sale boundary

and above 4” diameter and 16’ height are harvested if the trees will fall on the road. This accounts for the dynamic nature of the infestation, saves costly remarking of sales, and better meets the purpose of safeguarding public safety and road maintenance costs.

(b) Visual effects. The Landscape Architect (LA) points out that the visual appearance of this sale with individual tree marking is more desirable than the Roadside #2 Salvage in Labelle where species designation was applied in solid stands of lodgepole. Leaving patches of smaller trees that are not hazards improves the appearance. Sale administrators pointed out that operating around patches results in more than one pass over ground and greater disturbance/compaction. It’s a trade-off between resource impacts. The LA will work with boundary marking crews to avoid corridor effects. The purpose and need of the projects will continue to be protecting public safety. Harvest should concentrate on trees that will fall in the road, not all trees in a 150’ corridor.

Figure 17. Corridor effect of species designation marking on Labelle Roadside Salvage, winter 2009

(c) Firewood gathering. How do we meet demand for firewood and control the impacts of firewood gatherers on accomplishing the salvage? Side roads are still available to cutters, only major arterials are affected by this and future proposals. We can leave a few piles with material in designated free use areas where cutting standing trees is prohibited. Since piles have traditionally been undesirable to some cutters, we will need to inform people these piles are cleaner than the old dozer piled clearcut-slash.

(d) Slash piling and burning. Detrimental soil impacts from roadside salvage are pretty low in most cases, according to the soil scientists, except related to piling and burning slash. The group discussed ways to mitigate this – making piles smaller and higher to reduce impact of heat on soils. Other mitigations which would eliminate impacts entirely include contract chipping and distributing the chips, the other being to purchase a burn box where slash can be incinerated any time of the year in a box.

Soil Productivity

Item 7

Monitoring Question: Are management actions maintaining soil quality?

Performance Measure: Effects of treatments on areas treated.

Data Sources: Inspection reports, daily diaries, resource compliance monitoring, BMP monitoring and evaluation.

Measurement Period: 5 years **Reporting Period:** 5 years

Background:

Location of Project and Activity Monitored
Roadside Safety Tree Removal project is a hazard removal project conducted in 2008 and 2009 along selected roads in the Butte Ranger District. To determine the effects of the project on soil quality as measured through detrimental soil disturbance, we monitored harvest units along the Delmoe Lake (Road 222), Camp Creek (Road 8520), Lime Kiln (Road 8492) and Soap Gulch (Road 599) roads.

Sampling Methods
Soil disturbance was recorded in 6 harvest units. Indicators recorded included erosion, compaction, rutting, puddling and displacement. These indicators are identified in the Northern Region Soil Quality Standards (SQS), which set limits to the degree and aerial extent of soil disturbance to maintain soil productivity, thus meeting the intent of the National Forest Management Act. The Forest Soil Disturbance Monitoring Protocol (Dumroese and others, 2009) was followed to assess soil disturbance in the harvest units. The protocol is applied to areas disturbed by management activities, and is a presence/absence (1=present, 0=absent) method of collecting visual attribute data in order to assess soil disturbance. Attributes evaluated include forest floor impacts, surface soil displacement, mixed surface soil/subsoil, rutting, burning (only management prescribed burning is assessed), compaction, and platy or massive structure. Samples were taken every 60 feet along random transects placed in a zig-zag fashion through harvest units, to adequately cover the units.

Monitoring Results:

All units monitored met the SQS (see Table 5), with an average of 7% detrimental soil disturbance (DSD) found. Units located on the Delmoe Lake and Lime Kiln Roads had a lower percentage DSD than those located on the Camp Creek and Soap Gulch Roads. This is due, in part, to different operators, and also to the fact that the harvesting activity that occurred on the Camp Creek and Soap Gulch Roads was completed with tracked equipment to skid the trees, and also to pile the slash since the operator's rubber tired skidder broke down. Much of

the DSD in these units took place when the tracked equipment turned abruptly, causing displacement and mixing. The sale administrators recognized this, and began having operators drive the tracked equipment straight in, and back it straight out. This practice effectively reduced the DSD in subsequent harvest units. Additionally, harvest occurred on the Delmoe Lake road portion during dry conditions in the fall, and in frozen conditions on the Lime Kiln road, while conditions were overly wet and not frozen in the Highlands area (Camp Creek and Soap Gulch Roads) when harvest occurred.

Table 5. Location, Geology and Results of DSD Sample Plots

Location	Geology, dominant soil texture	Number of plots taken	Number of Detrimental Plots	Percentage detrimental
Delmoe Lake Road (222), miles 1-2	Granite, sandy loam	136	4	3%
Delmoe Lake Road (222), mile 7	Granite, sandy loam	60	3	5%
Lime Kiln Road (8492), mile 2	Granite, sandy loam	30	1	3%
Soap Gulch Road 1 (599), mile 2	Metasedimentary, gravelly loam	55	4	7%
Soap Gulch Road 2 (599), mile 4	Metasedimentary, gravelly loam	30	2	7%
Camp Creek Road (8520) just south of Moose Creek	Metasedimentary, stony loam	41	6	15%
AVERAGE DETRIMENTAL SOIL DISTURBANCE				**7%**

The unit located along Camp Creek Road that had 15% detrimental soil disturbance (see Table 5) is just south of Moose Creek. This area is characterized by a veneer of Belt (metasedimentary) rocks overlaying generally impermeable granitic bedrock. Since the granite is relatively impermeable, water tends to travel laterally through the Belt rocks, meaning the soil is wet at a shallow depth for most, if not all, of the year. Since the unit was harvested in the fall after a significant snow event, the ground appeared to be saturated but not yet frozen. As a result, detrimental rutting and puddling as well as detrimental displacement and soil mixing were evident in the unit (see Figure 18).

Figure 18. Detrimental soil disturbance visible just south of Moose Creek. Puddling, displacement, and soil mixing are evident.

Evaluation:

When followed, the soil BMPs effectively reduced detrimental soil disturbance as evidenced by an average of 7% detrimental soil disturbance across the project. The unit that we monitored just south of Moose Creek was harvested when the soil was saturated, which was not in line with typical soil BMPs requiring either frozen or dry soils before harvest. As a result, it had over twice the detrimental soil disturbance seen in units that were harvested when the soil was dry enough. This particular unit had notable lateral subsurface flow and likely would not have dried sufficiently during the summer to prevent rutting and mixing; winter harvest with frozen soils is the only condition that would have reduced detrimental disturbance. This example demonstrates the importance of identifying areas that are unlikely to dry out during the course of the summer, and designating such areas for winter logging over frozen soils. Since we are experiencing widespread tree mortality, soils are retaining more water later in the growing season. This effect is magnified by the occurrence of non-drought conditions. These factors combined mean that assuring soils are sufficiently dry and/or frozen before beginning ground-based operations is now even more important in reducing detrimental soil disturbance.

Aspen Restoration

Item 9

Monitoring Question: Are management activities restoring aspen at the rate projected in the Forest Plan?

Performance Measure: Acres of aspen treated or converted by wildfire.

Data Sources: Forest accomplishment reports, FACTS data base, FIA data base

Measurement Period: Annual **Reporting Period:** Annual

Background:

A 10-year forestwide aspen monitoring project begun in 1998 established 80 permanent monitoring plots on aspen treatment sites distributed across all 7 Districts. Field personnel recorded sprout height and intensity, browse levels, site descriptions and treatment type. Results and recommendations were published in both the 1999 Aspen Handbook for the Forest and the 2008 Forest Monitoring and Evaluation Report. Forestwide, the treatment methods used prior to 1998 resulted in only a 40% success, though areas of the Forest like the Gravelly Range showed much higher success rates. See the 2008 report results at http://fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5123386.pdf. As a result of that 10-year aspen monitoring project, aspen treatment methods have been modified on this Forest. The primary treatment method over the last 10 years has been removal of conifer competition.

Aspen restoration continues to be a critical issue for the Forest. A primary objective of the 2009 Forest Plan is to restore aspen habitat on 67,000 acres over the planning period. Two assumptions were made in developing this aggressive objective. First, much of this objective must be accomplished by wildfire stimulating dormant clones since Forest budgets and NEPA assessment capabilities limit how many acres we can treat. Second, aspen sprouts responding to wildfire and landscape scale treatments stand a better chance of surviving browse pressure than the small treatments we have accomplished in the past.

Monitoring continues to be critical to answer the primary question highlighted in bold type above regarding the success of our management *treatments*, but also:

- How well do existing aspen stands respond to wildfire?
- Will dormant clones respond when wildfire passes through conifer stands as well as being released by fuel treatment or timber harvest?
- Are aspen sprouts on wildfires surviving browse pressure in the long term?

The Forest initiated a second 10-year aspen monitoring effort in 2009. Field personnel established 66 new permanent plots in aspen sites treated since 2001 with a variety of modified

treatment methods on a range of sites. In addition, 24 plots have been established in 2000 and 2007 wildfires on sites where aspen sprouts have been found (Mussigbrod, Rat Creek, Stony Creek, Sand Basin, and Medicine Lake fires). We will continue to add plots within new wildfire perimeters each year, returning to previously established plots either on a 3-5 year return interval. By the time the Comprehensive Evaluation Report is written in 2014, we hope to expand our knowledge on which treatments or conditions lead to successful stands as well as if wildfires result in healthy viable aspen stands.

The results below summarize both the aspen treatment accomplishments for FY09 and the baseline data for the next 10-year monitoring effort.

Results:

(A) ACRES TREATED in FY09

Aspen stands were treated on 201 acres across the Forest in 2009. The majority (192 acres) took place at various locations in the Gravelly Mountains on the Madison Ranger District. Hand crews slashed conifers competing along the edge and within mature aspen stands. Treatment data was extracted from the FACTS data base.

Figure 19. Conifer slashing on the Madison Ranger District, Gravelly Range

(B) LONG TERM MONITORING DATA:

Aspen stand data gathered on 66 treatment sites and 24 wildfire sites are displayed in Table 6 below. Symbols used in the table are defined at the bottom of each column. Progressing stands have a low level of browse, or a moderate level of browse with moderate numbers of sprouts (over 1,000/acre), or a high level of browse with high numbers of sprouts (over 3,000/acre) OR sprouts grown out of reach of browsing regardless of numbers.

Table 6. Status of Aspen Restoration in FY09, Sites Progressing versus Sites Stagnant

Site Impact	# of Sites	# of Sites Progressing	# of Sites Stagnant
Management Treatment	66	43 (65%)	24 (35%)

Fenced treatments all have a low level of browsing and 100% are progressing. It was premature to make an assessment of sprout success on wildfire sites.

Figure 20. Fenced aspen clone east of Wisdom, no treatment, 15 foot sprouts

Figure 21. Aspen and lodgepole pine sprouting on 2000 Middle Fork Complex fire, Pintler RD

Table 7. Aspen Permanent Plots, Treatment Descriptions, and Survey Data for Selected Sites, 2001-2009

District	Site Name	Trtmnt Date	Treatment Type	Stand Replacement	Site Type	Sprouts/ Acre	Sprout Height	Browse Level	Success Rating
2	Panama E	2005	Wildlife Fence	N	U	5000	7	L	P
2	Panama W	2005	Wildlife Fence	N	U	1800	2	L	P
2	Stone Cr. 1	2007	Wildfire	Y	U	0	0	0	
2	Stone Cr. 2	2007	Wildfire	Y	U	0	0	0	
3	Arnold 1	2005	No Treatment	0	ST	6000	5	H	P
3	Arnold 2	2005	Slash Conifer/Burn	Y	U	5000	3	H	P
3	Arnold 3	2005	Slash Conifer/Burn	Y	U	5000	5	M	P
3	Arnold 4	2005	Slash Conifer/Burn	Y	U	5000	6	M	P
3	Arnold 5	2005	Slash Conifer/Burn	Y	U	3000	4	H	P
3	West Face 1	2005	Slash Conifer/Burn	Y	U	4000	3	H	St
3	West Face 2	2005	Fence only	N	U	4000	7	L	P
3	West Face 3	2005	Fence only	N	U	3000	6	L	P
3	West Face 4	2005	Fence only	N	U	3000	5	L	P
3	Isaac Mdw 1	2006	Fence only	N	U	3000	4	L	P
3	Isaac Mdw 2	2006	Fence only	N	U	5000	10	L	P
3	Isaac Mdw 3	2006	Fence only	N	R	1000	5	L	P
3	Lwr Mussigbrod	2000	Wildfire	Y	ST	900	1.5	L/M	
3	Plimpton Ridge	2000	Wildfire	N	U	9000	1.5	M	
3	Bender Cr #1	2000	Wildfire	Y	ST	100	2.5	H	
3	Bender Cr #2	2000	Wildfire	Y	R	12000	4	M	
3	Johnson Cr #1	2000	Wildfire	Y	U	10	2	M	
3	Johnson Cr #2	2000	Wildfire	Y	U	110	2	M	
3	Johnson Cr #4	2000	Wildfire	Y	R	11400	2	M	
3	Johnson Cr #5	2000	Wildfire	Y	U	2400	2	M	
3	Bender Cr #4	2000	Wildfire	Y	U	360	2	M	

District	Site Name	Trtmnt Date	Treatment Type	Stand Replacement	Site Type	Sprouts/ Acre	Sprout Height	Browse Level	Success Rating
3	Bender Cr #3	2000	Wildfire	Y	U	120	2	M	
3	Bender Cr #5	2000	Wildfire	Y	U	54	1	M	
3	Maybee Meadows	2007	Wildfire	Y	U	1200	1.5	H	
3	Johnson Cr #7	2000	Wildfire	Y	U	700	2	M	
3	Johnson Cr #6	2000	Wildfire	Y	U	4500	4	L	
3	Schultz Cr #1	2000	Wildfire	Y	U	25	2	H	
3	Schultz Cr #2	2000	Wildfire	Y	U	100	3	M	
3	Johnson Cr #3	2000	Wildfire	Y	U	60	2	M	
3	Schultz Cr #3	2000	Wildfire	Y	U	50	2	M	
4	Sunday 1	2006	Clear Conifer	N	U	6000	2.5	H	P
4	Sunday 2	2006	Clear Conifer	N	U	1000	2	H	St
4	Sunday 3	2006	Clear Conifer	N	U	3000	2.5	H	P
4	Sunday 4	2006	Slash	Y	U	1000	2.5	H	St
4	Sunday 5	2006	Clear Conifer	N	R	2500	2.5	H	P
4	Sunday 6	2006	Clear Conifer	N	U	500	2	H	St
4	Beaverdam	2009	Clear Conifer	N	R	100	15	M	P
4	N. Fork Moose 1	2007	Clear Conifer	N	ST	200	0.5	H	St
4	N. Fork Moose 2	2007	Clear Conifer	N	U	100	1	H	St
4	Labelle 1	2008	Clear Conifer	N	R	0	0	0	St
4	Labelle 2	2009	Clear Conifer	N	R	500	1	H	St
4	Labelle 3	2009	Clear Conifer	N	R	500	1	H	St
4	Labelle 4	2009	Clear Conifer	N	R	500	0.5	H	St
4	Labelle 5	2009	Clear Conifer	N	U	500	0.5	H	St
4	Labelle 6	2009	Clear Conifer	N	U	100	0.5	H	St
4	China 1	2007	Clear Conifer	N	U	1000	0.5	H	St
4	Basin Cr. 1	2007	Clear Conifer	N	U	0	0	0	St

District	Site Name	Trtmnt Date	Treatment Type	Stand Replacement	Site Type	Sprouts/ Acre	Sprout Height	Browse Level	Success Rating
4	Basin Cr. 2	2007	Clear Conifer	N	R	0	0	H	St
4	Basin Cr. 3	2007	Clear Conifer	N	U	1200	0.5	M	P
4	Basin Cr. 4	2007	Clear Conifer	N	U	400	0.5	L	P
4	Basin Cr. 5	2007	Clear Conifer	N	U	1200	0.5	H	P
6	Johnny G. 1	2008	Clear Conifer	N	U	1500	2	M	P
6	Johnny G. 2	2008	Clear Conifer	N	U	1400	2	L	P
6	Johnny G. 3	2008	Clear Conifer	N	U	800	3	L	P
6	Johnny G. 4	2008	Clear Conifer	N	U	900	3	M	P
6	Cottonwood 1	2008	Clear Conifer	N	U	1400	5	L	P
6	Cottonwood 2	2008	Clear Conifer	N	U	600	2.5	L	P
6	Cottonwood 3	2008	Clear Conifer	N	U	400	2	H	St
7	Shamrock 1	2006	Clear Conifer	N	U	5000	2.5	M	P
7	Shamrock 2	2006	Clear Conifer	N	U	8500	2.5	M	P
7	Shamrock 3	2006	Clear Conifer	N	U	6000	2	H	P
7	Shamrock 4	2006	Clear Conifer	N	U	6000	3	M	P
7	Mormon 1	2006	Clear Conifer	N	U	5000	2.5	H	P
7	Lady Smith 1	2006	Clear Conifer	N	U	5000	4.5	M	P
7	Lady Smith 2	2006	Clear Conifer	N	U	50	1.5	H	St
7	White House	2006	Clear Conifer	N	U	4500	3	M	P
7	Mormon Gulch	2006	Clear Conifer	N	ST	6000	3	H	P
7	Homestake 1	2007	Clear Conifer	N	U	1000	4	M	P
7	Homestake 2	2007	Clear Conifer	N	U	1500	2.5	M	P
7	Radar Cr. 1	2007	Clear Conifer	N	U	1500	7	H	P
7	Radar Cr. 2	2007	Clear Conifer	N	U	1000	1	H	St
7	Radar Cr. 3	2007	Clear Conifer	N	U	3000	1	H	P
7	Radar Cr. 4	2007	Clear Conifer	N	U	2000	1	H	P
8	Prison Ranch	2002	Clear Conifer	N	U	6000	2	H	St

District	Site Name	Trtmnt Date	Treatment Type	Stand Replacement	Site Type	Sprouts/ Acre	Sprout Height	Browse Level	Success Rating
8	Prison Ranch	2002	Clear Conifer	N	U	150	1.5	H	St
8	North Flints 1	2001	Clear Conifer	N	U	7000	2.5	H	St
8	North Flints 2	2001	Clear Conifer	N	U	100	1.5	H	St
8	G. Cr. 1	2003	Clear Conifer	N	U	500	2.5	M	P
8	Barker Lake 1	2002	Clear Conifer	N	U	2200	2	M	P
8	Barker Lake 2	2002	Clear Conifer	N	U	1800	1.5	M	P
8	Barker Lake 3	2002	Clear Conifer	N	U	1400	2	M	P
8	Barker Lake 4	2002	Clear Conifer	N	U	300	2	H	St
8	Stony Cr. 1	2007	Wildfire	Y	U	4620	3	L	
8	Sand Basin 1	2000	Wildfire	Y	U	300	3.5	M	
8	Sand Basin 2	2000	Wildfire	Y	U	1200	3.5	H	
8	Medicine Lake 1	2000	Wildfire	Y	U	500	2.5	H	
Districts: 1=Dillon 2=Wise River 3=Wisdom		4=Butte 6=Madison 7=Jefferson 8=Pintler			U=Upland R=Riparian St=Stream Terrace			H = >2/3 M = 1/3-2/3 L=<2/3	P=Progressing St= Stagnant

Evaluation:

(A) ACRES TREATED IN 2009

The scale of aspen treatment on the Forest is insignificant in terms of the need for restoration. The Forest Plan FEIS assumption that the aspen 67,000 Forest Plan Objective for aspen restoration will be met through wildfire stand conversions rather than scheduled treatments appears to be valid at this time.

(B) LONG TERM MONITORING DATA

- Recommendations from initial aspen monitoring findings (1998 and 2008 Forest Monitoring and Evaluation Report) are generally being implemented. A wide range of treatments are being applied: fencing only, conifer slashing, burning, conifer slashing with burning, conifer removal, or wildfire.
- With a couple exceptions, stand replacement treatments without fencing are no longer being done. However, parent stands are non-existent on the wildfire plots so they are considered stand replacements.
- Conifer clearing adjacent to and within aspen stands, reported as one of the more successful treatments, predominate.
- Fenced stands with good maintenance are nearly 100% successful
- All treatments are resulting in successful sprouting of aspen with few exceptions
- Where wildfire passes through existing clones or lodgepole stands with remnant evidence of aspen, sprouts result. Stands re-establishing behind wildfire are not showing great promise. Browse pressure on these stands is generally moderate to high.
- To date, a sampling process has not been designed to determine how widespread aspen sprouting is following wildfire. This information will be important to gather prior to the 5-Year Monitoring Report in 2014.

Beyond these statements, it is too soon to reach conclusions about the success of treatments or wildfire in rejuvenating aspen stands.

Grassland/Shrubland Restoration

Item 10

Monitoring Question: Are management activities restoring grassland/shrublands at the rate projected in the Forest Plan?

Performance Measure: Acres of encroachment species treated or converted by wildfire.

Data Sources: Forest annual accomplishment reports and project accomplishment reports

Measurement Period: Annual R**eporting Period:** Annual

Results:

Conifer encroachment on sagebrush grasslands was reduced or removed from 1,945 acres across the Forest in 2009. Three hundred acres were treated in the Basin Creek burn pictured below. Treatment data was extracted from the FACTS data base.

Figure 22 . Basin Creek prescribed burn of conifer encroachment in sagebrush stands, Butte Ranger District, 2009

Figure 23. Ratio Mountain prescribed burn of conifer encroachment in sagebrush stands, Jefferson Ranger District, 2009

Evaluation:

The scale of encroachment treatment on the Forest is insignificant in terms of the need for restoration. The Forest Plan objective for grassland/shrubland and riparian areas is to reduce conifer encroachment on 74,000 acres. The Forest Plan FEIS assumption that restoration will be met primarily through wildfire stand conversions rather than scheduled treatments appears to be valid at this time.

Sage Grouse Habitat

Item 12

Monitoring Question: Are management activities affecting sage grouse brood rearing habitat?

Performance Measure: Acres of sagebrush cover affected by scheduled vegetation treatments on BDNF lands within 18 kilometers of historic or active leks.

Data Sources: (1) Annual lek location reports from partners (local sage grouse working groups) and Montana Fish Wildlife and Parks (MFWP). (2) Acres treated from accomplishment reports or FACTS data base.

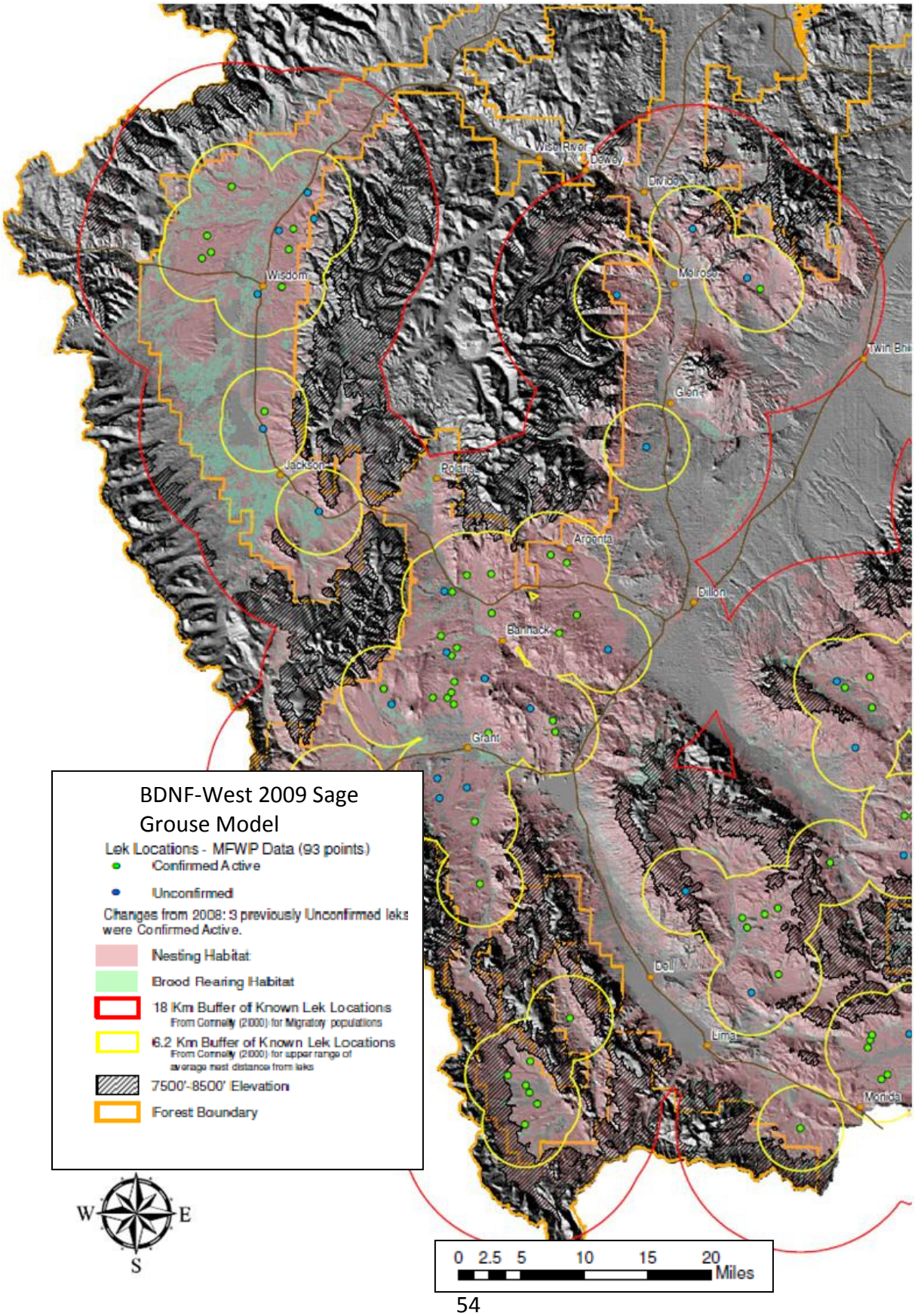
Measurement Period: Annual **Reporting Period:** Annual

Results:

Fifty-eight active sage grouse leks are confirmed in southwest Montana in proximity to the BDNF. None are located on National Forest land. The two maps in Figure 24 below indicate the location of those leks as well as the habitat within 18 kilometers of the active leks. In 2009, the North Doolittle Prescribed Burn project, West Pioneer Mountains, took place within 18 km of active leks. The North Doolittle burn was designed in cooperation with MtFWP. The Prescribed Burn Plan, 2009, (Element 5: B. Objectives, page 7) complied with Standard 8 in the Forest Plan which requires sagebrush be protected "within 300 meters of riparian zones, meadows, lakebeds or farmland unless site specific analysis indicates such removal promotes achievement of the sagebrush habitat goal".

Evaluation:

In 2009, prescribed burning in sage grouse habitat within 18 km of leks was conducted in cooperation with MtFWP and was designed in compliance with Forest Plan standards. Implementation and effectiveness of sage grouse habitat protections in the North Doolittle Burn project will be reported in the FY10 Report.


BDNF-West 2009 Sage Grouse Model
Lek Locations - MFWP Data (93 points)
Confirmed Active
Unconfirmed
Changes from 2008: 3 previously Unconfirmed leks were Confirmed Active.
Nesting Habitat
Brood Rearing Habitat
18 Km Buffer of Known Lek Locations
From Connelly (2000) for Migratory populations
6.2 Km Buffer of Known Lek Locations
From Connelly (2000) for upper range of average nest distance from leks
7500'-8500' Elevation
Forest Boundary
W
E
S
0 2.5 5 10 15 20
Miles
Wisdom
Jackson
Polaris
Argenta
Dillon
Grant
Lima
Monida

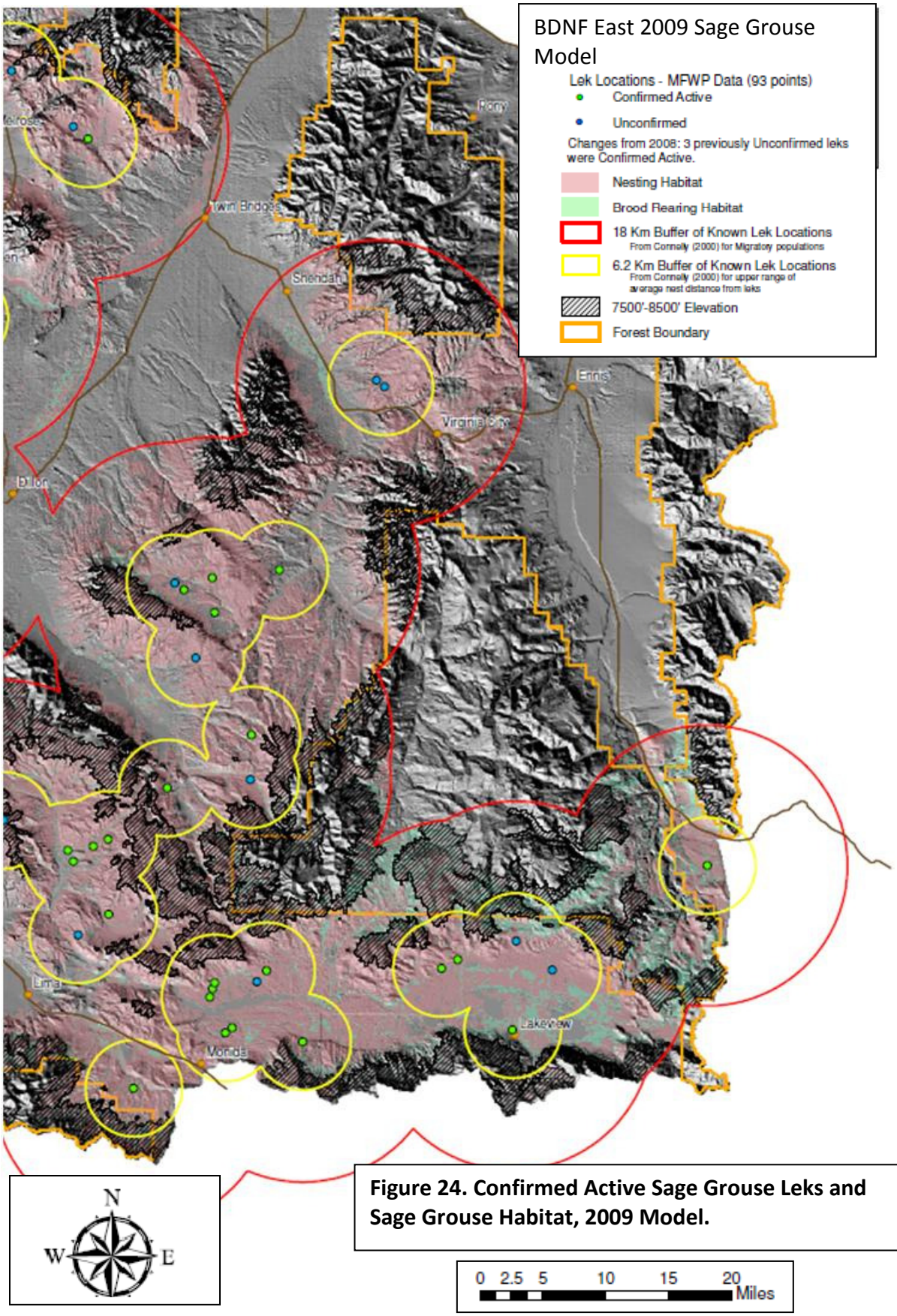


Figure 24. Confirmed Active Sage Grouse Leks and Sage Grouse Habitat, 2009 Model.

Elk Populations

Item 13

Monitoring Question: How are elk populations changing?

Performance Measure: Population data from Montana Fish Wildlife & Parks.

Data Sources: Annual MFWP reports on animal numbers and licenses issued.

Measurement Period: Annual **Reporting Period:** Annual

Background: Elk, mountain goats, wolverine and mayfly were selected as MIS because these species can be monitored and a connection between population trends, habitat conditions, and management activities can be established. Mountain goats and wolverines were selected as the best indicator of the effects of disturbance on high elevation winter range and denning habitat. Note that designation of a species as MIS does not infer a special degree of protection.

Elk are a commonly hunted species important to Montana Fish Wildlife and Parks (MtFWP) and the populace in general. Elk populations are monitored annually in relationship to population objectives set by Montana Fish Wildlife and Parks. That data is maintained for the public at on the MtFWP website: http://fwp.mt.gov/hunting/planahunt/default.aspx

Results:

The 2008 elk population data only became available in early 2010. The data for 2009 is still not published. Table8 below presents the most currently available Montana Fish, Wildlife and Parks (MtFWP) data from both the website listed above and the State Elk Plan.

Table 8. Montana Fish Wildlife and Parks Elk Objectives compared to Population Estimates

BDNF Hunting Districts	2005 FWP State Elk Plan Objective ± 20%	FWP 2003 Population Estimates ± 10%	FWP 2006 Population Estimates ± 10%	FWP 2007 Population Estimates ± 10%	FWP 2008 Population Estimates ± 10%	Trend from Objective
210	2500	1043	952	1020	1391	Below objective but trend is up
211	600	679	485	262	135	-
212	850	1100	1074	1494	1825	+
213	650	401	689	484	660	+
214	200	309	270	284	331	+
215	1000	736	1144	1234	1502	+
216	325	457	288	473	140	-
300	700-900	615	1137	1450	1883	+
302	550-700	399	736	956	1195	+

BDNF Hunting Districts	2005 FWP State Elk Plan Objective ± 20%	FWP 2003 Population Estimates ± 10%	FWP 2006 Population Estimates ± 10%	FWP 2007 Population Estimates ± 10%	FWP 2008 Population Estimates ± 10%	Trend from Objective
311	2700	2096	3100	3000	2620	At objective but slight down trend
318	500	366	383	535	656	+
319	1100 Max	1515	936	819	911	At objective, stable since 2006
320 333	1000 for both	1130 549	942 470	745 477	954 859	1.8X objective. Upward trend
323 324 327 330 Total	Gravelly EMU Total = 7000	3119 3114 No winter elk 1830 (8063)	2682 2500 No winter elk 1132 (6314)	2265 1928 No winter elk 1116 (5309)	2286 2608 0 1328 (6222)	Basically stable considering no winter counts for 327
328	550-700	574	650	635	620	
329	900 Max	582	683	727	766	Stable to slight upward trend
331	1400 Max	1250	896	1085	773	-
332	900 Max	506	600	376	588	Basically stable
340 350 370	1600 combined for all	219 602 330 (1151)	557 268 192 (1017)	839 500 (1339)	423 529 529 (1481)	Below combined but upward trend
341	600 Max	669	494	272	166	-
360	2200	4555	1914	1661	2494	Above objective, slight upward trend
362	2500	1159	3629	3845	3524	Above objective, upward trend
TOTAL	**30,575**	28,074	28,803 stable	28,482 stable	**29,831 stable**	Well within 10%

Evaluation: No 2009 data was available from Montana Fish Wildlife and Parks as of printing date for this report in 2010. This table updates information since 2007. Several individual hunting units are well below objectives and have declined since last year (Rock Creek, Sapphires and Pioneers). Overall, however, the elk population within hunting units on the BDNF is up from the previous four years and very close to Montana Fish Wildlife and Parks objectives at that scale.

Mountain Goat and Wolverine Winter Security

Item 14

Monitoring Question: Are management activities effectively protecting high elevation winter habitats for mountain goats and wolverines?

Performance Measure: (1) Populations of mountain goats from MFWP.
(2) Number of snowmobile entries into non-motorized high elevation units protected for wolverine and mountain goats. (3) Presence or absence of wolverine in high elevation habitats.

Data Sources: (1) Annual MFWP reports on animal numbers and licenses issued.
(2) Results of aerial observation flights and field observations.
(3) Bait stations, DNA testing, and track surveys obtained from MFWP and other partners

Measurement Period: Annual **Reporting Period:** Annual

Background: Mountain goats, along with elk, wolverine and mayfly were selected as MIS because these species can be monitored and a connection between population trends, habitat conditions, and management activities can be established. Mountain goats and wolverines were selected as the best indicator of the effects of disturbance on high elevation winter range and denning habitat. Designation of a species as MIS does not infer a special degree of protection.

Results: (1) Populations of mountain goats

Mountain goats are a management indicator species for secure high elevation winter habitats in the 2009 Forest Plan (p. 47). The species is not classified as a Montana Species of Concern, it has a Natural Heritage ranking of S4 (apparently secure). Data on populations of mountain goats on the Forest are acquired through the Montana Department of Fish Wildlife and Parks (Mt FWP). Mt FWP collects population data and reports numbers on their website: http://fwp.mt.gov/hunting/planahunt/. This website has not been updated for 2008 or 2009 information. Population data from 2003-2007 can be found in last year's Forest Monitoring and Evaluation Report. Population survey data is available on a smaller scale, however.

In 2009, the BDNF cooperated with Mt FWP under a Challenge Cost Share Agreement to gather mountain goat population data and snowmobile travel data in the Flint Creek Range, Goat Hunting Districts 212 and 213, an area where local goat population declines concern Mt FWP, and Goat Hunting Districts 222 and 223 in the Anaconda-Pintler Range where the population is also small.–The helicopter flight was funded by the BDNF as part of a joint effort to monitor species potentially affected by winter recreation and public adherence to winter travel standards under the new Forest Plan.

(a) Hunting Districts 212 and 213 - The early April survey in clear, calm weather and week-old snow covered core habitat in the central Flint Creek Range (HD 212) as well as formerly occupied habitat in Lost Creek (HD 213). The search was concentrated on open alpine and sub-alpine ridges, basins, bowls, cliffs, and peaks. All goats were observed near Deer Lodge Mountain with most of them found on the north side in the Tin Cup Joe drainage. The largest group was 5 with 2 nannies and 3 kids, another group was composed of 1 billy and 2 goats of unknown sex/age, and there were 5 sightings composed of only 1 goat. Given the poor snow conditions it is difficult to estimate the probability that goats were not observed and how many may have been missed. It is also difficult to calculate accurate billy/kid/nanny ratios due to the low number of classified goats . The survey was as intensive as that completed in 2007, but tracking conditions were variable. It is reasonable to conclude that the goat population in the Flints remains small with under 50 individuals in the population. Goat counts by Hunting District are summarized below.

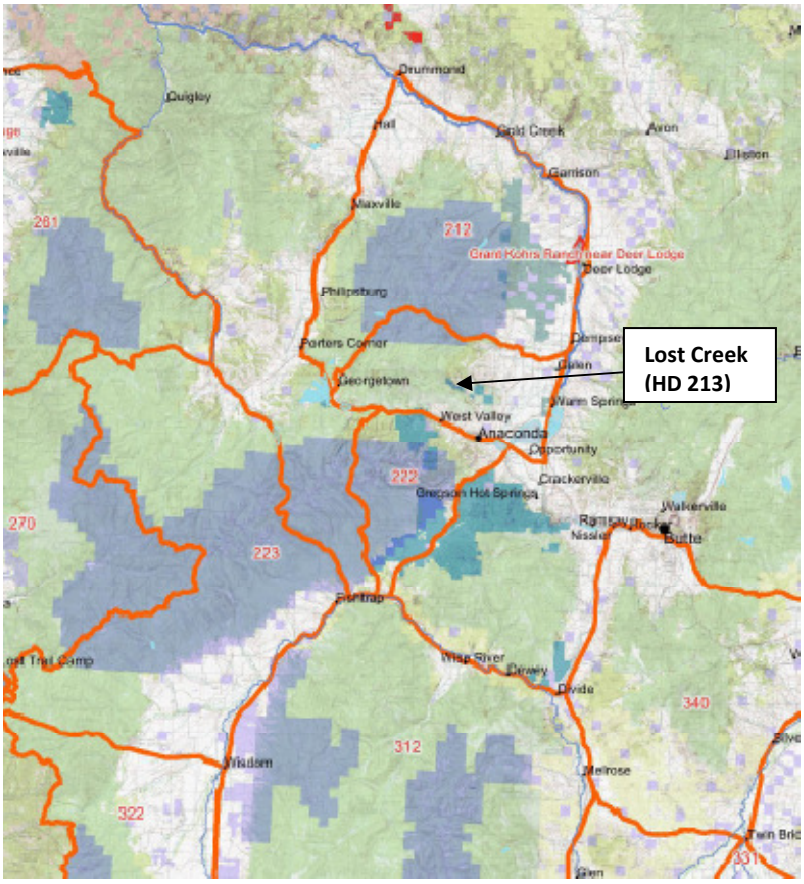


Figure 25. Known Mountain Goat Distribution in the Flight Vicinity (Montana FWP)

Table 9. Results of Goat Survey in HD 212 and 213, April 8, 2009

Hunting District	Species	Billies	Nannies	Kids	Unknown	Total
212	Mountain Goat	4	2	3	4	13
213	Mountain Goat	0	0	0	0	0

.

b) Hunting Districts 222 and 223 -An early March survey took place in the Anaconda Pintler Mountains after a major storm had hit the area in the prior 48 hours and deposited 3 feet of powdery snow in the mountains. Although flying mountain goats after a storm is ideal for tracking, this much fresh snow hindered the movement of goats and may have caused a low count. Most of the observed goats were still waiting out the storm and hidden in caves or under overhangs. Nine goats were observed at six locations, with a group of 3, another of 2, and 4 singles. Five of the goats were in the Mill Creek drainage near Short Peak and Mount Haggin, another was near Mount Howe, and the final 2 (the only goats observed in HD 223) were on a ridge below West Goat Peak. The count included two billies, 2 nannies, 1 kid, 3 yearlings of unknown sex, and 1 goat that was not classified . During the last survey in 2006, 40 goats were seen with ideal tracking and weather—this flight is not comparable. Observations by hunters and hikers suggest that the population is small, but the status or trend of goats in the Anaconda-Pintler cannot be determined based on this flight. Goat counts by HD are summarized below.

Table 10. Results of Goat Survey in HD 222 and 223, March 30, 2009

HD	Species	Billies	Nannies	Kids	Unknown	Total
222	Mountain Goat	2	1	1	3	7
223	Mountain Goat	0	1	0	1	2

Unable to calculate accurate billy:kid:nanny ratios due to the low number of classified goats

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Results: (2) Snowmobile entries into high elevation non-motorized allocations (ALSO SEE 14a, page 61, A SPECIAL REPORT ON MT JEFFERSON RECOMMENDED WILDERNESS BOUNDARY)

The 2009 BDNF Land and Resource Management Plan (Forest Plan) allocated a number of high elevation habitats to winter non-motorized uses, in part to secure habitat for mountain goats and wolverine. The Flint Uplands Management Area is one example (Forest Plan, p. 115). Under the Challenge Cost Share Agreement (described in Item 1), a Mt FWP biologist mapped snowmobile travel in the new winter non-motorized areas allocated by the Forest Plan. At the time of the flight, closures were not marked or enforced. The Forest Plan was still under the

appeal process and review. This information is used by District personnel to understand where closure enforcement efforts will be needed in the future.

(a) Five winter non-motorized units lie in higher elevations of the Flints, Dolus Lakes, North Dempsey Creek, Upper Lost Creek, Red Lion Mountain and Echo Lake. Snowmobile (or skier) use was not observed in winter closures in any of these units. Snowmobile play areas were observed at the head of Warm Springs Creek and near Racetrack Peak, areas open to snowmobiles. Backcountry skier tracks (and associated snowmobile tracks) were observed at the head of Royal Gold Creek and on the ridge above Trask Lakes.

(b) No sign of winter recreational use of any kind was observed in the Anaconda - Pintler Wilderness, in the Storm Lake winter closure, or elsewhere in the Anaconda Pintler Range.

Results: (3) Presence or absence of wolverine in high elevation habitats

Data on presence or absence of wolverine in high elevation habitats is acquired through research partners working in southwest Montana: the Wildlife Conservation Society (WCS) Greater Yellowstone Wolverine Program. WCS works with the Beaverhead-Deerlodge National Forest under a Challenge Cost Share Agreement and provides direct reports to the Forest on an annual basis. The WCS 2009 Report includes a number of items of interest.

In 2009, WCS continued testing methodology for documenting the presence or reproductive den sites of wolverine for monitoring distribution. Six radio implanted adult females being monitored for reproduction using VHF telemetry flights were used to test the aerial den detection survey method. In early April, an observer without knowledge of the telemetry location results conducted a blind den detection survey within the home ranges of the marked females. The observer identified tracks as wolverine within each of the female's home ranges and identified concentrated tracks/activity in 4 of the 6 female home ranges.

Monitoring of wolverine home ranges using radio telemetry in 2008 and 2009 recorded 20 wolverines (12 female and 8 males). This included 6 individuals in the Anaconda/Beaverhead Ranges and 8 in the Madison/Gravelly Ranges. One of two cubs captured and collared in the North Beaverhead Range (West Big Hole country) in 2008 moved into the southern Anaconda Range, back to the Beaverhead Mountains in January of 2009 and dispersed to the Flint Creek Range a month later. In June 2009 she was still in the Flint Range. Her sibling was found dead in Rock Creek, Beaverhead Range late in 2008. Death appeared due to another animal, species unknown.

In addition to the WCS wolverine data, Mt FWP biologist Ray Vinckey observed wolverine tracks in both the central and southern Flint Creek Range during mountain goat counts described in Item 10 above. Tracks were observed near Pikes Peak and on Red Lion Mountain, likely wolverine tracks were seen near Altoona and Goat Mountain Lakes. In the Anaconda-Pintler, tracks were observed above Lake of the Isle, at the headwaters of Twin Lakes Creek, and below

Mount Tiny. This coincides with telemetry detections of F541 mapped by the orange polygon in Figure 26.

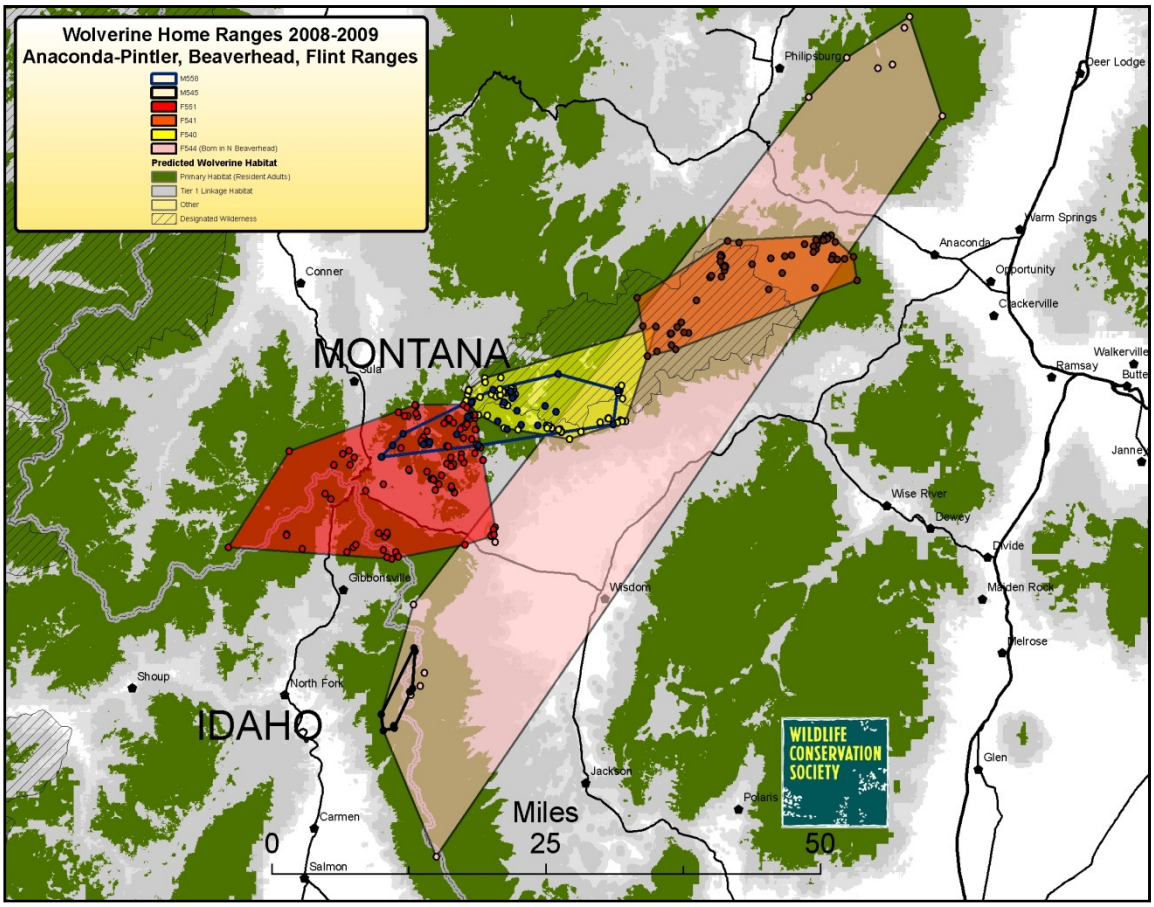


Figure 26. Home ranges of 4 females and 2 males in the Anaconda and Beaverhead Ranges of Montana and Idaho. Note the overlap of F551 with 2 major highways. F551 also uses portions of the Salmon-Challis, Bitterroot, and Beaverhead-Deerlodge National Forests

Evaluation:

While both mountain goats and wolverines are found at low densities, observations indicate that both species are secure from disturbance on the BDNF where monitoring occurred in 2009. Human incursions into monitored winter habitat do not appear to be a concern at this time. More comprehensive monitoring of non-motorized allocations begins in 2010 under a new Challenge Cost Share Agreement with Wildlife Conservation Society.

Mount Jefferson Wolverine Habitat Closure

Item 14a

Monitoring Question: Are snowmobiles intruding into the wolverine habitat closure from December 2-May 15 and any other time of the year snow conditions make snowmobiling possible?

Performance Measure: Number and distance of intrusions into the closed area.

Data Sources: Results of aerial flights observation and data recorders, field observations by employees of Forest Service, Bureau of Land Management, Mt FWP, USFWS, or other partners. Law Enforcement violation notices.

Measurement Period: Annual **Reporting Period:** Annual

Background:
The 2009 Record of Decision for the Beaverhead-Deerlodge National Forest Plan recommended the north half of the Mt. Jefferson/Hellroaring Creek area in the Centennial Mountains as wilderness and left the south half open to snowmobiling. This management of the Mt. Jefferson/Hellroaring area is influenced by past commitments. The Forest Service agreed to administer the area consistent with wilderness recommendations made by the Bureau of Land management (BLM) in the 1990 Centennial Mountains Wilderness Suitability Study FEIS and Record of Decision. The addition of part of Mt Jefferson to recommended wilderness adjacent to the BLM recommended wilderness area acknowledges the agreement. The Mt. Jefferson/Hellroaring decision also provides access for snowmobilers on the Idaho side of Mt. Jefferson while providing greater protection for wolverine and other wilderness values in Hellroaring Creek. The boundary line between winter snowmobiling in Mt Jefferson Management Area and the snowmobile closure for Centennial Recommended Wilderness Management area is drawn along the 2001 wolverine habitat closure.

As the Record of Decision states on page 21, “the combination of uses allowed on Mt Jefferson under the Forest Plan represents a management challenge, because the boundary between the motorized and non-motorized use areas does not follow an effective topographical barrier to illegal motorized entry. The success of this compromise decision relies heavily on voluntary compliance with recommended wilderness boundaries by over-snow vehicle users. The Forest Monitoring Plan specifically spells out monitoring requirements that address compliance with restrictions on motorized use in Mt. Jefferson. If monitoring reveals that non-compliance is an issue, the decision to allow snowmobiling on Mt. Jefferson will be re-evaluated. “

Since 2001, snowmobile incursions into the wolverine habitat closure have been monitored. Incursions occur annually. In the past 9 years, both Forest Service and BLM have improved signage along the closure boundary. In 2009, BLM and FS employees and volunteers inspected

signs on the BLM Wilderness Study Area (WSA) and Recommended Wilderness boundaries. Signs were still present at major entry locations. The crew installed an additional 6 signs along Section 36 of the WSA and 5 more signs to the closure boundary southeast of Lillian Lake. The BLM field monitoring form, dated January 31 – February 2, 2009, states "as with past years – tracks were observed in the area of existing signs and were obviously ignored". A FS Memo addressed to the District Ranger, dated February 3, 2009, stated "the area is amply posted with several, highly visible orange "Closed Yearlong to Snowmobiles" signs that apparently had no effect, as riders had to pass in direct proximity of the signs en route to high marking play areas.

Results:

Table 11 documents the date, type of monitoring visit and recorded violations into the Mt Jefferson closure.

Table 11. 2009 Mt Jefferson Closure Violation Monitoring – Violation Reports

Date	Type of Monitoring	Unauthorized Use	Number and Extent
01/10/09	Private citizen – skier, report and photographs	Entry from closed BLM Wilderness Study Area onto FS closure east of Lillian Lake	Eight violators observed and photographed. Passed in direct proximity to closure sign.
01/17/09	Private citizen – skier, report, no photos	Entry from BLM Wilderness Study Area onto FS east of Lillian Lake, passed in close proximity to evident orange closure signs,	Tracks of estimated 3 riders penetrated closure one mile
01/31/09	FS and BLM Recreation Managers – ski patrol	Week old tracks, in the BLM WSA, Section 36. West face of Nemesis Mt. and from there into FS closure. Riders passed in direct proximity to closure signs enroute to high marking play areas.	Tracks of estimated four machines came from Reas Peak into closure ½ mile or better, both sides of Hellroaring Creek..
02/01/09	FS and BLM Recreation Managers – ski patrol	Tracks indicating 4 different violations in the past 10 days	Estimated 14-20 violators.
02/27/09	Private Citizen – skiing, submitted incident report	NE facing slopes, east of Blair Lake, Across from Nemesis Hut	A number of machines, high marking all slopes and drainages NE of Nemesis Mt.
03/13-03/15/09	FS Recreation Manager – ski patrol	Short incursions looping behind closure signs.	Few machines, short distance
03/14/09	BLM Recreation Manager - Aerial	No violations apparent from the air.	

	flight of BLM WSA		

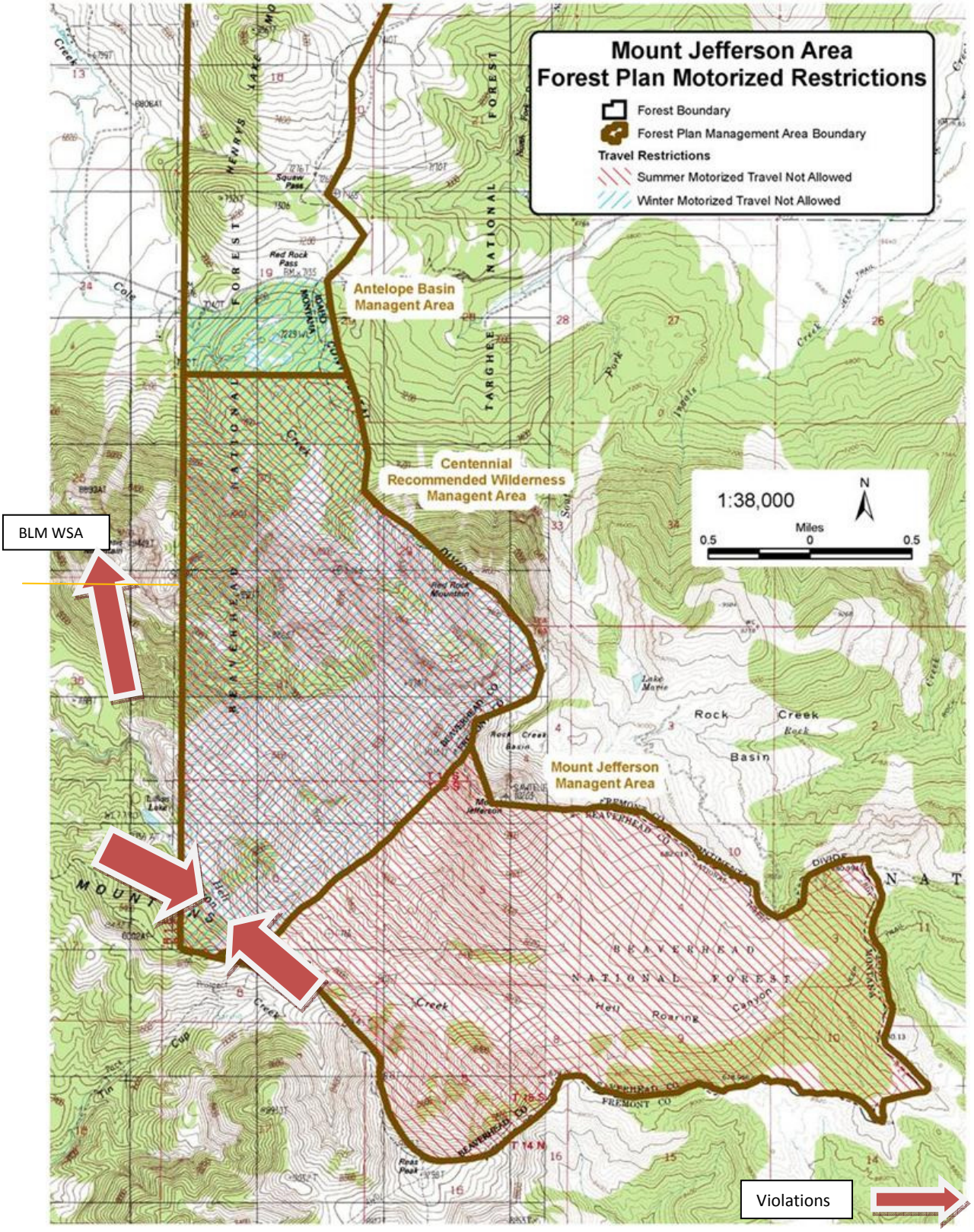


Figure 27. Mt Jefferson Snowmobile Closures and FY09 Violations with direction of entry.

Evaluation: During the winter of 2008/2009 the BDNF Forest Plan Record of Decision (ROD) (January 2009) was under appeal and not in full force. A closure order to protect wolverine den habitat, established in 2001, was still in effect. Following the ROD being signed, the Blue Ribbon Coalition and Idaho Snowmobile Association distributed flyers at trailheads requesting riders protect their right to ride by respecting the closure. Closure signs were well distributed and maintained along the 1.25 mile closure boundary on the south end and along Cole Creek ridge north of Mt Jefferson.

Violations into the wolverine habitat closure and the BLM WSA were documented on 11 separate occasions in 2009. It is too early to evaluate the success of the Forest Plan Record of Decision allocations of winter motorized opportunities and closures in the Mt Jefferson area, since the Record of Decision was under appeal until late in 2009. It is worth noting, however, that publicity around the closure and the active signing program yielded no better results than observed in years prior under the Closure Order.

Noxious Weeds

Item 16

Monitoring Question: Are management actions preventing or controlling new and existing weed infestations?

Performance Measure: (1) Change in acres of known noxious weed infestations.
(2) Number of sites of new species and their extent.

Data Sources: Forest NRIS data base, FACTS, eventually FIA, annual review of reports of known species and locations.

Measurement Period: Annual

Reporting Period: Annual

Background:

In the past, Forest Plan monitoring reports tracked acres of noxious weeds treated from year to year. Monitoring requirements of the 2009 Forest Plan focus on the acres occupied by noxious weed infestations. This information will give decision makers an accurate picture of whether weed treatment programs are achieving results. The Forest is building a noxious weed location data base with a spatial layer in order to do this. In 2009, District weed specialists were still entering data into the data base and reconciling Geographic Information Systems (GIS) to track changes. By the end of 2010, the Forest expects to have District level data entered into the Forestwide data base and maps available for reporting.

The 2009 report will be confined to treatment status.

Results:

Noxious weeds were treated on 8,088 acres spread across all Ranger Districts. This includes 100 acres of biological control and acres treated through partnerships agreements with other agencies or non-profit organizations.

Special projects funded with assistance from the Rocky Mountain Elk Foundation and Montana Fish Wildlife and Parks in German Gulch, Fleecer Mountains and on Jefferson Ranger District. The bulk of the targets were accomplished as part of annual District weed maintenance work.

Forest Outputs and Accomplishments	2005	2006	2007	2008*	2009
Noxious Weed Treatment (acres)	7,636	6,017	5,001	8,570	8,088

Figure 28. The Region 1 FS Mule Team packing water and chemical into the Lee Metcalf Wilderness for hand crews.

Figure 29. Hand crews spraying a Yellow Toadflax infestation in the Lee Metcalf Wilderness creeping through a sea of grass.

Evaluation:

Treatment acres are at the high end of the last 5 year average. An evaluation of whether treatment is successfully keeping noxious weed infestations controlled cannot be made until all Districts have successfully entered their baseline infestation locations and acres into the data base.

Insect and Disease Infestations

Item 17

Monitoring Question: Are levels of insect and disease increasing to damaging levels as a result of management activities?

Performance Measure: Changes in acres infested by landscape, percent change on the Forest compared to the Region.

Data Sources: USDA Northern Region Forest Health Protection Program conducted by State and Private Forestry department annually.

Measurement Period: Annual

Reporting Period: Annual

Results:

A report summarizing the major forest insect and disease conditions in Montana during 2009 was jointly prepared by the Montana Department of Natural Resources and Conservation, Forestry Division (DNRC) and the USDA Forest Service, State and Private Forestry, Forest Health Protection, Northern Region (FHP). The survey is titled "Montana Forest Insect and Disease Conditions and program Highlights – 2009", Report 10-01, A. Gannon, S. Sontag, 2010. The annual aerial detection survey in Montana, upon which the report is based, covered approximately 27.8 million acres of mixed ownership, forested lands, excluding most wilderness areas.

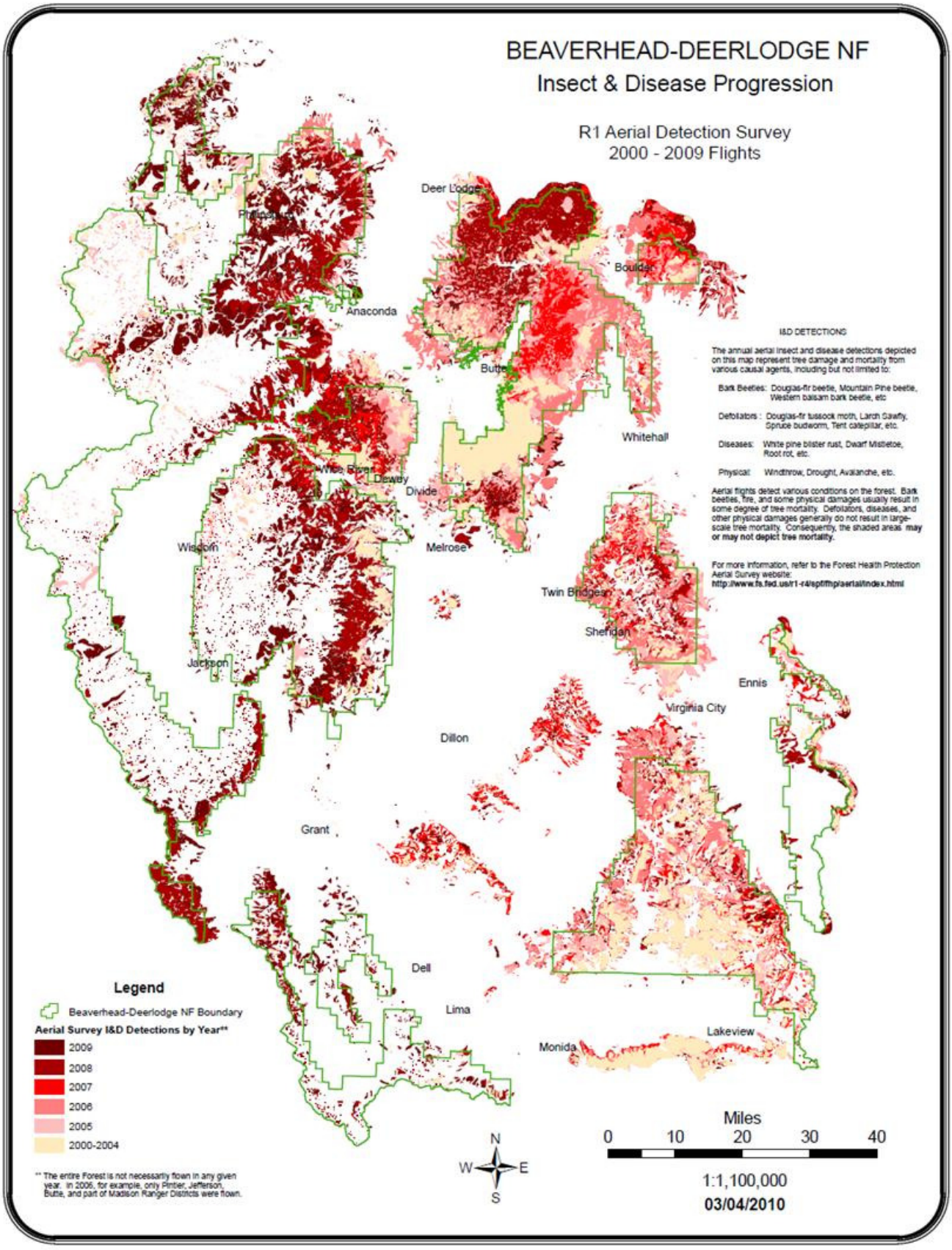
Figure 30. Mountain Pine Beetle in Whitebark Pine by Ken Gibson, USDA Forest Service

The data summarized in the Montana report is a product of the aerial surveys, as well as ground surveys and biological evaluations. Along with the data summaries, aerial survey maps are available from the Missoula FHP Field Office, in both paper and digital GIS format. Data may also be downloaded at http://www.fs.fed.us/r1-r4/spf/fhp/aerial/index.html. The Beaverhead-Deerlodge area data is drawn directly from this data and report. Table 12 extracts the mortality and damage data for each Ranger District on the BDNF by threat.

Table 12. Mortality, Defoliation and Other Damage on National Forests during 2009

BEAVERHEAD NF		
Dillon RD	**Acres**	**Trees**
Douglas-fir Beetle	14	42
Mountain Pine Beetle (LPP)	68,975	228,697
Subalpine Fir Mortality	30	209
MPB (Hi-elev 5-needle Pines)	50,794	191,143
Western Spruce Budworm	43,405	0
Madison RD	**Acres**	**Trees**
Douglas-fir Beetle	12	58
Engelmann Spruce Beetle	2	6
Mountain Pine Beetle (LPP)	46,398	175,268
Subalpine Fir Mortality	334	1,144
MPB (Hi-elev 5-needle Pines)	12,695	38,610
Western Spruce Budworm	18,478	0
Sheridan RD	**Acres**	**Trees**
Douglas-fir Beetle	12	50
Mountain Pine Beetle (LPP)	21,540	72,689
Subalpine Fir Mortality	79	185
MPB (Hi-elev 5-needle Pines)	27,821	116,308
Western Spruce Budworm	15,673	0
Wind-throw	25	0
Aspen Decline	12	0
Wisdom RD	**Acres**	**Trees**
Douglas-fir Beetle	22	194
Mountain Pine Beetle (LPP)	9,576	17,599
Subalpine Fir Mortality	36	252
MPB (Hi-elev 5-needle Pines)	5,571	4,652
Western Spruce Budworm	1,204	0
Wise River RD	**Acres**	**Trees**
Douglas-fir Beetle	6	33
Mountain Pine Beetle (LPP)	92,961	346,439
MPB (Hi-elev 5-needle Pines)	16,609	58,187
Western Spruce Budworm	8,406	0
DEERLODGE NF		
Butte RD	**Acres**	**Trees**
Douglas-fir Beetle	14	46
Mountain Pine Beetle (LPP)	108,989	884,224
MPB (Hi-elev 5-needle Pines)	6,665	22,310
Western Spruce Budworm	27,365	0
Deer Lodge RD	**Acres**	**Trees**
Douglas-fir Beetle	7	37
Mountain Pine Beetle (PP)	474	3,375
Mountain Pine Beetle (LPP)	113,606	1,185,762
MPB (Hi-elev 5-needle Pines)	4,064	10,697
Western Spruce Budworm	12,239	0
Wind-throw	53	0
Jefferson RD	**Acres**	**Trees**
Douglas-fir Beetle	360	942
Mountain Pine Beetle (PP)	1,388	30,109
Mountain Pine Beetle (LPP)	247,548	2,553,861
Subalpine fir mortality	972	5,124
MPB (Hi-elev 5-needle Pines)	8,131	85,989

Western Spruce Budworm	17,830	0
Wind-throw	255	0
Philipsburg RD	**Acres**	**Trees**
Douglas-fir Beetle	24	118
Mountain Pine Beetle (PP)	1,177	1,726
Mountain Pine Beetle (LPP)	114,462	454,827
Subalpine fir mortality	1,353	1,765
MPB (Hi-elev 5-needle Pines)	4,361	9,713
Western Spruce Budworm	13,756	0


BEAVERHEAD-DEERLODGE NF
Insect & Disease Progression
R1 Aerial Detection Survey
2000 - 2009 Flights
Deer Lodge
Philipsburg
Anaconda
Boulder
Butte
Whitehall
Wise River
Dewey
Divide
Melrose
Wisdom
Twin Bridges
Sheridan
Ennis
Virginia City
Jackson
Dillon
Grant
Dell
Lima
Lakeview
Monida
I&D DETECTIONS
The annual aerial insect and disease detections depicted on this map represent tree damage and mortality from various causal agents, including but not limited to:
Bark Beetles: Douglas-fir beetle, Mountain Pine beetle, Western balsam bark beetle, etc
Defoliators: Douglas-fir tussock moth, Larch Sawfly, Spruce budworm, Tent catepillar, etc.
Diseases: White pine blister rust, Dwarf Mistletoe, Root rot, etc.
Physical: Windthrow, Drought, Avalanche, etc.
Aerial flights detect various conditions on the forest. Bark beetles, fire, and some physical damages usually result in some degree of tree mortality. Defoliators, diseases, and other physical damages generally do not result in large-scale tree mortality. Consequently, the shaded areas may or may not depict tree mortality.
For more information, refer to the Forest Health Protection Aerial Survey website:
http://www.fs.fed.us/r1-r4/spf/fhp/aerial/index.html
Legend
Beaverhead-Deerlodge NF Boundary
Aerial Survey I&D Detections by Year**
2009
2008
2007
2006
2005
2000-2004
** The entire Forest is not necessarily flown in any given year. In 2006, for example, only Pintler, Jefferson, Butte, and part of Madison Ranger Districts were flown.
N
W
E
S
Miles
0 10 20 30 40
1:1,100,000
03/04/2010

INSECT AND DISEASE CONDITIONS BY COUNTY

County summaries are excerpted from the 2009 Montana Condition Report, available at www.fs.fed.us/r1-r4/spf/fhp/**conditions**/entry1.html. For each County, damage effects on their respective ownership are noted. To the extent possible, the summary indicates areas affected and an estimate of extent.

The following abbreviations are used in the table and discussion:

DFB = Douglas-fir beetle,
ESB = Spruce beetle
FE = Fir engraver
MPB = Mountain pine beetle
WPB = Western pine beetle
WSBW=Western spruce budworm
LPP = Lodgepole pine
PP = Ponderosa pine
DF = Douglas-fir
SAF = Subalpine fir

Beaverhead County

Acres of Forestland, Mortality, and Defoliation by Ownership

	National Forest	Other Federal	Private	State	Total
Forestland	1,073,844	135,995	40,745	17,003	1,267,587
Aspen Decline	0	283	63	0	346
DFB	51	14	4	0	69
ESP	2	4	0	0	6
MPB-LPP	134,180	16,526	4,909	2,710	158,325
MPB-High Elevation	63,854	4,803	828	747	70,232
SAF Mortality	134	6	0	4	144
WSBW	54,263	31,955	15,243	9,243	110,704
Windthrow	25	0	0	0	25

MPB continues to increase in Beaverhead County, particularly in five-needle pines. New activity in LPP is particularly notable in the Big Hole area and the southern portion of the Pioneer Mountains. Large groups were mapped in the Pioneer and Beaverhead Mountains to the NW and SW of Dillon, respectively. FINDITs plot summaries from recently infested areas show 2-41% of LPP currently dead. Based on previous trends some areas can be expected to have up to 90% mortality of trees >5" diameter. On BLM administered lands in the Centennial Mountain Range, MPB-killed LPP and WBP were at reduced levels from just a few years ago. WSBW caused defoliation continues to be present over much of the County with increases most notable on USFS managed lands. DFB remains low, with only a few acres of newly found ESB activity. Also of note is the high level of SAF mortality attributed to WBBB, with significantly more acres noted in 2009. Schweinitzii root and butt rot is common in DF, causing decay in the butt logs but not acting as an aggressive root pathogen. LPP dwarf mistletoe and LP dwarf

mistletoe are present. White pine blister rust is common in WBP. A 25- acre patch of windthrow was mapped on Forest Service administered lands 12 miles north of Lima Reservoir.

Deer Lodge County

Acres of Forestland, Mortality, and Defoliation by Ownership

	National Forest	Other Federal	Private	State	Total
Forestland	213,376	9,963	45,203	27,770	296,313
DFB	4	0	5	0	9
MPB-LPP	51,613	2,179	40,670	22,253	116,715
MPB-PP	0	0	10	0	10
MPB-High Elevation	1,861	0	576	1,054	3,491
WSBW	3,102	0	5,530	33	8,665
Windthrow	48	0	5	0	53

MPB continues to be very active with MPB-caused tree mortality decreasing in the northern portions due to host depletion and increasing in areas south of the Continental Divide. In both 2008 and 2009 similar numbers of acres in each ownership group were surveyed. However, acres of LPP affected by MPB increased by almost 25% with estimated number of trees killed increasing nearly 80%. In LPP stands where MPB activity is increasing, FINDITs surveys show 2-30% total mortality, with up to 60 times more mortality than found in 2008. Far fewer acres of MPB in five-needle pines were noted, especially in private ownership, although the estimate of trees killed actually increased. DNRC personnel hung MPB-baited traps in Anaconda at the MT DNRC Office to determine flight period. Peak collections were on 8/27/09 (36). Acres of 12

WSBW caused defoliation also increased greatly, with many more acres noted under private ownership. White pine blister rust has been found in LP. Schweinitzii root and butt rot is common in DF, causing decay in the butt logs but not acting as an aggressive root pathogen. LPP dwarf mistletoe and LP dwarf mistletoe are present in the County. One 53-acre patch of wind-throw was mapped in just west of Champagne Pass (47 acres on Forest Service administered lands and 5 acres on private land), and one wind event causing wind-throw in Deerlodge, Powell, and Jefferson Counties, where these three counties border each other.

Granite County

Acres of Forestland, Mortality, and Defoliation by Ownership

	National Forest	Other Federal	Private	State	Total
Forestland	597,814	30,748	176,283	38,303	843,147
DFB	875	44	58	6	983
FE	41	0	0	0	41
MPB-LPP	144,858	5,547	21,330	1,712	173,447
MPB-PP	2,163	729	3,612	714	7,218
MPB-High Elevation	5,776	0	414	0	6,190
SAF Mortality	1,982	0	5	0	1,987
WPB	0	2	6	4	12
WSBW	17,638	10,518	24,739	3,751	56,646

Despite slight decreases in the total numbers of acres surveyed in 2008, 2009 surveys noted a 5-fold increase (or greater) in MPB activity in LPP, PP, and five-needle pines. Large groups of MPB-killed LPP were mapped north and east of Georgetown Lake. Virtually all pine stands east of Philipsburg and north of Anaconda, and between Philipsburg and Deerlodge, have been infested at some level by MPB. Defoliation by WSBW was also noted on approximately 10 times the number of acres, over all ownerships. DFB activity showed only a slight increase in acres while SAF mortality was detected at lower levels. Root diseases are common in counties west of the Continental Divide. The more common ones known to occur in this County are: s-type annosus root disease, armillaria root disease, and brown cubical root and butt rot. The tree species most affected are DF and true firs. P-type root disease is known to occur in PP. Schweinitzii root and butt rot is common in DF, causing decay in the butt logs but not acting as an aggressive root pathogen. Elytroderma needle disease is a significant agent in PP in localized areas in this County. LPP dwarf mistletoe and WL dwarf mistletoe are present in this County.

Jefferson County

Acres of Forestland, Mortality, and Defoliation by Ownership

	National Forest	Other Federal	Private	State	Total
Forestland	434,471	56,442	118,934	8,099	617,947
DFB	200	31	218	8	457
MPB-LPP	273,453	4,323	21,240	105	299,121
MPB-PP	18,022	7,968	36,344	1,432	63,766
MPB-High Elevation	7,608	577	675	69	8,929
WSBW	25,790	6,527	21,791	742	54,850
Windthrow	249	0	0	0	249

MPB was still the most significant mortality agent in the County this year. MPB-caused mortality increased in some areas and decreased in many others due to the lack of available host trees. Large groups of MPB-killed trees were recorded in both LPP and PP stands, from about Jefferson City west nearly to Castle Rock, and east to nearly Canyon Ferry Lake. There was a significant increase in MPB activity in PP stands especially near Clancy and Montana City. At highest elevations, MPB-killed WBP remains high. Number of acres defoliated by WSBW significantly increased in 2009. DFB-caused mortality remains about the same but may increase in response to an increase of acres repeatedly defoliated by WSBW. White pine blister rust has been found in LP. A large 250-acre patch of wind-throw, adjacent to a 53-acre patch of wind-throw in Powell County, was mapped on Forest Service administered lands approximately 10 miles due east of the community of Racetrack

Madison County

MPB has been active in Madison County for several years, with activity continuing to show some increases in LPP but, overall, beginning to level off as host is depleted. Mortality of WBP continues throughout high elevations of both the Tobacco Root and Snowcrest Ranges.

Acres of Forestland, Mortality, and Defoliation by Ownership

	National Forest	Other Federal	Private	State	Total
Forestland	602,613	120,988	112,579	0	836,180
Aspen Decline	13	0	26	0	39
DFB	14	6	4	0	24
MPB-LPP	107,474	8,295	23,803	1,210	140,782
MPB-PP	92	0	2	0	94
MPB-High Elevation	55,400	1,978	5,627	308	63,313
SAF Mortality	5,609	6	720	2	6,337
WSBW	44,677	18,253	25,232	2,581	90,743

Past WBP mortality in the Gravelly Range has left few remaining large WBP, many of which are dying is small scattered spots. Mortality of LPP continues along the eastern fronts of the Tobacco and Gravelly Ranges, and in the Snowcrest Range where LPP are found. Both DFB activity and SAF mortality remain similar to 2008 levels, approximating endemic conditions. The few small polygons of DFB-caused DF mortality were noted along the Warm Springs drainage of the Gravelly Range and the headwaters of the Ruby River. Area affected by WSBW defoliation showed modest increases over all ownerships at lower elevations around all three mountain ranges. If defoliation continues at high levels or drought conditions return, increases in DFB activity may be expected. White pine blister rust is common in WBP and LP. Schweinitzii root and butt rot is common in DF, causing decay in the butt logs but not acting as an aggressive root pathogen. LP dwarf mistletoe is present in this County.

Powell County

Acres of Forestland, Mortality, and Defoliation by Ownership

	National Forest	Other Federal	Private	State	Total
Forestland	629,866	69,322	242,905	13,704	955,797
DFB	183	27	58	8	276
MPB-LPP	183,149	51,805	45,667	7,642	288,263
MPB-PP	5,808	2,958	24,921	2,936	36,623
MPB-High Elevation	2,346	0	13	0	2,359
IPS	0	0	135	0	135
SAF Mortality	102	0	0	0	102
WPB	0	0	20	6	26
WSBW	55,046	41,451	114,034	13,286	223,817
Windthrow	52	0	0	0	52

WSBW caused defoliation significantly increased across many parts of the County. MPB activity increased in both LPP and PP, on private and federal lands. Around MacDonald pass, mortality has peaked and is declining. On Forest Service administered lands, large polygons of MPB-killed LPP were detected near Ovando Mountain. Endemic levels of DFB, WPB and IPS were lightly scattered across the County.

White pine blister rust is common in WBP and LP. Root diseases are common in counties west of the Continental Divide. The more common ones known to occur in this County are: s-type annosus root disease, armillaria root disease, and brown cubical root and butt rot. The tree species most affected are DF and true firs. P-type root disease is known to occur in PP. LPP dwarf mistletoe is present in this County. One 52-acre patch of wind-throw was mapped very

near a 250-acre patch of wind-throw mapped on Forest Service administered lands in Jefferson County. Both patches are likely due to the same wind event, and are located approximately 10 miles east of the community of Racetrack.

Silver Bow County

Acres of Forestland, Mortality, and Defoliation by Ownership

	National Forest	Other Federal	Private	State	Total
Forestland	178,528	24,440	39,153	4,067	246,189
Aspen Decline	0	0	56	0	56
DFB	13	8	10	6	37
MPB-LPP	102,577	5,712	7,774	4,191	120,254
MPB-High Elevation	11,528	2	36	212	11,778
WSBW	23,687	11,070	17,552	2,666	54,975

Over 80% of the County was surveyed in both 2008 and 2009. MPB continues to kill large numbers of trees over large areas; nearly doubling activity in high elevations (LPP and five-needle pines). However, mortality in LPP (trees per acre and numbers of trees) is down, due largely to depletion of adequate host. WSBW-caused defoliation has increased over two-fold. Although DFB activity remains at low, endemic levels, increased defoliation may cause greater DFB activity in the future. White pine blister rust is common in WBP and LP.
Evaluation:

Bark Beetles
The" Montana Forest Insect and Disease Conditions and Program Highlights – 2009" reports that weather conditions were near normal in 2009. Neither winter nor summer temperatures were extreme; and summer precipitation was only slightly less than normal. MPB populations remained high in most infested areas; SAF stands continued to be damaged by a host of factors—one being WBBB; mortality attributed to FE declined markedly; and DFB-infested stands increased in a few areas. Most other bark beetle species were found at relatively low levels throughout the state.

MPB populations, highest in the west-central portion of Montana, continued to increase in 2009; but not at rates suggested by acreage figures derived from aerial surveys. On parts of the Helena and Deerlodge NFs, beetle populations have begun or continued to decline because of host depletion. Beetle-infested areas increased significantly in a few locations, and populations expanded into some previously un-infested areas—notably ones on the western Deerlodge, Beaverhead, Lewis and Clark, southern Flathead, western parts of the Lolo, and Gallatin NFs. Considerably more acres of PP with MPB were detected in 2009, especially around Helena. Overall, decreases were recorded in infested stands on portions of the Flathead, Lolo, and Deerlodge NFs. In summary, MPB-infested acres in LPP stands increased dramatically in 2009—up from just over 1.5 million acres recorded in 2008, to slightly more than 2.7 million acres in 2009.

DFB-infested acres remained about the same in western Montana in 2009. At a few locations in northwestern and central Montana, populations remained at low-epidemic levels; in other areas they declined considerably. Decreases were noted in most areas, except in the Pryor Mountains on the Custer NF. Declines were especially noted on the Flathead, Helena, and Lolo NFs. Infested acres increased, but only slightly in 2009 from levels recorded in 2008—from 21,500 acres to 22,500 acres. In most areas, DFB populations remain at nearly endemic levels.

SAF mortality, likely attributed to WBBB, was mapped on more acres in 2009, likely a result of more infested areas being surveyed. Notable beetle-caused mortality was found in some areas as affected SAF acreage increased from 52,700 acres to just over 79,500 acres. 3

Mortality in PP stands, attributed to IPS and WPB both decreased in 2009. Both were found at relatively low levels, likely due to nearly normal amounts of moisture received the past couple of years.

Fire activity was once again low during the summer of 2009, so few fire/beetle interactions should be encountered in 2010. WSBW populations, however, increased significantly in many areas and we may observe more severely defoliated trees being killed by bark beetles. While drought effects have ameliorated somewhat, cumulative effects of prolonged dry weather in many parts of the state have taken their toll and bark beetle populations are quite adept at taking advantage of any opportunity presented them. Dependent to a large extent on weather for the remainder of the winter and into spring, some bark beetle populations could rebound in 2010. MPB populations, more reflective of host conditions than weather, likely will continue to expand into and within susceptible host stands and decrease in stands already severely affected.

Defoliators

WSBW continues to be the most significant defoliator in the state.. Most of this defoliation was in Beaverhead, Flathead, Gallatin, Judith Basin, Lewis and Clark, Lincoln, Meagher, Powell, and Sanders Counties with each reporting over 100,000 acres. Defoliation was widespread in northwestern and central Montana affecting mainly DF. A few areas with multiple years of defoliation are beginning to see tree mortality in association with DFB. Continued defoliation, especially with droughty conditions, could cause an increase in DF mortality.

Fuel Reduction in Wildland Urban Interface

Item 18

Monitoring Question: Are fuels reduction projects being implemented in high risk urban interface areas?

Performance Measure: Acres in wildland urban interface (WUI) areas of reduced fuel loadings and crown fire risk.

Data Sources: Forest annual accomplishment reports (FACTS data base) and project accomplishment reports.

Measurement Period: Annual

Reporting Period: Annual

Background:

The 2009 Forest Plan fuel objective highlights fuel treatment in wildland urban interface. Treatment priorities are, in order:

1. Areas where a community wildfire protection plan has been developed.
2. High risk areas adjacent to communities
3. Other areas in Condition class 2 and 3 and fire regime 1, 2, &3.
4 Areas to be maintained in condition class 1.

Results:

The data base of record for fuels treatment (NFPORS) indicates a target of 5,191 acres of Forest Protection fuel treatments for both units of the BDNF. The Forest accomplished 13,443 acres. This includes brush disposal, hazardous fuels and other fuels treatments. The Forest exceeded the fuel reduction target by 258%. This is in part due to integrated projects which also provide wildlife habitat benefits. Specific projects included: Doolittle Creek, Cat Creek, West Face, Moffett Mtn., Grasshopper Valley, and McAtee Creek.

Acres of Wildland Urban Interface (WUI) fuels treated	= 3,365
Acres non-WUI high priority hazardous fuels treated	=10,078
TOTAL	***= 13,443***

Forest Outputs and Accomplishments	2005	2006	2007	2008	2009
Fuel Reduction- WUI Acres only	1,840	2,195	1,038	1,586	3,365
TOTAL Acres Treated	5,273	4,898	12,360	6,101	13,443

Evaluation:
Fuel treatment accomplishments are up from most previous years. Fire crews were able to spend more time on the Forest working on fuel targets rather than being dispatched for fire suppression actions.

Cultural Resource Protection

Item 22

Monitoring Question: Are cultural resources being protected as the Forest Plan is implemented? Are mitigation measures sufficient to prevent damage to cultural resources from project work?

Performance Measure: Number of projects that protect cultural resources.

Data Sources: Review up to 10% of projects in the field

Measurement Period: Annual

Reporting Period: Annual

Results:

Site Monitoring

In 2009, nineteen previously recorded heritage properties were formally monitored on the Forest. Formal monitoring includes a field inspection and usually comprehensive re-recordation and re-mapping, supplemented by new photographs and/or video tapes. Formal monitoring forms are completed for each site and these forms are filed in our site records and sent to the Montana SHPO and University of Montana Archaeological Records office for archiving with Beaverhead-Deerlodge National Forest site forms. Our monitoring program has been in operation for more than 15 years.

Table 13. Historic Sites Monitored in FY 2009

2009 Section 110 Site Monitoring			
Site	**Date Visited**	**NRHP Status**	**PHA**
24BE1604 Humbolt Mountain Mine	06/15/2009	Unevaluated	N
24GN0799 McFarland Cabin	04/21/2009	Not Eligible	N
24GN0808 Stanisich Cabin	04/21/2009	Eligible	N
24JF0100 Spire Rock – Hartman Creek prehistoric	09/16/2009	Unevaluated	N
24JF0269	07/21/2009	Unevaluated	N
24JF0271	07/21/2009	Unevaluated	N
24JF0281	07/21/2009	Unevaluated	N
24JF0637	07/21/2009	Unevaluated	N

24JF0955 Dearborn Canyon Pictographs	05/07/2009	Unevaluated	Y
24JF0960 Hartman Administrative Site	09/15/2009	Unevaluated	N
24JF0964 Silver Queen Mine	09/15/2009	Unevaluated	N
24JF1544 Quartz Chipping Station & Prehistoric Campsite	09/18/2009	Unevaluated	Y
24JF1587 Lindsey's Site	09/16/2009	Unevaluated	N
24JF1589 Hartman Creek Prehistoric – above old FS admin site	09/15/2009	Unevaluated	N
24JF1593 Ali's Site	09/16/2009	Unevaluated	N
24PW0127 Bertha May Claim	09/30/2009	Unevaluated	N
24PW0155 BPA Pit 1	06/25/2009	Unevaluated	N
24PW0653 Hidden Hand Mine	09/30/2008	Unevaluated	N
24SB0117 Bull Ranch	07/30/2009	Unevaluated	N

NRHP = National Register of Historic Preservation
PHA = Priority Heritage Asset

Project Monitoring:

In 2009, 2,937 acres were surveyed for cultural sites or artifacts as part of pre-project analysis. Forty four new prehistoric or historic sites were discovered.

Evaluation:

The type of survey the Beaverhead-Deerlodge Heritage staff conducts is consistent with the Region 1 Programmatic Agreement between the MT State Historic Preservation Office and the Region 1 Forests. Heritage personnel use the Site Identification Strategy in which 100% of high probability areas, (locations where sites are more likely to occur), 30% of moderate probability areas, and 10% of low probability areas are surveyed. All cultural sites are flagged and avoid or mitigation measures, in consultation with the Montana State Historic Preservation Office, are developed to ensure the sites are not affected adversely.

Quantities of Goods and Services

Item 23

Monitoring Question: What is the status and trend of goods and services provided from the Forest

Performance Measure: Quantities of goods and services and the cost of producing them compared to Plan predictions

Data Sources: FACTS, INFRA, and other corporate budgeting databases.

Measurement Period: Annual **Reporting Period:** Annual

Results:

Annual data for Forest outputs, expenditures, revenues, and employment is required to generate employment and labor income contributions for the 5 year Comprehensive Evaluation Report (2014) using the IMPLAN tool for modeling economic impacts. Evaluation of this same data annually reveals trends in budgets and regional or national priorities.

(A) GOODS AND SERVICES:

Goods and services produced by the Forest Service are measured by resource outputs (timber sold, animal unit months grazed) or accomplishments (miles of stream restored). Table 14 summarizes Forest Outputs and Accomplishments into a single table to simplify tracking. The brief discussions following the table compares FY09 accomplishments to the BDNF target, if there was one, and evaluates the trend.

Table 14. Summary of Forest Outputs and Actual Accomplishments for Fiscal Years 2005-2008

Forest Outputs	2005	2006	2007	2008*	2009
Watershed Assessments (each)	0	0	1	2	1
Watershed Restoration (miles)	14	21	8	16	24
Noxious Weed Treatment (acres)	7,636	6,017	5,001	8,570	8,088
Timber offered for sale (MMBF)	21.7	7.24	10.8	14.13	23.0
Timber Harvested (Acres)	950	309	920	1,358	668
Livestock grazing (AUMs)	185,601	226,461	161,129	204,561	174,764
Fuel Reduction: WUI Acres only TOTAL Acres	1,840 5,273	2,195 4,898	1,038 12,360	1,586 6,101	3,365 13,443
Road Maintenance			961	934	962

*Source: Beaverhead-Deerlodge National Forest Final Accomplishment Certification Report for 2009.

The following information compares targets to accomplishments. Data was extracted from the report "FY09 R1 Core Integrated Partnership Accompl 11_13_2009.xlsx".

(1) Watershed assessments

- One broadscale assessment was completed on the Forest in 2009. Butte and Wise River Ranger Districts collaborated on the Fleecer Mountains Assessment. The assessment area was almost 100,000 acres of National Forest involving parts of 12 different 6th code hydrologic units. The Watershed Assessment is posted on the BDNF Forest web at www.fs.fed.us/r1/b-d/ under Land and Resource Management, Planning.
- The Forest's FY09 target of 1 broadscale assessment was accomplished.

(2) Watershed Restoration

- Twenty four miles of stream were enhanced for fisheries in FY09. Projects included the Selway Creek exclosure and Brays Canyon culvert on Dillon District, crossing restoration at Warm Springs/Three Forks and brook trout removal from North Greenhorn Creek on the Madison District, for example.
- The trend is up from FY08 and previous years. The target of 21 miles stream improvement was exceeded.

(3) Noxious weed treatment

- Noxious weed treatments amounted to 8,088 acre, which includes 100 acres of biological control.
- This was 147% of the Forest target of 5,485 acres. The trend continues up from the 5 year average, in part because wildlife funding contributed to weed spraying accomplishments on big game winter range.

(4) Timber Offered and Sold

Category	MMBF for FY 09	CCF for FY09
Timber Offered and Sold	23	46,977
Additional Volume (not competitive)	3.5	7,238
Personal Permits	6.1	15,596
Total Sold	**32.6**	**69,811**
Timber Harvested	14.6	31,444

- The trend continues up from a low of 7.6 MMBF offered in FY06. Timber sold was the highest in the last 5 years and above the ten year average.
- The amount of timber sold was 89% of the targeted 78,319 CCF for FY09.

(5) Livestock Grazing, Actual Use in 2009, in Animal Unit Months

- Actual use by livestock on the Forest was 174,764 animal unit months.

Table 15. Actual livestock use in 2008 in Animal Unit Months

Type of Use	FY05	FY06	FY07	FY08	FY09
Cattle or Bison	173,937	217,917	153,710	198,136	167,524
Horses	838	917	457	324	252
Sheep	10,826	7,627	6,962	6,101	6,988
TOTAL	185,601	226,461	161,129	204,561	174,764

Source: USFS, INFRA data base, actual use by District

- Actual use is down from FY08.

(6) Fuel Reduction

- Acres of Wildland Urban Interface (WUI) fuels treated = 3,365

  Acres non-WUI high priority hazardous fuels treated =10,078

  TOTAL = 13,443
- The Forest target of 5,191 treatment aces was exceeded by 250%, largely in the non-WUI areas.

(7) Road Maintenance and Obliteration

- There were 962miles of Forest roads maintained in FY09 compared to 934 miles in FY08. This includes roads maintained with FS fund and with non-FS funds (such as by counties, permittees, timber purchasers, and other commercial operators).

- Two miles of road were decommissioned (unauthorized roads).

- The Forest road maintenance target was 922 miles. The target was exceeded by 4%.

(B) BUDGETS: COST OF PROVIDING GOODS AND SERVICES

The programmed budget for the BDNF ($19,805,000) was notably higher than the last 3 years due partly to increases for timber management and forest health protection.

Table 16. Beaverhead-Deerlodge Actual Budget Expenditures by Budget Line Item 2006 to 2009

Budget Line Item	DESCRIPTION	2006 Budget Expenditure ($000)	2007 Budget Expenditure ($000)	2008 Budget Expenditure ($000)	2009 Budget Expenditure ($000)
BDBD	Brush Disposal	25	21	13	11
CMFC	Facilities	585	133	269	327
CWFS	Cooperative Work	30	300	57	38
CMII					67
CMLG	Capital Mtce - Legacy				396

CMRD	Rd Construction and Mtce	966	965	1,112	1,107
CMTL	Trail Construction & Mtce	1,006	1173	1,160	1,168
CWKV	Knudtson/Vanderberg Fund	489	144	38	60
WFPR	Fire Protection/Preparedness	2,741	2,814	2,984	3,749
WFHF	Hazardous Fuels	597	459	1,004	635
NFIM	Inventory and Monitoring	93	337	357	430
NFLM	Land Ownership	237	167	211	452
NFMG	Minerals and Geology	858	634	440	510
NFPN	Land Mgt Plans (Plan Revision)	439	258	464	366
NFRG	Grazing Management	826	861	849	1,045
NFRW	Recreation,Heritage, Wilderness	1,210	1,108	1,059	1,174
NFTM	Timber Sales Management	1,568	1,667	1,248	2,513
NFVW	Vegetation and Watershed	801	858	857	931
NFWF	Wildlife and Fish	592	481	505	639
RBRB	Range Betterment	112	97	69	101
SSSS	Timber Salvage	11	3	342	60
TRTR	Road and Trail Restoration	83	69	30	-
SPSP	Forest Health Action Programs	49	53	51	626
NFWFEX	Grants/Agreements/coop	1,301	310	154	384
FDFD	Fee Demo	207	169	78	207
WFSU	Unplanned Wildfire Suppression	2,759	10,567	623	1,848
Admin	Administration (Cost pool, computers, facilities) (CACA, CMFM, QMQM)	2,703	2,735	2,513	2,809
	TOTAL Programmed Expenditures	$17,618	$15,816	$15,864	$19,805
	TOTAL Including Fire Suppression	$20,377	$26,383	$16,487	$21,653

**Source of data: Unit Status of Funds Report, USDA FS, BDNF, 09/2009*)

(C) BUDGET: REVENUES FROM PROVIDING GOODS AND SERVICES

Table 17. Revenues Collected for Goods and Service Provided by the BDNF

Source Of Revenues Collected	Receipts ($)
Timber	19,140
Land Uses	22,452
Recreation Special Uses	304,738
Minerals	864
L&WCR Recreation User Fees	2,275
Grazing	181,3730
TOTAL of National Forest Funds	**530,843**
Salvage Sale Fund	286,066
Knutdsen Vandenberg Fund	26,492
TOTAL of ALL Funds	**843,401**

(D) EMPLOYMENT

The BDNF employed 153 full time equivalent (FTE) career employees in 2009 and 56 temporary or seasonal FTE employees. Temporary employees are traditionally employed 3 to 6 months, which would be the equivalent of .25 to .5 of a full time equivalent. This is an increase from 150 FTE career employees and 48 temporary or seasonal FTEs in 2008.

Evaluation:

The BDNF met or exceeded most of the Forest's assigned targets related to product outputs in FY09. Targets for fuel reduction and noxious weed treatment were again far exceeded. Economies of scale for both targets were achieved by integrating wildlife habitat targets on big game winter range with noxious weed targets and wildlife habitat improvement with fuel reduction targets.

Targets for timber offered and sold were not met. Environmental analysis was not completed on projects anticipated to generate FY09 sales.

Funding for forest health protection efforts and timber sales has increased with concerns about insect epidemics and the associated fire threat with large expanses of beetle killed trees.

The number of positions employed by the BDNF increased slightly since 2008.

Developed Recreation Facilities

Item 25

Monitoring Question: Are we maintaining and reconstructing campgrounds and developed sites on schedule?

Performance Measure: Number of developed sites reconstructed compared to the objective of 30% over the planning period.

Data Sources: Forest annual accomplishment reports and project accomplishment reports

Measurement Period: Annual

Reporting Period: Annual

Background:

The BDNF has 297 developed recreation sites which range from campgrounds with paved access and water to day use sites and trailheads with few or no facilities. Assuming a 30 year life expectancy, ten sites a year would require reconstruction to maintain a 30-year schedule. Because these sites range widely in monetary value, not all of them warrant full capital improvement work. Many can be brought to standard by, for example, installing an accessible toilet. Priorities for the BDNF include addressing a deferred maintenance backlog (especially for historic cabins) and bringing sites to accessibility standards.

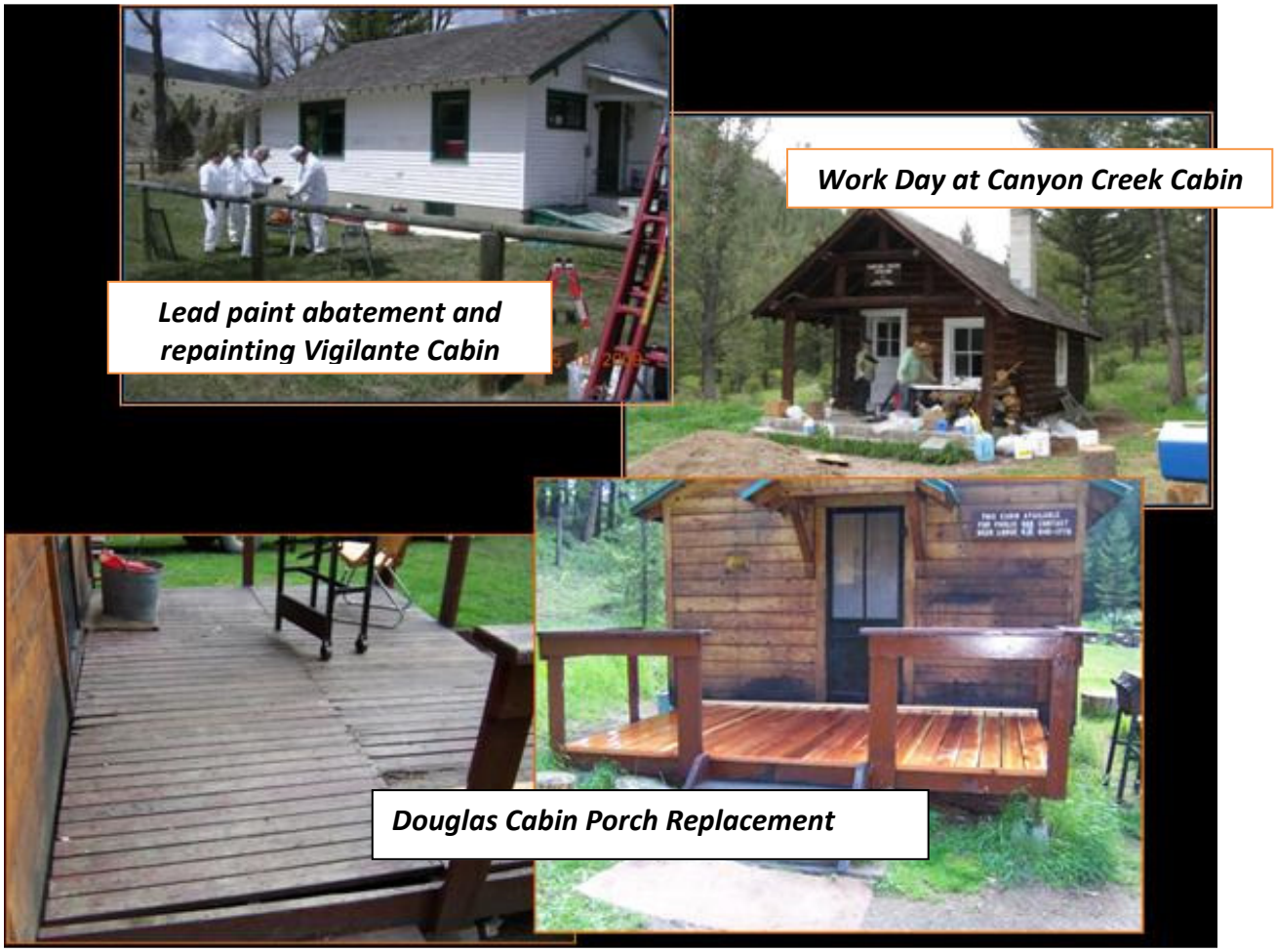
Recreation site reconstruction is funded primarily through the Capital Improvement Process (CIP), which in FY09 focused in on the reconstruction of Thompson Park (Butte District, in cooperation with Butte Silver Bow County). From 2009 through 2011, collections from the Fee Demo project provided funding through the Recreation Site Improvement (RSI) program. These funds have been directed at the restoration of several rental cabins, the installation of a new toilet at Cliff Lake (Madison District, 2009), the installation of new toilets and water system at Lodgepole Campground (Pintler District, 2011), and the design and reconstruction of Grasshopper Campground (Dillon District, 2010-2011).

All improvements are recorded through the National FS Infrastructure data base (INFRA), and a special module exists to record the status of RSI projects. Additional information for this monitoring item is captured through this annual report, produced by the Recreation Program Manager. There is no target assigned to the Forest for this type of work.

Results: In FY09, 161 recreation sites were maintained to standard. The Forest had a target of 110 sites. Developed site rehabilitation and reconstruction was completed on eleven rental cabins located throughout the Forest, and reconstruction of Thompson Park,

and installation of nine accessible toilets at various developed recreation sites. See details regarding these projects below.

Rental Cabin Restoration Projects:



Federal Lands Recreation Enhancement Act (FLREA) Funding:

Canyon Creek Cabin (Wise River District) and Twin Lakes Cabin (Wisdom District):

- Upgraded, repaired and replaced items at the cabin.
- Corrected all health and safety concerns.
- Repaired window frames/replaced window glass and restored operability of all windows (Canyon Creek).
-
- Repainted interior/exterior windows, floors, door, and furnishings.
- Replaced 2 mattresses (Canyon Creek).

Fleecer Cabin (Butte District):

- Provided heating oil.

Vigilante Station (Madison District):

- Lead paint abatement and removal of exterior paint.
- Scraping, cleaning, priming and repainting of exterior.

Douglas Cabin (Pintler District):

- Repair and replacement of front porch, refinished the floor, and installed a new gate on the entrance road.

Moose Lake Cabin (Pintler District):

- Refinished floor.
- Constructed a new picnic table.
- Constructed some gravel paths.
- Repaired woodshed floor.
- Oiled exterior logs and patched log chinking.

Stony Cabin (Pintler District):

- Oiled exterior logs.
- Patched concrete foundation.

West Fork of Rock Creek Cabin (Pintler District):

- Installed fire ring.
- Placed gravel in front of porch.
- Installed new hand pump.

Special Project Funding Recreation Site Improvement (RSI):

Racetrack Cabin (Pintler District):

- Installed new picnic table.
- Purchased new propane cook stove, pots, pans, plates and utensils.
- Renovated inside of outhouse.

High Rye Cabin (Butte District):

- Removal of hazard trees and slash.
- Collections were used to volunteer stipends and vehicle gas to remove and replace 750 feet of jackleg and rail fence at cabin.

Black Butte Cabin (Madison District):

- Replacement/ repair of logs, floor, and windows.

Developed Recreation Sites:

Capital Improvement (CMFC funding):

- Thompson Park Reconstruction (multi-site facility NFS and county ownership). Roads and site layout excavated and constructed in FY09; site furnishings, road and parking features, signs and toilets installed in FY10.
  1. Nine Mile: Gateway to Thompson Park. Day use picnic site and visitor information.
  2. Sagebrush Flats: Day use area picnic site with toilet and parking.
  3. Eagles Nest Trailhead: Parking for cars, trucks and horse trailers and overflow parking for Frisbee golf area. Day use area picnic site with toilet.
  4. Host site: On site supervision of Thompson Park, located near Eagle's Nest Trailhead.
  5. Lower Eagles Nest: Day use area picnic site with toilet and parking.
  6. Lion's Den: Trailhead parking and day-use picnic with toilet.
  7. Blacktail Trailhead-located north of Thompson Park. Provides parking and trail access into Thompson Park.

Reconstruction of Thompson Park sites: Nine Mile, Lion's Den and Lower Eagles Nest.

Evaluation:
With the number of sites improved in FY09 and project work anticipated over the next 5 years, the Forest is on track to accomplish reconstruction of valuable recreation assets over the 30 year life cycle.

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