

# Derby Fire Burned Area Emergency Response (BAER) Summary Report

September 29, 2006

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## **The Derby Fire Multi-Agency Burned Area Emergency Response (BAER) Team**

On Friday September 15, 2005, the Derby Fire Burned Area Emergency Response (BAER) team kicked off operations on the Derby Fire. This group's purpose was to *evaluate and propose mitigation for emergency post-fire effects*. It's analysis and report was finished on Friday, September 29, 2006.

This was a multi-agency team, using specialists from Stillwater and Sweet Grass counties, local Conservation Districts, Natural Resource Conservation Service (NRCS), Bureau of Land Management (BLM), the Montana Department of Natural Resources (DNRC), and the U. S. Forest Service. It was set up, staffed, and organized following the principles of the Incident Command System (ICS), similar to the fire suppression organization. ICS is used to manage emergency events. It is a very flexible and responsive system that can be applied to a wide variety of situations.

Team objectives were developed in consultation with the designated multi-agency oversight group (Derby Fire Multi-Agency Post-Fire Recovery Group (DFPFRG)). These objectives are:

- Assessing the short-term emergency risks to lives and property from the fire for Federal, state and private land,
- Identifying emergency measures needed to encourage ecosystem recovery,
- Prescribing and implementing treatments to mitigate those risks on Federal land, and suggesting treatments for values on private land,
- Providing foundation information to the Implementation/Private Landowner Assistance Team.

The BAER team assessed all lands in the burned area. However on private lands, field inventory occurred only through permission or request by the landowner.

The team completed its operations quickly, taking two weeks to complete their final report. They looked at:

- Potential risks to homes and other infrastructure (i.e. outbuildings, fences, water developments),
- Spread of invasive weeds,
- Risks to road systems,
- Risks to rangeland recovery,
- Effects on critical wildlife habitat (i.e. elk winter range)
- Risks to cultural and archeological features.

Rehabilitation efforts for non-Federal lands are the responsibility of the appropriate agency, depending on ownership and landowner objectives. The Implementation/Private Landowner Assistance Team will act as a clearinghouse for landowners to aid in their search for agency programs that will help mitigate threats to or damage on their lands. The BAER report, however, provided a foundation of risk assessment and recommendations by the appropriate agencies. These will help landowners identify their

own risks, document the nature of the burned area on their own lands, and provide a way forward to help restore their own lands to productivity.

### ***Products***

The intent of the BAER process is to evaluate and mitigate emergency post-fire effects. For public land, this includes assessment, development of treatments, and implementation of those treatments. For private land, development and implementation of treatments is completed by local Service Providers as an aid in supplying technical and financial assistance to individual private landowners.

The BAER process results in three products. These are an assessment of potential impacts, specification of treatments to mitigate impacts to values at risk, and implementation of those treatments. These products are identical in scope and purpose regardless of land ownership. However, the methods used to create them and their content differs, depending on landowner objectives, service-provider capabilities, and legal considerations. Here is a description of these products.

### **Assessment**

The first part of this product includes a single burned area inventory identical in accuracy and precision across ownership boundaries. This map estimates burn intensity (vegetation effects), and soil burn severity (soil and ecological effects). It is the basic document from which all interpretations are made. This is combined with other mapped landscape parameters such as slope, vegetation, soil types, and elevation to produce maps that predict landscape response to these parameters. These responses can include flooding, debris flows, weed expansion, range vegetation response, and wildlife distribution.

The second part includes Values at Risk (VAR). This consists of a list of values (homes, roads, rangeland production, native vegetation, or fences), and the post fire risk to these values, which may include flooding, weed expansion, or washouts.

Final map products includes the Burn Intensity map, Soil Burn Severity map, the Values at Risk map, and the National Forest Treatment map. Other analysis maps are also created for specific purposes. See the Derby BAER CD for more information.

Tabular products include burn intensity and soil burn severity by ownership, slope, vegetation type; summaries of values by ownership (e.g. miles of fence); and others as defined by users.

Because of variation in landowner objectives, assessment methods, and data sources, the product “look and feel” varies between public and private lands. For public lands, specific lists of VAR’s are included. For private lands, only summaries are shown to protect confidentiality. Private land values are obtained from a voluntary questionnaire,

with the exception of major values such as farmsteads in potential flood zones, which were field-evaluated by NRCS for risks and to provide a quality-check on summary data.

### **Treatments**

It is impossible to completely mitigate post-fire effects. However, land and channel treatments can mitigate or reduce emergency impacts. Some examples include road treatments (culvert up-sizing or removal), channel treatments (trash-racks, debris removal), or land treatments (mulching, seeding, weed treatment). For private lands, treatments may include fence rebuilding, grazing deferrals, application of grazing rotation systems, and other needed practices.

For public land, treatments are described in enough detail that an implementation specialist can complete them in the specified time frame. For private land, general summaries of suggested treatments are provided, and later evaluation by service providers will provide details.

### **Implementation**

The final (and most important) product is implementation. For public land, implementation consists of the actual application of the funded treatments. This includes contracting where necessary, project control, supervision, and completion in an appropriate time frame. This entire section is funded under the BAER program.

For private land, implementation consists of the actions of the Implementation/Landowner Assistance team, which provides a “one stop shop” of agency service providers who will help implement appropriate treatments as funding becomes available. There is a partial list of service providers at the end of this document.

### **Publications**

This report, all data, documentation, and administrative records are published on CD; posted on the Derby BAER website; and summaries are sent as hard-copy to interested parties. Topics on the CD include all maps, specialist reports, the Burned Area Report (a funding request document), executive summaries, treatment specifications where appropriate, long-term restoration needs, assessment cost and treatment cost summaries. There is a table of contents at the end of this document, and a list of contacts for obtaining the CD. There is a web site that contains all the information. You can reach it by either of the following:

Go to: [http://www.fs.fed.us/r1/gallatin/?page=fire/fires&fire=derby\\_fire\\_baer](http://www.fs.fed.us/r1/gallatin/?page=fire/fires&fire=derby_fire_baer)

or

Go to: <http://www.fs.fed.us/r1/gallatin> and go to the Derby Fire BAER link.

One of the most useful products of the BAER team is the Burn Intensity map. It can be used for planning salvage operations, evaluating habitat impacts, planning weed treatments, estimating fence damage, and others. As such, the BAER team has produced a “map book”, which is an atlas of documents showing burn intensity at a detailed scale for all lands in the burned area. It is included on the Derby BAER CD. The format is shown below.

## Final Burn Intensity Map Atlas

“Burn intensity” refers to the effect of fire on vegetation. Intensity classes for the Derby Fire are defined as follows:

**Unburned Forest land** – Understory and groundcover minimally scorched along edge of stand. No mortality of shrub/timber canopy.

**Moderate Intensity on Forest land** – 30 to 80% of shrub/timber canopy consumed or scorched, most of under-story consumed.

Consumption removes needles and branches up to ¾ inch leaving only the main bole and branches. Scorching retains most needles/leaves, but 50 percent or more scorching of individual trees generally results in mortality. Needle cast from scorched trees provides partial groundcover to reduce rain drop impact and subsequent surface erosion.

**High Intensity on Forest land** – More than 80 percent of the timber stand consumed or scorched. Significant needle cast will occur across approximately 15 percent of the high intensity forest land.

**Unburned Grass land** - Groundcover neither scorched nor consumed.

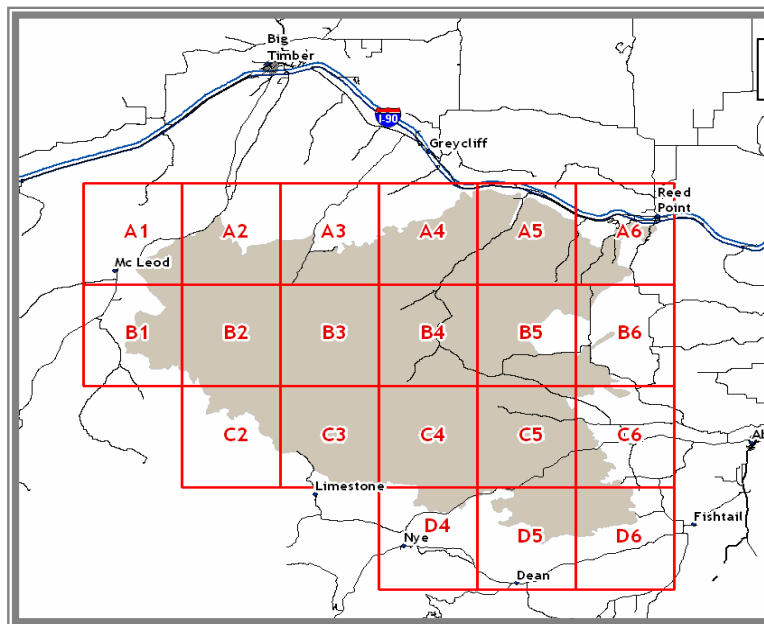
**Burned Grass land** - Above ground vegetation consumed, but duff generally intact.

**Other** - Rockland, water, mines. Scorching or consumption of isolated plants may have occurred.

The Derby fire encompasses both forest and rangeland. Where grasslands burned, ground cover was generally consumed and is relatively consistent in burn intensity. These areas are identified only as burned grasslands for the purposes of this analysis. Fire effects to grasslands are described through burn severity mapping, which describes effects to soil and vegetative roots.

### Burn Intensity Levels

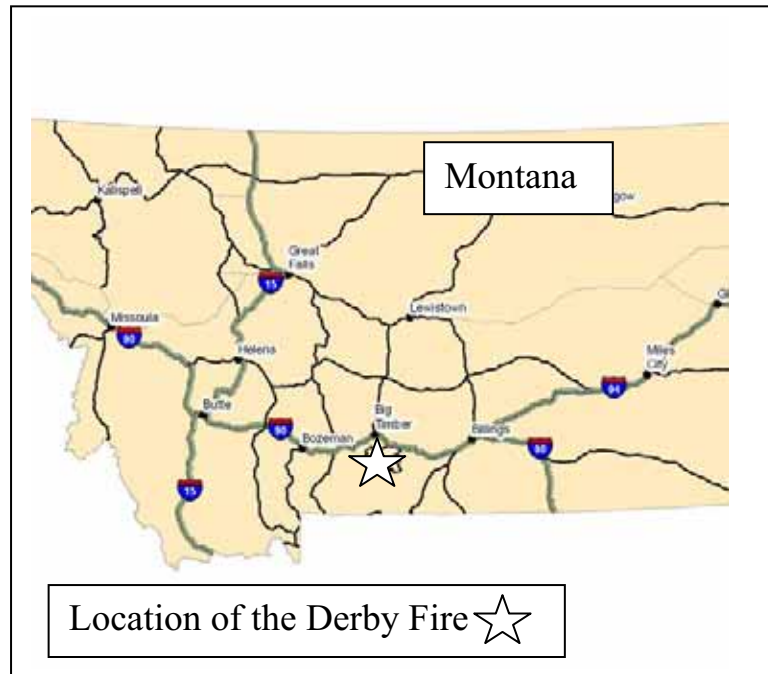
- Burned Rangeland
- Unburned Grasslands
- Moderate Intensity Burn - Forested La
- High Intensity Burn - Forested Land
- Unburned Forested Land
- Others (e.g., Rock, Water)



Map Index

## The Derby Fire Chronology

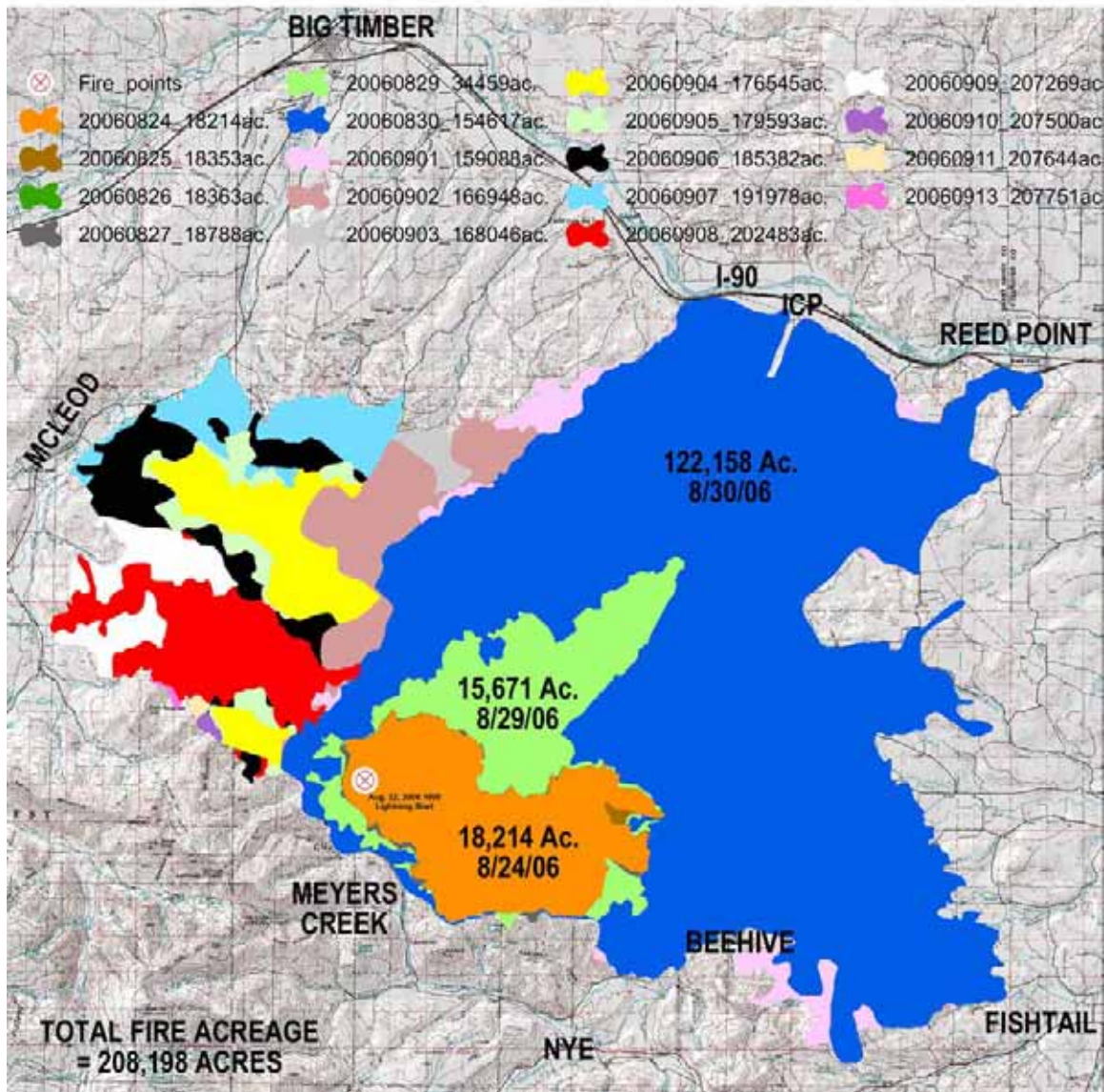
The Derby Fire began with a lightning strike August 22, 2006 at 4:00 p.m. on the northeast ridge of Sugarloaf Mountain on the Big Timber Ranger District of the Gallatin National Forest 21 miles south of Big Timber, Montana (Location Map). It was burning in steep, rugged, unroaded, timbered terrain. Energy release components (ERC's) were above the 95th percentile due to extremely dry 1000 hour fuel moisture conditions.



Seventeen smoke jumpers jumped the fire within a couple of hours of the report of the fire when the fire was estimated at ten acres. A local helicopter initially worked the fire with a small bucket previous to the arrival of the smoke jumpers. By the morning of August 23<sup>rd</sup> the fire had grown to over three hundred acres. Increasing wind from the northwest drove the fire 7 miles to the southeast during the night of August 23<sup>rd</sup>. In the early morning hours of August 24<sup>th</sup>, the wind shifted to the east driving the fire back to the west.

By the evening of the 24<sup>th</sup> the Derby Fire was an estimated 18,214 acres, with the majority of the burned acreage on the Beartooth Ranger District of the Custer National Forest (see the Derby Fire Progression Map August 22 – September 13, 2006). Plume dominated fire behavior accounted for large increases in the Fire numerous times during the next two weeks with notable firestorm events during the nights of August 29<sup>th</sup> and again on August 30<sup>th</sup> when the Fire grew by 15,671 and an amazing 122,158 acres respectively. On August 30<sup>th</sup> the Incident Command Post (ICP) along Interstate 90 and Bridger Creek Road had to be evacuated. The August 30<sup>th</sup> event burned 26 homes in the Stillwater drainage near Beehive, Bridger and West Bridger Creek drainages.

## DERBY FIRE PROGRESSION MAP AUGUST 22 - SEPTEMBER 13, 2006



As of September 27, 2006 there have been four Northern Rockies Incident Management Teams on the Derby Fire; Glen McNitt's Type II Team, Wally Bennett's Type I Team, Chuck Stannich's Type I Team and currently Tim Reid's Type II Team. As of September 23<sup>rd</sup>, suppression costs reached \$21.5 million dollars.

Overall, the fire presented many challenges. Due to the complex topography and weather systems passing through the area, shifting winds were common in many locations, which hampered suppression efforts. The forest was in weakened condition resulting from extended drought. The terrain around the south and west perimeter was extremely steep, (40% to 100% slopes), presenting hazards for firefighters and causing heavy reliance on air resources.



One of Many Retardant Drops on the Derby Fire (photo by Terry Jones)

Fire behavior generally consisted of fire backing down into canyons, then making uphill runs, resulting in a mosaic of effects on vegetation, although there were periods of very active fire behavior as mentioned above.



Crown Fire During the Afternoon of August 29<sup>th</sup>, 2006 (photo by Terry Jones)

### Nature of the Burned Area

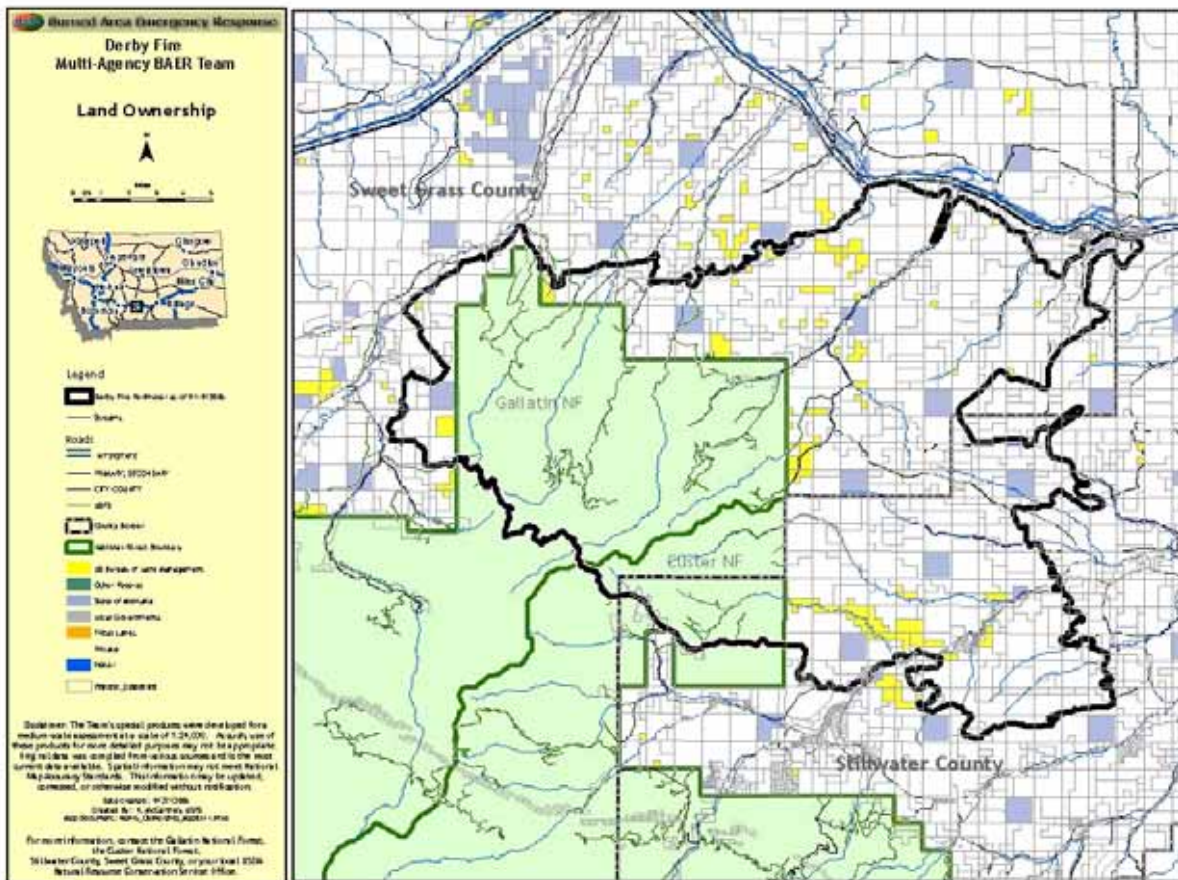
The fire burned in lodgepole pine, spruce-fir, Douglas fir, ponderosa pine, sagebrush, riparian hardwood and grassland. Elevations within the fire perimeter range from about 3,800 feet near Reed Point on the Yellowstone River to 8,000 feet on the north ridge of Elk Mountain. The burned area is characterized by slopes less than 40 percent in the lower elevation valleys, and greater than 40 percent at the middle and upper elevations.

The final fire size is 207,115 acres as of September 19, 2006. Burned lands are in various ownerships (see Table 1. Acreage Within Derby Fire Perimeter as of September 19, 2006). This table includes all area within the official burn perimeter. The most striking difference between this fire and many other large wildfires is in the high proportion of private land. Sixty percent of the area within the burn perimeter is privately owned. See the Land Ownership map for its distribution.

#### Acreage Within Derby Fire Perimeter as of September 19, 2006

Ownership	Acres	Percentage
Private – Sweet Grass County	73,706	36%
Private – Stillwater County	49,789	24%
State	5,486	3%
Bureau of Land Management	7,020	3%
National Forest - Gallatin	55,163	27%

National Forest - Custer	15,951	7%
Total Acres	207,115	100%



Not all the area within the fire perimeter burned, and burn effects are variable even within the burned lands. The nature of this burned area is critical in determining its effects on resources. Therefore, the first duty of the BAER team was to map this nature. This is one of the most important products used by the BAER team in evaluating burn effects, and one of the most difficult to complete due to the large size of the Derby fire.

***The Burned Area Map***

Two aspects of fire effects are described in the Burned Area Map. The first, *Burn Intensity* estimates the effect of fire on vegetation. The second, *Soil Burn Severity* estimates the effects of fire on the soil and below-ground ecosystem. Both are needed to evaluate the effect of the fire on both above- and below-ground ecosystems.

**Burn Intensity**

Burn Intensity classes for the Derby Fire are defined as follows:

Consumption removes needles and branches up to  $\frac{3}{4}$  inch leaving only the main bole and branches. Scorching retains most needles/leaves, but 50 percent or more scorching of individual trees generally results in mortality. Needle cast from scorched trees provides partial groundcover to reduce rain drop impact and subsequent surface erosion.

- Unburned forested land–Understory and groundcover minimally scorched along edge of stand. No mortality of shrub/timber canopy.
- Moderate Intensity on forested land– 30 to 80% of shrub/timber canopy consumed or scorched, most of under-story consumed.



Moderate Burn Intensity

- High Intensity on Forest land– More than 80 percent of the timber stand consumed or scorched. Significant needle cast will occur across approximately 15 percent of the high intensity forest land.



High Burn Intensity

- Unburned Grass land- Groundcover neither scorched nor consumed.
- Burned Grass land- Above ground vegetation consumed, but duff generally intact.

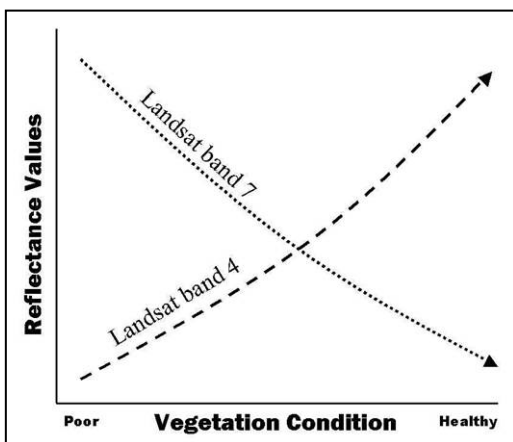


Burned and Unburned grassland

- Other- Rockland, water, mines. Scorching or consumption of isolated plants may have occurred.

The Derby fire encompasses both forest and rangeland. The intensity definitions above relate to timber and dense woody shrub habitat types, not grassland habitat types. Where grasslands burned, ground cover was generally consumed and is relatively consistent in burn intensity. These areas are identified only as burned grasslands. Fire effects to grasslands are described through burn severity mapping, which describes effects to soil and vegetative roots.

Burn intensity mapping began with satellite-derived maps of pre and postfire vegetation condition. Burn Area Reflectance Class (BARC) maps are made by comparing satellite near and mid-infrared reflectance values as measured through reflectance bands 4 and 7 respectively. The logic behind the process is as follows:



Near infrared light (band 4) is largely reflected by healthy green vegetation. That means that near-infrared bands will be very high in areas of healthy green vegetation and low in areas where there is little vegetation.

Mid infrared light (band 7) is largely reflected by rock and bare soil. That means that mid-infrared band values will be very high in bare, rocky areas with little vegetation and low in areas of healthy green vegetation.

Imagery collected over a forest in a pre-fire condition will have very high near-infrared band values and very low mid-infrared band values.

Imagery collected over a forest after a fire will have very low near-infrared band values and very high mid-infrared band values.

It is the relationship between these two bands that BARC mapping attempts to exploit. The best way to do this is to measure the relationship between these bands prior to the fire and then again after the fire. The areas where the relationship between the two bands has changed the most are most likely to be severely burned. The areas where that relationship has changed little are likely to be unburned or very lightly burned. To determine this relationship, analysts perform a band ratio between the mid and near-infrared bands. The result is a classification of burned areas, and is clipped to the extent of the fire. Images may be from different years (but with similar yearly climate), but should be taken at the same time of year to avoid phenological differences.

A GIS (geographic information system) was used to efficiently perform the complex spatial calculations required for the creation of the Burned Area Map. Four post-fire satellite images were acquired to develop a burn intensity map as the Derby Fire progressed. These images were from satellite passes on September 2, 3, 10, and 18. Initial field validation used a combination of the 9/3 and 9/10 images, but the final intensity map was based on a complete image from 9/18. Weather conditions on 9/18 resulted in a near perfect image, clear of clouds and smoke. The 9/18 image also accounted for minor fire expansion along the west side, and interior fire that occurred since the 9/3 and 9/10 images. The pre-fire image was taken on 9/3/2003.

The BARC layer itself contains both a preliminary four-class grid and the full range of results in a 256-class grid. Aerial and on-the-ground reconnaissance suggested that the initial BARC four-class image under-estimated high intensity and over-estimated low and moderate intensity. Three helicopter flights provided seven individuals the opportunity to review fire characteristics and effects to various resources including hydrology, soils, fisheries, wildlife and range. Field reconnaissance also provided 74 data points which were linked spatially to the 256-class image. The 256 band image was adjusted to account for these observations as follows:

INTENSITY CLASS	ORIGINAL BAND WIDTH	RECLASSIFIED BAND WIDTH
UNBURNED	0-75	0-75
LOW	76-130	------(to MODERATE)
MODERATE	131-152	76-120
HIGH	153-255	121-255

Due to weather and fuel moisture conditions, timber stands generally burned with high intensity and produced relatively narrow strips of moderate intensity along the stand edges. Low intensity burn was limited in extent so was not identified and displayed in forested stands.

The spatial model used above is applicable only to forested land. To accurately classify burned grassland, forest-level vegetation data (SILC3) was used to differentiate burned rangeland from burned forest land. This effort allowed more refined spatial data to be produced for both vegetation types.

The revised image was cleaned up using GIS filters to remove background noise and smooth intensity-class polygons. The final burn intensity is summarized by intensity class and ownership in the following tables. A spatial representation is in the following map.

**Burn Intensity by Ownership (Acres)**

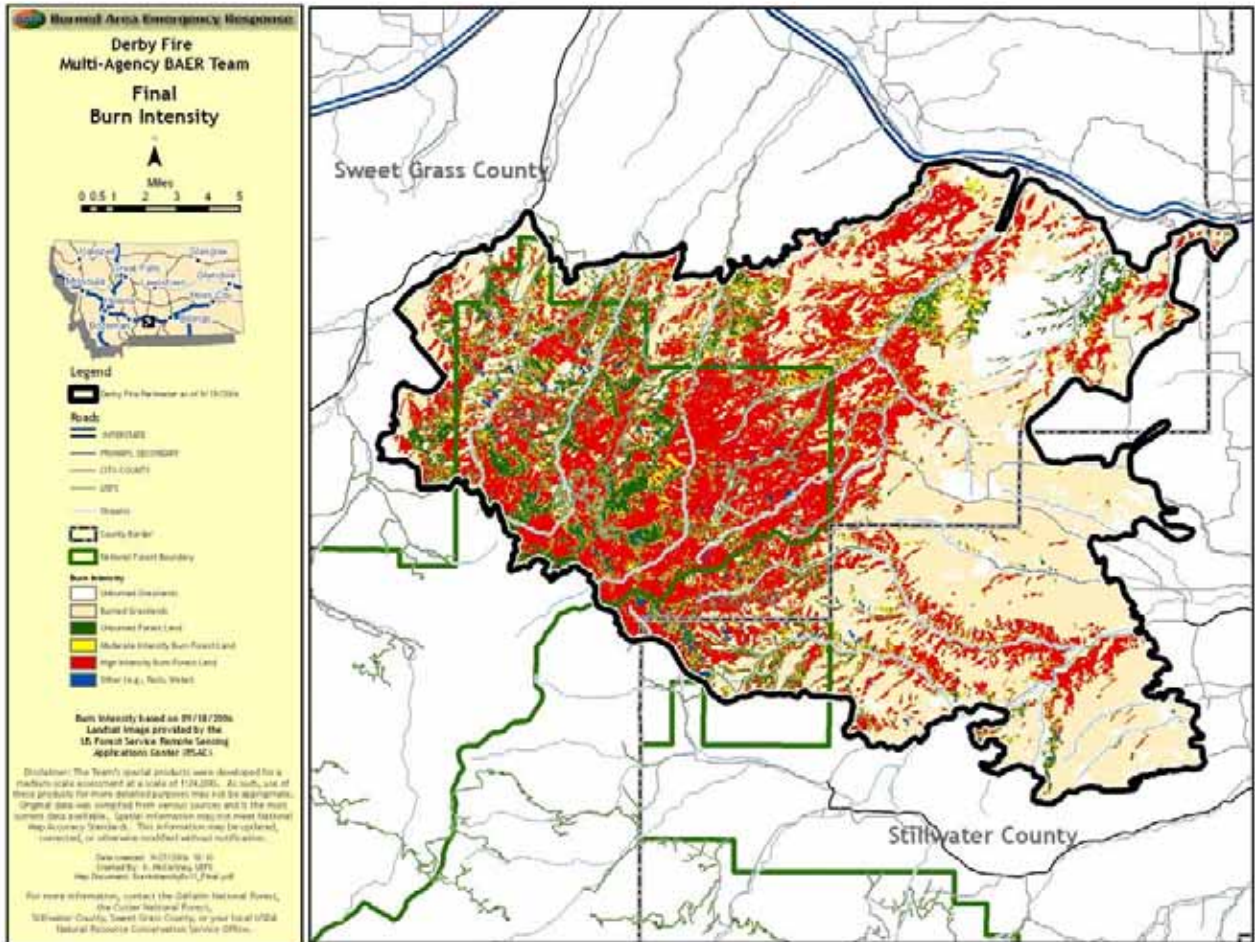
OWNERSHIP	FOREST LAND (acres)			RANGE LAND (acres)		OTHER	TOTAL
	HIGH	MOD	UNBURNED	BURNED	UNBURNED		
PRIVATE– SWEET GRASS COUNTY	17,913	6,266	4,953	31,427	13,042	105	73,706
PRIVATE– STILLWATER COUNTY	6,044	1,976	1,340	34,703	5,455	271	49,789
<b>Subtotal Private</b>	<b>23,957</b>	<b>8,242</b>	<b>6,293</b>	<b>66,130</b>	<b>18,497</b>	<b>376</b>	<b>123,495</b>
GALLATIN NF- Nonroadless	6,529	1,666	1,559	2,362	315	124	12,555
GALLATIN NF- Roadless	22,272	6,375	8,499	3,960	781	721	42,608
CUSTER NF- Nonroadless	3,386	1,600	1,001	3,332	365	225	9,909
CUSTER NF- Roadless	2,951	920	689	672	422	388	6,042
<b>Subtotal Federal – National Forest</b>	<b>35,138</b>	<b>10,561</b>	<b>11,748</b>	<b>10,326</b>	<b>1,883</b>	<b>1,458</b>	<b>71114</b>
BUREAU OF LAND MGMT	3,205	818	340	2420	194	43	7,020
<b>Subtotal All Federal</b>	<b>38,343</b>	<b>11,379</b>	<b>12,088</b>	<b>12,746</b>	<b>2,077</b>	<b>1,501</b>	<b>78,134</b>
MT SCHOOL TRUST LAND*	869	465	516	3,330	296	10	5,486
<b>Grand Total</b>	<b>63,169</b>	<b>20,086</b>	<b>18,897</b>	<b>82,206</b>	<b>20,870</b>	<b>1,887</b>	<b>207,115</b>

\*Includes 162 Acres of State Montana Fish Wildlife and Parks Land

**Burn Intensity by Ownership (%)**

OWNERSHIP	FOREST LAND (%)			RANGE LAND (%)		OTHER	TOTAL
	HIGH	MOD	UNBURNED	BURNED	UNBURNED		
PRIVATE– SWEET GRASS COUNTY	24.3	8.5	6.7	42.6	17.7	0.2	100
PRIVATE– STILLWATER COUNTY	12.1	4.0	2.7	69.7	11.0	0.5	100
<b>Subtotal Private</b>	<b>19.4</b>	<b>6.7</b>	<b>5.1</b>	<b>53.5</b>	<b>15.0</b>	<b>0.3</b>	<b>100</b>
GALLATIN NF- Nonroadless	52.0	13.3	12.4	18.8	2.5	1.0	100
GALLATIN NF- Roadless	52.3	15.0	19.9	9.3	1.8	1.7	100
CUSTER NF- Nonroadless	34.2	16.1	10.1	33.6	3.7	2.3	100
CUSTER NF- Roadless	48.8	15.2	11.4	11.1	7.0	6.5	100
<b>Subtotal Federal – National Forest</b>	<b>49.4</b>	<b>14.9</b>	<b>16.5</b>	<b>14.5</b>	<b>2.6</b>	<b>2.0</b>	<b>100</b>
BUREAU OF LAND MGMT	45.7	11.7	4.8	34.5	2.8	0.5	100
<b>Subtotal all Federal</b>	<b>49.1</b>	<b>14.6</b>	<b>15.5</b>	<b>16.3</b>	<b>2.6</b>	<b>1.9</b>	<b>100</b>

MT SCHOOL TRUST LAND	15.8	8.5	9.4	60.7	5.4	0.2	100
Grand Total	30.5	9.7	9.1	39.7	10.0	1.0	100



## Soil Burn Severity

Soil Burn Severity refers to the effect of fire on soils. It accounts for effects on soil characteristics resulting from downward-moving conductive and radiant heat. Generally, there is a close correlation between the depth, intensity, and residence time of heat penetrating into a soil and the loss and/or alteration of soil properties. Increased fire intensity also promotes the formation of water repellent (hydrophobic) layers at or near the soil surface, and loss of soil structural stability. These changes to the soil environment can dramatically increase the potential for runoff and soil particle detachment by water and transport off-site (erosion) in burned areas. To mitigate the potential for large-scale erosion events, it is important that accurate predictions be made regarding the hydrologic response of post-burn soils. The production of a soil burn severity map is the primary tool used for making these predictions.

The spatial distribution and extent of soil burn severity in burned areas was completed using aerial reconnaissance and field evaluations. This information was then used to reclassify the initial satellite BARC map into a soil burn severity map. The criteria used to evaluate soil burn severity on the ground included assessments of soil hydrophobicity (water repellency), ash depth and color (fire severity), size of residual fuels/vegetation (fire intensity), soil structure and aggregate stability, post-fire effective ground cover, and subsurface plant root viability. Based on ground and aerial results, the Derby Mountain Fire area was mapped into four relative soil burn severity classes. These included *high*, *moderate*, *low*, and *unburned*.

A *High soil burn severity* classification represents sites where surface soil properties have been significantly modified. In these areas, organic duff layers have been completely consumed and some surface soil structure and stability has been lost. Additionally, soils at these sites contain non-viable roots/seeds in the upper several inches of the soil so recovery of natural vegetation is slowed. The surface soil is hydrophobic. Sites with a high soil burn severity classification are highly susceptible to rain-impact erosion at the soil-air interface, reduced infiltration, and increased runoff and erosion.



High Soil Burn Severity

A *Moderate soil burn severity* classification indicates sites where most of the organic duff layer has been consumed and some surface soil structure and stability has broken down and been lost. Surface-soil hydrophobicity is typically increased compared to the pre-burn condition. Because some near surface fine root viability (grasses and/or shrubs) is usually lost at these sites, natural vegetative recovery is somewhat impaired. Areas with a moderate burn severity classification can be susceptible to rain-impact erosion, reduced infiltration, and increased runoff and erosion.



Moderate Soil Burn Severity

A *Low soil burn severity* classification indicates the duff layer have only been partially consumed by fire. Due to the insulating qualities of the remaining duff layer, surface soils on these sites show very limited affects from fire. Surface soil structure and stability remain intact, and water repellency is similar to pre-burn conditions. In general, there are unburned tree crowns in the over-story, unburned shrubs present in the under-story, and many viable small plant roots just under the soil surface. Natural vegetative recovery on these sites is typically very good. Areas mapped as low burn severity have a limited susceptibility to rain-impact erosion, reduced infiltration, and increased runoff and erosion.



Low Soil Burn Severity

Two helicopter flights provided three individuals the opportunity to aerially identify and locate the high soil burn severity areas. Field reconnaissance also provided 67 data

points which were linked spatially by GPS locations to the BARC image. The defined data points were located in a variety of severity types across the burned area.

Reconnaissance suggested that the initial BARC four-class image under-estimated Moderate soil burn severity and over-estimated High soil burn severity. The BARC-classified unburned areas when ground-verified were proven to be very accurately identified. This was also true for the small amount of the fire that was classified as low soil burn severity. The 256-class image was adjusted to account for these observations as follows:

SOIL BURN SEVERITY CLASS	ORIGINAL BAND WIDTH	RECLASSIFIED BAND WIDTH
UNBURNED	0-75	0-75
LOW	76-130	76-130
MODERATE	131-187	131-210
HIGH	188-255	211-255

The following table details burn severity by ownership. The map is a spatial representation of the same data.

#### Burn Severity by Ownership (Acres)

OWNERSHIP	FOREST LAND (acres)				RANGE LAND (acres)		OTHER	TOTAL
	HIGH	MOD	Low	Unburned	BURNED (LOW Severity)	UNBURNED		
PRIVATE–SWEET GRASS COUNTY	1,236	14,848	8,095	4,953	31,427	13,042	105	73,706
PRIVATE–STILLWATER COUNTY	223	5,164	2,633	1,340	34,703	5,455	271	49,789
Subtotal County	1,459	20,012	10,728	6,293	66,130	18,497	376	12,3495
GALLATIN NF-Nonroadless	1,297	4,939	1,959	1,559	2,362	315	124	12,555
GALLATIN NF-Roadless	3,809	17,746	7,092	8,499	3,960	781	721	42,608
CUSTER NF-Nonroadless	365	2,554	2,067	1001	3,332	365	225	9,909
CUSTER NF-Roadless	365	2,397	1,109	689	672	422	388	6,042
Subtotal Federal – National Forest	5,836	27,636	12,227	11,748	10,326	1,883	1,458	71,114
BUREAU OF LAND MGMT	263	3,282	478	340	2,420	194	43	7,020
Subtotal All Federal	6,099	30,918	12,705	12,088	12,746	2,077	1,501	78,134
MT SCHOOL TRUST LAND*	10	718	606	516	3,330	296	10	5,486
Grand Total	7,568	51,648	24,039	18,897	82,206	20,870	1,887	207,115

\* Includes 162 Acres of State Montana Fish, Wildlife and Parks Land

Burn Severity by Ownership (%)

OWNERSHIP	FOREST LAND (%)				RANGE LAND (%)		OTHER	TOTAL
	HIGH	MOD	Low	Unburned	BURNED (LOW Burn Severity only)	UNBURNED		
PRIVATE– SWEET GRASS COUNTY	1.7	20.1	11.0	6.7	42.6	17.7	0.2	100
PRIVATE– STILLWATER COUNTY	0.4	10.4	5.3	2.7	69.7	11.0	0.5	100
Subtotal County	1.2	16.2	8.7	5.1	53.5	15.0	.30	100
GALLATIN NF- Nonroadless	10.3	39.3	15.6	12.4	18.8	2.5	1.1	100
GALLATIN NF- Roadless	8.9	41.6	16.6	19.9	9.3	1.8	1.9	100
CUSTER NF- Nonroadless	3.7	25.8	20.9	10.1	33.6	3.7	2.2	100
CUSTER NF- Roadless	6.0	39.7	18.4	11.4	11.1	7.0	6.4	100
Subtotal Federal – National Forest	8.2	38.9	17.2	16.5	14.5	2.6	2.1	100
BUREAU OF LAND MGMT	3.7	46.8	6.8	4.8	34.5	2.8	.6	100
Subtotal All Federal	7.8	39.6	16.3	15.5	16.3	2.7	1.8	100
MT SCHOOL TRUST LAND	.2	13.1	11.0	9.4	60.7	5.4	.2	100
Grand Total	3.6	25.9	11.6	9.1	39.7	10.0	0.1	100.0





High Intensity Burn

Storm flow increase potential in the Derby fire is high. On September 15<sup>th</sup>/16<sup>th</sup>, a rain event produced between 1”-2” across the fire, creating runoff in many small draws including several of which reached streams. Some streams had significant ash and debris within the channel, especially behind obstructions. Several draws across National Forest roads are prone to flooding and washout, thus were identified as HIGH risk.

The Derby and Bridger Creek areas in particular, have vast expanses of fine-textured material exposed by the fire. Erosion risk is high. ERFO (Emergency Relief Federally Owned)-funding from the 5/2005 flood event will fund replacement of many of the at-risk sites in these drainages. The field review identified additional sites or needs culvert capacity increments that would not be covered by ERFO.

The effect of wildfires on storm flow is well documented. These negative impacts are predominantly true in watersheds with moderate and high vegetation burn intensities and moderate and high soil severity effects. The magnitude of the water yield increase is variable but an increase is common, often with orders of magnitude larger than pre-fire events.

Peak flow increase potential is greatest in smaller watersheds where individual storm cells can impact a higher percentage of a watershed. In the larger watersheds in the fire area, such as Bridger Creek and Upper and Lower Deer Creeks, peak flow increase due to relatively frequent storm flow events is much less. Much of the fire area has relatively low amounts of winter snowpack accumulation which combined with the peak flow desynchronization of earlier melt on south facing slopes limits snowmelt stream flow increase from the Derby fire. Due to the predominance of high soil burn severity and erosive soils, particularly in the Derby, Deer, and Bridger Creek areas, significant erosion and stream-sediment delivery is possible.

Wildfire typically also increases responsiveness of burned areas to precipitation events. Burned watersheds can yield runoff more quickly, producing “flash-type” floods. Fires may increase the number of runoff events, as well. Flow increases from the fire may also be augmented by debris flows of floatable and transportable material within the active channel areas. Recent experiences at both Cerro Grande and the Bitterroot NF demonstrate how flow and debris are interrelated. The highest post-fire flows at both of these areas were a combination of water and debris, called bulking.

## Treatments and Recommendations

The BAER process is designed to produce an emergency “response” product. Though many longer-term restoration activities are described, only the most urgent are addressed by emergency treatments. Those longer-term restoration needs are addressed in the document “DerbyPostBAERLongRangeRestoration.doc” for public and private lands on the Derby Fire BAER CD. Additional private land restoration recommendations are described below.

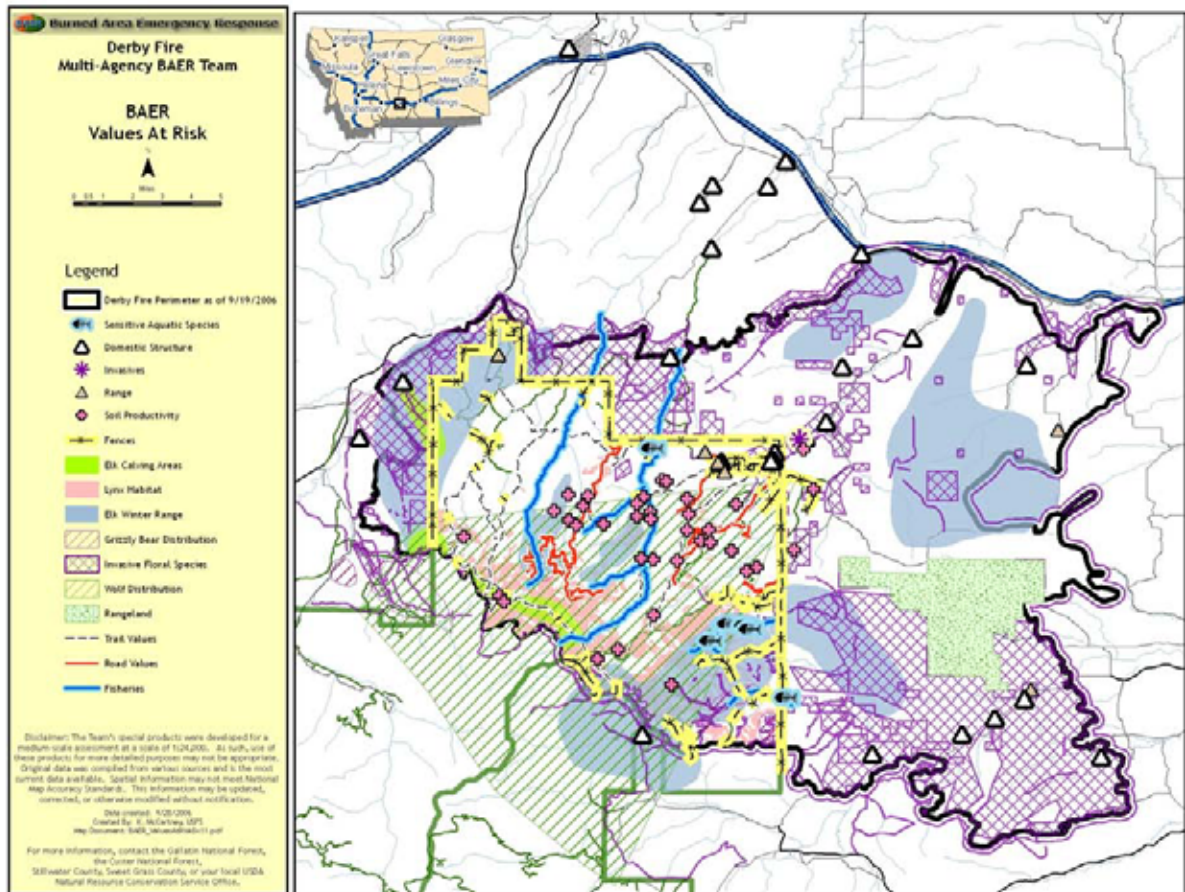
### *Values at Risk*

The term Values at Risk (VAR) is often misunderstood. The BAER assessment is limited to investigating “values”. An entity must be valuable to someone to be a candidate for evaluation (generally either life or property). It must also be at “risk”, or there must be some chance of an occurrence (e. g. 20% chance of flooding) and some negative consequence of that occurrence (e.g. culvert washouts). The BAER team’s job is to assess values and risk, and recommend ways of reducing risk, or at least alerting owners of that risk. There are 375 Values at Risk identified for the Derby Fire, summarized below, and represented on the following map. Of course only a part of that number falls on Federal land where treatments are funded through the traditional BAER program. Many are on private lands, where agencies other than the Forest Service have jurisdiction.

Values at Risk Count by Value at Risk Type

Ownership	Value at Risk type	Count
Public		
	Aquatic Species	26
	Cultural	8
	Domestic Structure	1
	Invasives	11
	Range	47
	Soil	35
	Transportation	121
	Vegetation	8
	Wildlife	3
Total Public		260
Private		
	Domestic Structure	25
	Invasives	10

	Range	28
	Soil	3
	Transportation	33
Total Private		99
Multiple Ownerships		
	Aquatic Species	3
	Invasives	2
	Range	2
	Vegetation	2
	Wildlife	7
Total Multiple		16



## *Assessment*

The nature of field investigations varies with land ownership. For federal lands extensive field work was completed to specifically determine values and risks. For private land, field work on county roads and permitted reviews of private values were supplemented with a survey technique that was used to estimate values at risk.

In order to facilitate the identification of values at risk, a questionnaire was mailed to 116 individuals in Sweet Grass County and 170 in Stillwater County that could be affected by the Derby Fire. The questionnaire included questions about many resources. For example, two specific questions were included pertaining primarily to the engineering aspect of the fire. One question was: “Do you have a home or other structure that you feel is threatened by a runoff-related problem due to fire?”. The other was: “Do you have a home, other structure, access road, where a hazard exists from weakened or burned trees?”. Eighty-three individuals responded to the questionnaire. Sixteen houses, 12 outbuildings, and 12 bridges were identified as potentially being threatened. At the time of report writing, 14 house concerns, 12 outbuilding concerns, and 8 bridge concerns were responded to by NRCS and DNRC. Nine “other” concerns were also addressed.

In addition to the questionnaire, three parties of two drove the primary roads within and adjacent to the burned area to identify potential risks. Four NRCS staff, two DNRC staff, and one USFS staff conducted the assessments. The risk assessments extended well below the fire perimeter in many cases. When a potential risk was identified, an attempt was made to contact the owner at their residence. If unsuccessful, a message was left or contact was made by phone.

Assessment specific to landowner impacts included a two part approach.

- Comprehensive Survey Data: An information request letter was sent to each individual landowner in the burn area and those likely to be threatened by effects downstream.
- Validation Data: On-the-ground sample

The BAER team identified a representative portion of the fire on private lands and completed on-the-ground inventory assessments. On-site assessments of rangeland and forest were done with landowners representing 29 percent (38,000 acres) of the private land area that burned. Structures that were completely burned were not entered into the Values-at-Risk (VAR) data base.

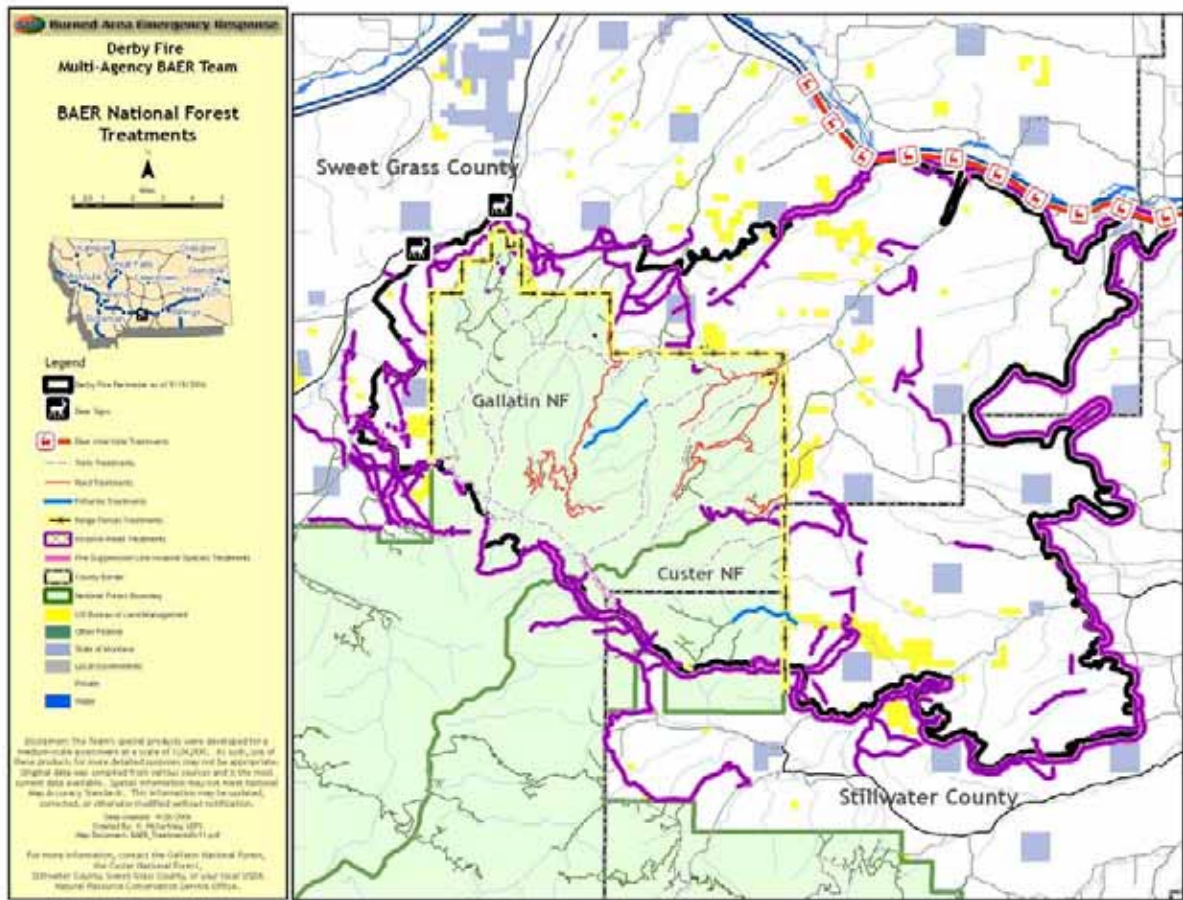
These two data sources were combined to identify immediate threats to life and property, and develop an integrated assessment of landowner-specific impacts, recommended mitigations, and a summary estimate of rehabilitation and recovery costs.

## Responses to The Landowner Survey

Amount	Unit	Value at Risk
40	Structures	Homes or other structure may be threatened by a runoff-related problem due to fire
945	Miles	Fence damage or loss
27,815	Acres	Area scheduled for fall/winter grazing but were destroyed by fire
11,120	Linear Feet	Amount of fire lines used for fire suppression with noxious weed infestations
47,745	Acres	Native rangeland grazing reported to be deferred for 2007
1124	Trees	22 Respondents identified hazard trees needing removal

Responses represented 72,350 acres or 55 percent of the private and State Land area. At the time of writing, BAER team engineers had completed on site inspections on 34 of the 40 respondents that identified hazards to dwellings from runoff or flooding. This information is found in the Engineering Report For Private and Non-Forest Service Public Land of the overall BAER assessment (included on the BAER CD). Inspections by NRCS engineers are ongoing.

The nature of recommended treatments also varies with land ownership. Only general recommendations are made for private lands. Follow up is necessary with the appropriate agencies for more specific treatments. However, for National Forest lands there is a well-defined process to obtain funding for emergency needs. These treatments include land and facility treatments, and are represented on the following map



Note that a request has been made for up to \$1,000,000 for treatment of these National Forest lands. General categories of treatments on Federal lands are as follows:

**Rangeland Vegetation:** Two land treatments have been identified for burned area emergency response on National Forest; permitted livestock deferment and private livestock exclusion from burned area via private boundary fencing repair and replacement.

**Livestock Deferment:** This is projected to be one to two growing seasons, with the first growing season beginning the spring of 2007. Sometimes post-freeze light grazing can be allowed after the first growing period depending upon the mix of vegetation. However, since cattle tend to browse woody species in the fall where hardwood draws exist, continued deferment rather than allowing light late season grazing is generally preferable to allow these vegetation types to get a jump-start on recovery. Continued deferment in late fall also prevents mechanical injury to these vegetation types from livestock shading in these areas. Deferment also allows for litter accumulation to protect soils.

**Fencing:** About 43 miles of fence will need varying degrees of repair or replacement in order to exclude livestock from entering burn area from adjacent private lands and adjacent unburned grazing lands under permit. There is a desire to replace, in kind, hard line fence needs rather than only using temporary fence usually allowed under BAER funding. This BAER request only covers 54% of the total hard line fencing cost. Other fund sources will contribute to the total cost. The BAER fencing proposal does not include interior fences (~ 49 miles) that separate burned areas from other burned areas. Reconstruction and repair of these fences will be pursued under other funding sources.

**Invasive Plant Species:** The treatments proposed are designed to reduce the expansion of noxious weeds within federal lands. Herbicide applications will reduce the vigor of existing infestations and native grass seeding will provide competition. If emergency mitigation activities are not implemented this problem will expand exponentially and will require future extensive resources to manage. If left unmanaged the results could permanently alter plant communities and critical habitats.

**Fisheries/Aquatics:** Approximately 110 acres of heli-mulch treatments are recommended on high intensity and high severity portions of the steep hillslope to reduce surface erosion and sediment delivery to critical habitat for yellowstone cutthroat trout. Channel treatments (berm and debris removal) on lower Trout Creek will improve floodflow access to floodplains and reduce floodflow energy in destabilized channel segments and reduce instream erosion.

**Roads and Trails:** The objective of the road and trail treatments is to protect these travel routes and aquatics systems from the consequences of post-fire flow events. Without treatment, these sites and routes will be at high risk of washing out, losing the investment in the travel route while also contributing sediment to the aquatic ecosystem. The primary hydrology objective of the BAER treatments on NF road routes is to increase the capacity of about 30 culverts and allow the culvert to carry at least the projected 5 yr stormflow runoff events. An objective of several other culverts is to reinforce the culvert's ability to handle peak flows by augmenting the inlet and outlets with additional rock and cleaning slash out of the channels. An additional objective is to maintain functioning of stream crossings and ditch relief culverts with cleaning and rock armoring.

**Heritage Resources:** Due to the intensity of fire that swept through the site area four sites have been exposed to public viewing. High visibility sites are susceptible to looting by hikers, hunters, etc. This is an unacceptable degradation of a critical heritage resource highly likely to occur within one year. Site documentation of visible surface artifacts is proposed in order to increase the scope of documentation in anticipation of data loss due to looting. Monitoring will provide additional site protection from disturbance and destruction. See the Derby Fire Burned Area Report (form 2500-8) on the CD for more information.

### ***Private Land Recommendations***

All major resource areas were reviewed by the BAER team. However, only resources identified as being at risk are discussed below.

### **Roads, Bridges, Culverts, Buildings, and Water Storage Reservoirs**

On non-Federal lands in and adjacent to the Derby Fire the values at risk assessed include threats to private and public property; primarily roads, bridges, culverts, buildings, and water storage reservoirs. Threats to health and safety were also considered. The Derby Fire poses a risk to private and public property primarily as a result of the increased

runoff potential from areas void of vegetation and water-absorbing surface organic matter and litter. The increased risk of runoff is highly dependent on burn intensity and burn severity within a given watershed. Burned watersheds that are dominated by grasslands, such as the Cow Creek, Spring Creek, and Hump Creek, are not expected to have significant increases in peak discharges.

The grassland watersheds, which are typically non-Federal, are also expected to recover quickly. Highly forested watersheds that have extensive burns, such as Bridger Creek, Lower Deer Creek, and Upper Deer Creek, are expected to have significant increases in peak discharges. In addition to increased peak discharges, it is expected that runoff events will be more often and more sudden. The increased runoff will likely cause more hill slope erosion and channel erosion. The altered hydrologic conditions will pose a greater threat to improved property and natural resources by elevating flow depths and stream power.

Three teams of two individuals from NRCS and DNRC conducted the Values at Risk assessment between September 17 and 22<sup>nd</sup>. One Forest Service hydrologist also assisted in the field assessments. Identification of potential values at risk was a challenge since the area affected by the fire is potentially much more than the 207,000 acres within the burn perimeter. The potential for increased threats from flooding can be miles from the fire perimeter. Many of the potential threats were visually identified from the road system and from word of mouth. The following values were identified through the questionnaire process identified above.

VALUE	OWNERSHIP	Count
Bridge	Public	6
Bridge	Private	8
Buildings	Private	22
Culvert	Public	21
Culvert	Private	24
Pond	Public	1
Pond	Private	8

Since NRCS and DNRC are not the decision makers for the values identified as being potentially at risk, only preliminary treatments have been recommended. There were no designs or specifications provided to enable owners to implement a treatment plan. In a number of cases owners have indicated an unwillingness to invest in a treatment plan for potential increased risks. Treatments such as culvert enlargement, installation of small dikes or sandbags, ditch cleaning, spillway upgrades, debris removal, and protective barriers from debris flow were recommended. In many cases monitoring of sites, or maintenance, is recommended to ensure structures continue to function to their full capability. Warning signs are recommended on roads, bridges, and culverts that are vulnerable to overtopping or washout. Many of the structures identified as having an increased threat after the fire were flood prone prior to the fire. Private owners and public entities affected by the Derby fire should obtain engineering and scientific help for more specific information and guidance.

The Forest Service Burned Area Emergency Response team provided valuable hydrological analysis of the burn affected watersheds which enabled NRCS and DNRC to better assess risks. The Forest Service also provided valuable burn data and mapping products.

### **Private Rangelands**

Approximately 82,206 acres (39.7 percent) of the 207, 115 acre Derby Mountain Fire are burned rangelands. Of the area that burned on Forest Service portion of the fires, approximately 80% was forested and 20% non-forested areas. Of the area that burned on private land portion of the fires, approximately 35% was forested and 65% non-forested areas. The majority of vegetation that burned on private land was grassland, with small amounts of forested land.

The burned area was rated as low severity for grasslands. Roots crowns were abundant in all non-forested and open timber types of the burn. This indicates that the majority of the area may have the ability for rapid natural recovery of herbaceous species within one to three years. With livestock deferment, the burn will release a flush of nutrients into the soil that may increase production of recovered grasslands for up to three to four years, depending on pre-existing conditions and precipitation events.

The burned area encompasses portions of seven Forest Service grazing allotments and affects approximately 15 permit holders and approximately 286 private landowners. There are fences, stockwater dams, and water developments within the fire perimeter that have been damaged to varying degrees. The Derby Fire will have short-term impacts to livestock management on the associated allotments as well as on private lands.



Burned Transitional Range



Burned Fences and rangeland

## Burned Rangelands and Fences

Rangeland recovery and critical habitat recovery (riparian areas and sagebrush ecotypes) are emergency values at risk found on private lands. It is recognized that there are significant impacts to individuals and property that are not reflected in the report. The purpose of this assessment, however, is to focus on emergency threats to life and property and other immediate natural resource recovery needs.

With good grazing management including proper deferment, and thereafter through proper grazing management, production should continue to rise over the next few years. Approximately 415 miles of fence on private land were estimated to be in need of varying repair/replacement. Additional private land findings are outlined in the following table. This table was generated from the private land surveys discussed above.

Amount	Unit	Value at Risk
945	Miles	Fence damage or loss
27,815	Acres	Area scheduled for fall/winter grazing but were destroyed by fire
11,120	Linear Feet	Amount of fire lines used for fire suppression with noxious weed infestations
47,745	Acres	Native rangeland grazing reported to be deferred for 2007

There is a large difference between fenceline estimates in this table and given above. This probably because on the landowner survey, many boundary fences were counted twice, once by each adjoining landowner.

**Economic Effect of Forage Lost Due to Fire Effects and Deferment:** The following table outlines potential economic effects of forage loss due to immediate fire effects in 2006 and due to deferment during the first growing season (2007). Values reflect the estimated cost to operators relocating to other summer pasture at private pasture market values.

### 2006 EFFECTS TO FEDERAL PERMIT HOLDERS & PRIVATE LAND RANCHING ENTERPRISES

Allotments	AUMs Lost	Average Private Grazing Value / AUM	Fall 2006 Forage Lost
Gallatin NF: Deer Creek, Evergreen, Lodgepole, West Bridger, Blind Bridger, Carey Gulch Allotments	680	\$18	\$12,240
Custer NF: Bad Canyon, Lodgepole Allotments	600	\$18	\$10,800
Private – Stillwater and Sweet Grass <sup>1</sup> Counties	8,622	\$18	\$155,195
Subtotal	9,902		\$178,235

**2007 EFFECTS TO FEDERAL PERMIT HOLDERS & PRIVATE LAND RANCHING ENTERPRISES**

<b>Allotment/Pasture</b>	<b>Grazing Treatment</b>	<b>No. Of AUMs Affected</b>	<b>Average Private Grazing Value / AUM</b>	<b>Total Private Grazing Value of AUMs</b>
<b>GNF Allotments burned</b>	Defer grazing at least one growing season to late use in 2007 or into 2008	2,715	\$18	\$48,870
<b>CNF Allotments burned</b>	Defer grazing at least one growing season to late use in 2007 or into 2008	2,385	\$18	\$42,930
<b>Private Land</b>	Defer grazing on native rangeland until after frost in fall 2007 (and possibly 2008, depending on range recovery)	31,838	\$18	\$573,084
		36,938		\$664,884

There are cumulative economic effects to affected landowners who also lost forage on federal permits, lost hay due to the fire, and likely to lose hay to deer or elk pressure. The following are recommendations for livestock deferment and fencing.

**Deferment**

<b>Land Use</b>	<b>Acres Burned</b>	<b>% BURNED</b>	<b>% BURNED High Intensity</b>	<b>DEFERMENT / RECOMMENDATIONS</b>
<b>Forest</b>	32,199	84	62	Defer to 2008 Season
<b>Rangeland</b>	66,130	78	5	Defer to 2007 Late Season

**Fencing:** Approximately 415 miles of fence will need varying degrees of repair or replacement in order to exclude livestock and allow grazing deferment. This does not include boundary fence on the National Forest.

Treatment Unit Costs<sup>2</sup>

Steel posts installed and wood bracing repaired      \$ 3500.00 per mile  
 Complete replacement    \$ 8000.00 per mile

**Forestry**

This report identifies and addresses known and potential impacts to vegetative resources within the Derby Fire on Gallatin National Forest (GNF), Custer National Forest (CNF), State, Bureau of Land Management and private lands. Findings and recommendations contained within this assessment are based upon information obtained from personal interviews with agency representatives and staff from the Natural Resource Conservation Service and USDA Forest Service, literature research, and field reviews of the fire area.

The Derby Fire burned over 207,000 acres on both sides of a major mountain divide (Absaroka Mountains) between the GNF and CNF at elevations ranging from foothills to

ridgetops on all aspects. As a consequence, most vegetative cover types common to the Northern Rocky Mountain region were present in the pre-burn forest matrix. The fire burned predominantly in mixed Douglas-fir, Ponderosa Pine, and lodgepole cover types at low to mid elevations within the fire perimeter of the GNF and CNF. There are also significant inclusions of Ponderosa pine and dry Douglas-fir types, primarily at lower elevations east of the West and East Bridger's side of the fire but elsewhere as well primarily on private lands. At higher elevations cover types are a mix of lodgepole pine, spruce-subalpine fir along with some mixed Douglas-fir/lodgepole. Spruce-subalpine fir types also occur along the headwaters of Enos, Upper and Lower Deer Creeks.

Reconnaissance of impacted areas was conducted utilizing aerial and ground survey methods. Burned area mapping was completed using satellite images (SILC and LANDSAT) interpreted to emphasize the signature of recently burned vegetation. Delineations created from the severity map imagery were revised after field time was spent to accurately reflect any differences found. Additional field time and low level resource flights are recommended to adequately delineate the fire mosaic and provide realistic precision for future management activities.

Coniferous species in the fire area vary in their response to fire with some species more resistant to heat damage and crown scorch than others. Larger islands, smaller patches and individual trees of these species have survived the fire and are scattered throughout the area. They will be an ongoing source of seed for reforestation of much of the area. Other trees that were severely scorched and killed by the fire still have viable cones that were not completely consumed. Seedfall from these cones occurs throughout the burned area in the weeks following the fire, and thus will contribute to reforestation of the area. Fine roots remain intact near the soil surface and sprouting of shrubs and other plants has already been observed in many areas within the fire.



Upper Deer Creek

Two areas of concern regarding vegetative recovery exist on those areas burned at high severity. These conditions in conjunction with reduced seeds and rhizomes in the upper soil layers will reduce the vigor and abundance of new growth from both residual

propagules and seed from off-site sources. This is especially a concern in the vicinity of Derby Mountain, Upper Deer Creeks south of Evergreen Mountain, Main Bridger, West Bridger, Packsaddle, and Lower Deer Creek where high-severity burn areas that are now lacking in overhead shade and coarse woody debris.

There were 32,199 acres of forested private land with high to moderate fire intensity. Of that approximately 11,787 acres have merchantable trees that should be evaluated for salvage and reforestation. Approximately 6,293 acres of forested land was unburned or low fire intensity. See the Forestry report on the CD for more information.

In areas burned by wildfire, fire killed trees and partially burned through trees pose a significant hazard as they begin to fall. Even relatively small trees whose roots are damaged or rapidly decay after fire can strike and injure or kill workers, public, or recreationists present in a burned area. The hazard diminishes over time but is a concern in major public use areas especially along county, state, and public roads.

Following are some general recommendations for private landowners.

- Review all forested lands with high to moderate fire severity to determine mortality.
- Determine potential acres that are salvageable for safety and economic reasons within the next six months to attain the most value possible prior to rot and blue stain especially in Ponderosa Pine and Lodgepole pine. Douglas-fir has a longer salvage life of approximately two to three years
- **For further information and available resources for determining forestland values contact Montana Department of Natural Resource Conservation, Billings Regional Office, Airport Industrial Park, 1371 Rimtop Drive, Billings, Montana 59105-1978, Phone: 406/247-4400 , Fax: 406/247-441. And refer to the following website, (<http://www.bber.umt.edu/forest/pdf/sawlog2006q2.pdf>). This information is provided by the Bureau of Business and Economic Research of the University of Montana, Missoula, Montana 59812 that provide current sawlog and veneer log prices for eastern Montana.**
- Refer to “After Wildfire” publication that can be obtained at your local Montana State University Extension Service office in either Stillwater County
- Use of pheromone capsules to protect high value live Douglas-fir trees adjacent to homes and other high scenic value areas. For further information and available resources contact USDA Forest Service Northern Region State and Private Forestry, P.O. Box 7669 Missoula, MT 59807 (406) 329-3308.

## Contacts

### BAER team members and Positions

NAME	HOME UNIT	BAER TEAM POSITION
Walt Allen	Gallatin NF	Cultural
Tom Ballard	Gallatin NF	Info. Mgmt
Scott Barndt	Gallatin NF	Info. Mgmt
Stacey Barta	Sweetgrass CD	Weeds
Pete Becken	Gallatin NF	Trails
Mike Bergstrom	Custer NF	Archeologist
Barb Berry	Sweetgrass CD	BAER info/ Landowner Contacts
Melissa Cooney	NRCS-Livingston	Engineers
Ellen Davis	Northern Region Office	BAER info/ Landowner Contacts
Rob Ethridge	Montana DNRC	MAC Liaison
Alane Fitzpatrick	Helena NF	Information Officer
Brent Foster	Gallatin NF	Forester
Lorri Ghormley	Gallatin NF	Administration
Mary Gonzales	Custer NF	GIS
Joe Hamilton	Helena NF	Information Officer
Jennifer Hickenbottom	IDP NF	Hydrologist
Steve Johnson	Kootenai NF	Hydrologist
Terry Jones	Custer NF	Range
Ronald Krogstad	NRCS	Engineer
Kelsey McCartney	Lewis and Clark NF	GIS
Jerry Meyer	Helena NF	Information Officer
Ted Nelson	NRCS	Engineer
Mark Nienow	Custer NF	Plans Chief
Rich Nordquist	NRCS	Engineer
Sally Orr	Gallatin NF	Range
Todd Orr	Gallatin NF	Trails
Barb Pitman	Custer NF	Wildlife
Kim Reid	Custer NF	Range
Art Robinson	DNRC	Engineer
George (Tony) Rolfes	NRCS	Soils
Charles Roloff	NRCS	Resource Eval.- pvt land
Gina Rone	IDP NF	Soils
Wanda Rouwhorst	NRCS	GIS

Philip Sandoval	NRCS	Resource Eval.- pvt land
Scott Schwartz	Kootenai NF	Engineers
Henry Shovic	Gallatin NF	Incident Commander (Team Leader)
Scot Shuler	Gallatin NF	Fisheries
Claire Simmons	AD - Private	Wildlife
Dean Sirucek	Flathead NF	Soils
Mark Story	Gallatin NF	Lead Hydrologist
Bo Stuart	Helena NF	Hydrologist
Ron Thatcher	Kootenai NF	Engineer
Terry Voeller	DNRC	Engineer
Darin Watschke	Custer NF	Fisheries
Coral Wilson	Sweet Grass CD	BAER info/ Landowner Contacts
Averiel Wolff	Northern Region Office	Adminstration/ Logistics

## Obtaining a CD



You may request a CD complete with the Derby Fire Multi-Agency BAER Report for Private & Public Lands and other information by contacting the following offices.

Custer National Forest  
Supervisor's Office  
1310 Main Street  
Billings, MT 59105  
(406) 657-6200  
E-mail: [dlcook@fs.fed.us](mailto:dlcook@fs.fed.us)

Gallatin National Forest  
Supervisor's Office  
PO Box 130  
Bozeman, MT 59771  
(406) 587-6701  
E-mail: [mailroom\\_r1\\_gallatin@fs.fed.us](mailto:mailroom_r1_gallatin@fs.fed.us)

Natural Resources and Conservation Service  
Big Timber Field Office  
(serves Sweet Grass Conservation District)  
225 Big Timber Loop Road  
P.O. Box 749  
Big Timber, MT 59011-0749  
(406) 932-5160  
E-mail: [charles.roloff@mt.usda.gov](mailto:charles.roloff@mt.usda.gov)

Natural Resources and Conservation Service  
Columbus Field Office  
(serves Stillwater Conservation District)  
334 N. 9th Avenue  
PO Box 415  
Columbus, MT 59019-0415  
(406) 322-5359  
E-mail: [Philip.sandoval@mt.usda.gov](mailto:Philip.sandoval@mt.usda.gov)

**Partial List of Service Providers for post-fire recovery efforts**

Agency Name	Programs/Resources	Details	Contact Name	Phone Number
Farm Service Agency	Emergency Conservation Program	The Emergency Conservation Program provides emergency financial and technical assistance to rehabilitate farmland damaged by natural disasters.	Marla Moen, Sweet Grass County Dane Schmidt, Stillwater County Donna Linger, Stillwater County	(406) 932-5159 (406) 322-5359 ext 104 (406) 322-5359 ext 105
Farm Service Agency	Emergency Loan Program	The Emergency Loan Program provides emergency loans to help agricultural producers recover from production and physical losses due to natural disasters	Marla Moen, Sweet Grass County Dane Schmidt, Stillwater County Donna Linger, Stillwater County	(406) 932-5159 (406) 322-5359 ext 104 (406) 322-5359 ext 105
Farm Service Agency	Livestock Indemnity Program	The Livestock Indemnity Program provides partial reimbursement for livestock losses resulting from a natural disaster	Marla Moen, Sweet Grass County Dane Schmidt, Stillwater County Donna Linger, Stillwater County	(406) 932-5159 (406) 322-5359 ext 104 (406) 322-5359 ext 105
Stillwater Conservation District	Educational Outreach 310 Permits, Natural Streambed Preservation Act Project and Grant sponsorship Water Reservation Program Stillwater Landowner Maps	Educational materials available to landowners. Application assistance is available for all projects that impact a streambed or streambank. Assistance and Sponsorship for projects to the conservation of natural resources This program provides irrigation water rights through an application process.	Barbara Berry	(406) 322-5359 ext 101

Sweet Grass Conservation District	Educational Outreach 310 Permits, Natural Streambed Preservation Act Project and Grant sponsorship Water Reservation Program	Educational materials available to landowners. Application assistance is available for all projects that impact a streambed or streambank. Assistance and Sponsorship for projects to the conservation of natural resources This program provides irrigation water rights through an application process.	Coral Wilson	(406) 932-5160 ext 3
Natural Resources Conservation Service (NRCS)	Emergency Watershed Program	The Emergency Watershed Program provides financial and technical assistance to implement emergency measures to relieve imminent hazards to life and property created by a natural disaster.	Chuck Roloff, Sweet Grass County Wanda Rowhorst, Sweet Grass County Phil Sandoval, Stillwater County	(406) 932-5160 ext 3 (406) 932-5160 ext 3 (406) 322-5359
Montana Department of Natural Resources and Conservation (DNRC)	Forestry Division	Service Foresters from the Montana DNRC's Forestry Division provide technical assistance to private forest landowners upon request. Service Foresters can conduct post-fire assessments for individual landowners and help them develop plans to mitigate impacts from a wildfire and to promote rehabilitation and recovery of their forests. Financial assistance through cost share may be available depending on funding	Fred Bicha, DNRC, Billings, MT	(406) 247-4403
Department of Emergency Services (DES)	Emergency assistance	Information on many state and federal emergency programs	Kerry O'Connel	(406) 932-3028

Montana State University Extension Service (MSU)	Educational Resources and technical assistance	The MSU Extension Service offers educational resources and technical assistance via county extension offices and university faculty in areas including range, forestry, horticulture, and financial planning.	Mark King, Sweet Grass County Extension Agent Travis Standley, Stillwater County Extension Agent	(406) 932-5146 (406) 932-5146
County Weed Districts	Technical Assistance	County Weed offices can provide technical assistance to help landowners develop revegetation, weed management, and monitoring plans, and in some cases, financial assistance to help implement plans. County Weed Districts may also provide assistance in preparing and sponsoring applications to the Montana Noxious Weed Trust Fund Grants Program administered by the Montana Department of Agriculture.	Stacey Barta, Sweet Grass County	(406) 932-5146



