Flathead National Forest
Tally Lake Ranger District

Sheppard Creek Post-Fire Project

Purpose of the Project and Proposed Action
December 14, 2007

Introduction

This document presents information about the Brush Creek Wildland Fire and a proposal to salvage merchantable wood products affected by the fire.

The Brush Creek fire burned a total of approximately 30,000 acres on the Flathead and Kootenai National Forests, Plum Creek Timber Company lands, and a small amount of other private property. A lightning storm on July 26, 2007 ignited the fire which steadily grew in size for several weeks, finally being declared contained on August 26. Approximately 24,700 acres of the fire burned on lands administered by the Tally Lake Ranger District, Flathead National Forest. The majority of these acres burned in the upper reaches of the Sheppard Creek drainage (approximately 18,000). Other drainages affected by the fire were Good Creek and Griffin Creek. A small portion of this fire reburned areas affected by the Little Wolf Wildland Fire of 1994. Please refer to Figure 1 for the location of the fire area.

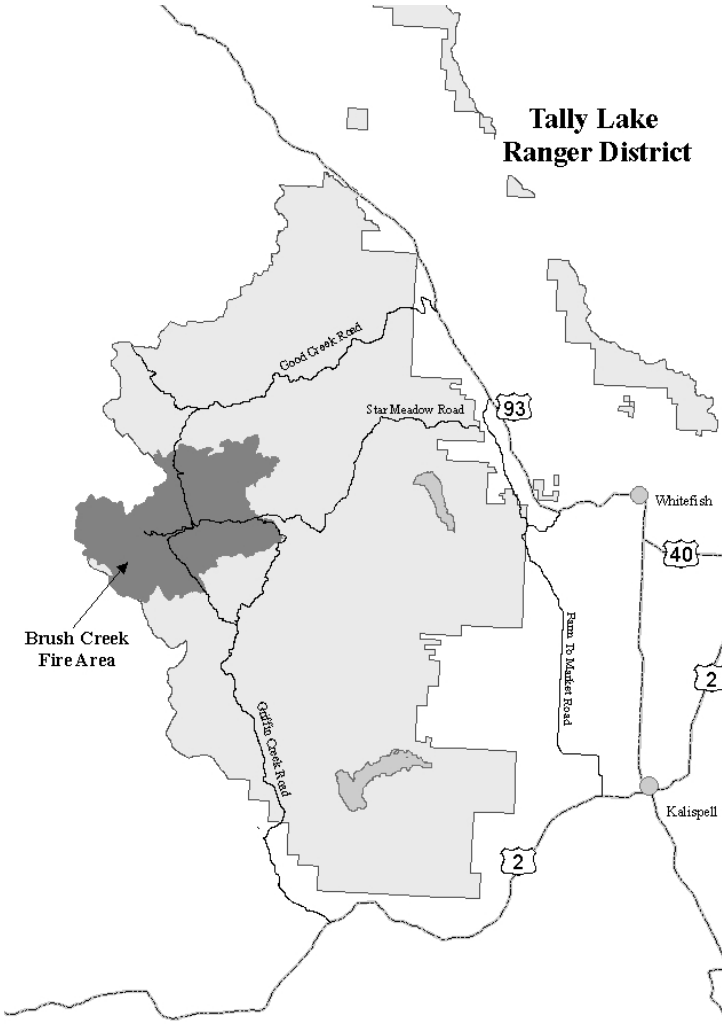

Figure 1. Vicinity of the Brush Creek Fire to Whitefish and Kalispell

The Flathead National Forest Plan allows the salvage of merchantable wood products after catastrophic disturbances such as wildland fire. The Forest Service is therefore proposing a project, called the Sheppard Creek Post-Fire Project, to recover the value of wood products from the fire area. The

Kootenai National Forest is also proposing a similar but separate project on the west side of the Brush Creek Divide. Their proposal is referred to as the Brush Creek Fire Salvage Project. Information regarding that proposal can be found at the Libby Ranger District, 12557 Highway 37 North, Libby, MT 59923, (406) 293-7773.

All proposed activities are located within the perimeter of the Brush Creek fire. The center of this area is approximately 20 air miles due west of Whitefish, Montana. The legal township locations for project activities include T30N, R25W; T30N, R26W; T31N, R25W; and T31N, R26W; Principal Montana Meridian, Lincoln and Flathead Counties, Montana.

Fire suppression and control activities employed a variety of methods, ranging from hand crew fireline construction to fire line construction using heavy equipment such as bulldozers and feller-bunchers. Approximately 60 miles of machine fire line were constructed on the Flathead National Forest side of the Brush Creek Divide. Some closed and impassable roads were reconstructed for firefighter access. Fire-killed trees along some roadways were felled for public safety.

Some post-fire rehabilitation activities have already been completed or are scheduled. All fire lines have been rehabilitated by installing drainage features and seeding. Trees felled for safety have been contracted for removal.

A Forest Service Burned Area Emergency Rehabilitation (BAER) team was assigned in August 2007 to determine emergency watershed rehabilitation needs created by the fire. Some of the needs identified in their analysis included insect control using pheromones, noxious weed control and monitoring, storm patrols, trail erosion control, warning sign installation, culvert cleaning, and upgrading culverts. These actions began in late 2007 and will continue in the summer of 2008.

A portion of the Brush Creek fire burned into an area in the Good Creek drainage that was under contract for timber harvest activities. This part of the fire in the timber contract sale area will not be considered for salvage activities under the Sheppard Creek Post-Fire Project proposed action. The remaining area on the Tally Lake Ranger District considered in the analysis of the proposed action includes 22,285 acres.

Summary of Fire Behavior and Preliminary Effects on the Landscape

The following is a summary of how the Brush Creek Fire behaved and some preliminary results of that behavior on selected forest resources.

Pre-Fire Vegetation Conditions

The Sheppard Creek drainage is characterized by the moist, lower subalpine; cool lodgepole pine; and moist Douglas-fir fire groups described by Fisher and Bradley in 1987. Early fire history records show that a large fire occurred here during 1889 burning the head end of Sheppard Creek around Tepee and Sheppard Mountains. It burned approximately 15,000 acres and left unburned patches scattered across the landscape.

In 1913 the area was part of the Blackfeet National Forest, USDA, Forest Service, District 1. A land classification and summary of forest values for the area's forest cover in 1913 is described as:

> "Lodgepole pine is the most common timber type and is the result of repeated fires covering the greater part of the area over the last 150 years. Larch is found over a large part of the area as scattered trees in the lodgepole stands. On some of the more moist sites and slopes where the fires were not severe, larch forms almost pure mature stands. Douglas-fir is commonly found in mixture with larch. Fir is common along the tops of ridges and higher slopes. Pockets of mature balsam [subalpine fir] have been noted in some of the higher basins and balsam is mixed with other reproduction as an understory in mature stands. Spruce is largely confined to the stream bottoms where it forms an unimportant type."

A detailed forest inventory for Flathead and Lake Counties was completed in 1941. Data for the Sheppard Creek area were collected in 1939 and published as a series of half quadrangle maps in 1941. At this time, about four percent of the Sheppard Creek drainage was described as seedlings or non-stocked stands, two percent were sapling sized stands, 21 percent were pole size stands, and 73 percent were stands larger than pole-sized.

A major infestation of the mountain pine beetle occurred in the Sheppard Creek drainage and across the northern Rocky Mountains in the 1980s. This infestation started building in 1983 and reached epidemic proportions in 1985 and 1986. Mortality in lodgepole pine was extensive during this period.

Timber has been managed for wood products in the Sheppard Creek drainage since the 1950s. Much of this management was in response to pine beetle activity in the 1980s. Harvest by decade in the area proposed for salvage logging is presented in the following table.

Decade	Acres of Timber Harvest	Percent of Total Area Harvested
1950s	198	1%
1960s	1622	7%
1970s	2908	13%
1980s	4894	22%
1990s	2420	11%
2000s	422	2%
total	12,464	56%

Approximately 56 percent of the project area has experienced some type of timber harvest activity. Over 90 percent of the past timber harvest activities have been even-aged regeneration treatments. These types of treatments require the reinitiation of the forest either by planting or natural regeneration. Intermediate harvests have also occurred for salvage and thinning objectives. In addition, personal-use firewood cutting is considered a salvage treatment, concentrated along existing road systems. This is estimated to be approximately one to three percent of the area, with the majority occurring since the 1980s.

Past wildland fire, timber management, insect epidemics, and personal-use firewood cutting have all changed the vegetation structure and composition on the landscape than displayed in the 1941 inventory. Prior to the Brush Creek fire, about 5 percent of the project area was described as seedlings or non-stocked stands, 50 percent were sapling sized stands, 5 percent were pole size stands, and 40 percent were stands larger than pole-sized. Although artificial regeneration in the form of tree planting has occurred, conifer species distribution is still very similar to that found in 1941.

Brush Creek Fire Behavior and Effects

The lightning strike that started the Brush Creek fire occurred in an area of heavy fuels. These heavy fuels primarily resulted from insect-caused mortality in lodgepole pine and subalpine fir stands over the past twenty to thirty years. Dry fuels resulting from sparse seasonal rainfall and prolonged drought created extreme fire behavior, allowing the fire to escape initial suppression efforts. Periodic wind events and low relative humidity over the next four weeks, as well as heavy fuel loading, contributed to the fire spreading to nearly 30,000 acres. Fire suppression activities and higher humidity levels later in the summer allowed the fire to be contained and eventually controlled.

Large fires in northwest Montana in the past usually exhibited behavior that resulted in a mosaic of low, moderate, and high vegetation burn severities. Low severity burns resulted from areas of little live and dead fuel levels, high fuel moisture content, and/or shading. Tree and other vegetation mortality is typically spotty with many of the largest, thick-barked trees surviving. Figure 2 shows the result of a low severity burn. High severity effects often resulted from areas with south- or west-facing slopes, high levels of dead fuel, and upland areas away from moist drainages. Nearly all trees succumb to high severity fire behavior. Figure 3 shows the resulting high fire severity after extreme fire behavior. Moderate severity burns resulted from areas exhibiting the middle range of low and high conditions. Each of these three severities was typically well represented after a large fire.

Recent fire behavior on the Flathead National Forest (2006 and 2007) appears to be affected by a prolonged regional drought over the past eight to ten years. Areas not previously harvested experienced high levels of tree mortality across the fire area. Dried duff and litter layers on and in the soil burned hotter, longer, and deeper than had been observed in the past, thus damaging tree roots close to the surface and the area of the tree bole at ground level. Many of these stands did not have a component of “ladder” fuels so crown fires were not initiated. These trees now appear to be green and alive, but the charred roots and lower bole have effectively killed the tree but with mortality delayed. Large areas now appear alive, but are anticipated to turn brown next spring.

As discussed above, about 56 percent of the project area has had some type of timber harvest activity in the past. Most of the timber harvest activities removed enough trees to require the reforestation of the site after the logging was complete. These reforested areas had some type of post-harvest fuel treatment prior to reforestation activities so the resulting forests contained little surface fuels. As the Brush Creek fire moved over the landscape and encountered these reforested areas, light fuel loading often allowed these stands to avoid damage from fire. The most common effect in these areas was charred seedlings and saplings around the perimeter with the interior sapling and pole-sized trees unaffected.

Figure 2. Low Severity Burn.

Figure 3. High Severity Burn.

Estimates of vegetation burn severity (low, moderate, and high) within the Brush Creek fire area differs by whether or not the area had been previously timber harvested. The following table describes the extent of the burn severities by the percentage of the areas affected.

Vegetation Burn Severity	Percent of Burn Severity for Areas with Past Timber Harvesting	Percent of Burn Severity for Areas without Past Timber Harvesting	Description of Mortality from Fire
Low or No Fire	65%	5%	<30% of the trees were killed
Moderate	10%	20%	30 to 80% of the trees were killed
High	25%	75%	>80% of the trees were killed

Purpose of this Project

The purpose of the Sheppard Creek Post-Fire Project is to salvage harvest burned trees and recover merchantable wood fiber while it is still economically feasible to do so. Timely recovery of wood fiber would support the economies of local and regional communities. Past experience with fire salvage in northwestern Montana indicates that "whitewood species" such as spruce, subalpine fir, and lodgepole pine substantially deteriorate within a year or so after a fire. Salvage operations would need to be completed within one to two years to ensure economic utilization of the white-wood species that burned in the Brush Creek fire.

Western larch and Douglas-fir resist checking (cracking or splitting along the grain) and rot for a longer period of time, perhaps up to two or three years. But because these more rot-resistant species do lose some value immediately and are intermingled with whitewood species within drainages in the proposed project area, it is most cost-efficient to also begin harvesting these species in the next year or two as well.

The Proposed Action

The primary actions proposed for the Sheppard Creek Post-Fire Project include timber salvage, fuels reduction and planting within these salvage units, and temporary road construction needed for salvage harvest activities.

Timber Salvage

Salvage harvest of trees affected by the fire is proposed on a total of approximately 6485 acres (approximately 30% of the project area) (*please see enclosed map*).

In developing the Proposed Action, the interdisciplinary team proposes to salvage only those acres that meet the following criteria:

- Within stands with enough timber volume to be merchantable considering the harvest method appropriate for the soil type, steepness of slope, and available transportation system.
- In burned areas with dead trees.
- Outside areas with vegetation that meet Forest Plan old growth habitat direction.
- Outside riparian areas.

The number of acres included in the Proposed Action are the maximum that the interdisciplinary team considers at this time to be appropriate candidates for salvage. Further field surveys in the summer of 2008 may provide information that could reduce the total number of acres proposed for salvage harvest, may change the logging system proposed for particular units, or may cause other unforeseen changes in total acres.

Mostly dead or dying trees would be harvested in all areas that burned. A small number of live trees may be cut to accommodate landings, skid trails, skyline corridors, or for safety reasons. Individual and variable sized patches of dead trees would be maintained to provide adequate present and future amounts of larger diameter standing and down trees across the landscape, or to provide for site protection.

Logging methods to remove merchantable trees would depend on slope and soil sensitivity, and would include cable, skyline, helicopter, and tractor-type equipment such as crawler tractors, skidders, feller/bunchers, and cut-to-length harvesters. Some units would require a combination of tractors and cable equipment. Impacts to the more severely burned soils would be minimized through the use of helicopters, winter logging, or skidding on slash mats (when there are adequate amounts of available fine woody debris). Up to 10 helicopter landing areas would be proposed and reclaimed after harvest activities. Approximately 50 percent of the area would be logged by tractor-type equipment, 33 percent by skyline, 11 percent by helicopters, 1 percent by cable, and 5 percent by a combination of tractor and cable equipment.

Fuels Reduction and Planting within Salvage Units

After salvage harvest, fuel reduction and site preparation activities are proposed for some units, depending on soil resource concerns. Planting native tree seedlings would occur within some salvage units (approximately 3200 acres) after harvest to return the site to forested conditions in a timely manner and promote desired species diversity in the future forest. Desired species to plant would be western larch, ponderosa pine, Douglas-fir, western white pine, and Engelmann spruce. Willow, alder, and other shrub species would be considered for planting in and near riparian areas.

Roads Needed for Salvage Harvest

No new permanent system roads would be constructed. Approximately 9.5 miles of new temporary roads would be constructed to access proposed salvage areas. The design and location of these new temporary roads was accomplished with a minimum of new stream crossings. In addition, approximately 16.7 miles of historic road templates would be temporarily used to provide access to salvage harvest units *(see enclosed map)*. These temporary roads would then be rehabilitated after logging activities are completed. Best Management Practices would be employed to minimize soil

erosion and protect water quality on those roads used during salvage activities and in harvest units. No road construction is proposed in Forest Plan MA 2C lands.

Compatibility of Salvage Harvest with Flathead Forest Plan Direction

The majority of acres proposed for salvage harvest are located in Forest Plan management areas (MAs) that are suitable for long-term timber management: MAs 7, 15, and 17. Also proposed for salvage are a total of approximately 996 acres that are in MAs considered unsuitable for long-term timber management, but where salvage is allowed under specified conditions. These MAs are:

- MA 2C - lands suited for dispersed, roaded natural appearing recreation. Motorized recreation access is allowed (725 acres).
- MA 12 - riparian areas consisting of aquatic, riparian, and a portion of terrestrial ecosystems along most perennial streams, lakes, ponds, marshlands, bogs and some important seasonal flow streams (271 acres).

The project area is not located in or near any congressionally designated areas such as wilderness areas, wilderness study areas, or national recreation areas. The project area is also not near any inventoried roadless areas or research natural areas.