



USDA Forest Service
Gallatin National Forest
Bozeman Ranger District

Bozeman Municipal Watershed Project

Scoping Document
September 2005



Bozeman Municipal Watershed Project Scoping Document

Gallatin National Forest Bozeman Ranger District

to reduce potential fire spread and intensity between National Forest System lands and adjacent private lands.

Introduction

Based on findings from studies conducted over the past three years and on-going collaborative discussions with the Bozeman Watershed Council, City of Bozeman, Gallatin County, and other concerned citizens, the Forest Service (Bozeman Ranger District, Gallatin National Forest) proposes to implement a fuel reduction project on National Forest System (NFS) lands in the Bozeman Creek and Hyalite Creek drainages (please see Figures I-1 and I-2).



The purpose and need for this project is to help maintain a high-quality, long term, and predictable domestic water supply for Bozeman area residents through cooperative efforts with the City of Bozeman in implementing sustainable land management practices. To accomplish this, the Forest Service proposes to:

- Begin reducing the potential severity and extent of future, wildland fires in the Bozeman and Hyalite Municipal Watersheds.
- Begin creating vegetation and fuel conditions that will reduce the risk of excess sediment and ash reaching the municipal water treatment plant in the event of a severe wildland fire.
- Create vegetation and fuel conditions that will provide for firefighter and public safety by beginning to modify potential fire behavior.
- Reduce vegetation and fuel conditions in the wildland/urban interface (WUI)

Bozeman Municipal Watershed Project

Background

In 2004 the Bozeman Watershed Council completed a study that provided baseline resource information and identified conditions which limit watershed integrity and function within the Bozeman Creek watershed (Bozeman Watershed Council, 2004). One of the main conclusions of this analysis was that the Bozeman Creek municipal watershed is “at risk of high severity fire and fuel reduction measures may be necessary to protect water quality from extensive sediment delivery”. The

Bozeman Watershed Council has recommended the Forest Service reduce the heavy fuel loading through vegetative fuel treatments, including prescribed fire, timber harvest and thinning.

The City of Bozeman contracted with Western Groundwater Services to complete a Source Water Protection Plan focusing on the water supply sources for Bozeman’s public water system. The report studied the potential impacts that could occur to these sources and identifies activities the city could use to protect these source waters. It concluded that wildfire is the highest potential threat to the Hyalite Creek and Bozeman Creek watersheds saying, “a significant wildfire in one drainage would likely enter the other resulting in a complete shutdown of the City of Bozeman water treatment plant during runoff events”.

Forest Service personnel conducted a fire risk assessment for the Bozeman Municipal Watershed (Bozeman Creek drainage and Hyalite Creek drainage) in 2003. The combined sized of these drainages is 42,000 acres with 3,900 acres of City of Bozeman land. Fire simulation models showed that a large fire started in either Bozeman Creek or Hyalite Creek could easily burn into the adjacent drainage, resulting in a situation where both major sources of city water supply are simultaneously impacted. Like other studies, a key finding of this assessment was that burned areas could become significant sources of sediment and ash delivery to streams. Major rainfall or runoff events following a wildfire could result in heavy sediment loads that would exceed the capacity of the city's water treatment plant. Under such conditions, which could last from days to weeks and persist for several years following a major fire event, the city would be incapable of meeting water demand, resulting in a local water supply crisis. Another conclusion of the Forest Service assessment was that a catastrophic wildfire within the municipal watershed would pose significant danger to both firefighters and the recreating public due to limited road access in these areas. Based on these findings, Forest Service managers and resource specialists presently consider both Hyalite and Bozeman Creek drainages to be high priority, full suppression areas in the event of a wildfire.

Detailed Project Purpose & Need

Begin to reduce the potential severity and extent of future wildland fires in the Bozeman and Hyalite Municipal Watersheds.

To achieve a meaningful reduction in fire severity and probability, the Forest Service proposes treating extensive areas of forested and non-forested land within

these two drainages by reducing forest density, increasing crown base height and reducing existing high levels of down woody debris. The proposed treatments will be spaced over a five to eight-year period and concentrated within the lower reaches of both drainages, rather than scattered throughout. In order to maintain a reduced level of fire severity and probability, future treatments will likely be necessary as the forest grows and changes

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Current Situation: Currently the level of vegetation management occurring within these two drainages is very limited. The last activity of note occurred almost a decade ago called the Bozeman Creek visual rehabilitation project that partially harvested around 720 acres in order to improve the visual integrity that had been created with a 1981 timber harvest where clearcuts were used. Presently, the forested vegetation is dominated by mature and older forest (70%) with a smaller percentage (30%) consisting of pole size and the smaller seedling and sapling forest type. Where the older trees dominate, insect outbreaks and or serious fire risk exist. Presently, an outbreak of western spruce budworm is occurring throughout both drainages where the mature and older Douglas-fir forests dominant. The many harvests that have occurred in these areas over the last 40 to 50 years are the only reason younger, faster growing and healthier stands of forest exist today. These stands are fairly resistant to insect and disease attack and are providing areas where fire severity levels would be lower were a fire to occur.

Begin to create vegetation and fuel conditions that will reduce the risk of excess sediment and ash reaching the municipal water treatment plant in the event of a severe wildland fire.

Current Situation: Bozeman and Hyalite Creeks are the major sources of water supply for the City of Bozeman. The City has water intake diversions on both streams near the Forest boundary with pipelines to the City Water Treatment Plant near the Bozeman Creek trailhead. Approximately 95% of the City's water supply originates from these drainages, with an additional minor source in Lyman Creek in the Bridger Mountains.

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The City of Bozeman Water treatment plant uses a direct filtration process, including flocculation followed immediately by filtration and chlorination. Although the water treatment plant is designed to remove suspended sediment and particulates, rapid shifts in sediment and turbidity and high levels of particulates

Both the Bozeman and Hyalite Creek road systems are potential evacuation corridors for the recreating public. At the same time, these roads are the access route for incoming firefighters and equipment. This is essentially a one-way in, one-way out situation in both drainages.

creates treatment difficulty and under severe circumstances would not allow treatment. The City has contracted with Allied Engineering for a facility plan (contract due 12/05) which will recommend renovations to the treatment system (such as conventional filtration) and possibly additional raw or treated water storage. The upgraded treatment plant would cost several million dollars and would not be completed for 6-15 years.

Wildfire related ash deposits and sediment in Bozeman and Hyalite Creeks, due to increased erosion in wildfire areas, is a major potential source of contamination to Bozeman's water supply. A large wildfire in Hyalite and Bozeman watersheds could result in short to long term loss of water supply from a few days to several weeks. The most at risk situation would be heavy rainfall within 2 years of a major wildfire. In the event of temporary closure of the treatment plant, water could be rationed from the storage tank on the east side of Bozeman with about a 3 day drinking supply if conservatively used. In a prolonged shutdown Bozeman residents may need to use bottled water until the treatment plant resumes operation.

Create vegetation and fuel conditions that will provide for firefighter and public safety by beginning to modify potential fire behavior.

Current Situation: Both the Bozeman and Hyalite Creek road systems are potential evacuation corridors for the recreating public should a large fire event occur. At the same time, these roads are the access route for incoming firefighters and equipment to fight the fire. This is essentially a one-way in, one-way out situation in both drainages. The corridors are narrow and winding with few places to pull off the road or turn vehicles around. Up to 2,000 vehicles per day may be entering Hyalite Canyon on a busy summer weekend day. This is a safety concern because of potential traffic jams during a fire event. The situation is compounded when smoke impairs visibility and breathing; heat, flames and burnt trees falling can block passage along

the corridors and potentially injure firefighters and the public.

Much of the vegetation along both sides of the Bozeman and Hyalite roads are in Condition Class 2 and Condition Class 3, which are a high fire hazard. The condition of the vegetation is such that tree density is greater and dead and down fuel loadings are higher because natural fire frequencies have been missed. This means there is great potential for fires to burn hotter and spread faster than historic conditions would allow. Safety concerns outlined above in regards to the evacuation corridors could begin to be mitigated with fuel reduction treatments.

Reduce vegetation and fuel conditions in the wildland/urban interface (WUI) to reduce potential fire spread and intensity between National Forest System lands and adjacent private lands.

Wildland Urban Interface is defined as: The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative

fuels. The Healthy Forest Restoration Act further defines WUI in terms of at-risk communities. Under HFRA Section 101(1),

an at risk community is one that:

- Is a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) in or adjacent to Federal land;
- Has conditions conducive to a large-scale wildland fire; and
- Faces a significant threat to human life or property as result of wildland fire.

The common goal would be to reduce fuels in the WUI, thereby reducing conditions for initiation and spread of crown fire, which will lessen the fire behavior potential of a fire spreading from or to national forest system (NFS) lands.

Current Situation: The current fuel situation in the WUI, the terrain, prevailing winds and long term drought are conditions that pose a concern for a potential wildfire to spread either from the Forest to private lands or from private lands onto the Forest. The WUI for this analysis area is along the northern boundary where private land meets National Forest Land in both Hyalite Creek and Bozeman Creek; and along the northwest boundary adjacent to the ridge between Hyalite Creek and Cottonwood Creek. The common goal would be to reduce fuels in the WUI, thereby reducing conditions for initiation and spread of crown fire, which will lessen the fire behavior and potential of a fire spreading from or to national forest system (NFS) lands.

The purpose and need for this project would be achieved by:

- Maintaining low fire severity conditions through prescribed burning;
- Reducing the potential for severe fire by removing excessive canopy and surface fuels off the landscape through harvest and fuel treatments;
- Reducing the fire behavior potential along access routes;
- Maintaining the Hyalite road as an evacuation corridor;
- Maintaining the effectiveness of the riparian filtration zone by removing or cutting conifers to invigorate shrub communities;
- Treating invasive weed species to maintain native plant communities and allow the riparian area to function as efficiently as possible;
- Treating up to 6,000 total acres, including a small portion of the Gallatin Divide Inventoried Roadless

Area, in the Bozeman Creek watershed which would encompass:

- up to 4,900 acres of prescribed burning or thinning combined with fuel treatments;
- up to 1100 acres of timber harvest including thinning, partial cutting, and regeneration.
- Treating up to 3,000 acres in the Hyalite Creek watershed which would encompass:
 - up to 1,100 acres of thinning and piling;
 - up to 1,000 acres of prescribed burning; and
 - up to 900 acres of thinning and prescribed burning combined or commercial thinning.

Proposed Action

Project Area

The Bozeman Municipal Watershed analysis area is a landscape dominated by steep canyons and timbered slopes in the lower reaches of Bozeman and Hyalite Creeks. Vegetative types are predominantly Douglas-fir and lodgepole pine forest, riparian communities, and minor amounts of aspen, grassland, and sagebrush.

These two drainages are very popular and receive heavy use for outdoor recreation activities such as pleasure driving, hiking, biking, camping, picnicking, fishing, and hunting to name a few.

The area along the northern boundary of the project area where private land abuts National Forest land constitutes the wildland urban interface (WUI). There are several homes and sub-divisions in this WUI area. Many of the homes are within one half mile of the forest boundary.

Portions of lower Bozeman Creek watershed and the Hyalite drainage have a high probability of stand replacement fire. Sensitive soils found in portions of the area and steep erosive slopes increase the risk of excessive sediment deposition to the creek following a severe wildfire. Also, large areas of grassland and transition forest land are being encroached by conifers which are increasing the fire severity potential.

Treatments Proposed

The Forest Service is looking for ways to do innovative treatments to address this project's purpose and need. Potential fuel treatments being considered include prescribed burning, thinning, brush cutting, and commercial harvest of trees.

The Forest Service is looking for ways to do innovative treatments to address this project's purpose and need. Potential fuel treatments being considered include prescribed burning, pre-commercial thinning, slashing, brush cutting, and commercial harvest of trees.

Proposed prescribed burning efforts would be spring and fall burns of low to moderate intensity. Thinning and commercial harvest activities could occur most any time of year that there's access, generally April thru November.

Proposed Treatment Areas

For analysis purposes, the project Interdisciplinary Team (ID Team) identified two primary treatment areas within the Bozeman and Hyalite Watersheds (please see Figure I-2). These focal areas generally involve the lower portion of both drainages, near the intake and water treatment plant facilities. The Interdisciplinary Team will further define specific treatment sites within the broader study area presented in this document after reviewing public comments,

continuing coordination efforts with other groups and organizations, and conducting in-depth resource analyses.

The Bozeman Municipal Watershed Project would be responsive to the National Fire Plan and the Healthy Forest Initiative (HFI). This project will be considered for use with the Healthy Forest Restoration Act (HFRA) authority.

For more information about the National Fire Plan, HFRA and HFI visit <http://www.fs.fed.us/>.

Preliminary List of Environmental Issues

Wildlife - Agency actions taken to reduce fuel loading can cause disturbance and alter habitat conditions, which could impact some wildlife. Animals that may be affected by such actions include species federally protected under the Endangered Species Act and Forest Service Sensitive Species, as well as a broad spectrum of other creatures inhabiting wild lands within the Gallatin National Forest. On the other hand, catastrophic wildfire can convert huge expanses of habitat to a condition that is unsuitable for occupation by many wildlife species for several generations.

Soils - Soils in the Bozeman Creek drainage are generally moderately-fine textured. They have moderate fertility and water-holding capacity. Soil erosion and compaction potential is moderate to high. There is potential for landslides in some areas. Wildfire is a disturbance that can affect soil productivity through erosion, but is unlikely to produce large impacts in this drainage. Issues of protecting soil productivity under timber harvest may be mitigated by use of standard Best Management Practices for ground-disturbing activities.

Fisheries - Fuel reduction, including timber harvest, construction of roads and log landings, disturbed soils could increase the potential for erosion and sediment transport and deposition in streams. Increased fine sediment in streams has been shown to reduce habitat quality and cause adverse effects to fish populations. Harvest activities may also reduce riparian integrity and bank stability. Fuel reduction treatments could reduce the amount of large woody debris (LWD) recruited to stream channels. In riparian areas that are treated, this project could improve the health of the fishery.

Gallatin Divide Inventoried Roadless Area - Inventoried roadless areas will be managed to preserve their roadless characteristics. The Forest is considering treatment options within the Gallatin Divide Inventoried Roadless Area to address this project's purpose and need. These treatments would be guided by Forest Service national policy.

Recreation - Proposed treatment options may have the potential to impact the general public who recreate in these heavily used drainages. Area access may be restricted during periods of management activities.

Water Quality - Water Quality in the Bozeman and Hyalite Creeks is at risk to sediment and ash from precipitation events following wildfire which could cause major problems with the City of Bozeman water treatment plant and reduce the supply of treated water for municipal needs. Fuel reduction treatments also have potential to increase sediment and are constrained by strict water quality standards.

Sensitive Plant Species - Vegetative treatment such as timber harvest, brush removal and prescribed burning can damage or eliminate individuals or even entire populations of sensitive plant species inhabiting treatment areas. Alternatively, many of the sensitive plant species occurring

on the Gallatin National Forest do not respond positively to fire, and would therefore be adversely affected by a catastrophic wildfire event.

Invasive Plants – Fuel reduction efforts could introduce or further spread invasive plant infestations in both drainages. Reducing the spread of and treating current infestations of invasive plants would be a priority of this project.

Scenery/Visual Quality - A large part of the project area is within the foreground to background view-shed of Bozeman and the Gallatin Valley, as well near a few popular recreational trails. Fuel reduction could change the character of the scenery and the means for accomplishing that fuel reduction could also reduce the quality of the scenery. However, a large scale crown fire could dramatically alter the scenery in ways that might be perceived as negative.

Air Quality (Smoke) - Prescribed burning associated with the Bozeman Municipal Watershed project may temporarily increase particulate levels in the wildfire urban interface residential areas at the mouth of Hyalite Creek and Bozeman Creek. Smoke plumes may also increase particulate levels in Bozeman.

Smoke from the Bozeman Municipal Watershed project may temporarily obscure visibility along the Hyalite Creek road and Bozeman Creek trail and temporarily obscure views to scenery.

Next Steps & Project Timeline

Public comments and resource analysis will help determine what level of National

Environmental Policy Act (NEPA) analysis will be necessary. The Forest Service will conduct a broadscale and a cumulative effects analysis. The Forest Service will also continue public involvement efforts and will document the issues that surface as a result of those efforts.

Depending upon the level of NEPA determined necessary, the Forest could potentially implement treatment activities in 2006. The Forest Service estimates that it would take five years after initial treatment activities begin to accomplish

the purpose and need.

If you would like to be added to this project's mailing list please write to, or you may submit comments to:

Gallatin National Forest
Bozeman Watershed Project
P.O. Box 130
Bozeman, MT 59771
Attn: Jim Devitt

Electronic comments can be sent to: comments-northern-gallatin@fs.fed.us. Please include Bozeman Watershed Project in the subject line. To be most helpful, comments should be received by November 11, 2005.

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Working together, the City of Bozeman and the Forest Service, with your help, can begin to address the issues in our municipal watershed.