Restoration Study Sites

The map shows 27 locations in Montana used as case studies that have undergone or are undergoing various types of environmental and natural resource restoration. Complete restoration, or the return of damaged resources to pre-existing conditions, is seldom accomplished. However, cleanup, reclamation, and mitigation are steps toward restoration and at all of these sites, significant measures toward these objectives were done.

These sites were selected as case studies to reflect the range of restoration work being done in Montana. They are listed individually at the right and numbered according to where they are located on the map. The sites generally fit within five categories of restoration: Forest, Riparian, Industrial, Oil and Gas, and Mining. They are where active restoration work was underway during this study, allowing the actual work to be viewed and photographed.
Project Description
The Sula Ranger District of the Bitterroot National Forest received $2,327,686 in American Reinvestment and Recovery Act [ARRA] funds in 2008. These funds were applied to a project along the Middle East Fork of the Bitterroot River [MEF]. This “Hazardous Fuels Reduction Project,” was a reaction to the fires that affected this area in 2000.

This project consisted of analyzing 25,800 acres of the Bitterroot National Forest for wildfire risk and associated potential dangers to local residents. Treatment options aimed at reducing risks of wildland fires and consequent dangers to local residents and structures were then developed.

The objectives of the activities undertaken throughout this MEF Stewardship project were aligned with the US Congress’s 2001 National Fire Plan, the Healthy Forests Restoration Act of 2002, the Bitterroot Community Wildfire Protection Plan of 2003, and the Bitterroot National Forest Land and Resource Management Plan. Specific project objectives were to reduce wildland fire threats to the MEF community, to restore fire-adapted ecosystems in the MEF landscape, and to re-establish tree stands affected by the Douglas-fir bark beetle epidemic.

This project consisted of two different approaches. The first was to treat stands impacted by the bark beetle via removing affected trees; the second approach consisted of increasing species diversification of remaining forest stands. The diversification process occurred through the thinning of dense Douglas-fir stands, permitting the Ponderosa Pine to re-establish itself in the area. As a crown fuel species, Ponderosa Pine is far less dangerous than the more densely occurring Douglas-fir. A decrease in stand density limits dangers that may accompany wildfires.

Additional project work comprised cleaning understory brush and conducting road maintenance on 9 miles of United States Forest Service [USFS] roads.

Overall, this project treated 1,293 acres of the Bitterroot National Forest, removing 16,300,000 board feet
of timber material. This removal yielded 10,176 cunits [1 cunit = 100 ft³] of timber.

A “Stewardship” contract was awarded by the USFS in 2009 to R&R Conner Aviation Logging [Conner]. R&R Conner is Montana’s lone helicopter logging company. Two types of Stewardship contracts exist within the USFS. The first is an “Integrated Resource Timber Contract,” which is similar to a regular timber sale, in that the value of timber removed is exchanged for services provided; the second is an “Integrated Resource Services Contract,” which augments with cash the difference between timber value removed and services provided. This project consisted of both contract types.

The final amount received by R&R Conner from the forest service was $2,285,050; however, the total amount recognized by the USFS as being received by R&R Conner, including timber value, was $2,327,686.

Owing to the lack of road creation and maintenance necessary for helicopter logging, its negative impact upon the surrounding tree stands is far inferior to both conventional and mechanical logging operations. R&R Conner also developed a specialty niche for the removed beetle-killed timber, manufacturing large center beams that appear kiln dried.

History
Starting in the early 1900s, human settlement in the MEF began altering local vegetation composition and ecosystem structures. This shift was due in part to fire suppression activities that did not permit the region to biologically diversify in its natural cycles. This lack of biodiversity permitted the Douglas-fir to repress the growth of other arboreal species. Douglas-fir tree stands occur at a density that forces out other species that serve to moderate the effects of fire intensity. If not properly managed, these Douglas-fir stands can lead to intense wildfires that are more difficult to contain and suppress.
Current Project
This project has been completed and no further activity is required.

Cost and Source of Funds
In 2009, the Bitterroot National Forest was awarded $1,800,000 in ARRA funds for this project. This amount was eventually augmented to $2,285,050 utilizing remaining USFS Region 1 ARRA funds that were not expended on other USFS Region 1 ARRA-funded projects.

R&R Conner was unwilling to provide any detailed information on labor costs. What was determined though is that White River Sawing, Inc., was responsible for all timber cutting, which involved 6-8 sawyers. Independent truckers were hired to haul timber that was removed. Limbing was subcontracted out and reseeding at the site was done by an unknown contractor.

Project Design
Project design was provided by USFS employees. Responsibilities included authoring a National Environmental Policy Act (NEPA) document and an Environmental Impact Statement (EIS). This USFS pre-project labor totaled $245,137. USFS project design, layout, and timber cruising reflects $257,042 in associated labor, and USFS contract administration labor totaled $172,379. This funding arrived from general USFS Region 1 Annual Operating funds.

Pat Connell was hired as a private forestry consultant by R&R Conner. He was responsible for evaluating specific operating units and developing the most appropriate fuels reduction approach for each unit. He received roughly $25,000 for his services.

Project Labor
The principle contractor on this project was R&R Conner. For their services they received a total of $2,327,686, with $42,636 arriving in timber sale funds, and $2,285,050 paid by the USFS.

Services provided by R&R Conner consisted of light slashing [489 acres for $69,769], moderate slashing [143 acres for $30,030], road maintenance [9 miles for $2,411], leave tree protection

Chronology
USFS project work began in 2003 with Forest Service employees writing the requisite environmental review documents; however, the results of these reports were the subject of 5 years of litigation activity before any further, on-the-ground work could commence. Subsequent USFS activities consisted of project layout and design, which occurred in the following years. In 2009, R&R Conner contracted an independent forester, Pat Connell, to develop specific treatment activities for each operable unit.

Timber removal activities entailed felling timber and then utilizing a 180’ long cable to remove the timber via helicopter [Figure 1-5]. The helicopter used by R&R Conner has a maximum load capacity of 3,000 lbs. These timbers were then removed to pre-designated landing areas, where they were limbed and loaded onto waiting haul trucks for transport to the R&R Conner millsite [Figure 1-6]. Once weather permitted, the remaining slash piles [Figure 1-9] were burned.

Figure 1-5 – This photo depicts the helicopter transporting felled timber to a landing site. Helicopter logging, while moderately more expensive than traditional or mechanical logging operations, has a decreased residual impact on the surrounding environment. Helicopter logging also permits limbs to be moved with the main timbers, so as not to leave slash piles throughout a treated area. These slash piles are instead consolidated at individual landing areas. [Photo: Property of Pat Connell]
Project Oversight

Project oversight was provided for R&R Conner by Pat Connell, and, for the USFS, by Ruth Wooding, Bitterroot National Forest District Ranger.

Figure 1–6 – Hauling operations were subcontracted by R&R Conner to several independent loggers, thereby providing employment for a greater number of individuals in the Bitterroot Valley. [Photo: Property of Pat Connell]

Figure 1–7 – The lumber yard at R&R Conner consists of dozens of acres of timber waiting to be processed. Timbers harvested on the Middle East Fork project, which had succumbed to the bark beetle, were milled for use as center beams. Their appearance is that of having been kiln dried. R&R Conner developed this unique process specifically for beetle-killed timbers harvested on this project. [Photo: H. Janssen, August 2010]

Figure 1–8 – Forest Service employees were responsible for all unit layout and timber marking. This photo depicts the boundary of one operable unit. [Photo: H. Janssen, August 2010]

Figure 1–9 – As of August 2010, the sole remaining aspect of the Middle East Fork Stewardship fuels reduction project was for the slash piles at the landing sites to be removed or burned. This has since been completed and this project requires no further action. [Photo: H. Janssen, August 2010]
Project Description
The remediation project undertaken by the Rocky Mountain Elk Foundation [RMEF] was to treat 156 acres of terraced hillside in the Sula Ranger District of the Bitterroot National Forest [BNF] along the Swift Creek drainage.

The project involves tree thinning, subsoil decompaction, and tree mastication along terraced lands; additional, minor road work was included in the overall project description, owing to the accessibility of the site and the equipment necessary to conduct the project.

This project is an exploratory project consisting of the treatment of 156 of 13,000 total terraced acres in the BNF. As an exploratory project, the main purpose is to assess the efficiency of soil decompaction on terraced hillsides and to prevent the spread of the Mountain Pine Beetle infestation. Additionally, this project will serve to increase the viability of elk habitat in an area that houses an elk herd of approximately 200 animals.

History
This site exists within the boundaries of the BNF, which was officially created in 1898. Its name was officially changed from the Bitterroot Forest Reserve to the Bitterroot National Forest in 1908.

The Swift Gulch property, where this project is being undertaken, has served as an active grazing allotment since the Forest’s inception, and is known as the Wetzsteon’s allotment.

The Swift Gulch site underwent a terracing project at the behest of the [USFS] in 1967. At this time, the site was bulldozed and manmade terraces were created to facilitate tree

Figure 2-1 – The above photo depicts an Exaliner utilized on this project. Its reach of 800’ enables timber to be harvested from distances well off the road without requiring the construction of additional roads. [Photo: H. Janssen, October 2010]

Figure 2-2 – This photo depicts timber that has been harvested to prevent the spread of the Mountain Pine Beetle. Utilizing the Exaliner, this material was able to be extracted without heavy machinery compacting the soil. [Photo: H. Janssen, October 2010]
production [Figure 2-5]. This method was undertaken with the belief that the removal of extraneous vegetation would promote the growth of canopy-providing trees. USFS engineers also believed that terraces would catch and hold greater concentrations of snow.

Ninety-seven percent of trees planted along the terraces survived to maturity. Unfortunately, the terracing process served to compact the soil to the extent that vegetation other than noxious weeds was unable to develop. The increased survival rate of trees planted along the terraced hillsides led to an overcrowding of mature tree stands; however, logging in these areas would have only served to further compact the soil, whereby USFS soil-damage standards would have been exceeded.

In 1974, tree stands existing between the plantations were salvaged, with tree planting occurring on three separate occasions between 1966 and 1974.

RMEF became interested in the area in 2008, shortly after the ARRA regulations became public. RMEF envisioned this site as a locale in which elk habitat could be improved while a concurrent experimental research objective could have a practical trial area.

**Chronology**

USFS surveying and planning occurred prior to the specific Swift Gulch Stewardship Project as a portion of a larger BNF project. Site specific vegetation and soils surveying occurred in late 2008 by USFS scientists. Additional pre-project work was conducted by the USFS Darby station. This included timber cruising, project boundary delineation, and map creation.

In June 2010, Enhanced Forest Management [EFM] [Corvallis] began on-site remediation activities. The work undertaken by the lead contractor required the development of a unique piece of machinery that would effectively decompact subsurface material through the use of a subsoiler [Figure 2-4]. Effects of this machine can be perceived in Figure 2-6.

**Current Project**

With work 85% complete at the site, the frozen ground arrested the efficacy of the subsoiler for the season, forcing remediation activities at the site to halt until the spring 2011 thaw.
Cost and Source of Funding
The total project cost, including all cash and non-cash sources was $348,985.

A $137,974 ARRA grant from the USFS to RMEF was the largest contributor to the Swift Gulch Stewardship Project. An additional $5,000 arrived from a Department of Natural Resources and Conservation [DNRC] Resource Advisory Council grant [RAC]. Two separate grants from the USFS National Forest Vegetation and Watershed [NFVW] in both 2009 and 2010 added an additional $129,323. These funds are all designated as “cash” sources as the funding arrived from sources that were directly designated for work on this project.

“Non-cash” funds applied to this project are considered monies that were expended upon the Swift Creek Stewardship project, but had not been specifically designated to the project. These funds equal $76,688. This reflects RMEF’s time and expenses, which totaled $25,800, an additional $7,200 contribution from RMEF, complemented by $1,000 from miscellaneous RMEF sources, $300 in forest product value, and a final project expenditure arriving from USFS costs totaling $42,388.

Pre-Project Planning & Testing
Project planning, soil and vegetation sampling, and surveying was conducted by USFS scientists totaling $42,388—salary expenses [$37,928], travel [3,800], and supplies [660]. USFS salary expenses reflect work at the Swift Gulch Stewardship Project site for nine USFS employees’ intermittent work over the course of 2 years’ time. This figure includes surveying that was conducted by three USFS GS5 employees [$13.83-17.98/hour] for a total of approximately 84 hours.

Project Labor
Project labor was supplied by EFM beginning June 14, 2010. EFM received $221,888 for their services by January 2011, this figure includes $18,149 in timber value sale.

EFM employed three full-time individuals, with some part-time office work being attributed to the overall projects’ completion. EFM’s mean wage is $17/hour, and they totaled 1,664 total hours of labor on this project as of January 2011.

EFM subcontracted work to two firms for on-the-ground labor. These firms received $34,250 for their services. Additional subcontractor work was provided in the form of timber trucking [$27/ton], freight trucking [$350], and lowboy services [$3,347.50]. This was provided by three separate firms and totaled $19,504. Additional subcontractor labor was supplied for on-the-ground work by two separate, local firms. This subcontractor labor totaled $34,250 for the treatment of 60 acres.

Project Oversight
Project oversight was conducted by Dale Kerkvleit, RMEF Director of Habitat Stewardship Services, who logged 456 hours on project oversight as of November 2010. Lee McAlpine, USFS silviculturist, and Cole Mayn, USFS soil scientist, also served as project supervisors on the Swift Gulch Stewardship Project.

Figure 2-5 – USFS silviculturist Lee McAlpine holds a historical photo depicting the terracing technique utilized by the USFS at the Swift Gulch Creek site in 1967. The present site appears in the background. [Photo: Property of the Missoulian]
Figure 2-6 – The effects of the subsoiling machine are such that subsurface material as deep as 24” is decompacted, permitting vital nutrients to enter regions that have been inaccessible since the 1967 terracing project. [Photo: H. Janssen, October 2010]

Figure 2-7 – USFS silviculturist Lee McAlpine, explains the changes that have occurred at the Swift Gulch Creek site. [Photo: Property of the Missoulian]

Figure 2-8 – Enhanced Forest Management was the lead contractor on the project, and was responsible for timber thinning and decompacting the subsurface soils. [Photo: Property of the Missoulian]

Figure 2-9 – Trees had been planted along the terraces in a uniform manner by USFS contractors to maximize growth efficiency. [Photo: Property of the Missoulian]
Project Description
The Montana Department of Natural Resources and Conservation [DNRC] received $3,615,430 in American [ARRA] stimulus grants for use in fuel reductions projects throughout Montana. These funds were divided among 15 separate projects.

F.H. Stoltze Land and Lumber Company [Columbia Falls] received $489,335 in stimulus funds for fuels reduction work on 710 acres at 6 operable units. The company currently owns 38,000 acres of land and employs 120 individuals.

Project work was conducted on 63 acres of State School Trust lands, managed by the DNRC, while the remaining 647 of the project’s acres were on non-industrial private lands.

Fuels reduction work was divided amongst three separate contractors: Makin’ the Grade [MTG] [Kalispell], Quiram Logging [QL] [Whitefish], and F.H. Stoltze [FHS] [Columbia Falls].

Site work required the removal of diseased, weak, or dying timber, the reseeding of impacted areas, burning of remaining slash piles, and extraction and sale of salvageable timber.

The majority of the timber removed consisted of Douglas fir [Pseudotsuga menziesii] Grand fir [Abies grandis], and Ponderosa pine [Pinus ponderosa], some which has suffered from the presence of the mountain pine beetle [Dendroctonus ponderosae].

The expressed purposes of this project were to increase crown spacing, to decrease the possibility of intense fire occurrence by separating ground fuels from crown fuels, to reduce tree density, and to remove dead, diseased, and dying timber that poses risk as a fire accelerator.

The results of this fuels reduction project will provide ameliorated wildlife habitat, decrease the possibility of intense fire occurrence through reduced crown spacing, and provide for a healthier forest ecosystem through more viable tree spacing. The primary heavy equipment involved in various aspects of this project con-
sisted of: feller-bunchers, skidders, chainsaws, tractors, forwarders, lowboys, log processors, and excavators.

Additional subcontractors were hired by MTG, QL, and FHS. These subcontractors utilized timber hauling trucks, dump trucks, and self-loaders for hauling timber to various markets.

**Chronology**
The DNRC awarded the work contract to F.H. Stoltze in September 2009. Pre-project design work began shortly thereafter. The forested state trust land parcel was selected by the DNRC Service Foresters who determined merit base upon public need and overall benefit.

Private parcels that received fuel reduction treatments were selected through a referral process, whereby F.H. Stoltze was approached by private landowners who desired fuels reduction activities on their property. This is how all of the private parcels were selected for treatment under this contract.

MTG contracted for fuel reduction treatment of 300 acres around Lake Blaine in Flathead County. MTG was 93% complete at the time of this report.

QL undertook fuels reduction activities at three parcels: Spring Brook Ranch [159 acres], Courtney/Osborne [84 acres], and Shorts Meadow [63 acres] for 306 total acres. As of December 2010, their work was 95% complete with the grinding of hog fuel the sole activity remaining; however, owing to the severely diminished value of this product, its processing is not economically viable.

FHS treated 70 acres at Haywire Gulch in Flathead County. This treatment process is complete.

**Current Project**
The aspects remaining for project completion of the Flathead County Fuels Reduction project are the grinding of hog fuel at several QL sites, while the Lake Blaine subunit still requires the treatment of 20 acres, as well as some re-seeding, and the burning of brush piles. Due to the geographic area comprising this unit, work was seasonally stalled. Work resumed at the site in early 2011 when weather permitted.
Figure 3-5 – Makin’ the Grade employees conduct much of their harvesting and limbing manually, mainly utilizing heavy machinery solely for timber transport. [Photo: H. Janssen, October 2010]

Cost and Source of Funds
The [ARRA] provided $489,335 for fuels reduction activity in Flathead County. These funds were divided among the three contractors [MTG, QL, and FHS].

Project Design
Project design was conducted by foresters for each contractor. As reference, the FHS 70 acre project entailed 72 hours of pre-project design. This consisted of mapping the region and project layout.

Project Labor
MTG labor totaled 11,625 hours and consisted of administration/office [142 hrs.], general laborer [781 hrs.], chainsaw operators [4,648 hrs.], heavy equipment operators [5,831 hrs.], and supervisory labor [181]. An additional 42 hours were allocated for training and safety applicable to this project. QL registered 2,055 total labor hours on the treatment of 310 acres, utilizing five company employees. QL labor was comprised of administrative/office labor, heavy equipment operators, and trucking services. QL’s mean hourly wage is $18.50 and their employees receive full medical insurance, one week paid vacation, and a SEP-IRA option. QL subcontracted 1,330 hours to a local logging firm, which hauled timber to the mill for processing and averaged a haul rate of $7/ton.

MTG was responsible for the treatment of 330 acres. MTG employs six full-time and one part-time employees. Their labor services are comprised of a project manager/supervisor, heavy equipment operators, sawyers, general laborers, and office/administrative staff. MTG mean wage is $17.50. Economic circumstances forced MTG to discontinue any benefits to its employees in 2009.
FHS labor on the project consisted of treating 70 acres. There were 1,328 total labor hours applied to this portion of the project. FHS labor consisted of Administration/Office, surveying, heavy equipment operation, and thinning crews. The mean wage for this work was $33.15/hour. FHS employees receive full medical and dental insurance, a 401k option, paid vacation, and life insurance as part of their compensation.

**Project Oversight**

Project oversight was provided by Dave Jones and Rick Moore, DNRC Service Foresters, as well as FHS Land and Resources Manager, Paul McKenzie.

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**Figure 3-6** – Tractors, such as these, enabled Makin’ the Grade to work at several sites simultaneously. The timber could then be collected in a central location for limbing and stacking. [Photo: H. Janssen, October 2010]

**Figure 3-7** – Larger tractors enable larger loads to be transported to the landing for processing; however, larger tractors also require more extensive re-seeding at a project’s conclusion. Owing to the site of Makin’ the Grade’s work, the company opted for smaller equipment. [Photo: H. Janssen, October 2010]

**Figure 3-8** – Adjacent to the landing site is a slash burning area. Limbs and timber that do not meet mill size requirements for processing are burned. [Photo: H. Janssen, October 2010]

**Figure 3-9** – Manual fuels reduction requires far more labor hours than mechanized action. And while manual fuels reduction is preferred on specific types of operable units, owing to its decreased impact on the environment, the need for more direct labor suggests an increase in project time. [Photo: H. Janssen, October 2010]
4 - McGregor Lake/Woods Bay Fuels Reduction Projects
Triple B Logging and Construction

**Project Description**
The Montana Department of Natural Resources and Conservation [DNRC] received $3,615,430 in an American Recovery and Reinvestment Act [ARRA] stimulus grant for use in fuels reduction projects throughout Montana. These funds were divided among 15 separate projects.

Triple B Logging and Construction [Bigfork] received $265,982 in stimulus funds for fuels reduction work on 420 acres located at 6 separate sites along McGregor Lake and at Woods Bay. All of these parcels are owned by the Montana Fish, Wildlife, and Parks Department.

Site work required the removal of diseased, weak, or dying timber. The majority of this degraded timber consisted of Douglas fir and Lodgepole pine [*Pinus contorta*], which has suffered from the presence of the mountain bark beetle [*Dendroctonus ponderosae*].

The expressed purposes of this project were to decrease the possibility of intense fire occurrence by separating ground fuels from crown fuels, as well as to dilute tree density.

The results of this fuels reduction project will provide ameliorated wildlife habitat, an increase in access to public use sites, and improvement of treated sites for future, potential land trades.

The primary equipment involved in this project consisted of two masticators, a timberjack processor, and a timberjack forwarder. Triple B Logging presently [December 2010] employs four individuals, not including administrative work and a forester.

Additional subcontractors were hired by Triple B to haul felled timber to a local mill processing facility.

**History**
The 420 acres that underwent fuels reduction activities were acquired by Montana FWP from Plum Creek Timber Company in 1993. The merit of sites that would receive fuels reduction work were based upon recreational initiatives and a willingness by FWP to decrease potential fire risks to neighboring, private properties.
The McGregor Lake property lies in the Thompson Chain of Lakes region, which stretches from McGregor Lake north to Horseshoe Lake, in Flathead County. The Woods Bay sites lie to the east of Flathead Lake, also in Flathead County.

**Chronology**

The ARRA grant for this project was issued to Triple B by the DNRC on April 30, 2010. Because the DNRC is the grant issuer, they were responsible for maintaining all of the grant’s parameters. However, owing to the fact that the majority of work is being conducted on FWP lands, the DNRC and FWP share joint project oversight responsibilities.

An Environmental Assessment was completed by Montana FWP District Park Management Specialist, Dave Bennetts in early spring 2010. This process required 20 hours of labor. The 60-day public response period elapsed in April 2010. During this time, Triple B’s forester, Beverly O’Brien, conducted project design on the 6 separate parcels.

Triple B Logging and Construction began on-the-ground work in May 2010.

The project is presently [December 2010] 90% complete.

**Current Project**

Remaining activities at the work site include the mastication of some standing timber, the removal of residual felled timber, and grinding into hog fuel portions of ground debris.

At the time of our visit the expected completion date for this project was spring 2011.
Cost and Source of Funds
The fuels reduction project undertaken by Triple B Logging and Construction was funded entirely by ARRA funds. This grant equaled $265,982 and was provided and administered through the Montana Department of Natural Resources and Conservation.

Project Design
Project design was conducted by Beverly O’Brien, a Triple B Logging and Construction forester. Design work included the identification of dead, diseased, and dying timber, possible fuel reduction areas, recreational camping area improvement, and Streamside Management Zone [SMZ] sensitivity areas. This design work entailed 56 hours of labor for the forester.

Project Labor
To date, Triple B Logging and Construction has received $167,723 for work conducted on these six parcels. This work reflects approximately 656 hours of total labor.

On-site project machinery consists of heavy equipment operation, utilizing two masticators, a timberjack feller, and a timberjack forwarder. All of this equipment can be operated by each Triple B employee.

Triple B employee wage range is $12.50-20/hour, and is not dependent upon task being performed.

Owing to present economic circumstances, Triple B employees no longer receive benefits.

Project Oversight
110 hours of project oversight were provided by Dave Bennetts, Montana FWP District Park Management Specialist, and Dave Jones, Montana DNRC Urban Forester.

Figure 4-5 – A masticator was used on timber with diameters less than 6” during this fuel reductions project. Ground chips are jetisoned up to 300’, but remain on site to provide nutrients and to prevent weed growth. [Photo: H. Janssen, September 2010]
Figure 4-6 – The above photo depicts an area of the fuel reductions project that has not yet undergone treatment. Tree density has prevented the introduction of undergrowth and increased the potential risk of intense fire occurring. [Photo: H. Janssen, September 2010]

Figure 4-7 – This area has undergone fuel reductions treatment. The underbrush has been removed, decreasing the risk of increased fire intensity, and the vegetation density has been reduced to provide for greater diversification and viability. [Photo: H. Janssen, September 2010]

Figure 4-8 – The masticated debris is used to provide nutrients and to prevent the spread of weeds within a recently treated area. [Photo: H. Janssen, September 2010]

Figure 4-9 – A masticator increases the volume of timber that can be treated at a site, justifying the costs associated with mechanized treatment approaches. [Photo: H. Janssen, September 2010]
Project Description

The Montana Department of Natural Resources and Conservation [DNRC] received $3,615,430 in American Recovery and Reinvestment Act [ARRA] stimulus grants for use in fuel reductions projects throughout Montana. These funds were divided among 15 separate projects.

Eureka Pellet Mill [Eureka] received $345,000 in stimulus funds for fuels reduction work on 430 acres located at 16 separate parcels, 385 acres of the treated lands are on 15 separate private sections, while the remaining 45 acres were on State School Trust Lands just outside of Eureka.

The Lincoln County, Upper Tobacco Basin fuels reduction work was divided among four separate contractors who were responsible for selecting the private parcels that would undergo treatment. Mike Justus of Montana DNRC, responsible for conducting project oversight, gave final approval for the prospective parcels.

Site work required the removal of timber from dense tree stand areas. Most of this timber was green timber; however, the projects’ purpose was to suppress trees in dense stands, regardless of tree health. The majority of trees chosen for removal were less than 10” diameter at breast height [dbh] for ladder fuels, with ground fuels removed that were less than 3”. In most instances, the largest and most vigorous trees were retained.

This fuels reduction project was undertaken to reduce crown bulk density. Most of the material that was removed was pulp material, with very few sawlogs being removed, and the majority of timber removed was Douglas fir [Pseudotsuga menziesii].

The expressed purposes of this project were to decrease the possibility of intense fire occurrence. This was conducted through the dilution of tree density, thus removing a suspected cause of intense fire, crown density. The results
of this fuels reduction project will reduce the risk of wildfire and restore moderately dry forest habitats in the Wildland Urban Interface surrounding the towns of Eureka and Fortine. Secondary objectives were to create or sustain jobs associated with forest management infrastructure. This project directly affected areas that historically experience fire cycles every 20 years, yet have missed several concurrent cycles since the early 1900s.

Lastly, the treated stands all hold high wildlife values as big game habitats, and by creating mosaics of treated areas, these habitats were sufficiently improved.

The primary heavy equipment involved in this project consisted of masticators, a timber deck processor, bulldozers, timber skidders, excavators, and a tree forwarder.

**Chronology**
The DNRC awarded the ARRA-funded contract for this project on August 6, 2009. Site selection and contracting began shortly thereafter.

Project design was undertaken by Mike Justus, DNRC Service Forester, in 2009. He was responsible for site mapping and administrative project oversight.

Ron Hvizdak was contracted by the Eureka Rural Development Partners upon contract receipt, to serve as project administrator, tracking all progress and expenditures for the project.

Contractors were responsible for preliminary site selection. Once these sites were selected, approval was granted by the DNRC oversight administrator.

The project was completed in fall 2010.

**Current Project**
This project is complete and requires no further follow-up or activity.

**Cost and Source of Funds**
The Lincoln County and Upper Tobacco Basin fuels reduction projects were funded by a $345,000 grant from the American Reinvestment and Recovery Act [ARRA]. This grant was administered by the Montana DNRC. Only $312,971 of the available funds was used. The remaining funds were rejoined to the DNRC to offset administrative costs in separate projects.
Project Design
Project design was conducted by Mike Justus, Montana DNRC, who was responsible for mapping the prescribed areas. The grant paperwork was compiled by Tracy McIntyre of the Eureka Rural Development Partners.

$11,685 was issued to the Eureka Rural Development Partners for administration and oversight work. This labor was conducted both in-office, and in-the-field by Ron Hvizdak, the contracted oversight forester.

Project Labor
Project labor was divided among four separate contractors:
Bill Pluid Logging conducted work on 74 acres. This crew received $59,200 for their work, and was composed of five members who logged roughly 1,200 hours. Labor on this project consisted of cutters, skinners, clippers, and pilers. Project wages ranged from $17-23/hour. This firm conducted all timber hauling, and only subcontracted piling work at a rate of $35/hr., including machine time.

Jim Hurst treated 36 acres. His crew averaged 2.5 members and registered 300 billable hours, receiving $23,400 in revenue.

Carvey Enterprises treated 92 acres. His crew consisted of 2-4 crew members, which recorded a total of 300 hours. Crew member wages ranged from $14-20/hr. Carvey Enterprises subcontracted all clipping, log hauling, loading, and mastication. Carvey Enterprises received $58,160 for their services.

Gerald Keller conducted fuels reduction on 228 acres. This crew was comprised of 3-6 members, which logged 225 hrs. This crew primarily conducted hand thinning and brush piling. Gerald Keller received $122,208 for his crews’ services, of which 75% was subcontracted for log hauling and clipping. Gerald Keller crew employees earn wages between $15-17/hr.

Gerald Keller logging subcontracted 40 acres to Pat Flanagan, who received $26,001 for work on this parcel. This 40 acre parcel took six months to treat, and the two laborers received a wage of $25/hr.

Grant administration was conducted by the Eureka Pellet Mill, for a total of 80 hours of administrative labor. For administrative services, the Eureka Pellet Mill received $5,510.

Project Oversight
Mike Justus, Montana DNRC, and Ron Hvizdak, independent forester hired by the Eureka Rural Development Partners for implementing and tracking the grants progress, were jointly responsible for overseeing the Lincoln County and Upper Tobacco Basin fuels reduction projects.

Project oversight totaled 294 hrs. Grant oversight hours provided by the Eureka Rural Development Partners Inc. for 2009 and 2010 equaled 77 hrs.
Figure 5-6 – Felled timber awaits extraction by Carvey Enterprise’s tractors. Much of this area will be re-seeded after work is completed, so that the effects of thinning will be virtually unnoticeable in a year’s time. [Photo: H. Janssen, October 2010]

Figure 5-7 – Utilizing the tractor for extraction purposes enables less impact to be present on treated areas as the tractors are able to move several trees concurrently to the landing area. [Photo: H. Janssen, October 2010]

Figure 5-8 – The treatment project at Sophie Lake was delayed for 10 months owing to the discovery of a bald eagle’s nest. Endangered Species Act regulations only permitted construction equipment to operate in the vicinity of this nest for a period of 9 weeks. [Photo: H. Janssen, October 2010]

Figure 5-9 – Use of a masticator assists in expediting the fuels reduction process over large parcels of land. [Photo: H. Janssen, October, 2010]