

Wildfire Adapted Missoula Treatment Descriptions

Non-mechanized Wildfire Risk Reduction Fuel Treatments



1. Young Forest – Small Tree Thinning and Prescribed Burning
2. Hand Thinning and Piling and Prescribed Burning (Cut, Pile, Burn)
3. Hand Thinning and Prescribed Burning
4. Prescribed Fire (>300 acres)
5. Restoration of acquired lands
6. Meadow restoration
7. Managed wildfire

Mechanized Wildfire Risk Reduction Fuel Treatments



8. Hand Thinning and Prescribed Burning + Incidental Mechanized Fuel Treatment
9. Mechanized Thinning and Prescribed Burning
10. Shaded Fuelbreak

Wildfire Adapted Missoula

Non-mechanized Wildfire Risk Reduction Fuel Treatment Description



1. Young Forest - Small Tree Thinning & Prescribed Burning

Blue Mountain Fuel Treatment (Units 80-84, 655 acres)

Hand thinning is proposed in young ponderosa pine, Douglas-fir, western larch, and mixed conifer forests (standsⁱ). A disturbance event (fire, harvest, blowdown, other) within the last 50 years removed or killed trees creating growing space for the establishment of a new age class of conifer tree seedlings through natural regeneration, planting or both. These forests are generally even-aged and have low to moderate wildfire hazard that increases over time as trees grow larger and

vegetative biomass accumulates. Tree competition for sun, water, and/or nutrients may be extreme with little to no spacing between trees. Treating forests while young reduces thinning difficulty as small trees are easy to cut by hand and thinning slashⁱⁱ can often be leftⁱⁱⁱ on site.

Hand thinning is proposed to reduce tree density and wildfire hazard over the short and long term. Tree spacing would be variable and fire reintroduced to these forests as a wildfire hazard reducing and forest regulating process. The treatment



would thin small diameter ($<12"$ dbh) trees leaving the best 50 to 200 trees per acre favoring the healthiest, most vigorous, dominant ponderosa pine and western larch trees. The treatment would increase individual tree crown or tree clump spacing to roughly 15' to 30' in an irregular naturally appearing pattern of individual trees, tree clumps, and openings. Thinning slash would be treated by lopping and scattering tops and limbs on the forest floor, hand piling and burning, or underburning. Individual treatments or a combination of treatments may occur. To maintain low to moderate wildfire hazard over time, sites may be underburned and/or small trees cut every 5 to 15 years to maintain spacing between individual tree crowns or tree clumps

Wildfire Adapted Missoula

Non-mechanized Wildfire Risk Reduction Fuel Treatment Description



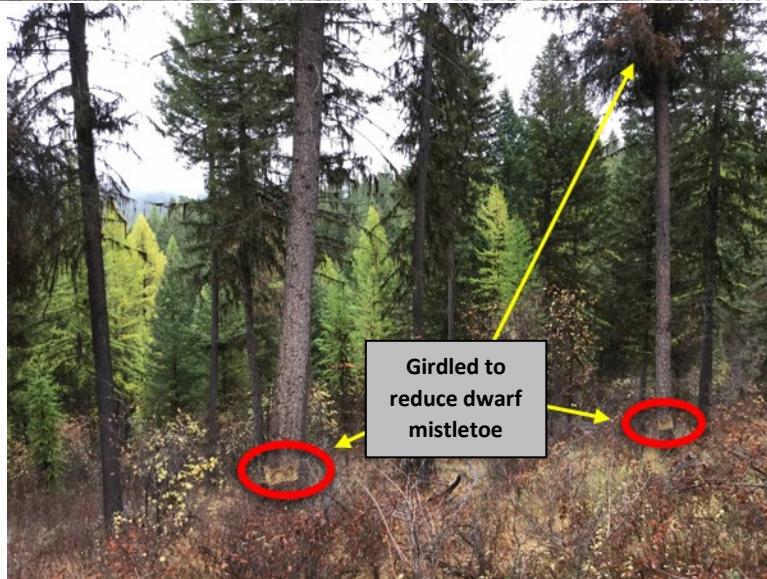
2. Hand Thinning & Piling & Prescribed Burning (Cut, Pile, Burn)

Blue Mountain Fuel Treatment Type Area (Units 90-91, 125 acres)

This treatment is designed to reduce hazardous (surface and crown) fuels in mid-aged mixed conifer forests to reduce wildfire hazard. The treatment would thin small diameter trees in the main canopy trees (generally $\leq 12"$ dbh). Crown spacing between trees would only increase to the degree that cutting small trees can do that in a mature forest. Additionally, to reduce heavy crown fuels and associated wildfire hazard, larger mistletoe infected trees would be girdled or killed by fire, creating gaps in the forest canopy. Underburning, jackpot burning, or broadcast burning may follow tree thinning and girdling. The treatment is designed to lower crown fire initiation potential by reducing ladder and surface fuels through hand thinning or slashing and hand piling and burning (cut, pile, burn). Killing mistletoe infected trees by non-mechanized means is generally proposed where road access is not available, terrain is limiting, or other environmental constraints preclude mechanized treatment.



Blue Mountain Unit 90



Action specific to Blue Mountain: Where crown fuels are extensive due to dwarf mistletoe, those trees may be girdled or killed by fire and canopy openings up to 25 acres created through a series of, often costly, treatments to reduce wildfire hazard. Each treatment would reduce fuels incrementally. These openings are designed to lower wildfire risk by treating sites with the highest wildfire hazard reducing the risk of high intensity and severity wildfire within or near the wildland-urban interface.

Wildfire Adapted Missoula

Non-mechanized Wildfire Risk Reduction Fuel Treatment Description



3. Hand Thinning and Prescribed Burning

Blue Mountain Fuel Treatment Type Area (Units 60-64, 829 acres)

Hand cutting small (\leq 12" dbh) understory trees beneath the main overstory tree canopy and underburning is proposed in predominately ponderosa and Douglas-fir forests. These forests generally have multiple tree layers, or are two-storied, with thickets of mostly Douglas-fir trees below the main canopy. Western larch or other tree species may be present on favorable microsites where moisture is adequate, but these forests are typically dry to moderately dry with water often a limiting requirement.



Pattee Canyon

Dry, non-forested meadow inclusions, that may currently support weeds, are common.

Wildfire hazard is typically low to moderate with areas of high wildfire hazard, often where dwarf mistletoe infection in Douglas-fir has resulted in heavy crown fuels. The treatment is designed to lower wildfire hazard by reducing ladder and surface fuels through hand cutting or thinning of understory trees and underburning. Where crown fuels are extensive due to dwarf mistletoe, those trees may be girdled or killed by fire. Slash would be treated by lopping and scattering tops and limbs and underburning; some hand piling may also occur. Raking or mixing at the base of large diameter (21" dbh) ponderosa pine trees may occur to reduce duff accumulations prior to underburning where these trees exist. Invasive weeds would be treated along roadsides, trails, and within open forests and grasslands. Individual treatments or a combination of treatments would occur.

Wildfire Adapted Missoula

Non-mechanized Wildfire Risk Reduction Fuel Treatment Description



4. Prescribed Fire (> 300 acres)

This prescribed fire fuel treatment is designed to reduce wildfire hazard across large areas (>300 acres), by creating a mosaic of forest structure, size, and ages to reduce fuel continuity and potentially interrupt future fire spread. Reducing continuous fuels lessens the potential for large crown fire establishment.

Prescribed fire fuel treatment may involve jackpot burning, broadcast burning, and underburning. Aerial (helicopter) ignition may be used to start a fire in a strip or spotty pattern to achieve the desired fire intensity. A backing or flanking fire would be used to reduce fire behavior. Still, rolling material on steep slopes could cause uphill, head fire runs, and pockets of higher fire intensity. Sites typically would be lit in the spring when fuel moistures are high and control conditions the most manageable. Yet, where higher fuel moisture conditions exist due to elevation or aspect, these sites would likely be burned in the fall. Prescribed fire ignition would occur ahead of a forecasted weather system to provide moisture to aid in fire control and reduce smoke impacts.

The fuel treatment area perimeters identify where active ignition could occur. Within prescribed fire fuel treatments, it's expected that 35% to 85% of the area would be burned. This could occur over

multiple days, over a several year period. Prescribed fire application may include areas of low to moderate intensity surface fire, as well as, active crown fire areas ranging from 5 to 100 acres in size in mixed severity fire regimes. Within high severity fire regimes, low to high intensity surface fire and passive to active crown fire pockets ranging from 5 to 250 acres may be expected. Some incidental tree cutting to reduce ladder fuels or create a fuel bed to carry the fire may occur prior to burning. Planting blister rust-resistant whitebark pine trees on high elevation sites may occur following prescribed fire.



Section 33 Marshall Canyon

Wildfire Adapted Missoula

Non-mechanized Wildfire Risk Reduction Fuel Treatment Description



5. Restoration of Acquired Lands

Fuel treatments on recently acquired former industrial timberlands may also include restoration activities to rehabilitate these sites following extensive past harvest and unsustainable management practices. Many of these sites were 'high-graded' where the best-adapted dominant and codominant overstory trees were removed and suppressed, often diseased trees, left behind. Restoration activities may include weed treatments, tree planting and netting, and stand improvement activities (i.e. disease control, slashing, slash disposal, and prescribed burning) as appropriate. The restoration activities would occur in conjunction with other fuel treatments. Individual treatments or a combination of treatments may occur depending on site conditions.



Section 33 Marshall Canyon

Wildfire Adapted Missoula

Non-mechanized Wildfire Risk Reduction Fuel Treatment Description



6. Meadow Restoration

Blue Mountain Fuel Treatment Type Area (Unit 100, 349 acres)

Meadow restoration may occur where these sites exist within the WAM fuel treatment area. Some sites are within highly-used recreation areas or are remote summer and winter ranges for big game. Many of these open meadows were identified as critical big game habitat with high levels of noxious weeds in the Big Game Winter Range project in 2001 and treatments have been ongoing since then. Weed infestations are typically composed of multiple noxious species with a robust underlying native plant component.



Blue Mountain Unit 100

Naturally occurring meadows generally need highly specialized weed treatments to address new invaders coupled with broadcast area treatment to address the wide-spread, common noxious weeds. To restore meadows and native plant communities, and prevent or limit noxious weed spread, an integrated weed management approach has been used to reduce the infestations since 2001. Noxious weed treatments would continue using the integrated weed management approach where herbicides, biological controls, hand-pulling, prevention, education, and potentially, revegetation techniques to restore native plant communities.

Additionally, where conifers are encroaching along the edges or within meadows, these trees may be removed by a combination of tree cutting, burning, and/or chipping. These actions would help restore meadows and maintain low wildfire hazard.

Wildfire Adapted Missoula

Non-mechanized Wildfire Risk Reduction Fuel Treatment Description



7. Managed Wildfire

In the project area, wildfires are common in the WAM every year, burning about 61,000 acres since 200 (43% were on National Forest System lands). All wildfires will continue to be managed within the project area. How wildfires are managed is based on several factors including:

cause, location, ownership, values at risk, fire season severity, vegetation and fuel conditions, past fire and fuel treatments, season, firefighting resources available, risk, smoke impacts, existing and predicted weather, and regional and national fire activity levels. A wildfire may be managed for a variety of objectives which may change over time based on fuel, weather, topography, social complexities (understanding and tolerance), the time of year, smoke impacts, and differing missions and objectives of landowners and jurisdictions.



Beeskove Fire Rattlesnake

In some cases, wildfire management within the WAM boundary may achieve the purpose and need of the WAM project. When conditions allow, a wildfire or portions of a wildfire could be managed to meet the objectives of the WAM project. A “confine” wildland management strategy would be used where wildfires are managed to meet the goals and objectives of the WAM project.

Wildfire Adapted Missoula

Mechanized Wildfire Risk Reduction Fuel Treatment Description



8. Hand Thinning and Prescribed Burning + Incidental Mechanized Fuel Treatment

Blue Mountain Fuel Treatment Type Area (Units 50-55, 856 acres)

Action specific to Blue Mountain area only: Where overstory tree density is high (i.e. interlocking crowns or

low crown spacing) or pockets where tree diseases are prevalent, incidental mechanized fuel treatment would reduce wildfire hazard and heavy crown fuels. For example, stands with overstory disease (i.e., dwarf mistletoe) may include mechanized removal of these trees prior to understory thinning and burning as opposed to girdling as described above. Incidental mechanized fuel treatment is designed to lower wildfire risk by treating areas with the highest wildfire hazard within designated fuel treatment areas that



Blue Mountain Unit 55

have lower wildfire hazard. Mechanized treatment is listed as incidental as overstory tree density is typically low to moderate over much of the fuel treatment area. Mechanized fuel treatment may occur where existing or planned road access facilitates the use of conventional ground-based or cable harvest systems.

Wildfire Adapted Missoula

Mechanized Wildfire Risk Reduction Fuel Treatment Description



9. Mechanized Thinning and Prescribed Burning

Blue Mountain Fuel Treatment Type Area (Units 1-25, 1688 acres)

Action specific to Blue Mountain area only: Mechanized wildfire risk reduction thinning of the main overstory tree canopy and underburning is proposed in mixed conifer

predominately ponderosa pine, Douglas-fir, and western larch forests to reduce crown fuels, wildfire hazard, and associated risk. Mechanized fuel treatment is proposed in the areas with the greatest wildfire hazard. Wildfire hazard is moderate to extremely high due to heavy overstory crown fuels associated with dwarf mistletoe infection and where tree crowns are very close together or interlocking. The treatment is designed to reduce wildfire hazard and risk by thinning the main forest tree canopy and removing diseased trees. This fuel treatment involves creating space and gaps between trees to reduce crown fire potential. Mechanized fuel treatment involves using conventional ground-based, cut-to-length, or cable harvest systems where trees are too large to remove by hand. Roughly 35 to 65% of the existing forest canopy would be removed resulting in gaps or small openings in the overstory. Most of the trees that would be cut and removed are diseased, are Douglas-fir trees, or are overtapped by larger, more dominant trees that would be left to grow larger. Trees would be removed from the site as

biomass or other wood products. Ladder and surface fuels would be reduced through a combination of mechanized and hand cutting, slash disposal, and underburning. Slash would be typically treated by removing whole trees including limbs and tops, lopping and scattering, hand or machine piling, followed by underburning. Small understory trees would be removed or thinned as described in the suite of non-mechanized fuel treatments. Individual treatments or a combination of treatments may occur.



Blue Mountain Unit 10

Action specific to Blue Mountain Units 22-24 only: Mechanized wildfire risk reduction fuel treatments within units 22-24 are anticipated to result in openings over most of the area due to extensive tree diseases. Very few healthy, normally formed trees are present. Mechanized fuel treatment would remove diseased and unhealthy trees and retain the healthiest and most disease-resistant overstory trees on-site and create conditions for the regeneration of healthy western larch tree seedlings. Approximately 80% of the overstory would be removed mechanically to reduce extremely high wildfire hazard associated with extreme disease levels and heavy crown fuels. The forest would be two-aged forest where healthy overstory trees are retained. The stands would be underburned to reduce fuel loading and regenerated naturally with some likely planting. Animal browse damage netting may be used to protect planted seedling from big game browsing.

Wildfire Adapted Missoula

Mechanized Wildfire Risk Reduction Fuel Treatment Description



9. Shaded Fuelbreak 108 miles, 4092 acres

The WAM project includes shaded fuelbreaks identified by interagency partners along existing primary road systems, trails, and strategic areas. These shaded fuelbreaks are strategically located and composed of a wide block or strip, where surface and canopy fuels would be reduced to limit the potential for wildfire spread. The objective of shaded fuelbreaks is to reduce wildfire hazard by altering fire behavior by



Pattee Canyon

reducing surface and crown fire intensity within them. During wildland fire management operations (including prescribed fire), shaded fuelbreaks offer wildland fire managers effective areas to anchor their actions from and increase the likelihood of success. Shaded fuelbreaks provide first responders access during a wildfire to enter the area, size up the situation, implement evacuations as needed, and to initiate management actions. In some cases, these fuel treatments may also provide residents or forest visitors an evacuation route if a wildfire is threatening their safety. Implementation would be coordinated across ownerships where shaded fuelbreaks cross multiple jurisdictions.

Wildfire risk reduction fuel treatments would be used in both the understory and overstory to create the shaded fuelbreaks. Depending on the vegetation conditions, a combination of non-mechanized and mechanized fuel treatments would be used. The shaded fuelbreaks would thin overstory trees so the crowns are spaced approximately 10-20 feet apart, remove ladder fuels under them, and may remove lower limbs. Small (i.e. < 12" dbh) understory trees thin would also be thinned (i.e 10-25' spacing) trees. The shaded fuelbreaks may vary from 150-400 feet depending on slope, aspect, and vegetation and would be melded into the forest to minimize their linear appearance. Treatment slash could be removed or treated on site by piling and burning, masticating, underburning, or chipping. Depending on site-specific conditions, one or both sides of existing roads and routes may be treated and maintained to ensure effectiveness.

Wildfire Adapted Missoula

Elements Common to all Fuel Treatment Descriptions:

- Individual treatments or a combination of treatments may occur. A single treatment or a combination of treatments may occur depending on current fuel loading, size, arrangement, and treatment feasibility.
- To maintain low to moderate wildfire hazard over time, sites may be underburned and/or small trees cut every 5 to 15 years to maintain spacing between individual tree crowns or tree clumps
- Increase individual tree crown or tree clump spacing in an irregular naturally appearing pattern of individual trees, tree clumps, and openings. Tree spacing would be variable.
- Provide for in-stand and landscape age class, species and structural diversity to increase resilience and resistance to stressors (fire, insects, and diseases, etc.).
- Favor the healthiest ponderosa pine and western larch trees; retain large diameter, old ponderosa pine and western larch trees, and create stand conditions that could provide large trees in the future. Healthy ponderosa pine and western larch in each canopy layer would be featured and retained over, less disease and fire-resistant Douglas-fir.
- Restore fire as an ecological process focusing on low intensity, high frequency and mixed severity fire regimes.
-

ⁱ A contiguous groups of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit.

ⁱⁱ The tree residue left on the ground after cutting or mechanical treatment.

ⁱⁱⁱ Slash may be lopped and scattered to decompose naturally or hand piled and burned.

Wildfire Adapted Missoula

Proposed Road and Trail Actions

No changes to existing public motorized access are proposed as part of the WAM project. See the Blue Mountain Area map for proposed road and trail locations.

New road construction is proposed in the Blue Mountain area to access treatment units, maintain these treatments long term, and provide first responders access during a wildfire to enter the area, size up the situation, implement evacuations if needed, and to initiate management actions. In some cases, they may also provide visitors a safe evacuation route if a wildfire is threatening their safety.

Four permanent roads are proposed ranging from approximately 0.5 to 4.2 miles in length (6.2 miles total). The location, design, and construction of these roads would follow Best Management Practices to minimize potential environmental impacts. Following use for the project, approximately 1.2 miles of these roads would be stored, 0.8 miles of road would return to the current status as a motorized trail, and the rest of the roads (5.4 miles) would be restricted to public motorized use yearlong. Storage treatments would include decompacting, slashing, and water barring the road surface, and removing drainage structures.

Approximately eight temporary road segments are proposed ranging from approximately 0.1 to 0.8 miles in length (about 2.6 miles total). They would be constructed to a minimum standard for safe transport of timber harvesting equipment and log trucks. After use for the project, temporary roads would be decommissioned by removing drainage features and recontouring the road prism as much as feasible and placing slash and grass seed on disturbed areas.

Currently the Blue Mountain area has 17.8 miles of undetermined roads that were never added to the official National Forest road system and are a legacy of past management activities. This project would add 9.9 miles of these undetermined roads to the National Forest road system to aid in long-term resource management in the area. About 5.5 miles of these roads would be used for treatments including shade fuelbreaks, and following use for this project, approximately 1.2 miles would be stored. Storage treatments would include decompacting, slashing, and water barring the road surface, and removing drainage structures. These roads would remain restricted to public motorized use yearlong.

The rest of the existing undetermined roads are not needed for future management and would be decommissioned (7.9 miles). Decommissioned roads may or may not be physically treated depending on condition and location. Physical treatments may be used to address impacts including illegal motorized use, sediment delivery and impact to streams and riparian areas, and soil disturbance from road prism failure. Physical treatments would range from entrance closure to full road obliteration.

The project proposes adding 0.4 miles of non-motorized trail to the Blue Mountain trail system. The addition of this existing trail would help implement prescribed burns in the area.