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Roadless Area Conservation

National Forest System Lands in Idaho

Fuel Management and Fire Suppression Specialist Report; Final EIS

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Abstract

Issues addressed in this analysis are framed by the National Fire Plan, Healthy Forests Restoration Act (HFRA), and an analysis of fire cause. The indicator for addressing National Fire Plan and HFRA is Ability to Treat Potential Treatment Areas, which are defined as wildland-urban interface and community public water systems. Uncharacteristic or Unwanted Wildland Fire is used to define hazardous fuels. Unwanted Wildland Fire fuels are identified through various assessment processes most often contained in Idaho's County Wildfire Protection Plans. Uncharacteristic Wildland Fire fuels are characterized by Fire Regime Condition Class.

Overall for Idaho Roadless Areas, 62 percent of the acres are in Condition Class 2 and six percent are in Condition Class 3. Wildland-urban interface areas have more acres in Condition Class 2 and about the same acres in Condition Class 3 as the Idaho Roadless Areas as a whole. Community public water systems have less area in Condition Class 2 acres than the wildland-urban interface or overall for the Idaho Roadless Areas.

Ability to Treat is described by access and tools. Access is related to the allowances for road construction or reconstruction and tools are related to the ability to use mechanical and prescribed fire versus prescribed fire alone. Mechanical treatments are assumed to provide a more precise hazardous fuels treatment, in a shorter timeframe than using prescribed fire alone. Of particular concern are very hazardous fuels near wildland-urban interface. However, the ability to treat mechanically is limited in areas without access. Prescribed fire is assumed to be less precise, but can be applied farther from roads.

An analysis of fire cause relative to Idaho Roadless Areas revealed that more starts and acres burned are attributed to humans outside Idaho Roadless Areas. Literature indicates that access may increase the number of starts and acres burned by humans. The indicator for this assessment is Access Prohibited and Access Not Prohibited.

Changes Between Draft And Final EIS

- Developed a new process for identifying wildland-urban interface to describe potential treatment areas under the various alternatives relative to the National Fire Plan and Healthy Forests Restoration Act. The mapped area, called the community protection zone (CPZ), is used in all alternatives to replace the wildland-urban interface (WUI) used in the draft EIS. WUI and CPZ are used interchangeably;
- Clarified terminology relative to the National Fire Plan Cohesive Strategy, Healthy Forests Restoration Act and Modified Roadless Rule;
- Changed terminology for municipal water supply areas and watersheds to community public water systems. The terms municipal water supply areas and community public water systems are used interchangeably;
- Added the Modified Idaho Roadless Rule alternative (alternative 4) to address concerns relative to the treatment of and access for hazardous fuels management in wildland-urban interface and community public water systems described in the Proposed Idaho Roadless Rule;
- Clarified portions of the analysis that addressed the use of tools (prescribed fire and mechanical) and access (road construction or reconstruction);

- Clarified terminology about fuels treatments relative to the assumptions about fuel treatment costs and developed relative costs for comparison based on different treatment and access combinations;
- Updated the Fire Regime Condition Class to the LANDFIRE National data products which were derived from a year 2000 remotely sensed image;
- Described acreage burned in Idaho Roadless Areas from 2000 through 2007 to address vegetative changes not reflected by the LANDFIRE data;
- Changed terminology for access in the analysis from restricted to prohibited to better reflect the rules.

Introduction

Linkage to the 2001 Roadless Rule Final Environmental Impact Statement

The 2000 Fuel Management and Fire Suppression Specialist's report for the 2001 Roadless Final Environmental Impact Statement (2000 Fuel and Fire Report) serves as the starting point for the evaluation of the alternatives. This included a review of the issues and indicators to determine whether they are still valid as described, and therefore could be carried forward as originally developed or needed modification based on a changed condition. The issues and indicators described in the 2000 Fuel and Fire Report were framed within the context of addressing 1) a prohibition on road construction and reconstruction, and 2) the tradeoff between commodity and stewardship timber harvest. A variety of land management personnel and other experts, and Forest Service EISs and policy documents were consulted to help identify issues relative to the two topics. The key issues identified through this process were:

- Fire suppression costs
- Prescribed fire and fuel management costs
- Wildfire size
- Public safety
- Wildland-urban interface
- Ability to complete fuel management tasks
- Firefighter safety
- Uncharacteristic wildfire effects
- Fire occurrence
- Fire cause (human versus lightning ignitions)
- Mechanical fuel treatment and fuel management work
- Geographic distribution of fire management activities (Alaska, the West, the South, the East)
- Severity of wildland fires
- Global warming and wildland fires

From this list, the following components were established as criteria to evaluate the consequences of the alternatives relative to the fuel management and fire suppression programs. The issues were synthesized into the following:

- Large Wildland Fires
 - Escaped Wildland Fire
 - Firefighter Safety

- Severity of Wildland Fire
- Potential Treatment Areas
- Wildland-Urban Interface
- Cost of Hazardous Fuel Management
- Annual Acreage Burned by Wildland Fire
- Fire Pre-Suppression and Emergency Fire Suppression Costs

Large Wildland Fires were assessed in the 2000 Fire and Fuels Specialist Report based on number of starts, size, and cause. An analysis of number of starts and acres burned by small (<1,000 acres) and large (>1,000 acres) wildfires in or outside of Inventoried Roadless Areas (IRAs) revealed that there were several more fires and acres burned outside compared to inside of IRAs (Table 1). Data from the national forests in Idaho was similar but less striking for small (<1,000 acres) fires (table 2). For small (<1,000 acres) fires, the number and total acres burned per year were similar. For large fires, average number of fires inside and outside IRAs was the same. However, total acres burned per year by large (>1,000 acres) wildfires were three times greater outside than inside roadless area (Table 2). Nationally twice as many acres burned per year outside of roadless areas (table 1).

Table 1—Number of Small (<1,000 acres) and Large (≥ 1,000 acres) Wildfires and Total Acres Burned Per Year Inside and Outside of Inventoried Roadless Areas (IRA) for All Forest Service Regions (1986-1996)

	Inside IRAs		Outside IRAs ¹		Total	
	Number of Fires Per Year	Total Acres Burned Per Year	Number of Fires Per Year	Total Acres Burned Per Year	Number of Fires Per Year	Total Acres Burned Per Year
Fires Less Than 1,000 Acres	1,642	13,000	8,398	68,400	10,040	81,400
Fires Equal to or Greater Than 1,000 Acres	19	172,200	41	345,200	60	517,400
Total	1,661	185,200	8,439	413,600	10,100	598,800

¹Does not include Designated Wilderness areas

Table 2—Number of Small (<1,000 acres) and Large (≥ 1,000 acres) Wildfires and Total Acres Burned Per Year Inside and Outside of Idaho Roadless Areas for National Forests in Idaho (1986-1996)

	Inside Idaho Roadless Areas		Outside Idaho Roadless Areas ¹		Total	
	Number of Fires Per Year	Total Acres Burned Per Year	Number of Fires Per Year	Total Acres Burned Per Year	Number of Fires Per Year	Total Acres Burned Per Year
Fires Less Than 1,000 Acres	406	2,464	562	2,921	968	5,385
Fires Equal to or Greater Than 1,000 Acres	5	47,113	5	142,546	10	195,024
Total	411	49,577	567	145,467	978	200,409

¹Does not include Designated Wilderness areas

The 2000 Fuel and Fire Report also assessed number of starts and acres burned by cause to determine if there was any relationship in and out of Idaho Roadless Areas. The national assessment showed that number of starts and acres burned per year for both lightning and human-caused starts was greater outside roadless areas than inside (table 3). The same was true

for Idaho though there was not much difference for lightning-caused fires (table 4). In Idaho, the land-base inside Idaho Roadless Areas is slightly less than the land-base outside of Idaho Roadless Areas (8,763,330 acres versus 8,842,930 acres) but this difference doesn't fully account for the greater number of lightning starts and acres burned outside of Idaho Roadless Areas.

Table 3—Number of Starts and Acres Burned Per Year by Cause (Lightning and Human) Inside and Outside of Inventoried Roadless Areas for All Forest Service Regions (1986-1996)

	Lightning-caused			Human-caused		
	Number of Starts Per Year	Acres Burned Per Year	Average Acres Burned Per Start	Number of Starts Per Year	Acres Burned Per Year	Average Acres Burned Per Start
In Idaho Roadless Areas	1,239	143,100	115	422	42,100	100
Outside Idaho Roadless Areas	4,202	221,100	53	4,236	192,500	45

Table 4-- Number of Starts and Acres Burned Per Year by Cause (Lightning and Human) Inside and Outside of Idaho Roadless Areas for National Forests in Idaho (1986-1996)

	Lightning-caused			Human-caused		
	Number of Starts Per Year	Acres Burned Per Year	Average Acres Burned Per Start	Number of Starts Per Year	Acres Burned Per Year	Average Acres Burned Per Start
In Idaho Roadless Areas	358	47,527	133	56	2,051	37
Outside Idaho Roadless Areas	440	51,303	117	127	94,164	740

Nationally lightning accounted for about 75 percent of the total number of fires that started in Idaho Roadless Areas (table 3). In Idaho, about 86 percent of the fires in Idaho Roadless Areas were from lightning. Nationally outside of roadless areas, lightning and human-caused starts were equal while in Idaho, lightning accounted for 78 percent of the starts. Nationally and in Idaho acres burned per start from lightning were greater in roadless areas compared to outside. This was also the case nationally for human-caused fires. However, for human-caused starts, data for Idaho was different than nationally as 20 times more acres were burned by human-caused starts outside of Idaho Roadless Areas (table 4).

For Large Wildland Fires, the 2000 Fuel and Fire Report table 7 showed that roads or lack of roads or availability of timber harvest or lack of timber harvest did not contribute to more and larger fires in Idaho Roadless Areas compared to outside of Idaho Roadless Areas. In fact, the statistics show the opposite. The data for Idaho is similar to the national data and therefore the same conclusions appear to apply. This conclusion was further validated based on available literature reviewed to determine what effects roads (or lack of roads) and timber harvest (or lack of timber harvest) have on fire occurrence, fire cause, fire size, firefighting effectiveness, fire suppression costs, firefighter safety, and fuel management effectiveness. While roads, when available, may be used for wildland fire management roads have not been constructed solely for this purpose.

For roads, it was concluded that there is little literature dealing with the consequences of building a road solely for fire suppression or fuel management purposes. McHugh and Finney (2003) assessed road density and burn severity on the 2002 Hayman Fire in Colorado and found

no correlation relative to fire suppression. Road construction for the purpose of fire suppression is extremely rare (2001 Roadless Rule). The timeframes necessary to construct a road makes it difficult to allow for effective delivery of fire suppression resources where and when they would be needed when a wildfire is burning. However, access is sometimes provided through road reconstruction or some other form of temporary road development. In a summary of scientific findings for the Interior Columbia River Basin (USDA Forest Service 1996), researchers wrote: “The occurrence and intensity of wildfires are correlated with lightning storm routes, fuels, local wind patterns, terrain complexity, and roads. Wildland areas with complex terrain or a moderate or high road density have moderate or higher risk of wildfires...Areas with fuels, roads, and complex terrain that are on lightning storm routes have the highest risk of wildfire.” This relationship appears in the Idaho statistics which show more starts and acres burned outside of Idaho Roadless Areas, which presumably have more roads. This information was used to develop indicators for Fire Prevention.

The literature is inconclusive regarding what effect timber harvesting has on determining the ultimate size of a large wildland fire particularly when burning under extreme weather conditions (Martinson et al. 2003, Stratton 2004, Peterson et al. 2003). However, there were conclusions that could be drawn regarding roads and timber harvest, and the ability to change wildland fire effects. This information was used to develop indicators for addressing Severity of Wildland Fire.

Based on information relative to the assessment for Large Wildland Fires and the literature, it was concluded in the 2000 Fuel and Fire Report that there would be no differences in Escaped Wildland Fire, Firefighter Safety, Annual Acreage Burned by Wildland Fire, and Emergency Fire Suppression Costs between alternatives in roadless areas. Therefore these components will not be carried forward in this assessment. Fire Pre-Suppression includes the organization and resources that Forests use to manage wildland fires including the Fire Prevention program. As concluded in the 2000 Fuel and Fire Report, there would be no differences for most of the program elements under Pre-Suppression except for Fire Prevention. Because it appears there is a relationship between roads and the number of starts and acres burned caused by humans, Fire Prevention will be carried forward into the analysis.

Most of the remaining components (Severity of Wildland Fire, Potential Treatment Areas, Wildland-Urban Interface, and Cost of Hazardous Fuel Management) relate to the potential effects of wildland fire. Forest Service policy is to allow fire to play a natural role where appropriate. However, vegetative conditions in some areas are such that there is high potential for having uncharacteristic (unwanted) wildland fires. The 2000 Fuel and Fire Report laid out this concern relative to the uncharacteristic wildfire using the *Coarse-Scale Spatial Data for Wildland Fire and Fuel Management* (Hardy et al. 2000) and *Protecting People and Sustaining Resources in Fire-Adapted Ecosystems: A Cohesive Strategy (Cohesive Strategy)* (USDA Forest Service 2000). The indicator for hazardous vegetative condition was the Fire Regime Condition Class (FRCC) (Hardy et al. 2000), which is an indicator of the ecological effects of fire. In the case of Fire Regime I, Fire Regime II, and in some vegetation types that fall into Fire Regime III, characteristic wildland fire is of low intensity and severity. However, in other vegetation types in Fire Regime III, and in Fire Regime IV and V, high intensity stand-replacement fire is characteristic.

The 2000 Fuel and Fire Report characterized the Fire Regime Condition Classes for roadless areas and used this information to address road construction and timber harvest. Since that

time, the strategy for managing uncharacteristic fuels has expanded under the Healthy Forests Initiative (HFI), initiated by President Bush in August 2002, and the Healthy Forests Restoration Act (HFRA) (P.L. 108-148), approved by Congress in December 2003. These and other documents addressing wildland fire are collectively referred to as the National Fire Plan. The national implementation strategy, titled *A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment: 10-year Strategy Implementation Plan* was updated December 2006 (USDA and USDI) as was the *Idaho Statewide Implementation Strategy for the National Fire Plan*. Both address concerns about the effects of uncharacteristic wildland fire on the environment including community public water systems. In addition, the National Fire Plan also addresses “unwanted wildfire effects” from unwanted wildland fire which is defined as any wildland fire in an undesirable location or season, or burning at an undesirable intensity, spread rate, or direction (USDA and USDI 2003). In general wildland fire, particularly stand-replacing fire, is unwanted in the WUI and community public water systems because of risks to firefighter and public safety, private property and effects on drinking water. In general the criteria for prioritizing lands for hazardous fuels treatments correspond to: (1) closest proximity to communities at risk in the WUI; (2) strategic areas outside the WUI that prevent wildland fire spread into communities or critical infrastructure; (3) areas outside of WUI that in condition classes 2 or 3; and (4) other considerations.

The 2003 Healthy Forests Restoration Act reflected this change in understanding about the differences between restoration and hazardous fuels management in certain ecosystems. For WUI, HFRA applies a broader concept of hazardous fuels while it retains the ecosystem restoration emphasis for municipal water supply systems. The emphasis for municipal water supply systems is Condition Class 3 and Condition Class 2 in Fire Regimes I, II and III. The 2006 *10-year Strategy Implementation Plan* for the Cohesive Strategy also reflects this change in that the performance measures are based on hazardous fuels as defined through Community Wildfire Protection Plans or other collaborative efforts, rather than historic range of variability (i.e. Fire Regime Condition Class).

For the WUI, the most desirable type of wildland fires are those of low intensity and severity that can be safely managed with minimal effort. Changing the distribution and continuity of vegetation and fuels on the landscape, particularly in areas where fires have the potential to be stand-replacing, can also aid fire suppression efforts by providing fuel breaks or other kinds of conditions where small fires or portions of large fires can be safely suppressed (Deeming 1990, Finney 2000, Graham et al. 1999, Peterson et al. 2003). The most effective treatments create surface fuel loadings that produce low flame lengths and vegetative conditions that reduce the chance of fire moving from the ground into the tree crowns or that provide fuel breaks that reduce the spread of fire across the landscape. Hazardous fuel treatments should take into account effects on canopy base height, canopy bulk density and canopy continuity as well as modification of the combustion environment of surface fuels (Peterson et al. 2003).

While almost 96 percent of the wildland fire ignitions are successfully suppressed (Finney and Cohen 2003) the four percent that escape initial attack and become large account for 85 percent of the suppression costs (The Brookings Institution undated). These large fires exhibit similar characteristics in that they start in remote areas and cover long distances; they often threaten communities and public safety; and they exceed all efforts at direct control until relief from weather or a break in fuel occurs (Finney and Cohen 2003). Examples are the fires of 2002 including the Rodeo-Chediski in Arizona which burned more than 450,000 acres, the Hayman in Colorado that burned 138,000 acres and the Biscuit in Oregon that burned more than 500,000

acres. All three were the largest fires in these state's histories; in total they burned 540 homes and caused more than 55,000 people to be evacuated. These fires, in addition to others around the west between 2000 and 2002 helped propel the HFRA. They also raised awareness of the need to address the spatial and physical relationships between causes of large wildland fires and effects on natural resources and the WUI to evaluate how benefit is derived from management actions (Finney and Cohen 2003).

For hazardous fuels management to create the desired effect on fire behavior, management strategies must address the local and landscape scales. Local scale addresses effects of fire within a forest stand, treatment unit, or adjacent to or including the area around a house or structure (Finney and Cohen 2003). Many studies have shown that conditions can be created at this scale that produce fire behavior that poses less risk to homes and public safety (Agee and Skinner 2005, Finney 2005, Martinson et al. 2003) and that allows firefighters to work safely (Scott 2003).

This concept proved to be effective during the 2007 wildfires in Idaho. Prior to 2007 the Forest Service had conducted treatments in the vicinity of structures in the Warm Lake area and adjacent to the city limits of Yellowpine, Idaho. These treatments had included a variety of activities such as under-burning, hand thinning, pile and burn, and mulching. In the Warm Lake area the actively burning fire converted from crown to ground fire when it encountered the defensible space areas (Loseke 2008). This stopped the forward progress of the fire and no structures were lost. At Yellowpine, firefighters were able to conduct a safe and successful back-burn through previously treated areas at the city limits. The vegetative conditions that existed before treatment would have been riskier to back-burn given the proximity of the community (Loseke 2008).

Early strategies for addressing risk of wildfire within the WUI were focused on the local scale conditions immediately adjacent to structures and development of fuel breaks between developed areas and the wildlands. Hann and Strohm (2003) also pointed out that managing hazardous fuels in or adjacent to the WUI could increase the opportunity to use wildland or prescribed fire within the roadless or wilderness where WUI and roadless/wilderness overlap. Currently, the risk of undesirable effects on the WUI from prescribed or wildland fire has discouraged the use of these tools. However, mitigations of hazardous fuels conditions within or adjacent to this interface would reduce the risk of fire spread into or from the WUI.

The other important scale is the landscape scale which is a collection of local features. While most fires that are successfully suppressed during initial attack occur at the local scale, those that escape initial attack and become large are generally landscape phenomena. Understanding hazardous fuels management relative to the spatial arrangement of stands and homes is important in changing the effects of wildland fire. Finney and Cohen (2003) challenge the idea that only local-scale treatments including fuel breaks can be, by themselves, effective in protecting communities and the public. They state that fuels management must address the landscape in addition to the local scale. On page 363 of their paper, they summarize this approach as it applies to community protection stating that the broad objective of "community protection" must be partitioned to reflect the specific types of fire behavior changes that are relevant to the values concerned. They emphasize that treatments for the urban portions of communities must be considered separately from the wildlands because the same effects or scales of consideration do not apply to both. They conclude:

“To benefit the **urban** [emphasis added] portions of a community, fuel management research suggests that fuel management activities need only be concerned with the fuels in the immediate proximity of the structures --- within their ignition zone. The material properties of the structures themselves are also important, and managing fuels within the home ignition zone is shown to be most effective at reducing the nearby sources of firebrands and combustible fuels and vegetation that are commonly associated with structure ignition....Wildland fuel management in low-elevation forest types, extending perhaps many kilometers from urban locations, however, is critical to reducing the likelihood that wildland fires will spread to urbanized areas and pose ignition threats. Wildland fire treatments can reduce the probability portion of the expected net value calculation by changing fire behaviors at long distances as well as fire movement. These changes in fire behavior increase the effectiveness of fire suppression, especially during initial attack by slowing fire growth and spotting....Because urban fire disasters often result from wildland fires igniting tens of kilometers away from urbanized areas under extreme weather conditions, wildland fuel management activities must be located broadly across those landscapes.”

While fuel treatments in themselves will not stop wildland fires, they can change fire behavior such that the outcomes are less catastrophic or may increase the effectiveness of fire suppression by reducing resistance to control. Therefore community protection must be addressed at different scales including the ability to alter hazardous conditions at a broader context over space and time.

The types and sequence of hazardous fuels treatments depend on many factors including the amount of surface fuel present and the density of ladder fuels (Peterson et al. 2003). Some areas may require multiple fuel treatments staged over time to achieve the desired effect. Treated areas will also require some type of maintenance over time. Costs associated with conducting hazardous fuels treatments are highly variable depending on the initial conditions, access, terrain, existing and potential surface fuel loads, market conditions, and host of other factors. Initial treatment costs are generally higher than the costs of conducting maintenance, particularly if multiple treatments are required.

In the 2001 Roadless Rule Final EIS, WUI was described based on five population classes developed from the ambient population information in the LandScan Global Population Database for 1998 (Lockheed Martin Energy Research Corporation 1999). Since 2001 Roadless Rule, States have been defining WUI following direction from the National Fire Plan and HFRA, which encourages development of Community Wildfire Protection Plans. To facilitate this process in Idaho, the Idaho State Fire Plan Working Group (State Working Group) was formed. The State Working Group is comprised of individuals representing state and federal agencies, counties, tribes, and non-governmental organizations, and provides the key link between national and local levels of government to implement the National Fire Plan. The State Working Group also provides leadership in the development of Community Wildfire Protection Plans. In Idaho, these plans are developed and updated at the county level, and are therefore referred to as County Wildfire Protection Plans. Currently, all counties in Idaho have CWPPs (Idaho Department of Lands [IDL] 2007).

Information from the State Working Group was used in development of the draft EIS. However, several responders expressed concerns about how WUI was mapped in the draft EIS and the types of activities that were allowed or not allowed based on the Themes. For the Final EIS, we used the Stein et al. (2007) publication titled “*National Forests on the Edge*” and their year

2030 projections of housing density to identify areas that could be WUI. Stein et al. developed their 2030 projections using the 2000 census statistics on housing density and population, road density data, past growth patterns, proximity to urban areas, and other factors. They defined three categories of housing density:

- Rural I—Lands with 16 or fewer housing units per square mile;
- Rural II—Lands with 17 to 64 housing units per square mile;
- Exurban/Urban—Lands with 65 or more housing units per square mile.

We used the Rural II and Exurban/Urban categories for this analysis. Census blocks identified as Rural II or Exurban/Urban were buffered with an area defined as the “community protection zone” (CPZ). For consistency across the state the CPZ was mapped based on the definition from the HFRA, Section 101(16)(B) for determining Wildland-Urban Interface in the case for any areas in which a community wildfire protection plan is not in place. This is:

- an area extending ½-mile from the boundary of an at-risk community;
- an area within 1½ miles of the boundary of an at-risk community, including any land that:
 - has sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community;
 - has geographic feature that aids in creating an effective fire break, such as a road or ridge top; or
 - is in condition class 3, as documented by the Secretary in the project-specific environmental analysis.

Due to the complexities of attempting to identify and map parts I, II and III, we used the 1 ½ mile area described in part ii. For the analysis this represents the greatest extent of area that could be treated. Actual treatment areas would most often be less than this based on the conditions described in parts I through III within the ½ to 1 ½ mile zone.

At-risk communities are defined in HFRA as an area:

(A) that is comprised of--

- an interface community as defined in the notice entitled “Wildland Urban Interface Communities within the Vicinity of Federal Lands That Are at High Risk from Wildfire” issued by the Secretary of Agriculture and the Secretary of the Interior;
- a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) within or adjacent to federal land;

(B) in which conditions are conducive to a large-scale wildland fire disturbance event; and

(C) for which a significant threat to human life or property exists as a result of a wildland fire disturbance event.

We used the Stein et al. (2007) product assuming that it captures the majority of areas that would meet the definition of at-risk communities defined by HFRA across the state to define the CPZ (figure 1). We also assumed that applying the CPZ to the Stein et al. (2007) product would capture a large portion of the area defined as WUI in Idaho County Wildfire Protection Plans.

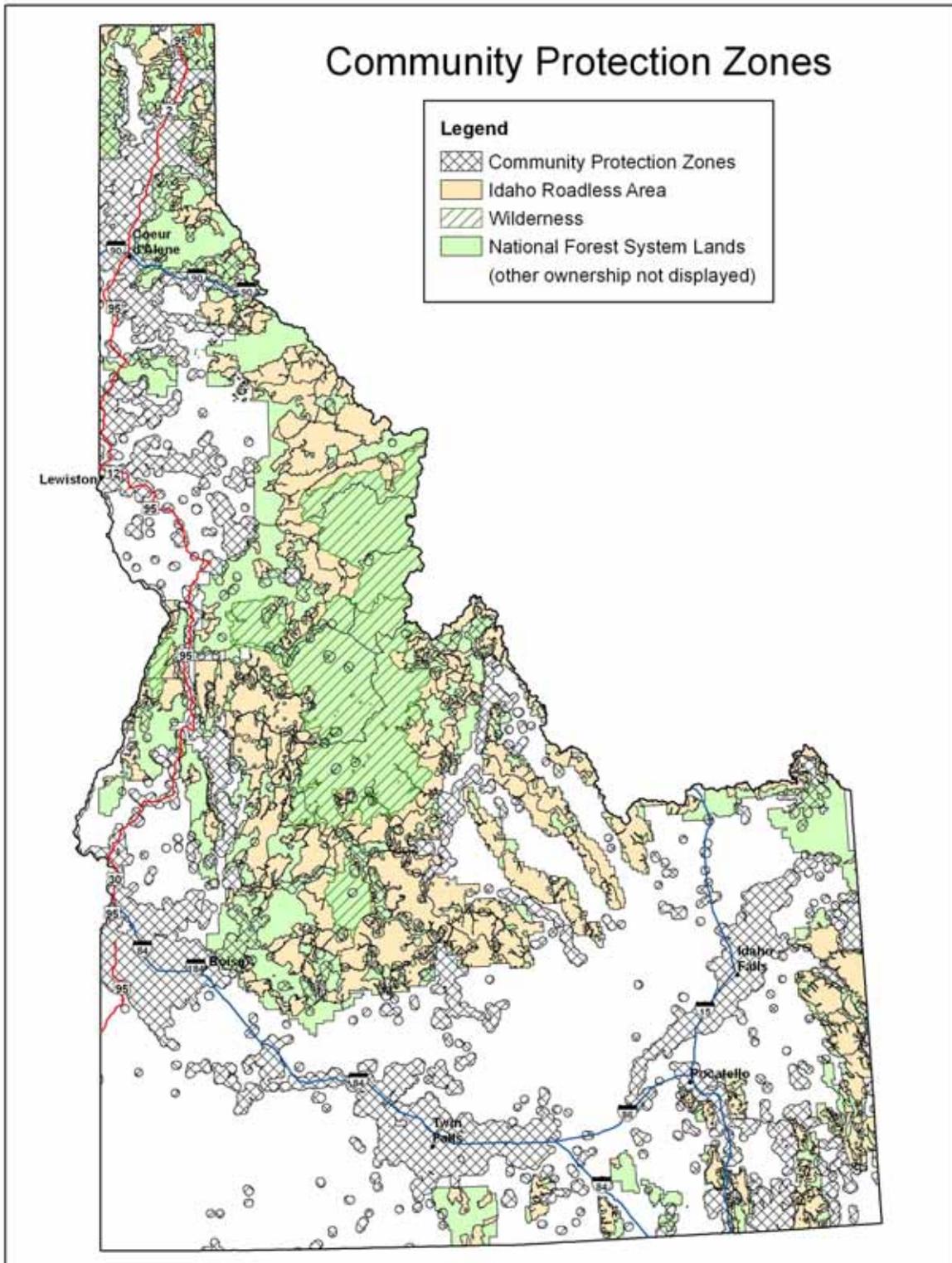


Figure 1--Overlap of community protection zones with Idaho Roadless Areas

For purposes of the analysis, we use the term wildland-urban interface except where the CPZ specifically applies though the terms are used interchangeably in the analysis. The CPZ area was used to generate acres of WUI for all alternatives though this zone, as named, applies only to the Modified Rule. Areas outside of the CPZ that could be treated based on a significant risk determination under the Modified Rule were not identified because this requires a site-specific assessment using several criteria that cannot be addressed at the scale of this analysis.

For community public water systems HFRA uses the term “municipal water supply system” for the collection, impoundment, storage, transportation or distribution of drinking water. Public water sources are termed source waters. In Idaho more than 95 percent of all source waters are from ground water and five percent are from surface water. Our analysis uses the terms set forth by the Environmental Protection Agency. Communities dependent on surface water supplies are most vulnerable to changes as a result of land management actions. Public water systems are divided into three categories. As a proxy of municipal water supply systems this analysis used community public water supply systems which are public water systems that regularly serve year-round residents (that is, a system that serves people at their homes; examples include systems that serve towns or subdivisions). Surface (as opposed to ground) water supply systems were used in this analysis because they are the most likely to be affected by wildland fire (Landsberg and Tiedemann 2000).

In the 2000 Fuel and Fire Report, concerns regarding Large Wildland Fire were based on priorities described in the *Cohesive Strategy*, which are threats to public safety, private property, water quality, or Threatened and Endangered species habitats. As described in the *Cohesive Strategy*, unless these concerns overlapped roadless areas, roadless areas would be a low priority for fuel treatment because higher priority areas are more common outside roadless areas. These same priorities have carried into the National Fire Plan.

From 2001 through 2006 in Idaho, half (51 percent) of the acres treated for hazardous fuels statewide were in WUI. As County Wildfire Protection Plans have been put in place, treatments have become more coordinated and strategic to meet the goals and expectations developed through these collaborative efforts. CWPPs are reviewed annually to identify new priorities as work is accomplished and/or conditions change.

In areas that have been treated, mechanical methods were more often used in WUI than outside while prescribed fire is more often used outside WUI than inside (figure 2). Mechanical treatments are probably used more often in the WUI because conditions can be altered more rapidly mechanically than they can be altered with prescribed fire alone. Furthermore it may be difficult to control prescribed fire in dense stands with high fuel loadings. In addition, prescribed fire may be undesirable in the WUI because of concerns from adjacent private property owners about risk of escape and concerns about smoke (Peterson et al. 2003). Treatments inside WUI are generally more expensive compared to outside WUI because of the emphasis on mechanical activities. Implementing prescribed fire is also more expensive in compared to out of WUI.

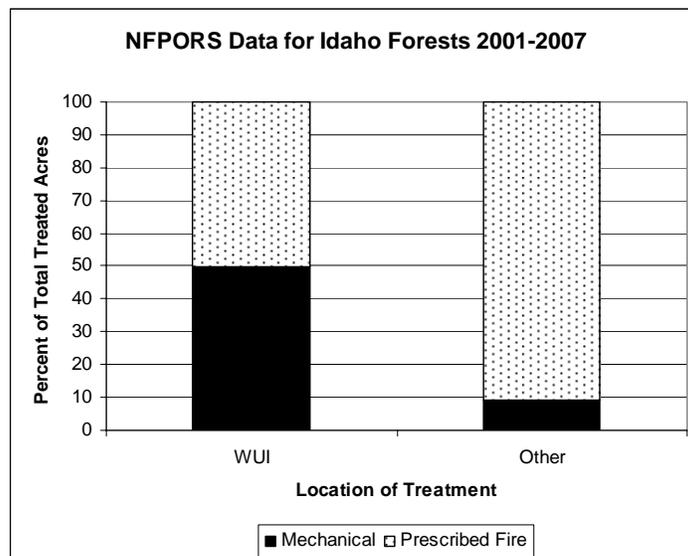


Figure 2—Acres Treated Mechanically and With Prescribed Fire in Wildland-Urban Interface and Other on Ten National Forests in Idaho from 2001 through 2007.

Data from the National Fire Plan Operations and Reporting System (NFPORS) (contained in spreadsheet *Idaho_nfpors_fuels_acres_2001_2007*)

In Idaho fuels treatments outside of WUI have generally been for community public water systems or restoration of ecosystems. Though National Fire Plan identified hazardous fuels relative to threatened and endangered species habitats, in Idaho such treatments have generally not been undertaken exclusively for addressing threatened and endangered species habitat (Dether 2007). In some cases though, particularly for treatments that address risks of Uncharacteristic Wildland Fire, there are often secondary benefits to threatened and endangered species.

Issues and Indicators

Large Wildland Fires

The component of Large Wildland Fires from the 2000 Fuel and Fire Report is addressed in this analysis as Uncharacteristic or Unwanted Wildland Fire. This analysis assesses the ability to undertake treatments to mitigate hazards that contribute to the risk of Large Wildland Fire based on the two topic areas (road construction and reconstruction, and timber cutting, sale, or removal).

Alternatives are compared based on “Ability to Treat Potential Treatment Areas”. Potential Treatment Areas are: 1) where wildland-urban interface overlaps Idaho Roadless Areas and 2) in portions of Idaho Roadless Areas that contribute to community public water systems. The Ability to Treat is interpreted from the direction relative to road construction or reconstruction and timber cutting, sale, or removal contained in the 2001 Roadless Rule, the Existing Plans, the Idaho Roadless Rule and the Modified Idaho Roadless Rule.

Selection of WUI and community public water systems as the Potential Treatment Areas does not imply that these are the only areas within Idaho Roadless Areas that could be treated for hazardous fuels. Rather, it reflects that most current priorities for hazardous fuels management as described by the National Fire Plan.

Ability to Treat

Ability to Treat is based on access and tools as they would apply to hazardous fuels management (ability to address Uncharacteristic or Unwanted Wildland Fire hazard). Access is described as Prohibited, Variable or Not Prohibited. This was determined by interpreting how each alternative addresses road construction or reconstruction specific to hazardous fuels management and should not be construed as applying to the Management Theme for all purposes. For tools, prescribed fire and mechanical are the most commonly applied methods for addressing hazardous fuels. Mechanical hazardous fuels treatments generally include timber harvesting and timber cutting (Graham et al. 2006, Rummer 2006). Tools are described as:

- Prescribed Fire Available to Treat [fuels that contribute to the risk of] Uncharacteristic Wildland Fire
- Prescribed Fire Available to Treat [fuels that contribute to the risk of] Unwanted Wildland Fire
- Prescribed Fire and Mechanical Tools Available to Treat [fuels that contribute to the risk of] Uncharacteristic Wildland Fire
- Prescribed Fire and Mechanical Tools Available to Treat [fuels] for Various Purposes
- Prescribed Fire and Mechanical to Treat [fuels that contribute to the risk of] Unwanted Wildland Fire

Table 5 displays the combinations of access and tools used to compare the alternatives. For this analysis, the Ability to Treat interpretations are for hazardous fuels management in or adjacent to WUI and community public water systems. The interpretation of each alternative to the indicator in Table 5 is located in the assumptions. For the 2001 Roadless Rule, the interpretation applies to the all Idaho Roadless Areas. For the Existing Plans, and Proposed and Modified Rules, the interpretation applies to acres assigned to the Management Themes.

Table 5—Description of Ability To Treat Idaho Roadless Areas and Application to Alternatives for Treating Hazardous Fuels for Wildland-Urban Interface or Community Public Water System Areas

Management Themes	Alternatives			
	2001 Roadless Rule	Existing Plans	Proposed Rule	Modified Rule
Wild Land Recreation	Prescribed Fire and Mechanical Tools Available to Treat Uncharacteristic Wildland Fire, Access Prohibited	Prescribed Fire Available to Treat for Various Purposes, Access Prohibited	Prescribed Fire Available to Treat Unwanted Wildland Fire, Access Prohibited	Prescribed Fire Available to Treat Uncharacteristic Wildland Fire, Access Prohibited
Primitive and Special Areas of Historic or Tribal Significance		Prescribed Fire and Mechanical Tools Available to Treat for Various Purposes, Access Prohibited	Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire, Access Prohibited	Prescribed Fire and Mechanical Tools Available to Treat Uncharacteristic Wildland Fire, Access Prohibited
Backcountry Restoration Outside CPZ or Significant Risk Area		Prescribed Fire and Mechanical Tools Available to Treat for Various Purposes, Access Variable	Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire, Access Not Prohibited	Prescribed Fire and Mechanical Tools Available to Treat Uncharacteristic Wildland Fire, Access Prohibited
Backcountry Restoration Inside CPZ or Significant Risk Area				Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire, Access Not Prohibited
General Forest, Rangeland, Grassland		Prescribed Fire and Mechanical Tools Available to Treat for Various Purposes, Access Not Prohibited	Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire, Access Not Prohibited	Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire, Access Not Prohibited

Fire Prevention

Fire Prevention is evaluated based on access. The indicator is number of acres assigned to management themes with Access Prohibited or Access Not Prohibited. Assumptions relative to the indicator are in the assumptions related to access (roads) section. The designators described in table 5 provided the basis for assigning alternatives to the categories. For the Existing Forest Plans, Access Variable was assigned to Access Not Prohibited.

Assumptions

Assumptions related to ability to treat

Interpretation of Ability to Treat for the 2001 Roadless Rule—The 2001 Roadless Rule was interpreted as not allowing road construction or reconstruction for hazardous fuels treatments. Page 2-7, Volume 1, Chapter 2 discussion for Alternative 3 (the selected alternative) states that road construction or reconstruction in support of treatments that reduce the risk of uncharacteristic wildland fire would not be allowed in Inventoried Roadless Areas. Therefore, access is described as Prohibited (table 5).

For tools, the 2001 Roadless Rule allows the cutting, sale, or removal of generally small diameter timber if it will maintain or restore the characteristics of ecosystem composition and structure, such as to reduce the risk of uncharacteristic wildland fire effects, within the natural range of variability created by the natural fire regimes. This is defined in this analysis as Uncharacteristic Wildland Fire. Therefore, tools are described as Prescribed Fire and Mechanical Tools Available to Treat Uncharacteristic Wildland Fire (table 5).

Interpretation of Ability to Treat for the Existing Plans—Prescriptions in Existing Plans were cross-walked to the Idaho Roadless Rule's Management Themes as a method for capturing Existing Plan intent. For hazardous fuels management it was assumed that the access and tools available under Existing Plans are generally the same as those for the Management Theme to which the prescription was cross-walked. However, in some cases the intent of Forest Plan prescriptions varied from the intent of the Proposed and Modified Idaho Roadless Rule Management Themes. For example, the purpose of some of the Caribou Forest Plan prescriptions that allowed access and tools similar to the Backcountry Restoration Management Theme was generally for habitat restoration rather than for reducing the significant risk of wildfire effects. Therefore Existing Plans were assigned to Mechanical and/or Prescribed Fire Available for Various Purposes. This was also the case in Forest Plan Special Areas.

Ability to construct or reconstruct roads for hazardous fuels treatments was also variable in Existing Plans relative to the Proposed and Modified Idaho Roadless Rule Management Themes. For example, on the Boise, Payette, and Sawtooth National Forests, one of the prescriptions cross-walked into the Backcountry Restoration Management Theme allows for hazardous fuels treatments to protect human life, structures, and investments from wildland fire. This is consistent with reducing the significant risk of wildland fire. However, unlike the Proposed Rule theme for Backcountry, road construction or reconstruction for treatments that reduce this risk are not allowed. Therefore, access for the Existing Plans for Backcountry was defined as Access Variable since it varies by plan. Access for Existing Plans cross-walked to the Wild Land Recreation, Primitive, and General Forest, Rangeland, and Grassland (GFRG) were assumed to be consistent with the Idaho Roadless Rule themes.

Interpretation of Ability to Treat for the Proposed Idaho Roadless Rule—Access under the Proposed Rule varies by management theme (table 5). For Wild Land Recreation and Primitive, road construction and reconstruction are only allowed in limited situations unrelated to hazardous fuels management. Therefore, access was interpreted as Prohibited for these two themes (Table 5). In Backcountry, the Proposed Rule allows road construction or reconstruction to protect health and safety in cases of significant risk or imminent threat of flood, fire or other catastrophic event. This includes hazardous fuels treatments that benefit WUI and community public water systems. Therefore, for this management theme, access was interpreted as Not

Prohibited for hazardous fuels management (table 5). Under the GFRG theme, there are no conditions limiting road construction or reconstruction and access is assigned to Not Prohibited for hazardous fuels management.

Like access, tools vary by management theme. For Wild Land Recreation, timber cutting, sale, or removal of timber is prohibited except for limited purposes not related to hazardous fuels management. There is no limitation on prescribed fire and it was assumed this tool would be used to treat hazardous fuels where feasible. Therefore, this theme was assigned to Prescribed Fire Available to Treat Unwanted Wildland Fire. For Primitive and Backcountry, timber cutting, sale, or removal can be used to reduce the significant risk of wildfire. This would include hazardous fuels treatments that reduce wildfire risks in or adjacent to WUI and community public water systems. Therefore, these management themes were assigned to Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire (table 5). The GFRG theme was interpreted as having the full range of tools available for the full range of hazardous fuels treatment needs and was assigned to the same Ability to Treat as Backcountry.

Interpretation of Ability to Treat for Modified Idaho Roadless Rule—Access under the Modified Rule varies by management theme (table 5). For Wild Land Recreation and Primitive, road construction and reconstruction are only allowed in limited situations unrelated to hazardous fuels management. Therefore, access was interpreted as Prohibited for these two themes (table 5). In Backcountry, the Modified Rule allows road construction or reconstruction to reduce hazardous fuels in the CPZ or outside the CPZ to reduce significant risk if certain conditions are met. To meet the intent of the rule for the purposes described, road construction or reconstruction would only occur in the community protection zone or areas analyzed as posing a significant risk to WUI or community public water systems. Though roads would be temporary, for this management theme access was interpreted as Access Not Prohibited (table 5) if within the CPZ or if there is a significant risk determination. Outside these two conditions, this management theme was interpreted as Access Prohibited. Under the GFRG theme, there are no conditions limiting road construction or reconstruction and access is assigned to Access Not Prohibited for hazardous fuels management.

Like access, tools vary by management theme. For Wild Land Recreation, timber cutting, sale, or removal of timber is prohibited except for limited purposes not related to hazardous fuels management. There is no limitation on prescribed fire and it was assumed this tool would be used to treat hazardous fuels where feasible. Therefore, this theme was assigned to Prescribed Fire Available to Treat Uncharacteristic Wildland Fire. For Primitive, timber cutting, sale, or removal is allowed where it reduces the risk of uncharacteristic wildland fire effects to WUI or community public water systems. Therefore this area was assigned to Prescribed Fire and Mechanical Tools Available to Treat Uncharacteristic Wildland Fire. In Backcountry, tree cutting, sale, or removal is allowed in the CPZ or areas outside of the CPZ that pose a significant risk to WUI or community public water systems. These areas were assigned to Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire. Areas outside the CPZ or significant risk area were assigned to Prescribed Fire and Mechanical Tools Available to Treat Uncharacteristic Wildland Fire. This was based on the assumption that community public water system areas not addressed through a significant risk determination could be treated to maintain or restore the characteristics of ecosystem composition and structure. The GFRG theme was interpreted as having the full range of tools available for the full range of hazardous fuels treatment needs and was assigned to the same Ability to Treat as the CPZ or significant risk area in Backcountry Restoration.

Assumptions related to tools

The primary purpose of hazardous fuel management is to reduce the occurrence of uncharacteristic or unwanted wildland fire (Davis and Cooper 1963; Wood 1982; Van Wagtendonk 1996).

Reduction of hazardous fuels can be accomplished with prescribed fire alone (Swetnam 2000). However, treatments using only prescribed fire may take longer to achieve the desired effect than hazardous fuels treatments using mechanical treatments, or mechanical and prescribed fire in combination (Mutch 1994). This can occur because of the current vegetative conditions and the ability to target the “problem” condition, availability of burning windows, and the need to apply repeated treatments because of past fire exclusion.

Density management or ladder fuel treatments using mechanical methods are more reliable in that they are more precise and usually are accomplished in a shorter timeframe. In some cases, some form of mechanical treatment may be necessary initially in areas where the long-term goal is to use prescribed fire. However, whether mechanical treatments reduce the intensity and severity of wildland fire is disputed and uncertain. Hazardous fuel conditions can be abated provided the ladder fuels and unutilized coarse and fine fuels (natural and activity fuels) are removed from the site (Peterson et al. 2003). Conversely, mechanical treatments can sometimes elevate fire hazard by increasing dead-ground fuel, removing larger fire resistant trees leaving an understory of ladder fuels, or opening up the site creating warmer, drier and windier conditions (Graham et al. 1999; Sackett et al. 1996; Barrett 1994; Feeney et al. 2000; Weatherspoon 2000, Peterson et al. 2003). Therefore the following is assumed for mechanical fuel treatments:

- where conducted to reduce the risk of Uncharacteristic Wildland Fire, the action would improve the Fire Regime Condition Class and treatments would be conducted to mitigate natural fuels if necessary, and activity fuels so that the treatment is effective in meeting the purpose;
- where conducted to reduce the risk of Uncharacteristic or Unwanted Wildland Fire treatments would be conducted to mitigate natural fuels if necessary, and activity fuels so that the treatment is effective in meeting the purpose.

Treatments in condition class 2. Condition class 2 areas are generally easier to treat because they are not as far departed from natural conditions. Therefore, they are less dense, have lower natural fuel loadings, and have a more diverse landscape pattern. In these areas, fewer acres may require some type of initial treatment through prescribed fire. Mechanical treatment would focus on removing ladder fuels through thinning or limbing the lower branches. In areas where mechanical treatments may be beneficial initially, there may be a lower volume of surface fuels to mitigate. In addition, prescribed fire may be more feasible as an initial treatment in some of these areas, potentially allowing more area to be treated.

Treatments in condition class 3. In the situations where condition class 3 occurs because of lack of past disturbance, vegetative conditions are often such that some type of mechanical treatment is desirable initially even in areas where prescribed fire would eventually be the goal. The risk can be most effectively reduced through thinning that removes ladder fuels, and natural and activity fuel abatement that reduces the fuel loading and continuity. Ground-based systems are the most economical method for achieving this goal because fuels can be yarded off the site. Where this is not feasible but is within reach of helicopters, fuel abatement can be a challenge

where high volumes of activity fuels are created. On-site surface fuels can be difficult to mitigate, particularly with burning, in areas with deep and continuous fuel loadings. Although prescribed fire can be an effective tool for reducing hazardous fuels, applications are risky in these types of areas as well as in condition class 3 areas that have not been treated mechanically.

Assumptions related to access (roads)

Only authorized roads are used for hazardous fuel management.

The cost of using prescribed fire is more expensive where access is limited (Brown 1991). These higher costs are associated with factors such as transportation of personnel to conduct operations and a greater reliance on aerial (e.g. helicopter) compared to hand-ignition.

The cost of mechanical treatments is more expensive where access is limited because of a variety of factors including harvest systems and treatment of activity fuels. Where access is limited, timber harvesting is often conducted with helicopter yarding, which is more expensive than ground-based yarding systems. In addition, hazardous fuels treatments are more effective where natural and activity fuels, particularly the smaller coarse size class (more than 3 inches and less than 8 inches), are mitigated. Where the treatment is targeting smaller diameter material, whole tree yarding is the most effective method for reducing activity fuels within treatment areas. However, this is more expensive where helicopter yarding is used. Post-treatment activity fuel abatement in helicopter areas is also more expensive than in areas with better access.

To provide a relative comparison of hazardous fuels treatment costs for the alternatives, we developed combinations of treatment types and access. The following were assumed to provide a relative comparison of hazardous fuels treatment costs per acre (from 1-least expensive to 9-most expensive):

- 1) Timber harvesting, ground based, with existing system roads
- 2) Timber harvesting, ground based, with temporary roads
- 3) Timber harvesting, ground based, with new road construction
- 4) Prescribed fire, hand-lighting, with existing system roads
- 5) Prescribed fire, aerial-lighting, with existing system roads
- 6) Timber harvesting, helicopter yarding, with existing system roads
- 7) Timber harvesting, helicopter yarding, with temporary roads
- 8) Timber cutting, ground based, with existing system roads
- 9) Mechanical treatments (chipping/mastication/mulching, etc), with existing roads

The order of the above was based on the following assumptions:

- Timber harvesting generates revenues that at least partially off-set costs associated with new road construction or reconstruction.
- Timber cutting does not generate revenue and therefore new road construction would not occur. However, some heavy maintenance or reconstruction of existing roads may be required. Timber cutting requires a secondary treatment of removing trees through yarding which is an additional cost that exceeds aerial ignition costs for prescribed fire.

- Prescribed fire does not generate revenue and therefore new road construction would not occur. Heavy maintenance or reconstruction of existing roads would also not occur. Prescribed fire using hand- or aerial-lighting is potentially less costly than timber cutting due to the additional costs associated with timber cutting to treat residual fuels.
- Natural and activity fuel mitigations create the same ending surface fuel loadings.

These different types of hazardous fuels treatments were attached to the various combinations of tools and access described in table 5. This information was used to develop relative cost comparisons for treating hazardous fuels in WUI and community public water system areas for the alternatives. A single type of treatment was assigned to a proportion of WUI or community public water system areas that were developed based on the following assumptions:

- Treatments are first entry, not maintenance of previous treatments.
- All the acreage in the WUI or community public water system area is treated. That is, the analysis is not based on projections for the alternatives but rather on total number of acres of WUI or community public water system assigned to Management Themes. Proportions of areas assigned a treatment are for comparison purposes only; they do not constitute an intent to treat.
- There are existing roads available.
- Mechanical ground based treatments would occur closest to existing roads. Aerial treatments would occur farther away.
- While several combinations of treatments could often be used within a Management Theme, the least expensive would be applied.
- More mechanical treatments than prescribed fire would occur in WUI. More prescribed fire than mechanical would occur in community public water system areas.

This information was used to develop a relative cost per acre of treating hazardous fuels in WUI and community public water system areas based on the ranking of treatments and proportion of area that falls into various categories (table 6).

Table 6. Information used to develop cost comparisons for treating hazardous fuels in the WUI and community water supply system*

	Wildland-Urban Interface			
Management Themes	2001 Roadless Rule	Existing Plans	Proposed Rule	Modified Rule
Wild Land Recreation	1/8 treated w/ 1** 1/4 treated w/ 4	1/2 treated w/ 4 1/2 treated w/ 5	1/2 treated w/ 4 1/2 treated w/ 5	1/2 treated w/ 4 1/2 treated w/ 5
Primitive and Special Areas of Historic or Tribal Significance	1/4 treated w/ 5 1/4 treated w/ 6 1/8 treated w/ 8	1/8 treated w/ 1 1/4 treated w/ 4 1/4 treated w/ 5 1/4 treated w/ 6 1/8 treated w/ 8	1/8 treated w/ 1 1/4 treated w/ 4 1/4 treated w/ 5 1/4 treated w/ 6 1/8 treated w/ 8	1/8 treated w/ 1 1/4 treated w/ 4 1/4 treated w/ 5 1/4 treated w/ 6 1/8 treated w/ 8
Backcountry Restoration Outside CPZ or Significant Risk Area		1/4 treated w/ 1 1/8 treated w/ 3 1/8 treated w/ 4 1/8 treated w/ 5	1/4 treated w/ 1 1/8 treated w/ 3 1/8 treated w/ 4 1/8 treated w/ 5	1/2 treated w/ 4 1/2 treated w/ 5
Backcountry Restoration Inside CPZ or Significant Risk Area		1/8 treated w/ 6 1/8 treated w/ 8 1/8 treated w/9	1/8 treated w/ 6 1/8 treated w/ 8 1/8 treated w/9	1/4 treated w/ 1 1/8 treated w/ 2 1/8 treated w/ 4 1/8 treated w/ 5 1/8 treated w/ 6 1/8 treated w/ 8 1/8 treated w/9
General Forest, Rangeland, Grassland		1/2 treated w/ 1 1/4 treated w/ 3 1/4 treated w/ 6	1/2 treated w/ 1 1/4 treated w/ 3 1/4 treated w/ 6	1/2 treated w/ 1 1/4 treated w/ 3 1/4 treated w/ 6
	Community Public Water System Areas			
Wild Land Recreation	1/8 treated w/ 1 1/4 treated w/ 4	1/2 treated w/ 4 1/2 treated w/ 5	1/2 treated w/ 4 1/2 treated w/ 5	1/2 treated w/ 4 1/2 treated w/ 5
Primitive and Special Areas of Historic or Tribal Significance	3/8 treated w/ 5 1/4 treated w/ 6	1/8 treated w/ 1 1/4 treated w/ 4 3/8 treated w/ 5 1/4 treated w/ 6	1/8 treated w/ 1 1/4 treated w/ 4 3/8 treated w/ 5 1/4 treated w/ 6	1/8 treated w/ 1 1/4 treated w/ 4 3/8 treated w/ 5 1/4 treated w/ 6
Backcountry Restoration Outside CPZ or Significant Risk Area		1/8 treated w/ 1 1/8 treated w/ 2 1/4 treated w/ 4 1/4 treated w/ 5 1/4 treated w/ 6	1/8 treated w/ 1 1/8 treated w/ 2 1/4 treated w/ 4 1/4 treated w/ 5 1/4 treated w/ 6	1/8 treated w/ 1 1/4 treated w/ 4 3/8 treated w/ 5 1/4 treated w/ 6
Backcountry Restoration Inside CPZ or Significant Risk Area				1/8 treated w/ 1 1/8 treated w/ 2 1/4 treated w/ 4 1/4 treated w/ 5 1/4 treated w/ 6
General Forest, Rangeland, Grassland		1/4 treated w/ 1 1/4 treated w/ 3 1/2 treated w/ 6	1/4 treated w/ 1 1/4 treated w/ 3 1/2 treated w/ 6	1/4 treated w/ 1 1/4 treated w/ 3 1/2 treated w/ 6

* Numbers 1 through 9 refer to the different types of hazardous fuel treatments listed above.

**Under the 2001 Roadless rule 1/8 of the treatments in WUI would use timber harvesting, ground based systems, from existing road systems (1); 1/4 of the treatments in WUI would use prescribed fire, hand-lighting, from existing road systems (4); 1/4 of the treatments in WUI would use prescribed fire, using aerial systems, from existing roads (5); 1/4 of the treatments would use timber harvesting, using helicopter systems, from existing roads (6); and 1/8 of the treatments in WUI would use timber cutting, ground based systems from existing roads (8).

The incidence of human-caused starts is assumed to be higher in areas that could be roaded compared to areas that remain unroaded. This is based on the national and Idaho 1986-1996 data that showed that number of human-caused starts was greater in roaded versus unroaded areas.

Assumptions related to hazardous fuels management for unwanted wildland fire

Hazardous fuels treatments in the WUI may create conditions within a landscape that are not natural. This includes features such as shaded fuelbreaks, or areas where fuels are chipped or masticated. It may also include the removal of ladder fuels in vegetation types where such conditions contributed to a natural stand-replacing fire regime. This would occur because although this type of fire would be part of the natural fire regime, it would be unwanted in areas such as WUI.

Information Used

Fire Occurrence—

Fire occurrence data was determined from a dataset provided by the State Working Group. The data covered a greater number of years than were displayed. The timeframes used for this assessment were matched to the data available nationally from the 2000 Fuel and Fire Report. Cause was recoded to a numeric value to assist in the analysis. Human-caused ignitions are wildland fires started by campfires, smoking, debris burning, incendiary, equipment use, railroads, and children. Fires of undetermined causes were included in the human-caused category for table 3, but were not included in the assessment described in table 4 because in some cases the cause was not listed. Designated wilderness was also not included in the analysis to be consistent with the 2000 Fuel and Fire Report.

The data set is:

FIRE_OCCURRENENCES_with_wilderness.xls

Summary spreadsheet for the above:

FIRE_OCCURRENENCES_with_wilderness_analysis.xls

Ability to Treat and Fire Prevention for the draft and final eis—

Source data for acres were derived from GIS overlays converted to spreadsheets. The original datasets for the draft EIS were:

- Ability_to_treat_FP_08222007.xls
- Ability_to_treat_SP_08222007.xls

Summary spreadsheets for the above:

- Roadless_fr_frcc_FP
- Roadless_fr_frcc_SP
- Information from the summary spreadsheets above is displayed in Appendix A.

- The wildland-urban interface is described in: wui_metadata.doc. Municipal water-supply metadata is in the project file.

Source data for acres for the final EIS were:

- Ability_to_Treat_FP1.xls
- Ability_to_Treat_NA41.xls
- Ability_to_Treat_SP1.xls

Summary spreadsheets for the above:

- Roadless_fr_frcc_summary_all.xls
- Roadless_fr_frcc_FP.xls
- Roadless_fr_frcc_NA41.xls
- Roadless_fr_frcc_SP.xls
- relative_costs.xls

Data from the Roadless_fr_frcc_FP.xls was used in the summary Fire Regime and Condition Class tables for the Idaho Roadless Areas (tables 6 and 7).

For the draft EIS the Fire Regime Condition Class (FRCC) information was derived from the LANDFIRE Rapid Assessment (RA). For the Final EIS, FRCC was developed from the LANDFIRE National Product which was classified from a 2000 remotely sensed image (LANDFIRE 2007). Idaho is covered by the Northern and Central Rockies, Great Basin, and Northwest LANDFIRE map zones though the majority of the state is in the Northern and Central Rockies. The LANDFIRE National process was a mid-scale effort to produce maps and models of potential natural vegetation groups, reference fire regimes, and FRCC for the conterminous United States. LANDFIRE National data is intended for national- to regional-scale strategic planning, broad ecological assessments and resource allocation.

Though we are using the FRCC, we acknowledge that the conditions have likely changed in some areas since 2000 due to wildland fires, insects and disease, and etc. Acres burned were summarized to provide some indication of how extensive these changes may be. However, this information is derived from the fire perimeters and does not necessarily indicate that all the acres within the perimeter have burned. In some cases areas may be much different than characterized by the FRCC while other areas may have underburned or be unburned and therefore be little changed.

Affected Environment

The Analysis Area for the comparison of alternatives is the Inventoried Roadless Areas in the State of Idaho. The Affected Environment for the WUI and community public water systems is the WUI and community public water systems within the Idaho Roadless Areas. The Affected Environment for Fire Prevention is the Analysis Area. Fire Regime Condition Class is characterized individually for the Analysis Area, the WUI, and the community public water systems. The FRCC within the Analysis Area and Affected Environment are used to help set context for the alternatives.

The natural fire regimes classified through the LANDFIRE are used to describe the natural role of fire. The Hardy et al. (2000) Fire Regime classification describes natural fire in terms of fire return interval and amount of replacement of the upper life-form. Fire Regimes are classified into five categories:

I – Frequent, low to mixed severity: (0-35 year return interval, less than 75 percent of the upper life-form replaced)

II – Frequent, high severity: (0-35 year return interval, greater than 75 percent of the upper life-form replaced)

III – Less frequent, mixed severity: (35-100+ year return interval, less than 75 percent of the upper life-form replaced)

IV – Less frequent, high severity: (35-100+ year return interval, greater than 75 percent of the upper life-form replaced)

V – Infrequent, high severity: (200+ year return interval, greater than 75 percent of the upper life-form replaced)

Of the total Idaho Roadless Area acres, 94 percent of the area is classified into Fire Regimes. The unclassified areas are rock, water, snow or ice, and bare soil, or are developed areas such as transportation corridors, mines, quarries, home sites, or other kinds of features that are not described by the Fire Regimes. Of the area classified into Fire Regimes, most falls into Fire Regimes III, IV or V (table 7). Of this, Fire Regime III makes 53 percent of the acres followed by Fire Regime IV (22 percent). Fire Regime V comprises 12 percent. Less than 7 percent of the area falls into Fire Regimes I or II.

Table 7—Acres of Fire Regime and Percent of Total Acres by Fire Regime for Idaho Roadless Areas

Fire Regime for Idaho Roadless Areas	Acres	Percent of Total Acres
FR I	574,922	6
FR II	102,297	1
FR III	4,928,429	53
FR IV	2,066,194	22
FR V	1,067,028	12
Unclassified	565,483	6
Total	9,304,353	

Condition Class (Hardy et al. 2000) is a measure of the departure between the way fires would behave within the Fire Regime currently compared to naturally. The variety of conditions including ecosystem composition, structure, and function that resulted from the natural fire regimes are described as the natural range of variability. The time period for natural is pre-European settlement (also defined as historical). There are a variety of factors that contribute to altered fire regimes including past timber harvesting, livestock grazing, conversion of lands to agriculture, fire suppression and fire exclusion, introduction of exotics organisms including plants and diseases, etc. These factors generally result in changes to key ecosystem components such as vegetative species composition, structural stage, age, canopy closure, landscape pattern, and fuel loadings, which in turn affect fire frequency, intensity and severity, and patch size. There are three Condition Classes defined as:

Condition Class 1 – Little departure from the natural fire regime and natural range of variability; risk of losing key ecosystem components is low;

Condition Class 2 – Moderately departed from the natural fire regime and natural range of variability; risk of losing key ecosystem components is moderate;

Condition Class 3 – Highly departed from natural fire regime and natural range of variability; risk of losing key ecosystem components is high.

“Risk” is not used in the condition class definition as the probability of a fire occurring; rather it refers to the potential harmful effects to key ecosystem components that may occur because of altered vegetation composition and structure and to the uncharacteristic wildfire effects that can occur once a wildland fire ignites and burns.

The majority of the Idaho Roadless Area acres (62 percent) are classified as Condition Class 2 (table 8). The majority of the acres of all Fire Regimes except FR IV are in Condition Class 2. In FR IV, more of the acres are in Condition Class 1. Fire Regime II has the most acres in Condition Class 3.

Table 8—Acres of Fire Regime and Condition Class and Percent of Total Acres (in parentheses) for Idaho Roadless Areas

Idaho Roadless Areas		Condition Class Acres (Percent of Fire Regime Acres)		
Fire Regime	Acres	1	2	3
FR I	574,922	173,641 (30)	370,539 (65)	30,742 (5)
FR II	102,297	26,565 (26)	54,085 (53)	21,647 (21)
FR III	4,928,429	1,033,392 (21)	3,585,611 (73)	309,426 (6)
FR IV	2,066,194	1,082,153 (52)	907,258 (44)	76,783 (4)
FR V	1,067,028	454,102 (43)	551,024 (52)	61,903 (5)
Unclassified	565,483	--	--	--
Total	9,304,353	2,769,853 (32)	5,468,517 (63)	500,501 (5)

Since development of the LANDFIRE data in 2000, there have been several wildland fires in Idaho Roadless Areas. From 2001 through 2007, approximately 1,010,039 acres or 11 percent of the Idaho Roadless Areas acres have burned. Some areas have burned once, others multiple times during these years. Effects from these fires were variable ranging from low to high intensity. In addition, affects on Fire Regime Condition Class and hazardous fuels also varies depending on the pre-fire condition and the intensity/severity of the fire. It is not possible to state that Fire Regime Condition Class or hazardous fuel conditions have improved based only on the fact that acres burned. In some cases the effect may have been positive; however there are situations where it may have been negative. An example is Fire Regime I which historically had extensive areas in large open to moderately dense stands of ponderosa pine. High intensity fire over extensive areas generally creates a large amount of grass-shrub, a condition that was uncommon historically. A large enough area of this could move an area that was in Condition Class 1 or 2 before the fire to Condition Class 2 or 3. In other cases, particularly in the cooler, infrequent Fire Regimes such as IV and V, Condition Class may have improved because areas were becoming more homogeneous, with less of the different tree size classes that would have occurred historically. Therefore, changes to either Fire Regime Condition Class or hazardous fuels would be addressed at the local level during site-specific planning.

Wildland-Urban Interface

Wildland-urban interface overlaps eight percent of the Idaho Roadless Area acres. In general, wildfire is unwanted in WUI and hazardous fuels treatments to reduce the risk are generally those that provide for conditions where firefighters can safely suppress fire or where the risk of stand-replacing wildland fire is reduced. Fire Regimes for the WUI areas (table 9) are somewhat different from the Idaho Roadless Area as a whole (table 7) in that there are more acres in the warmer Fire Regimes (I, II and III) and fewer acres in cooler Fire Regimes (IV and V). While about 60 percent of the acres of Idaho Roadless Areas are in Fire Regimes I, II and III (table 7) for WUI Fire Regimes I, II and III make up about 72 percent (table 9).

Table 9—Acres of Fire Regime and Percent of Total Acres by Fire Regime for Wildland-Urban Interface in Idaho Roadless Areas

Fire Regime for Wildland-Urban Interface	Acres	Percent of Total Acres
FR I	91,027	12
FR II	13,138	2
FR III	423,376	58
FR IV	129,740	18
FR V	41,284	6
Unclassified	32,593	4
Total	731,158	

Condition Classes within Fire Regimes are also somewhat different. In the warmer Fire Regimes (I, II and III), the WUI areas have a greater proportion of acres in Condition Classes 2 and 3 (table 10) than the Idaho Roadless Areas as a whole (57 percent compared to 46 percent) (table 8). In the cooler Fire Regimes (IV and V), while Condition Class 3 acres are about the same, there is more Condition Class 1 area in WUI compared to the Idaho Roadless Areas.

Table 10—Acres of Fire Regime and Condition Class and Percent of Total Acres for Wildland-Urban Interface in Idaho Roadless Areas

Wildland-Urban Interface		Condition Class Acres (Percent of Fire Regime Acres)		
Fire Regime	Acres	1	2	3
FR I	91,027	23,574 (26)	61,201 (67)	6,252 (7)
FR II	13,138	2,622 (20)	7,238 (55)	3,278 (25)
FR III	423,376	82,348 (19)	318,121 (75)	22,907 (6)
FR IV	129,740	69,600 (54)	53,696 (41)	6,444 (5)
FR V	41,284	20,720 (50)	18,603 (45)	1,962 (5)
Unclassified	32,593	--	--	--
Total	731,158	198,864 (28)	458,859 (66)	40,843 (6)

Community Public Water Systems

Community public water systems occur on more than three percent of the Idaho Roadless Area acres. Ten percent of the acres that provide drinking water from Idaho Roadless Areas overlap WUI; therefore 90 percent are in Idaho Roadless Areas outside of WUI. Generally, high intensity or severity wildfire is unwanted in areas that contribute to community public water systems. The Healthy Forests Restoration Act defines hazardous fuels for community public water systems as Fire Regime Condition Class 3 or Fire Regime I, II, or III Condition Class 2 or 3.

Generally the Fire Regimes for areas in Idaho Roadless Areas that contribute to community public water systems (table 11) are more similar to the Idaho Roadless Areas (table 7) as a whole than to areas defined as WUI (table 9). Community public water system areas have about the same proportion of acres in the warmer Fire Regimes as do the Idaho Roadless Areas.

However, community water system areas have more acres in Fire Regime I and less in Fire Regime III than the Idaho Roadless Areas. In the cooler Fire Regimes, the proportion of Fire Regime IV and V is about the same.

Table 11--Acres of Fire Regime and Percent of Total Acres by Fire Regime for Community Public Water Systems Areas in Idaho Roadless Areas

Fire Regime for Community Public Water System Areas	Acres	Percent of Total Acres
FR I	35,358	11
FR II	6,501	2
FR III	159,593	50
FR IV	67,962	21
FR V	39,949	13
Unclassified	10,826	3
Total	320,189	100

Over all Fire Regimes, community public water systems have more Condition Class 1 acres and fewer Condition Class 2 acres (table 12) than Idaho Roadless Areas (table 8) or WUI (table 10). The amount of Condition Class 3 in community public water systems is very slightly less than Idaho Roadless Areas or WUI. However, for the warmer Fire Regimes (I, II and III) community public water system areas generally have less Condition Class 1 and more Condition Class 2 than either the Idaho Roadless Areas as a whole or the WUI. In the cooler Fire Regimes (IV and V), community public water system areas have the greatest amount of Condition Class 1 and less Condition Class 2.

Table 12—Acres of Fire Regime and Condition Class and Percent of Total Acres for Community Public Water System Areas in Idaho Roadless Areas

Community Public Water System Areas		Condition Class Acres (Percent of Fire Regime Acres)		
Fire Regime	Acres	1	2	3
FR I	35,358	9,856 (28)	23,157 (65)	2,345 (7)
FR II	6,501	883 (14)	5,569 (86)	49 (0)
FR III	159,593	35,058 (22)	113,150 (71)	11,386 (7)
FR IV	67,962	41,332 (61)	25,789 (38)	841 (1)
FR V	39,949	21,770 (54)	16,194 (41)	1,985 (5)
Unclassified	10,826	--	--	--
Total	320,189	108,899 (35)	183,859 (60)	16,606 (5)

Environmental Consequences

Environmental Effects Common to All Alternatives

The effect of prescribed fire would be the same for the same vegetation, prescriptions, topography, soils, etc across the alternatives. The same is true for mechanical treatments such as timber cutting, chipping, masticating, etc in that the effects would be the same across the alternatives where the same vegetation is treated on similar topography. Differences between the alternatives are primarily in terms of which tools (prescribed fire or prescribed fire/mechanical) are allowed as there are differences in effects between prescribed fire versus mechanical, and whether or not road construction/reconstruction is allowed. Another difference between the alternatives is the objectives for treating hazardous fuels as this determines the outcomes of the treatments. The vegetative structure, composition, and landscape pattern that results from treatments to reduce uncharacteristic wildland fire may be different than those to reduce unwanted wildland fire.

Wildland fires are managed using the Appropriate Management Response (AMR). AMR can include wildland fire use for resource benefits where allowed under current or future Forest Plans. Neither the 2001 Roadless Rule nor the Proposed or Modified Rules effect where or how wildland fire management tactics or strategies, including wildland fire use can occur.

By policy, an unwanted wildland fire is a wildfire. Wildfires include fires started by humans other than agency personnel, lightning-ignited fires that are not managed for wildland fire use, or prescribed and wildland fires managed for fire use that are no longer meeting the prescriptive criteria. Fire suppression includes a full range of options, from very resource intensive (large numbers of personnel and equipment) to less intensive activities (few personnel and minimal equipment). The AMR decision to use one or a combination of options over others depends on many factors, including threats to life, property, and investments; fuel and weather conditions; natural resource concerns; terrain; and available resources such as personnel and equipment.

The alternatives do not directly affect the strategies or tactics undertaken for wildland fire management since roads are not constructed or reconstruction (though maintenance activities may be conducted) and timber harvesting is not undertaken to manage wildland fires. Timber cutting, such as that which might occur for hazard tree removal or fire line construction is still allowed as it is incidental. The alternatives indirectly affect fire management in that different tactics might be undertaken in roaded versus unroaded areas (McHugh and Finney 2003). However, this difference cannot be segregated from all the other factors that contribute to decision-making regarding strategies and tactics related to any one wildland fire. There has been an assumption that wildfire size in Idaho Roadless Areas may be larger than outside of Idaho Roadless Areas because there is a greater desire outside of Idaho Roadless Areas to keep wildfires small due to values at risk, or that when multiple starts occur more resources are prioritized to ignitions outside Idaho Roadless Areas. The national data may support this claim since for lightning and human-caused wildfires acres burned per start were about two times greater inside roadless areas than outside (table 3). For Idaho, acres burned per start from lightning were slightly greater inside Idaho Roadless Areas compared to outside (table 4). However acres burned per start from human-caused fire were 20 times greater outside of Idaho Roadless Areas. Therefore the Idaho data does not support this assumption. In any case, the alternatives would not have a direct effect on AMR. However, there may be an indirect effect

from the alternatives as they relate to the ability to alter conditions that contribute to fire behavior, which in part affects firefighter safety and fire management success. In Idaho Roadless Areas this most often occurs in or adjacent to WUI or community public water systems due to values at risk. There is therefore, an indirect relationship between the Ability to Treat Potential Treatment Areas and AMR. There is a direct relationship between fuels management program and Ability to Treat as described above.

Ability to Treat Hazardous Fuels in Wildland-Urban Interface

2001 Roadless Rule

Under the 2001 Roadless Rule, Ability to Treat WUI is defined as Prescribed Fire and Mechanical Tools Available, Access Prohibited for WUI in all Inventoried Roadless Areas. Hazardous fuels are defined as those that contribute to Uncharacteristic Wildland Fire which are described using Fire Regime Condition Class. In any Fire Regime, acres classified as Condition Class 2 or Condition Class 3 are at risk of burning uncharacteristically in the event of a wildland fire. Under the National Fire Plan, hazardous fuels can be defined more broadly for WUI at the local level through CWPPs, and therefore can include a greater range of fuel conditions than those that define Uncharacteristic Wildland Fire under the 2001 Roadless Rule.

Based on the Fire Regime Condition Class definitions, the majority (72 percent) of the WUI acres in Idaho Roadless Areas fall into Condition Class 2 or 3 (table 10). Therefore, under the 2001 Roadless Rule, much of the WUI warrants treatment to reduce the risk of Uncharacteristic Wildland Fire since so much of the area is in an uncharacteristic condition. In Fire Regimes I, II, and III reducing the risk of Uncharacteristic Wildland Fire would also benefit WUI. This would occur because the natural fire regimes in these areas are non-lethal or mixed. Non-lethal fires pose much lower risks to firefighters and can be more easily directed than stand-replacing (lethal) fires.

In ecosystems with mixed fire regimes, landscapes are highly diverse with mosaics of high and low fuels. In the mixed fire regimes (II and III) in WUI, fuel mosaics that would burn with non-lethal fire behavior would be consistent with the natural fire regime. However, in Fire Regimes IV and V, characteristic wildland fire is stand-replacing and therefore in this case, maintaining or restoring ecosystem characteristics to the range of variability that occurs under the natural disturbance regimes may still produce fuels that are hazardous to WUI. Treatments in the short-term could be conducted that would reduce the risk, but over time, maintaining these kinds of fuels would not be consistent with natural processes. In these types of Fire Regimes, treatments that benefit WUI, such as fuel breaks or stand structures and species compositions that may benefit WUI are not ecologically appropriate. These types of treatments would be inconsistent with the 2001 Roadless Rule.

Because access is restricted for hazardous fuels treatments under the 2001 Roadless Rule, mechanical treatments would occur only in limited areas due to a general paucity of existing roads. The most hazardous conditions are those described by Condition Class 3. In Idaho Roadless Areas, these areas are likely in Condition Class 3 because they are very dense and have high surface and vertical fuel loadings, or are very homogenous across a landscape because of lack of past disturbance. However, areas may also be in Condition Class 3 because of recent large wildfires that created uncharacteristically large mosaics of early seral.

In the situations where Condition Class 3 occurs because of lack of past disturbance, vegetative conditions are often such that some type of mechanical treatment is desirable initially even in areas where prescribed fire would eventually be goal. The risk can be most effectively reduced through thinning that removes ladder fuels and natural and activity fuel abatement that reduces surface fuels loading and continuity. Ground based systems are the most economical method for achieving this because fuels can be yarded off the site. Where this is not feasible but is within the reach of helicopters, fuel abatement can be a challenge where high volumes of activity fuel are created. On site surface fuels can be difficult to mitigate, particularly with burning, in areas with deep and continuous fuel loadings. While prescribed fire can be an effective tool for reducing hazardous fuels, applications are risky in these types of areas as well as Condition Class 3 that have not been treated mechanically.

Condition Class 2 areas are generally easier to treat because they are not as far departed from natural conditions. Therefore, they are often less dense, have lower natural fuel loadings, and more diverse landscape pattern. In these areas, fewer acres may require some type of initial mechanical treatment before prescribed fire. In areas where mechanical treatments may be beneficial initially, there may be a lower volume of surface fuels to mitigate. In addition, prescribed fire may be more feasible as an initial treatment in some of these areas, potentially allowing more area to be treated.

The vegetative conditions that result from hazardous fuels treatments in WUI that reduce the risk of uncharacteristic wildland fire should be consistent with the values and features of roadless areas even though disturbance, particularly in mechanically treated areas, may be evident in the short-term. Over time this should become less noticeable, particularly in areas where activity fuels have been removed from the site or mitigated through burning. While vegetative communities that result from treatments may be more ecologically appropriate, their appearance may contrast with untreated (or undisturbed) areas. This may be particularly evident in non-lethal Fire Regimes where ladder fuels from conifer layers are reduced.

Existing Plans

The Idaho Roadless Rule management themes were used to help categorize the management prescriptions in the Existing Plans as described above. Table 13 displays the amount of the WUI areas in Ability to Treat categories. Based on this assessment, it appears the majority (89 percent) of the 731,159 acres may allow for prescribed fire and mechanical tools to treat hazardous fuels though the actual allowed area may be less depending on Existing Plan management prescription. In regards to access, based strictly on the cross-walk to the Idaho Roadless Rule Management Themes, a large proportion (65 percent) of the Idaho Roadless Areas WUI acres may allow access for hazardous fuels management. This would facilitate a greater opportunity to accomplish hazardous fuels treatments in Condition Class 3 areas. However, of the area available for mechanical, 26 percent is Access Prohibited. The ability to accomplish hazardous fuels treatments in these areas are similar to that described for the 2001 Roadless Rule.

As with the cross-walk for tools, the actual amount of area where roads can be constructed or reconstructed may be less than estimated depending on the management prescription in the particular existing forest plan. WUI acres assigned to GFRG, which are 14 percent of the Idaho Roadless Area acres (table 13), are likely most consistent with the cross-walk to the management themes for hazardous fuels. However, of the acres cross-walked to Backcountry Restoration,

which are about half (51 percent) of the Idaho Roadless Area acres, the amount of area with an Existing Plan prescription that allows access may be less than represented by the cross-walk.

Table 13 —Percent of Wildland-Urban Interface Acres in Idaho Roadless Areas by Ability to Treat Categories for Existing Plans

Existing Plans ¹ Tools	Access—Acres (Percent of Wildland-Urban Interface)		
	Prohibited	Variable	Not Prohibited
Prescribed Fire Available to Treat for Various Purposes	37,722 acres (5%)	0 acres (0%)	0 acres (0%)
Prescribed Fire and Mechanical Tools Available to Treat for Various Purposes	179,057 acres (24%)	373,768 acres (51%)	102,292 acres (14%)

¹Analysis does not include Forest Plan Special Areas which make up about 6 percent of the roadless area acres

The vegetative conditions that result from hazardous fuels treatments for WUI under Existing Plans could have variable impacts to the values and features of Idaho Roadless Areas. Where hazardous fuels treatments are for habitat restoration or to reduce the risk of uncharacteristic wildland fire, impacts would likely be consistent over time. The greatest impact could occur in areas where hazardous fuels treatments are to reduce the risk of Unwanted Wildland Fire. In some cases, particularly in the non-lethal fire regimes, restoring or maintaining vegetative conditions similar to the natural condition would reduce the risk of uncharacteristic as well as unwanted wildland fire effects. However, in stand-replacing (lethal) fire regimes, hazardous fuels treatments that benefit WUI may be fuel breaks or stand conditions that are not part of the natural vegetative condition. These types of treatments have a higher likelihood of impacting the values and features of Idaho Roadless Areas.

Proposed Idaho Roadless Rule (Proposed Action)

Road construction/reconstruction is prohibited in the Primitive and SAHTS themes, but timber cutting to remove hazardous fuels is permitted. Road construction/reconstruction and timber cutting would be permitted in the Backcountry theme to (1) protect at-risk communities and municipal water supply systems from adverse effects of wildland fire; (2) reduce hazardous fuels associated with wind throw, blow-down, or ice storm damage; or the existence or imminent threat of an insects or disease epidemic that is significantly threatening an ecosystem component; or resource values that may contribute to the significant risk of wildland fire; or (3) reduce hazardous fuels where wildland fire poses a threat to, and where natural fire regimes are important for, threatened and endangered species or their habitats. These activities are consistent with HFRA.

Under the Proposed Rule much of the WUI area (89 percent) is in a management theme that allows for prescribed fire and mechanical tools (table 14). Of this, 67 percent allows for road construction or reconstruction. The remaining area (6 percent) is in a management theme where prescribed fire is the primary tool for hazardous fuels management. Under the Proposed Rule, hazardous fuels management in WUI would be to address uncharacteristic and unwanted wildland fire. A combination of prescribed fire and mechanical tools and access provide the most opportunity to facilitate hazardous fuels management particularly in Condition Class 3 areas.

Table 14—Percent of Wildland-Urban Interface Acres in Idaho Roadless Areas by Ability to Treat Categories for the Proposed Idaho Roadless Rule

Proposed Rule ¹	Access—Acres (Percent of Wildland-Urban Interface)	
	Prohibited	Not Prohibited
Tools Available to Treat Unwanted Wildland Fire	41,379 acres (6%)	0 acres (0%)
Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire	162,464 acres (22%)	488,996 acres (67%)

¹Analysis does not include Forest Plan Special Areas which make up about 6 percent of the roadless area acres

The vegetative conditions that result from hazardous fuels treatments for WUI under the Proposed Rule could have variable impacts to the values and features of Idaho Roadless Areas. Hazardous fuels treatments under the Proposed Rule are to reduce the risk of Unwanted Wildland Fire. This could include a broad range of treatments like fuel breaks or stand conditions that are unlike the natural vegetative condition but meet the objectives of reducing wildfire risk.

Modified Idaho Roadless Rule (Preferred Alternative)

For this alternative, the permissions for road construction/reconstruction to support timber cutting to reduce hazardous fuels were changed from the Proposed Rule. Many people felt the Proposed Rule provide broad permissive language for road construction to reduce the significant risk of wildland fire effects. The Modified Rule changed this language by (1) designating an area known as the CPZ where temporary roads could be constructed to reduce hazardous fuels adjacent to communities; and (2) providing additional criteria for when temporary roads could be constructed to reduce significant risk outside the CPZ to protect at-risk communities and community public water systems.

Under the Modified Rule, WUI is addressed in different ways depending on the management theme (table 5). In the Wild Land Recreation, Primitive and Special Areas of Historic or Tribal Significance, wildfire hazards in WUI are defined as those conditions that contribute to the Uncharacteristic Wildland Fire. In Backcountry WUI is addressed through the CPZ. In this area, hazardous fuels treatments are for Unwanted Wildland Fire. In cases where WUI may have been identified through, for example, a County Wildfire Protection Plan but the area does not fall into the CPZ, hazardous fuels treatments could occur following a significant risk determination. Outside the CPZ, temporary roads could be constructed only if they were found to be the only feasible way to meet the objectives of reducing the significant risk of wildland fire effects on an at-risk community or community public water system, and if the activity was developed in a manner that maintains or improves one or more roadless area characteristics over the long-term. Additional analysis is required for these areas as well as regional forester approval. Treatments in these areas would also be for Unwanted Wildland Fire. Hazardous fuels treatments are also for Unwanted Wildland Fire in the GFRG theme. The analysis for the Modified Rule is based on WUI as defined by the “CPZ” concept as described above. We did not attempt to identify areas that may be treated based on a significant risk determination as this requires a site-specific assessment.

Under the Modified Rule much of the WUI area (87 percent) is in a management theme that allows for prescribed fire and mechanical tools (table 15). Overall, 21 percent of the WUI falls into Management Themes that allow prescribed fire and mechanical tools, but not access, for

treatment of conditions that contribute to Uncharacteristic Wildland Fire. Sixty-six percent of the WUI area is in management themes that provide prescribed fire and mechanical tools with access. A combination of prescribed fire and mechanical tools and access provide the most opportunity to facilitate hazardous fuels management.

Table 15—Percent of Wildland-Urban Interface Acres in Idaho Roadless Areas by Ability to Treat Categories for the Modified Idaho Roadless Rule

Modified Rule ¹	Access	
	Prohibited	Not Prohibited
Tools Prescribed Fire to Available to Treat Uncharacteristic Wildland Fire	50,803 acres (7%)	0 acres (0%)
Tools Prescribed Fire and Mechanical Tools Available to Treat Uncharacteristic Wildland Fire	153,306 acres (21%)	0 acres (0%)
Tools Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire	0 acres (0%)	488,730 acres (66%)

¹Analysis does not include Forest Plan Special Areas which make up about 6 percent of the roadless area acres

The vegetative conditions that result from hazardous fuels treatments for WUI under the Modified Rule could have variable impacts to the values and features of Idaho Roadless Areas. Hazardous fuels treatments under the Modified Rule are to reduce the risk of Uncharacteristic and Unwanted Wildland Fire. Outside the CPZ, significant risk area or GFRG the vegetative conditions that result from hazardous fuels treatments in WUI should be consistent with the values and features of Idaho Roadless Areas even though disturbance, particularly in mechanically treated areas, may be evident in the short-term. Over time this should become less noticeable, particularly in areas where activity fuels have been removed from the site or mitigated through burning. While vegetative communities that result from treatments may be more ecologically appropriate, their appearance may contrast with untreated (or undisturbed) areas. This may be particularly evident in non-lethal Fire Regimes where ladder fuels from conifer layers are reduced. In the CPZ, significant risk area or GFRG, vegetative treatments for Unwanted Wildland Fire may include a broad range of treatments like fuel breaks or stand conditions that are unlike the natural vegetative condition but meet the objectives of reducing wildfire risk.

Ability to Treat Hazardous Fuels in Community Public Water Systems

2001 Roadless Rule

In the case of the community public water systems, fewer acres are in Condition Class 3 (table 12) compared to the WUI (table 10). Therefore, and assuming that prescribed fire can be used more often as an initial treatment in Condition Class 2, a greater proportion of the community public water systems could potentially be treated with prescribed fire compared to WUI. In addition, prescribed fire is not as dependent on roads as are mechanical treatments. Prescribed fire may also be more acceptable in community public water systems than in WUI relative to risk of escape and smoke. Since only ten percent of the community public water systems acres in Idaho Roadless Areas correspond with WUI this may provide more opportunity for prescribed fire treatments.

Existing Plans

Similar to WUI, it appears the majority (93 percent) of the community public water system acres may allow for prescribed fire and mechanical tools to treat hazardous fuels though the actual allowed area may be less depending on Existing Plan management prescriptions (table 16). In regards to access, based strictly on the cross-walk to the Idaho Roadless Rule management themes, slightly less than half (47 percent) of the acres may allow access for hazardous fuels management. This is less area than for WUI, where 66 percent of the area is Variable or Not Prohibited. However, as described for WUI, the actual acres may be less depending on the Existing Plan management prescriptions.

Table 16—Percent of Community Public Water System Acres in Idaho Roadless Areas by Ability to Treat Categories for Existing Plans

Existing Plans ¹	Access—Acres (percent of Community Public Water System Area)		
	Prohibited	Variable	Not Prohibited
Tools			
Prescribed Fire Available to Treat for Various Purposes	18,901 acres (6%)	0 acres (0%)	0 acres (0%)
Prescribed Fire and Mechanical Tools Available to Treat for Various Purposes	146,832 acres (46%)	118,606 acres (37%)	32,770 acres (10%)

¹Analysis does not include Forest Plan Special Areas which make up about 1 percent of the roadless area acres

Proposed Idaho Roadless Rule (Proposed Action)

Compared to the WUI acres, slightly more are in Prescribed Fire Available (seven versus six percent), more are in Prescribed Fire and Mechanical Tools Available, Access Prohibited (34 versus 22 percent) and less are Prescribed Fire and Mechanical Tools Available, Access Not Prohibited (58 versus 67 percent) (tables 14 and 17). Under the Proposed Rule, treatments are to reduce the risk of Unwanted Wildland Fire. However, using Condition Classes 2 and 3 as an indicator of potential for Unwanted Wildland Fire, there are fewer acres are in Condition Class 2 and 3 in community public water systems than in WUI, and therefore having more area in prescribed fire the primary tool, or in where access is limited may not have the same consequences as areas that have greater proportion of Condition Class 2 or 3.

Table 16—Percent of Community Public Water System Acres in Idaho Roadless Areas by Ability to Treat Categories for the Proposed Idaho Roadless Rule

Proposed Rule ¹	Access—Acres (Percent of Community Public Water System Area)	
	Prohibited	Not Prohibited
Tools		
Prescribed Fire Available to Treat Unwanted Wildland Fire	21,516 acres (7%)	0 acres (0%)
Prescribed Fire and Mechanical Tools to Treat Unwanted Wildland Fire	107,748 acres (34%)	187,846 acres (58%)

¹Analysis does not include Forest Plan Special Areas which make up about 1 percent of the roadless area acres

Modified Idaho Roadless Rule (Preferred Alternative)

Under the Modified Idaho Roadless Rule, a minority (16 percent) of the community public water system areas fall into Prescribed Fire and Mechanical Tools to Treat Unwanted Wildland Fire, Access allowed (table 18). These are areas that are in the Backcountry Restoration CPZ and GFRG. The remainder of the community public water system acres is in Wild Land Recreation, Primitive or Backcountry outside the CPZ. Of these, about 135,315 are in Backcountry outside the CPZ. These areas could be treated with mechanical tools and access based on a significant

risk determination. In that case they would fall into Prescribed Fire and Mechanical Tools to Treat Unwanted Wildland Fire, Access Not Prohibited. However, as we could not identify what proportion of these acres might receive this determination, all acres in Backcountry outside the CPZ are displayed in Prescribed Fire and Mechanical Tools to Treat Uncharacteristic Wildland Fire, Access Prohibited.

Table 17—Percent of Community Public Water System Acres in Idaho Roadless Areas by Ability to Treat Categories for the Modified Idaho Roadless Rule

Modified Rule ¹ Tools	Access—Acres (Percent of Community Public Water System Area)	
	Prohibited	Not Prohibited
Prescribed Fire Available to Treat Uncharacteristic Wildland Fire	21,543 acres (7%)	0 acres (0%)
Prescribed Fire and Mechanical Tools to Available to Treat Uncharacteristic Wildland Fire	243,058 acres (76%) ²	0 acres (0%)
Prescribed Fire and Mechanical Tools Available to Treat Unwanted Wildland Fire	0 acres (0%)	52,508 acres (16%)

¹Analysis does not include Forest Plan Special Areas which make up about 1 percent of the roadless area acres

²Community Water System Areas in Backcountry Restoration outside the CPZ that receive a significant risk determination would fall into the Prescribed Fire and Mechanical Tools to Treat Unwanted Wildland Fire, Access Under Limited Exceptions (Not Prohibited). This comprises 42 of the 76 percent of the acres

Relative Treatment Costs for Wildland-Urban Interface and Community Public Water Systems

The analysis of relative treatment costs per acre for the alternatives indicates that hazardous fuels treatments for WUI was potentially most costly per acre for the 2001 Roadless Rule, followed by the Existing Plans, and the Proposed and Modified Rules. The 2001 Roadless Rule has higher potential treatment costs per acre due to an assumption that only a small amount of ground-based timber harvest would occur while the majority of the treatments would be timber harvest with helicopter yarding or prescribed fire from existing roads or helicopter. Helicopter yarding and prescribed fire are more expensive than ground-based timber harvest because timber harvest generates some revenue and ground-based yarding systems are less expensive to conduct than those that involve helicopters. The differences for the other alternatives are based on how many acres are in Management Themes that may allow for a greater mix of less expensive treatments. The Existing Plan is more expensive than the Proposed and Modified Rules because of the greater amount of WUI area in Wild Land Recreation and Primitive themes. The Proposed and Modified Rules have more WUI in Backcountry which allows for a greater mix of less expensive treatments. The Modified Rule is slightly less expensive than the Proposed Rule because it has a little more WUI area in Backcountry relative to the Primitive or Wild Land Recreation themes.

For the 2001 Roadless Rule, Existing Plans and Proposed Rule, relative treatment costs per acre in community public water system areas ranked highest for the 2001 Roadless Rule, followed by Existing Plans and the Proposed I Rule. For the Modified Rule, relative treatment costs per acre are the same as the Proposed Rule assuming that all community public water system acres outside the CPZ are treated like the CPZ using a significant risk determination. However, if all community public water system acres outside the CPZ are treated without using the significant risk determination, the Modified Rule falls in between the 2001 Roadless Rule and Existing

Plan. This was based on the assumption that treatments in community public water system areas outside the CPZ would be similar to the Primitive theme.

Fire Prevention

The 2001 Roadless Rule has little potential impact on the fire prevention program (table 19) since road construction or reconstruction is restricted to very limited exceptions. Therefore, there appears to be low potential for an increase in human-caused starts due to roads into additional areas on Forests under the 2001 Roadless Rule. This is also true for the Proposed Rule since 91 percent of the Idaho Roadless Area acres have Access Prohibited. Five percent allows Access Under Limited Exceptions but because these areas allow only temporary roads, long-term effects are minimal. For Existing Plans, 64 percent of the Idaho Roadless Areas could have some level of road construction or reconstruction while under the Proposed Rule the amount of area is 66 percent. Therefore, under the Existing Plans and Proposed Rule there could be an increase in human-caused starts into more areas on the Forests. This indicates there is a potential for an increase in the workload for the Fire Prevention program under the Existing Plans and Proposed Rule.

Table 18—Percent of Idaho Inventoried Roadless Area Acres With Prohibited, Variable and Not Prohibited Access Potential by Alternative

Access	2001 Roadless Rule	Existing Plans	Proposed Rule	Modified Rule
Access Prohibited	100%	38%	37%	39%
Access Under Limited Exceptions ¹	0%	0%	56%	(52)+5 ³ %
Access Variable ²	0%	48%	0%	0%
Access Not Prohibited	0%	14%	7%	4%
Total	100%	100	100%	100%

¹ Permitted under limited exceptions refers to the exceptions allowed in the rules

² Permitted under variable refers to the variety of allowances in existing plans

³ About 5 percent of the Backcountry theme is in the CPZ where temporary roads could be constructed. Outside the CPZ (52 percent of the area) a very limited amount of temporary roads are likely to be constructed because of conditions related to significant risk

Conclusions - Ability to Treat

2001 Roadless Rule

Under the 2001 Roadless Rule, all acres with uncharacteristic wildland fire hazard in WUI and community public water systems are available to treat with prescribed fire and mechanical tools. A majority of the acres are in Fire Regime Condition Class 2 and 3 therefore, much of the area is in need of treatment to reduce the risk of Uncharacteristic Wildland Fire. However, because access to accomplish fuels treatments is restricted, mechanical treatments would generally occur near the limited number of existing roads. This may compromise the ability to treat Condition Class 3 areas as these often benefit from an initial mechanical treatment before application of prescribed fire. This is particularly true in WUI where risk of escapes and smoke are a concern to adjacent property owners.

Under the 2001 Roadless Rule hazardous fuels are defined uncharacteristic wildfire. In the non-lethal and mixed fire regimes (Fire Regimes I, II, and portions of III), restoring and maintaining natural vegetative conditions can reduce risks of stand-replacing wildfire. However, in lethal

fire regimes, the natural vegetative conditions can still produce stand-replacing wildfire, which is often unwanted in WUI. Therefore, restoring natural fire regimes may not reduce wildfire risk some WUI areas. However, hazardous fuels treatments that move conditions toward natural vegetative conditions are likely more consistent with Idaho Roadless Area values and features.

Existing Plans

Based on the cross-walk of Existing Plan prescriptions to the Idaho Roadless Rule Management Themes, at least 89 percent of the WUI and 93 percent community public water systems are available to treat with prescribed fire and mechanical tools. However, access is prohibited on 29 percent of the area in WUI and 52 percent of the area in community public water systems. Also, not all Existing Plan management prescriptions that allow mechanical or road construction allow that activity for hazardous fuels management. In addition, some plans restrict hazardous fuels treatments to reducing uncharacteristic wildland fire while others include a broader category of unwanted wildland fire. Therefore, the amount of area that may allow mechanical treatments or prescribed fire, or with unrestricted access to treat hazardous fuels, particularly for the benefit of WUI or community public water systems, may actually be less than described by the cross-walk. Where hazardous fuels treatments are allowed, those that are to reduce the risk of uncharacteristic wildland fire may not reduce wildfire risk to WUI or community public water systems. Those that address unwanted wildland fire generally provide a greater range of options particularly in lethal fire regimes. However, hazardous fuels treatments that restore or maintain natural vegetative conditions may be more consistent with the Idaho Roadless Area values and features than those that reduce the risk of unwanted wildland fire.

Proposed Idaho Roadless Rule (Proposed Action)

At least 89 percent of the WUI and 92 percent of the community public water systems are available to treat with prescribed fire and mechanical tools. Access is prohibited on 28 percent of the WUI acres and 41 percent of the community public water systems. Therefore, 67 percent of the WUI acres and 58 percent of the community public water system acres could be treated with prescribed fire and mechanical with road construction or reconstruction. Hazardous fuels are defined as those that contribute to Unwanted Wildland Fire. This allows for a greater range of vegetative treatments such as fuel breaks or stand manipulations that reduce the risk of stand-replacing fire. However, hazardous fuels treatments that create conditions that reduce the risk of Unwanted Wildland Fire may not be consistent with retaining Idaho Roadless Area values or features.

Modified Idaho Roadless Rule (Preferred Alternative)

At least 87 percent of the WUI and community public water systems are available to treat with prescribed fire and mechanical tools. Access is prohibited on 28 percent of the WUI acres and 41 percent of the community public water systems. Therefore, 66 percent of the WUI acres and 16 percent of the community public water system acres could be treated with prescribed fire and mechanical with temporary roads. Hazardous fuels are defined as those that contribute to Uncharacteristic or Unwanted Wildland Fire. For Uncharacteristic Wildland Fire, in the non-lethal and mixed fire regimes (Fire Regimes I, II, and portions of III), restoring and maintaining natural vegetative conditions can reduce risks of stand-replacing wildfire. However, in lethal fire regimes, the natural vegetative conditions can still produce stand-replacing wildfire, which

is often unwanted in WUI. Therefore, restoring natural fire regimes may not reduce wildfire risk some WUI areas. However, hazardous fuels treatments that move conditions toward natural vegetative conditions are likely more consistent with Idaho Roadless Area values and features. Areas where treatments are for reducing the risk of Unwanted Wildland Fire allow for a greater range of vegetative treatments such as fuel breaks or stand manipulations that reduce the risk of stand-replacing fire. However, hazardous fuels treatments that create conditions that reduce the risk of Unwanted Wildland Fire may not be consistent with retaining Idaho Roadless Area values or features.

Conclusion - Fire Prevention

Road construction or reconstruction may increase the number of human-caused starts into areas where this is currently low. Therefore, number of starts and acres burned by humans could increase under the Existing Plans or Proposed Rule. Because the 2001 Roadless Rule does not allow road construction or reconstruction except under very limited circumstances, this alternative would likely have little affect on starts or acres burned by human-caused fires. The same is true for the Modified Rule because most roads are temporary. In addition, road decommissioning would occur under all alternatives which may offset road construction or reconstruction.

Cumulative Effects

Fire exclusion and lack of treatment in Idaho Roadless Areas may have contributed to the amount of area that is in Fire Regime Condition Classes 2 and 3 or is hazardous to WUI. In the past several years, wildland fires have likely had the greatest impact on altering vegetative conditions. The wildland fires and management activities that have occurred would not affect the Ability to Treat described in this assessment. However, they may have reduced the need to restore Fire Regime Condition Class or treat hazardous fuels in some areas. Ability to Treat could be affected by a change in Management Theme under the Proposed and Modified Rule or revision or amendment under the Existing Plans. This could increase or decrease the amount of area assigned to the various combinations of access and tools.

Past road construction or reconstruction actions in Idaho Roadless Areas may have affected the Fire Prevention program. Additional road construction or reconstruction under the Existing Plans and Proposed Rule could increase the amount of area that may be affected by human-caused wildland fires.

Residential development in the WUI areas has raised concern among natural resource managers and is recognized as a primary factor influencing management activities. The increase in population growth and development adjacent to roadless areas is expected to continue. Idaho is among six states in the intermountain West with the greatest projected WUI expansion from 2000 to 2030 (Theobald and Romme 2007).

The current limitations under the 2001 Rule on roads in roadless areas constrains the ability to address wildland fire hazard in priority areas, which increases the chance of experiencing large, unwanted, or uncharacteristic fires in WUIs and municipal watersheds within or adjacent to roadless areas.

Fire prevention programs, community fire safe councils, and continued development of CWPPs would continue to make contributions to reducing wildland fire threats to communities and

municipal water supply systems. The increase in CWPPs coupled with existing fuel management policies would result in identifying and treating more of the highest priority acres to reduce the threat to communities and municipal water supply systems. Fuel treatments would not only continue to be implemented on other federal and state lands, but also on city, county, and private lands, to meet objectives in collaboratively developed CWPPs.

The beneficial fire and fuel-related effects associated with Existing Plans, and the Proposed and Modified Rule alternatives are very small in comparison with changes in vegetation expected from all fuel treatments on surrounding lands, together with natural disturbance events such as wildland fires. However, the effects expected from these alternatives would provide a minor incremental cumulative effect in reducing wildland fire threats to communities and municipal water supply systems and improving the agency's ability to meet other wildland fire management objectives. With more tools available, the Existing Plans and Proposed and Modified Rules would permit opportunities for fuel reduction in local areas that are currently not available under the 2001 Roadless Rule.

Global and regional climate change may increase the magnitude and extent of insect and disease epidemics, wildfires, and other natural disturbance events. A large body of evidence suggests that in the western United States there is a foreseeable trend toward warming, together with reduced precipitation and more frequent extremes in winds, tornados, and other weather events. The high-danger fire season is expected to become longer, and wildfires are expected to become more frequent and severe as a result of these climatic trends (Flannigan et al. 2000, McKenzie et al. 2004, Miller and Urban 1999, Torn and Fried 1992). Changing weather conditions coupled with the over-accumulation of fuels and increase in stands with condition class 2 or 3 create a situation that lends itself to extreme fire behavior having devastating effects to communities and the natural resources that people depend on. The differences in effects among Existing Plans, Modified and Idaho Rule alternatives are not significant enough in magnitude, geographic extent, or duration to have any measurable cumulative effect relative to changes associated with global and regional climate change.

Past road construction or reconstruction actions in Idaho Roadless Areas may have affected the fire prevention program. Additional road construction or reconstruction under the Existing Plans and the Proposed Idaho Roadless Rule could increase the amount of area that may be affected by human-caused wildland fires; however, more roads are being decommissioned than are constructed. There would likely be no net change under the 2001 Roadless Rule or Modified Roadless Rule.

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