

Landowners Can Make a Difference

Fuel Treatment Effectively Slows the Spread of Wildfire

3 Success Stories



By Matt Butler & Byron Bonney

Fire: *Tin Cup fire*

Started: *2007 fire season*

Cause: *lightning strike*

Location: *Bitterroot National Forest just west of Darby, Tin Cup Creek drainage*

When the crown fire from the main fire spotted into these areas, the lack of surface fuels from the thinning and prescribed burning kept the spot fires from gaining intensity and entering the crowns of the residual trees.

The fire was initially attacked by the Bitterroot National Forest firefighters. It grew very quickly and became the number one priority fire in the United States due to its proximity to the Wildland Urban Interface in and around

Darby, Montana.

The Bitter Root RC&D had conducted about 200 acres of fuel reduction on private lands to the east of the fire area. This treatment involved about 20 different landowners and included thinning, pruning and treating all slash from the treatments. The Incident Commander for the Incident Management Team (IMT) responsible for fighting the fire made a comment during the fire that the fuel treatments done on private land gave them a great advan-

tage to be able to control the fire before it became an immediate threat to the private land and structures in the area.

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The fire did actually burn into one of the areas treated. When the fire reached that area, it fell to the ground out of the tree crowns and became a surface fire that was relatively easy to contain and control. The Incident Commander felt that if the fire had continued its path toward other private lands, the firefighters would have been able to control it in much the same manner as they did on the private land where the fire did burn through the treated area.



Photo taken on north-east side of fire showing dozer preparing fire-line in dense canopied stand. This stand in the background would have been more susceptible to sustained crown fire events.

Fire: *Downing Mountain fire*
Started: *August 26, 2010*
Cause: *lightning strike*
Location: *Bitterroot National Forest west of Hamilton*

The fire was initially attacked by resources from the Forest Service. The primary method of spread was by single and group tree torching in denser canopied fuels with multiple spots ahead of the fire under a west wind.

Of concern was the presence of private lands and structures within the fire perimeter and several dozen more structures just ahead of the fire. These concerns led to Stage 1 and Stage 2 evacuations in place for homes primarily along the Wyant Lane, Humphrey Ranch Road and Grub Stake Road areas.

Recently several private lands were treated for fuels reductions

a large flaming front had not pushed down the hillside

under some local planning efforts with the Bitter Root RC&D.

Conditions leading up to the Downing Mountain fire showed a typical summer pattern with warm temperatures and dry periods. However, the month of August overall was considered not as warm as usual and precipitation had come at intervals where fuels never really dried out to critical fire levels.

The private lands fuel treatment was effective at slowing the spread of the fire and resulted in lower surface fire intensities. In the denser canopied fuels with moderate amounts of surface fuel loadings, group torching was very evident. This caused several



Figure 4. East side of Downing Mountain fire on the afternoon of August 28th in the Sawdust Creek drainage. Photo shows a group torching run taking place under a moderate north wind. Fuels were untreated with a dense canopy stand with low crown base heights.

small canopy fire runs.

At one point one firefighter as quoted as saying, “We looked down towards the private land and could easily see 60 to 100 spot fires started by the embers.”

When first entering the area on the east side of the fire where the spot fires were located on private land, it was easy to assume that a large flaming front swept down the hillside being pushed by the west winds. This was further strengthened by the statements made by firefighters about the large number of spot fires that developed. But upon entering the burned area it was

very clear that a large flaming front had not pushed down the hillside.

The areas on private land that had burned was very clearly a mosaic type of burn and had several unburned islands within the perimeter as well as areas that had underburned the low brush signifying a low intensity burn.

Overall it was obvious to the IMT Fire Behavior Analyst that the fire had a difficult time spreading due to the fuel conditions. It was also clear that the area had been overwhelmed with several dozen spots that had difficulty coalescing together.



Photo taken on north-east side of fire showing dozer preparing fireline in a dense canopied stand. This stand in the background would have been more susceptible to sustained crown fire events.

Fire: *Kootenai Creek fire*

Started: *July 2009*

Cause: *lightning strike*

Location: *Bitterroot National Forest, in the Selway-Bitterroot Wilderness*

The fire was not initial attacked due to the location of the fire in steep, rocky terrain in the Kootenai Creek.

Of concern was the presence of private lands and structures to the east of the fire that were

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threatened. Concerns led to some evacuation notices for homes primarily in Larson, Kootenai, Brooks, and Bass Creek drainages.

Some of the private lands were treated for fuels reductions under some local planning efforts with the Bitter Root RC&D, with private landowners, and the U.S. Forest Service previous to the Kootenai Creek fire in previous years.

Conditions leading up to the Kootenai Creek fire showed a typical summer pattern with warm temperatures and dry

periods. However, the month of August overall was considered not as warm as usual and precipitation had come at intervals where fuels never really dried out to critical fire levels.

Fuels had been treated on private lands and National Forest just east of the fire within the past several years. This treatment was effective at slowing the spread of the fire, specifically on the Brook's Face and resulted in lower surface fire intensities.

It was clearly stated that in the denser canopied fuels with moderate amounts of surface fuel loadings, group torching

and running crown fire with high winds was very evident. This caused several stand replacement fire runs.

The numerous spot fires caused firefighters to back off and try to operate safely while attacking the spots.

Burnout operations were conducted from these firelines through many of the areas that had been thinned on private land and through the area prescribed burned by the U.S. Forest Service in 1991. The fire from the burnout stayed on the ground in the surface fuels.



Area that had been thinned showing high canopy base heights. Fire in this stand would have trouble transitioning to the crowns even under more severe fire conditions. Due to the thinned nature of the stand any fire that did transition to the crowns would have trouble maintaining itself due to the discontinuous nature of the tree crowns.

Summary

With all three fires, looking at the areas on private lands that had burned it was very clear that the burns were very much a mosaic type of burn and had several unburned islands within the perimeter as

well as areas that had underburned the low brush signifying a low intensity burn.

There were three components to the success of reducing the spread and intensity of the fires:

- 1) thinning of the dense crowns,*
- 2) raising the canopy base heights, and*
- 3) reducing the surface fuel load.*

By disrupting any of the three components described above, the fire behavior can be altered.



Figure 3. Area on east side of Downing Mountain fire that had been treated for fuels reduction. Note the lack of larger fuels and the spotty nature of the burn. This was primarily due to a lack of continuous available fuel to burn.

By treating the surface fuels, a lower intensity fire occurs which makes it more difficult to jump to the crowns.

By raising the canopy base heights, a higher surface fire intensity can result without necessarily transitioning to the crowns.

And lastly, if the canopy is thinned any fire that does reach

the crowns will have a more difficult time sustaining itself.

It was evident that in many of the areas all three components had been disrupted, which in effect created an environment in which fire had a difficult time spreading.

In summary, the thinned areas definitely had an effect on the fire behavior of the Down-

ing Mountain fire, the Kootenai Creek fire and the Tin Cup fire. The treated areas within the perimeters displayed this very well. It is also believed that had the fire spread further, where homes and structures were more densely concentrated, the treated areas would have been effective at altering the fire behavior, allowing firefighters more opportunity to safely and effectively attack the

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fire. These treatments would have also reduced the risk of spread to the structures as well as resulted in lesser fire effects.

Acknowledgements:



The National Association of RC&D Councils advocates for local RC&D councils and helps local councils identify, address, and solve challenges to sustain and improve the quality of life in their communities. The National Association of RC&D Councils was established in 1988 to represent America's 375 local RC&D councils. The local councils deliver coordinated resources conservation and rural development assistance throughout rural America. By working together on local RC&D councils; communities, all levels of government, and grassroots organizations work together to develop and implement solutions to widespread problems and to develop opportunities that will help sustain rural communities, local economies, and natural resources.



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It was evident that in many of the areas all 3 components had been disrupted which in effect

created an environment in which fire had a difficult time spreading.

In summary the thinned areas definitely had an effect on the fire behavior of the Downing Mountain fire, the Kootenai Creek fire and the Tin Cup fire. The treated areas within the perimeters displayed this very well. It is also believed that had the fire spread further where homes and structures were more densely concentrated the treated areas would have been effective at altering the fire behavior allowing firefighters more opportunity to safely attack the fire. These treatments would have also reduced the risk of spread to the structures as well as resulted in lesser fire effects.

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Cause: *lightning strike*

Location: *Bitterroot National Forest, in the Selway-Bitterroot Wilderness*

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Of concern was the presence of private lands and structures to the east of the fire that were threatened by this fire. Concerns led to some evacuation notices for homes primarily in Larson, Kootenai, Brooks, and

Bass Creek drainages.

Some of the private lands were treated for fuels reductions under some local planning efforts with the Bitter Root RC&D, with private landowners, and the U.S. Forest Service previous to the Kootenai Creek fire in previous years.

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