

FSPro Analysis for Values at Risk

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Objectives

On August 28, 2015 a request was made to analyze probabilities of the fire perimeter affecting values in the area. Objectives were to identify the rare event potential for the fire along with values in the vicinity and the locations of the values. This consideration falls within the objectives delegated to the EA IMT under: "...Limit the spread of fire in the direction of Hwy 83 and the town of Seeley Lake by utilizing roads, natural barriers and Management Action Points wherever possible. ..."

Methods

Initial discussion identified the need for a 3-day Near Term Fire Behavior (NTFB) analysis followed up with a 14-day Fire Size Probability (FSPro) analysis based on NTFB. After evaluation of the NTFB analysis and an initial FSPro analysis, it was evident that the results would be invalid due to the limited distribution of the size probability classes. The 80-100% class was quite large and effectively "bunching up" the lower probability classes.

To improve distribution, 5 days were added to the start of FSPro analysis allowing for the ignition used to be the last known IR interpreted perimeter. This produces better results and a more reliable product. Three more analysis were performed on August 30th to validate current tactics in order to meet the objectives.

Inputs

The analysis start date was August 26, 2015 and ended on September 13, 2015. Fuels, topography, aspect, elevation, etc. were as follows:

- 1000 fires were modelled
- LANDFIRE 2012 v 1.3.0 dataset.
- Scott & Reinhart fuel models
- Landscape resolution of 90 meters
- Seeley Lake RAWS (241508) was 10 miles from the fire and used to generate the ERC Classes
 - Year Range: 1996 to 2015 with dates from March 1 to November 30
 - Max Lag: 30 days
 - Degrees of Fit: 9
- Pony Creek RAWS (241512) was 23 miles from the fire and used to generate the Winds Matrix
 - Year Range: 2012 to 2015 with dates from August 2nd to September 13th and hours of 10 AM to 8 PM.
 - Ten minute average winds were used to filter the data.
- Generation of the ERC Classes required manual entry of 3 days ERC's for the analysis to run. Persistence ERC's from the previous week (55-57) were added to the missing data.

An additional 3 analysis were performed to evaluate the effectiveness of the tactics to perform suppression on the west, south and north perimeters of the fire. Barriers used included the current suppression line, additional planned line on the North and South, and a combination of all three.

Results

All of the analysis described previously had the same overall probability cloud maximum size indicating that rare events were captured in the runs. The initial analysis which based ignition off of the 3-day NTFB run was rejected due to the poor distribution of classes in the probability cloud and a concern by the analyst of running a probability from modelled data as the ignition file.

The second analysis, which was approved, had a much better probability class distribution and still indicated that it had captured rare events identified by the <0.2% probability class. The outside perimeter of the probability cloud was downloaded and used in ArcMap 10.2.2 to select all recreation features/sites, buildings and private structures within ¼ mile of the lowest probability class (largest fire growth event). A large private inholding had already been identified by the Agency as a concern in the Management Action Point (MAP) process. The result was 9 recreation features/sites and 13 private structures along Lake Inez were identified and highlighted on the compiled map.

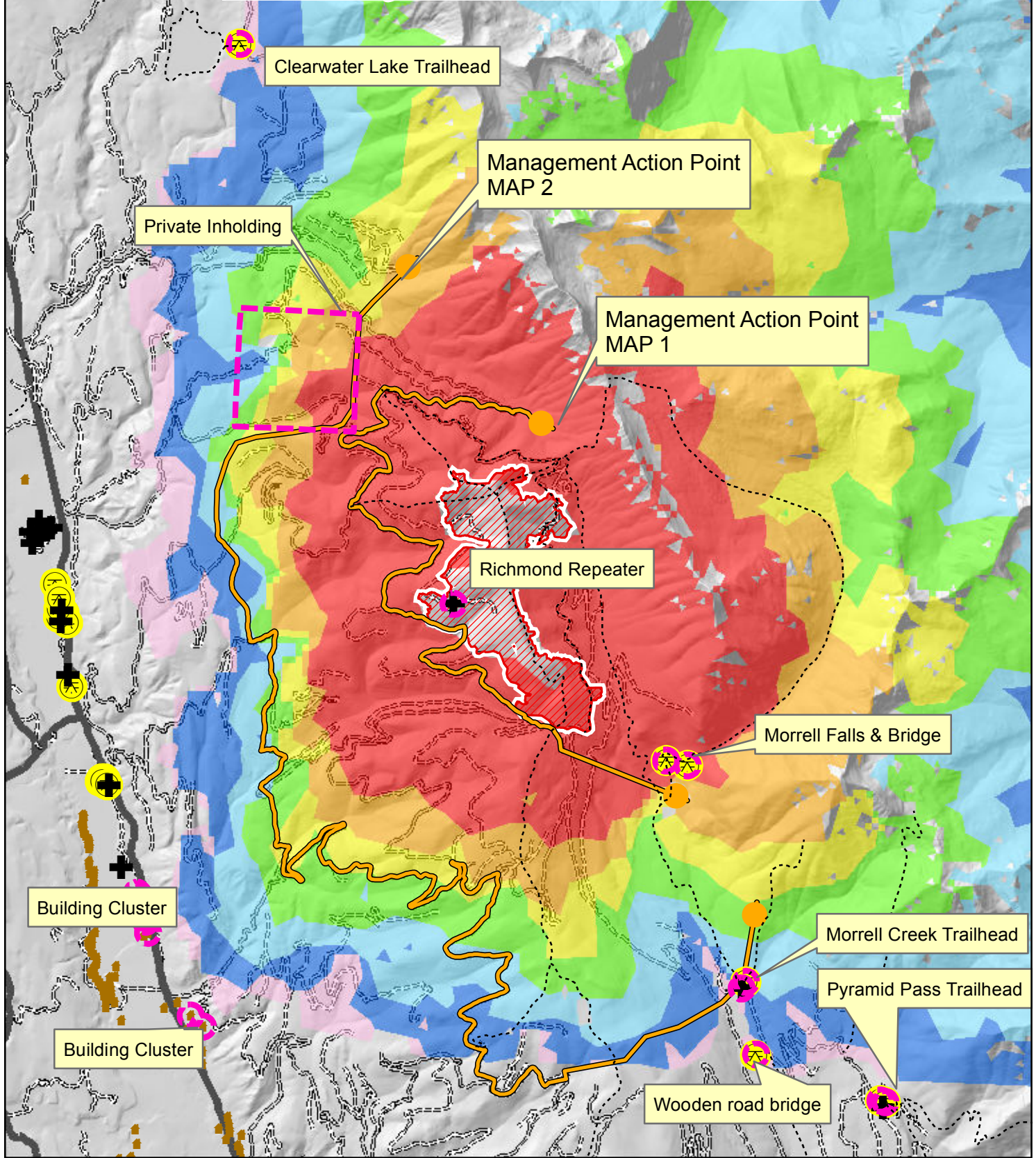
The final analysis which considered all current and planned control lines acting as barriers still had good probability class distribution, but was slightly smaller in size in the direction of the areas of concern (Hwy 83 and the town of Seeley Lake). Using ArcMap 10.2.2 to perform the same selection showed a reduction in values within or near the probability cloud. No private residences were within ¼ mile of the maximum extent; 6 recreation features/sites were still within the boundaries of the FSPro cloud; and the private inholding probability class values were reduced from over 80% on the east side to 20-39%.

Features still within the FSPro cloud include:

- Clearwater Lake Trailhead is within ¼ mile of the <0.2% probability class.
- Pyramid Pass Trailhead is within ¼ mile of the <0.2% probability class.
- The wooden bridge on USFS Road 4381 is within ¼ mile of the <0.2% probability class.
- Morrell Creek Trailhead and facilities fall within the 0.2 – 4.9% probability class.
- Morrell Falls site and foot bridge fall within the 40 – 59% probability class.
- The private inholding of concern falls within the 20 – 39% probability class on the east side to outside the cloud on the west side.
- Richmond Repeater was affected directly by the fire and protected during suppression operations.

With upcoming precipitation events, it is expected that the risk to the values identified should be reduced even further. Maps, analysis and other documentation can be found in WFDSS under the Richmond Ridge (2015-MTLNF-000845) incident. The two maps of the analyses are on final 2 pages of this document.

FSPro Analysis: No Control Lines Present



Morrell Complex
MT-LNF-000851
Sept. 2, 2015
870 acres
NAD 83
Degrees, Decimal Minutes

0 0.5 1 2 Miles

Legend

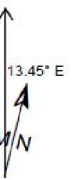
- Values
- Management Action Point
- Main Road
- Forest Road
- Two-track

FSPro Output - Free Burning Probability

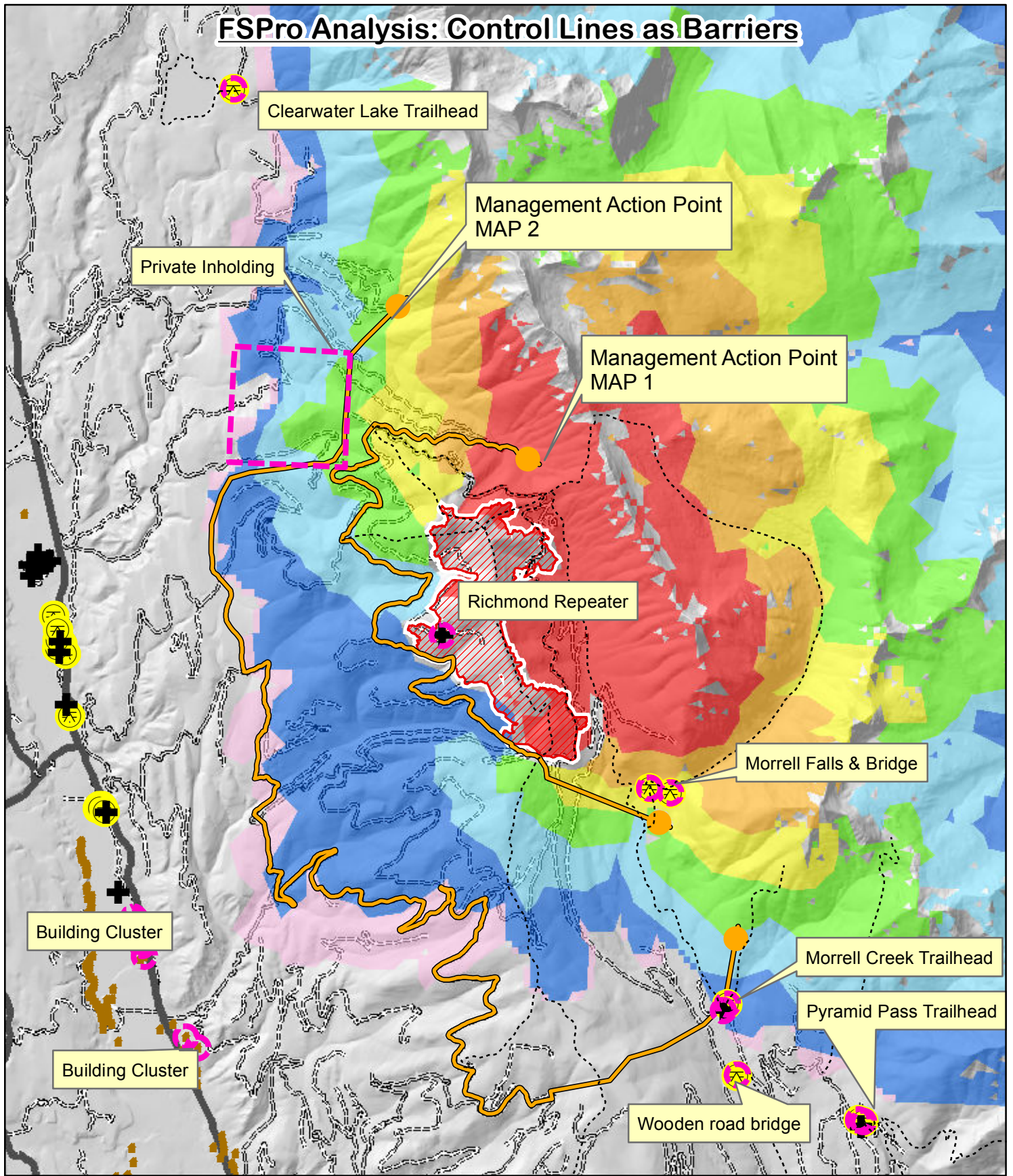
- <0.2%
- 0.2 - 4.9%
- 5 - 19%
- 20 - 39%
- 40 - 59%
- 60 - 79%
- 80 - 100%



W. Glesener, LTAN(t)
 Sept. 2, 2015
 1130 Hrs



FSPro Analysis: Control Lines as Barriers



Morrell Complex
MT-LNF-000851
Sept. 2, 2015
870 acres
NAD 83
Degrees, Decimal Minutes

0 0.5 1 2 Miles

Legend

- Values
- Management Action Point
- Main Road
- Forest Road
- Two-track

- FSPro Output - Control Present Probability**
- <0.2%
 - 0.2 - 4.9%
 - 5 - 19%

- FSPro Output - Control Absent Probability**
- 20 - 39%
 - 40 - 59%
 - 60 - 79%
 - 80 - 100%



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