

3.0 Landscape Wildfire Threat Analysis

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This Wildfire Threat Analysis evaluates the current risks and potential for wildfire ignition, spread, behaviour, suppression capability and threats to important values for the E8 forest management unit. This assessment reviews six components of wildfire management: 1) Fuels, 2) Values at Risk, 3) Suppression Capability, 4) Fire Occurrence, 5) Fire Behaviour Potential and 6) Wildfire Threat. Each component builds the understanding of wildfire management which can be used to develop fire prevention and mitigation strategies in forest management plans.

3.1 Fuels

Fuels for the E8 FMU are derived from AVI attributes with updates from recent harvesting and other disturbances not captured by AVI. The regional fuel types (Figure 1) illustrates the fuels within the E8 FMU as well as the fuel types in surrounding FMAs. This regional fuel context enables the consideration of fuel management strategies that are integrated with the surrounding areas. The distribution and characteristics of fuel types are shown in Table 1. C2 followed by C3 fuel types are the most abundant fuel types within and surrounding the FMU. These fuel types represent some of the most flammable fuels that when combined with the appropriate fire weather indices and weather phenomenon may lead to large high intensity wildfire.

Table 1. Distribution and Characteristics of Fuel Types

Fuel Type	Fuel Characteristics	Area	Comments
C1	Open black spruce stands	11,941	Scattered stands throughout the region. Discontinuous, associated with both upland and lowland sites.
C2	Closed canopy white and black spruce stands	232,855	Predominant throughout the central portion of E8. Moderately continuous but has been broken up due to recent harvesting.
C3	Mature, closed canopy lodgepole pine	162,961	Predominant throughout E8. Moderately continuous particularly abundant in higher elevations.
C4	Immature lodgepole pine	7,340	Scattered discontinuous stands.
C7	Ponderosa Pine-Douglas-fir	2066	Scattered discontinuous stands.
D1	Leafless aspen	46,417	Narrow continuous corridor along north-west boundary of E8 along Smoky river.
S1	Lodgepole pine slash	3,247	Scattered, discontinuous recently harvested openings.
S2	Spruce-Balsam fir slash	2,630	Scattered, discontinuous recently harvested openings.
O1	Grass	75,084	Early successional openings created by recent harvesting and naturally occurring. Clumped patches.
M1	Boreal Mixed- wood	8,508	Small, scattered discontinuous patches.
Non-fuel	N/A	33,252	Small to large (infrequent) discontinuous patches due to naturally occurring features (rock) and recent fires.
Water	N/A	2,640	N/A

The fuel types in the northern portion of E8 are a mix of C2 and O1. The O1 fuels are found in the recently harvested and reforested openings. Based on provincial rules for fuel transition in harvested blocks these O1 types will transition to either C4 or C6 (conifer plantations) fuel types within 20 years of harvest. Thus over time these fuel types will produce higher fire intensities and more potential for extreme fire behaviour. The southern portion of E8 is characterized by continuous C2 and C3 fuel types which under appropriate conditions pose a significant risk of high fire intensity and extreme fire behaviour. These areas could be considered as needing the most immediate fuel management strategies while balancing fire risk mitigation against other values.

3.2 Values at Risk

Six values at risk themes are shown in Figure 2. Due to SRD's suppression priority of life, communities and infrastructure and the significance and distribution of these values in the area the entire FMU is ranked as either extreme or high impact to Overall Values at Risk. The E8 FMU also maintains many important values for timber, water, infrastructure and wildlife (not shown).

3.3 Suppression Capability

Moderate to best capability (Figure 3) is found along the Highway 40 corridor and within line of sight of the lookout towers in the area to the west of E8 (not shown). The FMU does contain a secondary tanker base and several skimmer lakes and is within a 20 km attack time for a CL215. The main issue for suppression capability in E8 is visibility and access which makes detection and suppression activities more difficult and delays attack times.

3.4 Fire Occurrence

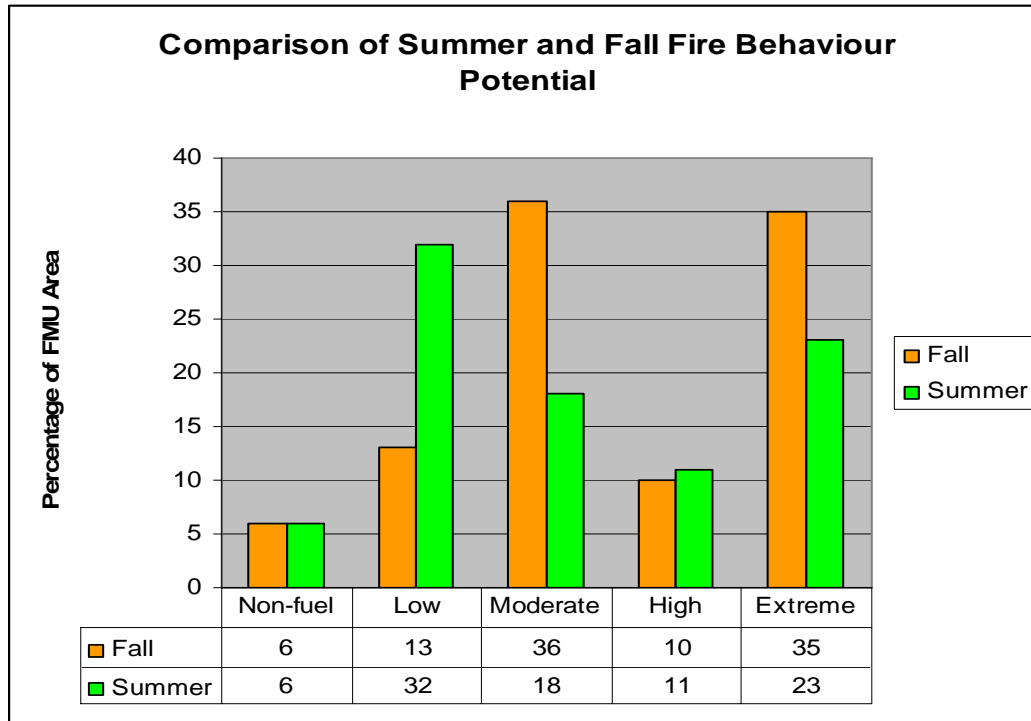
For the majority of the E8 FMU Fall Fire Occurrence is low (Figure 4). Lightning ignitions increase in occurrence from west to east while human caused ignitions occur primarily around the Highway 40 corridor.

3.5 Fire Behaviour Potential

Analysis for Fire Behaviour Potential was conducted for the Fall Season. Preliminary analysis revealed that fire intensities are significantly lower during the spring and summer compared to the fall and therefore the fall is the most hazardous season for wildfire. For comparison the relative area of Fire Behaviour Potential by season is shown in Graph 1.

Total area in the extreme Fire Behaviour Potential class is 76,659 ha. The majority of this area is found at lower elevations and corresponds closely with the distribution of the C2 fuel types shown in Figure 1. The most abundant Fire Behaviour Potential class is moderate (78,815 ha) which corresponds closely to the D1, O1 and C3 fuel types. The moderate Fire Behaviour Potential class is mainly found in the western (higher elevation) portion of the FMU. It also corresponds with C3 stands but rankings are probably influenced by different weather data from the different weather stations found in the area (not shown). The low Fire Behaviour Potential class is the third most abundant class at 27,960 ha, primarily associated with the O1 and D1 stands in the north portion of the FMU. The high Fire Behaviour Potential class is the least abundant and is found in the northeast and is associated with the C2 fuels in the area. Non-fuel types represent 13,523 ha.

Graph 1. Comparison of Fire Behaviour Potential classes by season.



3.6 Wildfire Threat Assessment

The greatest threat from wildfire (extreme and very high) exist in two separate patches near the central west and central east portion of the FMU. These areas contain large contiguous patches of highly flammable fuel types (C2) with significant historical fire occurrence and high potential impact to values at risk. Although suppression capability is moderate to good FireSmart management is a proactive approach to fire management and therefore fire management strategies should be developed to reduce the wildfire threat in this area.

3.7 Interactions with Mountain Pine Beetle

The mountain pine beetle stand susceptibility index (with climatic factor) and wildfire threat assessment were evaluated to identify harvesting hat could take place to reduce the area of susceptible pine and high fire hazard stands (Figure 7). These stands could be identified as priority for sequencing in the first 10 years to address fire and mountain pine beetle management simultaneously.

3.8 Fire Management Strategies

An overriding strategy is to manage the forest by emulating natural fire patterns in new harvest areas. The strategic placement of larger openings along the southern boundary of E8 will help break up fuel continuity possibly preventing a fire run either out of E8 and into E7 or out of E7 and into E8.

Harvesting in second pass areas should make use of Neptune and/or available Fire Regime information to assist with restoring natural patterns during the second pass.

Work with recreation user groups and public to attempt to reduce the number of human caused ignitions along the Highway 40 corridor.

Community Zone Planning

The Grande Cache Community Zone (Foothills Wildfire Management Area) overlaps the E8 FMU (Figure 8). Grande Cache is located within a D1 fuel complex with scattered C1, C2, C3 and O1a on the perimeter of the town. Fuels to the south are D1, C3 and C2, the fuels to the east are D1, C3 and scattered C2. Fuels to the west and north are D1, O1a, C3 and C2.

The wildfire threat is highest during the fall. The wildfire threat on a scale of 1 to 5 is predominantly rated at 3 associated with D1 fuels, a rating of 4 associated with O1a fuels, and rated 5 associated with C2 fuels. The highest wildfire threat is in the west half rated as 4 and 5 and this is due to the C2 fuels and the steep terrain, which provides a resistance to suppression. There are ongoing fuel modification projects within the town boundaries.

The highest Head Fire Intensity can be expected during the fall season when the DMC and DC will be highest providing the greatest amount of available fuel to burn. The 90-percentile fall HFI around Grande Cache indicates a similar spring and fall HFI potential due to the cured grass stages. The predominant HFI around this town is projected to be a rank 3 with rank 5 where there are C2 fuels.

The suppression capability for Grande Cache is moderate (31 – 60 min) to very good (<15 min) because of the airtanker base and Initial attack base at Grande Cache. The steeper terrain to the west and south makes suppression more difficult and therefore would require more time to contain a fire because of the steep slopes. Fixed detection is not very effective for detecting fires in and around the town as most of the area is blind to all lookouts.

The Wanyandie Flats East Settlement is adjacent to the E8 FMU and falls within the Smoky Wildfire Management Area (Figure 8). While fuel management strategies should be considered for Wanyandie during the DFMP development process for E8, formal fire behaviour potential reduction assessments need not be conducted.

E8 FMU Regional Fuel Types

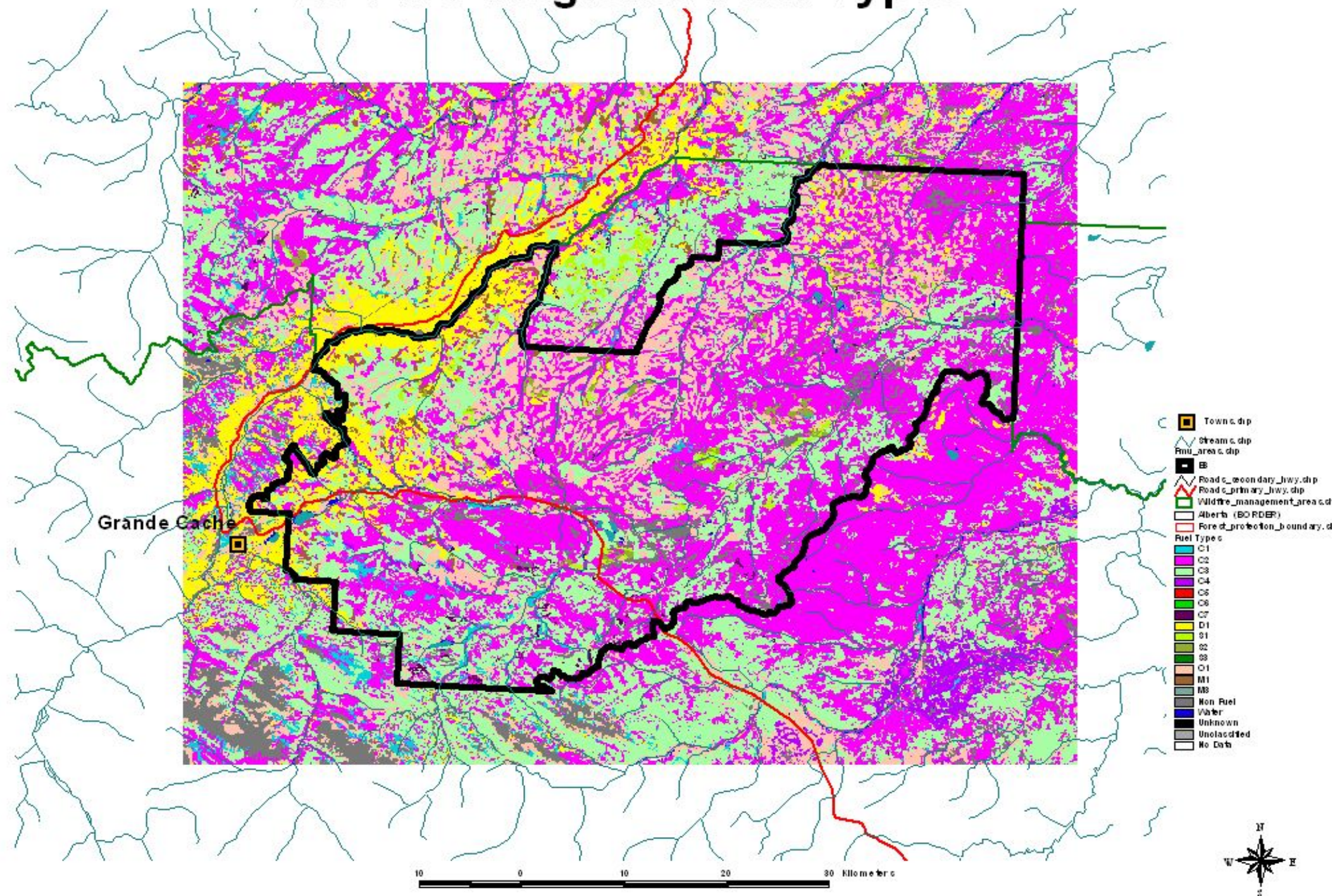


Figure 1. Regional fuel assessment based on 100m fuel grid resolution derived from AVI and updates for recent harvesting and disturbance

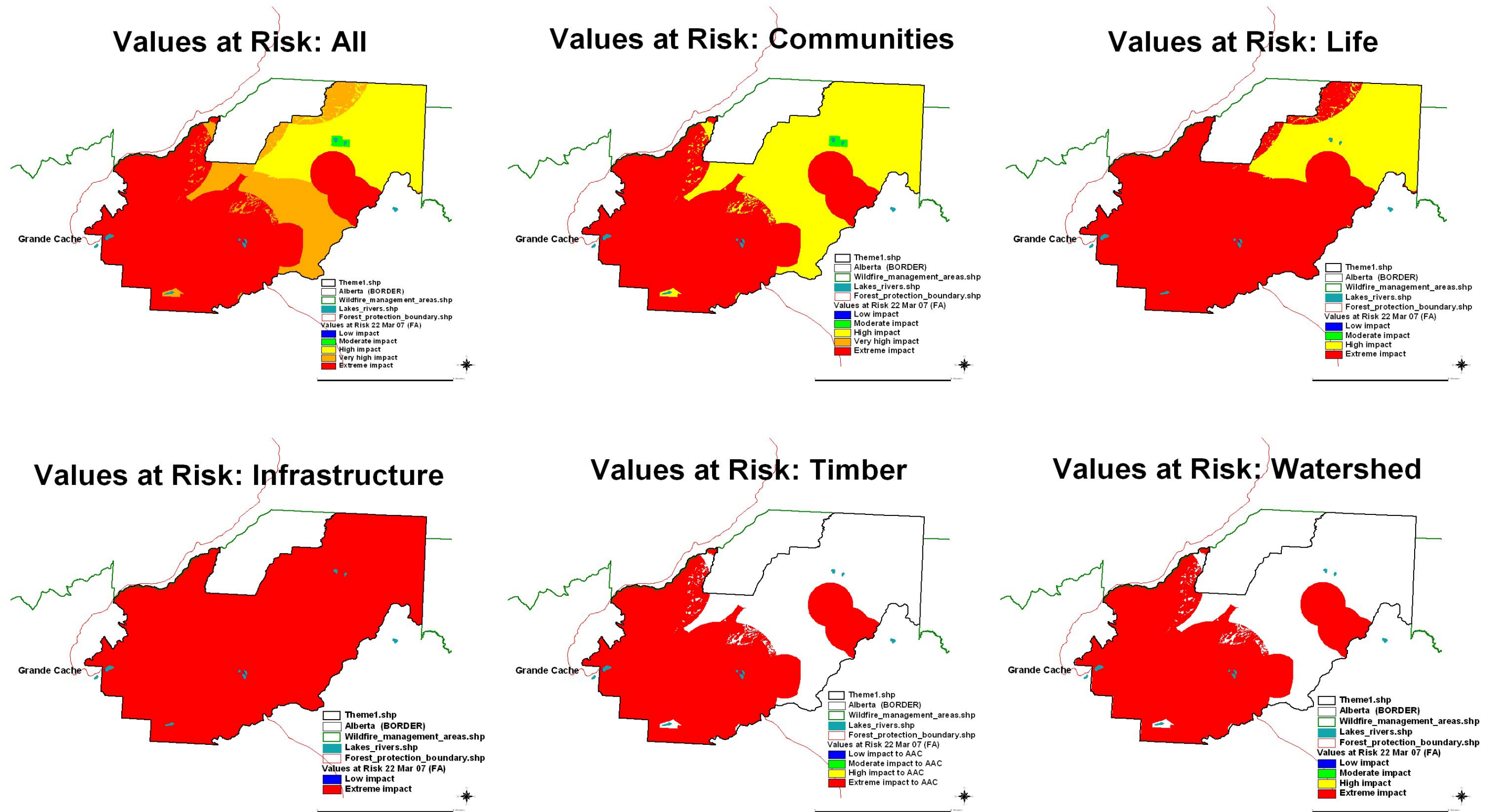


Figure 2. Values at risk assessment: Top left “Values at Risk Overall” is a weighted rollup of all discrete values shown in the remaining panels.

Suppression Capability

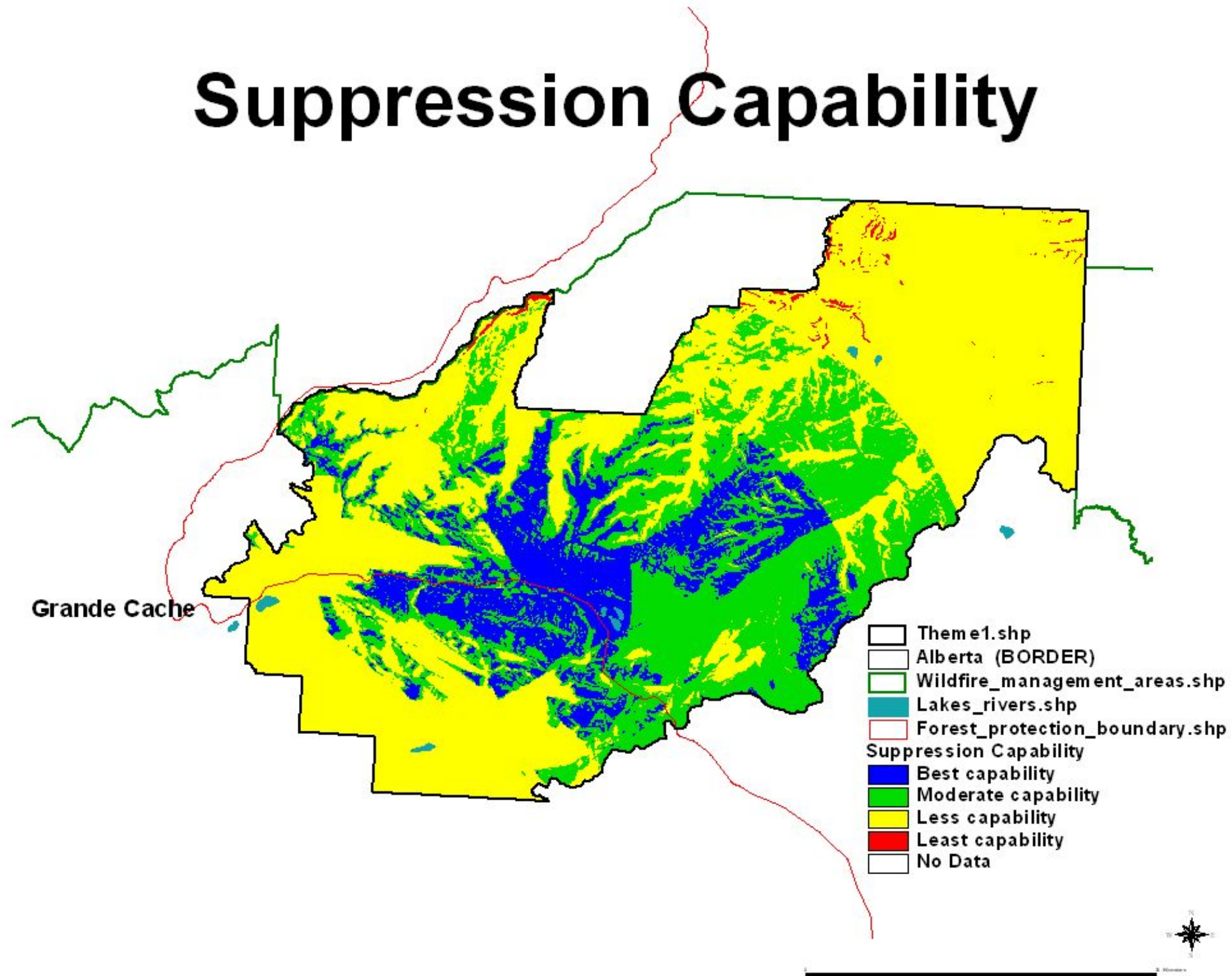


Figure 3. Suppression Capability based on visibility from one or more lookout towers

Fall Fire Occurrence Risk and Total Ignition Locations

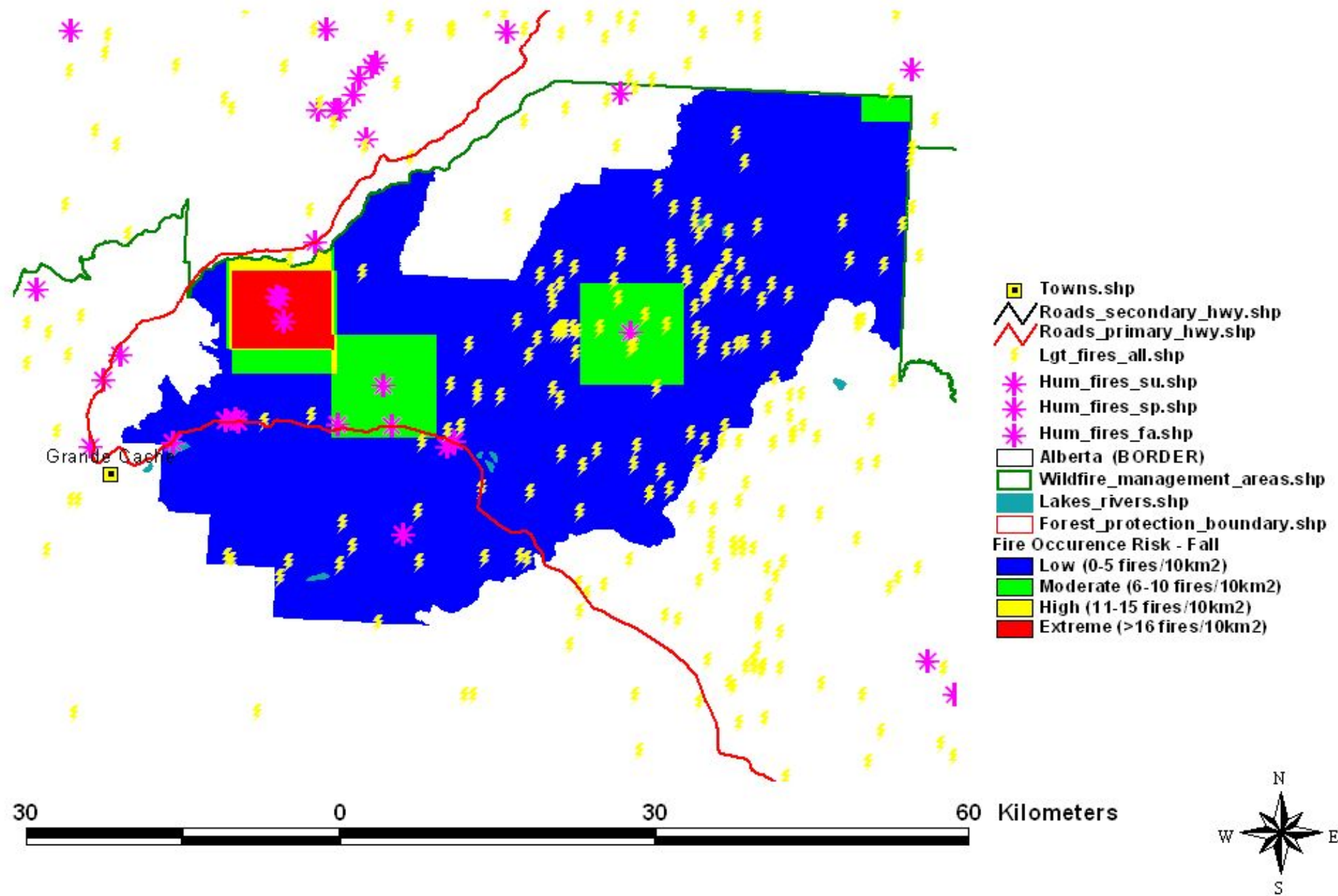


Figure 4. Fire Occurrence and Ignition Locations

Fall Fire Behaviour Potential

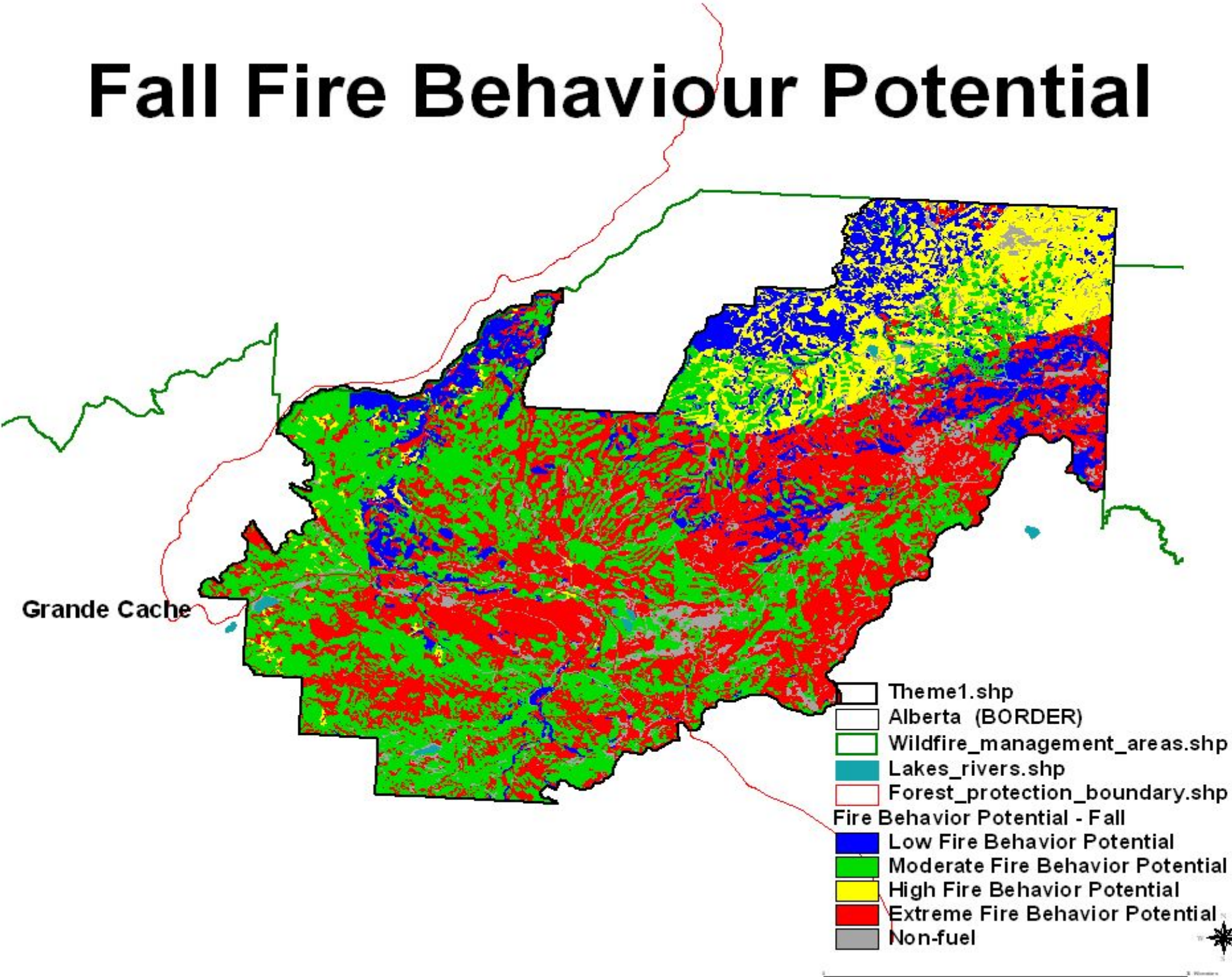


Figure 5. Fall Fire Behaviour Potential.

Fall Wildfire Threat

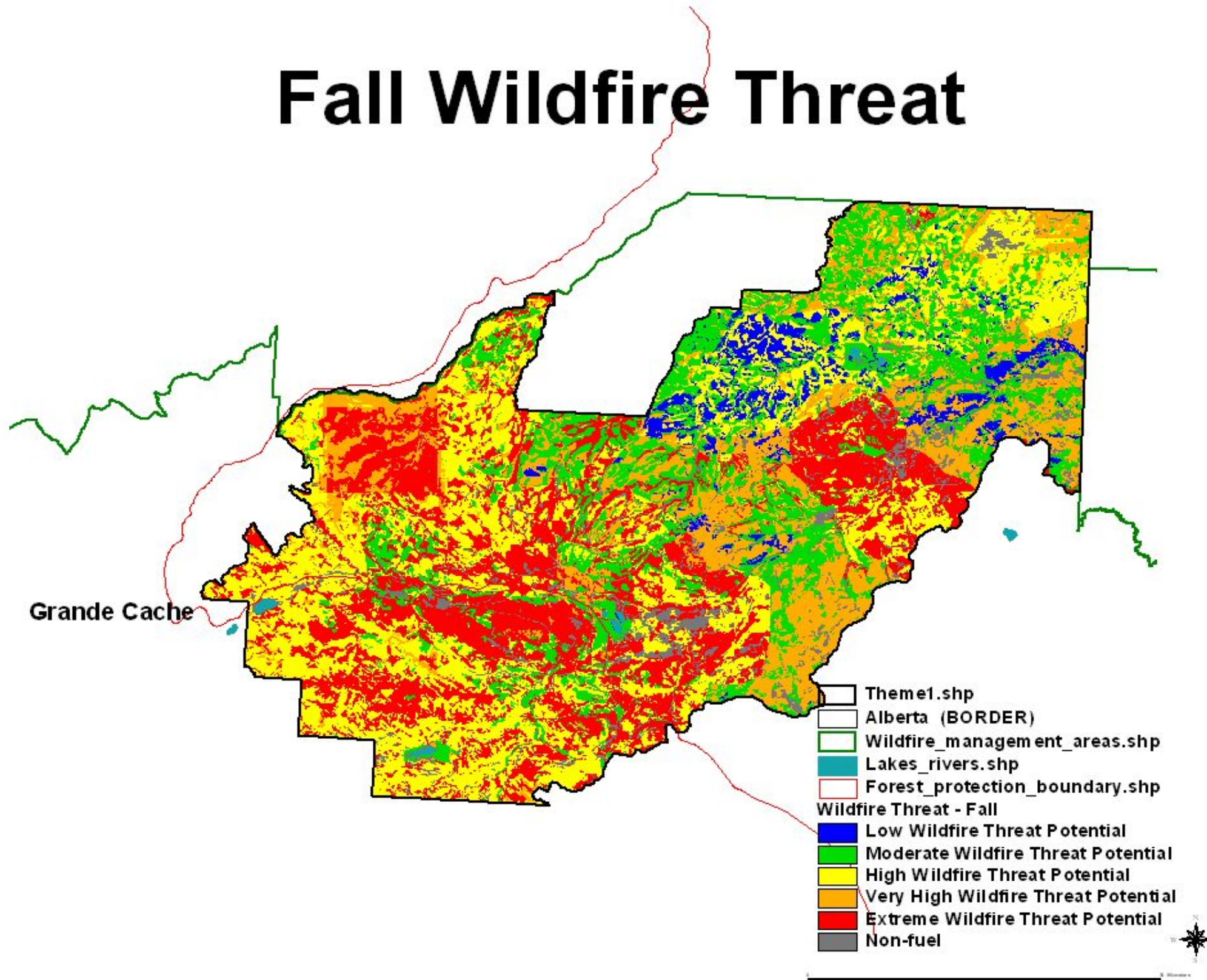


Figure 6. Wildfire Threat Assessment

Analysis of High and Extreme Ranked Mountain Pine Beetle and Fire Behaviour Potential Locations

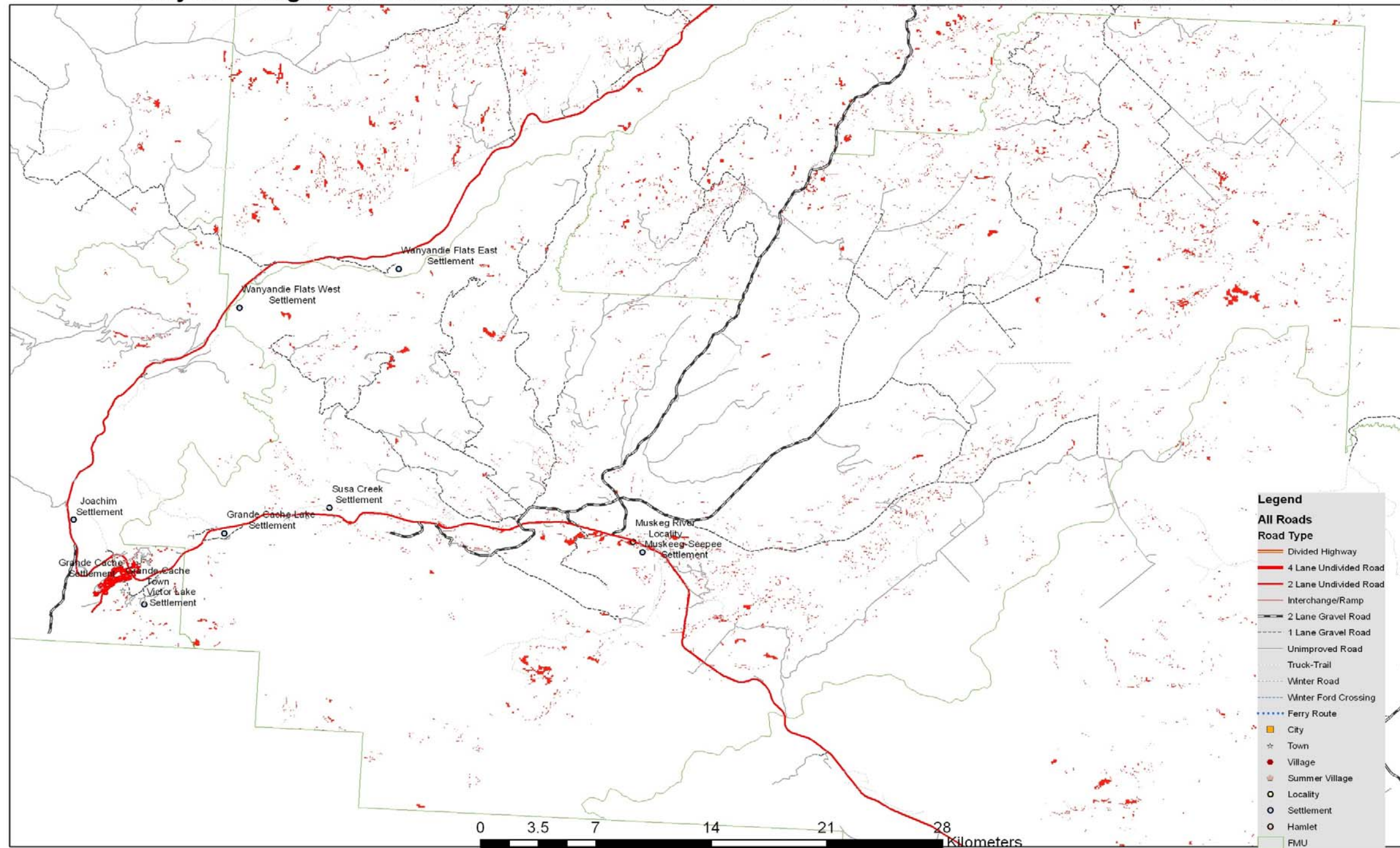


Figure 7. Identification of High and Extreme Ranked Mountain Pine Beetle and Fire Behaviour Potential Stands

Community Zone Assessment

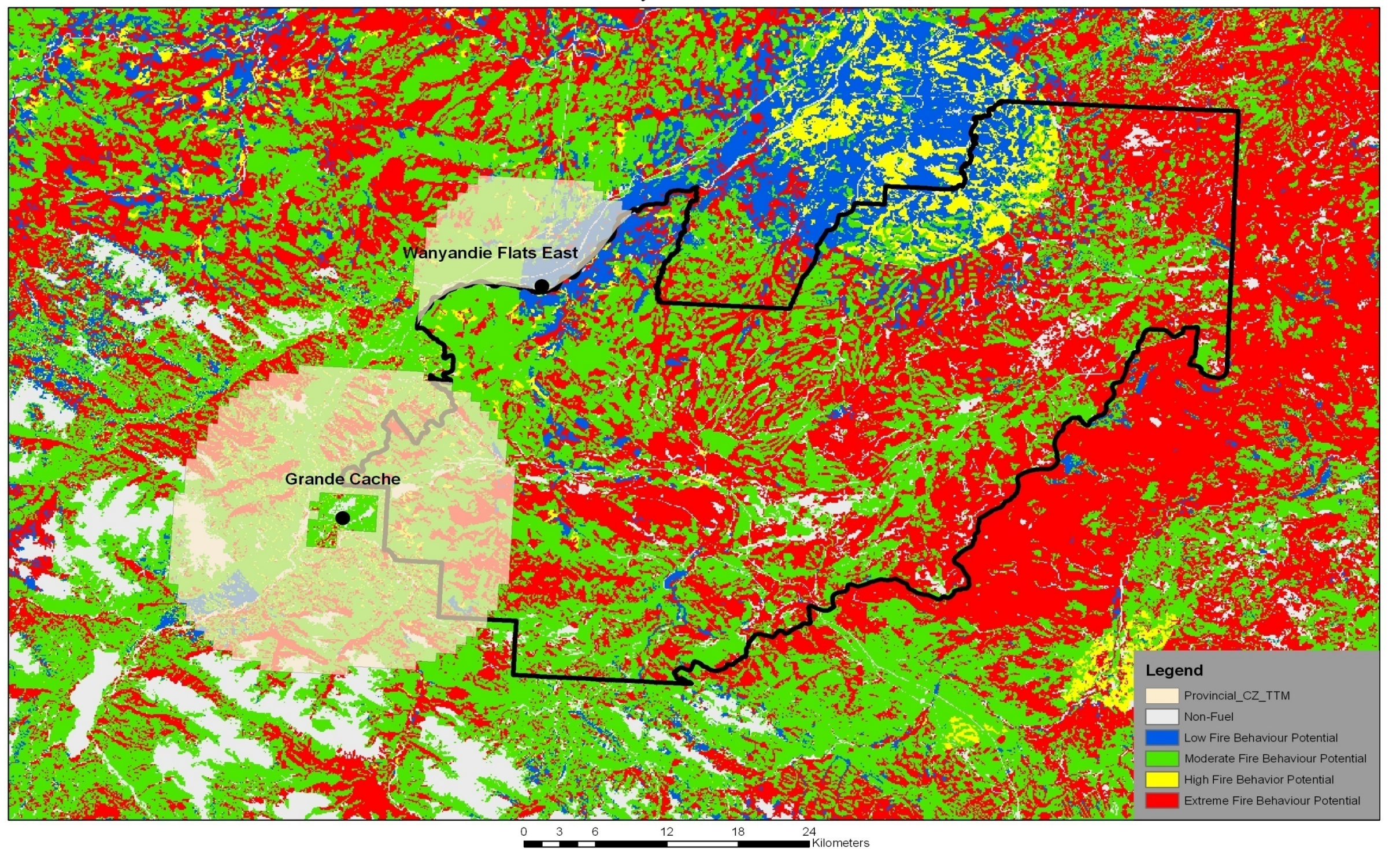


Figure 8. Community Zone locations within and adjacent to the E8 FMU. Clockwise from west to east: Grande Cache, Wanyandie Flats East Settlement, Muskeg-Seepee Settlement