Case Study 1: Blue Mountains & Central Idaho

Trend:

- LANDFIRE FRCC is higher for ponderosa pine – Douglas-fir systems in the Blue Mountains of Oregon than it is in central Idaho.
- Sharp transition in FRCC between map zone 9 in Oregon and zone 10 in Idaho.

Theme:

- LANDFIRE FRCC is a product of how BpS units and SClasses are mapped and represented by BpS vegetation dynamics models, which may vary between map zones for similar vegetation types.
- The quality of SClass mapping is contingent on the floristic resolution of LANDFIRE EVT units, and the degree to which mapped structural characteristics resemble SClass structural definitions in the BpS models.

Conclusion:

FRCC was different for ponderosa pine – Douglas-fir systems between the Blue Mountains and central Idaho because:

- BpS units and associated models were different between zone 9 in Oregon and zone 10 in Idaho; these were intended to represent differences in dynamics and structural characteristics in the different areas.
- LANDFIRE EVT units were generally not applicable to discriminating earlier from later seral tree species because species of various seral states were aggregated into the EVT units.
- LANDFIRE height may not correctly capture the later-successional status of some sites as intended in the BpS vegetation dynamics models due to low variability in mapped height.
- Different instructions were received during SClass review in each zone.
- Different levels of advanced regeneration were present in the training plots used for mapping vegetation structure, which may validate the difference in FRCC between Zones.

Discussion:

LANDFIRE FRCC appeared higher in Blue Mountains and lower in central Idaho, producing a sharp edge at the map zone boundary between Zone 9 (includes Blue Mountains) and Zone 10 (includes central Idaho) (Figure 1). The difference in departure measurements between ponderosa pine – Douglas-fir systems in either Zone is of particular concern (Figure 2). The FRCC values for these systems are depicted in Figure 3. It is important to note that these systems are represented by different BpS units and vegetation models between Zones; however, the overall fire regime groups assigned to these systems are similar between Zones (FRG I for systems dominated by ponderosa pine, FRG III for systems dominated by Douglas-fir; see Figure 4). The models varied between zones because modelers tailored their dynamics and structural definitions to the different geographical areas encapsulated by each zone.

SClass B was the dominant SClass for most of the ponderosa pine – Douglas-fir systems (Figure 5), driven in large part by the ubiquitous medium tree height class and canopy cover values

greater than 40-60% (Figure 6; note that SClass rules were different for the various BpS units). For these models, SClass B is described as a mid-seral closed canopy forest. Based on a literal interpretation of BpS model SClass rules, SClass B would also have been the dominant SClass in BpS 10530 in Zone 10 because of the vast majority of pixels mapped to medium tree height and greater than 40% cover (Figure 6). However, during SClass review, the sclass mapper was specifically instructed by the reviewers to consider any medium tree pixel with 40-60% cover and an EVT likely dominated by Douglas-fir (e.g., Douglas-fir alliance) as SClass E, and any tree pixel not dominated by ponderosa pine with greater than 60% cover as Uncharacteristic Native. These instructions were followed to produce the SClass layer depicted in Figure 5. These changes were intended to better capture the intent of the model, and resulted in somewhat increased FRCC departure values. The remaining models were generally interpreted literally with respect to their SClass rules, and did not experience significant modification during SClass review. In particular, the strong dominance of SClass B in BpS 10450 in Zone 9 was deemed acceptable by the reviewers.

The strong dominance of a single class in the canopy height layer may indicate that it is inadequate to differentiate between areas that should truly be mid-seral and late-seral compared to the intent of the SClass height descriptions within the models. It is possible that the structural characteristics that differentiate between mid- and late-seral states are not reflected in a map of overall canopy height, such as heavy advanced regeneration of more shade tolerant conifers under an overstory of ponderosa pine. Figure 7 depicts the estimated spatial distribution of advanced regeneration under an established canopy; these differences are not manifest in the canopy height map (Figure 6). It is important to note that these estimates of advanced regeneration are not available for LANDFIRE SClass mapping, and are presented here only to aid interpretation of trends in FRCC and vegetation structure.

In some of these systems, distinguishing mid-seral from late-seral SClasses was further confounded by the floristic community approach of the vegetation map units used in LANDFIRE EVT mapping. These units aggregate tree species indicative of different seral states, as is the case in the EVT counterpart to the 10451 model. Thus EVT is generally not applicable to correctly discriminating SClasses for these systems. Furthermore, if the structural indicators of seral state are not manifest in the upper canopy in closed canopy forests, it is very likely that neither EVT nor canopy height would be able to correctly discriminate sites with such structural indicators from sites without.

Zone	BpS (Figure 1)	Dominant FRCC (Figure 3)	Dominant Fire Regime Group (Figure 4)	Reference or Current?	Dominant SClass	Dominant Cover Range (Figure 6)	Dominant Height (Figure 6)	SClass instructions from review
9	**10450**: Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest	III	III	RC	D	10-40%	Tall Trees (25-50 m)	• Mostly B is OK
				CC	B (Figure 5)	60-100%	Medium Trees (10-24 m)	
	10531: Northern Rocky Mountain Ponderosa Pine Woodland and Savanna (mesic)	I-II	I	RC	D	10-40%	Tall Trees (25-50 m)	• Mostly B is OK
				CC	B (Figure 5)	30-60%	Medium Trees (10-24 m)	
	10532: Northern Rocky Mountain Ponderosa Pine Woodland and Savanna (xeric)	II	III	RC	D	10-30%	Tall Trees (25-50 m)	• Mostly B is OK
				CC	B (Figure 5)	10-60%	Medium Trees (10-24 m)	
	11660: Middle Rocky Mountain Montane Douglas-fir Forest and Woodland	II	III	RC	C	20-40%	Short Trees (5-10 m)	• Should be highly departed; expect high cover due to fire suppression
				CC	E (Figure 5)	60-100%	Medium Trees (10-24 m)	

Zone	BpS (Figure 1)	Dominant FRCC (Figure 3)	Dominant Fire Regime Group (Figure 4)	Reference or Current?	Dominant SClass	Dominant Cover Range (Figure 6)	Dominant Height (Figure 6)	SClass instructions from review
10	**10451**: Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (Ponderosa Pine-Douglas-fir)	I-II	III	RC	D	20-60%	Tall Trees (25-50 m)	
				CC	B (Figure 5)	60-100%	Medium Trees (10-24 m)	
	10453: Northern Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest (Grand Fir)	II	III	RC	E	40-100%	Medium-Tall Trees (10-50 m)	
				CC	E (Figure 5)	60-100%	Medium Trees (10-24 m)	
	10530: Northern Rocky Mountain Ponderosa Pine Woodland and Savanna	II	I & III	RC	D	10-40%	Tall Trees (25-50 m)	• Move non-ponderosa pine EVTs 40-60% cover to E • Cover of non-ponderosa pine EVTs >60% is UN
				CC	UN (Figure 5)	30-100%	Medium Trees (10-24 m)	
	11660: Middle Rocky Mountain Montane Douglas-fir Forest and Woodland	II	III	RC	C	20-40%	Short Trees (5-10 m)	
				CC	E (Figure 5)	60-100%	Medium Trees (10-24 m)	

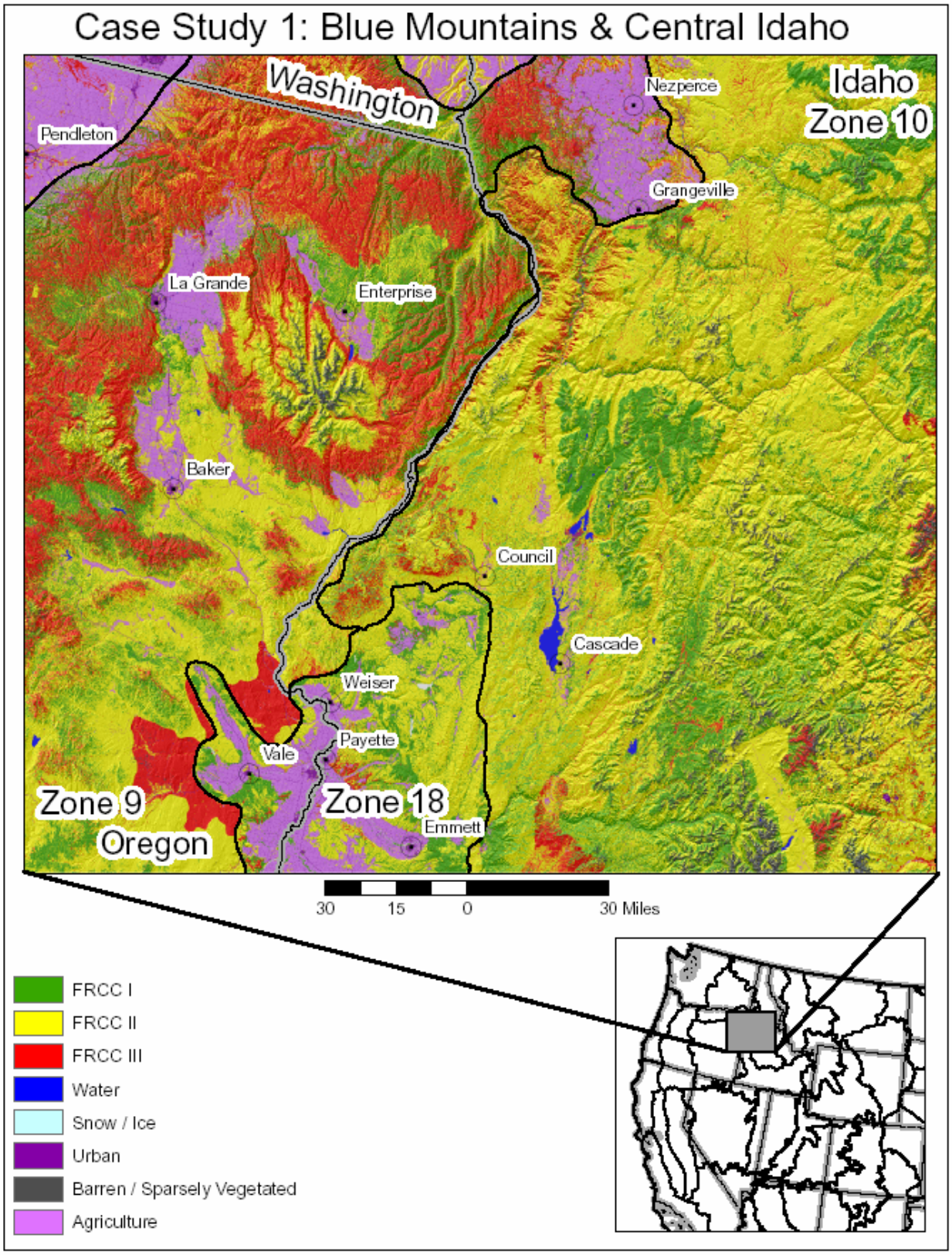

Figure 1: LANDFIRE FRCC for Zones 9, 10, and 18 in Washington, Oregon, and Idaho (note: Zone 18 is pending remapping efforts and subject to change; these data are excluded from further figures).

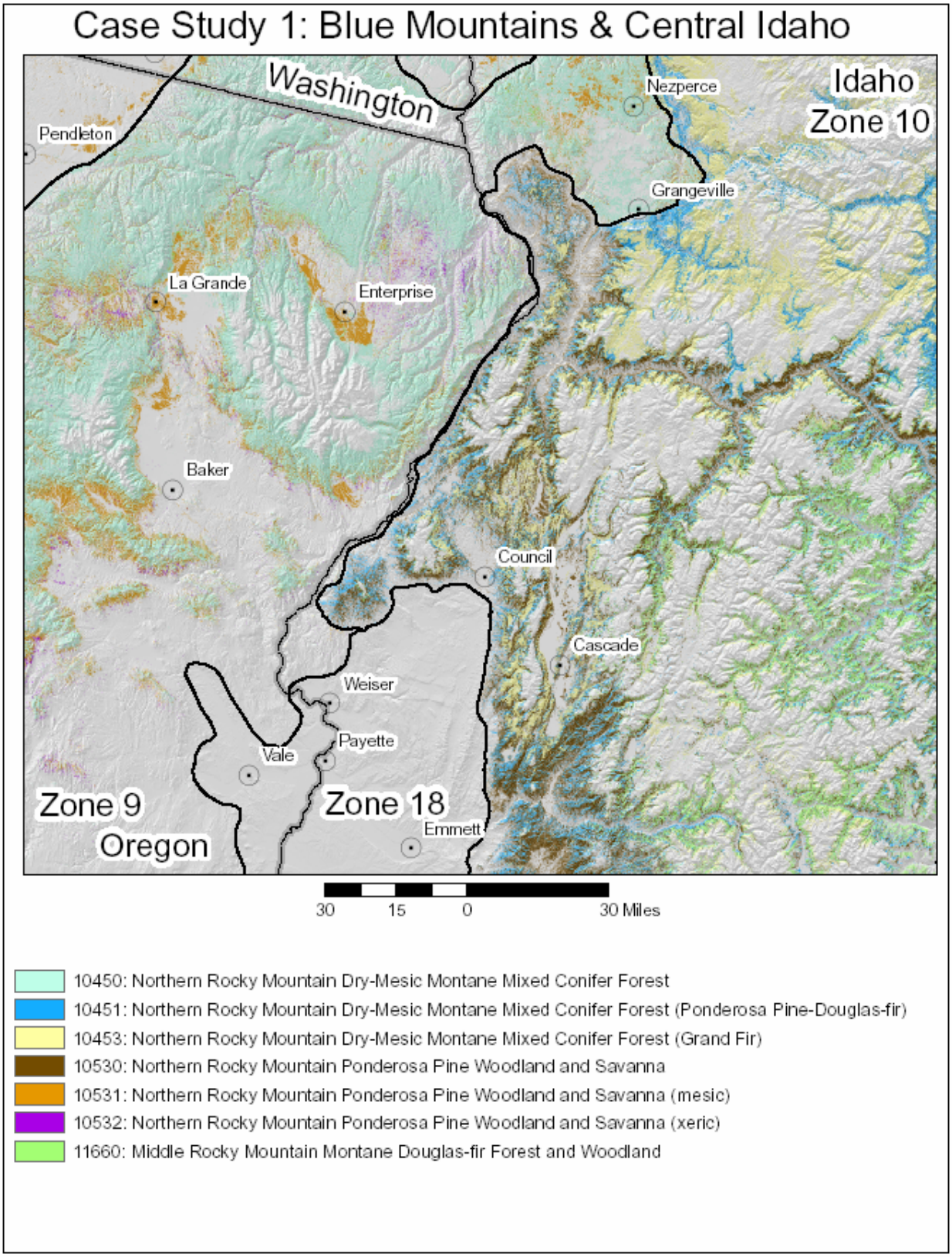

Figure 2: LANDFIRE BpS for ponderosa pine – Douglas-fir systems. Units 10450, 10531, 10532, and 11660 were mapped in Zone 9, whereas units 10451, 10453, 10530, and 11660 were mapped in Zone 10.

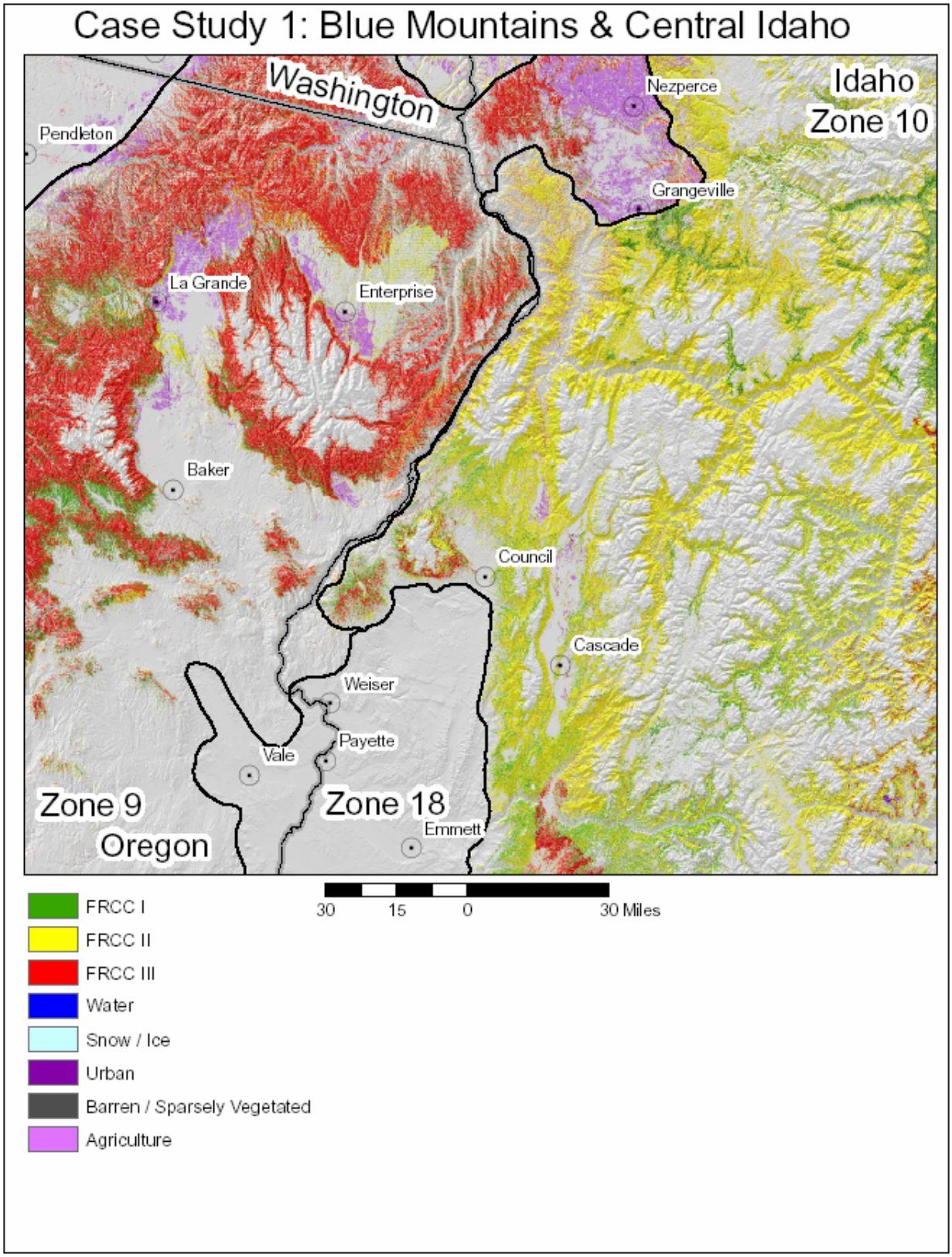

Figure 3: LANDFIRE FRCC for ponderosa pine – Douglas-fir systems (see Figure 2 for details on BpS units used).

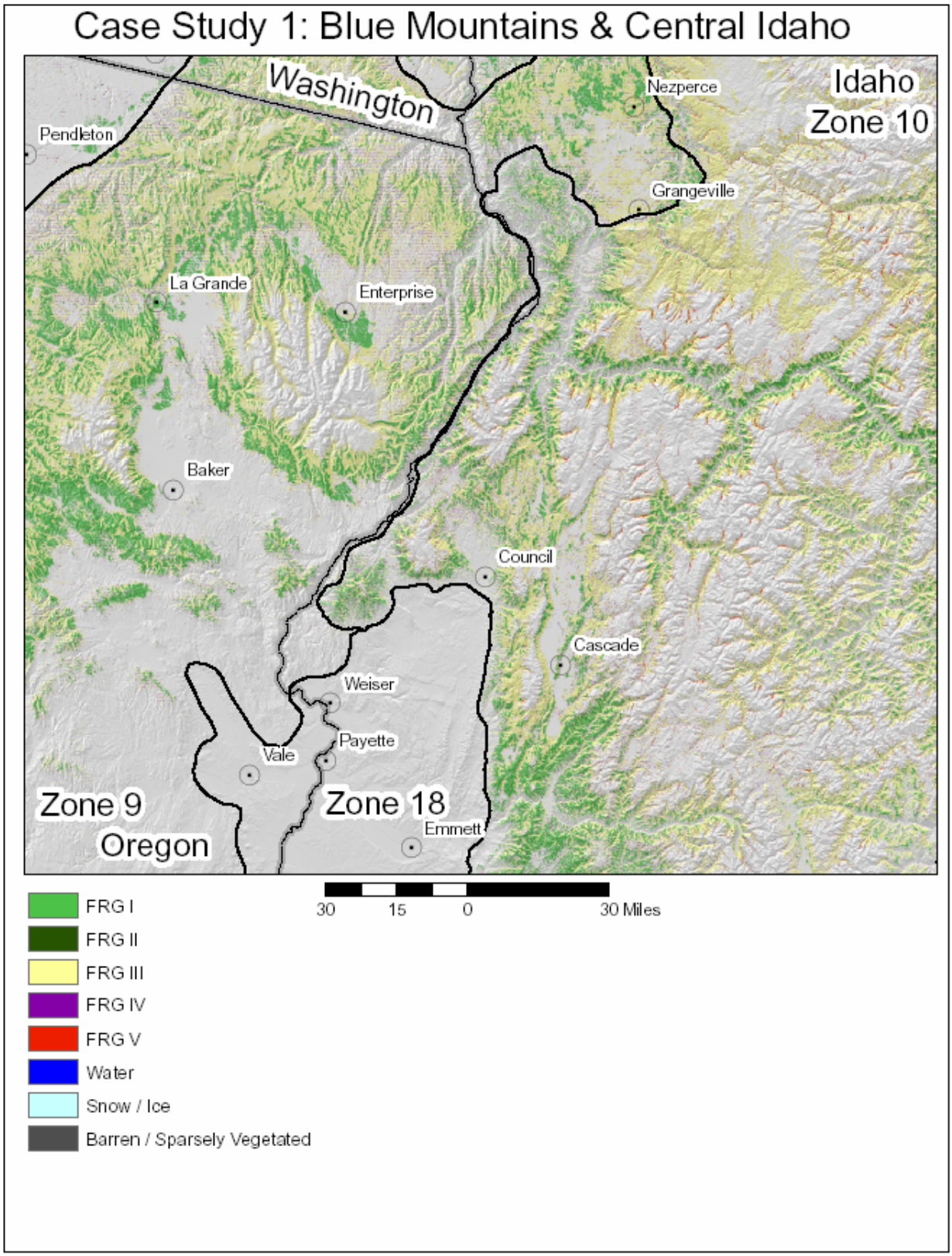

Figure 4: LANDFIRE Fire Regime Groups for ponderosa pine – Douglas-fir systems (see Figure 2 for BpS units used).

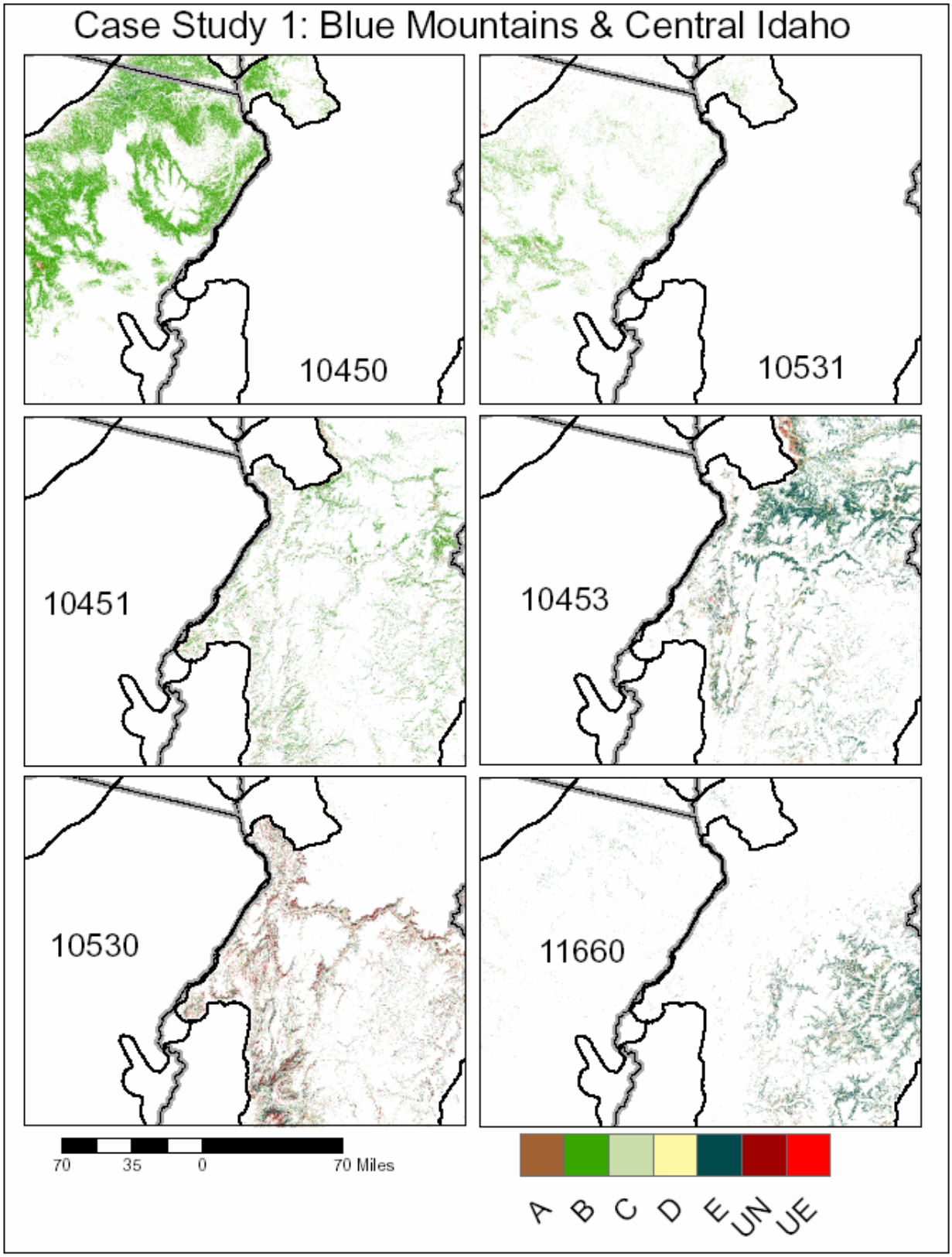

Figure 5: LANDFIRE Succession Class for ponderosa pine – Douglas-fir systems (see Figure 2 for BpS units used). Only wildland areas are shown for clarity.

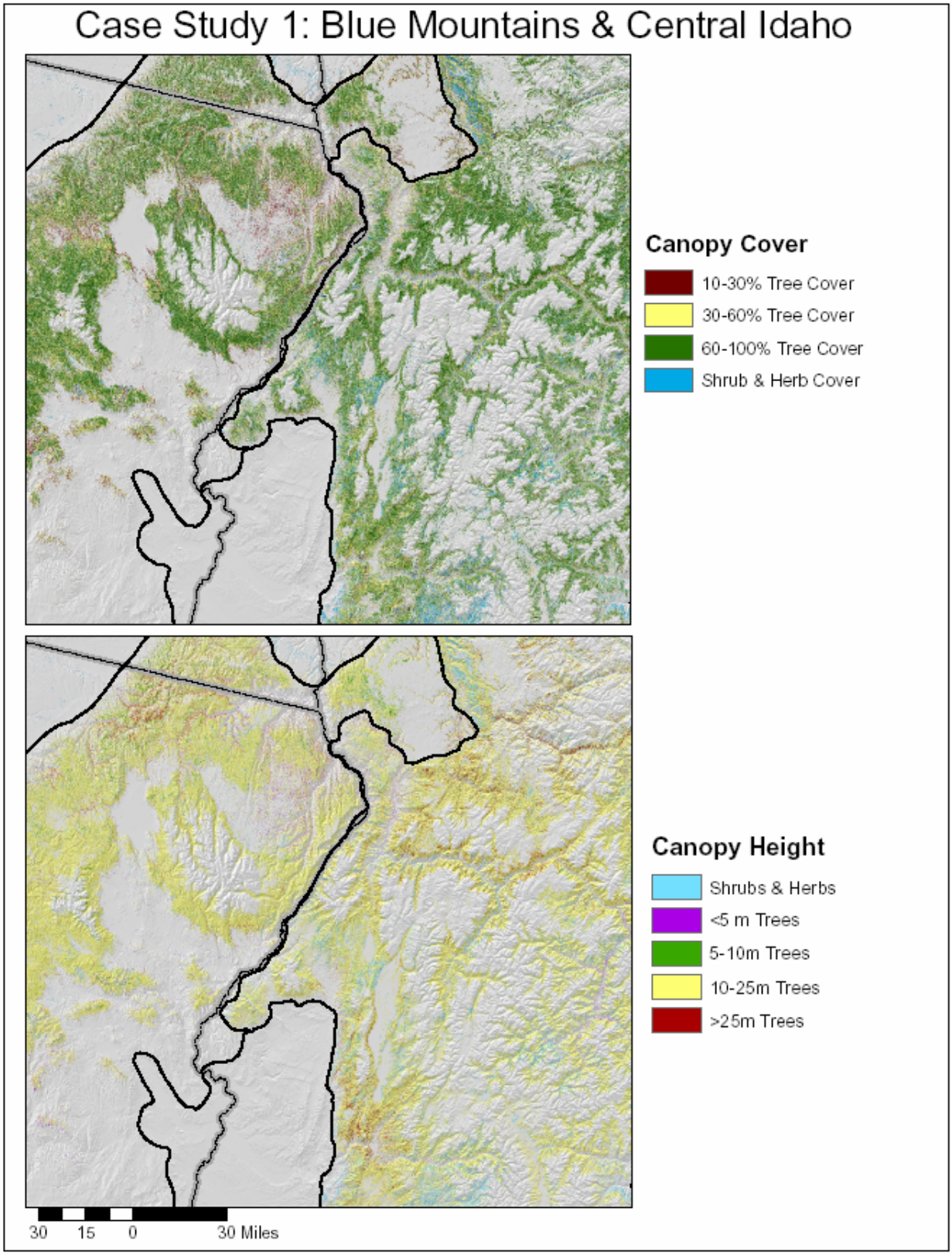

Figure 6: LANDFIRE Canopy Cover and Canopy Height for ponderosa pine – Douglas-fir systems (see Figure 2 for BpS units used). Only wildland areas are show for clarity.

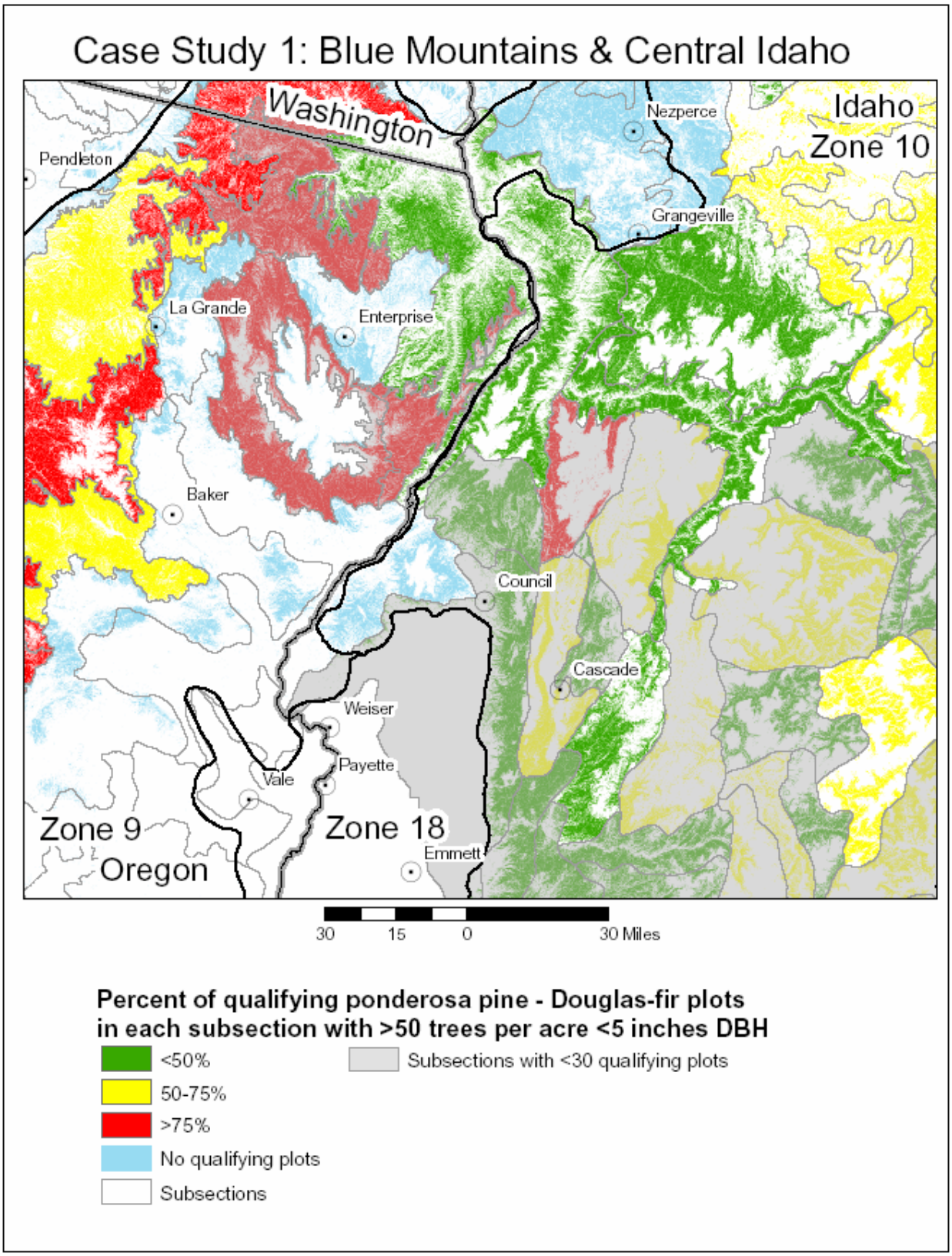

Figure 7: Estimate of advanced regeneration in ponderosa pine – Douglas-fir systems (see Figure 2 for BpS units used). Estimates are based on percent of qualifying plots per subsection; to qualify, a plot must be mapped to a ponderosa pine – Douglas-fir system and have >5 trees per acre >21 inches DBH (i.e., have an overstory). Map is masked just to show areas mapped to ponderosa pine – Douglas-fir systems.