Rim Lakes Forest Health Project

Fire Behavior and Fuels Analysis

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Purpose and Need

- Fire Behavior and Ecological Effects
  - Restoring fire as a natural disturbance
  - Potential Fire severity
- Community Wildfire Protection
  - Potential fire behavior

Alternatives

- Alternative A – No Action
- Alternative B – Uneven aged management with the intent to create groups and gaps where possible and as appropriate.
- Alternative C – Uneven aged management with the intent to create groups and gaps as in Alternative B but while being limited to a 16” cap.

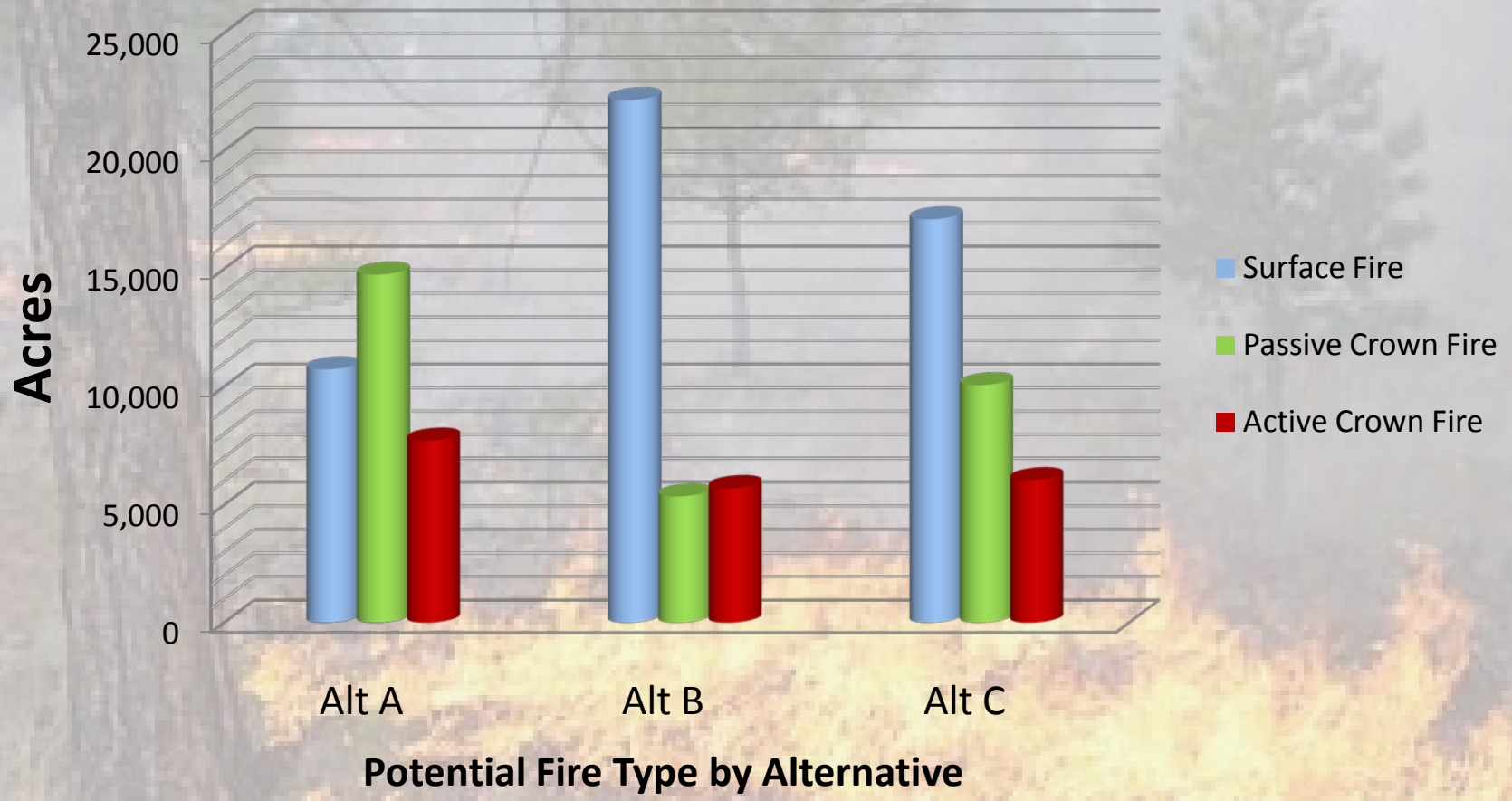
Analysis Criteria

- Potential Fire Behavior:
  - Fire behavior potential under weather similar to that of the Rodeo-Chediski fire.
  - Desired Condition = > 75% of area as Surface fire
- Fuel loading using stand averages from FFE
  - Average canopy bulk density, Crown base height and surface fuel loading for Ponderosa Pine, Pine-oak and dry mixed conifer forests.
  - Desired Condition = Pine: CBH >18', CBD >.05kg/m3, SF = 5-10 t/acre … DMC: CBH >10', CBD<.08kg/m3, SF = 8-16t/acre
- Ecological Effects: Fire Regime Condition Class (FRCC)
  - Percent of the area in FRCC 1, 2 and 3.
  - Desired Condition = 100% in FRCC 1

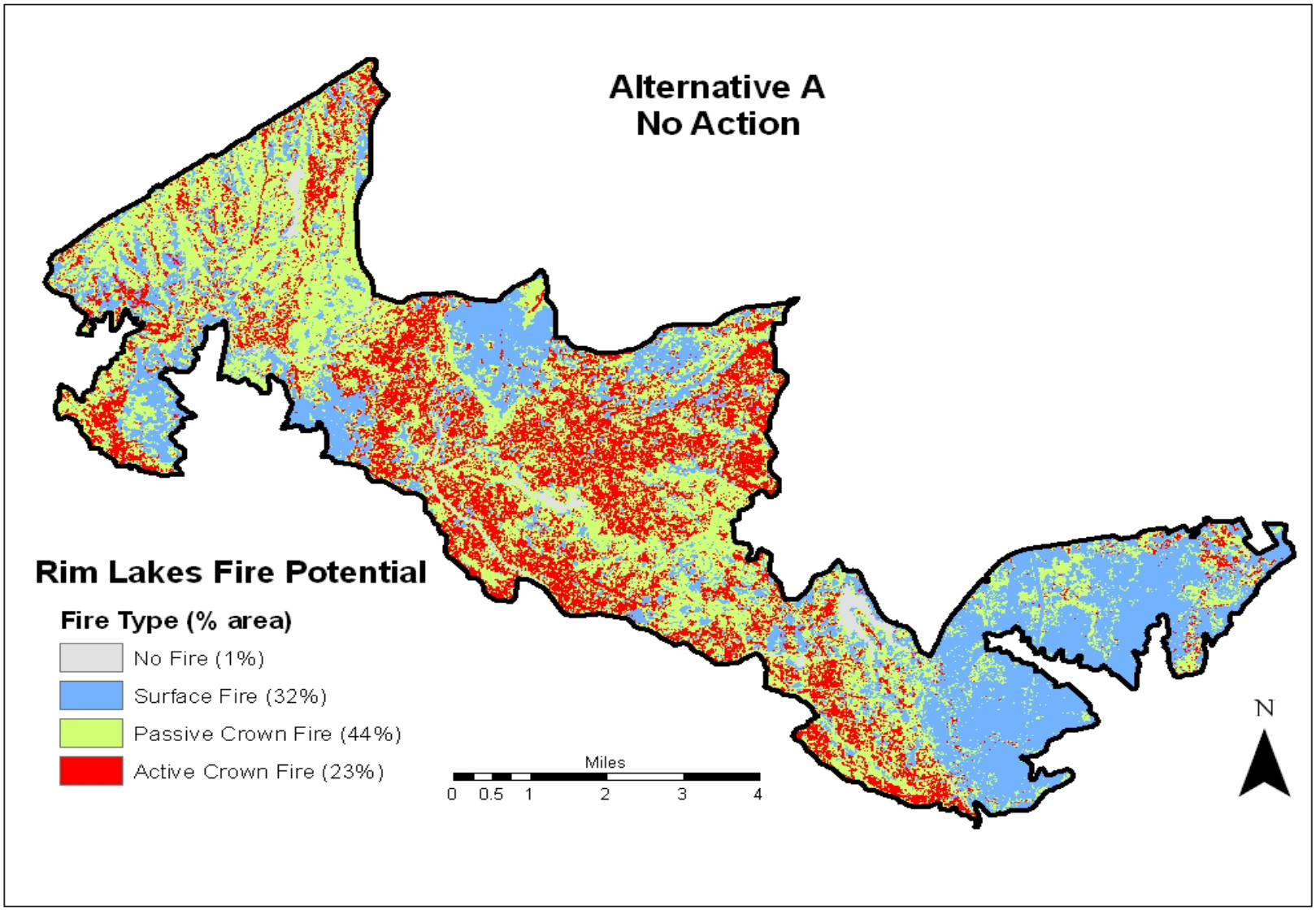
Potential Fire Behavior

- FlamMap
  - Fire behavior mapping and analysis program that computes potential fire behavior characteristics over an entire landscape for constant weather and fuel moisture conditions.
    - Weather Used for analysis
      - WIND: 23 mph at 20’ from 209 deg
      - FUELS: 4%, 5%, 6%, LH 30%, LW 60%
      - FUEL Conditioning 6/10/2002 to 6/20/2002 (days leading up to the Rodeo and Chediski fires starting and joining)

Potential Fire Behavior Results



Potential Fire Behavior Results



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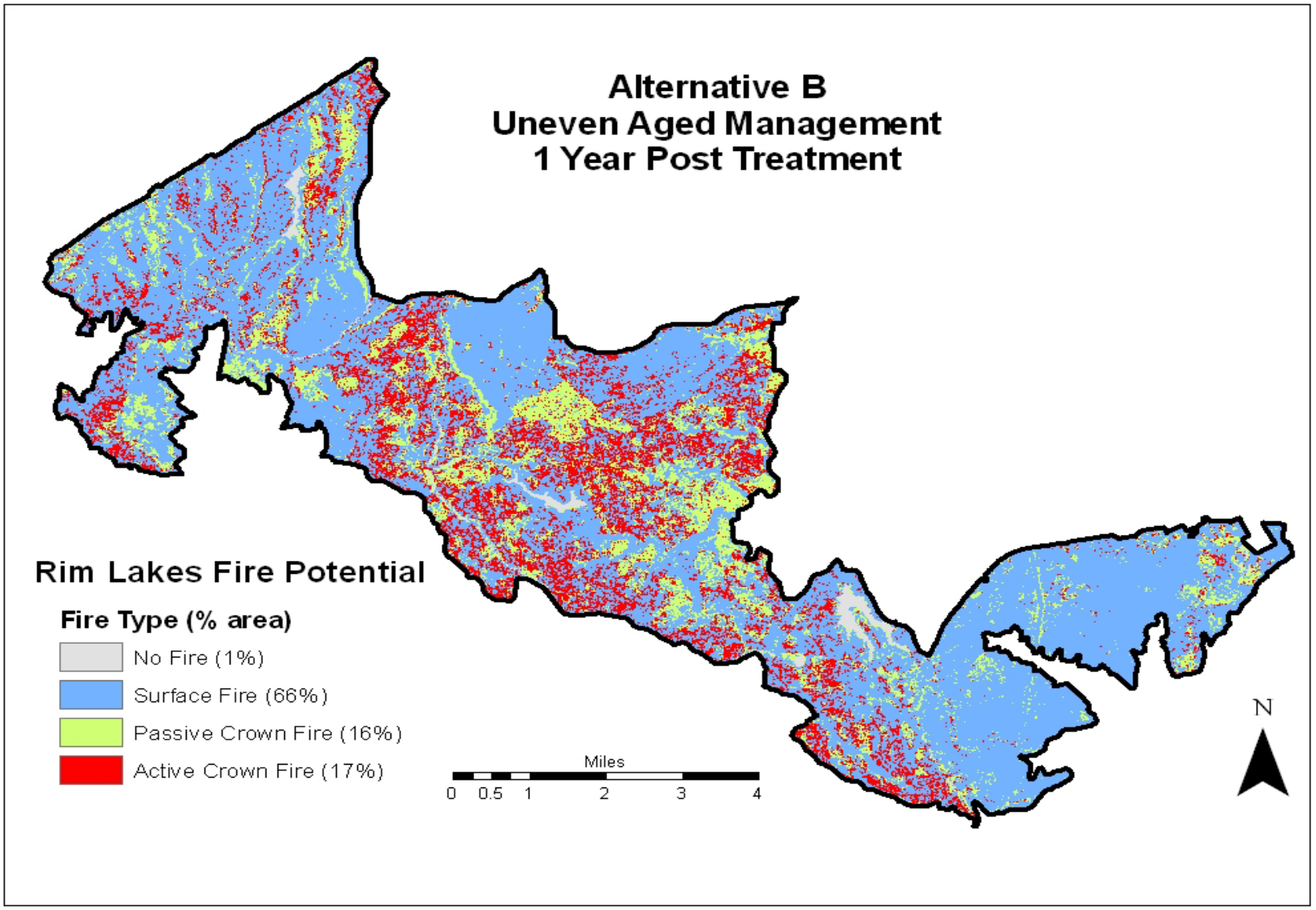

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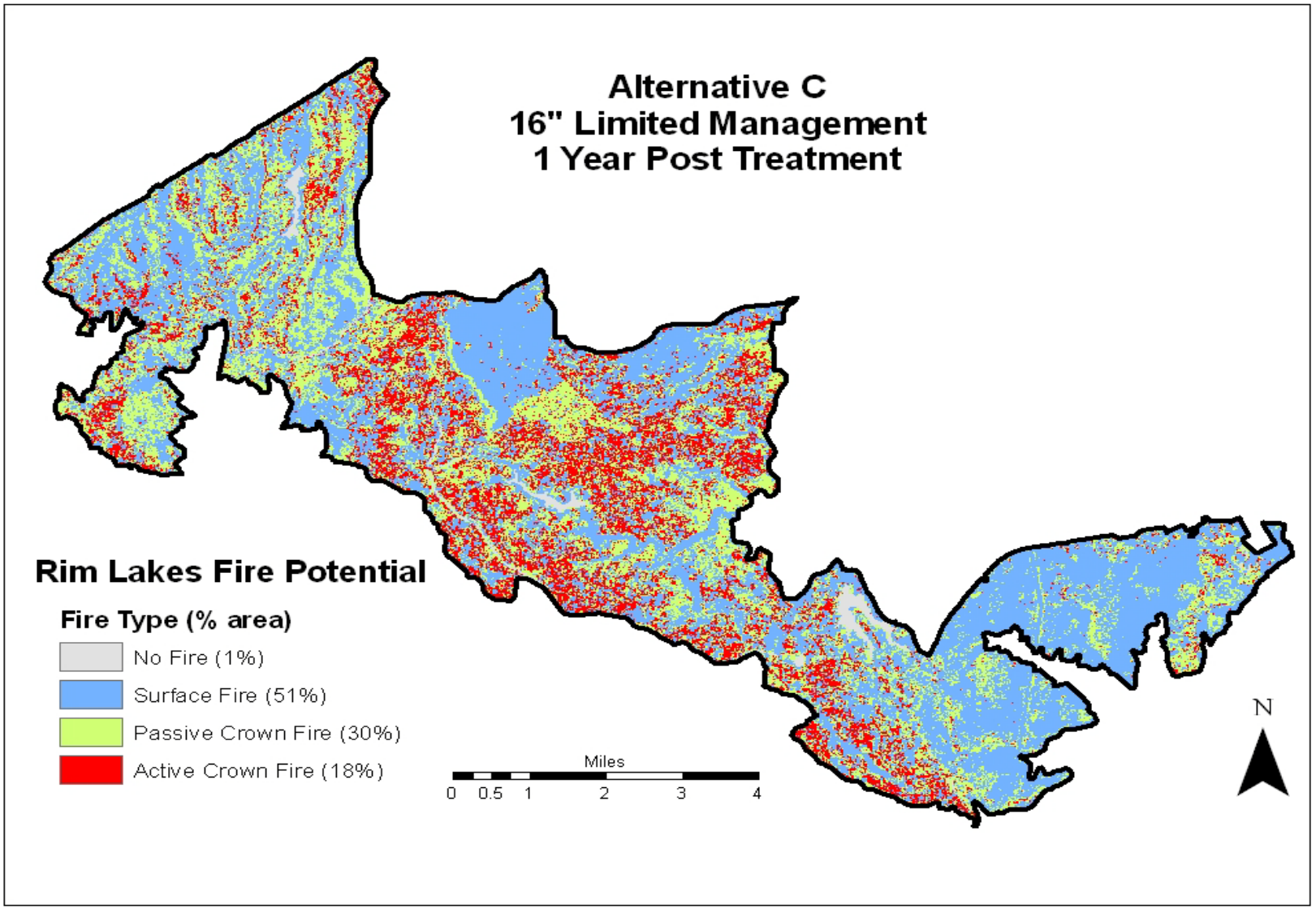

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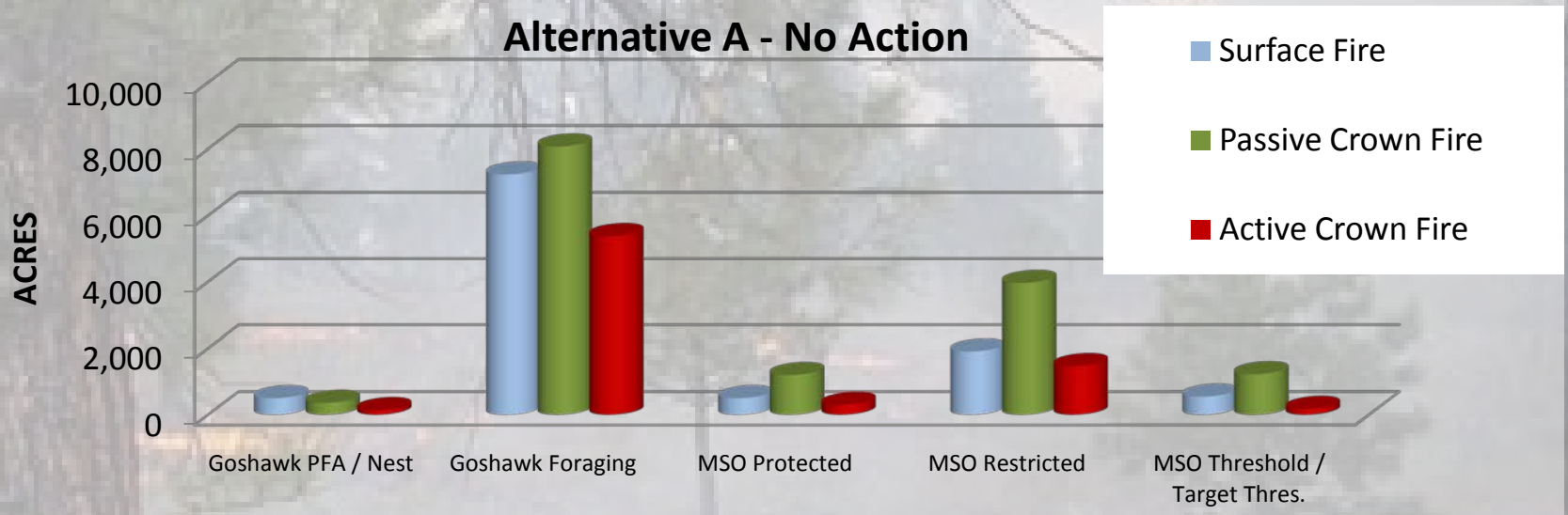
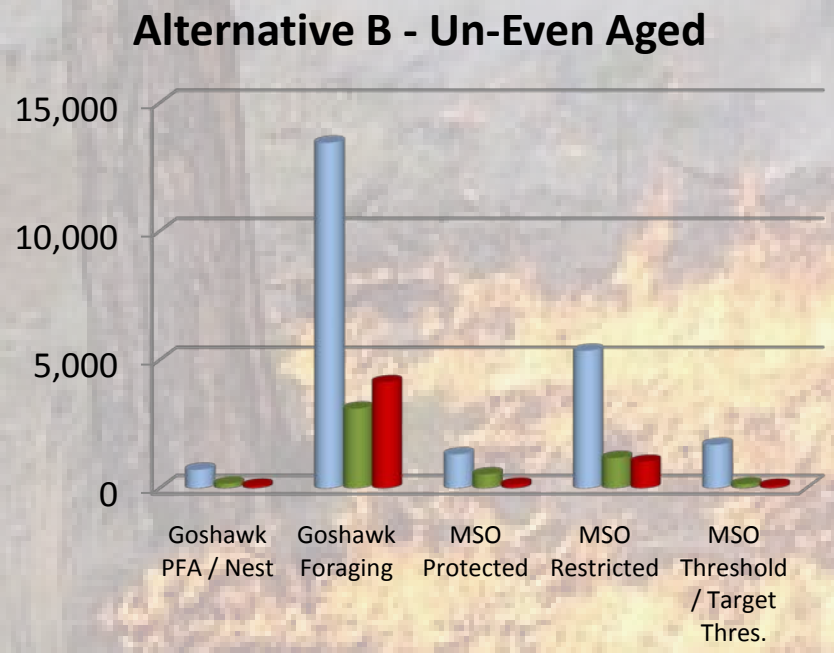
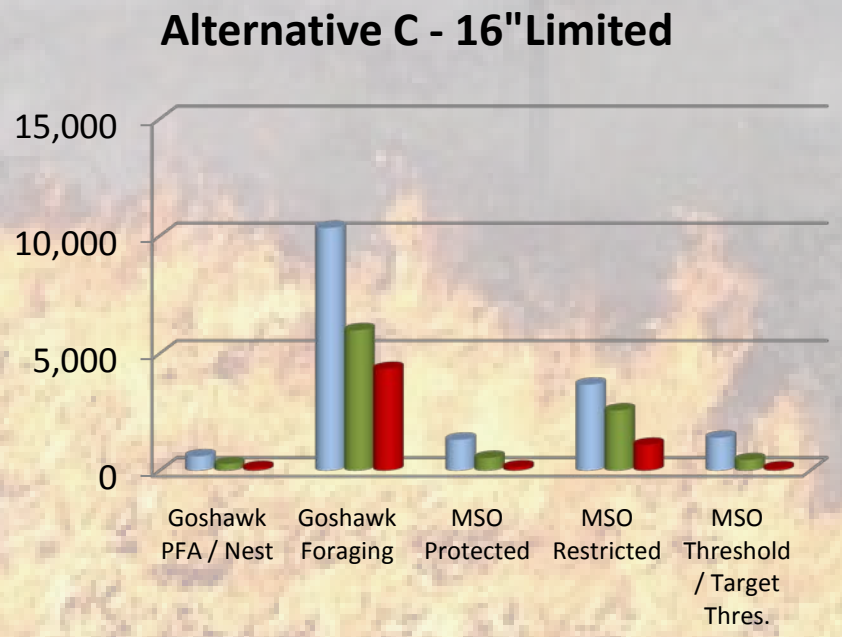






Fuel Loading Results

- Fire and Fuel Extension to the Forest Vegetation Simulator. (FVS-FFE)
  - Modeled fuel loading based on vegetation information as an average for a stand.

Fuel Loading Results

FVS/FFE calculation results					
Forest Types	**Criteria**	**Desired Conditions**	**Alt A - No Action**	**Alt B - Uneven**	**Alt C – 16" Limited**
Pine - Oak	Surface Fuel loading (tons per acre)	5 to 10	2 to 3	5 to 10	5 to 10
	Canopy Base Height (ft)	> 18	15	29	29
	Canopy Bulk Density (kg/m3)	< 0.05	0.05	0.02	0.02
Ponderosa pine	Surface Fuel loading (tons per acre)	7 to 14	3	7 to 14	7 to 14
	Canopy Base Height (ft)	>18	12	28	28
	Canopy Bulk Density (kg/m3)	< 0.05	0.04	0.02	0.02
Dry Mixed Conifer	Surface Fuel loading (tons per acre)	8 to 16	6	8 to 16	8 to 16
	Canopy Base Height (ft)	> 10	7	23	21
	Canopy Bulk Density (kg/m3)	< 0.08	0.09	0.03	0.04

Fire Regime Condition Class

- FRCC – Degree of departure from reference condition vegetation, fuels and disturbance regimes.
- Fire Regime includes Frequency and Severity
- FRCC 1 – Within historical range
- FRCC 2 – Moderately altered
- FRCC 3 – Significantly altered

Fire Regime Condition Class

- Rim Lakes area is comprised of Ponderosa Pine (PPIN7) and Dry Mixed Conifer (PPDF7) Biophysical settings.
  - Characterized by a high frequency low severity fire regime. (Fire Regime I)
  - Dominance of shade intolerant species
  - Un-even aged stand characteristics
  - Abundant herbaceous understory
  - Open canopies with gaps

Fire Regime Condition Class

- Ponderosa Pine Assumptions:
  - Moves to FRCC 1:
    - Density met with intolerant species and canopy gaps
    - Uneven aged attributes
    - Exhibits 75% open canopy attributes
  - Moves to FRCC 2:
    - Density met in even aged conditions without canopy gaps
  - Remains in FRCC 3:
    - >60% CC

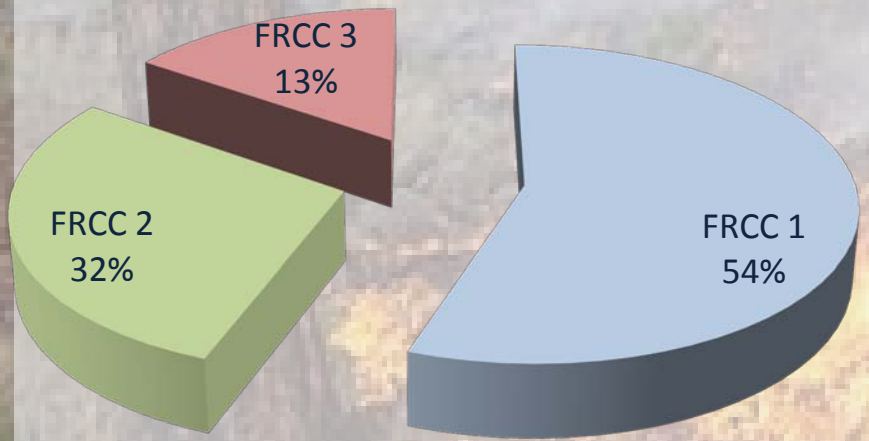
Fire Regime Condition Class

- Dry Mixed Conifer Assumptions:
  - Moves to FRCC 1:
    - > 70% open canopy
    - Dominance by shade intolerant species
    - Canopy gaps
  - Moves to FRCC 2:
    - <70% >15% open canopy
    - Dominance shared with tolerant species
  - Remains in FRCC 3:
    - >15% closed canopy
    - Dominance by shade tolerant species

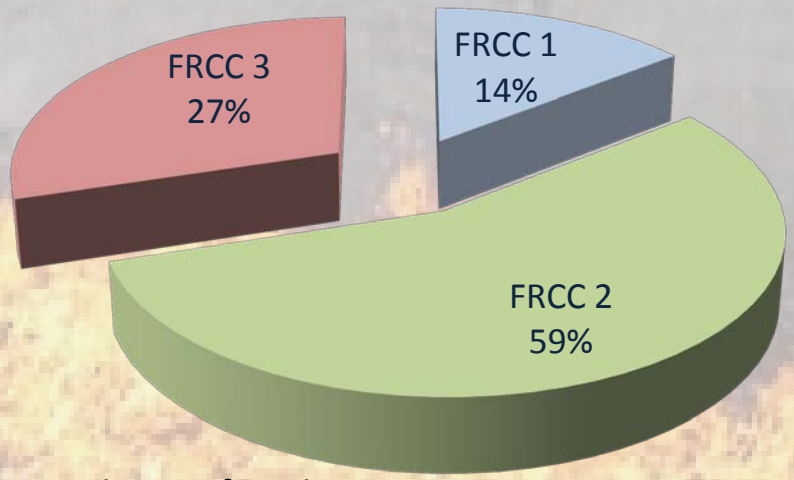
Fire Regime Condition Class Results

- FRCC 1 year post treatment

FRCC 1 Year Post Treatment Alternative B (Un-even aged)



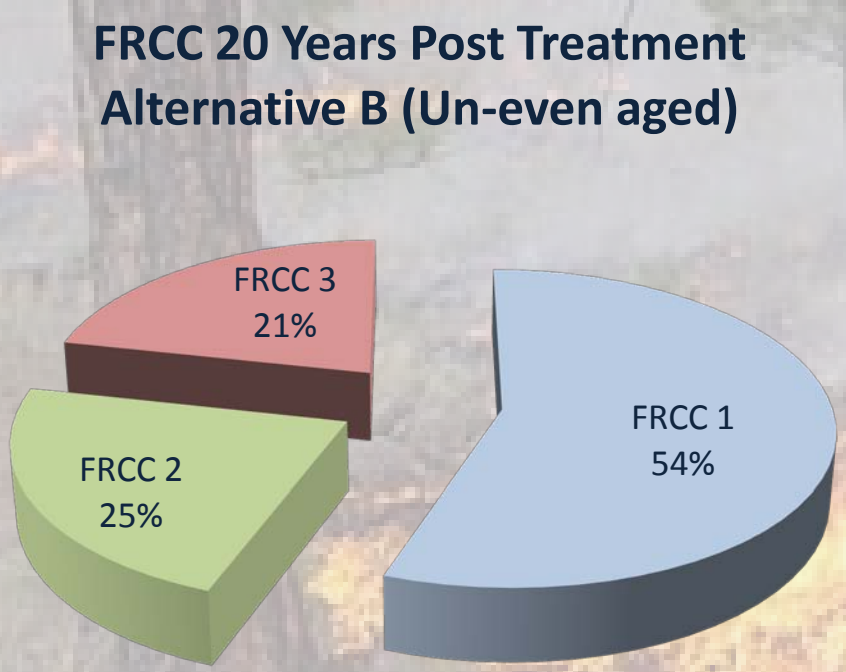
FRCC 1 Year Post Treatment Alternative C (16" limited)

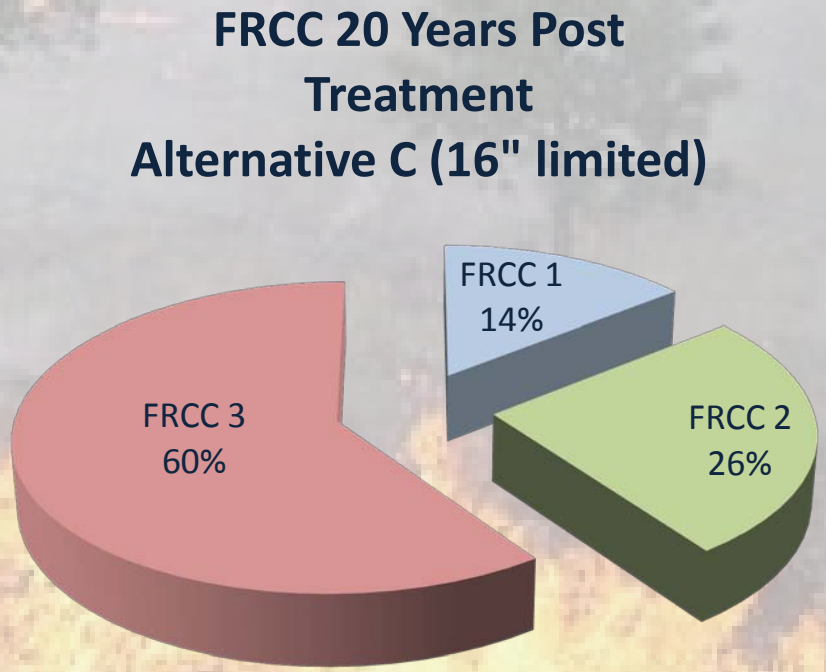


- FRCC 3 due to Habitat Restrictions and Canopy closure for Alt C.
- FRCC 2 in Alt C has much of it almost in FRCC 1 but for canopy or species.

Fire Regime Condition Class Results

- FRCC -20 year post treatment





  - FRCC 1 is maintained for both alts
  - FRCC 3 increases due to canopy closure… all even aged in Alt C is expected to close, while Alt B maintains gaps.

Conclusions and Management Implications

- Both action alternatives provide improvement in conditions when compared to the no action alternative
- The difference between alternative B and C is the ability to create canopy gaps and thereby create spatial discontinuity of canopy fuels, and maintain those gaps.