FUEL MANAGEMENT STRATEGIES TO REDUCE WILDFIRE IMPACTS IN CALIFORNIA'S COAST RANGES

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CLEAR NEED TO SHIFT FROM REACTIVE TO PROACTIVE APPROACHES

- >95% of wildfires are kept below 10 acres
- ~1% of California burns in a wildfire annually
- Increased fire frequency, size, and severity
- Increases in damages and costs
- <<1% of area treated annually
- Lack of coexistence with fire
COEXISTENCE WITH FIRE IS POSSIBLE

- Willingness to accept that fire is inevitable
- Employ appropriate and effective wildland fuel treatments where possible
- Promote fire-adapted human communities
- Accept workable trade-offs between ecological and community protection goals when necessary
- Work collaboratively in the planning and implementation process
- Heed the science on fire and fuels management
- Promote conditions that allow use of managed wildfire
- Recognize that risk can be reduced but not eliminated
WILDLAND FIRE FUNDAMENTALS

Fire Triangle

Fire Behavior Triangle
WILDLAND FUEL COMPLEXES

Canopy Bulk Density

Canopy Base Height

Fuel Bed Height

Fuel Loading

Keane 2016
PURPOSE OF FUEL TREATMENTS

- intentional alteration of a fuel complex to modify fire behavior and reduce the potential negative impacts of future wildfires
CONSIDERATIONS

• Vegetation Type and Structure
• Historical Fire Regime
• Weather/Climate
• Topography
• Proximity to communities
• Ownership objectives
STAND-LEVEL PRINCIPLES

- Reduce surface fuel loading
- Increase canopy base height
- Decrease crown bulk density
- Promote large, thick-barked trees

Agee and Skinner 2005
LANDSCAPE-LEVEL PRINCIPLES

• Sufficient extent of area treated (~15-30%)

• Promote heterogeneity of fuel conditions

• Strategic prioritization of treated areas
NEED TO ACCEPT TRADE-OFFS

• Importance of considering ecological and ecosystem services
• Some acceptance of trade-offs, especially within the wildland-urban interface
FUEL TREATMENT TYPES:
PRESERVED FIRE
(CONTROLLED BURNING)

Prescribed burning: intentional ignition and application of fire under desired conditions to reduce fuels and meet resource objectives

**Benefits**
- Reduces surface fuel loading
- Increases canopy base height
- Reduces small tree density

**Challenges/Drawbacks**
- Air quality considerations
- Narrow burn windows
- Insufficient intensity
**Fuel Treatment Types: Thinning**

**Mechanical thinning**: use of silvicultural principles to alter stand and fuel conditions to meet resource objectives

**Benefits**
- May increase canopy base height
- May decrease crown bulk density
- Reduces stand density

**Challenges/Drawbacks**
- Often increases surface fuel loading
- Need for subsequent treatment
- Insufficient reduction of stand density
- Need for greater social license
FUEL TREATMENT TYPES: MASTICATION

**Mechanical mastication:** mechanical shredding of shrubs and small trees to alter fuel structure

**Benefits**
- Decreases fuel bed height/Increased fuel bed bulk density
- Promotes greater access to fire fighters and prescribed burning
- Reduces small tree/shrub density

**Challenges/Drawbacks**
- Increases dead surface fuel loading
- Prolonged residence time
- Increased smoldering and smoke production
- Vegetation changes
Managed Wildfire: allowing a wildfire to burn under well-defined conditions and perimeters to reduce fuels and meet resource objectives

**Benefits**
- Increase pace and scale of treated area
- Effectively reduces fuel loading
- Promotes heterogeneity

**Challenges**
- More decision support tools needed
- Limited application
- Need clearer distinction
FUEL TREATMENT TYPES:  
FIRE SUPPRESSION

**Fire Suppression:** directly and indirectly extinguishing wildfires to limit the spread and negative impacts of wildfire

**Benefits**
- Community and resource protection
- Effective at limiting fire spread
- Stop-gap measure

**Challenges/Drawbacks**
- Doesn’t reduce fuel loading/alter fuel structure
- Declining effectiveness
- Increasing costs
LONGEVITY AND MAINTENANCE

• Loss of treatment effectiveness over time

• Keep in mind there is no one-time treatment

• Too frequent can result in type conversions

• Areas around the wildland urban interface will likely require more frequent treatment to maintain effectiveness

• Capitalize on prior wildfire footprints to maintain fuel reductions and as anchor points for further treatments
LINGERING CHALLENGES

• Limited effectiveness of existing treatments during high speed, dry east wind events

• Ember wash and long-distance spotting

• Requires prolonged effort and funding to affect substantive change
CONCLUDING REMARKS

• Fire is an inevitable part of living in the California Coast Ranges

• Leverage recent wildfires to affect change in the region

• Coexistence with fire is possible but will require a collaborative, multi-pronged, and strategic approach

• Need for more managed wildfire
THANK YOU FOR YOUR ATTENTION

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