Ground-Based Forest Machinery: Improving Wildland Fire Suppression

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-and-

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Logging Engineer, Retired USDA Forest Service
Introduction

• 2018 California (USA):
  • nearly 2 million acres burned
  • exceeding $12 billion in damages
  • almost 23,000 homes were destroyed
  • 103 people were killed
Agenda

- Machines & Tasks
- Safety
- Dispatch, Transport, & Access
- Remote Delivery of Water
- Northern California
- Innovations
## Machines & Tasks

Forestry machines are purpose-built for many tasks.

Graphics credit: Ry Basko

<table>
<thead>
<tr>
<th>FIRE TASK</th>
<th>Feller Bunchers &amp; Harvesters</th>
<th>Wheeled Skidders</th>
<th>Dozer &amp; Tracked Skidders</th>
<th>SoftTrack Skidders</th>
<th>Excavators, Shovels and Loaders</th>
<th>Forwarders &amp; SuperSkidders</th>
<th>Skidgines (Tracked, Wheeled)</th>
<th>Mulchers</th>
<th>Road Grader</th>
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Machines & Tasks
Machines & Tasks

• Heavy forestry equipment offers firefighters increased capabilities:
  • Safer night-time fireline construction
  • Faster, safer indirect and contingency fireline construction
  • More opportunities for direct line >4 ft. flame length
  • Safer methods of hazardous tree removal and brush clearing
  • A force multiplier to increase crew capabilities, efficiency and safety
  • Contracted equipment is an economic option (call-when-needed resources)
Safety advantages using mechanized wildfire operations: cut, position, night operations, clear hotspots (Art: Ry Basko)
Safety
Dispatch, Transport, Access

• Need to consider:
  • Mobilization Time
  • Transport
  • Access Roads
    • Geometry
    • Condition
  • Machine speed
Remote Water Delivery

• Skidgine: skidder + engine
• Can carry large volumes of water long distances
• Aerial refill capability
Northern California

• Stone Fire observations
Northern California

• Stone Fire observations
Leadership:

- Good potential yet limited use of logging equipment on federally managed fires in California.
- Most use involves repair and rehabilitation late during fire suppression.
- Construction of safety zones and escape routes in timber.
Northern California

• **Leadership:**
  • Use and choice: probability of success.
  • Concerns with decked timber.
  • Experience and assurance with fire managers is another factor.
Northern California

• **Leadership:**
  • Political and environmental challenges exist.
  • Efficient and safe fire suppression vs. circumventing the National Environmental Policy Act process, including the required public involvement.
Innovations

• Tethered Equipment
Innovations

• Heavy Equipment Task Force - Northern Rocky Mountains, USA
Innovations

• Fashioned after mechanical whole-tree logging side:
  • Felling
  • Skidding
  • Earthwork
  • Water delivery
  • Siderod (foreman)
Innovations

• *Ground Slope Maps on the Fireline*
Innovations

SLOPE MAP: THE FIRST THREE SLOPE BRACKETS INDICATE POTENTIAL UPSLOPE CONSTRUCTION; THE FOURTH IS DOWNSLOPE CONSTRUCTION.

0-25%  26-40%  41-55%  56-70%  70%+

Assignment Break

20140814_FireLines
Fire Lines
- 2000 Dozer Line
- Dozer Line
- Handline
- NHD_FlowLines
- contours_100

Sections
0 - 30
30.1 - 40
40.1 - 55
55.1 - 70
70.1 - 270.2856445

VIH 20140816 SLOPE

Div Y
Questions?