Landscape Level Planning - A Case Study

Wildland Fire Canada 2016
Stephan Martineau, Manager
Location
• Summer 2007: Springer Fire – a landscape scale fire beside our communities and our soon to be tenure.
Hotter Summers

Dryer Summers

Source: 2011 Kootenay Resilience Project
Area Burned – Past and Predicted

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Conclusion:

Option 1: by Wildfire and Insects
Option 2: by Human Intervention / Management

Option 1 is **not** preferred choice from water, infrastructure, habitat, ecological benefits or ecosystem health perspectives.
Conclusion:

Vegetation density in low elevation forests will be greatly reduced during next 50 years due to climate change.

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The reality in the woods…
So we got to work...
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- 2008 - we re-wrote our stocking standards / 400 stems/ha
- So far we have treated close to 300 ha
- Approximate investment = $2,300,000+
When you zoom in it looks really good!
When you zoom out at the landscape level?
Phase 2 – Landscape Level Planning
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Findings:
• Small projects have limited benefits when faced with landscape size fires
• We need a landscape level approach to **defend investments** and achieve goals.
Phase 2 – Landscape Level Planning

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• Small projects have limited benefits when faced with landscape size fires
• We need a landscape level approach to defend investments and achieve goals.

Questions:
• How do you choose where to treat in a landscape?
• Were there some areas that burned more frequently?
• Were there fire movement paths in the landscape?
Fire Behavior Model
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• Model requires a set of input data:
  • Elevation – Slope – Aspect – Stand Height – Canopy Cover (crown closure) – Fuel Model – Canopy Base Height – Canopy Bulk Density
  • Temperature – Wind speed and direction – Cloud Cover
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When data set is ready, we can light virtual fires
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Hot Dry Weather:
- 30° to 35° daytime temperatures, August.
- Has been a long hot summer – dry fuels.
- 16 km/hr winds.
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- Has been a long hot summer – dry fuels.
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**Fire Suppression:**
- Not successful.
Cumulative Fire Travel Paths
Sorted by Path Length
Paths > 2000 m long

150 Well Distributed Ignitions
Weather Conditions:
- August 7: High temperature.
- 30° daytime high temperature.
- Winds 15 kph from the west.
- Following a week of sunny 30° weather.

50% of Ignitions have at least 1 path > 2000 m long

computer generated ignitions
Model showed some key fire movement paths – transition paths from “local” to “landscape” fire.
Cumulative Fire Travel Paths
13 Test Ignitions
Current Landscape Conditions

Weather Conditions:
August 7 Clear skies.
35°C daytime high temperature.
Winds 16 kph from the west.
Following a week of sunny 30°C weather.

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Cumulative Fire Travel Path with Strategic Fuel Management Zones
13 Test Ignitions

Weather Conditions:
August 7 Clear skies.
35°C daytime high temperature.
Winds 16 kph from the west.
Following a week of sunny 30°C weather.

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Legend:
- Community Forest Boundary
- Houses (East of River Only)
- Fire Ignition Point
- Fire Path
- Existing WUI Fuel Managed Areas
- Potential Strategic Fuel Management Zone
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Wide and continuous fuel managed areas are most effective.
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Many factors affect results (wind – fuel load – terrain – time of day – temperature etc…)
Next: Landscape Level Plan – 2015-16

Using Fire Behavior Model we began locating Strategic Fire Break Zones with goal of creating a 5 year plan
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Using Fire Behavior Model we began locating Strategic Fire Break Zones with goal of creating a 5 year plan

• Where is it a priority to reduce fuels?
• Where is it feasible to operate?
• Where can reasonably sized treatment units be placed?
9 Guiding principles for choosing strategic fire break (SFB) locations:

1. SFB located to interrupt identified fire movement paths

2. SFB reduce the chances of transitioning from local to landscape level

3. SFB at least 200m wide and preferably wider

4. SFB should be as continuous as possible

5. SFB should break the landscape into subunits = suppression options

6. SFB located on slopes < 60% with minor exceptions

7. Treatment areas must be accessible

8. SFB expand from existing fuel treatments and natural low fuel areas

9. SFB consider ecosystem restoration needs
Slocan Valley Strategic Landscape Level Wildfire Protection Plan Pilot Project
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Proposes 4 types of treatment:
Type 1 – Wildland Urban Interface
Type 1 – After – same location
Type 2 – Post harvest clean up after - 40% retention (8 years later here)
Type 2 – Post harvest clean up after - 40% retention - 8 years later
Type 3 – Machine clean-up
Type 4: Ecosystem Restoration (NDT-4)
Type 4: Ecosystem Restoration (during harvest phase)

The ponderosa pine stems are the retained forest canopy.
One important question that needs answering:
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- What to do about private land?
leaving you with a few numbers:
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• Proposed Strategic Wildfire Protection Plan projected cost = 4 million (+/-1200 hectares)
• Cost of suppression of the one 2007 landscape size fire in Slocan Valley = 10 million dollar +
What we don’t want.
Thank You!