Characterizing private landowners’ fuel reduction activities for coupled systems modeling in Oregon’s (USA) ponderosa pine ecoregion

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PNW Research Station
Coupled human-natural system study area

- Bend
- Klamath Falls
Coupled human-natural system study area
Coupled human-natural fire-prone system

**Actors (values, goals, preferences)**
- Federal managers
- Industrial private landowners
- Nonindustrial private landowners
- Homeowners
- Tribes

**Decisions**
- Fuel treatment
- Fire suppression
- Harvest
- Development
- Fire-proofing
- Fire ignition

**External socioeconomic influences**
Markets, prices, population growth, policies

**Climate change**
- Forest resilience
- Biodiversity
- Carbon storage
- Wood products
- Recreation resources
- Biofuel, and others

**Endogenous feedback to social institutions**
Fire risk, wildfire, carbon storage, timber, amenities, biofuel

**Endogenous feedback to actors**
Fire risk, wildfire, carbon storage, timber, amenities, biofuel

**Social institutions**
- Fire districts
- Fire fighting agencies
- Stewardship groups

**Institutional influences**
- Risk mitigation information
- Cost-sharing
- Other programs

**Landscape**
- Structure
- Composition
- Dynamics

**Fuel conditions**
- Fire risk
- Wildfire

**Ecosystem services**
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**Feedback and flows to external socioeconomic system**
This Job By...

Wildfire Fuels Reduction

541-598-7393
Survey sample

- Conducted in 2008
- Survey sent to 1,244 landowners
- 234 surveys disqualified
- 505 usable surveys returned (50%)
- 360 surveys used in analysis (36%)
## Survey respondent characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treat for fuel</td>
<td>79%</td>
</tr>
<tr>
<td>Resident on parcel</td>
<td>28%</td>
</tr>
<tr>
<td>Timber objective</td>
<td>43%</td>
</tr>
<tr>
<td>Past fire on parcel</td>
<td>44%</td>
</tr>
<tr>
<td>Forestry or fire protection group member</td>
<td>26%</td>
</tr>
<tr>
<td>Age</td>
<td>63 years</td>
</tr>
</tbody>
</table>
Perceived wildfire risk

- Very concerned: 45%
- Concerned: 25%
- Moderately concerned: 18%
- Slightly concerned: 10%
- Not concerned: 2%
Wildfire hazard

Values at risk

Past wildfire experience

Social context

Perceived wildfire risk

Capacity

Perceived responsibility

Protective action
Empirical modeling

Perceived wildfire risk = $f($ wildfire hazard, values at risk, past wildfire experience social context $)$;

Treat for fuel = $f($ perceived wildfire risk, capacity, perceived responsibility $)$. 
## Perceived-wildfire-risk model

<table>
<thead>
<tr>
<th>Factor</th>
<th>Variable</th>
<th>Sign/sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wildfire hazard:</td>
<td>Crown fire potential</td>
<td>+++</td>
</tr>
<tr>
<td>Values at risk:</td>
<td>Resident on parcel</td>
<td>+</td>
</tr>
<tr>
<td></td>
<td>Timber objective</td>
<td>++</td>
</tr>
<tr>
<td>Past experience:</td>
<td>Past fire on parcel</td>
<td>+++</td>
</tr>
<tr>
<td>Social context:</td>
<td>Forestry or fire protection group member</td>
<td>+</td>
</tr>
<tr>
<td>Factor</td>
<td>Variable</td>
<td>Sign/sig</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>-----------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Perceived wildfire risk:</td>
<td>Level wildfire concern</td>
<td>+++</td>
</tr>
<tr>
<td>Capacity:</td>
<td>Resident on parcel</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td>Timber objective</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td>Forestry or fire protection group member</td>
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</tr>
<tr>
<td></td>
<td>Age</td>
<td>- - -</td>
</tr>
<tr>
<td></td>
<td>Mill distance</td>
<td>- -</td>
</tr>
</tbody>
</table>
Conclusions

• Landowners’ wildfire risk perceptions are shown to be correlated with hazardous fuel conditions predicted by fuel models.

• Risk perceptions also are correlated with past wildfire experiences, residency, timber-growing interests, and membership in forestry and fire protection organizations.
Conclusions continued

• Landowners’ propensity to reduce fuel is correlated with level of concern about wildfire

• Fuel treatment activity also is correlated with landowners’ capacity to undertake activities

• Policies potentially could increase fuel treatment activity through education to raise awareness of wildfire hazard, and technical assistance to increase capacity to conduct treatments
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