

Session 07 – Landscape Ecology

Landscape Ecology and Forest Fire

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Reciprocal Interactions between Fire and Landscape

- Fire has an effect on landscape pattern and vice versa. Fire dictates resulting spatial patterns but preexisting landscape patterns also dictate spread and severity of fire
- Landscape heterogeneity was found to be a function of fire size and the spatial mosaic in turn was important in determining reestablishment of areas that had experienced extensive burning.
- Effects of landscape heterogeneity on fire regime (related to spatial variation of vegetation as fuel production and moisture, in tandem with previous fire boundaries, restrict fires to small size.

Wild vs Anthropogenic Fires

- Wildfires are natural processes that shape landscape, but anthropogenically-altered fire regimes may affect spatial fire extent and patterns.
- Landscape homogenization resulting from agricultural activities may override the effects of fire in promoting landscape heterogeneity.

W-U Interface

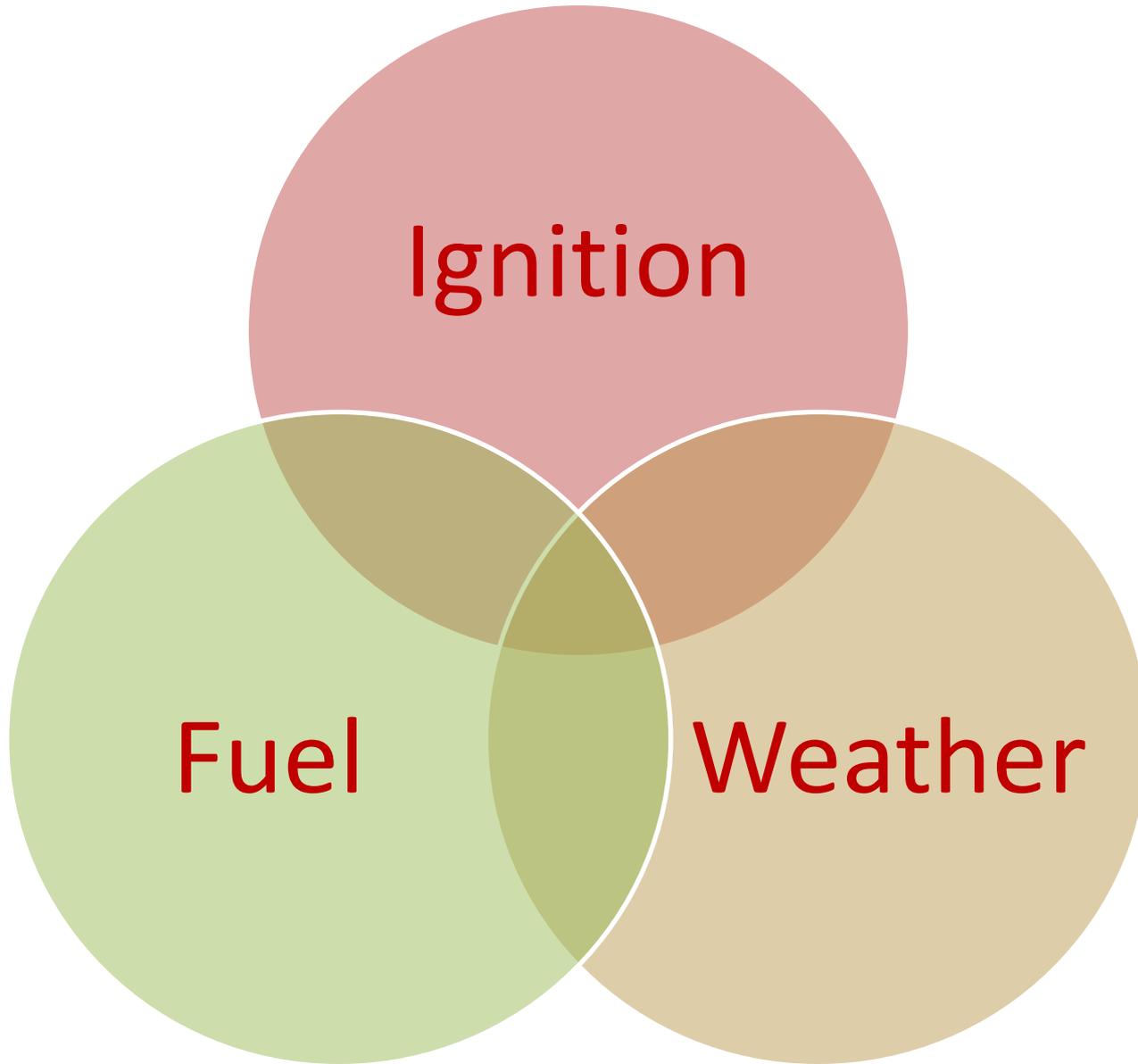
- WUI (Wildland-Urban Interface) is the interface where **human** development **meets** with undeveloped **vegetation**.
- Intermediate levels of urbanization were found to have the highest WUI due to the configuration of **fuel sources and ignition source**.

Losses due to Forest Fire

- Vegetation: less CO₂ will be assimilated by plants
- Air pollution: CO₂ and solid particles → human health: breathing problems
- Visibility: transportation risks
- Social Life
- Working hour and productivity

Forest Adaptation to Fire Disturbance

- Surface fires maintained low and variable tree densities, light and patchy ground fuels, simplified forest structure, and favored fire-tolerant trees, such as ponderosa pine, and a low and patchy cover of associated fire-tolerant shrubs and herbs.
- Fire-tolerant forest is maintained by elevating tree crown bases.
- Surface fires reduced the long-term threat of running crown fires by reducing the fuel bed and metering out individual tree and group torching, and they reduced competition for site resources among surviving trees, shrubs, and herbs.



Ignition

Fuel

Weather