

Landscape study may offer solutions for fire managers

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A fire is currently burning through a study area where projections were made about fire behavior about 2 years ago. Managers used data and analysis from the Gotchen Late-Successional Reserve (LSR) study in the planning, analysis, and implementation of treatments near where the Cold Springs fire is now active.

The Gotchen LSR, lies on the east slope of the Cascade Range in Washington, and covers about 15,000 acres of the Mount Adams Ranger District on the Gifford Pinchot National Forest. The Gotchen LSR was designated by the Northwest Forest Plan to protect habitat for species associated with older forests. Susan Stevens Hummel, a research forester at the Pacific Northwest Research Station, led a case study of the reserve in 2006. Her findings suggested that the potential for compatibility between fire and habitat objectives could be increased through a technique called landscape silviculture.

"Our intent in taking this approach was to expand silviculture decisionmaking beyond a unit-by-unit approach and instead to consider adjacent units and landscape objectives explicitly," explains Hummel. She and her colleagues used a combination of aerial photo interpretation and field sampling. Hummel focused on changes in forest structure, or the arrangement and variety of living and dead vegetation, a common denominator between fire behavior and owl habitat.

However, treatments that reduced fire threat or retained old-forest structure often conflicted in a given stand. To reveal the trade-offs

between them, Hummel teamed up with David Calkin, a research economist with the Forest Service Rocky Mountain Research Station in Missoula, Montana. Forest structure was used as the shared currency between the conflicting landscape objectives. Through the use of simulated treatments to develop the production possibility curves, Hummel and Calkin identified multiple sets of solutions that could reduce the threat of stand-replacing fires while maintaining the overarching goal of the reserve, which is to sustain older forests.

Some the key findings of Hummel's study are:

Fire threat is projected to increase sharply within the coming decade in the Gotchen Late-Successional Reserve. Fuels are increasing on hundreds of acres annually as trees die in association with persistent insect defoliation.

Treating more area of young, noncomplex forest reduced fire threat more effectively in the Gotchen Reserve than did treating structurally complex old-forest patches.

Treatments sometimes lost money and sometimes made money at the scale of an individual unit. However, when the treatments were evaluated in aggregate for the entire Gotchen Reserve, they could break even over the 30-year analysis period while supporting reserve objectives for maintaining old-forest structure and reducing fire threat. In contrast, requiring landscape treatments to earn a profit negatively impacted both habitat and fire objectives over the same analysis period.

In landscape treatments that generated revenue to offset implementation costs in the Gotchen Reserve, wood volume came mainly from grand fir in the 7- to 16-inch diameter classes.

"The methods we used—linking landscape dynamics and patterns of

forest structure to stand-level silvicultural treatments by considering the treatments collectively rather than on a unit-by-unit basis—could be used anywhere that multiple management objectives share a common basis in forest management," says Hummel.

Source: USDA Forest Service

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