Report on

Interactions Among Livestock Grazing, Vegetation Type, and Fire Behavior in the Murphy Wildland Fire Complex

(Idaho and Nevada, July 2007)

Larger and more frequent wildland fires are a growing reality in the management of Western rangelands. Annual weather conditions certainly influence the number of acres burned in any single year, but other factors such as livestock grazing management, the presence of invasive species, and more intensive human activity in wildland areas may also contribute to the risk of wildfire in sagebrush-steppe ecosystems.

The Murphy Wildland Fire Complex burned more than 650,000 acres of sagebrush grasslands in southern Idaho and northern Nevada between July 16 and August 2, 2007. Following containment of the fire, the Idaho Bureau of Land Management (BLM) established a team of scientists, habitat specialists, and land managers to examine the fire, with specific attention to the influence of livestock management and vegetation type on the fire's extent and behavior. The Murphy Wildland Fire Grazing and Fuel Assessment Team reported its findings in August 2008.

The full text of the report is published as a U.S. Geological Survey Open File Report, available online at http://pubs.usgs.gov/of/2008/1214/ and on the University of Idaho website, www.cnr.uidaho.edu/range/MurphyFireComplex/ .

Background

Wildland fire combines with other factors to maintain and, at times, transform sagebrush steppe ecosystems in western North America. Changes in livestock management in the area where the Murphy Complex burned prompted questions about the possible relationship between livestock grazing practices and the extent and intensity of wildfires. Specifically, could grazing be used to reduce the amount of wildfire fuel, thereby reducing the extent or intensity of fires while still maintaining other resource values?

The Murphy Complex began as several separate lightning fires on July 16 and 17, 2007 in rangelands near the Idaho-Nevada border southwest of Twin Falls, Idaho. Vegetation in the area included sagebrush with a native grass understory, grasslands seeded with introduced grasses (crested wheatgrass), and various shrublands and woodlands. Less than 5% of the burned area was dominated by non-native grasses like cheatgrass or medusahead. The Complex was notable for its expanse – encompassing more than 1,000 square miles – and the nearly complete consumption of vegetation in many places.

The fires affected grazing allotments; habitat for bull trout, bighorn sheep and sage-grouse; deer and elk winter range; watershed and riparian areas; and a number of cultural sites.

Emergency stabilization and rehabilitation of BLM-managed lands burned in the Murphy Complex wildfires begun in the fall of 2007 continues in partnership with grazing permittees and state agencies in Idaho and Nevada.

ASSESSMENT TEAM MEMBERS

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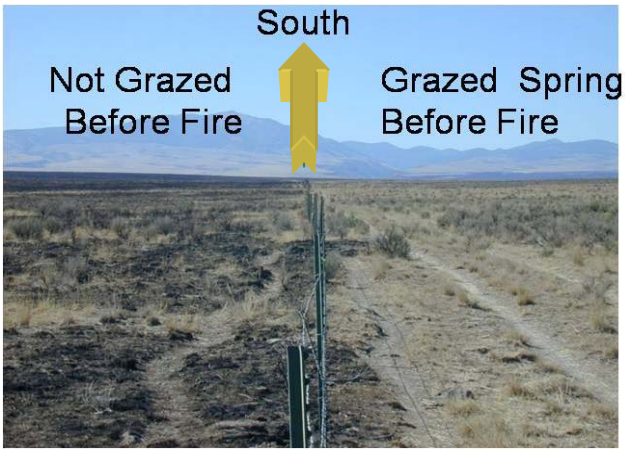

Team Objectives

- Formulate preliminary observations about the effects, if any, of existing vegetation mixes and current grazing management on how the fires behaved and spread.
- Recommend further studies and research needed to address remaining questions about the use of livestock to reduce fuels while maintaining other resource values.
- Discuss how the findings of this study might be applied in other areas.

The Team toured the Complex area on August 28, 2007. Livestock operators from the area shared their on-site observations of fire behavior and knowledge of pre-fire vegetation conditions and grazing use-levels.

Findings

- Under the extreme weather and fuel conditions in the Murphy Complex, grazing levels probably had little effect on fire behavior.
- Modeling suggests that in more moderate conditions, grazing can reduce the rate of spread and the intensity of fires. This potential is greater in grasslands than in shrublands.
- Livestock grazing that reduces annual carry-over of dead herbaceous fuels in grasslands can reduce rate of spread and fire-line intensity.
- Contrast lines observed in Murphy Complex areas were mostly due to distinct changes in types or amounts of pre-fire vegetation. A few abrupt contrasts coincided with fencelines associated with livestock grazing (*see photo above*), i.e., grazing was the distinct variable across fencelines.

Management Recommendations

The report recommends that a team of specialists and scientists create one or more carefully planned, targeted, and intensively monitored pilot projects large enough (landscape scale) to evaluate management opportunities and ecological implications.

A general technical guide should be developed based on existing research and field examples of how livestock grazing influences fire extent, severity, and intensity. This report would be a platform for creating the pilot projects and other targeted grazing opportunities, considering possible changes to existing grazing plans, and evaluating the effects of grazing on recent and future wildfires.

The Assessment Team recommends continued research and monitoring of the ecosystem effects of the Murphy Complex wildfires to gain additional insight for future management decisions in this ecosystem and others like it.

Research Recommendations

The team concluded that additional research tools are needed to analyze more thoroughly the interactions among grazing, vegetation, and fire behavior in sagebrush steppe ecosystems.

The concept of **burn severity** as developed for forests has somewhat limited value for shrublands and grasslands, and should be refined for evaluating fire behavior in non-forested environments.

New **fire behavior models** is needed to better reflect actual behavior in multi-layered sagebrush steppe and in more extreme conditions.

Remote sensing technology to assess fuels in sage steppe and to detect the influence of grazing at landscape scales is needed to support further use of grazing as a fuel management strategy.