

FIRE AND FOLLOW-UP MANAGEMENT

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Fire is dreaded on most ranches. Homes, other buildings, animals, equipment, fences, hay stacks and a year's range forage can all be lost in hours. The loss is much more than economic. It's extremely traumatic to see important stuff in our lives go up in smoke.

Periodic wildfire is also a natural part of the ecology of northern Great Plains grasslands and of Ponderosa Pine forests. While fire obviously kills some individual plants and animals, the biological systems are quite resilient. Some fire conditions are more destructive than others. For example a hot, slow-moving fire is generally more destructive of plants and soil than a fire that moves fast. Fire that reaches the crowns of trees is much worse than one that burns just the understory plants.

In most instances, rangeland and forest ecosystems in this region recover quickly from fire and may actually be more productive for a time after a fire than they were before the burn. Some nutrients that had been tied up in dead vegetation are returned to the soil and the remaining plants have less competition for soil water after fire. In general, the expected changes in soil chemistry after a fire are: slight increase in pH (i.e. a slight shift toward a more basic or alkaline soil), available nitrogen, phosphorus, calcium and potassium usually increase, the carbon-nitrogen ratio decreases. In most cases, these are positive changes. Fire is often the primary method of decomposition and nutrient cycling in grasslands. The only significant nutrient reduced by fire is nitrogen, because some nitrogen is converted to gaseous form and returned to the atmosphere. This lost nitrogen is usually restored fairly quickly through fixation by leguminous plants, such as clover, that are common after fire. Lightning also creates nitrogen compounds that then come to earth during rain showers.

Burned areas green up sooner in the spring and forage is generally more palatable and available to grazers on recently burned



A scene from Crook County's 15,000-Acre Thorne Divide Fire in July 2006

areas. Soil temperatures are warmer on recently burned sites which results in their green-up one to three weeks earlier than surrounding un-burned areas.

Potential Problems

However, there are some precautions in managing burned areas in the months or years after the fire.

Soil loss and damage to forage plants can occur if there is a heavy concentration of livestock on burned areas during the early part of the next growing season. In general, post-fire soil temperatures will be higher on burns (less shade and mulch). There may be higher evaporation losses and reduced snow catch or water infiltration. (Reduced transpiration from plants and less interception of rainfall may offset these water losses.) If favorable rainfall follows a burn, the grasses will usually do nicely. If there is too much rainfall, there may be sheet or rill erosion. Sandy or loess soils are especially vulnerable to wind erosion after fires. Clay soils (**Continued next page**)

can become compacted, reducing their ability to absorb water. If there is too little following precipitation, burning and drought may accentuate each other. Livestock and big game animals tend to accelerate erosion and congregate on the succulent growth after fire, which can result in over-use of the plants. Trailing animals over ash-covered soils can cause nutrient loss.

Weeds can invade burned areas. Many seeds in the soil normally survive ground fires. The nearly bare, but nutrient enriched soil, is an excellent seed bed for weeds. Weeds like leafy spurge, Canada thistle and downy brome (a.k.a. "cheatgrass") often increase greatly after fire, from new seedlings or by sprouting from surviving underground parts.

Management Recommendations After Fire

- 1) Grazing of burned areas should be deferred the following growing season until after seed set of the grasses.**
- 2) If possible, use the pasture during fall or winter, rather than spring or summer in the year after the burn.**
- 3) Re-seeding a burned pasture may be reasonable (especially if the burned area was not already dominated by productive forage plants).**
- 4) Seeding (if it fits with resource goals) should be done as soon as the climate permits, to take advantage of reduced competition and to provide ground cover and forage as soon as possible. Seeding is usually most successful when done in late fall or early spring.**
- 5) Weed control should also be accomplished as soon after the fire as reasonable. Don't wait for two years after a fire, for example, to treat noxious weeds such as leafy spurge or Canada thistle.**