

# Developing and Implementing a Burn Plan

## Case Study – Whites Creek, Humboldt-Toiyabe National Forest

### Summary

Burn plans are necessarily and deliberately complex and include many planning and implementation steps and procedures. Below is a brief description of the process and lessons learned following development of a burn plan and implementation of a prescribed fire in and around wildland urban interface near suburbs of Reno, Nevada.

### OVERVIEW

This brief shares insights from a June 4, 2024, prescribed fire field day hosted by the US Forest Service (USFS) and Great Basin Fire Science Exchange (GBFSE). The field day highlighted burn plan development in the Wildland Urban Interface (WUI) of Whites Creek on the Humboldt-Toiyabe National Forest. It also serves as an example of the types of relationship-building and communication opportunities and products the GBFSE makes possible through regional fire management partnerships.

### WHAT IS A BURN PLAN

- A burn plan, or prescribed fire plan, outlines the goals and specific conditions under which a fire will be intentionally set and controlled including contingency planning in case of fire escape.
- The Burn Boss develops the plan, which is reviewed by the Fire Management Officer, District Ranger, and additional technical reviewers.
- It incorporates 21 required elements, including objectives, site description, complexity analysis, funding, prescription details, smoke management, communication, safety, and post-fire actions.
- It is a living document whereby any updates trigger another review process.
- It is guided by modeling tools like the Behave Fire Model System, Interagency Fuel Treatment Decision Support System (IFTDSS), and local fuels information and knowledge.

### OBJECTIVES OF THE WHITES CREEK BURN PLAN

- Protect nearby communities (e.g., Galena, Caughlin Ranch, and Reno suburbs) from wildfire.
- Promote healthy forest conditions that will support low-severity, controllable fires in the future.
- Support aspen regeneration and wildlife habitat.
- Enhance quality of recreation areas used by hikers, bikers, and equestrians.

### SITE DESCRIPTION

- Vegetation is predominantly mixed conifer forest (Jeffrey pine, ponderosa pine, white fir) with manzanita, ceanothus, and mountain mahogany.
- Historically burned in low-severity surface fires every 7–10 years.
- Treatment area includes a protected historical logging village.
- Part of the Arrowhawk Fuels Reduction and Ecosystem Enhancement Project (NEPA approved).
- Considered moderately complex because of the diverse fuel types and their proximity to homes.

### WHITES CREEK PRESCRIPTION CONSIDERATIONS

- Spring burning is preferred because fall weather is too unpredictable.
- Trees and shrubs remain dry as they come out of dormancy, and 10-hr fuel moistures of 12% still burn.
- 20-30% of the Whites Creek area needs prescribed fire to prevent large fires in the future.



**Figure 1.** Mixed conifer forest in the Whites Creek area, fire developing from the drip torch line in the lower left. Photo courtesy of Alison Paulson, USFS.



- Prescription was to burn 25-50% of the site in a mosaic pattern (burned and unburned patches) to ensure some wildlife habitat survival in a wildfire event.
- Drought indices and wind patterns (e.g., Washoe Zephyr) are key fire modeling inputs.
- On south- and west-facing slopes nonnative annual grasses can increase following fuel treatments.

## IMPLEMENTATION

- The Burn Boss oversees all aspects of the prescribed fire including organizing and leading all personnel and equipment before, during, and after the fire.
- An After Action Review (AAR), the professional debrief, occurs following every fire event.
- A Facilitated Learning Analysis (FLAs) is required if something unexpected occurs during the event.

## COMMUNICATION AND COMMUNITY ENGAGEMENT

- The Burn Boss serves as the liaison to area public agencies, community groups, and landowners.
- Incident Action Plans (IAPs) and briefings translate ecological objectives into on-the-ground burn objectives and ensure personnel alignment and safety.
- Flexibility is emphasized in operational staging and updates.

## POST-FIRE MONITORING, RESEARCH, AND LEARNING

- The team successfully burned 2,000 acres over the last decade in Whites Creek, a huge accomplishment considering burning 30 acres of WUI costs the same

as 10,000 acres of non-WUI in other regions.

- Tree, shrub, and grass composition and abundance, fuel loadings, and fire effects (torching, scorching, mortality, char height) are being monitored.
- Research on the Tamarack Fire (Markleeville, CA – south of Whites Creek) found that USFS and BLM fuel treatments in many areas led to a 28% reduction in tree mortality and 11% reduction in crown-scorching. Anecdotally, fuel treatments also improved suppression options.
- Do not thin or limb mountain mahogany. Contiguous patches can be left alone and individual shrubs acting as ladder fuels can be removed entirely. Thinning resulted in mortality from sun scald and sapsucker damage, adding to the fuels problem.
- Research suggests lightning and Indigenous starts were supporting fires every 15 to 20 years in the greater Sierra Nevada region.

## PARTICIPANTS

Agencies represented included the US Forest Service, Bureau of Land Management, Clark County Fire Department, Inter-Tribal Council of Nevada, Nevada Department of Forestry, The Nature Conservancy, Washoe Tribe, and Walker Basin Recreation.

## ADDITIONAL INFORMATION

[21 Elements of a Burn Plan](#)

[Arrowhawk Fuels Reduction Environmental Assessment](#)

[BEHAVE Fire Modeling System](#)

[Interagency Fuels Treatment Decision Support System](#)



**Figure 2.** Prescribed surface fire and smoke produced in the sagebrush-mixed-conifer ecotone. Photo courtesy of Alison Paulson, USFS.