



Forsythe II Prescribed Fire: Unit 44 Post-Burn Monitoring Summary

Project Overview

Forsythe II is a fuels reduction project encompassing approximately 19,000 acres of federal, county, and private land within the Boulder Ranger District of the Arapaho and Roosevelt National Forests and Pawnee National Grassland (ARP) in Boulder and Gilpin Counties. The project includes mechanical and manual vegetation removal, prescribed burning, and defensible space mitigation. Unit 45 was thinned in 2019 and the overlapping Unit 44 was burned on May 17, 2025 (Table 1; Figure 1). The Unit 44 burn was a continuation of ongoing prescribed burns within the Forsythe II project area and represents an area that had not experienced fire in approximately a century. The Colorado Forest Restoration Institute (CFRI) established monitoring plots in Unit 45 to track changes in forest structure and composition, woody fuels, and understory plants following thinning and burning. This report summarizes immediate post-burn fire effects. The Forsythe II project is part of the Forests to Faucets program, a partnership between the U.S. Forest Service, Denver Water, Colorado State Forest Service, Natural Resources Conservation Service, and CFRI. Forest treatments were implemented to reduce wildfire risk to watersheds and improve forest conditions across the Colorado Front Range.

Goals and Objectives

The Forsythe II project is strategically located to protect values within the Wildland Urban Interface (WUI) in Boulder and Gilpin Counties, such as Gross Reservoir, a critical water resource for Denver’s supply system.

The overall project goals are to:

1. Reduce the severity and intensity of wildfire in the WUI.
2. Restore ponderosa pine/mixed conifer stands, aspen, and meadows/shrublands toward their characteristic species composition, structure, and spatial patterns to increase resistance and resilience to future natural disturbances.

The objectives of the prescribed burns are to:

1. Reduce understory vegetation (ladder fuels) by up to 75% across the project area.
2. Allow up to 25% mortality of the overstory across the entire broadcast burn unit.
3. Limit canopy scorch heights to 2/3 of average tree height in conifer trees greater than 14” DBH.

Table 1. Project Summary

Ownership	U.S. Forest Service
Funding	Forests to Faucets
Forest Type	Dry-mixed conifer
Year Completed	2025
Implementation Method	Thinning and prescribed fire
Acres Treated	125
Acres Monitored	131
Years Monitored	2019 (pre-treatment), 2020 (post-thin), 2025 (post-fire)

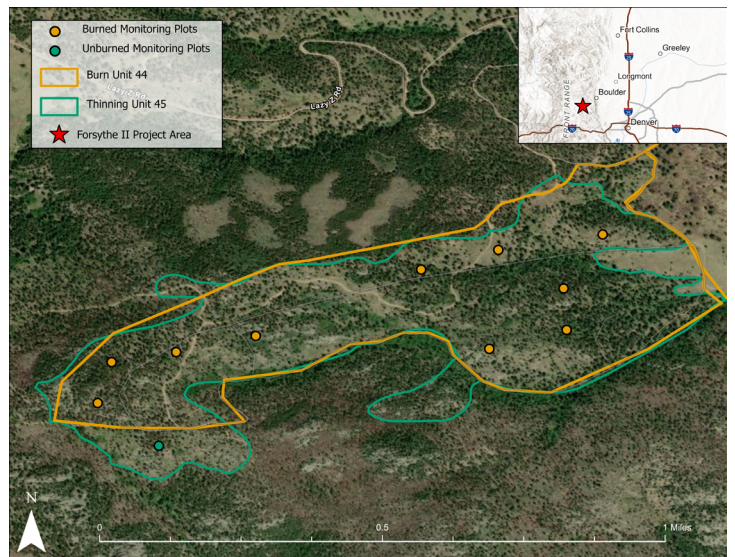


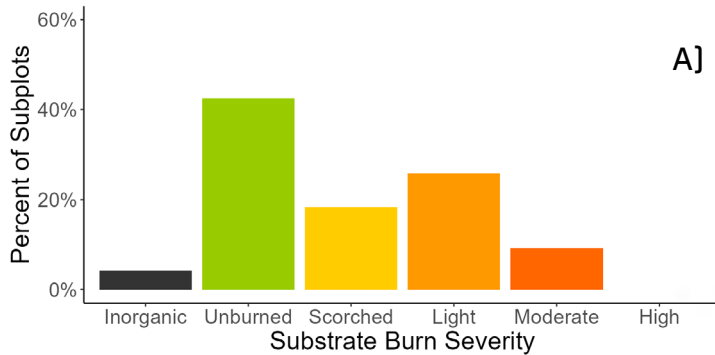
Figure 1. Map of burn Unit 44 and thinning Unit 45, part of the larger Forsythe II project area, located near Gross Reservoir between Boulder and Nederland, CO. This unit experienced prescribed burning in 2025. Eleven monitoring plots were established by the Colorado Forest Restoration Institute; 10 of these plots (orange circles) experienced prescribed fire (2025) and were monitored for initial fire effects immediately post-burn.

Methods

CFRI established 11 permanent plots in Unit 45, 10 of which were located within the Unit 44 prescribed fire (Figure 1). Fire effects data from the 10 burned plots was collected within 1–2 months following prescribed burn implementation in spring 2025. Fire effects on the forest floor were classified in 12 subplots within each 1/10th-acre plot that burned. A complete description of CFRI’s field data collection methods can be found in the Immediate Post-Burn Mothership Plot Protocol (CFRI 2020).

Highlights

The prescribed fire achieved good coverage across the area, burning all 10 monitoring plots. Within the plots, 53% of the substrate was burned, 43% remained unburned, and 4% was inorganic (not burnable). Understory vegetation was not evident across 57% of the monitored area (Figure 2B). Only 27% of the vegetation cover was burned, likely due to high



live fuel moisture in late spring.

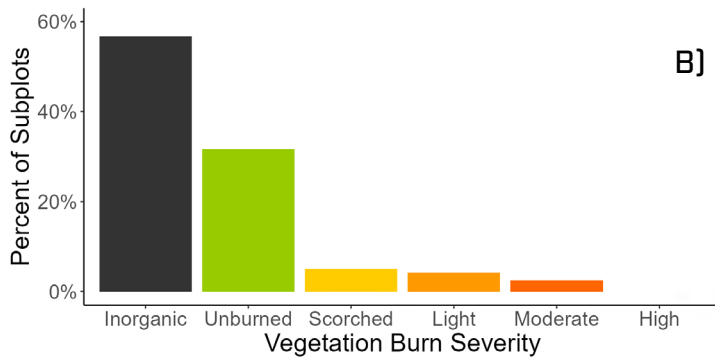


Figure 2. Burn severity across monitoring plots showing the majority of subplots were unburned or experienced light severity effects. Subplots recorded both A) substrate (e.g., litter, rock, soil, etc.) and B) vegetation, which included graminoids, forbs, and shrubs.

For overstory trees, crown scorch ranged from 0-100% with an average of 11%. Trees with greater than 90% crown scorch are likely to die, so overstory tree mortality is expected to be at least 4%. According to the burn plan, up to 25% overstory mortality was acceptable. Average maximum stem char height was 4 feet and maximum foliage scorch height averaged 15 feet. In trees over 14 inches DBH, maximum scorch height was 43% of tree height, which is below the burn plan goal of 2/3 tree height. These metrics suggest flame lengths were tall enough to scorch lower branches, effectively raising canopy base height and reducing ladder fuel continuity while maintaining large fire-resistant trees—a positive treatment outcome for lowering torching potential and crown fire risk. Only three saplings were recorded post-burn; one Rocky Mountain juniper showed significant crown scorch.

Woody fuel loading increased after thinning operations, then decreased to levels comparable to pre-thinning conditions following prescribed burning (Figure 3A). This is similar to results seen in other projects ([Schapira and Slack 2025](#), [Barrett and Parrish 2024](#), [Barrett 2024](#), [Slack et al. 2023](#)) and highlights the importance of prescribed fire

following mechanical treatments to consume residual and accumulated surface fuels that often increase after thinning operations. Litter and duff loading stayed relatively consistent across treatments, again suggesting the low severity effects of this burn (Figure 3B).

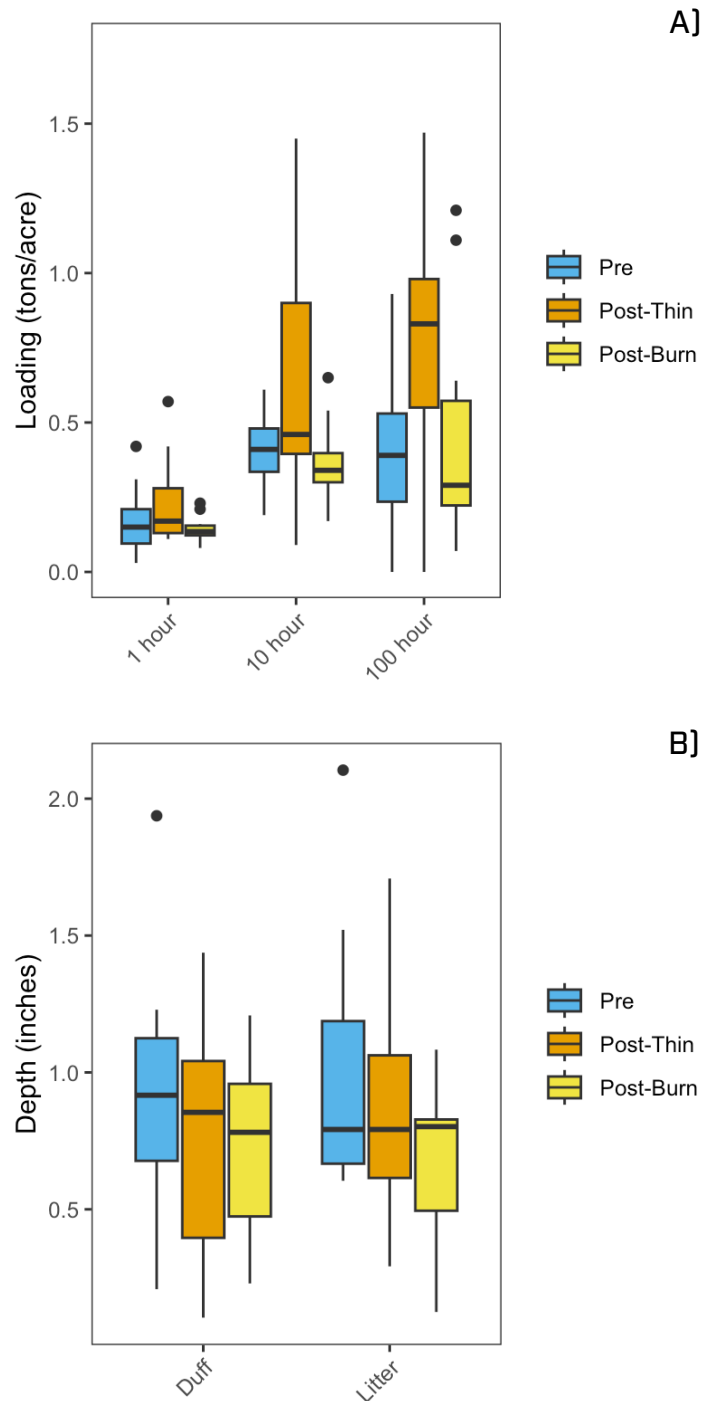


Figure 3. Pre-, post-thin, and post-burn fuel loading for surface and ground fuels. Figure 3A illustrates fuel loading for fine wood (e.g., 1-, 10-, and 100-hour fuels) and Figure 3B illustrates litter and duff depth.

The Forsythe II prescribed burn in Unit 44 reintroduced fire into a fire-dependent ecosystem. Fire behavior observations and post-burn monitoring indicate that prescribed fire successfully reduced ladder fuels and maintained overstory tree structure consistent with burn plan goals. Post-burn



Figure 4. Photos showing a CFRI monitoring plot pre-treatment in 2019 (A), post-thin in 2020 (B), and post-burn in 2025. The increase in woody surface fuels post-thin was moderated following the prescribed burn. Some lower tree branches were scorched by the fire, raising tree crown base height.

analyses further demonstrate the complementary role of prescribed fire following thinning, reducing fine woody fuel accumulations to pre-treatment levels. Understory vegetation monitoring is planned for 2026 which will give insight into herbaceous vegetation and shrub response to the burn. Overall, these results underscore the value of using prescribed fire under controlled conditions to maintain forest resilience, minimize future wildfire severity, and advance progress toward long-term landscape restoration goals.

References

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