

Effects of Burn Piles

Total area in burn piles. Burn scars covered an average of 10% of the ground surface in pile and burn units (range of 8 to 13%).

Ground surface conditions

- Most scars had a central area (C) where soil heating was intense, leaving white ash or reddened mineral soil. This was surrounded by an edge (E) of blackened duff or charcoal, with significantly less exposure of mineral soil (Fig. 45).
- Burning had no effect on ground conditions adjacent to the scar (U1 vs. U2) (Fig. 46).



Fig. 45. Transect from the center of a burn-pile scar (C, white ash) across the edge (E, blackened duff) into unburned vegetation (U1, U2).

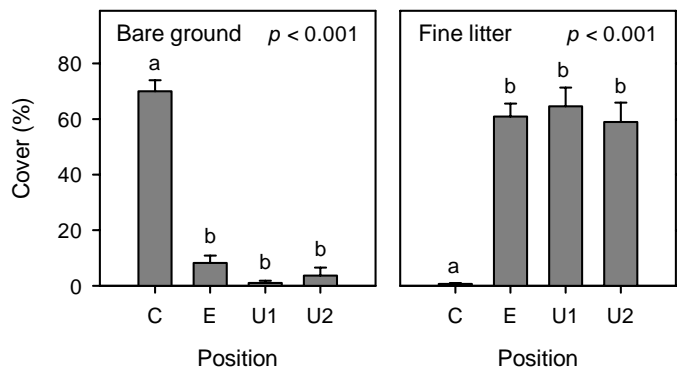


Fig. 46. Cover of bare ground (mineral soil) and fine litter from the burn scar center (C), across the edge (E), into unburned vegetation (U1, U2) (see Fig. 45). P values are from one-way ANOVA ($n = 15$). Different letters indicate significant differences among positions.

Initial effects on soil properties

- Concentrations of soil C and N were comparable inside and outside of burn-pile scars. Variation in C:N ratio was small but significant (Fig. 47).
- pH was significantly elevated (0.4 -0.5 units) at the center, but not at the edge (Fig. 47).

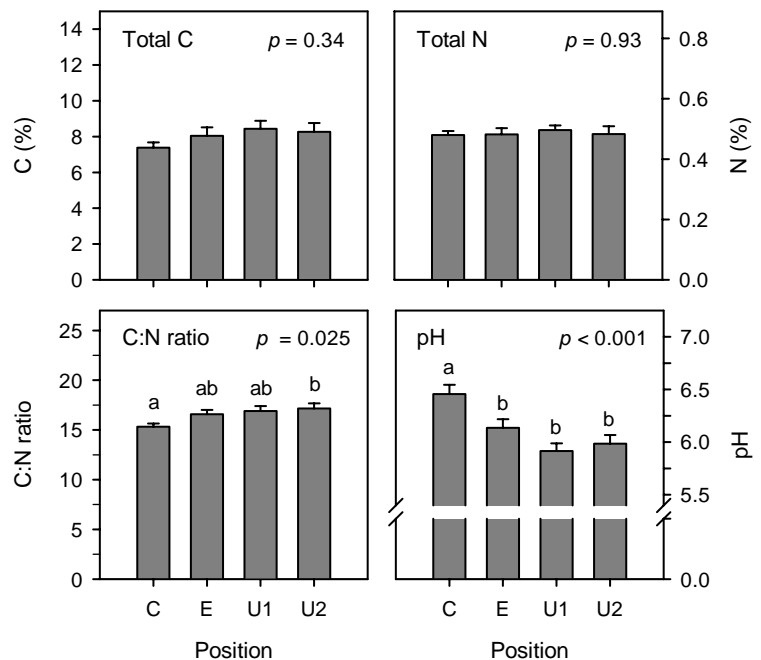


Fig. 47. Concentrations of soil C and N, C:N ratio, and pH from the burn scar center (C), across the edge (E), into unburned vegetation (U1, U2). See Fig. 46 for other details.

Initial effects on soil properties (cont.)

- Burn-pile scars were characterized by highly elevated concentrations of NH_4^+ -N at the center (C), and elevated concentrations of NO_3^- -N at the edge (E) (Fig. 48).
- Effects of burning on available N were not apparent in adjacent vegetation (U1 vs. U2) (Fig. 48).

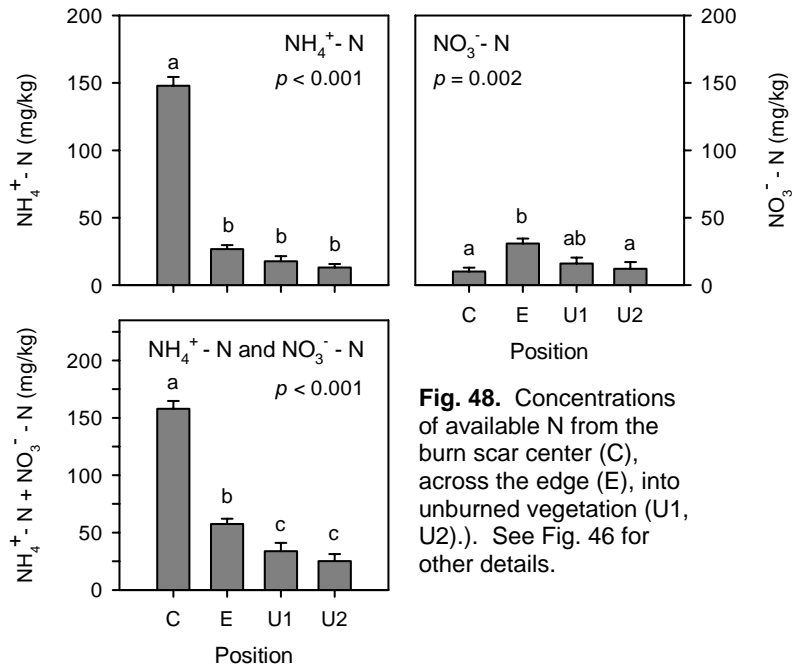


Fig. 48. Concentrations of available N from the burn scar center (C), across the edge (E), into unburned vegetation (U1, U2). See Fig. 46 for other details.

Initial responses of vegetation

- Plants were virtually absent from the centers (C) of burn scars and greatly reduced in diversity and cover at the edge (E) (Fig. 49).
- However, effects of burning were not apparent beyond the edge (U1 vs. U2) (Figs. 49, 50).

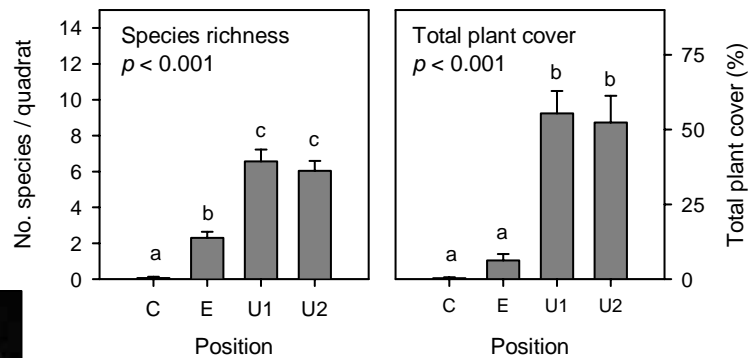


Fig. 49. Richness and total plant cover from the burn scar center (C), across the edge (E), into unburned vegetation (U1, U2). See Fig. 46 for other details.



Fig. 50. Plant cover at the edge of a burn-pile scar. Note the sharp transition to dense meadow vegetation (*Bromus carinatus*) beyond the burn scar.

Conclusion: The immediate effects of burn piles on soil chemistry (available N) and vegetation are dramatic, but localized. Plant survival within the burn scar and vigorous growth outside the edge suggest that natural ingrowth and healing may be possible over time. Although ruderals were uncommon in the first growing season, future establishment of these species may limit potential for recovery. Additional monitoring of permanent transects is planned and further experimentation (e.g., seedling and addition of litter) is being considered.