



Mechanical treatments were highly effective at reducing elevated small tree densities surrounding large and old Jeffrey pine trees in the Voorhis Demo Area, resulting in increased stand resistance to wildfires, bark beetles, and drought.

Mechanical Treatment Effectiveness in the Voorhis Old Forest Demonstration Area, Inyo NF

Old forests containing large (≥ 40 in dbh) and old (≥ 150 year) Jeffrey pine (*Pinus jeffreyi*) trees are important but relatively rare habitat for many wildlife species, including old forest associated species. However, these unique stands are at risk to large and severe wildfires, insect outbreaks, and drought stress due to elevated tree densities arising from long-term fire exclusion in the eastern Sierra Nevada region. I monitored the effectiveness of mechanical thinning treatments at reducing ladder fuels (i.e., small diameter trees) surrounding 15 large and old Jeffrey pine trees in the Voorhis Demonstration area, Inyo National Forest.

Key Findings

- Pre-treatment large Jeffrey pines were characterized by live stem densities that greatly exceeded the upper end of the Natural Range of Variation (NRV).
- Mechanical thinning treatments resulted in a remarkable 22-fold reduction in ladder fuel densities (saplings and small trees) surrounding large pines, producing tree densities within the lower end of NRV (Figure 1 on next page).
- Thinning also resulted in a 19-fold reduction in snag densities, shifting densities from 99 ± 17 (outside NRV) to 5 ± 2 snags per acre (within NRV; mean $\pm$ SE).
- Results suggest that mechanical thinning treatments can effectively reduce ladder fuels and snags surrounding large and old Jeffrey pines, which decreases wildfire risk, insect activity, and drought stress to these critical forest structures.



Fire-excluded Jeffrey pine stand with elevated small conifer and snag densities and high surface fuels (especially litter and duff) surrounding a large (>40 inch dbh) Jeffrey pines in the Voorhis Camp area of the Inyo National Forest.

Source:

Meyer, M.,D. 2025. Mechanical Treatment Effectiveness in the Voorhis Old Forest Demonstration Area, Inyo National Forest. Unpublished brief. USDA Forest Service Pacific Southwest Region. Bishop, CA.

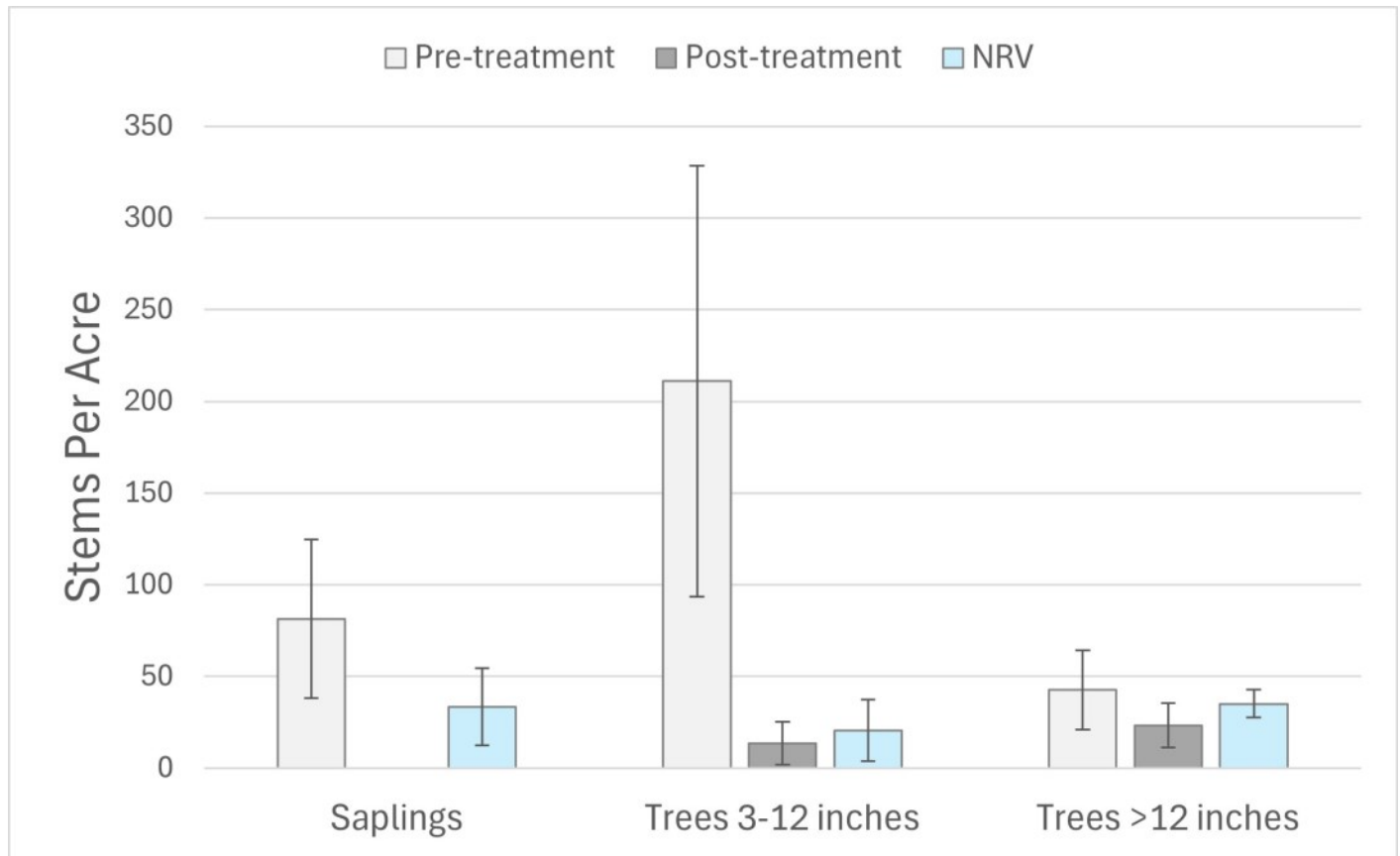


Figure 1: Pre- and post-treatment mean $\pm$ SD densities of saplings, small trees (3-12 in dbh), and larger trees (>12 in dbh) within 0.12 ac monitoring plots compared to the Natural Range of Variation (NRV). Plots are centered on large (>40 in dbh; mean $\pm$ SD: 48 $\pm$ 8 in dbh) Jeffrey pine trees in the Voorhis Demonstration Area, Inyo National Forest.



Bottom photos: Pre- and post-treatment photos of a large pine included in a monitoring plot at the Voorhis Demo Area.