

# Soil Monitoring on Fuel Treatment Sites

**US Forest Service - Pacific Southwest Region**



**Shasta-Trinity National Forest**

**Project Contact:** Brad Rust

**Phone:** 530-226-2427

**Email:** brust@fs.fed.us

**Project Cost:**

\$1,820 for monitoring

\$82,990 for fuel treatment

**Accomplishments:**

Conducted a soil monitoring study and used the results to modify seasonal restrictions on equipment operation, allowing more fuel treatments to take place during the winter.

**External Partners:** None

**Internal Partners:** Soils, Forest Management

**Project Objectives:** The soil monitoring project investigated seasonal restrictions on equipment operation. Results showed that guidelines based on site-specific conditions could protect soils while allowing a longer season of operation on less-sensitive sites.

The Shasta-Trinity National Forest created a fuel reduction buffer around the community of Lakehead, California, to protect the area from wildfire by thinning small conifer trees and removing Manzanita brush thickets. Machines equipped with masticator heads were used to shred and compress the slash on site. A total of 193 acres were treated, at a cost of \$430 per acre.

Managers were concerned about conducting mastication treatments in the winter. Soils are typically wet at that time of year, and compaction and displacement are more likely under wet conditions. Soil monitoring was conducted to measure moisture, disturbance, and compaction on flat, sloping, and steep slopes.

Results showed that winter conditions were too wet for conventional timber harvesting equipment, which can put considerable pressure on soils beneath the wheels. However, track-mounted masticators were able to operate at higher soil moisture levels on flat or moderately sloping areas without causing excessive displacement or compaction. Guidelines were developed to allow the use of low-pressure masticators on soils with less than 30% moisture, over a bed of masticated material, on slopes less than 35%.

Costs for soil monitoring were a small fraction of the amount expended for fuel treatments, and resulted in new guidelines that protect sensitive sites while allowing fuel treatments to take place during more of the winter.



**Caption:** Track-mounted equipment minimizes soil compaction as compared with wheeled vehicles. This masticator can operate in wetter conditions without damaging soils



**Caption: Stands with masticated fire fuels. Small trees and Manzanita brush have been shredded and compressed to reduce the risk of wildfire.**



**Caption: Field sampling as part of the Shasta-Trinity National Forest's soil monitoring project, on sites where fire fuels have been masticated.**

