

BAER Assessment Soils Report – Nickowitz Fire

Six Rivers National Forest (R5-SRF)

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This is an abbreviated soil assessment report, commensurate with the size and complexity of the fire. It includes little of the usual explanation of methodology and detailed discussion of Values at Risk (VARs). Further detailed information can be furnished by the authors if desired.

The Nickowitz fire is located roughly twenty-six miles northwest of Orleans, California, about 4 miles west of the Gasquet-Orleans (GO) Road intersection, between Forest Service roads 13N01 and 14N02. The fire occurred entirely within National Forest Service lands. The fire burned almost entirely within the Nickowitz Creek drainage, that is a tributary to Blue Creek. Blue Creek flows into the Lower Klamath River basin. Predominantly low soil burn severity (SBS) exists across the areas where fires burned with a steady downhill backing spread, with limited spotting and occasional single tree torching. In these areas fuel consumption was limited to surface litter and smaller diameter vegetation. Areas of moderate and high SBS exist in higher elevations, primarily along ridges.

The dominant vegetation types are mixed conifer forest of the Klamath Siskiyou. Mixed evergreen species include California Red fir (*Abies magnifica*), Coastal Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), Port Orford cedar (*Chamaecyparis lawsoniana*), white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), Jeffrey pine (*Pinus jeffreyi*), canyon live oak (*Quercus chrysolepis*), golden chinquapin (*Chrysolepis chrysophylla*), tanoak (*Notholithocarpus densiflorus*). The shrub and grass component consists of Evergreen huckleberry (*Vaccinium ovatum*), alder (*Alnus spp.*), Oregon Grape (*Berberis nervosa*), salal (*Gautheria shallen*), Idaho fescue (*Festuca idahoensis*), and bear grass (*Xerophyllum tenax*).

Soils generally have a significant rock component and are derived from Western Klamath accreted terrane, divided among the Galic Formation metasediments in the eastern and central portions of the burned area, Rogue Formation metavolcanics, tuffs, and interbedded metasediments in the western portion, and a small area of mafic and ultramafic intrusive rocks of the Josephine Ophiolite in the southwestern-most portion of the fire.

Although soil profiles range from shallow to deep, most of the soils are considered deep (40-60 inches). There are 4 dominant soil families within the various map units: Clallam, Kirstirn, Goldridge and Scalan. The soils are generally well drained, moderate soil permeability, high soil erosion hazard. Most of fire is located on steep to very steep (35 to greater than 60 percent slopes, and are considered stable geologically.

Soil burn severity was assessed based on field surveys and Burned Area Reflectance Classification (BARC) imagery. SBS is summarized in Table 1.

An estimated 85% of the Nickowitz fire area sustained low SBS and about 10% remained unburned, occurring in small un-mappable patches as a mosaic. The remaining 5% had moderate SBS in a few hand-mapped patches, and elsewhere under individual crowns of scattered trees. Given the preponderance of low SBS, there were no concerns to soil productivity, and few potential concerns to other VARs such as vernal pool plant community stability or cultural resources. Very few roads exist beyond the upland flats, except one road in the private portion of the fire which has a single culvert-crossing that appears well armored on both inlet and outlet.

Table 1. Soil Burn Severity from ocular field estimates of relative percentages.

Soil Burn Severity	Percent	Acres
Unburned and Very Low	58	4,464
Low	37	2,845
Moderate	4	384
High	1	55
Total		7,750

Hydrophobicity was present in roughly 1 percent of the soils having low SBS, characterized as “slight” degree at 0-1 inch depth. Moderate repellency was observed in about two-thirds of the moderate SBS soils at 1-3 inches depth. In all cases water repellency was quite patchy, and is not expected to significantly contribute to elevated watershed response.

Erosion hazard rating utilized the CA EHR system for sheet and rill erosion. Soil burn severity was factored in by manipulating values for infiltration and soil cover, as determined appropriate based on field observations within this fire. EHRs were formulated for the 4 dominant soil types, using GIS derived weighted average slope gradients for soil map units on the upper flats and the sideslopes. EHRs are high throughout the fire for unburned and low SBS; EHR is elevated to moderate where moderate SBS occurs.

Table 2. Post-Fire Erosion Hazard Ratings (in acres).

Soil Erosion Hazard Rating	Acres
Low	775
Moderate	1,162
High	5,811
Total	7,748

Values at risk and Emergency Determination

Soil productivity was not in itself determined to be a value at risk, nor was sediment impacts to water quality. The mixed conifer forests of the Klamath Siskiyou are fire-adapted, so periodic post-fire erosion is a natural ecological and geomorphic process. Due to the overall low percentage and position of the High and Moderate soil burn severity, the amount of remaining soil cover, and low hydrophobic conditions, it is anticipated that surface erosion and sedimentation would be within the natural range of variability, and Nickowitz Creek would experience no discernable downstream impacts.

APPENDIX – SOIL BURN SEVERITY MAP

