

HAR Summer Tour Topic Summaries

John Giordanengo will be sharing details of two post-fire restoration projects related to the High Park Fire recovery efforts. This includes the Skin Gulch Floodplain Restoration project (vegetation successes and failures), Plant community responses to emergency reclamation treatments following the High Park Fire.

Skin Gulch Floodplain Restoration Design and Implementation

Location: Larimer County, CO

Description: A tributary to the Cache La Poudre River (Colorado), the 6.8 acre Skin Gulch floodplain restoration site was heavily impacted by post-fire flooding and debris flows, resulting in areas of severe channel degradation and floodplain aggradation. The site was subsequently cleared of debris and fill soil removed, leaving a denuded floodplain and impaired channel. Working with the Coalition for the Poudre River Watershed, the US Forest Service, and Larimer County, John developed concept through final designs for creek realignment, instream structures, erosion control, weed management, bioengineering, and wetland and riparian restoration of 1.1 miles of Skin Gulch. Revegetation efforts included container stock, seeding, wood straw, erosion matting, willow/cottonwood cuttings, soil amendments, fascines, and soil/vegetation covered rip-rap. Structures included step pools, grade control, toe walls, and gully stability (zuni bowls and grade control weirs).

Client/Owner: Coalition for the Poudre River Watershed/USFS & City of Greeley

Results to Discuss: Results to be discussed include the interaction of mulch, soil amendments, and vegetation treatments, and their influence on native vegetation cover over time. The primary focus will be uplands, with a minor focus on riparian revegetation.

Plant community responses to emergency reclamation treatments following the High Park Fire

Location: Larimer County, CO

Description: Following the 2012 High Park Fire (87,000 acres), John developed and managed a post-fire research project to evaluate the impacts of revegetation and mulch on plant community development, diversity, weed cover, and other variables. The research was conducted in a sub-watershed known as Upper Laurence Creek, which experienced a high-severity soil and canopy burn (High Park Fire BAER Report, July 2012). Slopes within the research plots ranged from 25 to 47%, 348 to 48 degrees aspect, and were dominated by ponderosa pine (*Pinus ponderosa*), with a sub-dominance of Douglass fir (*Pseudotsuga menziesii*). Estimated tree density was greater than 100 trunks ha⁻¹ before the fire, with 100% tree mortality following the fire. Elevation ranged from 2,011 meters a.s.l. and 2,072 meters a.s.l. Composite soil samples were taken to 10 cm deep across representative sites in each treatment, and were deemed similar enough to be considered a confounding variable among treatment effects. Soils were classified as sandy loams (60% sand, 20% silt, 20% clay), with pH ranging from 5 to 6, and an EC of 0.1.

Twelve research plots (15m x 45m) were established in areas of high soil and canopy burn severity. Experimental treatments included **seeding + straw mulch (No Rake)**, **seeding + incorporation into the soil surface by means of raking + straw mulch (Rake)**, or **no treatment (Control)**. Four replicates of each treatment were installed. Vegetation and ground cover were monitored during the growing season in 2013, 2014, and 2015 using a line-point intercept method (Herrick et. al. 2005). In each plot, ten 30.5m temporary transects were established at random origins and laid vertically up the slope. Two sample points were recorded every 1 meter. Each transect served as a 2m x 30.5m belt transect to record presence-absence species data.

Clients/Owners: Coalition for the Poudre River Watershed, Wildlands Restoration Volunteers, Colorado Natural Heritage Program, University of Colorado, and Colorado State University.

Results to Discuss: Results to be discussed include the influence of treatments on plant community diversity, total vegetation cover, weed cover, and soil surface erosion.