# 2018 MSU Extension Southern Bitterroot Wildfire Recovery Tour—Sula State Forest



2001

State lands with heavy woody debris retention

Private ranch with thinning and debris cleanup



2013

Private land
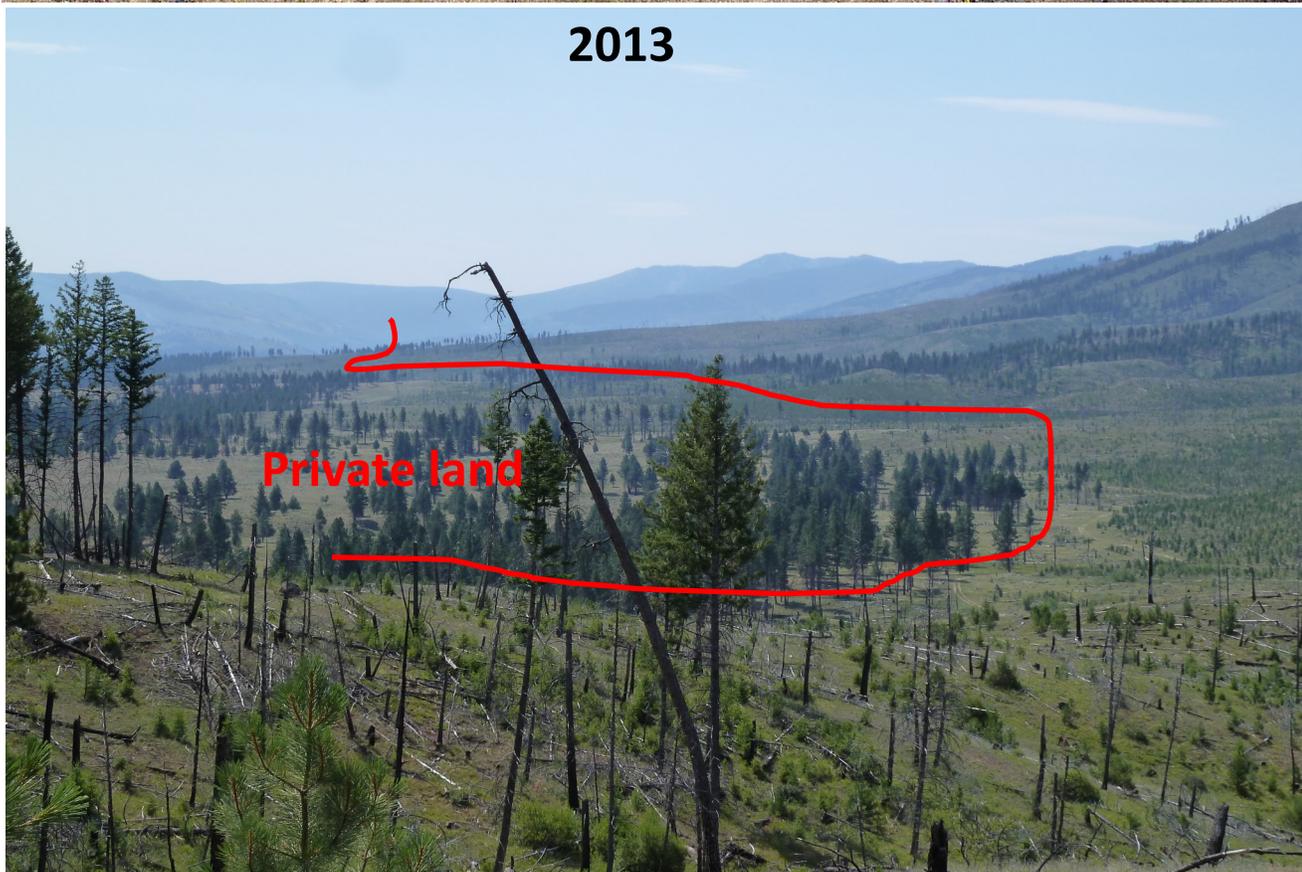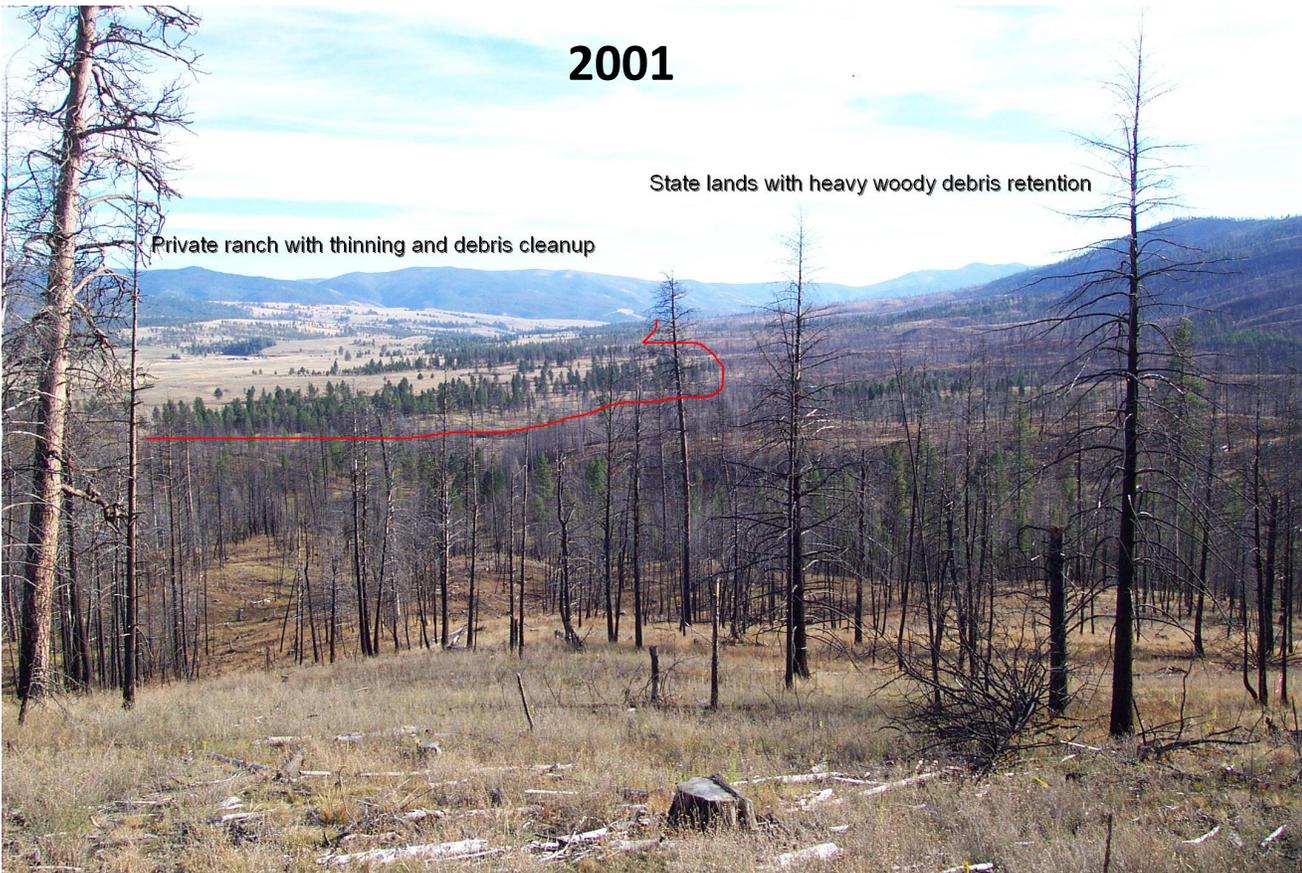
# Sula State Forest—repeat photographs
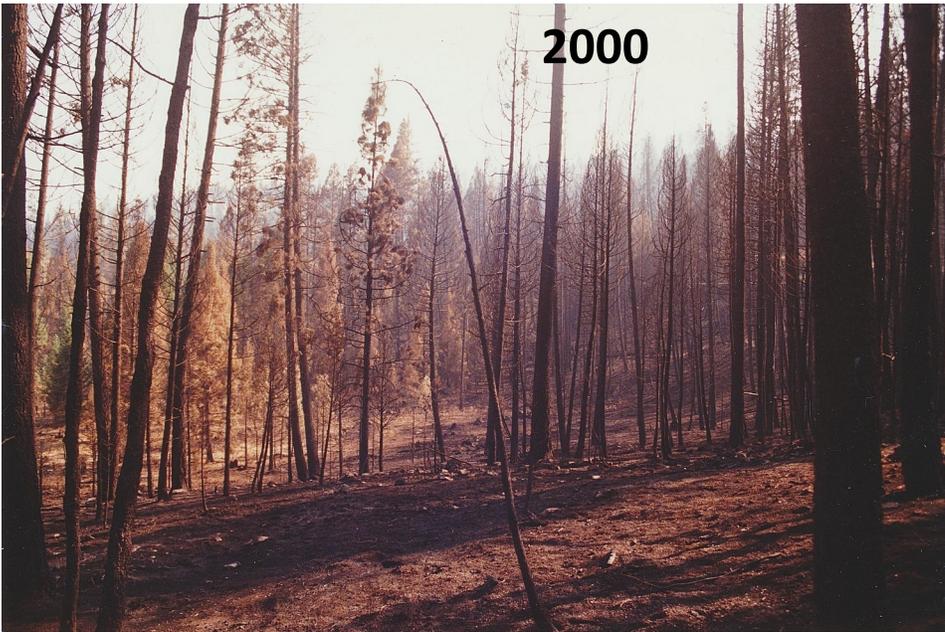


2000

September immediately after the fire
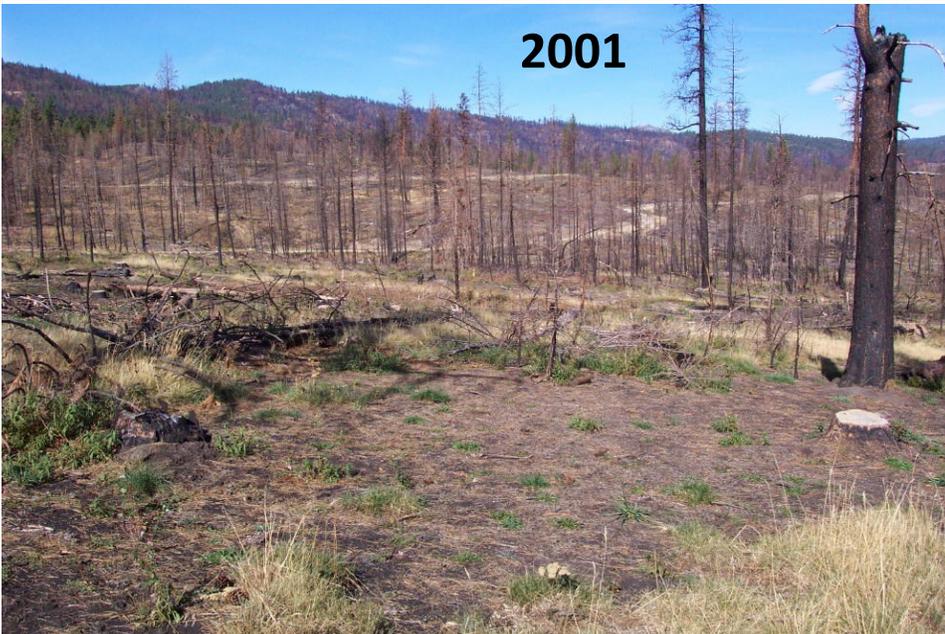


2001

September 1-year after fire and salvage logging that generated $4.5 million for Montana schools
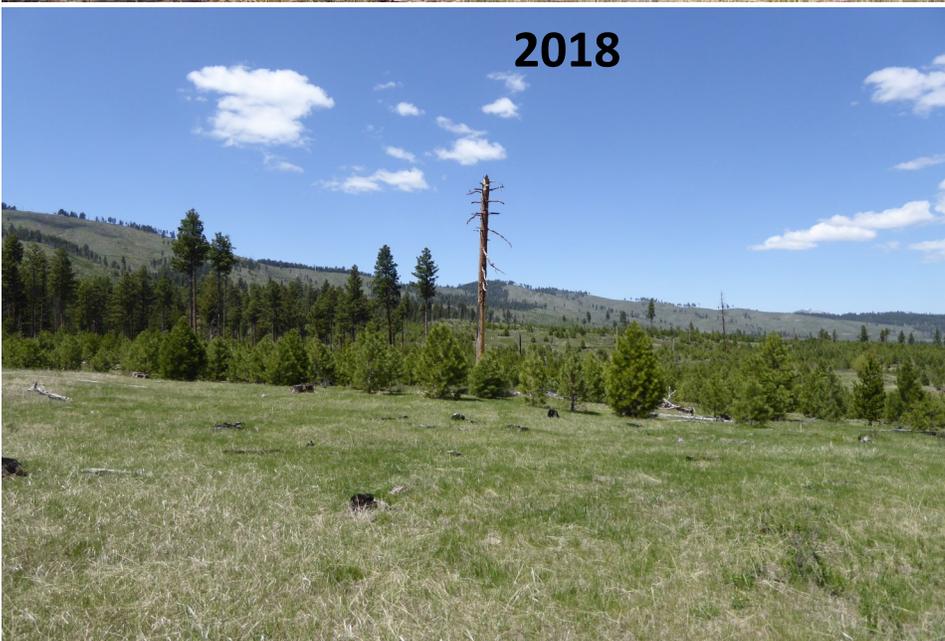


2018

1,117,606 seedlings – mostly ponderosa pine were planted 2003-2004, with a smattering of Douglas fir – on 4,215 acres.

# Salvage logging impacts

2000

September immediately

after fire

2001

August after winter

salvage logging

2018

August 2018 plus

planting and weed

control

**2000**

Thinning and surface fuel reduction can significantly reduce wildfire intensity and severity.

Although larger older trees can survive surface fires, stem scorch, soil heating, and an altered microclimate can cause significant residual mortality.

**2018**

**2003**

Wildfire that does not kill all trees also acts as site preparation for seeds and can result in excessive future tree seedling regeneration. Approaching 30 years post-fire, the forest stand may be overstocked and once again in a high fire intensity and severity class. Early tree thinning and competitive grass establishment may help reduce excessive tree regeneration and the future fire hazard.

**2000**



**2018**

**Salvage logging**

Salvage logging on the Sula State Forest occurred within months of the wildfire occurrence. The ability to quickly respond to wildfire affected areas had multiple benefits. Wildfires leave an area with little vegetation and covered with highly erodible ash. Fire adapted plants can rapidly recolonize burned areas one to two years after an event and help stabilize soils. Logging prior to plant colonization does not disturb this vital process and may actually help by breaking up ash covered hydrophobic soils. Placement of logging debris on contours to create erosion barriers further reduces soil displacement. This practice is identical to the costly but proven post-fire rehabilitation treatment of "contour felling". Finally, the rapid extraction of fire killed trees maximizes the economic value and utilization of this resource. The wood in fire killed as well as insect and disease killed trees rapidly becomes unsuitable for most wood product purposes.

**The landscape picture**

Critical landscape review of the Bitterroot fires, Nine-mile, Maudlow-Toston, Cave Gulch, Fridley, Moose Creek, and Cow Creek have shown similar patterns. Forested landscapes, that had previously well planned and implemented management practices that resulted in mosaic-patches of different forest age classes and tree species had a lower probability of carrying a landscape encompassing active crown fire, even under severe fire conditions. Wildfires that developed into active crown fires appeared to gain momentum in areas that had uniform forest crown canopies and burn into large, contiguous stand replacing fires of the highest severity. These types of wildfires cannot be actively suppressed until the weather significantly changes or landscape level fuel treatments are encountered. Wildfires that developed into active crown fires in forests with diverse tree spacing and patches of tree age classes were more probable to burn in a mosaic of small patches of crown fires and non-lethal surface fires, with significantly less severe residual fire effects. According to fire suppression experts, the later scenario represents a higher successful suppression scenario, which is the goal of using management to reduce wildfire hazards.

# 2018
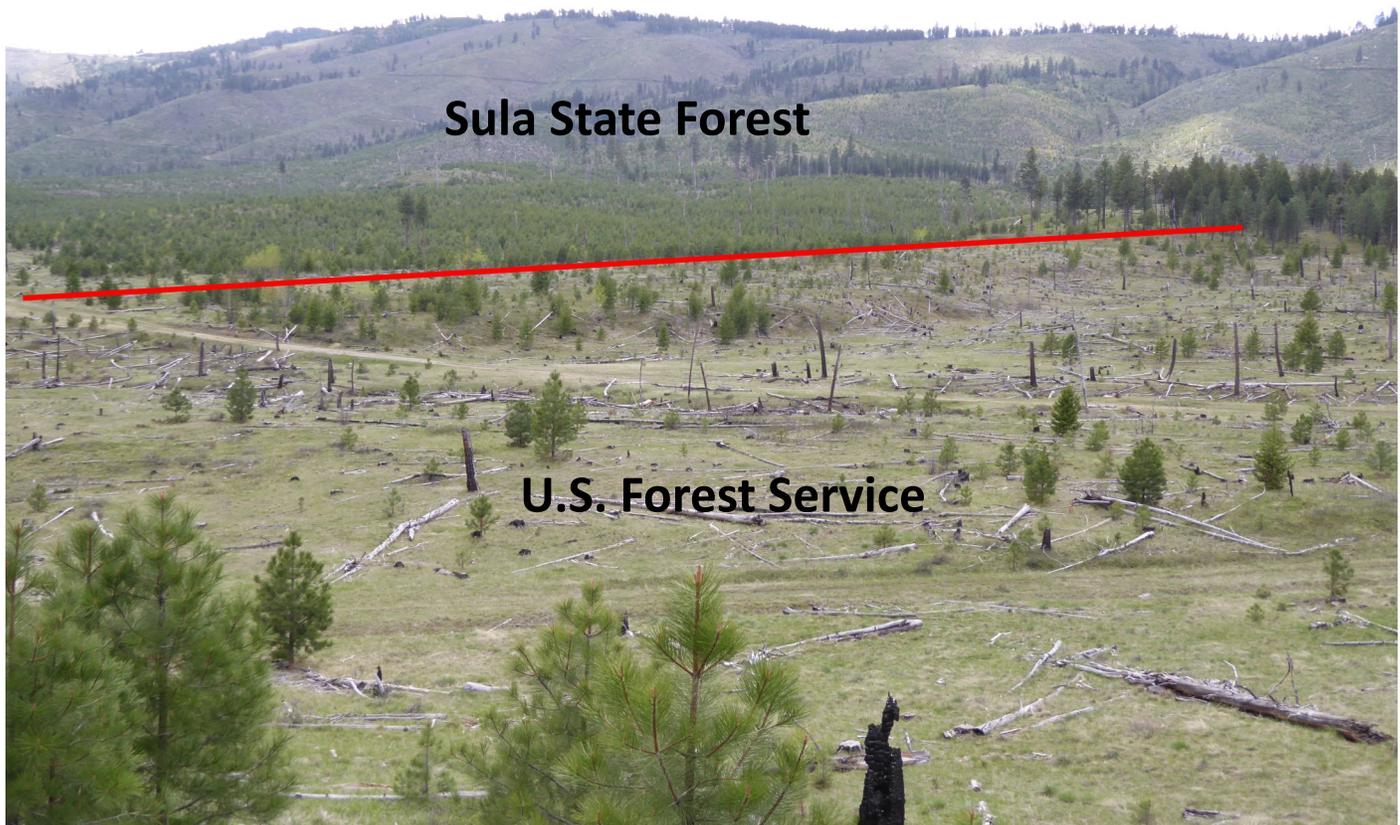


The long term impacts of different post-fire management strategies can be quite profound both visually, ecologically and economically. This 18-year case study indicates that immediate post-fire actions and subsequent investment in noxious weed control, grass seeding and tree planting resulted in faster ecosystem recovery to pre-fire conditions and economic opportunities.

# Adjoining Federal lands—no salvage or rehab work

## Surface Vegetation Cover

| 2001 | 2003 |
|------|------|
| Low intensity fire | |
| 40.5 % | 41.1% |
| Mixed intensity fire | |
| 33% | 45% |
| High intensity fire | |
| 22.9% | 41.2% |

**Effects of salvage logging ?**

**No vegetation differences detected between salvage logging and undisturbed sites**



2001



2004



2013