

Science Brief

Photo: Annapurna Holtzapfel

Post-Fire Recovery

Hotter and more destructive wildfires are making it hard for forest ecosystems to re-establish after severe wildfire. Ecologically-minded management helps forest landscapes recover following significant burn events.

➤ **Recent fires far surpass the beneficial scale and create significant challenges for forest regeneration.**

- Historic fire suppression has created the conditions for catastrophic wildfires.^{1, 2, 3}
- Recent wildfires have been catastrophic. **Unlike the beneficial fires this region is adapted for, contemporary wildfires impact huge landscapes, leading to tree loss, erosion, and decreased water quality.**^{1, 2, 3}
- After fires of this magnitude, the forest ecosystem needs help to return to a healthy state. **Often, the ecosystem is unable to regenerate on its own and can shift to a non-forest state.**^{1, 2, 3, 4}
- "An eight-fold increase in annual area burned at high-severity occurred between 1985 and 2017 in western U.S. forests."⁵
- The area that is burning is astonishing, we now face a greater need for reforestation from areas of forest burned and destroyed than during the peak of clearcutting in the 20th century. Particularly under drier climate-change conditions, tree regeneration after fire events is remarkably low.⁶

➤ **If left too long, standing dead trees present a safety hazard and challenge for restoration.**

- The intensity and scale of severe wildfires disrupt the ecological processes of restoration by destroying seed sources, interrupting nutrient cycles, and creating water-resistant soil.^{7, 8, 9}
- Trees are killed, leaving behind dead snags. These trees can be salvage logged but can become hazardous and create safety issues if left on the landscape for too long.¹⁰



Photo: tree planting in Flathead National Forest, Erika Williams

➤ ***The forest cannot recover on its own after high severity fire.***

- Nonforest vegetation, like grasses and shrubs, and particularly invasive plants, re-establish first, therefore outcompeting tree seedlings.^{7, 10}
- These conditions encourage the conversion of forests to chaparral or grasslands that do not provide the same ecosystem services as forests.^{8, 11, 12}

➤ ***Post-fire restoration solutions***

- Remove some standing dead trees to allow for safe replanting and post-fire operations.
- Replant native tree seedlings that are adapted to local conditions.
- Implement low-tech restoration solutions, including beaver-dam analogs and post-assisted log structures, to protect meadows and waterways
- Prevent shrubs and invasive plants from overtaking the landscape with weeding, plastic sheeting, or herbicide.
- Use prescribed burning and fuels reduction treatments to reduce future fire risk.^{13, 14}

➤ ***Benefits of fire regime restoration***

- Preparing the forest to be resilient under future fire scenarios significantly decreases the risk of another large, catastrophic wildfire.
- Preventing future high-severity fires leads to benefits such as:
 - Protected air quality from wildfire smoke
 - Protected water quality from post-fire erosion
 - Increased carbon stability and reduced emissions
 - Enhanced habitat for biodiversity
 - Protected nutrient cycling

¹⁵

The restoration needs after each fire vary depending on region and fire severity.
To learn about how conservation finance can support post-fire recovery, contact us at connect@blueforest.org.