

BIOENGINEERED WILDFIRE MITIGATION

Wildfire mitigation is enhanced through a combination of

BIOLOGICAL ELEMENTS & DEBRIS MANAGEMENT

Bioengineered wildfire mitigation uses aspects of the natural environment to mitigate the risk of wildfire to the community, including residential and commercial property, utilities, and infrastructure.



TECHNICAL BENEFITS

- ✓ Enhances the resistance of structures and their immediate surroundings to ember threats
- ✓ Reduces debris and other objects that might ignite around a structure
- ✓ Uses natural barriers to mitigate ignition risk
- ✓ Increases likelihood of infrastructure resilience following a fire event
- ✓ Increases accessibility for emergency personnel and first responders to address ignition situations



SOCIAL & CULTURAL BENEFITS

- ✓ Promotes resilience and fosters adaptation in a changing climate
- ✓ Builds and promotes a community knowledgeable about the Firewise USA® program of the National Fire Protection Association
- ✓ Enhances community safety and neighborhood collaboration



ECOLOGICAL BENEFITS

- ✓ Promotes the use of native plants and non-invasive exotic, ignition-resistant plants
- ✓ Decreases the spread of invasive species
- ✓ Promotes plant health and diversity of natural and cultivated landscapes
- ✓ Conserves soils and prevents soil erosion and landslides
- ✓ Maintains and restores wildlife habitat
- ✓ Improves air quality
- ✓ Decreases impacts from other natural phenomena (floods, wind-downed debris)
- ✓ Allows habitats and wildlife to recover from damage



ECONOMIC BENEFITS

- ✓ Reduces landscape treatment and maintenance costs because native plants require less water and upkeep
- ✓ Decreases wildfire threat to infrastructure
- ✓ Potentially decreases insurance costs



BIOENGINEERED WILDFIRE MITIGATION

TECHNIQUES AND MEASURES

The application of bioengineering techniques will vary according to geography, climate, and elevation, as well as community building density and design. The expansion rate of urban/suburban center development in the wildland-urban interface (WUI) continues to increase in various locations. These communities are at an increased risk of wildfire and must take pro-active steps to decrease vulnerability. In addition to building standards, codes, and building materials, three major factors are vital to addressing wildfire risk:

1. Reducing wildfire hazards and maintaining the defensible space around infrastructure, which can be achieved through debris reduction and surface fuel management
2. Wildfire-focused landscaping in the ignition zone, which consists of using various biological elements chosen for ignition-resistance and ability to reduce wildfire risk or intensity
3. Post-wildfire recovery and mitigation techniques that leverage landscape and soil stabilization, forest regeneration, and invasive species prevention to mitigate against flooding, erosion, and landslides

PRE-WILDFIRE MITIGATION TECHNIQUES & MEASURES

Reducing Wildfire Hazards in the Ignition Zone

- Focus new community development in lower-risk topographies and implement stringent wildfire-focused building codes
- Thin trees, vegetation, and brush
 - Recommend 15-foot spacing between crowns
- Remove highly flammable brush, vegetation, and plants
- Remove dying or stressed trees and plants
- Dispose of debris, accumulated pine needles, duff, leaves, and dead limbs
- Maintain firewood piles and compost piles at least 30 feet from structures
 - Clear flammable vegetation from firewood piles
- Keep grass and weeds mowed
- Prune and trim branches 10 feet from the ground and remove forest cover and branch overhang from infrastructure rooftops
- Eliminate fuel ladders
 - Keep shrubs at least 10 feet from the edges of tree branches

Firescaping and Landscape Mitigation Techniques in the Ignition Zone

- Design defensible space with driveways, walkways, lawn space, patios, and fences using materials such as brick, stone, and cement to reduce fuel loads
- Integrate and use natural features such as rock outcroppings, wetlands, streams, lakes, ponds, and fish ponds
- Prioritize plants that have high moisture content
 - Avoid plants that have oils, resins, or waxes
 - Use deciduous instead of evergreen plants
 - Use Herbaceous instead of woody plants
 - Include succulents, perennials, and low shrubs
- Refrain from using landscape timbers such as railroad ties
- Use rock or gravel instead of bark or wood mulches
- Avoid planting under eaves and vents, under trees or decks, and adjacent to siding

POST-WILDFIRE RECOVERY & MITIGATION

Landscape/Soil Stabilization and Forest Regeneration

- Stabilize landscape to control erosion, stabilize soil and stream valley slope, and control flooding using:
 - Channels or deflection walls to direct water
 - Straw mulch or hydraulic mulch (seeding)
 - Erosion control mats
 - Log erosion barriers
 - Fiber rolls
 - Silt fence
- Address soil moisture
 - Rototilling to break up charred (compacted) surface soil
 - Watering/irrigation methods
 - Mulching (choices vary; different types used for different terrains)
- Control opportunistic pioneer plants (invasive species)
- Control invasive insect species and plant diseases that increase ignition potential by killing already stressed woodland vegetation
- Plant perennial plants and ideal plant types for recovery
- Large-scale seeding
- Actively implement Operations and Management Plans

