USDA United States Department of Agriculture

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Natural Resources Conservation Service

after the fire

Post -Fire Restoration

Preparing for Winter Following Fire in Vineyards, Orchards, and Rangelands

The sound of falling rain this winter may take on a whole new meaning for those who either suffered property damage from wildfires or who live directly downstream of fire damaged watersheds.

If you have an existing Napa County-approved Erosion Control Plan (ECP) for your vineyard, a Sonoma County-approved Vineyard and Orchard Site Development Ordinance (VESCO) permit for your orchard or vineyard, or a Ranch Water Quality Plan (RWQP) for your grazed land in your watershed, follow it. Further guidance may be found in Sonoma County's Best Management Practices for Agricultural Erosion and Sediment Control and the Napa County Code (Chapter 18.108, Conservation Regulations).

10 Basic Rules

If you don't have one of the above plans and/or are concerned about the possibility of erosion, mudslides, flooding, or other winter storm impacts following fire, then these 10 Basic Rules may help you prepare your property and family for future winter storm runoff.

1. **Cover disturbed areas.** Protect remaining plant cover. Spread mulch (straw, wood chips, etc.) and establish vegetation by seeding bare or disturbed soils before winter rains, especially around buildings, structures, firebreaks, and access roads and driveways. Seed mixtures should either be native or, if non-native, should be non-invasive species. Note: seeding and mulching is generally not recommended in rangeland and wildland areas.
2. **Prevent soil disturbance.** Minimize travel on, and tillage of, burned areas during the rainy season. Slopes are less stable, and soils are more erodible, when vegetation is burned, soil has been impacted by heat, and when soil becomes saturated.
3. **Evaluate roads and drainage facilities.** Look for damage on earthen and gravel roads, firebreaks, culverts, and stream crossings. Runoff control treatments, including armored outlets, may be needed to protect downslope areas from erosion, slope failure, and flood hazards. Use the "4-D formula" to:
    a. **Decrease** volumes and/or velocity of runoff by providing energy dissipation (rock or other armoring) at culvert and drain outlets and dividing large flows from roofs and landscapes into smaller, less erosive forms.
    b. **Detain** or collect runoff and either release it over time or store it for later use to lessen impact on saturated soils and slopes during large storms.
    c. **Dissipate** runoff where ever concentrated flows come in contact with bare soil and/or steep slopes by installing practices that spread runoff (grass, mulch, rock aprons, etc.) and reduce soil erosion and runoff volume. Extend culverts to a safer discharge location or install velocity dissipaters at culvert and drain outlets if they have been denuded by fire.
    d. **Divert** runoff as a last resort and do so with extreme caution. It may be helpful to re-route runoff and drainage away from unstable slopes, eroded areas, or unprotected soils.

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4. **Monitor and maintain existing measures.** Check existing erosion and sediment control structures and treatments (including vegetative cover) before and throughout the rainy season. Correct deficiencies as soon as possible. Leaf litter may clog roof, driveway, and surface drainage systems because of the fire and heat damage done to evergreen vegetation. Properly designed and installed trash racks, debris barriers, gutter guards, and other devices will reduce maintenance and allow home and property drainage systems to function properly.

5. **Use caution with emergency treatments.** Use caution when employing sand bags, brush and slash, plastic sheeting, and hand-dug drainage ditches, or don't use them at all without professional guidance. For example, covering slopes with plastic sheeting can speed up rainfall runoff and dumping brush into gullies may clog downstream drainage structures. An improperly designed or placed emergency practice can be worse than not doing anything at all, adding new hazards and a false sense of security.

6. **Treat high hazard, fire damaged trees.** Prune or remove trees that may fall onto people, animals, structures, or roadways before winter storms. Note: don't remove healthy or slightly damaged trees unnecessarily. Healthy tree root systems still hold soil and slopes in place and the tree canopy protects soil from the impact of falling raindrops while reducing winter runoff. Consult Cal Fire and/or a Registered Professional Forester for assistance.

7. **Consider debris barriers below rocky slopes.** There is an increased threat of falling rocks from steep slopes and shallow, rocky soils in affected watersheds. Debris barriers are effective for catching smaller rocks, but larger rocks will require more substantial measures. If there is a threat of large rocks releasing from slopes on your property or adjacent properties, then seek professional assistance. Contact the USDA Natural Resources Conservation Service (NRCS) or your local Resource Conservation District (RCD).

8. **Seek professional assistance.** For the design and installation of any temporary or permanent practices to control runoff and/or prevent erosion, services from NRCS and RCDs are here for you. www.ca.nrcs.usda.gov.

9. **Work with neighbors.** Permanent solutions for drainage and runoff issues may be better with the cooperation of neighboring landowners since runoff rarely follows property boundaries. You may be liable for both controlled and uncontrolled releases of collected runoff on to downslope properties if you do not consider potential off-site impacts.

10. **Be prepared with an evacuation plan.** Don't stay if it becomes unsafe to do so. Prepare a property and neighborhood evacuation plan and an emergency plan for pets and livestock. Stockpile emergency supplies including sandbags, straw mulch, etc. Pay close attention to weather forecasts, flash flood and storm warnings, and creek water levels throughout the winter. Evacuation plans should include at least one alternative escape route and a list of emergency phone numbers, including those of neighbors. Roadblocks, flooding, gullies and streambank erosion are often worse in the first winter following fire. Sediment levels in creeks and waterways are expected to rise, reducing channel flow capacities and increasing the likelihood of flooding on properties and downstream. Note: do not attempt to drive through flowing water or mud on roads. Some signs of impending danger from debris flows, landslides, severe erosion, and/or imminent flooding include: an intense storm event (1" to 2" per hour) especially following recent rainfall; water flowing over the landscape where it hadn't appeared in previous winters; leaning or falling trees; tension cracks along the top edge of slopes and along driveways and roads; seeps and increased spring activity in slopes; severely disturbed and unprotected slopes caused by firefighting work or from recent removal of fire damaged trees or other stabilizing vegetation.

For more information, helpful publications, erosion control plant lists for fire-prone areas, drainage control and road maintenance guides, or other natural resource information for your property, contact:

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