

# Nevada Floodplain Management News

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WINTER 2021



## Flood Awareness Week Special Issue: The Risks of Flood After Fire

### INSIDE THIS ISSUE:

<b>Fire and Floodplain</b>	<b>Page 2</b>
<b>Flood After Fire Concerns in Douglas County – The Tamarack Fire 2021</b>	<b>Page 3</b>
<b>Wildfire Effects on Source Water Quality</b>	<b>Page 5</b>
<b>Nevada’s Flood After Fire Guide</b>	<b>Page 7</b>
<b>Governor’s Proclamation for Flood Awareness Week 2021</b>	<b>Page 8</b>
<b>Upcoming Events and Additional Resources</b>	<b>Page 9</b>



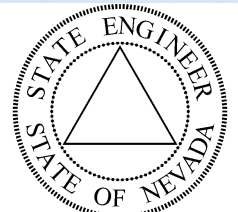
Photo of the aftermath of the 2018 Range 2 Fire around Lamoille Creek.



STATE OF NEVADA

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES

DIVISION OF WATER RESOURCES



## Fire and Floodplain

*Written by Sarah Fichtner, NDWR Floodplain Mapping Coordinator*

The geography of the Carson Valley has a tendency for catching smoke, sits adjacent to large forested areas with a tendency for catching fire, and exists in a windy climate with a tendency for fueling fires and blowing smoke into low-lying areas like our beautiful valley. In 2021, we started experiencing smoke and unhealthy air quality in mid-July and experienced unhealthy to dangerous air quality nearly every day in the month of August. In September we finally had respite from the smoke of the Dixie, Tamarack and Caldor fires which burned roughly 1.25 million acres in total. Essentially, it has become impossible to ignore the new normal in the last 10-20 years in the American west: extreme droughts, fires that destroy whole towns and dangerous, pervasive smoke conditions. Our climate is changing, and rapidly. By now, you might be wondering why I am talking so much about climate change and fire season in a floodplain management newsletter. Please allow me to explain.

The theme of this issue of Floodplain Management News is the risk of flooding as a result of fire. The fact is that fire alters the soil and landscape that it burns creating conditions where even a small rainfall event can cause flash flooding or even a debris flow (Courtney Walker's article). Another consequence of fires is water contamination in private wells, as well as in large water bodies lower in the watershed (see Kelli Nevills' article).

It is obvious to everyone that the large fires of the west are devastating, so much so that it is hard to take in all of the damage after the flames have subsided. The best that we can do is to be aware of the risks and take appropriate steps to protect ourselves. Even if you are not mapped in a flood zone, floods can happen anywhere and events like a forest fire can change your flood risk. Thus, we always recommend that you have flood insurance for your home or business. For more information or to obtain FEMA flood insurance, please visit [FloodSmart.gov](https://www.floodsmart.gov). It won't stop a flood, but it can help you recover more quickly after one has occurred. ~💧💧~



**NHP Northern Command** ✓  
@NHPNorthernComm



TRAFFIC ALERT: Mudslides on US395 at Mile Marker 1 in Douglas County. Multiple mudslides covering entire roadway near Topaz Lodge. No ETA to reopen. Northbound traffic stopped on California side. Southbound Traffic being diverted onto SR-208 through Wellington. [@nevadadot](https://twitter.com/nevadadot)



7:16 PM · May 21, 2018



In May 2018, a large debris flow near Topaz Lake forced a closure of Highway 395.

# Flood After Fire Concerns in Douglas County – The Tamarack Fire 2021

*Written by Courtney Walker, Douglas County Stormwater Program Manager*

The Tamarack Fire started by a lightning strike on July 4, 2021. High winds kicked it up on July 16, 2021 and caused the fire to spread to Markleeville in Alpine County, CA and then onto Holbrook Junction, Douglas County, NV. The area in Douglas County around the Holbrook Junction area contains steep slopes directly adjacent to the developed area. The developed area is primarily single-family residences and a mobile home park. The area was prone to flash flood events prior to the Tamarack Fire, and those concerns are elevated since the area was burned intensely recently.

In a natural landscape, vegetation promotes infiltration of precipitation, which reduces the velocity and amount of runoff. When an intense fire comes through and removes the vegetation, the ground becomes unable to absorb the water, causing flash flooding and debris flows. The increased risk in these areas can persist until the vegetation comes back, which in our dry Nevada cli-

-mate can take several years to recover.

The Douglas County Stormwater Division has been responding to and planning for drainage improvements to help alleviate some impacts from the Tamarack Fire. Staff inspected the burn area around the developed area in search of projects to mitigate the increased flooding risk. A couple of projects were identified in the areas of Penrod Lane, Reese Lane and the Holbrook Highlands.

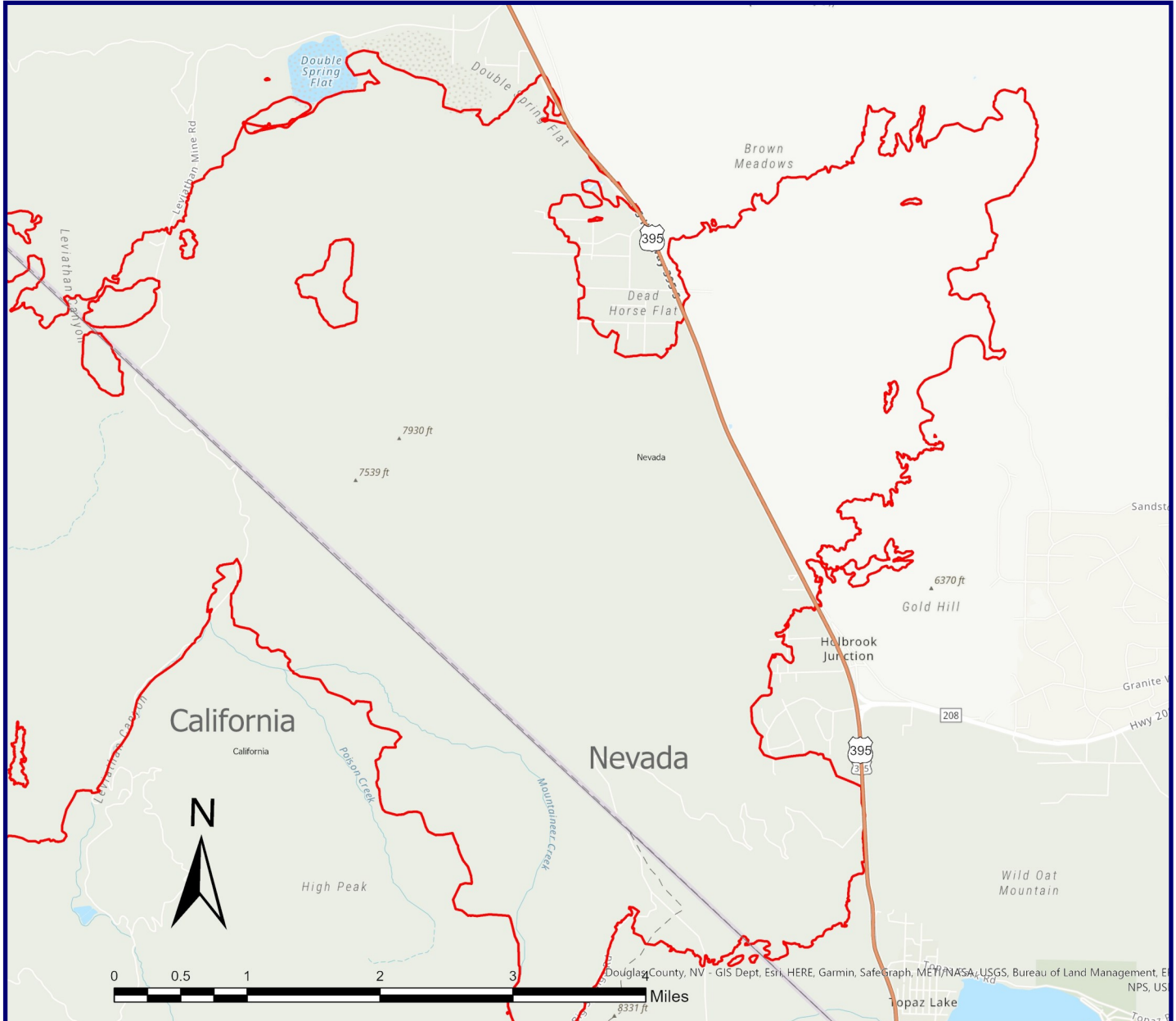
One project to date has been completed to alleviate potential flood damage on Penrod Lane. There is a drainage channel coming off the mountainside, into the developed area. The drainage channel flows under a private driveway. There are two corrugated metal pipe...

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Photos: Burned forest and terrain off of Spring Valley road in Douglas County, Nevada (left). Douglas County has worked to mitigate flood risk with the Penrod Lane drainage channel maintenance project. Photos are of drainage project before (upper right) and after (lower right) was completed.





Tamarack Fire Burn Perimeter in Douglas County, Nevada along the California-Nevada border

**<<<Continued from previous page: Flood After Fire Concerns in Douglas County– the Tamarack Fire 2021**

...(CMP) culverts that run underneath the driveway that were completely blocked with debris. The Stormwater Division cleaned the upstream portion of the channel and the culverts underneath the driveway (one 42" and one 24") so that the water can flow in its intended historic channel, rather than causing unknown downstream impacts.

The other project that was identified will be constructed in the next few weeks. An area downstream of an existing culvert was cleared to accommodate the flows better on Highland Way. Additionally, a new culvert will be installed at the intersection of Alba Vista and Highland Way. This will better accommodate flows through the Holbrook Highlands area.

Stormwater staff also met with the Nevada Division of Environmental Protection regarding long-term erosion control options. With the majority of the charred hillsides directly above the developed area being owned privately the coordination of replanting the area is challenging. The best thing that residents in the areas affected by fire can do is to look into obtaining flood insurance, having sandbags on site, and staying updated with notifications and alerts. ~ღღღ~

## Wildfire Effects on Source Water Quality

*Written by Kelli Nevills, NWRA Source Water Protection Specialist  
Edited by Sarah Fichtner, NDWR Floodplain Mapping Coordinator*

Wildfires are devastating and can lead to long-term changes to our landscape. With a significant amount of our nation's drinking water sources originating in forested watersheds, evaluating the effect fires have on our water quality is incredibly important.

About half of the water supply in the southwestern United States originates from forests, which generally yield higher quality water than any other source. Approximately 80 percent of the freshwater resources in the U.S. originate on forested land, and more than 3,400 public drinking-water systems are located in watersheds containing national forest lands (USDA, 2006). More than 12 million acres of land, including important forested water-supply watersheds, have burned in the southwestern U.S. in the past 30 years. Wildfires can compromise water quality both during active burning, and for months, or even years, after the fire has been contained. Storms following wildfires are known to impair drinking water supplies as burn areas are prone to greater rates of erosion, increasing the downstream accumulation of sediment in streams, rivers, and reservoirs. Thus, the potential impacts from past, current, and future wildfires on the quantity and quality of runoff are considerable, and may greatly influence water used for domestic, agricultural, and ecological water supplies.

Wildfire affects many facets of the source water delivery system, ranging from immediate effects during the fire to long-term alteration of the watershed. During a fire, interruption of power and access to water treatment plants, ambient water quality monitoring equipment and stream diversion and monitoring locations are a common occurrence. Runoff from burned areas contains ash and may have significant effects on the chemistry of those receiving waters such as lakes, wetlands, reservoirs, and rivers.

Extreme weather events (EWEs), including floods after fire, may significantly increase pathogenic contamination of private (unregulated) groundwater supplies. Due to the scarcity of protective guidance, private well...

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Aftermath of the Little Valley Fire in Washoe County, Nevada. Nevada Division of Forestry helicopter flies over burned terrain (above) and remnants of a burnt home (left).



### <<<Continued from previous page: Wildfire Effects on Source Water Quality

...users may be ill-equipped to undertake adaptive actions. The frequency and severity of flooding events will increase over the coming decades due to our changing climate. Research and mitigation efforts often focus on infrastructural and environmental outcomes for flood events; the potential adverse human health consequences associated with post-EWE consumption of private groundwater sources have received minimal attention. Subsequently, there is a poor understanding of private well users' preparedness and the drivers of practicing responsible well stewardship.



Photos of well heads damaged in forest fires. Maintenance is necessary to help prevent contamination of these water sources. For more information on protecting your home's water, [CLICK HERE](#).



Wildfires are some of the West's most deadly and expensive hazards. These events are incredibly destructive and are predicted to become bigger and more common in the future as extreme changes in climate and EWEs become more frequent. Despite their critical importance, wildfires and their impact on watersheds are challenging due to their unpredictability, the extensive damage they cause, and a lack of pre-existing information for comparisons. What we do know is they alter the surface soils, decrease infiltration during thunderstorms, and accelerate the movement of water, sediment, and debris from the landscape to nearby streams. This has a definitive impact on downstream water quality.

Managing for the array of these threats, (fire, drought, infestation etc.), in a changing climate is obviously complicated. Researching new adaptive management strategies can keep forests and our watersheds resilient under multiple stressors so they can continue to thrive for habitat, wildlife, clean air, clean water and even future timber. Many of our forests remain overgrown, and while there is still disagreement on how to restore diversity and resilience it is agreed that something needs to change. Without management, these forests and watersheds will remain prone to high intensity wildfires and increased damage to the watersheds. Events that threaten people have the potential to cost hundreds of millions of dollars and from which some species and areas of the forest and watersheds may never recover. ~△△△~

# NEVADA FLOOD AFTER FIRE GUIDE

Coming January 2022

A POST-FIRE RESOURCE FOR NEVADA COMMUNITIES

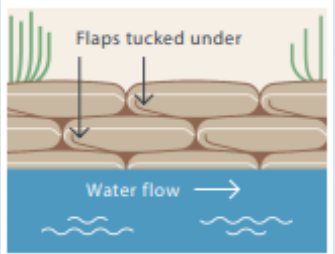
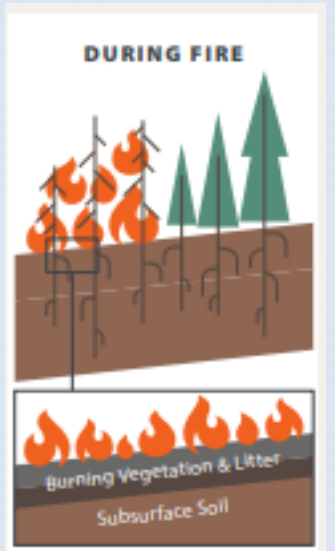


FIGURE 5. Proper sandbag placement when constructing a barrier

### WHAT TO DO AFTER A FLOOD

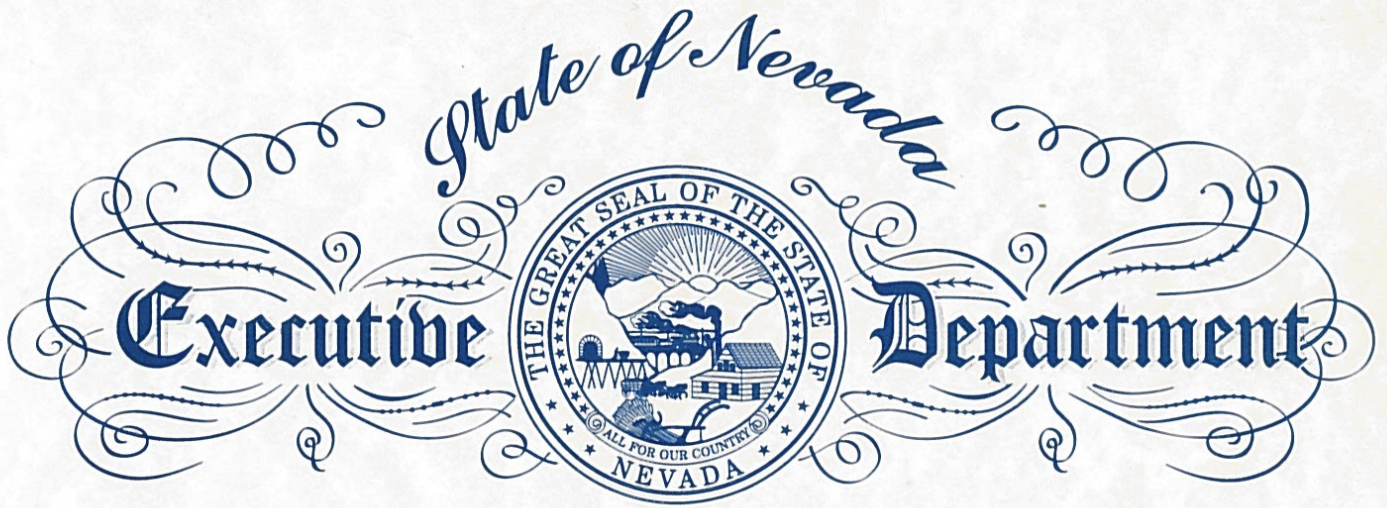
- 1 Throw away items that cannot be disinfected, like wall coverings, cloth, rug, and drywall.
- 2 Use fans, air conditioning units, and dehumidifiers for drying.
- 3 Clean walls, hard floors, and other surfaces with soap and water. Use a mixture of 1 cup bleach and 1 gallon water to disinfect.
- 4 Caution! Flood water may contain **sewage**.

**PRACTICE SAFE HYGIENE**

- 1 Wash hands with soap and water to help prevent germs.
- 2 Listen for information from your local officials on how to safely use water to drink, cook, or clean.
- 3 For cleanup, wear rubber boots and plastic gloves.

FOR MORE INFORMATION: [emergency.cdc.gov/disastr](https://emergency.cdc.gov/disastr)

The Nevada Silver Jackets Team is currently developing a statewide flood after fire guide, a consolidated resource that will provide pertinent flood risk information to help residents be better prepared for what comes before, during, and after a wildfire. This effort is part of the Nevada Post-Wildfire Workshops project, which is an interagency effort between Federal, State, and local agencies working to reduce flood risk throughout Nevada. In addition to the guide, other deliverables that will be developed include education and outreach materials to help convey post-wildfire flooding risks and a flood after fire workshop. A draft of the guide may be released earlier for communities at current risk following the 2021 fire season.



## *A Proclamation by the Governor*

**WHEREAS**, flooding creates emergencies of great concern to the State of Nevada, with imminent threat to life and property, as well as the potential for hundreds of millions of dollars in damage to homes, businesses, and local community infrastructure; and

**WHEREAS**, since 1955, Nevada has received 18 presidential disaster declarations for flooding, which in 2017 included: Douglas, Elko, Humboldt, Lyon, Storey, and Washoe counties; the independent city of Carson City, the Pyramid Lake Paiute Tribe, Reno-Sparks Indian Colony, South Fork Band of Te-Moak Tribe of Western Shoshone, and Washoe Tribe of Nevada and California; and

**WHEREAS**, Nevada continues to take critical steps to address climate change, the risk of more hazardous and frequent flooding remains a constant threat to people, property, and the natural environment; and

**WHEREAS**, flood hazard, flood risk reduction, vulnerability, and preparedness information are available from local, State, and federal partners and should be studied and observed throughout the year in order to reduce the impacts of flooding to communities, lives, and property; and

**WHEREAS**, the Nevada Flood Awareness Committee is committed to developing comprehensive and sustainable solutions to flood hazard issues, including flood awareness and outreach activities, flood hazard mitigation planning and projects, floodplain management, and flood and inundation mapping; and

**WHEREAS**, the Nevada Flood Awareness Committee continues to engage and inform Nevadans about how to prepare before, during, and after floods, as well as the importance of flood insurance to help create safer and more resilient communities; and ask all Nevadans to observe Nevada Flood Awareness Week by preparing their homes and communities for floods;

**NOW, THEREFORE, I, STEVE SISOLAK, GOVERNOR OF THE STATE OF NEVADA, do hereby proclaim the week of November 14 - 20, 2021, as**

### **FLOOD AWARENESS WEEK IN NEVADA**



*In Witness Whereof*, I have hereunto set my hand and caused the Great Seal of the State of Nevada to be affixed at the State Capitol in Carson City, this 26<sup>th</sup> day of October 2021.

By the Governor: \_\_\_\_\_ Governor

*Boulyna K. Cegavske*  
Secretary of State

By *Mark W. ...* Deputy





# Upcoming Events and Additional Resources

## Nov. 14 - 20 | Nevada Flood Awareness Week



Until the Nevada Flood After Fire Guide is completed, here are some additional resources:

Flood Risks Increase After Fires, Federal Emergency Management Agency

Post-wildfire Rehabilitation Fact Sheet, Nevada Division of Forestry

A Review of Fire Effects on Vegetation and Soils in the Great Basin Region, USDA Forest Service, Rocky Mountain Research Station

Wildland Fire in Ecosystems: Effects of Fire on Soil and Water, USDA Forest Service, Rocky Mountain Research Center

Addressing the Impacts of Wildfire on Water Resources, Colorado Extension

Resources compiled by Chuck Schembre, NDEP

The next issue of the Nevada Floodplain Management News will feature:  
**Risk Rating 2.0**

## Nevada Floodplain Management News is a Publication of the Nevada Floodplain Management Program

To Submit New Content, or if you have Questions or Comments

If you have any questions or comments regarding the content of this newsletter or are interested in contributing articles to future Nevada Floodplain Management Bulletin, please contact Nevada Division of Water Resources, Floodplain Mapping Coordinator, Sarah: [sfichtner@water.nv.gov](mailto:sfichtner@water.nv.gov) or our Public Outreach Manager, Carlos: [crendo@water.nv.gov](mailto:crendo@water.nv.gov).

