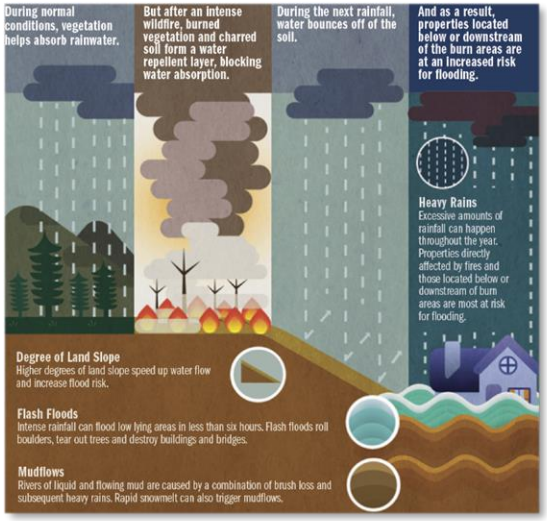
New Mexico Risk of Flooding from Wildfires



WATER & NATURAL RESOURCE INTERIM COMMITTEE

JULY 25, 2022

2022 Large New Mexico Wildfires

Hermits Peak/Calf Canyon (Mora & San Miguel) - 341,735 Acres

Black (Catron, Grant, Sierra) – 325,136

Cerro Pelado (Jemez Mountains) - 45,605 Acres

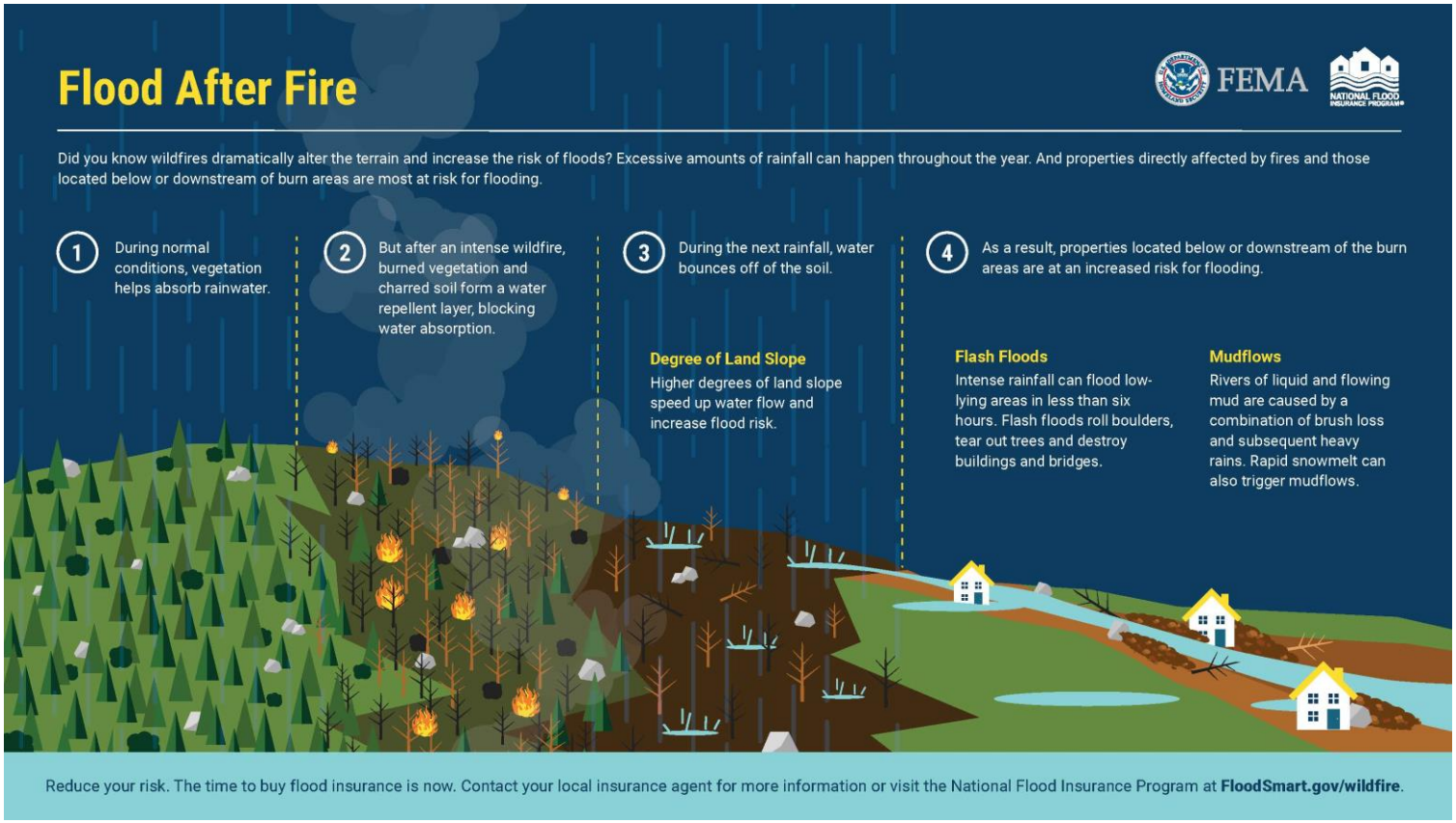
Cooks Peak (Mora & Colfax) – 59,359 Acres

McBride (Ruidoso) - 6,159 Acres

Bear Trap (Socorro) – 38,225 Acres

Photos courtesy Inciweb USFS

Photo Courtesy Inciweb, NM Forestry Division, Matthew Garcia, Type 3IMT



Freshly burned landscapes are at risk of damage from post-wildfire erosion hazards such as those caused by flash flooding and debris flows (mud flows). Burn scar areas have a tremendous impact on flood and debris flow following short duration high intensity rainfall. These high volume low frequency floods result from typical monsoon summer rains and occur in and downstream of the burn scar areas. Dramatic changes in runoff, erosion, and deposition have been documented in watersheds affected by wildfire. These post-fire changes have led to loss of life, damage to property, and significant impacts on infrastructure. (NM State Hazard Mitigation Plan 2018)

Source: https://www.nmdhsem.org/wp-content/uploads/2019/06/NM-HMP-Approved-Body-9-13-18-V2-low-res.pdf

Hydrophobic Soils

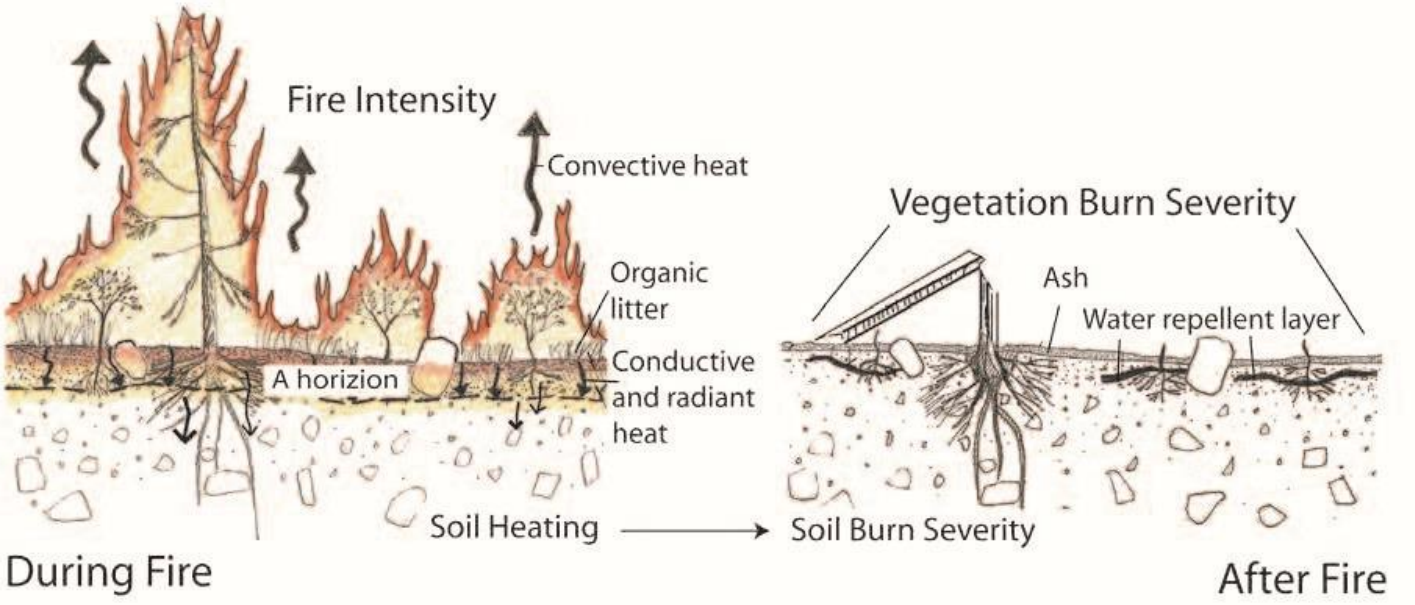
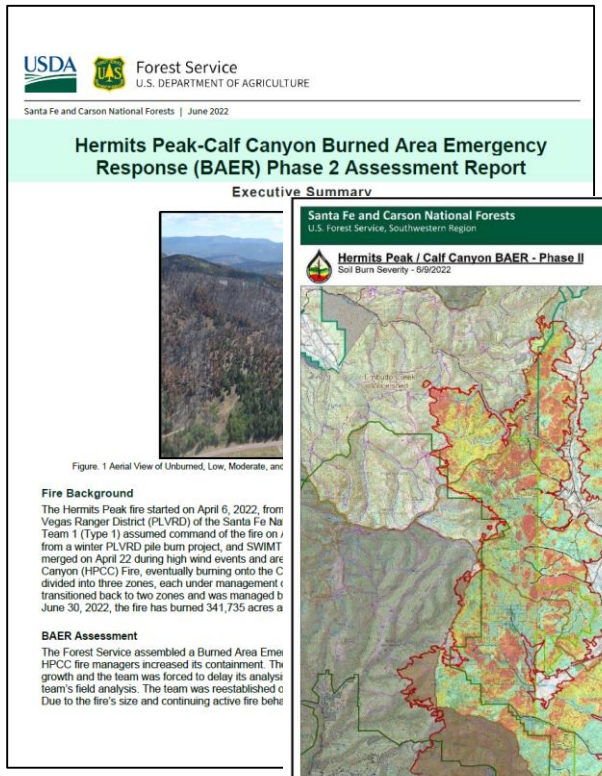


Figure 1. Illustrates the effect of fire intensity on above-ground vegetation and below-ground soil properties. Graphic modified by Mike Hankinson, National Park Service.

2 USDA Forest Service Gen. Tech. Rep. RMRS-GTR-243. 2010

Source: Field Guide for Mapping Post-Fire Soil Burn Severity USDA Forest Service General Technical Report RMRS-GTR-243 https://www.fs.fed.us/rm/pubs/rmrs_gtr243.pdf

Soil Burn Severity


USDA Forest Service
U.S. DEPARTMENT OF AGRICULTURE

Santa Fe and Carson National Forests | June 2022

Hermits Peak-Calf Canyon Burned Area Emergency Response (BAER) Phase 2 Assessment Report

Executive Summary

Figure. 1 Aerial View of Unburned, Low, Moderate, and

Fire Background

The Hermits Peak fire started on April 6, 2022, from
Vegas Ranger District (PLVRD) of the Santa Fe Na
Team 1 (Type 1) assumed command of the fire on
from a winter PLVRD pile burn project, and SWIMT
merged on April 22 during high wind events and are
Canyon (HPCC) Fire, eventually burning onto the C
divided into three zones, each under management
transitioned back to two zones and was managed b
June 30, 2022, the fire has burned 341,735 acres a

BAER Assessment

The Forest Service assembled a Burned Area Emer
HPCC fire managers increased its containment. Th
growth and the team was forced to delay its analysi
team's field analysis. The team was reestablished
Due to the fire's size and continuing active fire beha

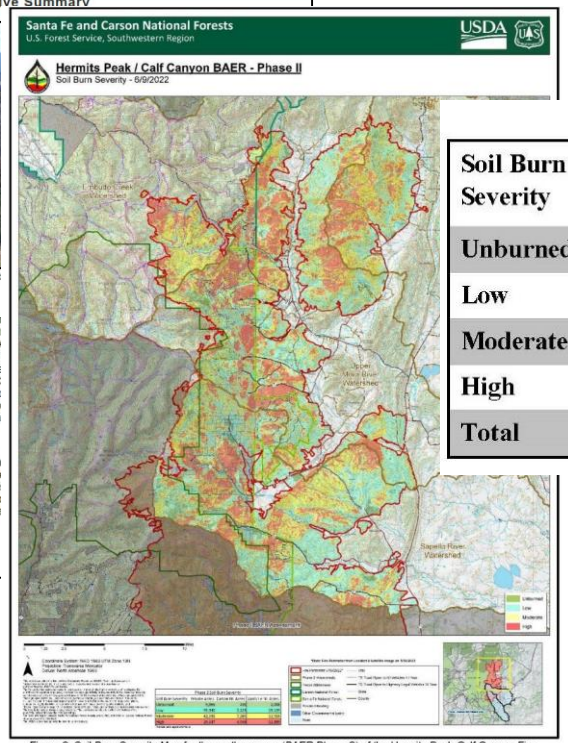


Figure 2: Soil Burn Severity Map for the northern area (BAER Phase 2) of the Hermits Peak-Calf Canyon Fire.

Hermits Peak-Calf Canyon

57% Moderate to High Severity

Table 2: Soil burn severity by land ownership

Soil Burn Severity	NFS	Other Federal	State	Private	Total	% of HPCC Phase 2 Perimeter
Unburned	2,443		0	5,065	7,508	4
Low	18,382		0	55,940	74,322	39
Moderate	20,223		0	42,581	62,804	33
High	16,045		0	29,347	45,392	24
Total	57,093		0	132,933	190,026	100

Source: Hermits Peak-Calf Canyon Burned Area Emergency Response (BAER) Phase 2 Assessment Report https://inciweb.nwcg.gov/photos/NMSNF/2022-05-15-2009-HermitsPeak-Calf-Cyn-BAER/related_files/pict20220608-001049-0.pdf

Low Burn Severity

Moderate Burn Severity

High Burn Severity

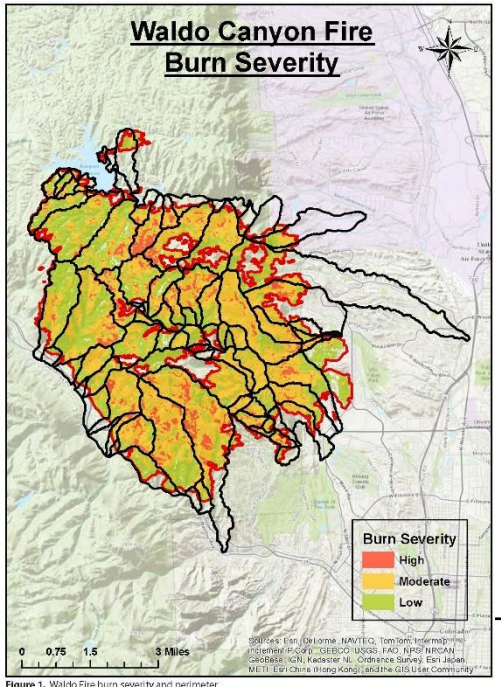
Hydrophobic Soil
Moderate Burn Severity

Source: Hermits Peak-Calf Canyon Burned Area Emergency Response (BAER) Phase 2 Assessment Report https://inciweb.nwcg.gov/photos/NMSNF/2022-05-15-2009-HermitsPeak-Calf-Cyn-BAER/related_files/pict20220608-001049-0.pdf

Waldo Canyon Fire Watershed Assessment

Burn Severity	Acres	Percentage
Low/Unburned	7,586	41%
Moderate	7,286	40%
High	3,375	19%

59% Moderate/High



Watershed	Pre-Fire		Post-Fire		Increase		
	Water Yield (acre-ft)	Total Sediment (tons/yr)	Water Yield (acre-ft)	Total Sediment (tons/yr)	Water Yield Increase (acre-ft)	Total Sediment Increase (tons/yr)	Total Sediment per Unit Area (Post-Fire) (tons/acre/yr)
Camp Creek	2,115	71	3,702	16,897	1,587	16,826	2.12
Douglas Creek	1,511	47	2,156	7,834	646	7,787	3.07
Fountain Creek	2,500	90	4,822	25,075	2,322	24,985	2.69
West Monument Creek	2,747	104	4,035	7,489	1,288	7,385	1.23

Source: Waldo Canyon Fire Watershed Assessment: The WARSSS Results, 2013, Figure 1, Tables 4 and 13.
http://www.uppersouthplatte.org/pdf/WARSSS/1.WaldoCanyonFireAssessmentReport.pdf

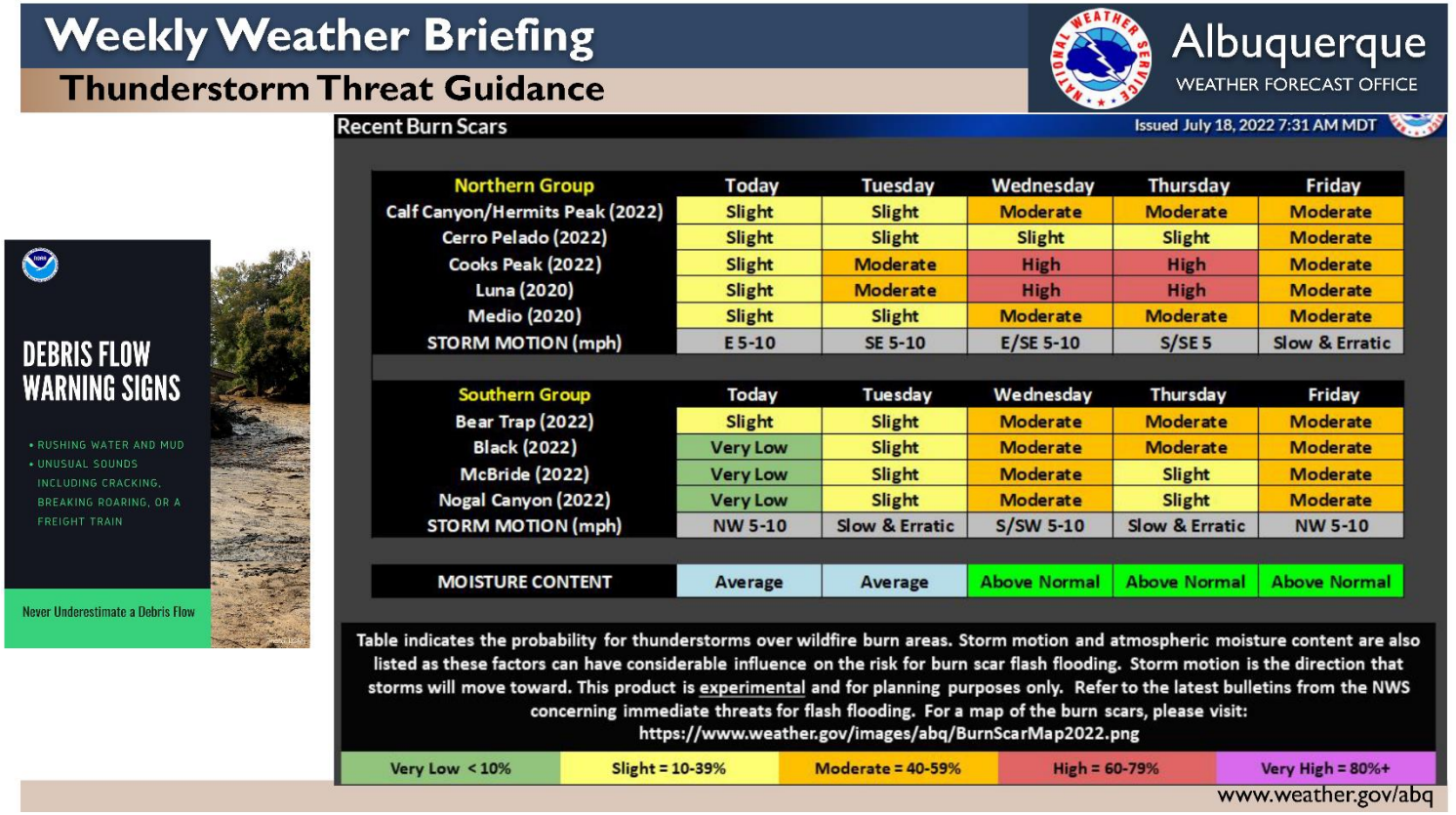
Risk to Acequias

Acequias are vulnerable to flooding, which can damage the acequia itself as well as cause property damage surrounding the acequia. Flood waters can damage culverts and diversion dams, and fill acequias with silt, requiring extensive restoration efforts (NM State Hazard Mitigation Plan 2018)

≥125 miles of acequias within Hermits Peak Calf Canyon Perimeter

Source: https://www.nmdhsem.org/wp-content/uploads/2019/06/NM-HMP-Approved-Body-9-13-18-V2-low-res.pdf
Photo credit: OSE Acequia Mapping Project https://arcg.is/K0nCO

NWS Weekly Weather Briefings



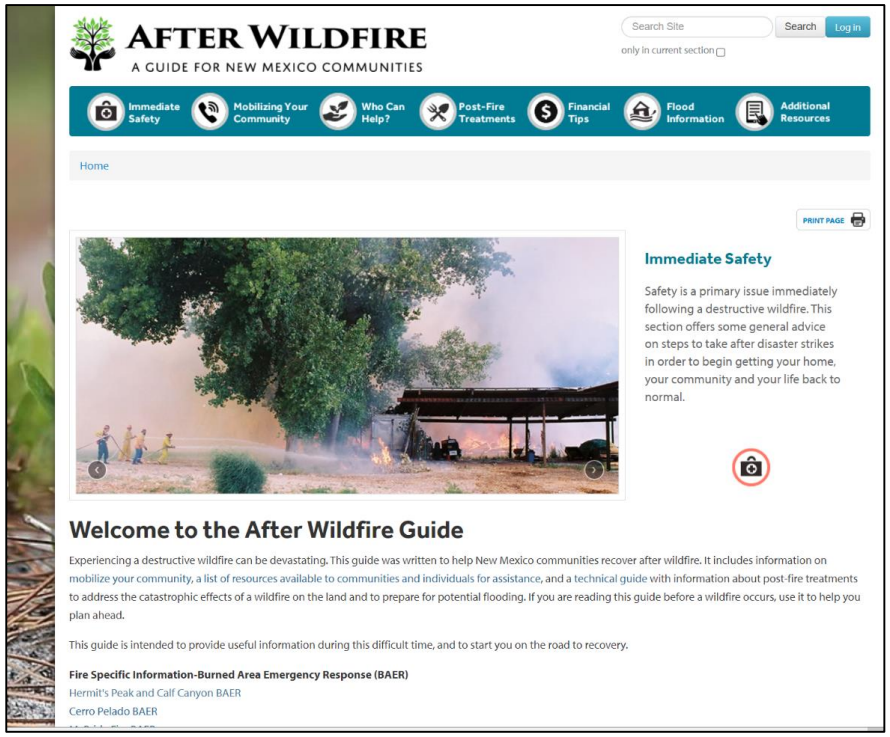
Northern Group	Today	Tuesday	Wednesday	Thursday	Friday
Calf Canyon/Hermits Peak (2022)	Slight	Slight	Moderate	Moderate	Moderate
Cerro Pelado (2022)	Slight	Slight	Slight	Slight	Moderate
Cooks Peak (2022)	Slight	Moderate	High	High	Moderate
Luna (2020)	Slight	Moderate	High	High	Moderate
Medio (2020)	Slight	Slight	Moderate	Moderate	Moderate
STORM MOTION (mph)	E 5-10	SE 5-10	E/SE 5-10	S/SE 5	Slow & Erratic

Southern Group	Today	Tuesday	Wednesday	Thursday	Friday
Bear Trap (2022)	Slight	Slight	Moderate	Moderate	Moderate
Black (2022)	Very Low	Slight	Moderate	Moderate	Moderate
McBride (2022)	Very Low	Slight	Moderate	Slight	Moderate
Nogal Canyon (2022)	Very Low	Slight	Moderate	Slight	Moderate
STORM MOTION (mph)	NW 5-10	Slow & Erratic	S/SW 5-10	Slow & Erratic	NW 5-10

MOISTURE CONTENT	Average	Average	Above Normal	Above Normal	Above Normal

Source: Albuquerque NWS Office Weekly Briefing July 18, 2022

After Wildfire NM



Resources for citizens and communities after and during a wildfire

- Safety
- Community Resources
- Assistance for Individuals & Families
- Post-Fire Treatments
- Flood Information
- Planning

https://afterwildfirenm.org/

Flood Mitigation & Remediation Efforts

USGS & NWS – water flow and precipitation gages

USACE – gabion structures, log booms, debris basins, GeoBrugg (wire netting), inundation mapping (Mora River & Gallinas Watershed)

USFS Forest Land – hazard signs & barriers, seeding and mulching, sediment catchment basins, storm proofing roads, protecting Gila Trout

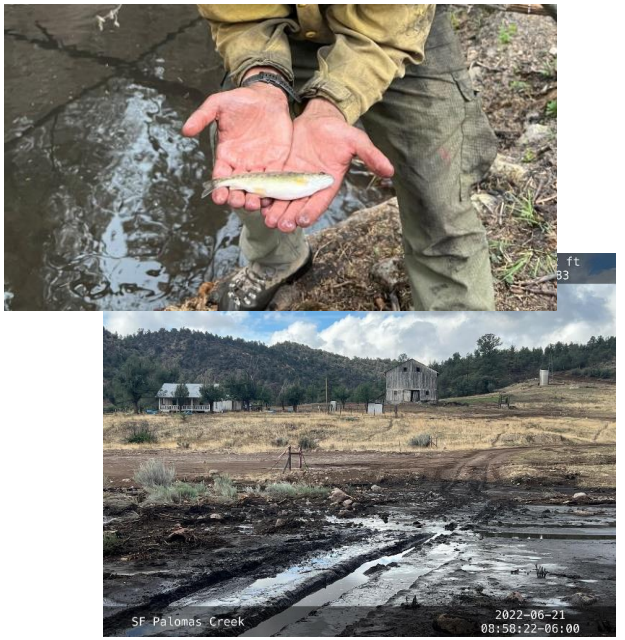
NRCS – Emergency Watershed Protection Program

Hermit's Peak Watershed Alliance team started to distribute seed on private property, helped to reduce sediment loading, and creating one rock dams to slow water flow

Office of State Engineer: Cleaning out debris/ash in front of Storrie diversion

State Land Office: protecting campgrounds, hazardous tree removal, seeding and erosion control

General: sand bagging operations, culvert cleaning



Gila Trout & Ash flowing in SF Palomas Creek near Hermosa (inciweb, USFS)

USACE GALLINAS WATERSHED: DIRECT ASSISTANCE PROJECT #1

CAO 16JUL2022

Location: Gallinas Watershed, NM

MSC: South Pacific Division (SPA)

FEMA Region: VI

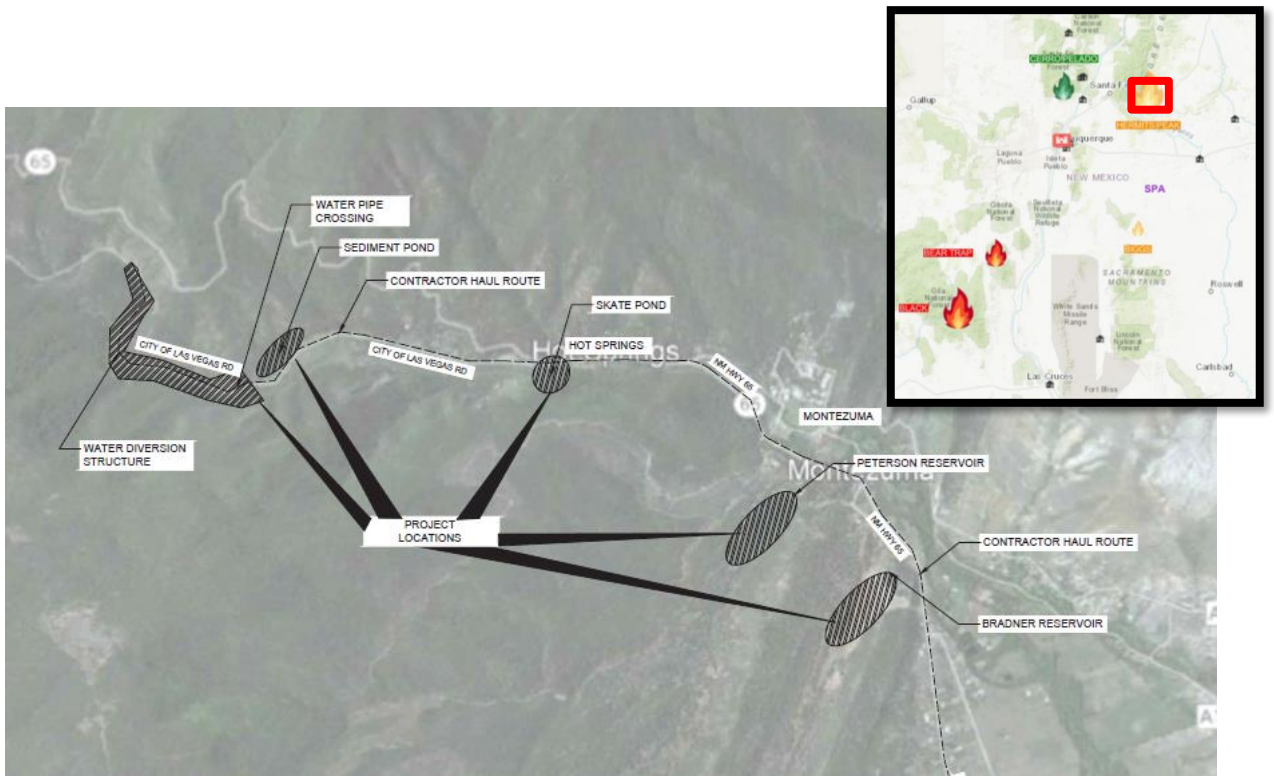
FCCE 510 Funds:

KTR:

Purpose: Multiple upstream areas with severe soil burn that present an increased flood risk.

SOW: 4x Log Booms, Debris Basins, 4x GeoBrugg (wire netting), 3x large Gabion structures, 5x Rip Rap structures and misc. Gabion/HESCO/Jersey barrier structures

CONTRACT TIMELINE	
Contract Awarded	10 June 22
Contractor on Site	11 June 22
Estimated Completion Date	15 July 22
Percent Complete	**100%**



UPDATE

- .
- Log booms complete.
- Geobrugg 100% complete.
- **RIPRAP 100% complete.**

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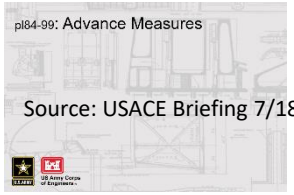

CAO 16JUL2022

GALLINAS WATERSHED: DIRECT ASSISTANCE PROJECT #1

Log Boom at Skate Pond


Gabion #3


GeoBrugg

pl84-99: Advance Measures

Source: USACE Briefing 7/18/2022

Ongoing & Future Actions

Debris Removal – Culvert Cleaning

- Sebastian Canyon - CoRd A11A - debris flows impacting road, Canyon del Agua severe burn area

Water Infrastructure Protection

- Storrie Lake water intakes & other water system infrastructure
- Acequia intakes and ditches

Watershed & River Restoration

Road Repairs

Post-Fire Treatments – public and private lands

Questions?

Shawn L. Penman, PhD, CFM, GISP

New Mexico Cooperating Technical Partner Coordinator
RGIS GIS Clearinghouse Manager
Earth Data Analysis Center, UNM

spenman@edac.unm.udu