2024 Wildfire Season: An Overview

Southwestern US

JUNE 2025

NAU NORTHERN ARIZONA UNIVERSITY

Ecological Restoration Institute

SOUTHWEST FIRE SCIENCE CONSORTIUM

Intermountain West Frequent-fire Forest Restoration

Ecological restoration is a practice that seeks to heal degraded ecosystems by reestablishing native species, structural characteristics, and ecological processes. The Society for Ecological Restoration International defines ecological restoration as "an intentional activity that initiates or accelerates the recovery of an ecosystem with respect to its health, integrity and sustainability… Restoration attempts to return an ecosystem to its historic trajectory" (Society for Ecological Restoration International Science & Policy Working Group 2004).

Most frequent-fire forests throughout the Intermountain West have been degraded during the last 150 years. Many of these forests are now dominated by unnaturally dense thickets of small trees, and lack their once diverse understory of grasses, sedges, and forbs. Forests in this condition are highly susceptible to damaging, stand-replacing fires and increased insect and disease epidemics. Restoration of these forests centers on reintroducing frequent, low-severity surface fires—often after thinning dense stands — and reestablishing productive understory plant communities.

The Ecological Restoration Institute at Northern Arizona University is a pioneer in researching, implementing, and monitoring ecological restoration of frequent-fire forests of the Intermountain West. By allowing natural processes, such as low-severity fire, to resume self-sustaining patterns, we hope to reestablish healthy forests that provide ecosystem services, wildlife habitat, and recreational opportunities.

The Southwest Fire Science Consortium (SWFSC) is a way for managers, scientists, and policy makers to interact and share science. SWFSC's goal is to ensure the best available science is used to guide management decisions and that scientists are working on the questions managers need answered. The SWFSC tries to bring together localized efforts to develop scientific information and to disseminate that to practitioners on the ground through an inclusive and open process.

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Cover photo: Sand Stone Fire, Arizona by Nick Castro

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Introduction

Wildfire is part of the landscape in the Southwest. It can be a threat to lives and property, but it is also crucial to maintaining healthy ecosystems. Plant communities in the Southwest are adapted to fire. For example, ponderosa pine forests need regular, low-severity fires to remain healthy. Over decades without fire on the landscape, fuel loads accumulated and facilitated more intense, high-severity fire. Each fire is different, and while some burn in ways that increase ecosystem resilience, others burn with greater severity than forests are adapted to, killing even the toughest trees and threatening lives and homes. Weather, climate, vegetation type, fuel conditions, and topography all influence how an individual wildfire burns on the landscape and whether it has beneficial effects. Some fires will leave many unburned patches, creating a mosaic burn pattern, whereas others will burn more contiguously.

This report is the twelfth in a series of annual overviews available from the Southwest Fire Science Consortium and the Ecological Restoration Institute. The goal of this overview is to provide a concise summary of the 2024 fire season and to facilitate comparisons with past fires and fire seasons. It follows the format of past years' overviews[1] and describes the impacts of 10 wildfires, each more than 10,000 acres, in Arizona and New Mexico in 2024. As in previous overviews, this report covers when each fire burned, fire management costs, vegetation types, previous wildfires in that area, and burn severity, where available. The conclusion section summarizes these same characteristics for the large wildfires in the region and discusses how fires burned in proximity to human communities. Fire season overview reports provide a unique opportunity to compare fires and fire seasons, which highlight trends and changes as managers and communities adapt to climate change.

Wildfire Management

Managers approach each wildfire with multiple objectives that range from managing the wildfire for public safety to managing the fire to benefit natural resources. Federal wildland fire management policy states:

> "Response to wildland fires is based on ecological, social and legal consequences of the fire. The circumstances under which a fire occurs, and the likely consequences on firefighter and public safety and welfare, natural and cultural resources, and values to be protected, dictate the appropriate response to the fire."[2]

A full range of wildland fire response strategies may be employed to meet these objectives, including containing, confining, or suppressing the wildfire. The National Incident Management Situation Report identifies the percentage of each fire managed with a monitor, confine, point zone protection, or suppression strategy. This report compiles these figures to better explain how fires were managed in 2024.

Wildland fire management strategies are based on a thoughtful and systematic risk-based approach that considers firefighter and public safety, cause of the wildfire, location, existing land management plans, availability of resources, values at risk, as well as social and economic factors. Federal policy dictates that "initial action on human-caused wildfire will be to suppress the fire."[2] The same federal policy allows naturally ignited wildfires (or parts of wildfires) to be managed for resource benefits (also called managed wildfires), such as mitigating fuel loads to reduce the risk of high-severity fire, enhancing wildlife habitat, improving watershed health, and reducing risk to neighboring communities. Though multiple strategies are used to manage wildfires, it is important to note that federal agencies only recognize two types of fires: prescribed fire (planned) and wildfire (unplanned).

The 2024 Fire Season

In 2024, wildfire burned 356,025 acres in the Southwest (Arizona and New Mexico), which is 63 percent of the average number of acres burned annually in these two states over the previous 10-year period (567,935 acres). Arizona had more wildfires (1,769) and more acres burned (288,657 acres) than New Mexico (699 wildfires and 67,368 acres). Arizona had fewer wildfire acres than its 10-year average (344,108 acres) while New Mexico less than half the number of acres of wildfire than its 10-year average (174,083 acres). For wildfires for which the cause was determined, lightning accounted for 42 percent of the ignitions and 72 percent of the acres burned. Based on data from the Southwest Coordination Center, managers were able to use prescribed fire on 68,310 acres

[1] 2023, 2022, 2021, 2020, 2019, 2018, 2017, 2016, 2015, 2014, and 2013 Wildfire Season: An Overview, Southwestern U.S. https://cdm17192.contentdm.oclc.org/digital/collection/p17192coll1/search/searchterm/wildfire%20season%20overview/field/type/mode/exact/conn/and

[2] Guidance for Implementation of Federal Wildland Fire Management Policy, 2009 https://www.doi.gov/sites/doi.gov/files/uploads/2009-wfm-guidance-for-implementation.pdf

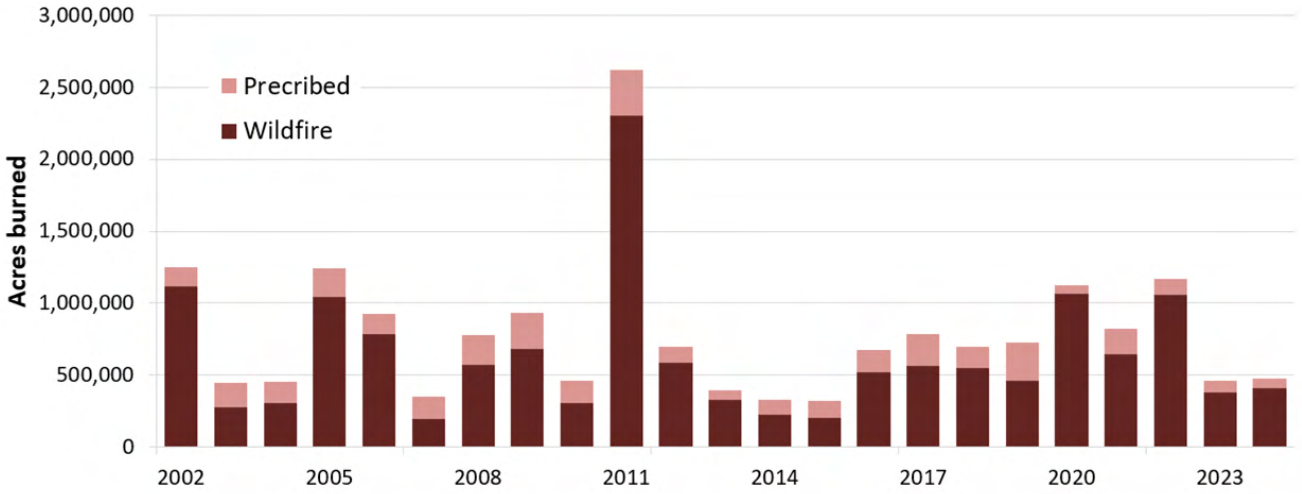

Figure 1. Wildfire and prescribed fire acres burned in Arizona and New Mexico, 2002 to 2024.[3] Wildfire burned 356,025 acres in the Southwest (Arizona and New Mexico), which is a lower than the average number of acres burned annually in these two states over the previous 10-year period (567,935 acres).

across the Southwest, or about half of the average over the previous 10 years (140,428 acres) (Figure 1).

Based on the Incident Status Summary (ICS-209) reports for the 10 largest wildfires covered in this report, managers used a full suppression strategy on 90 percent of the acres. In other words, 164,873 acres out of the 181,621 acres of the 10 largest wildfires were managed with a full suppression strategy. Designation of management strategy remains a metric with significant uncertainty because aggregated summaries of the ICS-209s do not include strategy and because the on-the-ground management strategy does not always align with the strategy listed in the ICS-209s.[4]

The letter of intent from the Chief of the Forest Service from April 24, 2024, supported managed wildfire with limitations:

> This year, Regional Foresters will again approve or disapprove use of natural ignitions as a management strategy during Preparedness Levels 4 and 5, in accordance with the Interagency Standards for Fire and Fire Aviation (Red Book). Increasingly, we see the potential for fire to increase landscape resilience when conditions permit.

The country went to Preparedness Level (PL) 4 on July 10 and stayed at PL 4 or 5 until September 26.[5] In 2024, the Southwest region never reached PL 4 and was at PL 3 for 86 days. In the preseason letter, the Chief also emphasized the importance of Potential Operational Delineations (PODs) which facilitate pre-fire planning and balancing resource objectives with safety and community protection.

This overview focuses on the 10 largest fires by acreage in the region, which include seven Arizona fires (Freeman, Sand Stone, Skeleton, Siphon, West, Wildcat, and Black) and three New Mexico fires (South Fork, Antone, and Indios). The 10 large fires in this report represent 45 percent of the acres burned by wildfire in 2024 (Figure 2).

Regional Context

The El Niño weather pattern influenced the Southwest heading into 2024, bringing periods of increased moisture that supported fine fuel growth. However, the distribution of fine fuels remained variable across Arizona and New Mexico. Snowpack levels were above normal in some regions, but overall precipitation patterns fluctuated. While winter precipitation was generally near or above average in Arizona and western New Mexico, eastern New Mexico continued to experience drier conditions, with lingering drought concerns. Meanwhile, the Upper Colorado River Basin maintained substantial snow levels through April 2024, contributing to improved water supplies in the region.

By mid-year, a warming and drying trend took hold, continuing the long-term pattern observed in recent

[3] National Interagency Coordination Center Wildland Fire Annual Reports https://www.nifc.gov/nicc/predictive-services/intelligence

[4] Davis et al 2022. Managed Wildfire: A Strategy Facilitated by Civil Society Partnerships and Interagency Cooperation. https://doi.org/10.1080/08941920.2022.2092803

[5] https://www.nifc.gov/fire-information

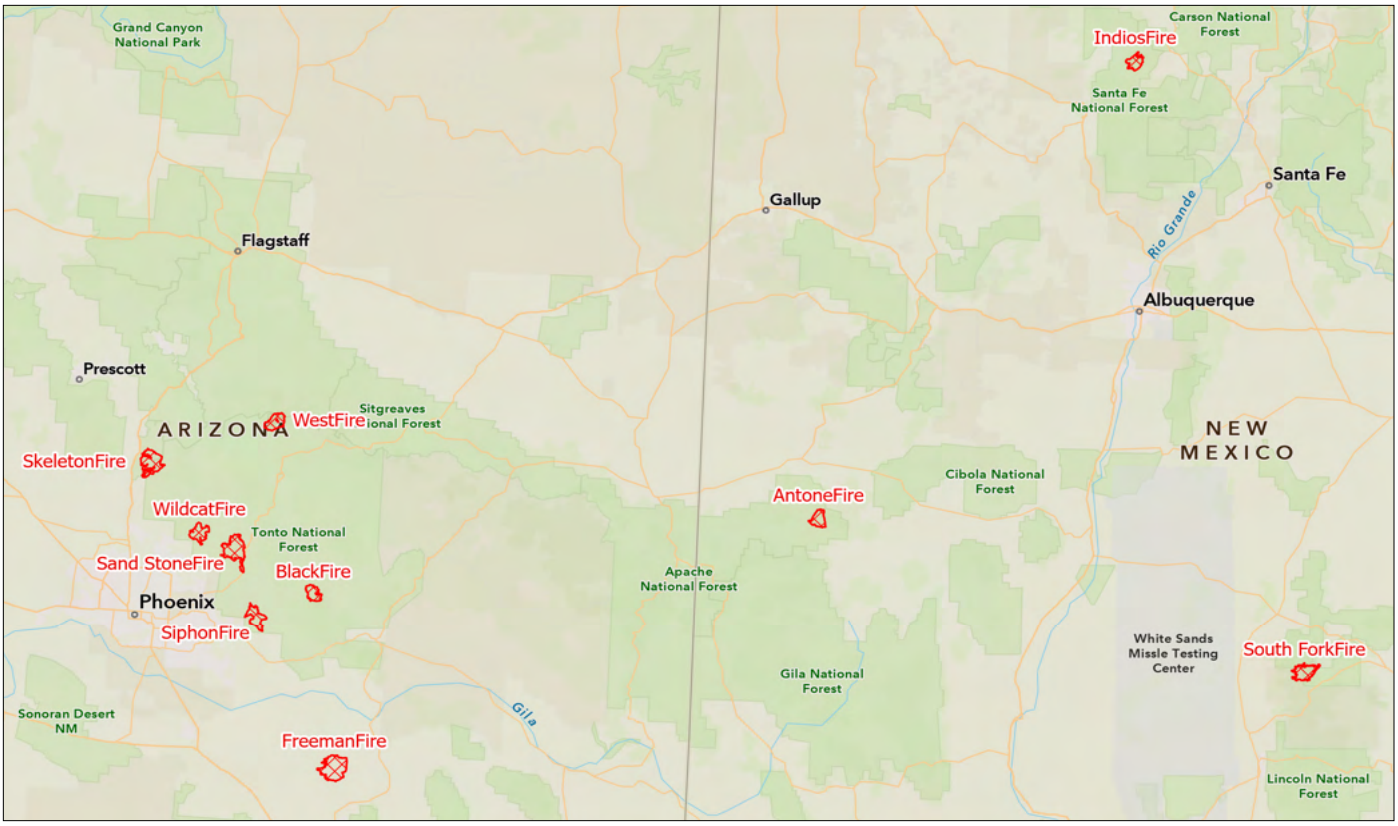

Figure 2. Map indicating the location of the 10 large fires from the 2024 fire season that were analyzed in this report.

years. Arizona recorded its 17th driest monsoon season on record, with rainfall below normal in most areas except for localized increases near Flagstaff and the northeast. Phoenix recorded its hottest year on record in 2024, with 70 days over 110˚F and an extended dry spell that came close to surpassing historical records. Unsurprisingly, five of the 10 fires listed in this report occurred within a roughly 50-mile radius of the Phoenix metropolitan area. New Mexico also faced prolonged dry periods interspersed with extreme weather events, including destructive flash flooding over burn scars and record-breaking snowfall in November. The 2024 monsoon season brought sporadic relief but remained below average in terms of precipitation. Limited monsoon moisture meant that much of the Southwest received less rainfall than the 30-year average (1991–2020). This contributed to the persistence or re-emergence of drought conditions in parts of the region. The overall trend of warming temperatures and variable precipitation continued to shape the fire and drought landscape in the Southwest.

The Energy Release Component (ERC) is an index that estimates the available energy a wildfire can release at the flaming front. ERC tracks seasonal fire danger based on the amounts and moisture of live and dead fuels. In 2024, ERCs exceeded the historical average in January, June, and October; while ERCs were at historical lows at the beginning of April and July (Figure 3).[6]

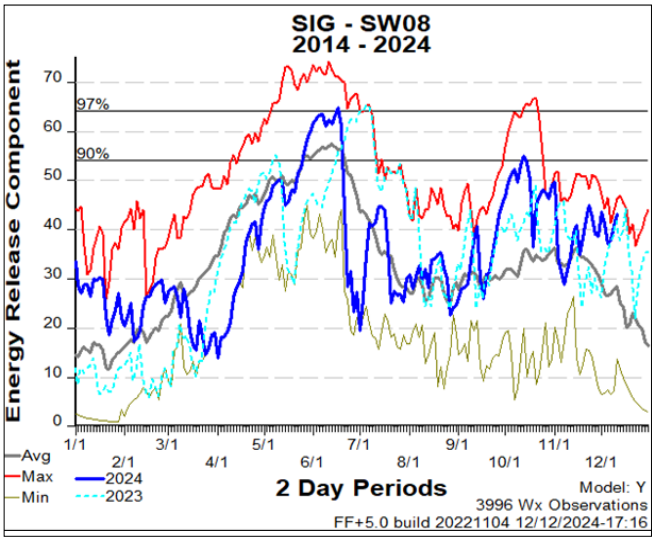

Figure 3. Energy release component (ERC) index for 2024 for western New Mexico (PSA SW-08).

[6] http://gacc.nifc.gov/swcc//predictive/fuels_fire-danger/nfdrs_charts/Areawide.htm

Data Sources

Management, Objectives, and Cost

The InciWeb website (inciweb.nwcg.gov) provides background information such as location and start date on most large fires. InciWeb is an interagency information management system designed to provide the public with a single source of incident-related information. Because InciWeb only sporadically reports costs, Incident Status Summary (ICS-209) reports were collected to document suppression or management costs for this report. These costs do not reflect any post-fire costs such as road rehabilitation and soil stabilization. The cost data from each fire over 10,000 acres is collected in a final table at the end of the document (Appendix I). ICS-209s also provide "strategic objectives," which briefly describe the desired outcome for the incident, high-level objectives, and in some cases, strategic benefits. Strategic objectives often change during a fire, and a review of the most common or persistent strategic objectives for each fire provides insight into the overarching management goals.

Perimeters

Each fire boundary was taken from the National Interagency Fire Center Open Data Site archive of fire perimeter maps (https://data-nifc.opendata.arcgis.com/). The NIFC Open Data Site also provides perimeters of past wildfires, which give historical context for the 2023 fires.

Vegetation

Basic information about the vegetation fire perimeters is available from LANDFIRE (www.landfire.gov). LANDFIRE provides nationally consistent, scientifically based maps of existing vegetation as well as Vegetation Condition Class (VCC). VCC shows how existing vegetation has departed from its estimated natural or historical condition. In the Southwest, this departure is generally due to fire exclusion and past logging and grazing, and it results in greater tree density and less healthy forest conditions that are more vulnerable to severe fires during dry conditions. VCC is a useful metric because it integrates information on existing vegetation, historical vegetation, and fire regimes into one variable and can be used to help determine where to focus restoration efforts. The most current VCC maps (2016) were used in this report.

Soil Burn Severity

Soil burn severity maps provide Burned Area Emergency Response (BAER) teams a tool to quantify soil impacts and assess potential for post-fire erosion (https://burnseverity.cr.usgs.gov). In the immediate aftermath of fire on federal lands, BAER teams perform an emergency assessment of post-fire soil conditions based on a combination of field observations and remote sensing change detection. Remote sensing for soil burn severity employs the Normalized Burn Ratio (dNBR), the change in the ratio of near infrared reflected by healthy green vegetation to the shortwave infrared reflected by bare soil and rock. Most soil burn severity maps have four classes: high, moderate, low, and unburned; however, some maps combine the last two categories to low/unchanged. The distribution of soil burn severity is included in this report for the individual fire discussions (where available) as well as in the final summary table.

Rapid Assessment of Vegetation Condition after Wildfire

Rapid Assessment of Vegetation Condition after Wildfire (RAVG) maps estimate canopy mortality (https://burnseverity.cr.usgs.gov/ravg/) and is another estimate of the effect of the fire on the vegetation. The USDA Forest Service Remote Sensing Applications Center provides RAVG analysis as a first approximation of areas that may require reforestation treatments because of the amount of canopy killed by high-severity fire. RAVG maps are created for wildfires that burn greater than 1,000 acres of wooded Forest Service land or other fires by request. The maps are produced by measuring the change between a satellite image before and immediately after a wildfire using the relative differenced Normalized Burn Ratio (RdNBR), which is sensitive to vegetation mortality resulting from the wildfire event. The RdNBR is derived directly from the dNBR that is used in Soil Burn Severity but is more sensitive to vegetation mortality than the dNBR.

While soil burn severity maps and RAVG canopy mortality maps use similar satellite change detection methods, they measure fundamentally different forest attributes. In many areas, canopy mortality and soil burn severity patterns are similar. However, in some vegetation types, such as chaparral or grass, it is possible for a fire to cause complete canopy mortality with little effect on the soils.

Caveats

There are important caveats for the data used in this summary. First, the fire information presented here was taken from official sources between November 2024 and February 2025 and may not include updates or revisions. Second, the geospatial data used to generate maps and tables are also based on the best available information; however, these data contain errors and uncertainties. For example, the remote sensing data used in all these datasets can include errors introduced during collection, processing, and interpretation. As noted for specific fires in this report, soil burn severity and RAVG maps are not available for every wildfire.

Individual Fire Summaries

This section describes the impacts of the 10 wildfires over 10,000 acres in Arizona (seven fires) and New Mexico (three fires) in 2024. This section covers when each fire burned, fire management costs, vegetation types, previous burn footprints, and burn severity, when available. The fires are ordered based on their ignition date and represent half of the acres burned by wildfire in the Southwest during 2024.

Wildcat Fire, Arizona

- Cause: Human
- Location: Maricopa County, AZ
- Incident start: May 18, 2024
- Incident close: June 4, 2024
- Acreage: 14,402
- Cost: $4.2 million

The Wildcat Fire ignited May 18 near Vista Verde, west of Bartlett Lake in Maricopa County, Arizona. The fire rapidly spread through dry grasslands and desert scrub, fueled by high temperatures, gusty winds, and rugged terrain. Early fire behavior included wind-driven runs, spotting, and active nighttime burning. Given the fire's rapid growth and threat to infrastructure, a full suppression strategy was implemented, with crews working to protect the Bartlett Lake Marina, nearby ranches, and critical power transmission lines.

Throughout the month, the fire expanded to reach its peak of 14,402 acres May 20, with containment gradually increasing thereafter. Firefighters faced significant challenges from erratic winds, steep terrain, and continuous heavy grass fuel loading. While increased humidity temporarily slowed fire behavior, flare-ups continued in pockets of dry vegetation. Road closures were enforced around Bartlett Dam Road and Horseshoe Dam Road to ensure public safety. Smoke concerns prompted advisories for nearby communities, and area closures were put in place to limit recreational activity. Crews focused on constructing containment lines, protecting critical infrastructure, and conducting mop-up operations to prevent rekindling. By June 4, the Wildcat Fire had reached full containment, with suppression costs estimated at $4.2 million, or approximately $292 per acre. The fire's impact included temporary disruptions to local businesses and recreational areas, though no structures were reported as destroyed.

Vegetation and Past Fires

The primary vegetation types included scrub (80 percent) and grassland (15 percent). Approximately 10 percent of the area within the Wildcat Fire, all in the northern tip, had burned in the 2020 Sears Fire. According to the LANDFIRE Vegetation Condition Class analysis, 94 percent of the area within the Wildcat Fire perimeter was classified as having moderate to very low departure from historical vegetation conditions.

Fire Severity

Soil burn severity analysis indicated a relatively low intensity fire, with 72 percent of the burn area categorized as low severity or unburned/undetected (61 percent and 11 percent, respectively). A quarter of the burn area experienced moderate fire intensity, with these pockets scattered evenly across the northern half of the burn area. Due to the vegetation type, canopy mortality data are not available.

A C130 airtanker drops retardant on the edge of the Wildcat Fire May 18, 2024. Credit/Inciweb

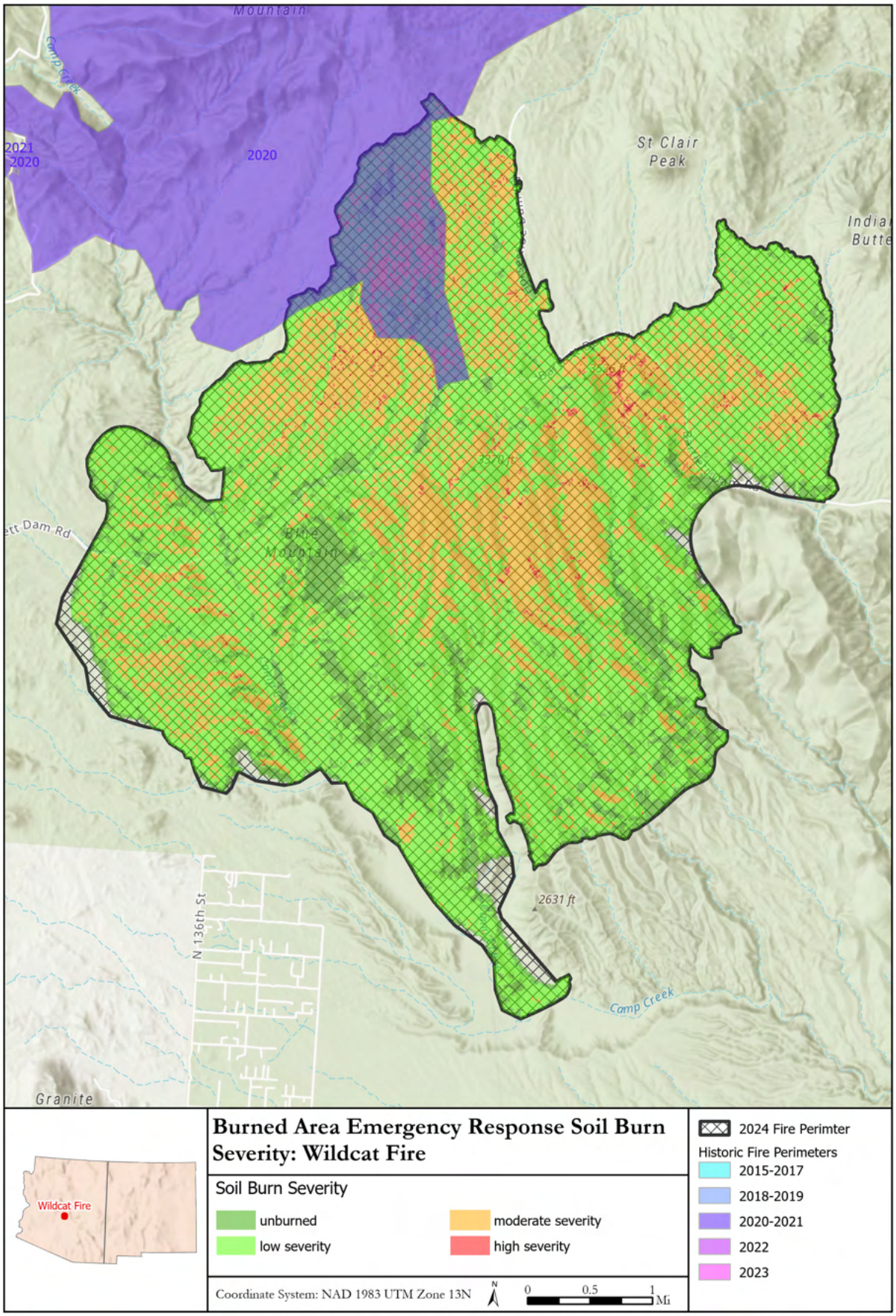

Figure 4. Soil burn severity in the Wildcat Fire.

Indios Fire, New Mexico

- Cause: Lightning/natural
- Location: Rio Arriba County, NM
- Incident start: May 19, 2024
- Incident close: August 2, 2024
- Acreage: 11,500
- Cost: $15,188,000

Following a lightning strike, the Indios Fire began May 19 approximately seven miles north of the village of Coyote in Rio Arriba County, New Mexico. The fire burned through timber litter and understory vegetation in steep, rugged terrain within the Rio Chama Wilderness. Initial fire behavior included flanking, backing, and smoldering, with occasional uphill runs when wind and topography aligned. Given the inaccessible location, fire managers implemented a strategy combining confinement and monitoring, using natural barriers and constructed fire lines along nearby roads to limit spread.

An excavator is used to rehabilitate firelines and roads following the Indios Fire. Credit/ Marija Osipchuk/BLM

Throughout late May and early June, the fire grew steadily, expanding to over 4,700 acres by late June. Fire crews faced challenges from steep terrain and high afternoon winds, which contributed to spotting and wind-driven runs. Hand crews and mechanical equipment were deployed along containment lines outside the wilderness area, while natural fire progression was monitored within the interior. Temporary area closures, including a section of the Continental Divide Trail, were enacted to ensure public safety. Weather fluctuations, including low humidity and gusty conditions, continued to influence fire behavior, with additional firefighting resources mobilized to support suppression efforts.

By July, the Indios Fire had reached its peak of 11,500 acres, with containment efforts still ongoing. Fire managers focused on minimizing adverse fire effects by employing low- to moderate-intensity firing operations to direct the fire's movement within designated perimeters. The total cost was estimated at $15,188,000, or approximately $1,321 per acre. Despite the fire's significant size, no structures were lost, and no evacuations were necessary. The incident underscored the challenges of wildfire management in remote wilderness areas.

Vegetation and Past Fires

The primary vegetation types included ponderosa pine (69 percent) and mixed conifer (21 percent). None of the area affected by the Indios Fire had burned in the past 10 years. According to the LANDFIRE Vegetation Condition Class analysis, 80 percent of the area within the Indios Fire perimeter was classified as moderate to high departure from historical vegetation conditions, covering nearly the entire unit except for the area surrounding Ojitos Canyon. .

Fire Severity

Canopy mortality varied across the fire; 46 percent of the area had mortality under 25 percent, while 1,528 acres (13 percent) had near complete mortality. Higher mortality was primarily locatedon the western arm of the unit and the interior, extending as far south as Mesa Corral. Soil burn severity analysis indicated lower temperatures at the ground level with three-quarters of the unit experiencing low severity or unburned/ undetected (57 percent and 19 percent, respectively). Only 728 acres (6 percent) exhibited high soil burn severity, and these locations aligned with areas of highest mortality.

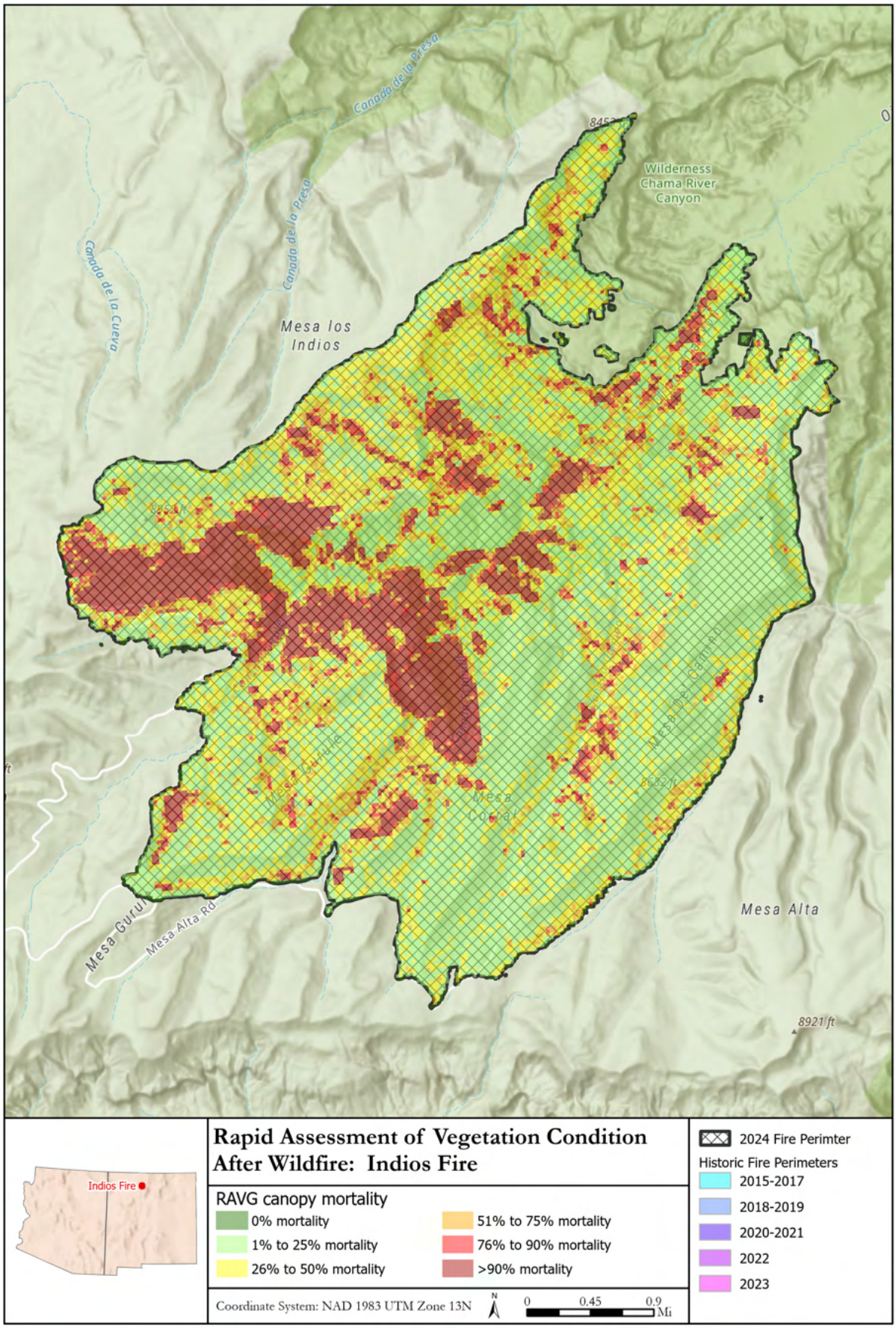

Figure 5. Rapid assessment of vegetation condition after the Indios Fire.

Antone Fire, New Mexico

- Cause: Lightning/natural
- Location: Catron County, NM
- Incident start: June 7, 2024
- Incident close: June 24, 2024
- Acreage: 12,395
- Cost: $1.8 million

A lightning strike ignited the Antone Fire June 7, in Catron County, NM, within the Gila National Forest. The fire spread through dry ponderosa pine, mixed conifer, and short grass, fueled by hot temperatures and low humidity. Early fire behavior included creeping, flanking, and isolated torching, making containment efforts difficult. Given the challenging terrain and fire conditions, a mixed suppression strategy was implemented, combining monitoring, confinement, and full suppression techniques to limit the fire's impact on infrastructure and natural resources.

Throughout mid-June, the fire expanded significantly, growing to over 11,000 acres. Firefighters conducted strategic firing operations to limit the fire spread while working to secure perimeters and protect critical areas, including the Continental Divide Trail and range infrastructure. The fire exhibited moderate to active behavior, with backing and group torching observed. Weather conditions, including excessive heat warnings and red flag warnings, contributed to the fire's persistence. Road and trail closures were enacted to ensure public safety, and mitigation measures were taken to protect a remote private inholding.

By June 24, firefighters had reached 97 percent containment, with full containment predicted within a week. The final size of the Antone Fire was 12,395 acres at a cost of $1.8 million, or approximately $145 per acre.

Vegetation and Past Fires

The primary vegetation types included ponderosa pine (87 percent) and pinon-juniper (6 percent). None of the area affected by the Antone Fire had burned in the past 10 years. According to the LANDFIRE Vegetation Condition Class analysis, nearly half of the area affected was classified as high departure from historical vegetation conditions, primarily in the area north of San Antone Canyon.

Fire Severity

Canopy mortality was generally low, with 63 percent of the area at 25 percent or lower mortality with a few isolated pockets of higher mortality in the interior which only accounted for 3 percent of the total. Soil burn severity analysis shows a generally low intensity fire, with 97 percent of the area as low severity or unburned/undetected (69 percent and 28 percent, respectively). None of the Antone Fire was identified as high severity and the 277 acres of moderate severity was predominantly in the north along Chimenea Canyon.

The Antone Fire burns in Gila National Forest. Credit/Inciweb

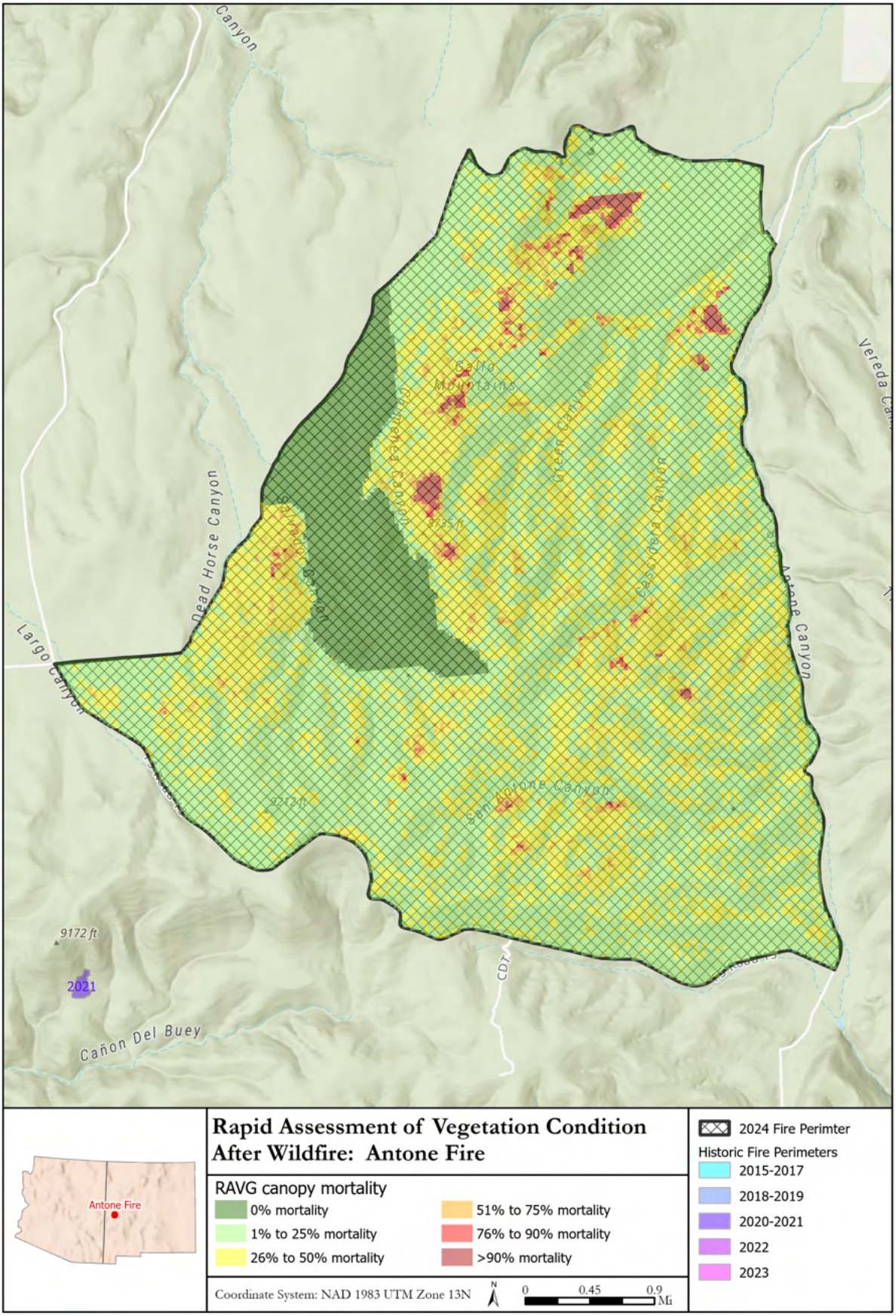

Figure 6. Rapid assessment of vegetation condition after the Antone Fire.

South Fork Fire, New Mexico

- Cause: Lightning/natural
- Location: Lincoln County, NM
- Incident start: June 17, 2024
- Incident close: September 13, 2024
- Acreage: 17,569
- Cost: $23,424,000

The South Fork wildfire in New Mexico began June 17 near the Ruidoso area in Otero County. Initially ruled human-caused, it was later deemed to be the result of a lightning strike. Fueled by dry conditions and a mix of timber, grass, and brush, the fire quickly spread across rugged terrain, reaching 17,551 acres by late June. Fire behavior was intense, with active crowning, group torching, and long-range spotting reported. A full suppression strategy was implemented to protect nearby communities and infrastructure. The fire forced the evacuation of approximately 8,000 residents, with significant impacts on local utilities and transportation corridors. Tragically, the South Fork Fire was responsible for two deaths in the community.

Later that day the Salt Fire also ignited on the Mescalero Apache Nation south of the South Fork Fire. The Bureau of Indian Affairs responded with a full suppression strategy. Firefighters were able to limit the Salt Fire to 7,939 acres in ponderosa pine and mixed conifer forests. Earlier, on May 16, the Blue 2 Fire was ignited by lightning north of the South Fork Fire. The Blue 2 Fire covered 7,532 acres within the footprint of the 2012 Little Bear Fire. Though not directly connected to the South Fork Fires, these two fires were important to the management context.

The South Fork Fire's behavior was driven by a combination of terrain and weather, with uphill runs and short-range spotting contributing to its rapid spread.

Firefighters move sandbags following the South Fork Fire. Credit/USDA Forest Service

Dead and downed fuels from the 2012 Little Bear Fire acted as receptive material for embers, accelerating fire movement through timber understory and brush. Firefighters focused on point protection strategies to defend critical infrastructure, including power lines and key water resources, while also working to establish anchor points for containment lines. Challenging weather conditions, including low humidity and strong winds, hampered early suppression efforts. However, by late July, increased humidity and scattered rain showers began to moderate fire behavior, reducing flame activity to smoldering and creeping in heavy duff and downed logs.

The final cost estimate was $23,424,000 million, or approximately $1,333 per acre. Over 950 residences were destroyed. Despite improved weather conditions, crews remained vigilant due to concerns over flooding and debris flows in the fire-scarred landscape. Emergency road closures and a temporary flight restriction remained in place through September to ensure public safety and to support ongoing recovery operations. On July 9, heavy monsoon rains dumped several inches of rain in just a few hours. The heavy rain on recently burned slopes caused a flash flood emergency and the evacuation of homes in Cedar Creek, Upper Canyon, Brady Canyon, Paradise Canyon, and along the Rio Ruidoso.

Vegetation and Past Fires

The primary vegetation types included ponderosa pine (45 percent), pinon-juniper (22 percent), and conifer oak (12 percent). Virtually none of the area affected by the South Fork Fire had burned in the past 10 years except for a small fire near Alpine Cellars Village in 2023, though the 2022 McBride Fire burned areas to the east and west. According to the LANDFIRE Vegetation Condition Class analysis, approximately a quarter of the area within the South Fork Fire perimeter was classified as high departure from historical vegetation conditions.

Fire Severity

Canopy mortality varied widely across the fire with 6,004 acres (34 percent) at near complete canopy mortality and only 363 acres (2 percent) escaping with zero percent mortality. The lower mortality areas were along the north and east perimeters with higher mortality in the interior of the unit. The soil burn severity analysis indicated a moderate to high intensity fire. Two-thirds of the burn area was moderate to high severity with only 10 percent of the burn area unburned/undetected. Twenty percent of the South Fork Fire was identified as high severity and those 3,315 acres were largely on the south side of the burn area, south of Cow Mountain.

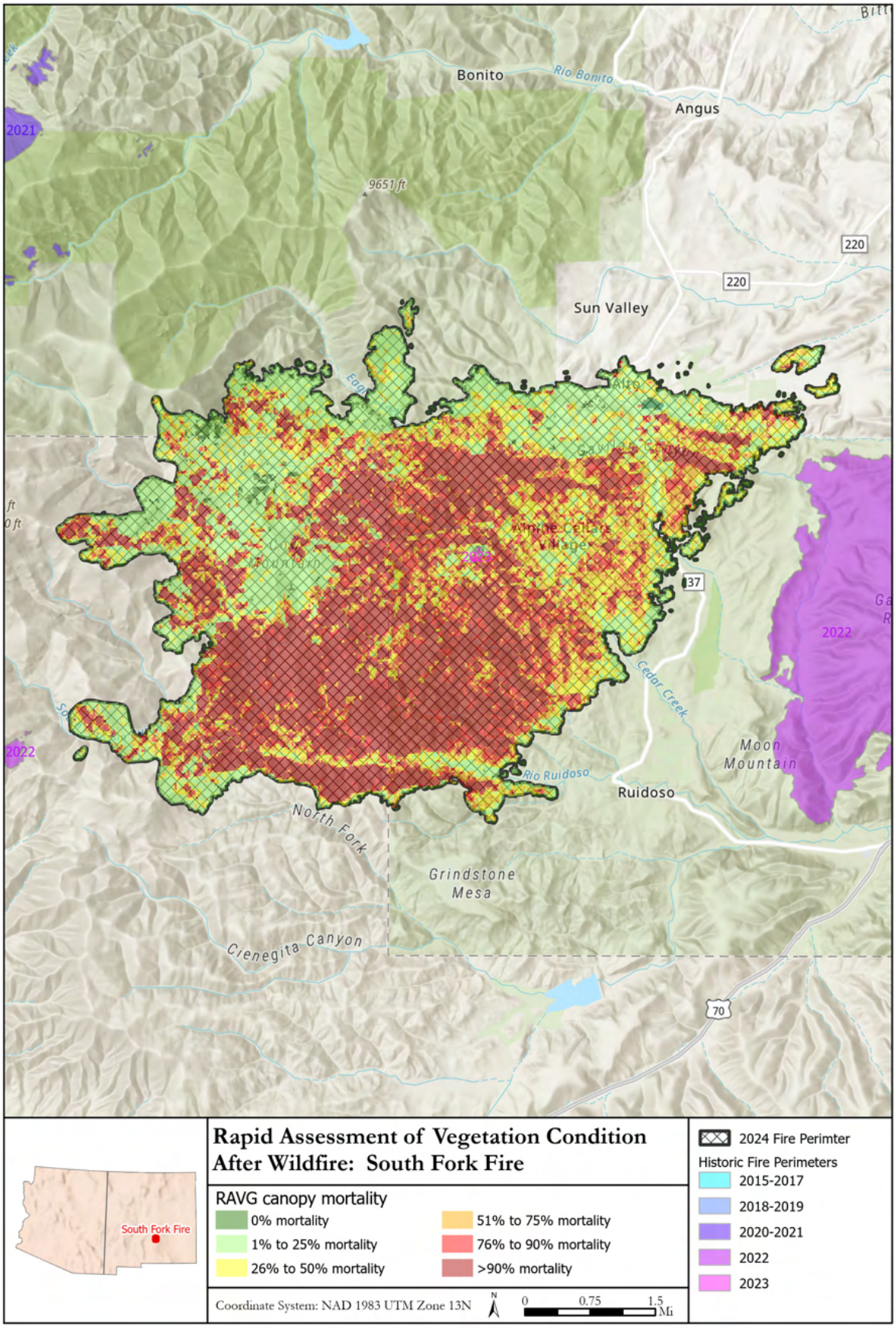

Figure 7. Rapid assessment of vegetation condition after the South Fork Fire.

Freeman Fire, Arizona

- Cause: Lightning/natural
- Location: Pinal County, AZ
- Incident start: July 11, 2024
- Incident close: July 18, 2024
- Acreage: 32,568
- Cost: $1.3 million

The Freeman Fire was a lightning-caused wildfire that started approximately 14 miles northwest of Oracle, Arizona. The fire was initially reported on July 11 and consumed 32,568 acres before being fully contained a week later, on July 18. This was the largest fire in Arizona and New Mexico during the 2024 season but was dramatically smaller than the largest fires of the previous few years.

The Freeman Fire burned through a landscape dominated by short grass, tall grass, and brush, creating conditions for rapid fire spread. According to the ICS-209 reports, fire managers implemented a full suppression strategy to combat the blaze, which was driven by erratic winds and dry fuels. The fire exhibited a range of behaviors, including active running, torching, and short-range spotting, particularly in the early days of the incident. As suppression efforts progressed, fire activity transitioned to moderate behavior with isolated torching and backing fire, eventually reduced to creeping and smoldering. The rugged terrain and remote location posed additional challenges, with aerial resources playing a key role in containment efforts. Wildfire management costs for the Freeman Fire were estimated at $1.3 million, or about $40 per acre.

Vegetation and Past Fires

The primary vegetation types included scrub (65 percent), conifer-oak (11 percent), pinon-juniper (9 percent), chaparral (8 percent), and grassland (7 percent). Most of the area affected by the Freeman Fire had not burned in the past 10 years, save for two very small pockets that burned in 2021. Seventy percent of the area within the Freeman Fire perimeter was classified as high departure from historical vegetation conditions according to the LANDFIRE Vegetation Condition Class analysis.

Fire Severity

No fire severity data were available for the Freeman Fire.

The Freeman Fire burns north of Oracle, Arizona. Credit/AZ Department of Forestry and Fire Management

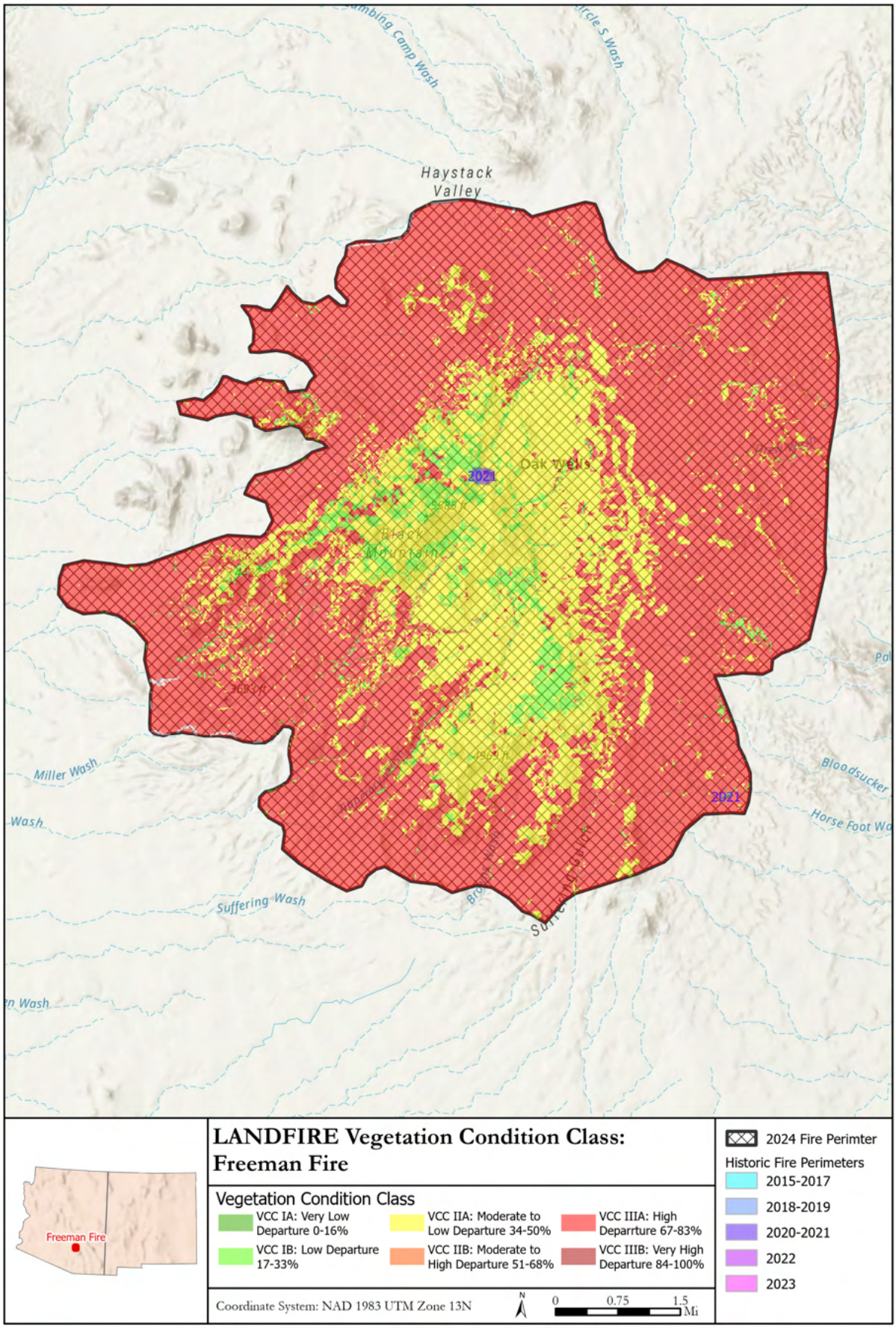

Figure 8. Rapid assessment of vegetation condition after the Freeman Fire.

Black Fire, Arizona

- Cause: Lightning/natural
- Location: Maricopa County, AZ
- Incident start: July 11, 2024
- Incident close: September 4, 2024
- Acreage: 11,162
- Cost: $6,910,000

The Black Fire ignited July 11, due to a lightning strike south of Lake Roosevelt, on the edge of the Superstition Wilderness, Arizona. The fire quickly spread through tall grass, chaparral, and brush, driven by high temperatures and dry conditions. Early fire behavior included moderate backing, creeping, and wind-driven runs with short-range spotting. Given the threat to critical infrastructure and private property, a full suppression strategy was implemented. Resources were deployed to protect structures and to limit fire spread toward Highway 188, Tonto National Monument, and Roosevelt Estates.

Throughout July and August, the fire grew significantly, reaching over 11,000 acres. Firefighters faced challenges from steep terrain, erratic winds, and prolonged dry conditions. Nighttime diurnal winds contributed to increased fire activity, while monsoonal precipitation remained inconsistent. Road and trail closures were implemented and evacuations were issued for communities near Roosevelt Lake, including Black Brush Ranch and Spring Creek RV Park. Crews conducted both direct and indirect suppression tactics, using water drops, controlled burns, and strategic fire lines to limit spread. Despite the aggressive firefighting efforts, the fire continued creeping and flanking in some areas.

By September 4, the fire reached 100 percent containment, with afinal size of 11,162 acres. The estimated cost of $6,910,000, or about $619 per acre, reflects the extensive aerial and ground resources employed.

Vegetation and Past Fires

The primary vegetation types included chaparral (43 percent), scrub (34 percent), and pinon-juniper (15 percent). None of the area affected by the Black Fire had burned in the past 10 years. According to the LANDFIRE Vegetation Condition Class analysis, only 2 percent of the area within the Black Fire perimeter was classified as high departure from historical vegetation conditions, while 79 percent was classified as moderate to low departure.

Fire Severity

Canopy mortality was 50 percent or lower across most of the fire (86 percent of the fire footprint). Small pockets of greater than 50 percent mortality could be found across 1,541 acres primarily on the north slope of Pinyon Mountain with only 1 percent of the burn area experiencing complete mortality. No soil burn severity data were available for the Black Fire.

A helicopter drafts water from the lake to deliver to the Black Fire. Credit/Inciweb

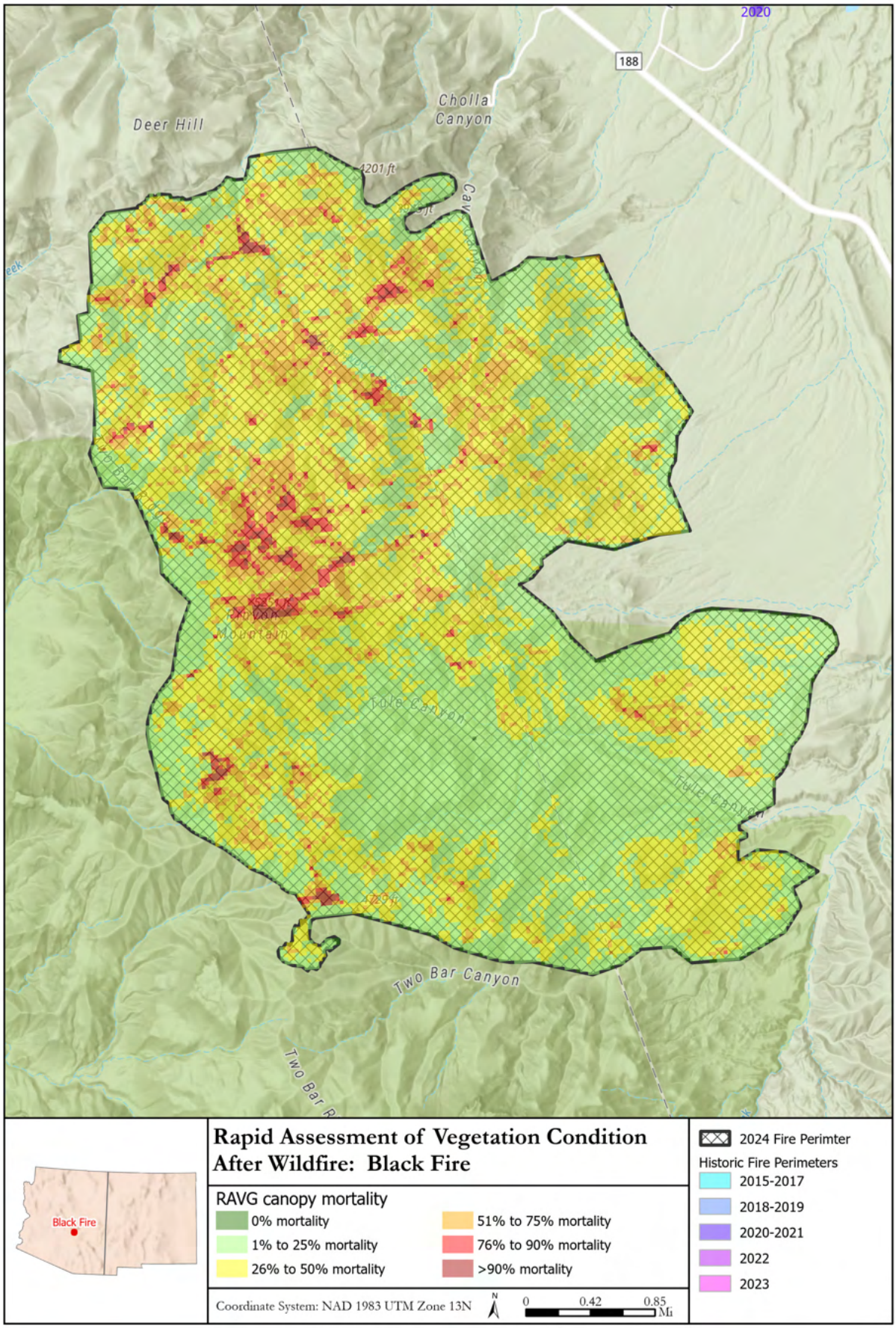

Figure 9. Rapid assessment of vegetation condition after the Black Fire.

Sand Stone Fire, Arizona

- Cause: Lightning/natural
- Location: Maricopa County, AZ
- Incident start: July 25, 2024
- Incident close: August 23, 2024
- Acreage: 27,390
- Cost: $9,292,000

The Sand Stone wildfire in Arizona, ignited by lightning July 25, quickly grew due to high temperatures, dry conditions, and strong afternoon winds. Located 14 miles northeast of Fountain Hills in Maricopa County, the fire burned through tall grass and brush, spreading rapidly across rugged terrain. By July 29, the fire had expanded to 24,133 acres with 20 percent containment. Firefighters faced significant challenges due to extreme temperatures exceeding 110°F, dry fuels, and limited access to remote areas, prompting a full suppression strategy to protect nearby communities, infrastructure, and natural resources.

The fire exhibited erratic and rapid growth, including uphill runs, flanking, and backing, with rapid rates of spread and flame lengths that made direct attacks unsafe. Afternoon winds intensified fire activity, driving the flames toward critical infrastructure such as high voltage power lines supplying Phoenix and surrounding areas. The Dos S Ranch, the community of Sunflower, and Highway 87 faced an immediate threat. Crews conducted backfiring operations to create buffer zones, but the fire still approached to within 100 yards of structures. Authorities planned evacuations for Sunflower, Rio Verde, Fort McDowell Reservation, and surrounding areas as the fire advanced.

By early August, the fire continued to expand, with a projected final size of 40,000 acres and a containment date estimated for August 20. Critical infrastructure, including Bartlett Lake's reservoir operations and essential power lines, remained at high risk. Aerial resources, including scooper planes, were deployed to protect key areas and reinforce containment lines. The economic impact of the fire escalated rapidly, with costs surpassing $9.2 million, or about $336 per acre.

Vegetation and Past Fires

The primary vegetation types included scrub (71 percent), pinon-juniper (16 percent), and chaparral (10 percent). Most of the area affected by the Sand Stone fire had not burned in the past 10 years, except the northeast and southeast tips of the fire perimeter, which burned in 2020 and 2023. According to the LANDFIRE Vegetation Condition Class analysis, 75 percent of the area within the Sand Stone Fire was classified as having a moderate to low departure from historical vegetation conditions.

Fire Severity

Canopy mortality varied across the fire but was primarily (73 percent) below 50 percent mortality. Scattered pockets of near complete canopy mortality were found throughout the burn area but only accounted for 418 acres (2 percent) of the fire. No data were available regarding soil burn severity for the Sand Stone Fire.

An engine at the Sand Stone Fire with the Four Peaks in the background. Credit/Inciweb

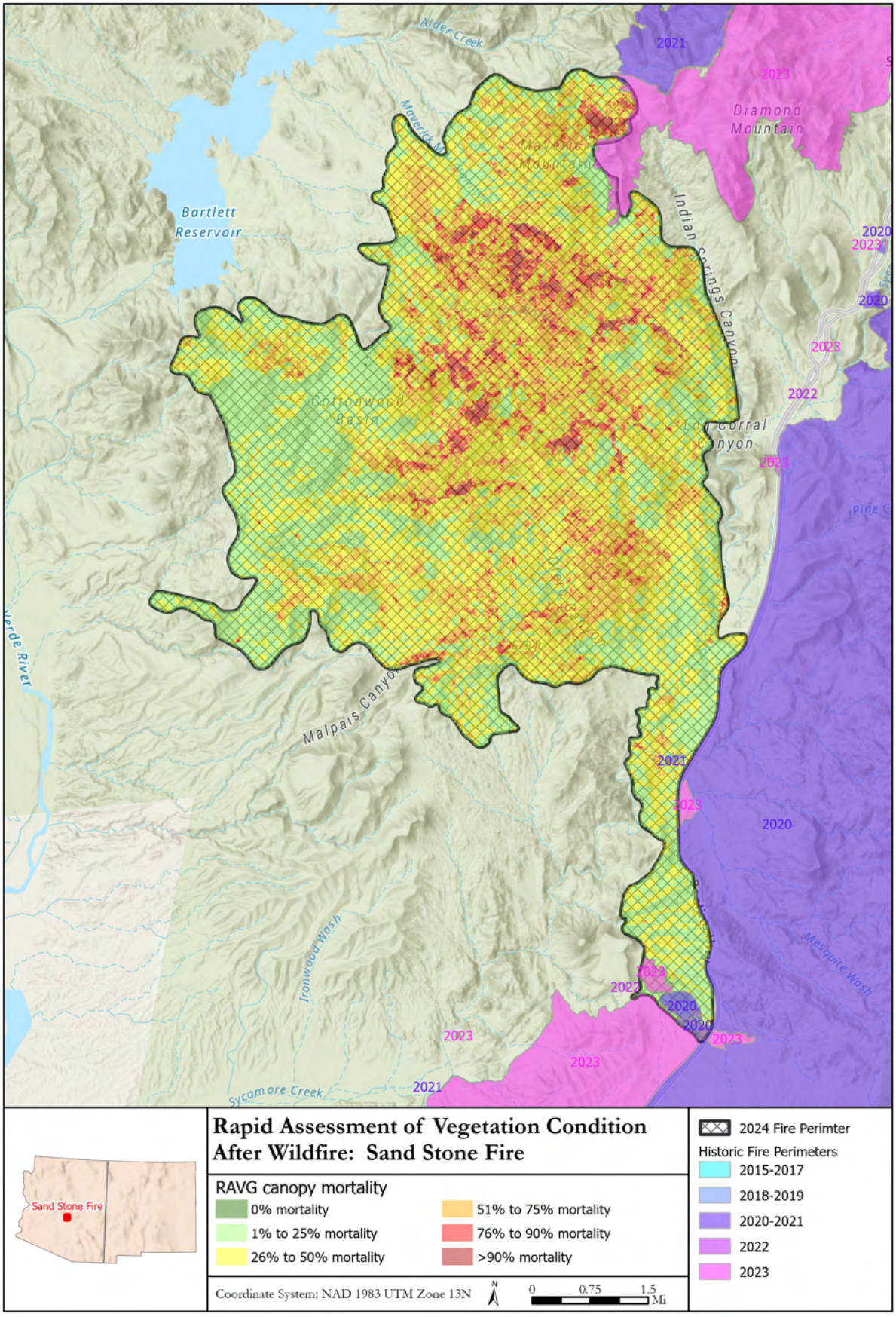

Figure 10. Rapid assessment of vegetation condition after the Sand Stone Fire.

Skeleton Fire, Arizona

- Cause: Lightning/natural
- Location: Yavapai County, AZ
- Incident start: August 3, 2024
- Incident close: September 1, 2024
- Acreage: 24,034
- Cost: $1.5 million

The Skeleton wildfire ignited August 3, due to a lightning strike, in the Agua Fria National Monument, Yavapai County, Arizona. The fire rapidly grew, fueled by tall grass and brush. Firefighters faced challenging conditions due to sporadic afternoon thunderstorms causing strong outflow winds and high temperatures. A full suppression strategy was implemented from the start to protect critical infrastructure and cultural resources within the monument. Despite these efforts, the fire exhibited intense behavior, including active runs, flanking, and backing, making containment efforts complex and resource-intensive.

The fire posed significant threats to high-tension powerlines supplying Phoenix, irreplaceable cultural artifacts within Agua Fria National Monument, and the Copper Basin Administrative Site. Strategic objectives prioritized keeping the fire south of Bloody Basin and north of Black Canyon City, where the fire's advancement risked transitioning into the urban interface. Crews focused on preventing the fire from reaching the 599 Road, which, if crossed, would endanger Black Canyon City. By August 9, containment had reached 30 percent, and efforts continued to strengthen fire lines, though difficult terrain and dry fuels persisted as major challenges.

By August 10, the fire's activity had reduced to minimal levels, though sporadic thunderstorms remained a concern. Containment reached 100 percent on September 1, with estimated suppression costs reaching $1.5 million across 24,034 acres, or about $62 per acre. The fire's impact on structures remained low, with one non-residential commercial property threatened but no reported damages or evacuations.

Vegetation and Past Fires

The primary vegetation types included scrub (45 percent), grassland (36 percent), and chaparral (16 percent). Most of the area affected by the Skeleton Fire had not burned in the past 10 years, except approximately 1,500 acres in the western portion of the fire perimeter that burned in the 2020 Bush Fire. According to the LANDFIRE Vegetation Condition Class, approximately 69 percent of the area within the Skeleton Fire perimeter was classified as having a moderate to very low departure from historical vegetation conditions.

Fire Severity

No data were available regarding fire severity for the Skeleton Fire.

The Skeleton Fire burns 11 miles northeast of Black Canyon City in Agua Fria National Monument. Credit/Inciweb

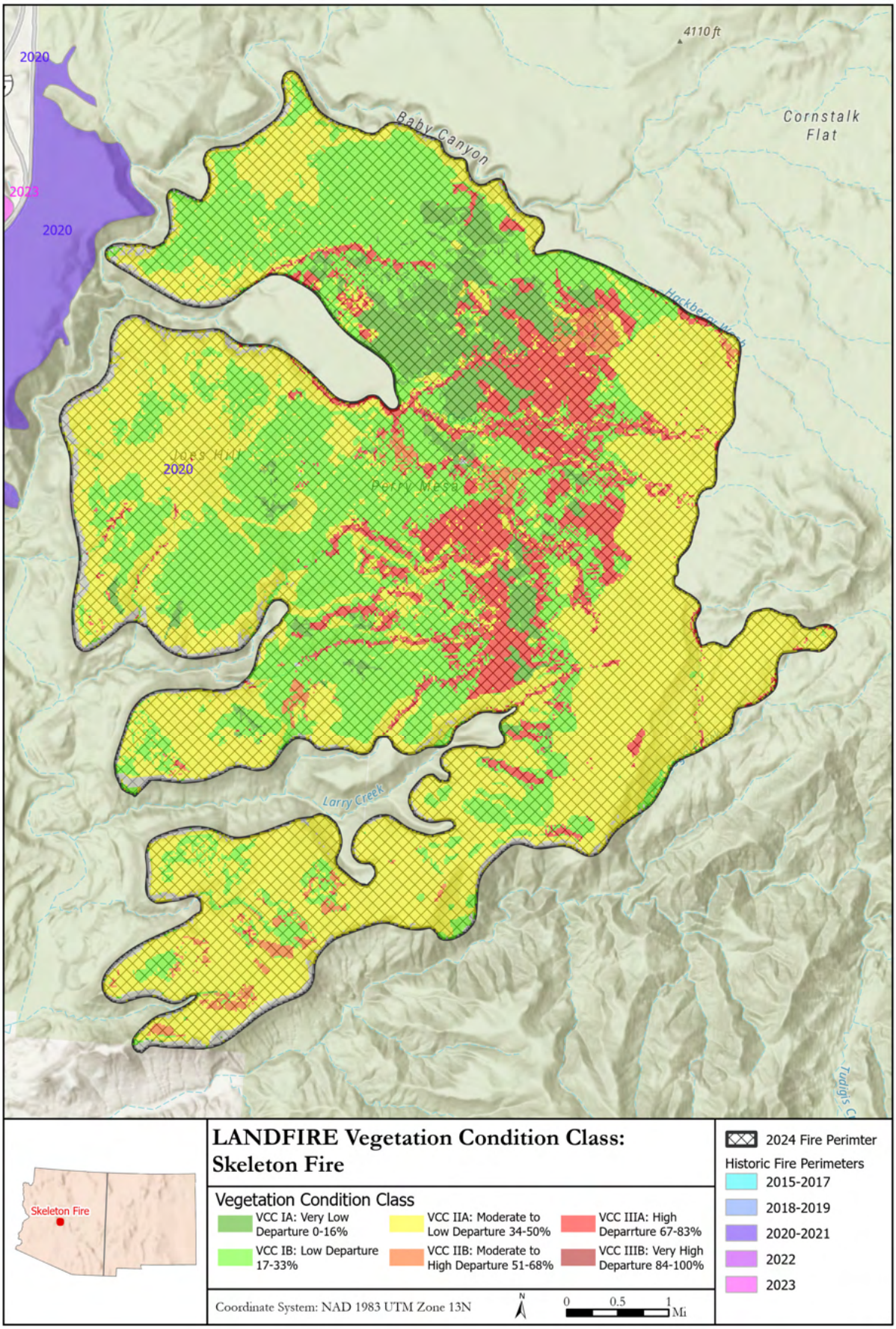

Figure 11. LANDFIRE vegetation condition class of the Skeleton Fire.

West Fire, Arizona

- Cause: Lightning/natural
- Location: Gila County, AZ
- Incident start: August 28, 2024
- Incident close: November 7, 2024
- Acreage: 15,074
- Cost: $20 million

The West wildfire in Arizona ignited August 28, due to a lightning strike approximately 13 miles northwest of Payson, in Gila County. The fire quickly spread across steep, rugged, and inaccessible terrain, burning primarily through ponderosa pine litter, interior chaparral, and mixed conifer pockets. Early fire behavior included active uphill runs, flanking, and isolated torching along the Mogollon Rim. Due to the challenging landscape and dry conditions, a "confine and contain" strategy was implemented.

Throughout early September, the fire grew slowly, reaching 138 acres by September 8, with no containment achieved. Firefighters faced continued challenges from rollout — where burning material rolled downhill, igniting new areas — alongside short upslope runs and sustained surface spread in timber litter on top of the Rim. Thunderstorms brought brief relief with increased humidity, slowing fire activity temporarily, but winds and drying fuels reignited active flanking and backing fire behavior. To protect nearby communities and infrastructure, crews began large-scale firing operations to guide the fire's movement into predetermined areas. Smoke impacts became a concern for communities near East Verde drainage, with health advisories issued for individuals with respiratory conditions. Fire crews continued constructing containment lines, improving road access, and preparing structure defenses for Camp Geronimo, Geronimo Estates, and the town of Pine.

By late September, the West wildfire had grown to 15,074 acres, with full containment reached on November 7. Costs were estimated at $20 million, or about $1,327 per acre, due to the extensive use of air resources and heavy equipment.

Vegetation and Past Fires

The primary vegetation types included ponderosa pine (45 percent) and conifer-oak (41 percent). None of the area affected by the West Fire had burned in the past 10 years. Nearly a third of the area within the West Fire perimeter was classified as high departure from historical vegetation conditions according to the LANDFIRE Vegetation Condition Class analysis, with most of that area along the Mogollon Rim in the southern part of the unit.

Fire Severity

Canopy mortality varied across the fire but was primarily (53 percent) under 25 percent mortality. Vegetation data analysis identified 1,780 acres (12 percent) of the fire as having near complete mortality, largely along the Mogollon Rim. Soil burn severity analysis showed a relatively low intensity fire. Over 80 percent of the burn area was low severity or unburned/undetected (40 percent and 41 percent, respectively).

Firefighters arrive at the West Fire. Credit/AZDFFM

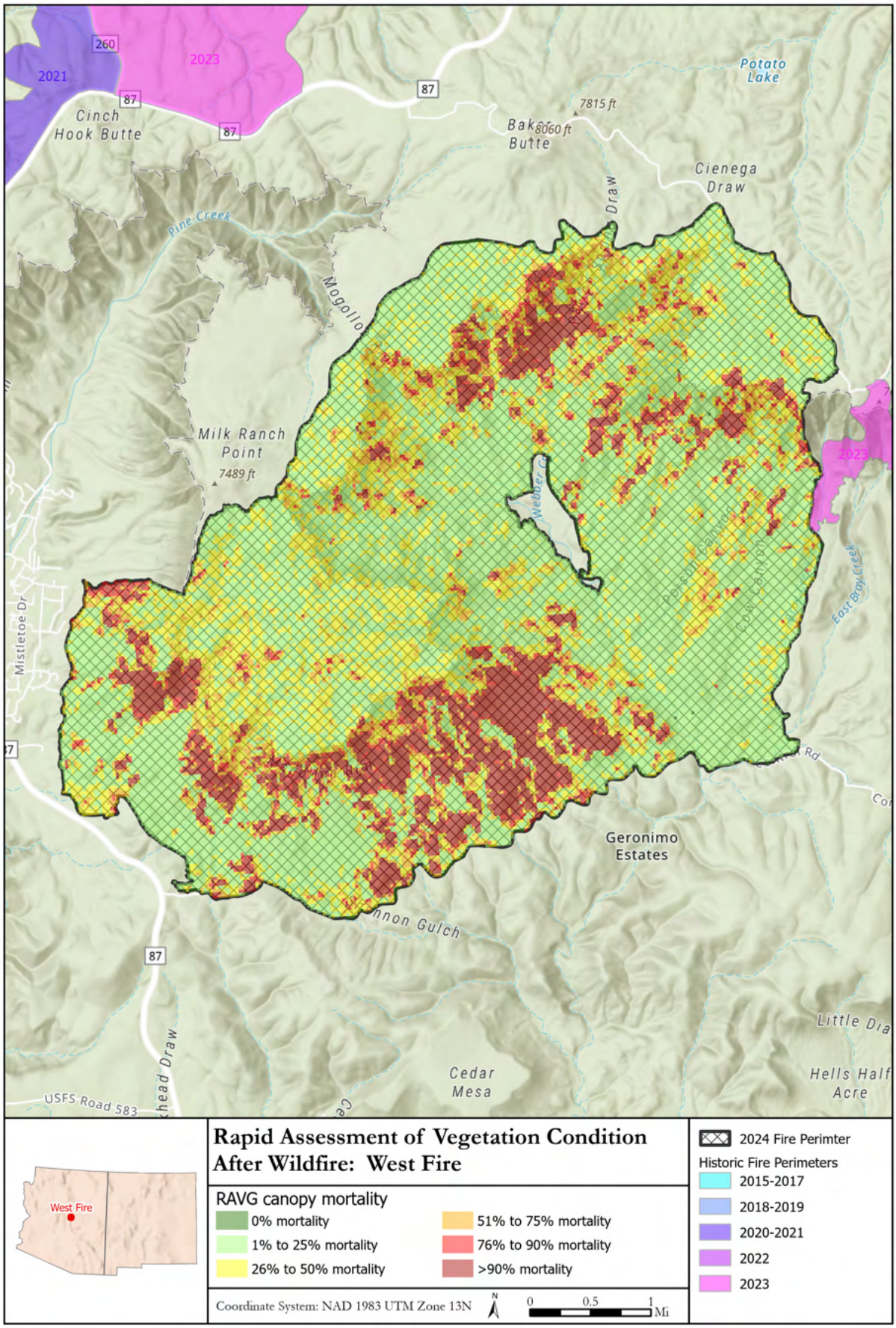

Figure 12. LANDFIRE vegetation condition class of the West Fire.

Siphon Fire, Arizona

- Cause: Human
- Location: Pinal County, AZ
- Incident start: September 10, 2024
- Incident close: September 27, 2024
- Acreage: 15,527
- Cost: $546,000

The Siphon Fire ignited from man-made causes September 10 within the Siphon Draw and Flat Iron areas of the Superstition Wilderness, Arizona. Initially fueled by dry brush, short grass, and chaparral, the fire rapidly expanded due to extreme weather conditions, including strong winds and low humidity. It quickly grew to over 15,000 acres, prompting a full suppression response. Fire behavior included wind-driven runs, flanking, and backing, challenging firefighting efforts. The blaze threatened major infrastructure, including power lines, Highway 88, and recreational sites such as Lost Dutchman State Park and Canyon Lake Marina.

As the fire intensified, evacuation plans were prepared for nearby communities, including Apache Junction and Gold Canyon, with five residents evacuated. Firefighters focused on burnout operations to create buffer zones, using air resources to slow the fire's progression in hard-to-reach areas. By mid-September, the fire had reached 15,527 acres, with containment rising to 32 percent. Weather forecasts brought hope, predicting cooler temperatures and potential rainfall, although gusty winds from incoming thunderstorms posed a risk of renewed fire growth and unpredictable spread patterns.

By late September, the fire's activity diminished to minimal smoldering, and crews shifted focus to suppression repair and reopening closed areas. Highway 88 was reopened, and evacuated residents were allowed to return home. The final incident size reached 15,527 acres, with an estimated cost of $546,000, or about $35 per acre.

Vegetation and Past Fires

The primary vegetation types included scrub (79 percent), chaparral (9 percent), and pinon-juniper (8 percent). About 50 percent of the area affected by the Siphon Fire was burned in the 2020 Superstition Fire. According to the LANDFIRE Vegetation Condition Class analysis, 92 percent of the area within the Siphon Fire perimeter was classified as moderate to very low departure from historical vegetation conditions.

Fire Severity

Soil burn severity analysis showed 68 percent of the burn area experienced low burn severity and the remaining 32 percent was unburned/undetected, indicating a very low intensity fire. Due to the vegetation type, canopy mortality data are not available.

The Siphon Fire burns in the Superstition Mountains. Credit/USDA Forest Service/Tonto NF

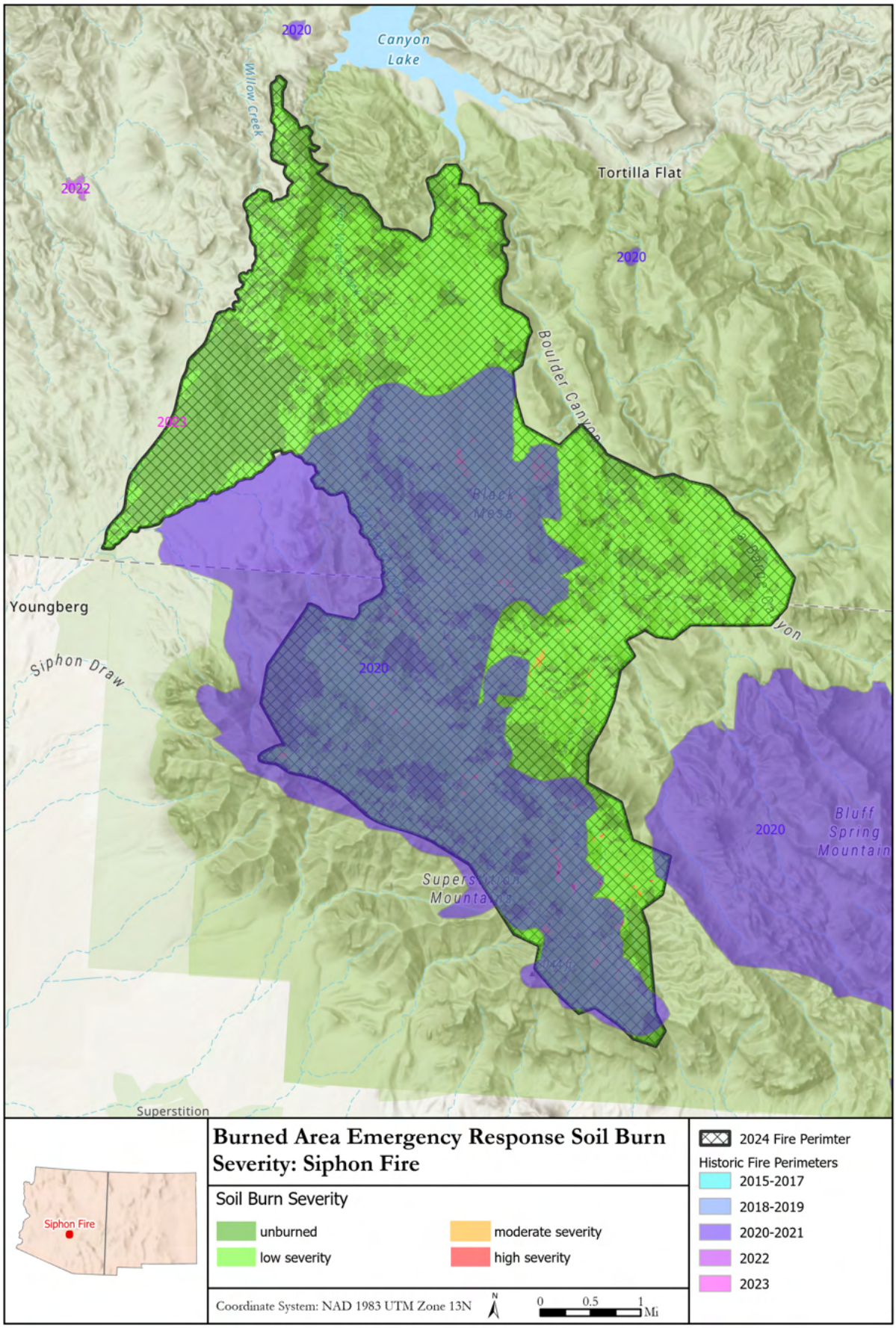

Figure 13. Burned Area Emergency Response soil severity of the Siphon Fire.

Conclusion

This report covers the 10 largest wildfires in Arizona and New Mexico during the 2024 fire season. These 10 wildfires represented half of all acres in the Southwest burned by wildfire in 2024. Of the fires in this report, scrub was the most common vegetation type followed by ponderosa pine. The West, South Fork, Indios, and Antone fires burned in ponderosa pine.

Soil burn severity data were available for five of the 10 fires analyzed in this report, covering 85,259 acres (about half of the acres in this report). Seventy-five percent of the area covered by these five fires was classified as low soil burn severity or unburned/undetected. Six percent (5,109 acres) of the burned area for which soil burn severity data were available experienced high soil burn severity. The South Fork Fire made up the majority of the moderate to high soil burn severity acres.

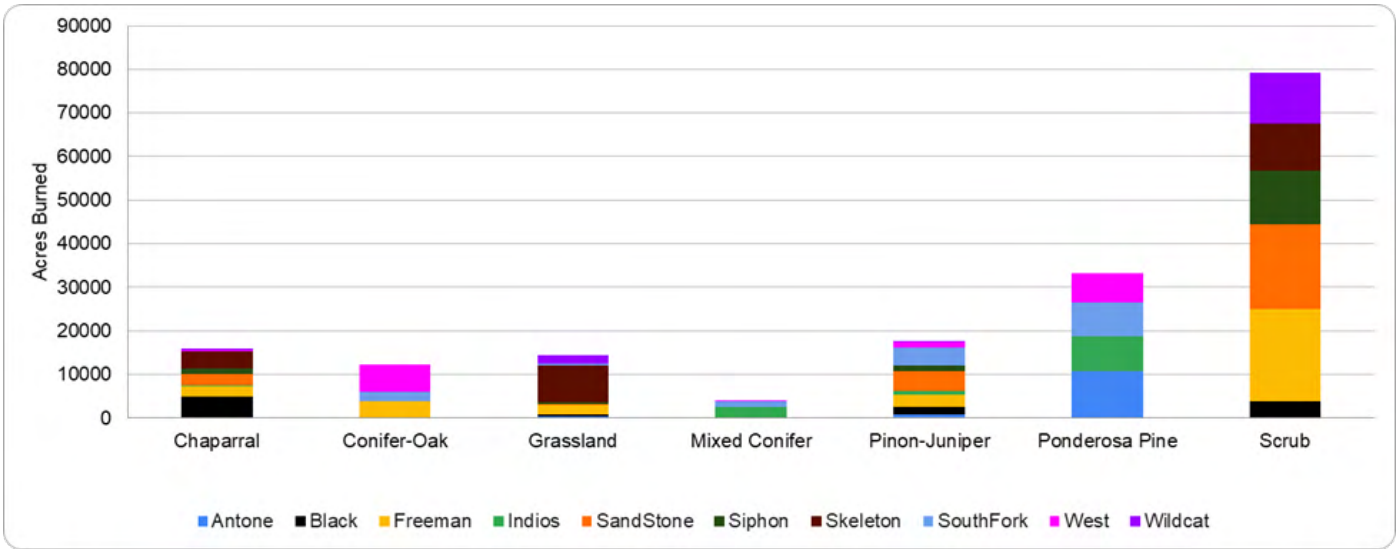

Figure 14. Summary of area burned in the largest fires of the 2024 fire season by vegetation type.

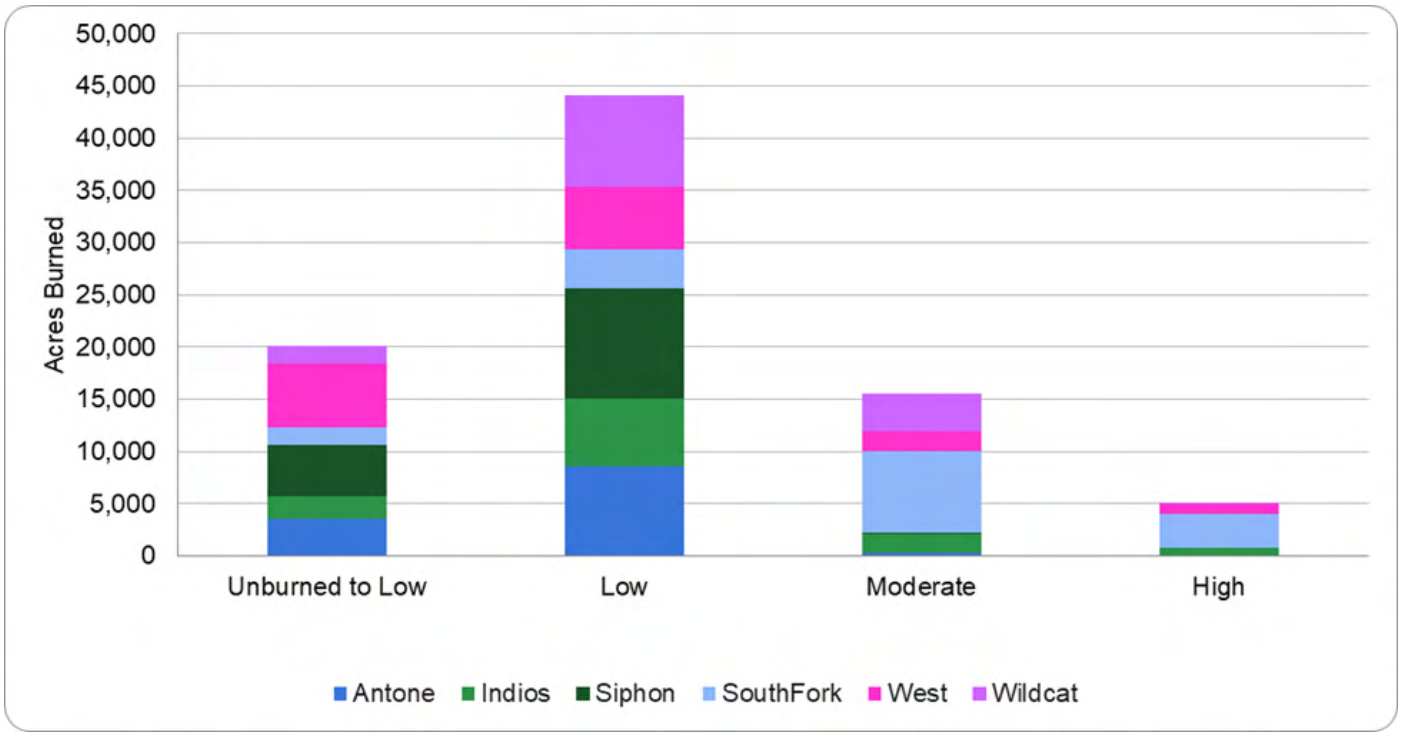

Figure 15. Summary of area burned by soil burn severity class.

Rapid Assessment of Vegetation Condition after Wildfire (RAVG) data were available for six of the 10 fires included in this report, covering 95,070 acres or about half of the acres in this report. Of these acres, 42 percent had less than 25 percent canopy mortality while 15 percent had greater than 75 percent canopy mortality. As with soil burn severity, the South Fork Fire dominated the highest mortality category.

According to the LANDFIRE Vegetation Condition Class analysis, 60 percent of the area covered in this analysis moderately departed from historical conditions. Wildfires often burn at lower severities in areas that are closer to historical conditions.

The South Fork Fire had the greatest impact on people, resulting in two fatalities, the largest number of evacuations (approximately 8,000 residents), and the destruction of nearly 1,000 homes.The Black, Sand Stone, and Siphon Fires also required evacuations.

Past wildfire season overview reports noted that most of the large fires in the Southwest are caused by lightning (naturally ignited), and 2024 followed this trend, with most of the fires reported as lighting-caused.

The Wildcat Fire reburned the 2020 Sears Fire footprint and about half of the Siphon Fire reburned through the 2020 Superstition Fire. While the severity maps do not suggest a strong causal link, both the Wildcat and Siphon Fire burned with low to moderate severity. Previous fires can serve as control features and aid in control. For example, past fire edges defined the edges of the Sand Stone Fire on portions of its east edge.

The 10 fires in this analysis were managed at an estimated cost of more than $84 million, for an average of $463 per acre. The average cost per acre was higher than the cost for the largest fires in 2023 and similiar to previous years. Costs ranged from a high of $1,333 per acre on the South Fork Fire to a low of under $35 per acre on the Siphon Fire. As noted above, managers identified the most appropriate strategy for each wildfire to minimize threats and maximize positive outcomes. In 2024, managers classified their strategy as full suppression on six of the 10 fires. Two fires, Antone and Black, demonstrate how managers applied the most appropriate strategies to different parts of the fires, resulting in a mix of full suppression and other approaches. Across the 10 fires in this report, only about nine percent of the acres were managed with strategies other than full suppression, marking a decrease compared to previous years. With the notable exception of the South Fork Fire, large portions of the fires for which data are available from 2024 burned with low soil or canopy severity, likely providing some ecological benefit. Though it is important to note that desert ecosystems are not adapted to wildfire. [7]

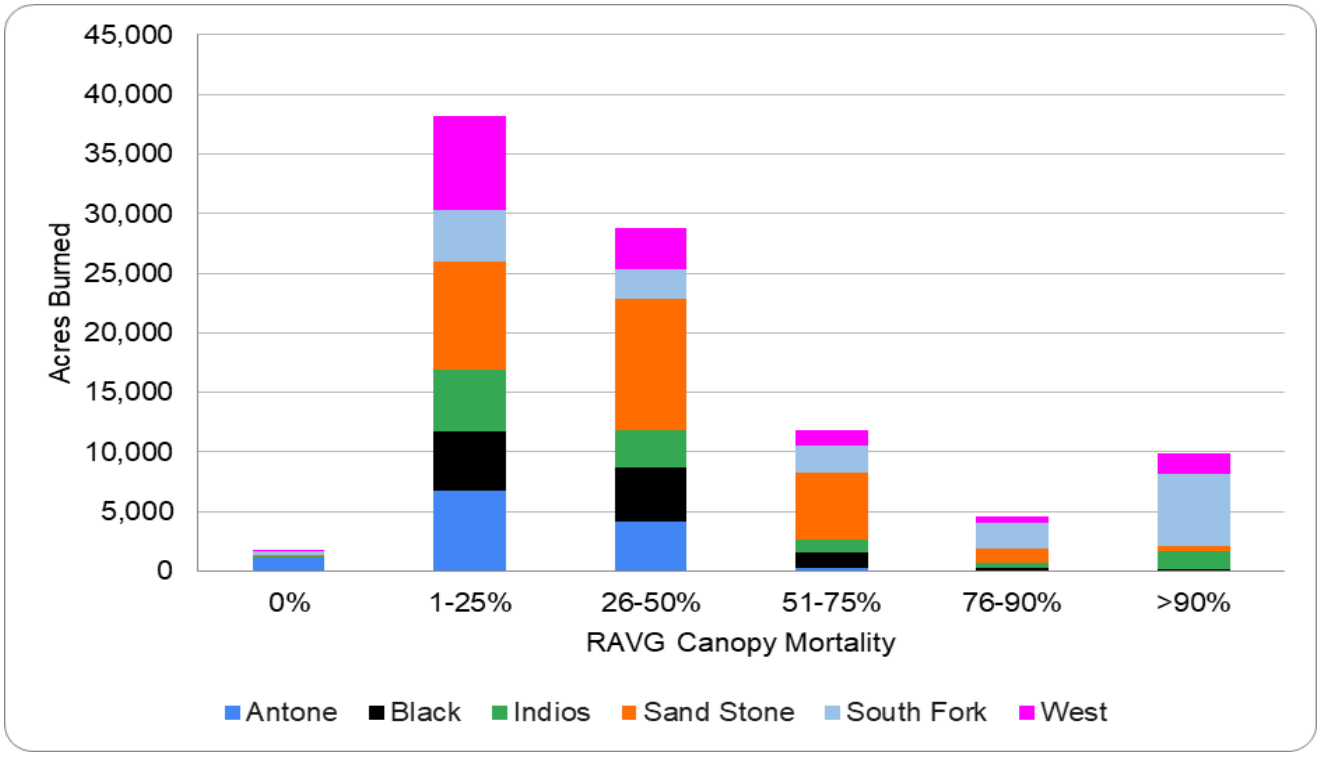

Figure 16. Summary of acres burned by canopy mortality class.

[7] Fire in the Sonoran Desert: An Overview of a Changing Landscape, 2024. https://www.swfireconsortium.org/2024/05/22/desert-fire-invasion/

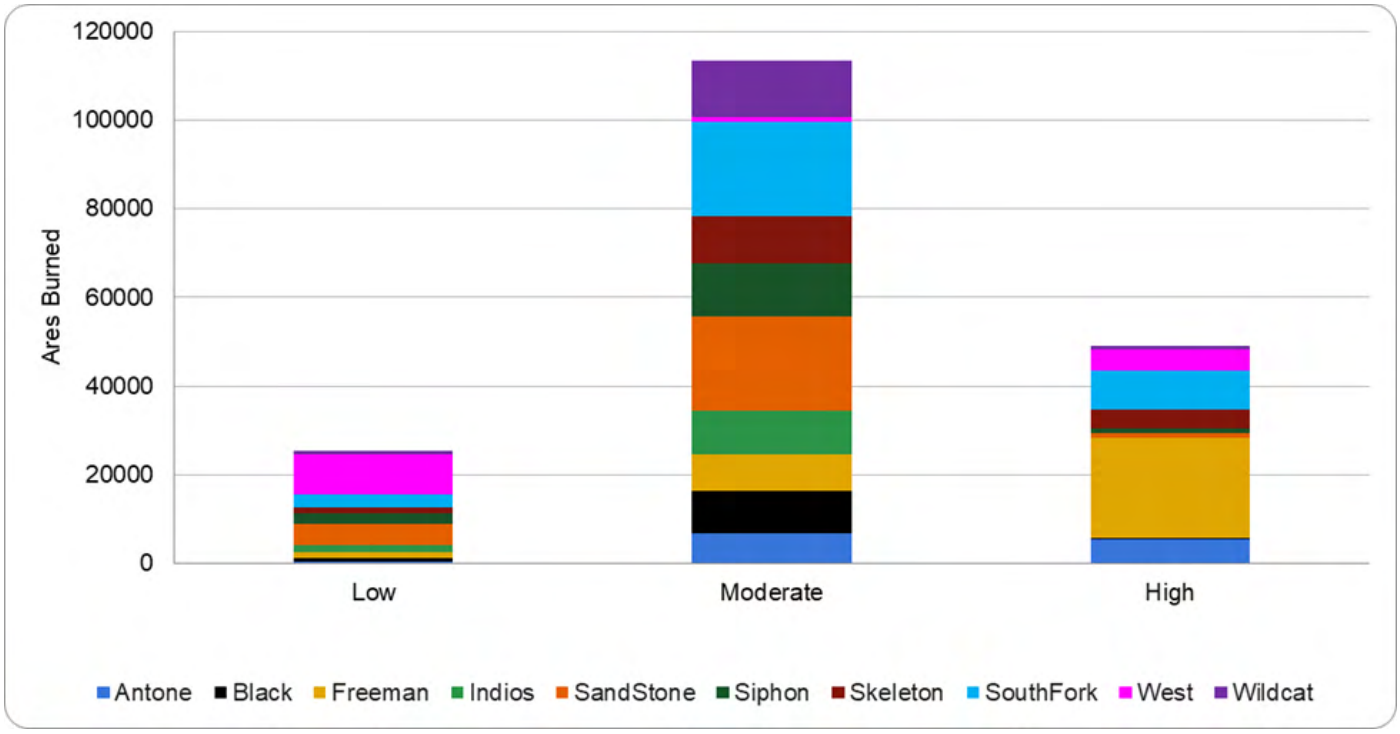

Figure 17. Summary of acres burned by LANDFIRE vegetation condition class.

Appendix I. Fire Statistics

General					Vegetation Structure		
Name	State	Acres	Cost	Cost/Acre	Low	Medium	High
Wildcat	AZ	14,402	$4,200,000	$292	6%	88%	6%
Indios	NM	11,500	$15,188,000	$1,321	14%	86%	0%
Antone	NM	12,395	$1,800,000	$145	2%	54%	44%
South Fork	NM	17,569	$23,424,000	$1,333	9%	65%	27%
Freeman	AZ	32,568	$1,300,000	$40	4%	25%	70%
Black	AZ	11,162	$6,910,000	$619	7%	91%	2%
Sand Stone	AZ	27,390	$9,200,000	$336	18%	78%	4%
Skeleton	AZ	24,034	$1,500,000	$62	9%	65%	27%
West	AZ	15,074	$20,000,000	$1,327	60%	8%	32%
Siphon	AZ	15,527	$546,000	$35	17%	77%	6%
Sum		181,621	$84,068,000	$463	14%	56%	30%

Soil Burn Severity					RAVG Canopy Mortality				
Name	Unburned	Low	Moderate	High	0%	0%-<25%	25%-<50%	50%-75%	75%-100%
Wildcat	11%	61%	25%	1%					
Indios	19%	57%	16%	6%	1%	45%	28%	9%	17%
Antone	28%	69%	2%	0%	9%	54%	33%	2%	1%
South Fork	10%	23%	47%	20%	2%	24%	14%	13%	46%
Freeman									
Black					0%	45%	41%	11%	3%
Sand Stone					0%	33%	40%	21%	6%
Skeleton									
West	41%	40%	12%	6%	0%	53%	22%	8%	16%
Siphon									


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