Watershed Emergency Response Team (WERT)
2025 Gifford Fire

CA-LPF-002181

September 17, 2025

California Department of Conservation
California Geological Survey

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WERT REPORT AUTHORSHIP AND PROFESSIONAL REGISTRATION

REPORT TITLE: Watershed Emergency Response Team (WERT) Evaluation – 2025 Gifford Fire

LIMITATIONS: This report presents the results of a rapid assessment to help communities prepare after wildfire by documenting and communicating postfire risks to life, property, and infrastructure posed by debris flow, flood, and rockfall hazards. The findings included in this report are not intended to be fully comprehensive or conclusive, but rather to serve as a preliminary tool to assist responsible jurisdictions and agencies in the development of more detailed postfire emergency response plans.

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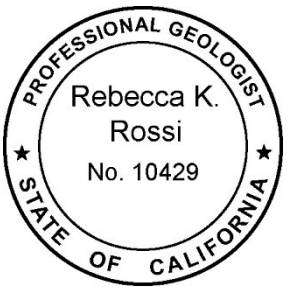

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Gifford Fire – WERT REPORT EXECUTIVE SUMMARY

CA-LPF-002181- WERT Evaluation

Mission Statement: The California Watershed Emergency Response Team (WERT) helps communities prepare after wildfire by rapidly documenting and communicating postfire risks to life, property, and infrastructure posed by debris flow, flood, and rockfall hazards.

It should be noted that the findings included in this report are not intended to be fully comprehensive or conclusive, but rather to serve as a preliminary tool to assist San Luis Obispo County Office of Emergency Services, Santa Barbara County Office of Emergency Management, local first responders, California Department of Transportation, the California Governor's Office of Emergency Services, the United States Department of Agriculture Natural Resources Conservation Service (NRCS), utility companies, and other responsible agencies and entities in the development of more detailed postfire emergency response plans. It is intended that the agencies identified above will use the information presented in this report as a preliminary guide to complete their own more detailed evaluations, and to develop detailed emergency response plans and mitigations. This report should also be made available to local districts, residents, businesses, and property managers so that they may understand their proximity to hazard areas and to guide their planning for precautionary measures as recommended and detailed in this document.

The Gifford Fire started on 1 August 2025 along Highway 166. The cause is under investigation. By 27 August 2025, the fire was 95% contained after reaching a size of 131,614 acres (205.6 mi^2). The soil burn severity inside the fire perimeter is mostly low and moderate.

Due to the potential for increased postfire runoff, sediment-laden flooding, and possibly debris flows, the burned area was assessed by an interagency WERT. The WERT rapidly evaluated postfire watershed conditions, identified potential **Values-at-Risk (VARs)** related to human life and property, and evaluated the potential for increased postfire hazards. Where appropriate, the WERT recommends potential emergency protection measures to reduce postfire impacts to VARs.

Summary of the Key WERT Findings

- The Gifford Fire produced mostly low and moderate soil burn severity. Gifford Fire soil burn severity: unburned to very low (4.6%), low (47.1%), moderate (46.8%), and high (1.5%).
- The degree of fire-induced damage to soil is called "soil burn severity" and is a primary influence on increased runoff, increased sediment supply, and the occurrence of postfire watershed hazards (e.g., debris flows and flooding). Moderate and high soil burn severities typically create the most impacts.
- Approximately 75% of the burned area is in Federal Ownership. Consequently, the WERT coordinated with a USFS Burned Area Emergency Response (BAER) team assigned to the Gifford Fire. The WERT only assessed areas outside of Federal Ownership. The BAER team assessed areas inside Federal Ownership.

- The Gifford Fire has a potential of generating low to moderate postfire floods and debris floods following high intensity and prolonged rainstorms. Smaller basins (< 2 mi^2) with mostly moderate and high burn severity will experience the highest response.
- Historic postfire response inside the fire perimeter and in the greater region with similar physiographic conditions suggest postfire debris flows are uncommon. Minimal dry ravel and soil loading were observed in basins burned by the Gifford Fire, suggesting a low potential for debris-flow initiation.
- The WERT identified 18 VARs inside and downslope/downstream of the fire perimeter. 8 VARs are shown as polygons which encompass multiple individual sites subject to similar hazard and risk. The remaining 10 VARs are points, which are associated with discrete sites such as homes and road crossing structures.
- No exigent VARs, which present a more urgent threat to life, safety, and/or property, were identified.
- The road network inside and downstream of the Gifford Fire perimeter will be subject to increased potential for storm damage for the next two to five years. Specific crossing structures that provide ingress and egress to homes or road crossings of main channels were addressed as specific VARs or more broadly under general recommendations.
- Roads that may be severely impacted by increased runoff and floods are Highway 166, Miranda Pine Road, Avenales Ranch Road, W Pozo Road, Hi Mountain Lookout Road, Los Machos Road, Stony Creek Road, Huasna Road, Shaw Ridge Road, Logan Ridge Road, Agua Escondido Road, Midway Road, Twin Rocks Road, 35 Canyon Road, Cable Corral Road, Miranda Pines Road, Old Sierra Madre Road, and Sierra Madre Road. Other roads, especially unpaved roads inside the fire perimeter, may also be severely impacted. Many additional roads are subject to potential blockage and overtopping from less severe flooding impacts.
- Residents subject to postfire hazards need to have a clear understanding of the hazards and mitigation strategies (e.g., evacuation, deflection structures, culvert improvements) to effectively reduce risk to life and property. Residents should consult with representatives from relevant Santa Barbara or San Luis Obispo Public Works or Natural Resources Conservation Service (NRCS) so that emergency protective measures can be designed to minimize nuisance flooding and property damage.
- **To trigger the National Weather Service early warning system, the WERT suggests thresholds of 0.35 inches in 15 minutes, 0.5 inches in 30 minutes, and 0.7 inches in 60 minutes.**
- Close coordination between the San Luis Obispo Office of Emergency Services, Santa Barbara Office of Emergency Management, the County Sheriff, local fire and law enforcement agencies, California Department of Transportation, the National Weather Service, NRCS, and other affected entities will be necessary to effectively develop and implement a response plan that will minimize risk. WERT information provides critical intelligence for response planning and implementation.

Introduction

Background

The Gifford Fire began on 1 August 2025 northeast of Santa Maria along Highway 166. As of August 27, 2025, the fire was 95% contained and had burned 131,614 acres. The Gifford Fire destroyed 5 structures. There were 14 firefighter injuries and 3 civilian injuries.

Given the steep slopes, erodible geology in the area, and proximity of the burned area to developed areas, Santa Barbara County requested a Watershed Emergency Response Team (WERT) assessment on 15 August 2025. In response to this request, the California Geological Survey (CGS) conducted a desktop review of the burned area and determined the presence of a high potential of floods and debris floods that would threaten communities impacted by the fire near Garcia Mountain and Sierra Madre Mountains. See footnote for definitions of different postfire runoff hazards evaluated by the WERT[1]. On 15 August 2025, Deputy Chief Kevin Bohall, Unified Incident Commander, requested a WERT.

During periods of thunderstorm activity and during the wet season (typically October through May), it is critical that people who live in hazard areas inside and downstream of the Gifford Fire implement emergency protection measures (EPMs) where appropriate, check weather conditions and forecasts, stay alert to National Weather Service (NWS) flash flood watches and warnings, and monitor local county resources for guidance on evacuations. This WERT report, and associated data products, provides critical intelligence for minimizing risk from postfire flood and geologic hazards.

This report presents the results of a rapid evaluation of postfire geologic and hydrologic hazards to life and property (i.e., collectively known as “Values-at-Risk” or “VARs”) for private lands affected by the Gifford Fire. Figure 1 shows the acreage and percentage of the burned area by ownership for the fire. Approximately 75% of the burned area is in federal ownership and 25% of the burned area is in private ownership.

The Gifford Fire WERT conducted a field assessment on 26 August 2025. WERT representatives interacted with stakeholders during the WERT assessment (see Appendix A for a list of key contacts). Briefings providing the WERT’s preliminary findings and VARs were conducted with San Luis Obispo and Santa Barbara Counties emergency response personnel and other responsible agencies on 2 September 2025. A draft report and preliminary data release composed of a summary VAR table as a csv file (Appendix B) and a geodatabase of spatial VAR data were released to key stakeholders on 29 August 2025. Copies of the summary

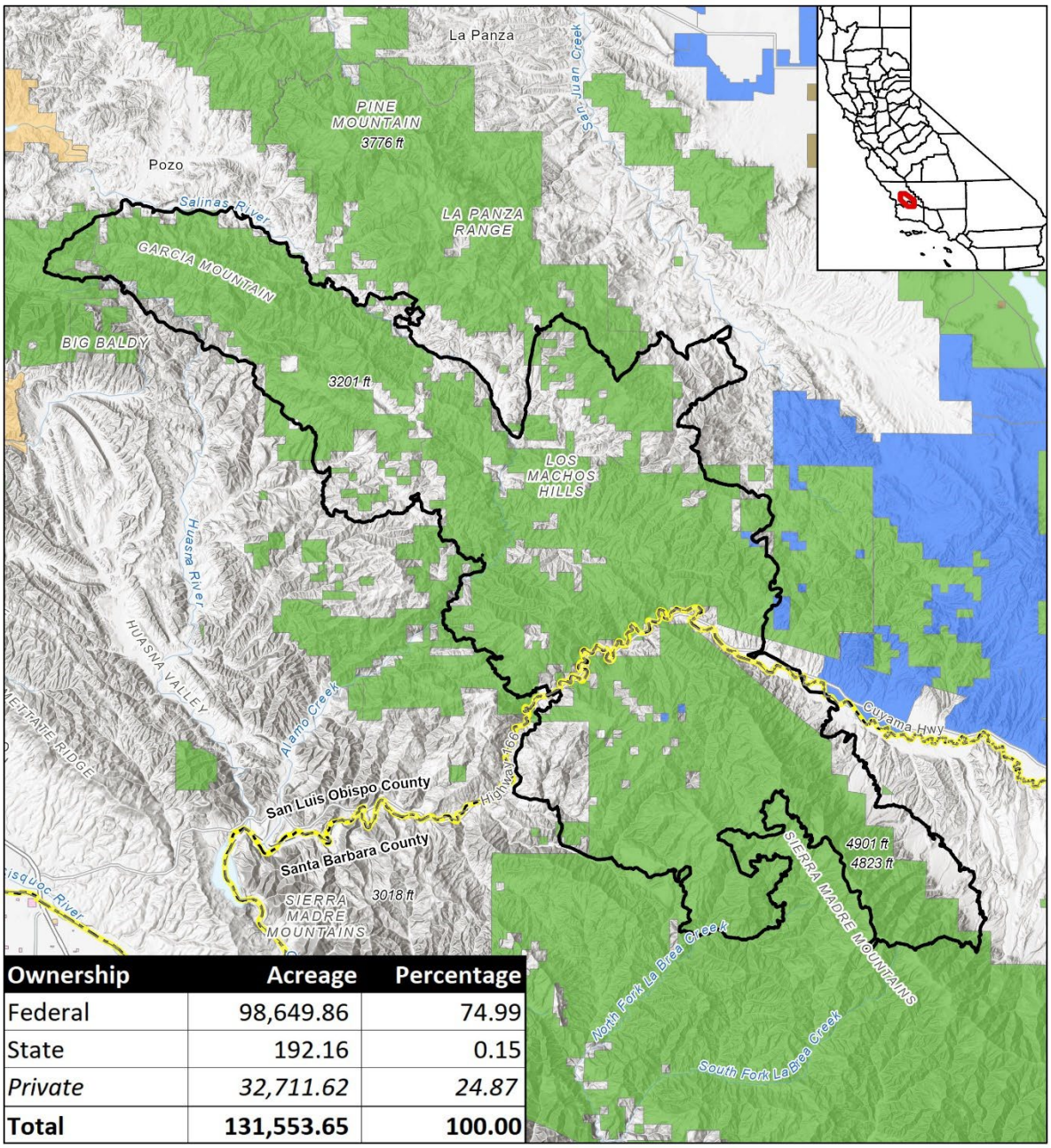
[1] Definitions of different flow types applied in this document are as follows (after Pierson (2005) and Hungr et al. (2001)):
Floods – closely resemble normal streamflow with sediment concentrations less than 20% by volume, bedload transport composed of sands to cobbles, and more predictable Newtonian fluid behavior.
Debris floods – rapid, surging flow that is heavily charged with debris and sediment. Suspended sediment composed of sand-sized particles is common with bedload transport composed of cobbles to boulders. Approximately Newtonian flow behavior and sediment concentrations by volume of 20% to 60%. Transient debris dams of boulders and woody material are common. Highly erosive.
Debris flows – rapid, surging flow composed of a slurry of sediment and water with suspended gravels and boulders. Less predictable non-Newtonian flow behavior with sediment concentrations of >50% by volume. Can cause catastrophic damage from burial and impact that can infill and divert streams, and destroy automobiles, buildings, and infrastructure.

VAR table (Appendix B), a VAR Map Book (Appendix C), and VAR detail sheets (Appendix D) are provided in this report.

Team members for the Gifford Fire WERT are listed in Table 1.

Table 1. Gifford Fire WERT members.

Name	Position	Agency	Expertise-Position
Don Lindsay, PG 7489, CEG 2323, CE 76899, GE 3097	Team Leader	CGS	Engineering Geology; Civil Engineering
Rebecca Rossi, PG 10429	Team Member	CGS	Engineering Geology
Paul Richardson, PhD, PG 10342	Team Member	CGS	Engineering Geology
Brian Mattos, RPF 2476	Team Member	CAL FIRE	Liaison; Safety
Peter Smith	Team Member	CAL FIRE	Safety
Adjunct Team			
David Cavagnaro, PhD	Adjunct Member	CGS	GIS / Geology
Michael Falsetto	Adjunct Member	CGS	GIS
Deshawn Brown	Adjunct Member	CGS	GIS



Ownership	Acreage	Percentage
Federal	98,649.86	74.99
State	192.16	0.15
Private	*32,711.62*	*24.87*
Total	**131,553.65**	**100.00**

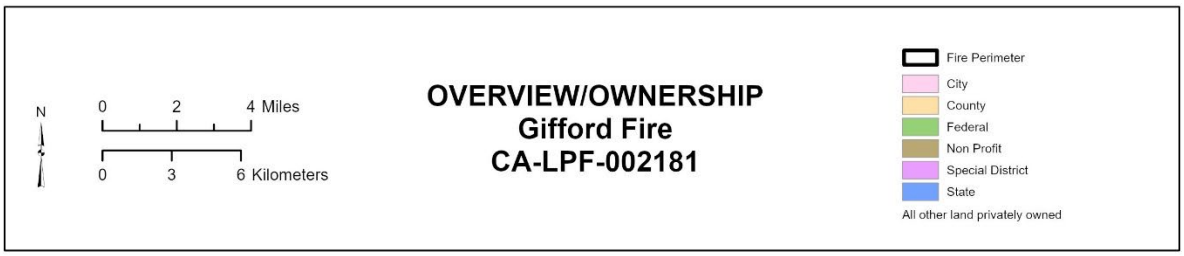


Figure 1. Ownership map of the Gifford Fire burned area.

Objectives and Scope

Primary objectives for the WERT are to conduct a rapid preliminary assessment that include the following components.

- Identify types and locations of on-site and downstream threats to life, property, and critical infrastructure (i.e., Values-at-Risk or VARs) from postfire flooding, debris flows, rockfall, erosion, and other hazards that are elevated due to postfire conditions.
- Rapidly determine relative postfire risk to these values, using a combination of state-of-the-art analytical tools (e.g., USGS postfire debris-flow likelihood model) and the best professional judgement of licensed geohazard professionals (i.e., Professional Geologists; Certified Engineering Geologists; Professional Civil Engineers).
- Develop preliminary emergency protection measures (EPMs) needed to avoid or minimize threats to life and property.
- Communicate findings to responsible entities and affected parties so that the information and intelligence collected by the WERT can be used in response planning to reduce risk from postfire watershed hazards.

It is important to emphasize that the WERT performs a rapid evaluation of postfire hazards and risk. A complete characterization of postfire hazards and/or in-depth design of protection measures is beyond the scope of the WERT evaluation. However, findings from the WERT evaluation can potentially be used to leverage emergency funds for emergency treatment implementation and more detailed site investigation and/or treatment design.

This document summarizes downslope/downstream VARs and makes specific and general recommendations to reduce exposure to postfire hazards to life and property on county and private lands. **While the report can provide useful information to emergency planners and first responders, the GIS data, in the form of a geodatabase, produced by the WERT is the most important source of information for postfire response planning. Clear communication of life and property hazards is an objective of the WERT process, and the use of these spatial data is a critical component for communicating hazards in a planning and operational context. These data have been shared with federal, state, and local responsible agencies.**

Physical Setting

Topography and Climate

The Gifford Fire occurred in the Garcia Mountain area and the Sierra Madre Mountains in the Coast Ranges (CGS, 2002). The mountains trend northwest-southeast. Highway 166 crosses east to west along the Cuyama River splitting the fire into two zones. The northern zone is in San Luis Obispo County. The southern zone is in Santa Barbara County. The slopes inside and downslope of the fire perimeter are predominantly moderate gradient but are very steep in some areas, especially near the southern boundary of the fire. Elevations range from approximately 1000 feet along Highway 166 on the western boundary of the fire to 4,900 feet near Timber Peak towards the southern boundary of the fire.

The Gifford Fire area is classified as having a cool-summer Mediterranean climate (Köppen Climate: Csb, Beck et al., 2018). Average annual precipitation at the Shell Peak rain gauge (2080 ft), which is just north of Highway 166 near the county lines of San Luis Obispo and Santa Barbara and ~0.6 mi west of the fire perimeter, is 20.43 inches and is primarily in the form of

rain (Santa Barbara County Flood Control District, 2023). Average annual precipitation decreases on the east side of the mountains. This area experiences high interannual variability in precipitation. Precipitation occurs primarily during the cool season (October-May) associated with winter storms, which may feature atmospheric rivers. Convection (i.e., thunderstorms) may be embedded within these winter storms, producing short-duration, high-intensity rainfall. Summertime thunderstorms are rare, but possible, over the burned area.

Geology and Landslides

The mountains are bounded by the East Huasna Fault to the west. The South Cuyama and Panza Faults parallel the range to the east, straddling the Salinas River (Jennings and Bryant, 2010). The San Andreas Fault also parallels the mountains and is approximately 20 miles to the east of the burned area (Jennings and Bryant, 2010). Many additional faults are also present in and near the mountain range. Most of the area impacted by the fire is underlain by Cretaceous marine sedimentary rocks with Oligocene to Eocene marine and nonmarine sedimentary rocks exposed, especially along faults (Fig. 2).

Soils on hillsides above the range front were typically shallow and coarse with fractured rock fragments present at the surface. Bedrock was commonly exposed on hillsides in the steeper areas above the range front. Dry ravel loading was minimal. Older debris flow deposits were present at the outlet of steep basins, particularly on the eastern flank of the Sierra Madre Mountains. Fluvial deposits were commonly observed where channel incision was present. Deep-seated and shallow landslides were common on steep slopes. Numerous shallow slope failures initiated along steep concave slopes that support shallow-rooted vegetation, including grass and chaparral. Many of the observed shallow landslides were reported to occur following a 9 January 2023 storm. This was confirmed through review of aerial imagery (Google Earth, 2025) that showed many shallow landslide scars, some of which transitioned into debris flows partially loading downgradient channels and spilling out onto valley bottoms as small-volume alluvial fans.

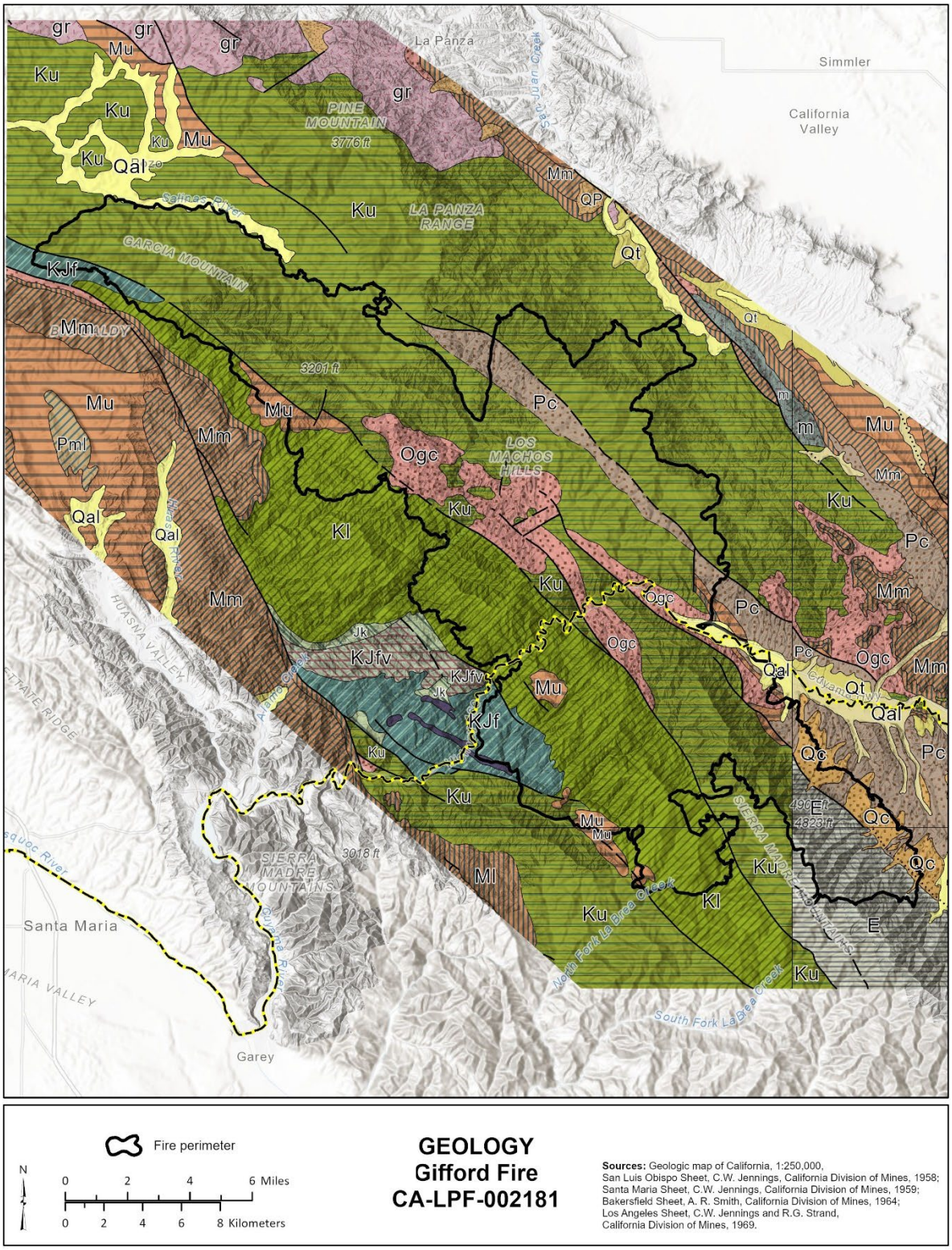


Figure 2a. Geologic map for the Gifford Fire (map sources included on map).

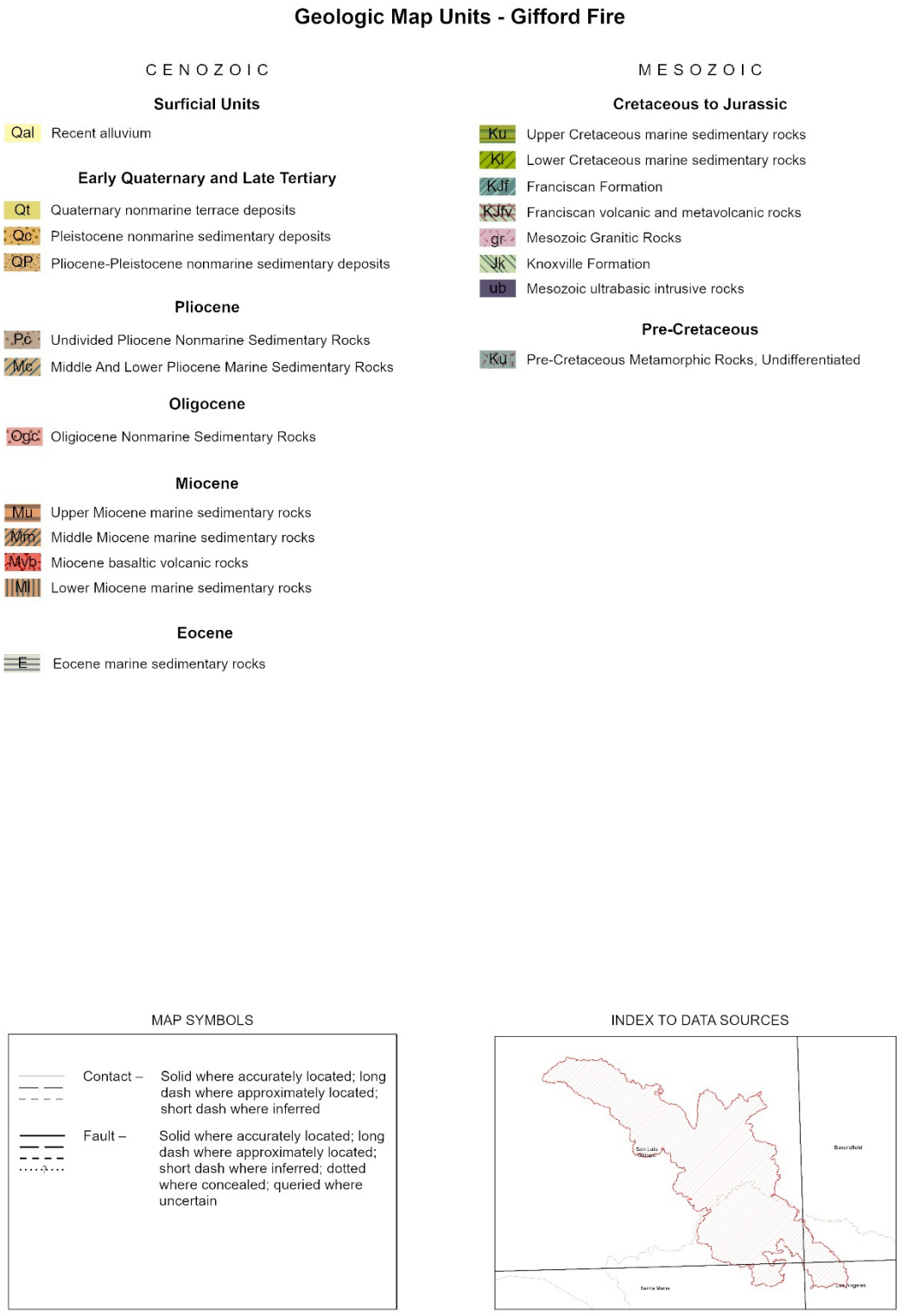


Figure 2b. Legend for geologic map in Figure 2a for the Gifford Fire.

Mineral Hazards and Wells

The locations of mines, prospects, wells and areas of potential mineralogical concern are shown on Figure 3a. This map indicates that there are three wells within the burned area on the southeast flank of the fire, but the wells are reportedly plugged and were not assessed for hazards. Along the Highway 166 corridor on the western flank of the fire perimeter, the map also identifies the approximate locations of gabbro, mélange or metavolcanic rock that have the potential to contain naturally occurring asbestos, chromium, cobalt, copper, manganese, mercury, or nickel, which could be potentially hazardous if present in sufficient quantity. Asbestos is a known carcinogen. Naturally occurring chromium, manganese, and mercury are metals found in metamorphic and ultramafic rocks of the Coast Ranges and there is the potential for the downstream transport of metals to local creeks and watersheds. Wildfires can increase postfire threats by catalyzing the transformation of chromium to its carcinogenic form in soil and ash, as hexavalent chromium, particularly in areas with metal-rich geologies (Lopez et al., 2023)

Information regarding the hazardous minerals discussed above can be found at the California Office of Environmental Health Hazard Assessment (https://oehha.ca.gov/chemicals/).

We recommend consultation with the Santa Barbara County Air Pollution Control District (ourair.org/asbestos/) to develop mitigations that are centered on limiting dust generation and limiting dust exposure.

For general review information on hazardous minerals, see:

https://www.conservation.ca.gov/cgs/minerals/mineral-hazards

https://www.oehha.ca.gov/air/asbestos-fact-sheet-information-health-risks-exposures-asbestos

For additional mineral hazards information, see:

https://pubs.usgs.gov/fs/2005/3014/

https://www.mindat.org/loc-30702.html

http://www.who.int/mediacentre/factsheets/fs361/en/

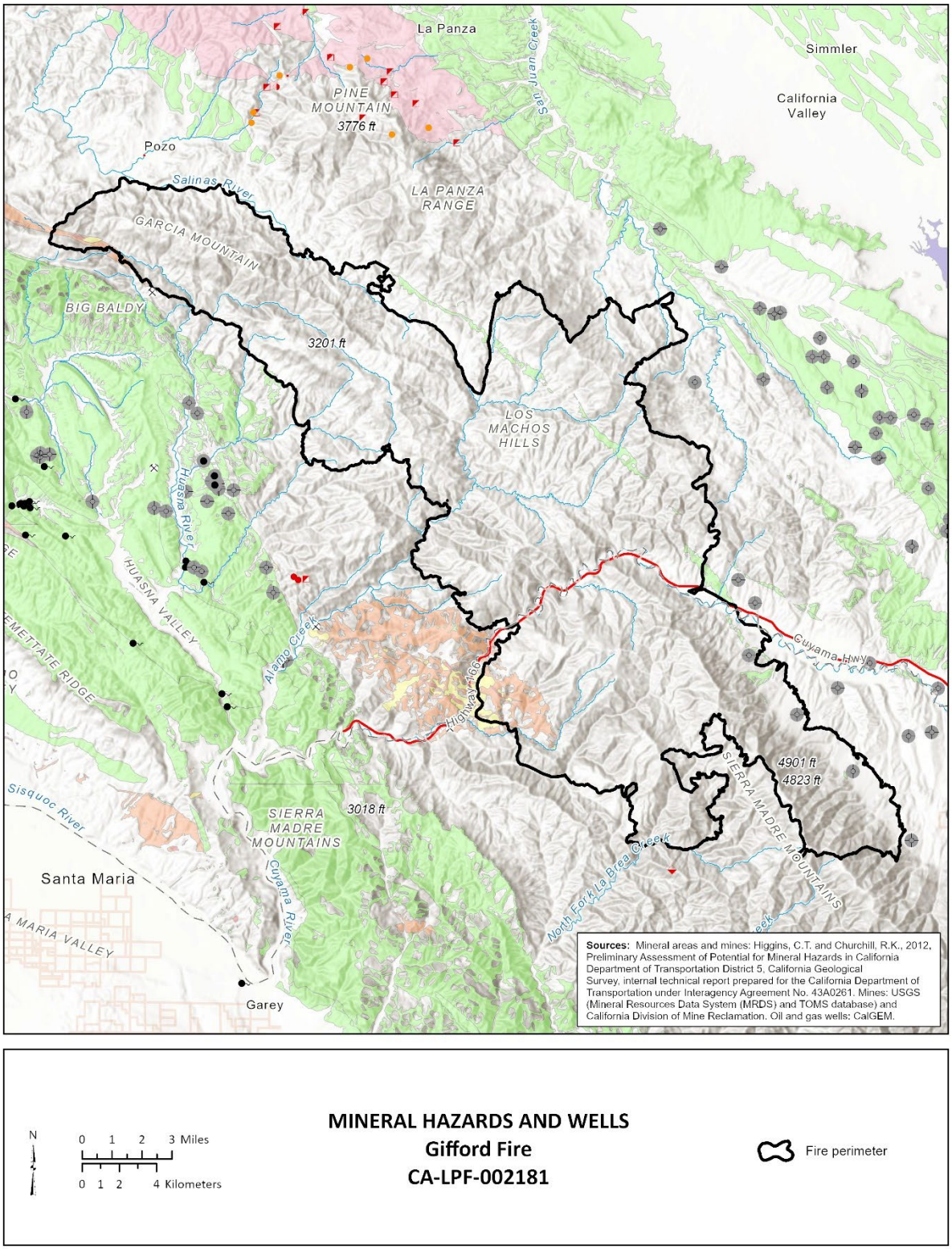


Figure 3a. Mineral Hazards and Wells map for the Gifford Fire

Figure 3b. Legend for mineral hazards map in Figure 3a for the Gifford Fire.

Vegetation and Fire History

Vegetation can influence potential soil burn severity with higher unit area biomass typically resulting in higher potential burn severity. Because biomass influences burn severity, areas dominated by scrub and chaparral will typically have a higher potential soil burn severity than areas dominated by grass. Vegetation inside the Gifford Fire perimeter was dominated by dry-

mesic chaparral. Foothill pine woodland and savanna, grassland, foothill pine forest and woodland, coastal oak woodland and savanna, and mixed evergreen woodland were also present inside the Gifford Fire perimeter.

The fire history of the burned area can potentially influence postfire watershed response. The Sierra Madre Mountains have experienced numerous historical fires and other fires have burned inside the Gifford Fire perimeter. Although mapped fire perimeters in the area date back to at least 1912, many areas within the Gifford Fire perimeter have burned in the last half of the 20th Century, with the exception of the northwestern finger of the fire, which up until the Gifford Fire had not burned since the 1924 and 1950 unnamed fires. There was also an area across the southern portion of the fire that had not burned since 1935. Three large fires (Logan, Spanish, and La Brea) burned the area in 1997, 1999, and 2009 respectively. The most recent large fire across most of the mountain front was the 1997 Logan Fire, which burned the central portion of the Gifford Fire area north of Highway 166. The 1999 Spanish Fire burned the southeastern edge, and the 2009 La Brea Fire burned portions of Pine Canyon on the southwestern edge of the fire. The Gifford Fire burned approximately to the edge of the 2025 Madre Fire to the east.

The lack of fire in the last several decades over a large portion of the Gifford Fire area may result in a higher potential for postfire response due to increased fuel loading, relative to areas which have burned more recently. Increased fuel loading may lead to more severely damaged soil after a fire and increased volumes of hillslope sediment being mobilized after vegetation has burned.

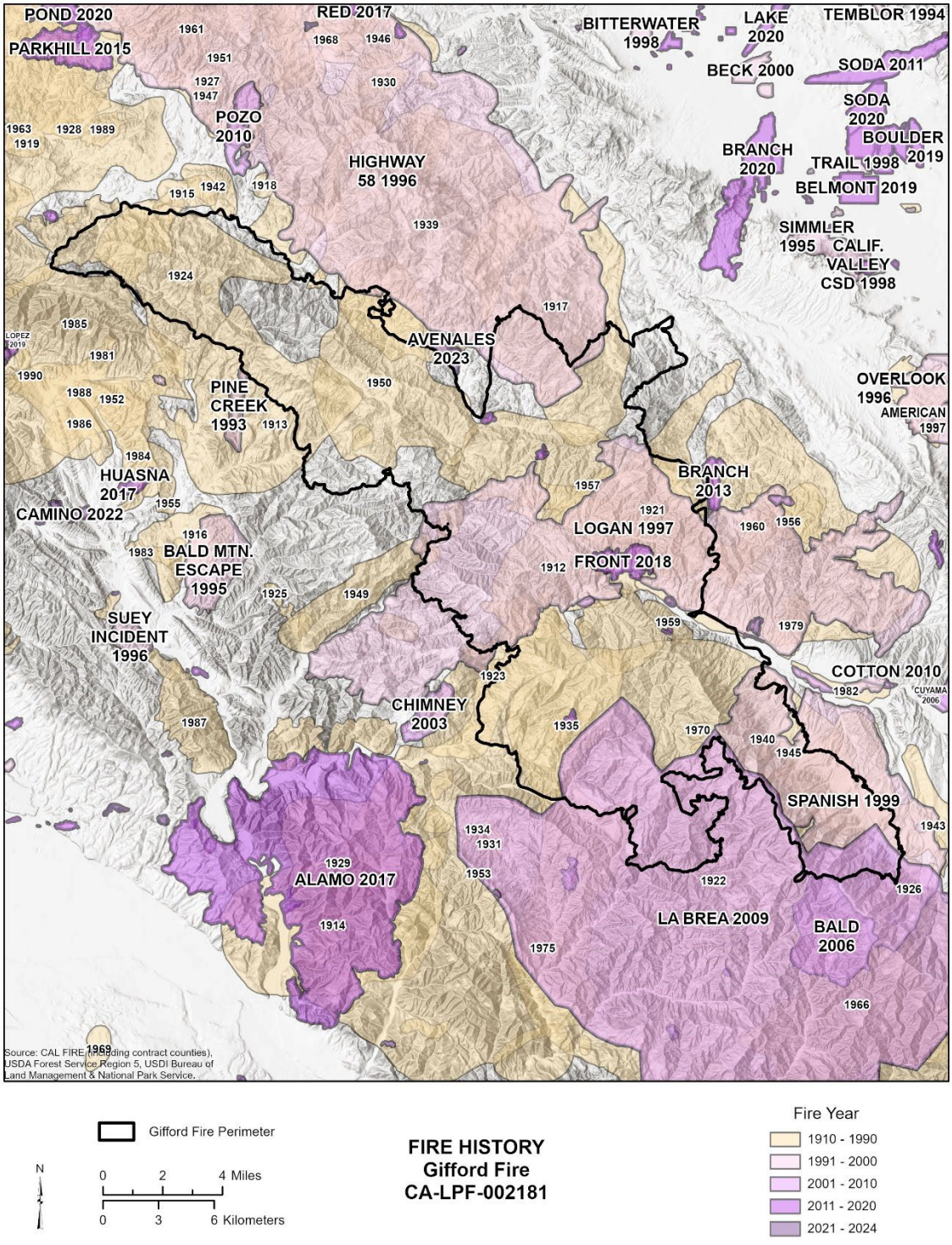


Figure 4. Fire history for the Gifford Fire.

Hydrology, Flood History, and Observed Postfire Response

The area burned by the Gifford Fire is primarily drained by Alamo Creek, Arroyo Grande Creek, Huasna River, and the headwaters of the Salinas River in the northern area of the fire and Cuyama River in the southern area of the fire. There are three reservoirs outside the fire boundary. There is one known stream gage with a near continuous record of flow data downstream of the burned area and multiple additional gages nearby but outside the fire perimeter. USGS stream gage 11136800 is located on the Cuyama River below Buckhorn Canyon near Santa Maria, California, approximately 3 miles west of the fire perimeter. This gage has an 886 mi^2 drainage basin and confirmed flow data from 1959 to present. The top three highest flows reported occurred during the winter period of 1998, 1969, and 1978, with estimated annual exceedance probabilities of about 2.0%, 3.8%, and 4.4%, respectively (Fig. 2).

On 9 January 2023, above bankfull flows were reported within and downstream of the burned area that caused localized flooding, washed out and damaged roads, and impacts to structures along watercourses. Shallow landsliding, triggered during the 2023 storm event, is evident on aerial imagery within steep slopes and headwall swales throughout the burned area (see Geology and Landslides). According to gaged data, the 9 January 2023 runoff event had an annual exceedance probability ranging between 2% to 20% depending on the size and location of the basin, with small basins reporting lower annual exceedance probability.

Portions of the Sierra Madre Mountains, including areas within the Gifford Fire perimeter, were burned in the 2009 La Brea Fire. A review of aerial imagery (Google Earth, 2025) shows several basins inside the La Brea Fire perimeter exhibit evidence of small volume landslides and runoff-induced debris floods that scoured channels. There is evidence of deposition forming alluvial fans and point bars indicative of high bedload transport where channels were less confined. The degree of scour, sediment entrainment, and deposition supports the potential for a moderate to high runoff response, particularly in steep slopes burned at moderate to high severity.

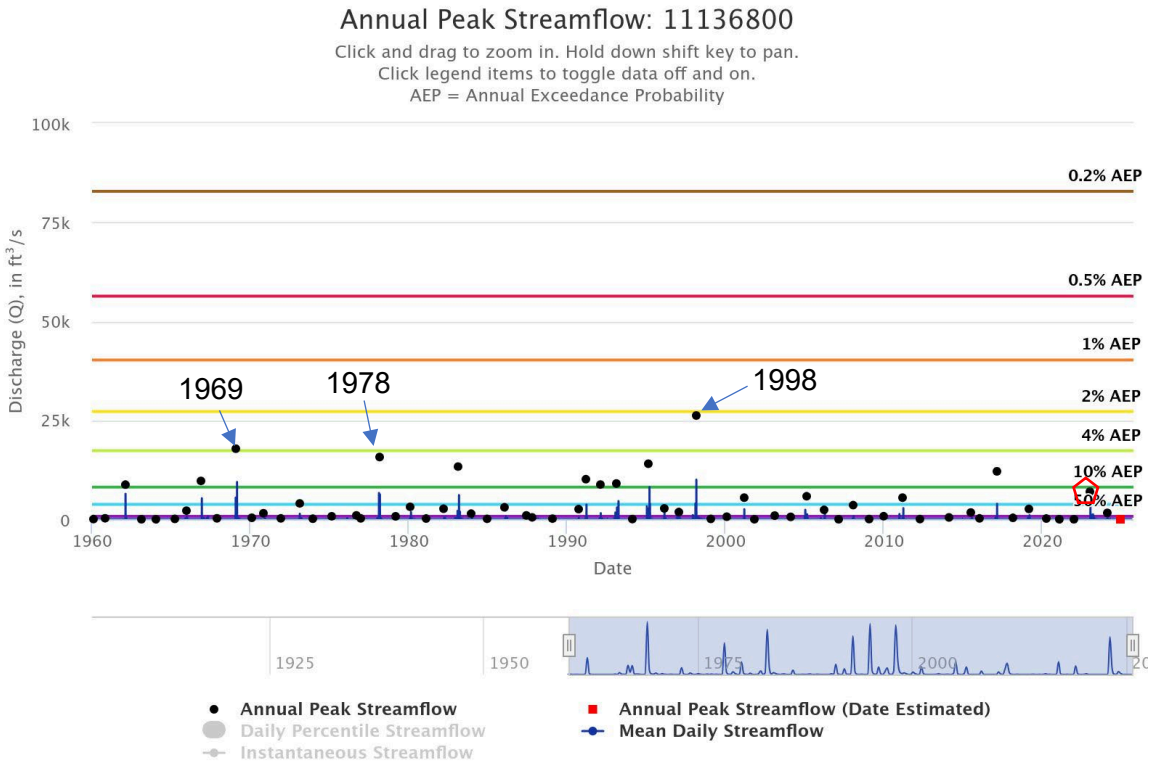


Figure 5. Annual peak streamflow for the USGS gage at Cuyama River near Santa Maria, CA (11136800). Arrows point to the 3 highest streamflow events. For context, the 9 January 2023 event is shown inside a red pentagon. (Data source: USGS | National Water Dashboard; Plot source: USGS | StreamStats).

Postfire Response

Soil Burn Severity

The WERT assessment was conducted using a Soil Burn Severity (SBS) map provided by the USDA Forest Service Burned Area Emergency Assessment (BAER) team assigned to the Gifford Fire (Fig. 6). According to the SBS map, most slopes inside the Gifford Fire perimeter were burned at low (47.1%) or moderate (46.8%). The remainder of the fire perimeter was classified as very low or unburned (4.6%) and high (1.5%).

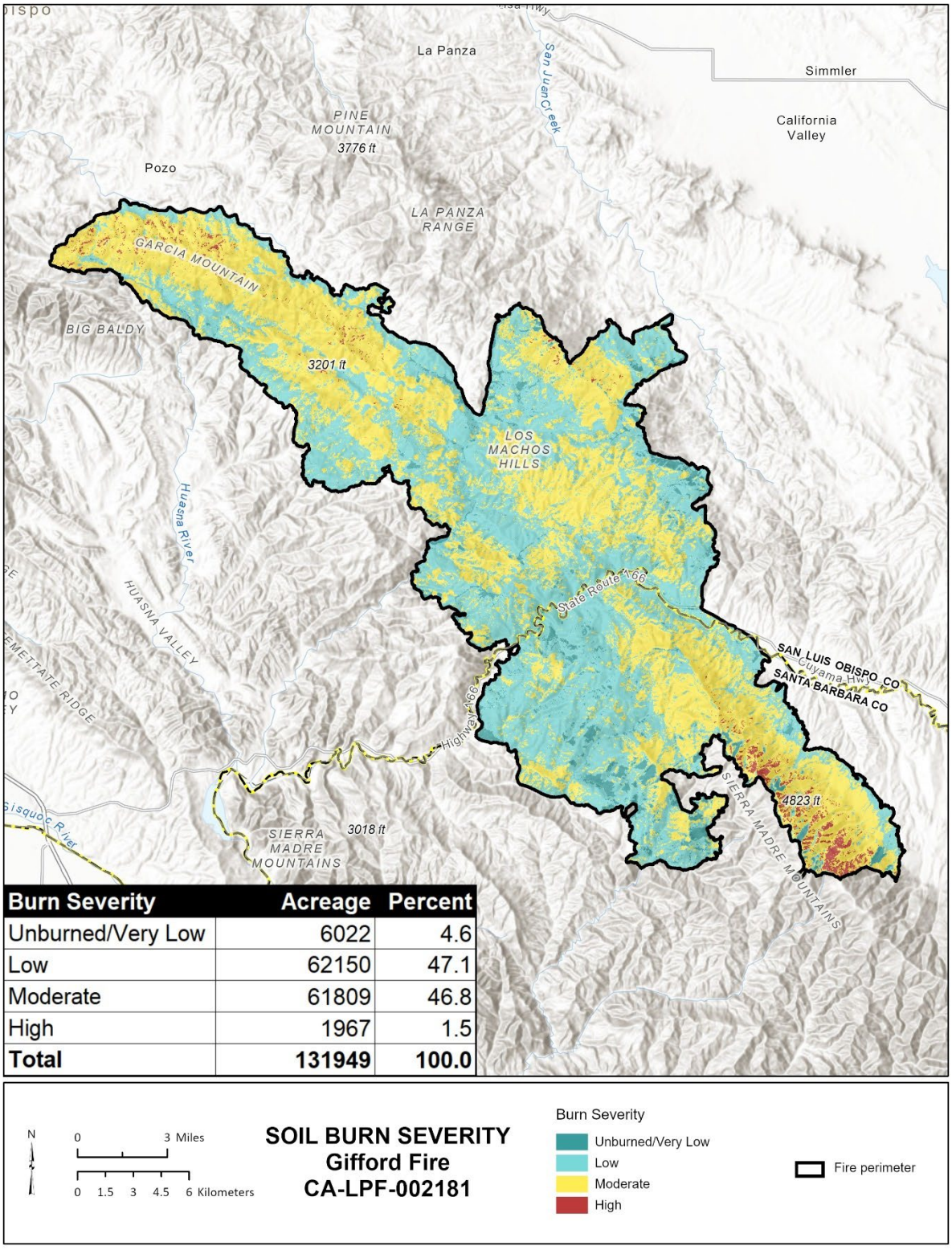


Figure 6. Soil Burn Severity map for the Gifford Fire.

Potential Impact to Reservoirs

There are three reservoirs near the Gifford Fire: Twitchell Reservoir, Lopez Lake, and Santa Margarita Reservoir. Outside the western boundary of the fire perimeter, Alamo Creek, Huasna River, and Cuyama River drain to Twitchell Reservoir. Lopez Lake is located further north and few basins that drain to Lopez Lake were impacted by the fire (Table 2). The Salinas River drains to the Santa Margarita Reservoir, which is located northwest of the fire perimeter. We focus on the Twitchell Reservoir because it has the highest percentage of upstream burned area (Table 2) and a history of high sedimentation.

According to Santa Barbara County and the Bureau of Reclamation, the Twitchell Reservoir has been trapping sediment at a rate approximately 70% faster than originally designed, leaving the reservoir with a reduced capacity and difficulty to operate the outlet control gates during periods of high sediment influx. Consequently, WERT evaluated the burn severity of the upslope area draining to the Twitchell Reservoir and found about 20% of the basin was burned (~15% from the Gifford Fire and ~5% from the Madre Fire) with 1.1% burned at very low, 11.5% burned at low, 7.7% burned at moderate, and 0.2% burned at high. High concentrations of sediment are likely to occur in and immediately downgradient of slopes burned at moderate and high severity. However, sediment concentrations will decrease as sediment-laden flows mix with runoff from unburned areas. Although sediment concentrations will be diluted as flows enter the reservoir, postfire increases to sediment loads are expected.

There are several models used to predict sediment erosion from burned landscapes, such as GeoWEPP (Renschler, 2008), KINEROS2 (Smith et al., 1995), and RUSLE (Renard et al., 1997). Many of these erosion models generate results that are not well-correlated to individual hillslope observations and perform only slightly better when hillslopes are grouped at the watershed scale. For this reason, postfire erosion models are more commonly used to identify and rank slopes based on their relative contribution of sediment yield in burned basins. Relying directly on the calculated sediment yield estimates generated by the models could be misleading. Further complicating estimating sediment loads is the recognition that numerous shallow landslides were triggered in the watershed during the winter of 2023 that loaded local channels with sediment.

Many of the slopes burned at moderate and high severity within the Twitchell Reservoir watershed are steep with poor access and are federally owned. For this reason, any hillslope treatments to minimize erosion will need to be evaluated and approved by the USFS. Quantifying hillslope erosion in burned areas and designing mitigation measures to reduce the impacts of elevated sediment entering Twitchell Reservoir will take time, require specialized skills unique to fluvial transport, and is outside the scope of the WERT.

Table 2. Summary of fire impacts to reservoirs near the Gifford Fire. Some of the area upstream of the reservoirs were also recently impacted by the 2025 Madre Fire. Upstream areas listed in square miles in parentheses.

Site	Upstream area (km^2 / mi^2)	Upstream area impacted by Gifford Fire (km^2 / mi^2)	Upstream area impacted by Madre Fire (km^2 / mi^2)	upstream area burned at very low (%)	upstream area burned at low (%)	upstream area burned at moderate (%)	upstream area burned at high (%)
Santa Margarita Reservoir	290.3 (112.1)	47.4 (18.3)	0	0.3	3.5	12.0	0.6
Lopez Lake	175.3 (67.7)	0.01 (0.005)	0	0.0	0.0	0.0	0.0
Twitchell Reservoir	2888.7 (1115.3)	441.0 (170.3)	151.7 (58.6)	1.1	11.5	7.7	0.2

Postfire Debris Flow: Predicted Hazards and Thresholds

Although the primary geohazard identified for the Gifford Fire is flooding, the WERT assessment also includes consideration of debris flow hazards. The USGS postfire debris flow hazard model (Staley et al., 2016) was run using the SBS map for the Gifford Fire (Fig. 6) to assist in the WERT's assessment of locations where hazards to life, property, and infrastructure may exist. The combined hazard model results reflect the potential likelihood of a debris flow occurring as well as the volumetric yield of the debris flow determined using the USGS postfire debris flow volume model (Gartner et al., 2014). These results are combined into an overall categorical ranking that range from low to high. Figure 7 shows the combined debris flow hazard for the 15-minute, 24 mm/hr (1 in/hr) intensity storm. Figure 7 indicates that the combined debris flow hazard is mostly moderate to high. Figure 8 illustrates 15-minute rainfall intensities required to generate a 50 percent likelihood of debris flows for each basin across the burned area. The fire-wide, 15-minute rainfall intensity threshold is 30.5 mm/hr (1.2 in/hr). Because this area and nearby areas effected by wildfire typically have no reported debris flows, and because we did not encounter strong field evidence suggestive of historic debris flow activity, the results likely overpredict debris flow likelihood in the Gifford Fire.

Debris Flow Model Accuracy and Limitations

For basins burned in the Gifford Fire, the results of the USGS debris flow model (Staley et al., 2016) produce a relative indication of potential postfire watershed response and may not accurately predict debris-flow likelihood or volume for a given design storm. In steep basins, the model predicts high likelihood of debris flows (Fig. 7), especially along the southern boundary of the fire. Evidence of historic, large-volume debris flows was minimal. Steep channels were typically bedrock or boulder-rich with minimal dry ravel limiting sediment supply for debris flows. Because of these reasons, we expect that moderate- to large-volume debris flows will be uncommon after the fire and will only be triggered during extreme precipitation events in steep, headwater basins.

The USGS model results do not constitute a site-specific analysis of debris-flow hazards. Additional on-the-ground evaluation should be conducted by qualified and licensed professionals where necessary and appropriate rather than taking the model results at face value. The model results are also limited in that they do not show hazards for basins that are less than approximately 5 acres in area. For areas not shown as having a debris flow hazard along a segment that is associated with a drainage network, a hazard may still be present yet undefined because the segment model results are limited based on the resolution of the input digital elevation model (DEM). Additionally, other hillslope processes such as rockfall, debris slides, and deep-seated slides are not included in the model results.

It should also be noted that the debris-flow model does not predict runout and inundation areas beyond the modeled source basin and does not consider potential increased hazards from multiple storm events that may load channels with sediment that could be entrained in future debris flows.

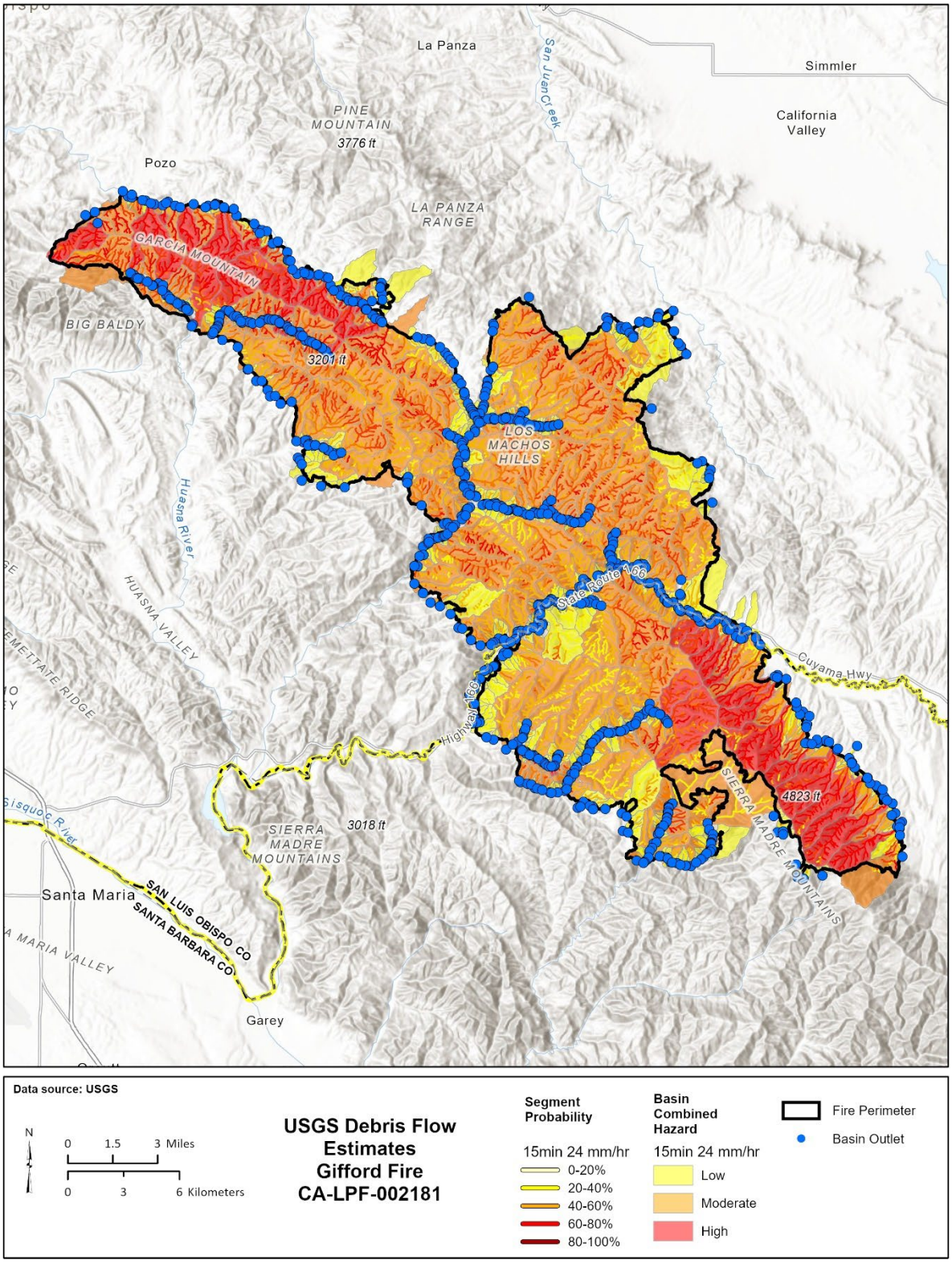


Figure 7. Combined debris flow hazard for the Gifford Fire for a 24 mm/hr (0.94 in/hr) 15-minute storm event.

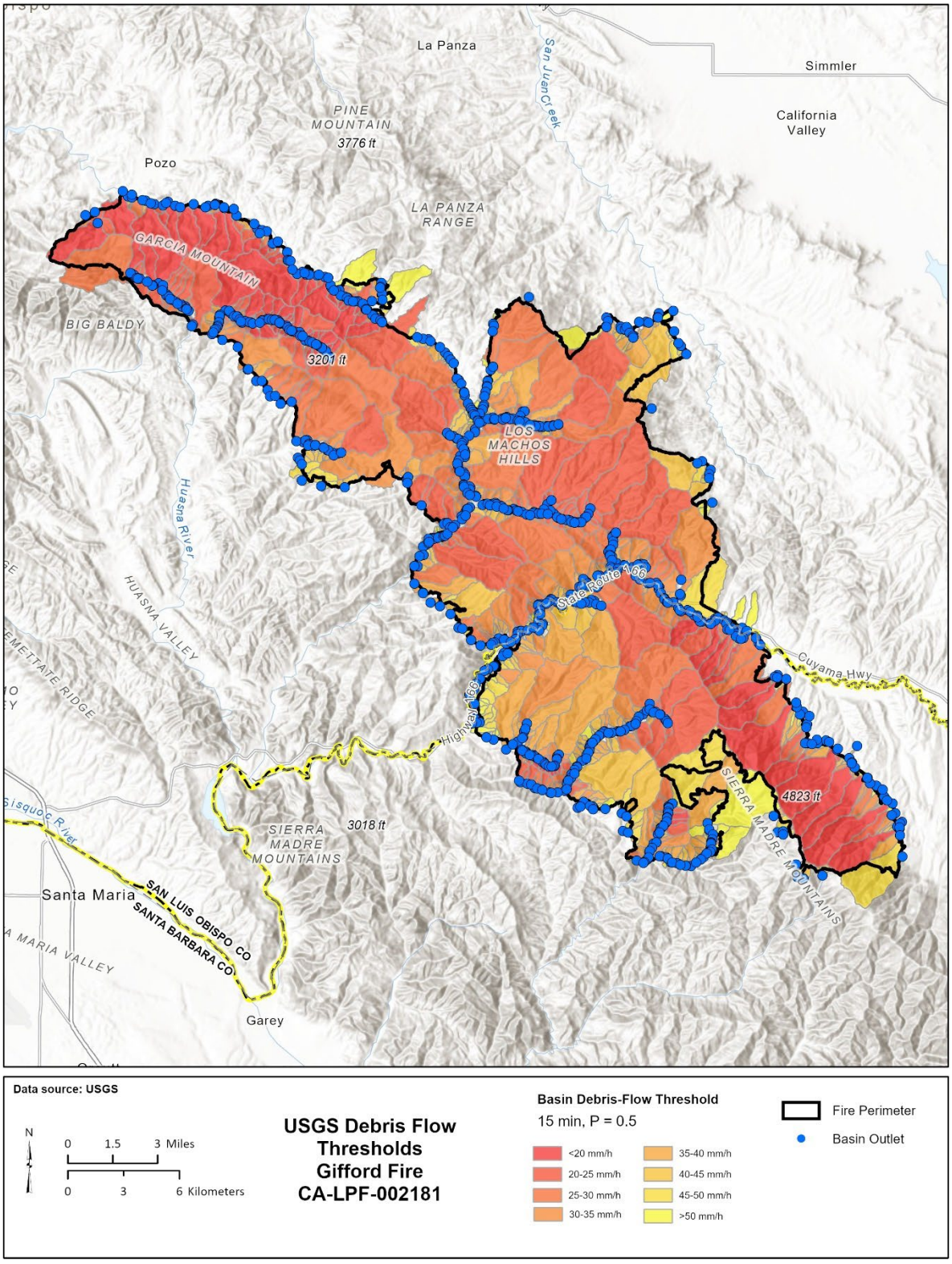


Figure 8. Predicted 15-minute rainfall intensity with a 50 percent likelihood of triggering a debris flow for the Gifford Fire.

Postfire Hydrology

Peak flows typically increase following wildfire due to reduced vegetation, surface cover, and infiltration rates, and the formation of water repellent soils. The largest peak flows occur during intense, short-duration rainfall events in watersheds with steep slopes (Neary et al., 2005). Research conducted in southern California indicates that postfire peak flows can increase as much as 30-fold for moderate storms (0.1- to 5-year recurrence interval) and approximately 2- to 3-fold for large magnitude storms (5- to 100-year recurrence interval) (Rowe et al., 1949; Moody and Martin, 2001). Kinoshita et al. (2014) reported that commonly used flood flow prediction methods have lower confidence with larger recurrence interval events (25- and 50-year). We chose to analyze pre- and postfire flows assuming a 2-year storm event because of the higher confidence in predicting postfire impacts and because 2-year storm events are more likely to occur relative to longer recurrence interval storms in the few years following wildfire when postfire impacts are highest.

The WERT selected five “pour points” (PP) to estimate potential postfire peak flow increases to Values-at-Risk (VAR) from flood to debris flood hazards. Figure 11 shows the five pour point locations that include catchments with identified VARs in or downgradient of the burned area. The pour points represent elevated flood and debris flood hazards to private and public roads and residential developments. Pour points located close to or within watersheds burned at moderate and high soil burn severity (SBS) yield larger postfire flow increases than those far below the fire perimeter or burned at lower severity.

Prefire peak flow estimates were first produced for the five pour point watersheds using the Central Coast USGS regional regression equations for 2-year recurrence interval discharges (USGS StreamStats, 2025; Gotvald et al., 2012). Changes in postfire peak flows were estimated using two methods. The first method used procedures outlined by USFS BAER teams (unpublished), referred to here as the BAER method. The BAER method uses the proportions of the watershed that are unburned and burned at low, moderate, and high SBS to account for postfire runoff increases. For this analysis, the postfire, 2-year recurrence interval flow was estimated by assuming areas that are unburned or have low SBS undergo no change in runoff (Q2); runoff from moderate SBS areas were assumed to respond similarly to a 10-year recurrence interval discharge (Q10); and runoff from the high SBS areas are assumed to respond similarly to a 25-year recurrence interval discharge (Q25). Applicable USGS regression equations for the Q2, Q5, Q10, and Q25 flows were applied to each category (USGS StreamStats, 2025; Gotvald et al., 2012). The area-weighted flow estimates by soil burn severity class were then summed to derive the runoff response that would typically generate a postfire, 2-year peak flow. Because the USGS regression equations were developed using gaged streamflow data spanning a wide range of flow conditions, including flow that was bulked by sediment and debris following fire, an additional bulking factor that accounts for sediment loading was not applied to estimate postfire peak flow.

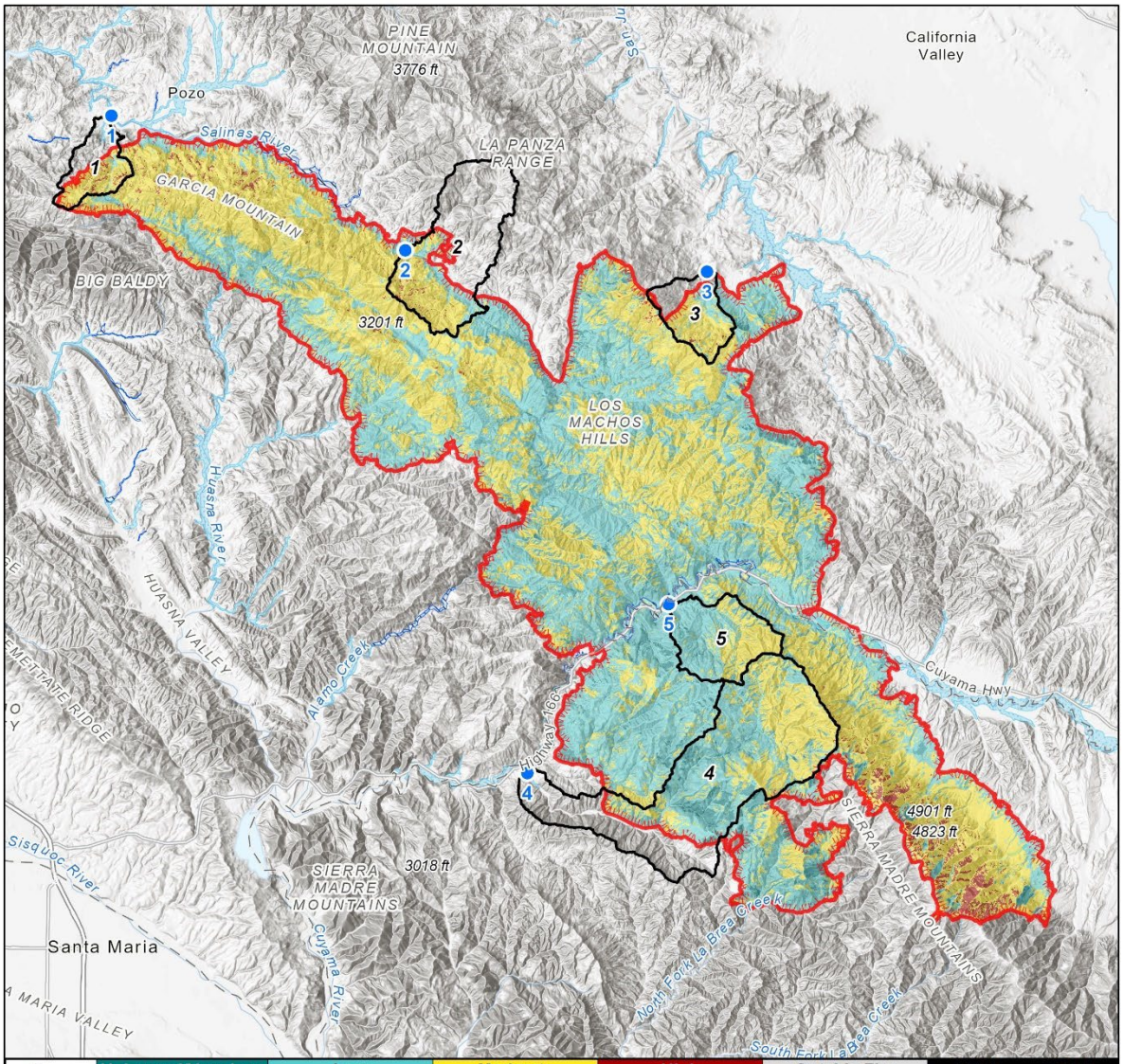
The second method estimates postfire peak flow using Moody’s level 2 empirical model (Moody, 2012) and calculates a post-fire runoff coefficient for a burned watershed as a function of mean difference in normalized burn ratio (dNBR), 30-minute rainfall intensities in excess of 7.6 mm/h (0.3 in/h), and basin area in square kilometers.

Field experience shows that the BAER method generally underestimates peak flows in central California, particularly for short return-period storms (< 5 year recurrence interval, RI) and for small watersheds that respond quickly to high-intensity, short-duration (< 30 min.) rainfall.

Conversely, Moody's (2012) empirical model, which is derived using data from geoclimatic unique regions along the front range of the Rocky Mountains and from southern California and northern Nevada, generally overestimates peak flows in central California.

To account for the range in model results, we present low (BAER method), high (Moody method), and average (mean of both methods) flow estimates at the five pour points (Table 3). The predicted postfire peak flow for the 2-year storm events were then compared to flow frequencies derived for each modeled watershed using the USGS Regional Regression Equation for the Central Coast (StreamStats, 2025; Gotvald et al., 2012) and reported in Table 3. Results indicate that the 2-year storm can result in postfire flows that have flow multipliers (defined here as the ratio of Q2 postfire/Q2 prefire) ranging between 2.3 to 11 and can result in average flow responses equivalent to 5- to 29-year recurrence interval floods. The estimated flow results calculated by these two approaches assume bulked-flow conditions. Flooding in excess of the postfire responses presented here may occur within steep watersheds burned at moderate or high that will be responsive to short-duration, high-intensity rainfall. Examples of basins meeting these conditions are in the southeastern portion of the burned area that drain the eastern flank of the Sierra Madre Mountains. Moreover, excessive flooding may also occur at tributary confluences, bridges directly below tributary confluences, or other areas that trap large wood if high volumes of woody debris are transported.

Postfire discharge can be estimated by multiplying a relevant flow multiplier (Table 3) to prefire discharge estimated with the USGS Regional Regression Equations (StreamStats) at the point of interest in a basin. The reported postfire flow estimates are intended for emergency response planning purposes only and are not to be used for design. Moreover, they are most appropriately applied to flows within the first year following the fire or until ground cover within the burned area is well established. As knowledge is obtained through monitoring the runoff response of stressing storms in the first wet season after fire or as the slopes in the watersheds become revegetated, these flow multipliers may be adjusted down to decrease predicted postfire flows and reduce conservatism.



Pour Point	Unburned/Very Low		Low		Moderate		High		Outside Fire		Total	Total
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	km²
PP-01	16.8	0.8	92.2	4.6	922.7	46.5	83.6	4.2	871.1	43.9	1,986.4	8.04
PP-02	58.9	0.9	775.0	11.7	1,857.4	27.9	69.7	1.0	3,887.7	58.5	6,648.7	26.91
PP-03	42.2	1.8	473.1	20.2	1,189.4	50.8	24.9	1.1	613.6	26.2	2,343.2	9.48
PP-04	761.8	5.4	5,325.7	37.5	4,504.6	31.7	2.5	0.0	3,612.1	25.4	14,206.7	57.49
PP-05	80.5	2.3	2,063.6	58.0	1,412.7	39.7	0.0	0.0	0.0	0.0	3,556.8	14.39

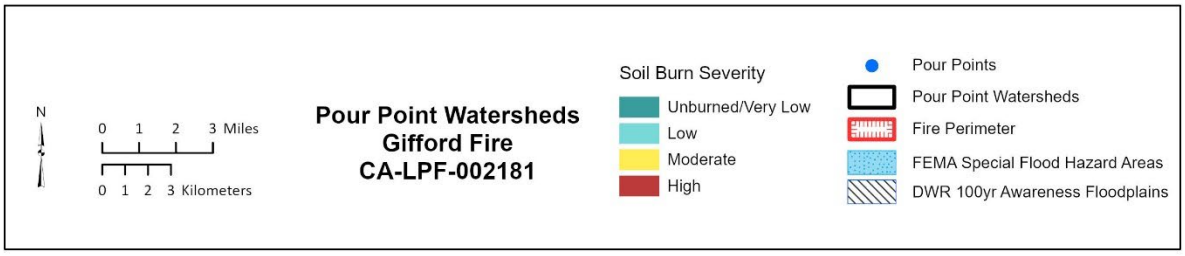
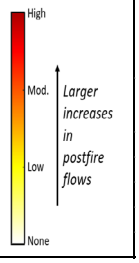


Figure 11. Pour Point locations for the Gifford Fire.

Table 3. Basin metrics, pre- and postfire Q2 flow estimates, postfire Q2 recurrence intervals, and prefire Q2 flow multipliers used to estimate increased relative flood response for watersheds assessed for flood hazard (i.e., “Pour Points”).

Pour Point #	Description	Anticipated flow type based on channel morphology and historic record	Basin Area (mi^2)	Relief (feet)	Mean Basin Elevation (feet)	% Unburned/very low	% Low SBS	% Moderate SBS	% High SBS
PP-01	W Pozo Rd	Flood Flow	3.10	1832	2111	45	5	46	4
PP-02	Avenales Ranch Rd	Flood Flow	10.39	2377	2449	59	12	28	1
PP-03	Rogers Crk	Flood Flow	3.66	1973	2778	28	20	51	1
PP-04	Pine Canyon	Flood Flow	22.20	3316	2276	31	37	32	0
PP-05	Clear Creek	Flood Flow	5.56	2087	2068	2	58	40	0

Pour Point #	Description	Q2 prefire flow (CFS)[1]	Q2 postfire flow (CFS) following BAER[2]	Q2 postfire flow (CFS) following Moody[3]	Average Q2 post-fire flow (CGS) average between BAER and Moody	Average postfire flow equivalent recurrence interval (RI) (Gotvald, 2012)	Q2 prefire to postfire flow multiplier (Postfire Q2/Q2) for Flood-Debris Flood/ Debris Flow[4]			Interpreted Postfire Response[5]
							Low (BEAR[2])	High (Moody[3])	Average	
PP-01	W Pozo Rd	69	206	424	315	10yr - RI	3.0	6.1	4.6	
PP-02	Avenales Ranch Rd	179	410	702	556	5yr - RI	2.3	3.9	3.1	
PP-03	Rogers Crk	71	235	534	385	12yr - RI	3.3	7.6	5.4	
PP-04	Pine Canyon	264	795	2136	1466	11yr - RI	3.0	8.1	5.6	
PP-05	Clear Creek	76	292	843	567	29 yr - RI	3.9	11.1	7.5	



[1]2-yr Recurrence Interval (Q2) flow estimated using USGS regional regression equations (basins between 0.04 to 850 mi^2) (Gotvald, 2012).

[2]Postfire, 2-yr Recurrence Interval storm (Q2) flow (clearwater) following BAER protocol based on Soil Burn Severity: non&verylow = Q2; low = Q5; moderate = Q10; High =Q25. See report text for explanation.

[3]Postfire flow using Moody's Level 2 empirical model (Moody, 2012).

[4]Flow multipliers based on BEAR, Moody (2012), and Average of the two methods indicating relative magnitude of prefire to postfire change in peak flow.

[5]Localized flooding in excess of the postfire responses presented may occur immediately downslope of basins burned at a high severity, at tributary confluence, and at crossing structures if high volumes of woody debris and large boulders are transported.

Postfire Hydrologic and Hydraulic Models

The peak flow estimates and flow multipliers summarized in Table 3 are best used to evaluate the relative magnitude of change from prefire to postfire runoff. However, because the methods applied only allow for peak flow to be estimated, they do not provide a complete runoff hydrograph needed to conduct unsteady 1D and 2D hydraulic modeling, which would inform flow conveyance and inundation extent within and downslope of burned areas. Postfire hydraulic modeling is time intensive and is outside the scope of this assessment. Upon request, the WERT can assist in developing postfire runoff hydrographs used to conduct hydraulic modeling.

VAR Observations and Discussion

This evaluation is not intended to be comprehensive and/or conclusive. Additional VARs may be identified through more detailed evaluation by responsible agencies. This includes more detailed site investigation for the development and design of appropriate mitigation measures. Several limitations are summarized below. Not all roadway culverts and bridges in and adjacent to the burned area were evaluated. Some potential VARs were not evaluated, or evaluated from a distance, due to access challenges. VAR evaluation was not conducted within all mapped flood hazard areas that are downstream of the fire perimeter. Risk of flooding in these areas is preexisting and is anticipated to be increased by postfire runoff and/or blockage of drainage structures (e.g., culverts and bridges) by postfire debris. As such, local agencies

should consider these previously mapped hazard areas in addition to the VARs identified in this report.

Specific Values-at-Risk (VARs) are contained within the geodatabase (VAR point and polygon feature classes) created by WERT, and these are the best product for use in response planning because they provide spatial location along with attribute data captured in the field. Detailed observations and potential mitigations are provided in the geodatabase (VAR point and polygon feature classes), VAR summary table (Appendix B), and VAR site information sheets (Appendix C and D). A summary of VARs by relative risk to life and property are shown in Table 4.

Exigent Values-at-Risk

Exigent VARs are those that should receive priority attention for pre-planning and emergency protection measure implementation. Exigent VARs contain high risk to life and/or property (Table 4). No exigent VARs were identified on the Gifford Fire.

VAR Details

The 18 VARs on the Gifford Fire are VARs with low to moderate risk to life and/or property (Table 4). These VARs are discussed below.

Pippin Corner community (SAL-01, SAL-02, SAL-03): Recent flooding during the 9 January 2023 storm occurred along the Salinas River and adjoining Dry Creek tributary through the Pippin Corner community. Multiple outbuildings (SAL-02) were flooded by the Salinas River and Dry Creek, and a well and driveway (SAL-03) were flooded by the Salinas River during the 9 January 2023 storm event. Increased postfire runoff and sediment transport will increase the potential of flooding to the houses, barns, and outbuildings located within or adjacent to the mapped DWR 100-year floodplain of both Dry Creek and the Salinas River. We recommend that the property owners consult a licensed engineer to consider implementing deflection structures, or other mitigation options, to help reduce flood damages to structures adjacent to the channel. Care should be given to the placement of deflection structures to prevent ponding of flood flows behind them, which could flood additional structures in the community. The bridge (SAL-01) directly downstream of VAR SAL-02 at the intersection of Dry Creek and W Pozo Rd also previously flooded during the 9 January 2023 storm event. Increased postfire runoff, sediment transport, and woody debris transport will increase the potential of damage to the bridge. Debris transported downstream may plug the bridge causing it to be overtopped and cut off access. We recommend clearing and maintaining the channel around the bridge as necessary. The property owners and local community should be aware of the potential risks and watch for storm warnings (for example, the National Weather Service Flash Flood Watches and Warnings).

Avenales Ranch Road along Salinas River (SAL-04, SAL-05): A house (SAL-04) is located on the outside bend of the Salinas River and the channel bank has been reinforced. The house is built approximately 5-10 ft above the channel elevation on a terrace surface and is mapped just outside of the DWR 100-year floodplain. As most of the upstream drainage area is large and unburned, increases to postfire runoff are expected to be low and future flooding potential is anticipated to be slightly elevated relative to prefire conditions. The property owners should be

aware of the potential risks and watch for storm warnings (for example, the National Weather Service Flash Flood Watches and Warnings). There is also a bridge (SAL-05) located further upstream along Avenales Ranch Road that crosses the Salinas River. The bridge was damaged and partially burned in the fire and could experience additional damage due to its burned condition. We recommend that a licensed engineer evaluate the burned bridge.

Avenales Ranch Road along Alamo and Rogers Creeks (ALA-01, ROG-01): Homes and outbuildings are directly adjacent to Alamo (ALA-01) and Rogers (ROG-01) Creeks. No evidence of recent flooding was observed at Alamo Creek and minor flooding that did not impact structures was observed at Rogers Creek in January 2023. Increased postfire runoff and sediment transport will increase the potential of flooding to the homes and outbuildings along both Alamo and Rogers Creeks. We recommend that the property owners consult a licensed engineer to consider implementing deflection structures, or other mitigation options, to help reduce flood damages to structures adjacent to the channel. Care should be given to the placement of deflection structures to prevent ponding of flood flows behind them, which could flood structures in the community. The property owners should be aware of the potential risks and watch for storm warnings (for example, the National Weather Service Flash Flood Watches and Warnings).

Highway 166 (HWY166-01, HWY166-02, HWY166-03, HWY166-04, HWY166-05): Multiple basins drain to the Cuyama River along Highway 166. These drainages burned at predominantly low to moderate severity. Multiple culverts (HWY166-01, HWY166-03), structures (HWY166-02), and a bridge (HWY166-05) adjacent to the stream channels may be subject to potential increases in flooding. A 12 x 12 ft box culvert (HWY166-01) with flared headwall inlet along highway 166 is located near the outlet of a tributary (~5.5 mi^2) to the Cuyama River. The culvert inlet may become plugged, potentially sending flood waters into surrounding low-lying areas before re-entering the channel. Aggradation of sediment on the channel bed was observed directly upstream of the culvert, indicating backwater effect that could potentially increase the water level upstream where a barn (HWY166-02) is located adjacent to the channel. We recommend that the property owner consults a licensed engineer to consider implementing deflection structures, or other mitigation options, to help reduce flood damages to structures adjacent to the channel. The property owner should also be aware of the potential risks and watch for storm warnings (for example, the National Weather Service Flash Flood Watches and Warnings). An additional 5 ft CMP culvert with headwall (HWY166-03) along Highway 166 contains a smaller upslope drainage area and is partially plugged with fine sediment. We recommend that both culverts (HWY166-01, HWY166-03) be cleared and/or maintained to facilitate flood conveyance. There is also a recently built bridge (HWY166-05) that spans the full channel near the intersection of Gifford Ranch Road and Highway 166 and there is no evidence of recent overtopping. Although the bridge is potentially subject to flood flows, overtopping is unlikely to occur, and the 6-8 ft of freeboard will likely facilitate flood conveyance.

Pine Canyon Road (PC-01, PC-02, PC-03, PC-04, PC-05): Multiple homes and cattle corrals are located along Pine Canyon Road/Miranda Pine Road within Pine Canyon. A large portion of the drainage area burned at low to moderate burn severity. Homes, outbuildings, fencing, and cattle corrals adjacent to the stream channel (PC-01, PC-02, PC-03) may be subject to flooding. A home and outbuildings near the mouth of the canyon (PC-01, PC-02) are within the DWR 100-year floodplain and are elevated above the active channel. Further upstream there is a

water tank (PC-04) at the base of a small, steep basin burned at low to moderate burn severity that is vulnerable to debris flows/floods, but the adjacent channel is incised which will likely divert flow around the water tank. There is also a mobile home (PC-05) that is located at the base of an actively eroding shallow landslide that likely failed prior to Gifford Fire. We recommend that the property owners consult a licensed engineer to consider implementing deflection structures, or other mitigation options, to help reduce damages to the mobile home at the base of the hillslope.

Kelsey Canyon (KC-01): A home and propane tanks are directly adjacent to the stream channel in Kelsey Canyon and vulnerable to debris flows/floods. We recommend that the property owners consult a licensed engineer to consider implementing deflection structures, or other mitigation options, to help reduce flood damages to structures adjacent to the channel. We recommend clearing the channel of large woody debris in the vicinity of the structures to enhance flow capacity. This activity may fall under the jurisdiction of the County, US Army Corps of Engineers, and other State and Federal agencies. The property owner should be aware of the potential risks and watch for storm warnings (for example, the National Weather Service Flash Flood Watches and Warnings).

Foothill Road and surrounding roadways: Hazards exist to transportation corridors that allow ingress and egress along Foothill Road and surrounding roads. If these transportation corridors are affected by postfire hazards, they may leave residents stranded after storm events, damage the road, and prevent the delivery of emergency services to these residents.

Table 4. Values-at-Risk (VARs) classified by risk to life and property. Risk to life encompasses all potential direct and indirect postfire geohazard risks (e.g., debris flows, debris floods, landslides, rockfall, floods) that may cause injury or death to humans.

		Risk to Life		
		Low	Moderate	High
Risk to Property	Low	HWY166-02, HWY166-03, HWY166-04, HWY166-05, PC-01, PC-02, PC-03, PC-04, PC-05, ROG-01, SAL-01, SAL-03, SAL-04		
	Moderate	ALA-01, HWY166-01, KC-01, SAL-02, SAL-05		
	High			

Key Infrastructure

Key infrastructure within and downslope of the Gifford Fire perimeter includes reservoirs, high tension power lines, and roads. Monitoring, maintenance, and repair costs to roads and flood-control infrastructure are expected to be high relative to prefire costs until the Gifford Fire burned area revegetates and recovers. The recovery period typically takes 2 to 5 years but may occur faster in some areas where the soil burn severity is less severe.

Public road and storm drain network potentially affected by the Gifford Fire was not completely evaluated during the WERT investigation. All roads, stream crossings, and drainages structures downstream and downslope of burned hillslopes are at risk of storm damage and may become plugged and overtopped, leading to crossings being compromised and access restricted.

Due to the prevalence of steep slopes and postfire impacts to soil, nuisance flooding of muddy flows is likely to occur along roads inside the fire perimeter and especially along roads at the base of mountain slopes. Many small drainages flow directly to roads and signage should be installed along these roads to warn drivers of the flooding risks.

Crossings and drainage associated with county roads within and downstream of the burned area should be evaluated and maintained as soon as possible after significant storm events. **We recommend receiving regional alerts (for example, the National Weather Service) and watching storm forecasts so problematic roads can be avoided during storms.**

Rockfall Hazards exist where cliffs and hillslopes are steep and produce cobble- and boulder-sized clasts. Increased rock exposure and root damage from the fire will increase in areas with pre-existing rockfall hazards.

General Hazards to Water Quality

Five structures were reported to be destroyed in the Gifford Fire. Destroyed structures adjacent to watercourses have the potential to transfer contaminated soils, large and small debris, and hazardous materials into waterways which can impact water quality downstream. Based on current understanding of impacts on burned residential homes and structures from wildfires, the resulting ash and debris can contain concentrated and toxic amounts of polycyclic aromatic hydrocarbons and heavy metals such as antimony, arsenic, cadmium, copper, lead, and zinc.

The characterization of hazardous materials and their impacts on the environment and water resources is outside the purview of the WERT and is generally under the review of other State and Federal Agencies, such as the State Water Quality Control Board, the Department of Toxic Substances Control, the California Department of Office of Emergency Services (Cal OES), the California Department of Conservation's Geological Energy Management Division (CalGEM), and the Federal Environmental Protections Agency. To protect water quality and human health from burned structures, local agencies may request assistance from the Cal OES Watershed Mitigation, Coordination, and Outreach unit to deploy emergency protective measures (EPMs) in areas with high potential for hazardous material runoff and increased sedimentation within the watershed.

General Recommendations

Implement an Early Warning System

An effective early warning system requires the implementation of different components (Fig. 12) for hazard and risk reduction, as well as linkages between these components so that the goals of protecting life, safety, and property are accomplished. In previous sections, this report characterizes the spatial distribution of hazard and risk within and downstream of the burned area, greatly increasing knowledge about potential risk from postfire hazards. This report also contains a fire-specific rainfall threshold to be used as a trigger point for forecast-based watches and warnings. Each VAR is characterized by the potential postfire hazard, relative risk from the hazard, and the potential emergency protective measures that can be implemented for risk reduction. The granular nature of VAR characterization allows for more targeted communication and response planning by emergency responders, public works/flood control agencies, and other entities tasked with implementing risk reduction activities (e.g., NRCS).

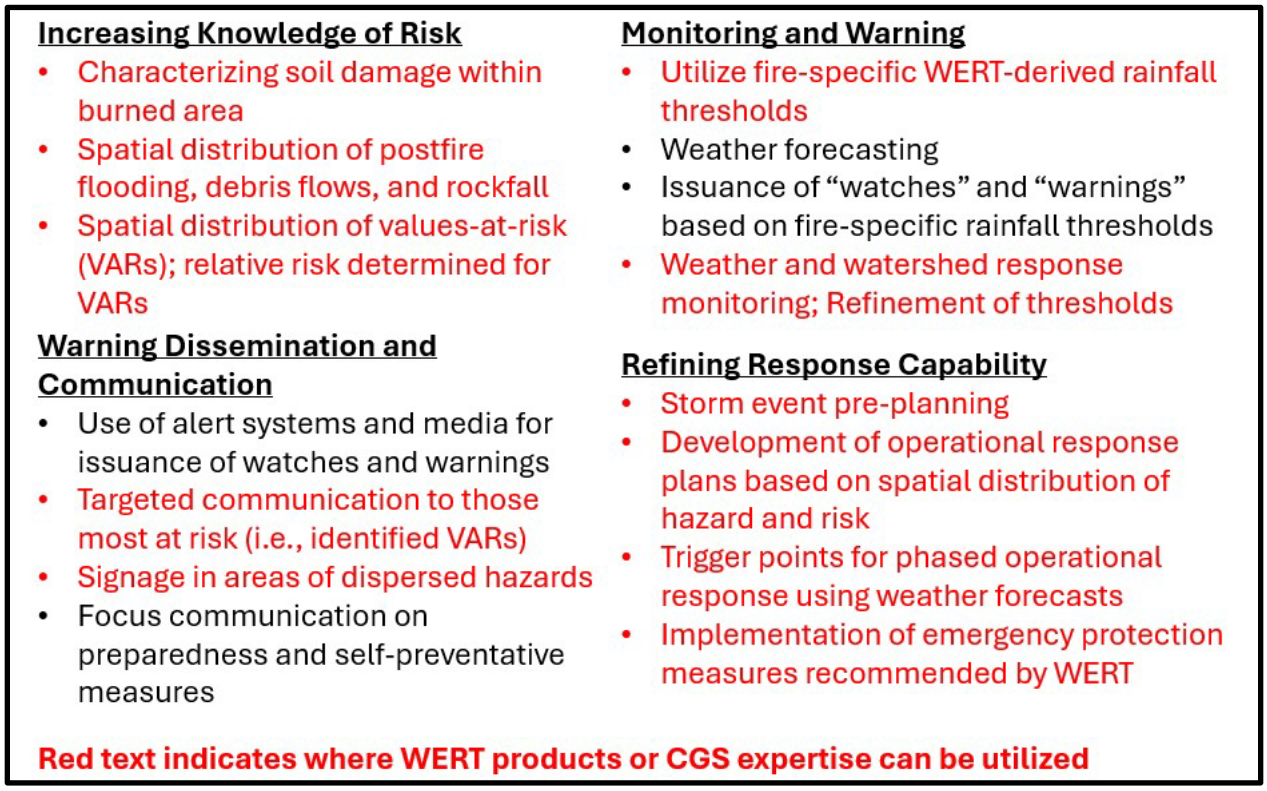


Figure 12. The four components of "people-centered" early warning systems (adapted from Garcia and Fearnley, 2012), along with steps necessary to implement each component specific to minimizing risks from postfire watershed hazards. This WERT report provides knowledge to implement each of these components in a manner specific to the fire.

Prescribed Rainfall Thresholds

Initial rainfall thresholds in the first year following fire are determined by WERT for the Gifford Fire by considering data such as the USGS modeled rainfall thresholds, regional debris-flow thresholds, previous flood and rainfall history, geologic/geomorphic conditions of the burned area, and the hazard and relative risk associated with each VAR. Shell Peak (35.072°, -

120.190°), which is immediately to the west of the fire perimeter, has a 2-yr 15-minute rainfall intensity of 1.22 in/hr (NOAA Atlas 14), which is similar to the fire-wide, 15-minute rainfall intensity threshold of 1.2 in/hr predicted from the USGS debris flow likelihood model. Near the northeastern boundary of the fire above SAL-01 to SAL-03, the Garcia Mountain ridgeline (35.274°, -120.390) has a higher 2-yr 15-minute rainfall intensity of 1.49 in/hr (NOAA Atlas 14). Thresholds assigned to the nearby 2024 Lake Fire were inside the range of these two values. Small debris flows in steep basins were reported during a storm in February 2025 following the Lake Fire and triggered by 15-minute rainfall intensity measured nearby that was below the prescribed threshold. Because the number and size of debris flows were small following the Lake Fire for sub-threshold rainfall intensities, limited evidence of prior debris flows in the Gifford Fire area exists, and limited sediment supply in channels was observed, we implemented the same rainfall intensity thresholds that were used for the Lake Fire (Table 5).

Table 5. Year 1 rainfall thresholds for the Gifford Fire.

Duration	***Year 1 Threshold Intensity mm/hr (in/hr)***	***Year 1 Threshold Depth mm (in)***	***Recurrence Interval***
15 minutes	36 (1.40)	9 (0.35)	~2 year
30 minutes	25 (1.00)	13 (0.50)	~2 year
60 minutes	18 (0.70)	18 (0.70)	~2 year

The WERT strongly recommends that the San Luis Obispo and Santa Barbara Counties Public Works, San Luis Obispo Office of Emergency Services, Santa Barbara County Office of Emergency Management, and the California Governor's Office of Emergency Services work with the National Weather Service and the California Geological Survey to monitor forecasts and rainfall intensity during storms, as well as observe postfire response following storm events. If the initial rainfall threshold is too conservative, and little response occurs during storm events, data and observations can be used to adjust the threshold upward in a defensible manner. Alternatively, rainfall thresholds can also be lowered based on gage data and observations.

Existing early warning systems should be used and iteratively improved such that residents can be alerted to incoming storms, allowing enough time to safely vacate hazard areas. In areas where cellular reception is poor or non-existent, methods should be developed to effectively contact residents. For example, installation of temporary mobile cellular towers should be considered. Early warning systems for the Gifford Fire should take advantage of the services described below.

Utilize National Weather Service Forecasting

Flash flood and debris flow warnings with practical lead times of several hours must come from a combination of weather forecasts, rainfall measurements of approaching storms, and knowledge of triggering thresholds. The following information is from the National Weather

Service (NWS); they provide flash flood and postfire debris flow “watch” and “warning” notifications in burned areas.

> **Watches** are issued when the likelihood of hazardous weather or a hydrologic event has increased significantly, but it’s occurrence, location, and/or timing is still uncertain. Watches provide lead time for pre-storm planning and response.
>
> **Warnings** are issued when hazardous weather or hydrologic events are occurring, are imminent, or have a very high probability of occurring.

For additional information, see the NWS Los Angeles/Oxnard Forecast Office webpage (https://www.weather.gov/lox/).

Residents Potentially Affected by Postfire Hazards Should Sign Up for Alerts

This report identifies areas within and downstream of the Gifford Fire perimeter with the highest potential for postfire flooding, debris flows, and rockfall. Santa Barbara County has implemented Ready Santa Barbara County (ReadySBC), a state-of-the-art emergency notification system to alert residents and businesses about natural disasters and other crises. The emergency notification system enables Santa Barbara County to provide essential information quickly in a variety of situations, including in the event of fire-induced flooding and debris flows. **Residents can sign up for ReadySBC through the following link**: https://www.readysbc.org/.

Wireless Emergency Alerts (WEA)

Residents should be aware of what to do when receiving an alert through WEA. WEA is an alert system originated by the NWS that can inform residents, visitors, and businesses of flash flood warnings and other potential hazards. WEA alerts are emergency messages sent by authorized government alerting authorities through mobile carriers. Government partners include local and state public safety agencies, FEMA, the FCC, the Department of Homeland Security, and the National Weather Service. **No signup is required**, and alerts are automatically sent to WEA-capable phones during an emergency. Since WEA alerts can be disabled by phone users, residents and businesses potentially subject to hazards associated with the Gifford Fire are urged not to opt out of WEA. You can find more information at the following link: https://www.weather.gov/crp/wea.

Communicating Hazard and Risk Associated with Gifford Fire

Increasing awareness is key to minimizing risk on the Gifford Fire. While the potential for debris flows exists within and downstream of the Gifford Fire, the primary hazard of concern is flooding along waterways that drain the area impacted by the Gifford Fire. These hazards constitute a potential threat to life and property. Residents and property owners downstream of burned areas should be aware that flood severity and frequency may increase. Public outreach should focus on communicating this to these affected residents and property owners.

Residents and property owners downstream of these burned areas recently experienced flooding from a storm on 9 January 2023. This storm caused flooding in and downstream of the Gifford Fire. Postfire increases in runoff response indicate that a 2-yr, short duration storm could result in a similar response as the 2023 storm in small (< 2 mi^2) basins burned mostly at

moderate soil burn severity. In larger basins (> 2 mi^2), particularly those with less than 50% burned at moderate burn severity, the storm required to match the 2023 runoff event would require more intense, longer-duration rainfall. Unpaved roads are likely to be damaged during intense storms, limiting ingress and egress. Public outreach should focus on communicating these findings to affected residents and property owners.

The following links are to additional information about postfire geohazards:

- CGS Burned Watershed Geohazards website: https://www.conservation.ca.gov/cgs/bwg/program
- CAL FIRE post wildfire safety website: https://readyforwildfire.org/post-wildfire/
- Cal OES postfire geohazards article: https://news.caloes.ca.gov/flood-after-fire-preparing-for-the-post-disaster-danger
- FEMA postfire factsheet: https://www.fema.gov/sites/default/files/documents/fema_flood-after-fire_factsheet_nov20.pdf

Response Planning for the Gifford Fire

An objective of the WERT process is to provide operational intelligence to those tasked with implementing risk reduction activities (e.g., emergency planners, fire departments, flood control agencies). WERT information should be used to narrow the decision-space for operational planning, strategy, and tactics. Key information provided by the WERT is listed below.

- VAR location (map and spatial data)
- Whether the VAR is a discrete structure (point) or a grouping of structures (polygon)
- The types of hazards posing risk to the VAR
    - The report discusses whether hazards are debris flows, debris flood/flooding, or rockfall
- What is the relative risk to life and/or property?
    - Relative risk is characterized as low, moderate, and high
    - Response efforts should prioritize VARs with moderate to high life and/or property risk
    - Low risk is associated with a nuisance level of hazard
- Emergency protective measures are recommended to reduce risk
    - WERT does not design direct protection measures (e.g., deflection structures)
    - Some measures need more intensive evaluation and design to reduce risk

Informing and empowering the public is a key step in risk reduction. Santa Barbara County has resources listed that can help reduce risk from postfire flooding and debris flows. This includes tips for storm preparedness guidelines, links to weather resources (i.e., rain gages and weather radar), and links for purchasing flood insurance.

https://www.readysbc.org/576/Stormeadiness

The WERT recommends that local government conduct public outreach so that residents and property owners can make informed decisions that reduce their risk exposure to postfire hazards.

Utilize NRCS's EWP Program to Implement Emergency Protection Measures

The National Resource Council Service's (NRCS) Emergency Watershed Protection (EWP) Program offers technical and financial assistance to help local communities relieve imminent threats to life and property caused by disasters such as wildfires. Many of the VARs documented in the Gifford Fire are associated with hazards such as flooding and sedimentation which may not necessarily pose a risk to life and safety but can result in significant damage to residential properties. In many instances, these risks can be mitigated with carefully designed emergency protective measures. NRCS provides planning, design, and construction oversight of the potential recovery measures. NRCS may also pay up to 75 percent of the cost of the recovery measures, and up to 90 percent when communities are designated as limited resource areas. However, NRCS must work with a project sponsor to provide EWP Program assistance. Project sponsors must be a state, a state agency, a legal subdivision of a state government, a local unit of government (i.e., county or city), or a Native American Tribe or Tribal organization with a legal interest in or responsibility for the areas threatened by a watershed emergency.

For sponsors, the point of contact for the EWP Program for the Gifford Fire is the following:

> Emma Chow-District Conservationist
> (805) 863-9926
> Emma.Chow@usda.gov

Additional information on the NRCS's EWP Program can be found at:
https://www.nrcs.usda.gov/programs-initiatives/ewp-emergency-watershed-protection

Road Drainage Systems, Storm Monitoring, and Storm Maintenance

Due to the presence of areas burned at moderate and high soil burn severity, increased flows on slopes and onto the road and storm drain systems can be expected. Increased erosion can inundate roads and plug these drainage systems. Flows could be diverted down roads and cause erosion and possible blockage, and/or loss of portions of the road infrastructure and structures along roads. The WERT did not evaluate the potential for rockfall, sedimentation, flooding, or debris-flow hazards at all roads or watercourse crossings along federal, state, county, or municipal road corridors. Existing road drainage systems should be inspected by the appropriate controlling agency to evaluate potential impacts from floods, debris floods, debris flows, and sedimentation resulting from storm events. Equipment should be staged in areas where risk is high and access is necessary. Spatial data generated by the USGS and the WERT (e.g., USGS debris-flow model and flood flow predictions) can be used to screen potential at-risk areas for increased monitoring and maintenance presence.

Rockfall Hazards

Rockfall hazards exist along roads where cliffs or steep hillslopes with cobbles and boulders are present. Due to the rapid nature of the evaluation, a fully comprehensive evaluation of rockfall hazard was not possible. Many low traffic roads inside the fire perimeter may experience rockfall and travelers should be cautious of rockfall hazards.

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Appendix A – WERT Contact List

Appendix A—Gifford Fire WERT Contact List

Gifford Fire WERT Contact List

Name	Affiliation	Position	Phone	Email
Scotty Jalbert	San Luis Obispo County OES	Director	805-781-5678	SJalbert@co.slo.ca.us
Trevor Keith	San Luis Obispo County P&B	Director	805-781-2670	TKeith@co.slo.ca.us
Kelly Hubbard	Santa Barbara County OEM	Director	805-319-0110	KHubbard@countyofsb.org
Pat Byde	Santa Barbara County Fire	Division Chief-Ops.	805-681-5503	PByde@countyofsb.org
Dave Erickson	CAL FIRE-San Luis Unit	Forester I	805-903-3406	David.Erickson@fire.ca.gov
Garrett Veyna	CAL FIRE-San Luis Unit	Assistant Chief	805-903-3404	Garrett.Veyna@fire.ca.gov
Matt Griffin	Santa Barbara Flood Control	Engineering Manager	805-568-3444	MGriff@countyofsb.org
Floyd Holmes	Santa Barbara Flood Control	Maint. Superintendent	805-568-3440	FHolmes@countyofsb.org
Walter Rubalcava	Santa Barbara Flood Control	Deputy Director (P.E.)	805-896-6468	WRubalc@countyofsb.org
Alex Doran	Santa Barbara Flood Control	Hydrology	805-568-3440	ADoran@countyofsb.org
Chris Sneddon	Santa Barbara Public Works	Director	805-568-3008	CSneddo@countyofsb.org
Mostafa Estaji	Santa Barbara Transportation	Deputy Director	805-568-3064	MEstaji@countyofsb.org
Udy Loza	Santa Barbara Transportation	Maintenance Manager	805-455-3323	ULoza@countyofsb.org
Matt Young	Santa Barbara County Water	Program Manager	805-568-3546	MCYoung@cosbpw.net
Emma Chow	USDA NRCS	Dist. Conservationist	805-345-8612	Emma.Chow@usda.gov
Doug Toews	USDA NRCS (retired)	Engineer (P.E.)	808-265-2688	Doug_Toews@msn.com
Ariel Cohen	NOAA NWS – Oxnard	Meteorologist	805-988-6626	Ariel.Cohen@noaa.gov
John Dumas	NOAA NWS – Oxnard	Meteorologist	805-988-6626	John.Dumas@noaa.gov
Jonathan Schwartz	USDA FS-LPF	Geologist/BAER	805-698-9752	Jonathan.Schwartz@usda.gov
Emily Fudge	USDA FS-CNF	Hydrologist/BAER Lead	619-430-3092	Emily.Fudge@usda.gov

Appendix B – Values-at-Risk Summary Table

Gifford Fire
Values-at-Risk Table

Site Number	Community / Local Area	Latitude	Longitude	Potential hazard / Field observation	Remarks	Hazard Category	Specific at-risk feature	Feature Category	Potential hazard to life	Potential hazard to property	Expected Probability	Expected Consequence	Risk Level	EPM	EPM2	EPM3	EPM4	EPM Text
ALA-01	Avenales Ranch Rd			Increased postfire runoff and sediment transport will increase the potential of flooding to homes and outbuildings. Possible probability of occurrence with moderate consequence = INTERMEDIATE RISK.	Alamo Creek is immediately behind homes and outbuildings. No evidence of recent flooding to structures.	flood	House and outbuildings	multiple	low	moderate	possible	moderate	intermediate	Early Warning	Deflection structure	Sandbags		
HWY166-01	Highway 166	35.096645	-120.122659	Increased postfire runoff and sediment transport will increase the potential of blockage at the culvert inlet. Possible probability of occurrence with minor consequence = LOW RISK.	Box culvert 12 x12 ft with flared headwall inlet. Aggradation directly upstream of culvert, indicating backwater effect.	flood	Culvert	drainage structure	low	moderate	possible	minor	low	Early Warning	Clear and maintain culvert			
HWY166-02	Highway 166			Increased postfire runoff and sediment transport will increase the potential of flooding to base of barn and fence. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.	If downstream culvert becomes blocked and back water occurs the risk to barn could be elevated.	flood	Barn/outbuildings	other	low	low	unlikely	minor	very low	Early Warning	Deflection structure			
HWY166-03	Highway 166	35.101955	-120.109051	Potential blockage of culvert could cause flows to back up before draining through secondary culvert. Likely probability of occurrence with minor consequence = LOW RISK.	5 ft CMP with headwall that is partially plugged by 3 ft of aggraded sediment.	debris flow / flood	Culvert/road prism	drainage structure	low	low	likely	minor	low	Early Warning	Clear and maintain culvert			
HWY166-04	Highway 166/Rock Front Ranch			Increased postfire runoff and sediment transport will increase the potential of flooding horse stables/corrals. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.	Multiple structures above channel on terrace are located within the DWR 100 year awareness floodplain.	flood	Horse stables/corrals	multiple	low	low	unlikely	minor	very low	Early Warning				
HWY166-05	Highway 166	35.096090	-120.059865	Increased postfire runoff and sediment transport will increase the potential of flooding to bridge. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.	Free spanning bridge that spans full channel and contains 6-8 ft of freeboard. Recently built bridge with no evidence of recent overtopping.	flood	Bridge	drainage structure	low	low	unlikely	minor	very low	Early Warning				
KC-01	Kelsey Canyon	34.999725	-119.923898	Increased postfire runoff and sediment transport will increase the potential of flood or debris flood impacting propane tanks and house located at top of bank. Possible probability of occurrence with moderate consequence = INTERMEDIATE RISK	Clear large woody debris in channel.	debris flow / flood	Home/propane tanks	home	low	moderate	possible	moderate	intermediate	Early Warning	Deflection structure			
PC-01	Pine Canyon			Increased postfire runoff and sediment transport will increase the potential of flooding to homes and outbuildings. Unlikely probability of occurrence with moderate consequence = LOW RISK.	Structures elevated above active channel on floodplain terrace. Large portion of upslope drainage area burned. Mapped in DWR 100 year floodplain.	flood	Residential structures/out buildings	home	low	low	unlikely	moderate	low	Early Warning	Deflection structure			
PC-02	Pine Canyon	35.022235	-120.190977	Increased postfire runoff and sediment transport will increase the potential of flooding to RV trailer/picnic area. Possible probability of occurrence with minor consequence = LOW RISK.	Channel and bank have been modified to increase channel capacity. RV trailer is elevated above incised channel bank. Mapped in DWR 100 year floodplain.	flood	RV trailer/picnic area	home	low	low	possible	minor	low	Early Warning	Deflection structure			
PC-03	Pine Canyon			Increased postfire runoff and sediment transport will increase the potential of flooding to outbuilding, fences, and cattle corral. Possible probability of occurrence with minor consequence = LOW RISK.	Multiple features within potential flow paths include shade structures, cattle corral, and fencing adjacent to active channel.	flood	Outbuilding/fencing	multiple	low	low	possible	minor	low	Early Warning				
PC-04	Pine Canyon	35.008147	-120.147096	Increased postfire runoff and sediment transport will increase the potential of flooding/debris flow to water tank at outlet of burned drainage. Possible probability of occurrence with minor consequence = LOW RISK.	Adjacent channel is incised. Shallow slope instability upslope of tank.	debris flow / flood	Water tank	utilities	low	low	possible	minor	low	Deflection structure				
PC-05	Pine Canyon	35.007408	-120.145816	Shallow slope instability upslope of mobile home. Possible probability of occurrence with minor consequence = LOW RISK.	Mobile home at base of shallow translational slide that likely had failure pre-fire.	landslide	Mobile home	home	low	low	possible	minor	low	Deflection structure				
ROG-01	Rogers Creek			Increased postfire runoff and sediment transport that will increase the potential of flooding to homes and outbuildings. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.	Minor flooding in January 2023 that did not impact structures. A large portion of the upstream area was burned at moderate.	flood	Houses and outbuildings	multiple	low	low	unlikely	minor	very low	Early Warning	Deflection structure			
SAL-01	Pippin Corner on the Salinas River	35.298676	-120.405484	Increased postfire runoff and sediment transport will increase the potential for overtopping or damage to bridge. Possible probability of occurrence with minor consequence = LOW RISK.	Bridge was previously flooded (storm on ~9 January 2023). Increased postfire runoff, sediment and woody debris transport will increase the potential of damage to the bridge.	flood	Bridge	drainage structure	low	low	possible	minor	low	Early Warning	Monitor and maintain			
SAL-02	Pippin Corner on the Salinas River			Increased postfire runoff and sediment transport will increase the potential of flooding to house and outbuildings. Possible probability of occurrence with moderate consequence = INTERMEDIATE RISK.	Two outbuildings were flooded during the 9 January 2023 storm. One was flooded by Dry Creek and the other was flooded by the Salinas River. Flooding possible from both Salinas River and Dry Creek. Increased postfire runoff and sediment transport will increase the likelihood of flooding. Multiple outbuildings are mapped within the DWR 100 yr floodplain.	flood	House, barns, outbuildings	multiple	low	moderate	possible	moderate	intermediate	Early Warning					
SAL-03	Pippin Corner on the Salinas River			Increased postfire runoff and sediment transport will increase the potential for flooding of home and well site. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.	Driveway and well flooded in January 2023 storm. Flooding occurred up to house. Water was a couple feet deep in driveway.	flood	House. Well near River Road.	home	low	low	unlikely	minor	very low	Early Warning	Deflection structure	Sandbags		

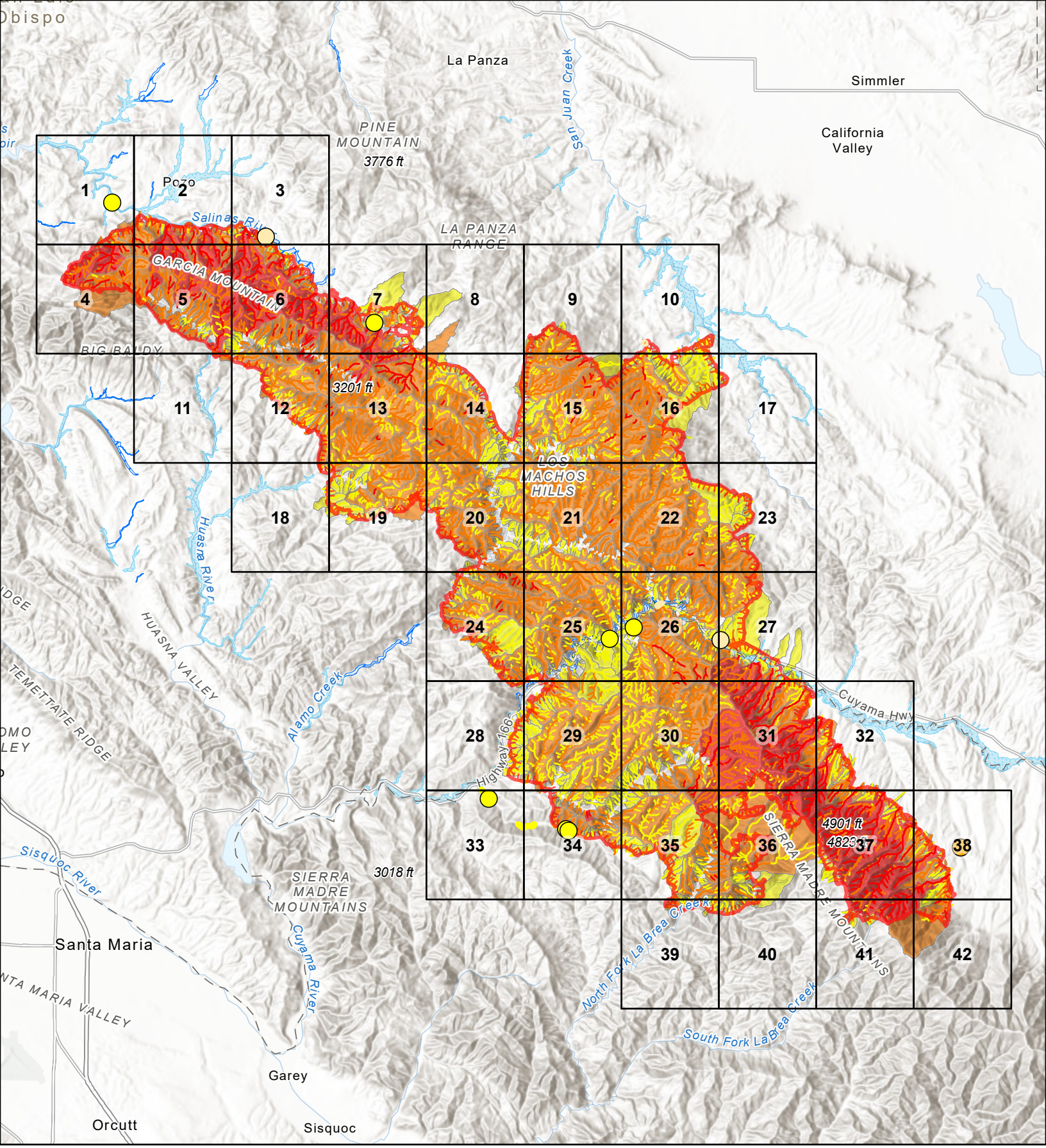
Gifford Fire
Values-at-Risk Table

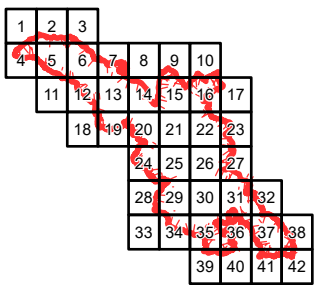
Site Number	Community / Local Area	Latitude	Longitude	Potential hazard / Field observation	Remarks	Hazard Category	Specific at-risk feature	Feature Category	Potential hazard to life	Potential hazard to property	Expected Probability	Expected Consequence	Risk Level	EPM	EPM2	EPM3	EPM4	EPM Text
SAL-04	Salinas River	35.283106	-120.318175	Low increase in postfire runoff expected for the Salinas River. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.	A house is located on the outside bend of the Salinas River and the channel bank has been reinforced. There is approximately 5-10 ft of elevation difference from the channel to the terrace surface where the house was built. The house is mapped just outside the DWR 100 yr floodplain. Because the majority of the upstream area is not burned and the drainage area is high, increases to postfire runoff are expected to be low. Future flooding potential should be considered slightly elevated relative to prefire conditions.	flood	House	home	low	low	unlikely	minor	very low	Early Warning				
SAL-05	Salinas River	35.243235	-120.256441	Damage to bridge on Avenales Ranch Road. Unlikely probability of occurrence with moderate consequence = LOW RISK.	The bridge was damaged and partially burned in the fire. The Salinas River was dry in August 2025 and vehicles were able to drive across the channel. Access will be blocked when the Salinas River is flowing. Bridge could experience additional damage due to its burned state.	flood	Bridge	drainage structure	low	moderate	unlikely	moderate	low	Early Warning	Monitor and maintain			Fire damage should be repaired.

Summary of General Recommendations and Findings

•Utilize early warning systems available to homeowners, particularly those located in flood-prone areas. The WERT recommends using the National Weather Service early warning system and forecasts.
•Increase the situational awareness of affected residents and communities regarding the hazards and risks associated with living downstream/downslope of burned areas.
•The WERT strongly recommends that San Luis Obispo and Santa Barbara Counties Public Works, San Luis Obispo Office of Emergency Services, Santa Barbara County Office of Emergency Management, and the California Governor's Office of Emergency Services work with the NWS and the California Geological Survey to monitor forecasts and rainfall intensity during storms, as well as observe postfire response following storm events. The initial rainfall thresholds can be adjusted accordingly after assessing hydrological response to storms.
•Monitor and/or remove accumulated debris from basins, culverts and channels that are upstream of culverts in areas that are subject to postfire flooding where there is an elevated risk to life and/or property.
•While the potential for debris flow exists within and downstream of the Gifford Fire burned area, the primary hazard of concern is flooding and debris floods. There is potential for flood flows and debris flooding to impact residential areas in the Pippin Corner community, Pine Canyon, Kelsey Canyon, and along Avenales Ranch Road.
•Crossing structures are subject to blockage with potential for roads to overtop along portions of all major canyon roads within and downslope of the burned area, including Highway 166, and rural road networks, with impacts to ingress and egress. These hazards constitute a potential threat to life-safety and property. If these roads are affected by postfire hazards, they may leave residents stranded after storm events and prevent the delivery of emergency services.
•The WERT recommends that local government conduct public outreach so that residents and property owners can make informed decisions that reduce their risk exposure to postfire hazards.
•Close coordination between San Luis Obispo Office of Emergency Services, Santa Barbara County of Office Emergency Management, the National Weather Service, and local first responders will be necessary to effectively implement a response plan that will minimize risk.

Appendix C – Values-at-Risk Map Book





Incident: Gifford Fire (CA-LPF-002181)

Values at Risk (Polygon)
Risk Level
- Very low
- Low
- Intermediate
- High
- Very high

Value at Risk (Point)
Risk Level
- Very low
- Low
- Intermediate
- High
- Very high

Combined Hazard (Basin)
15 min 24 mm/h
- Low
- Moderate
- High

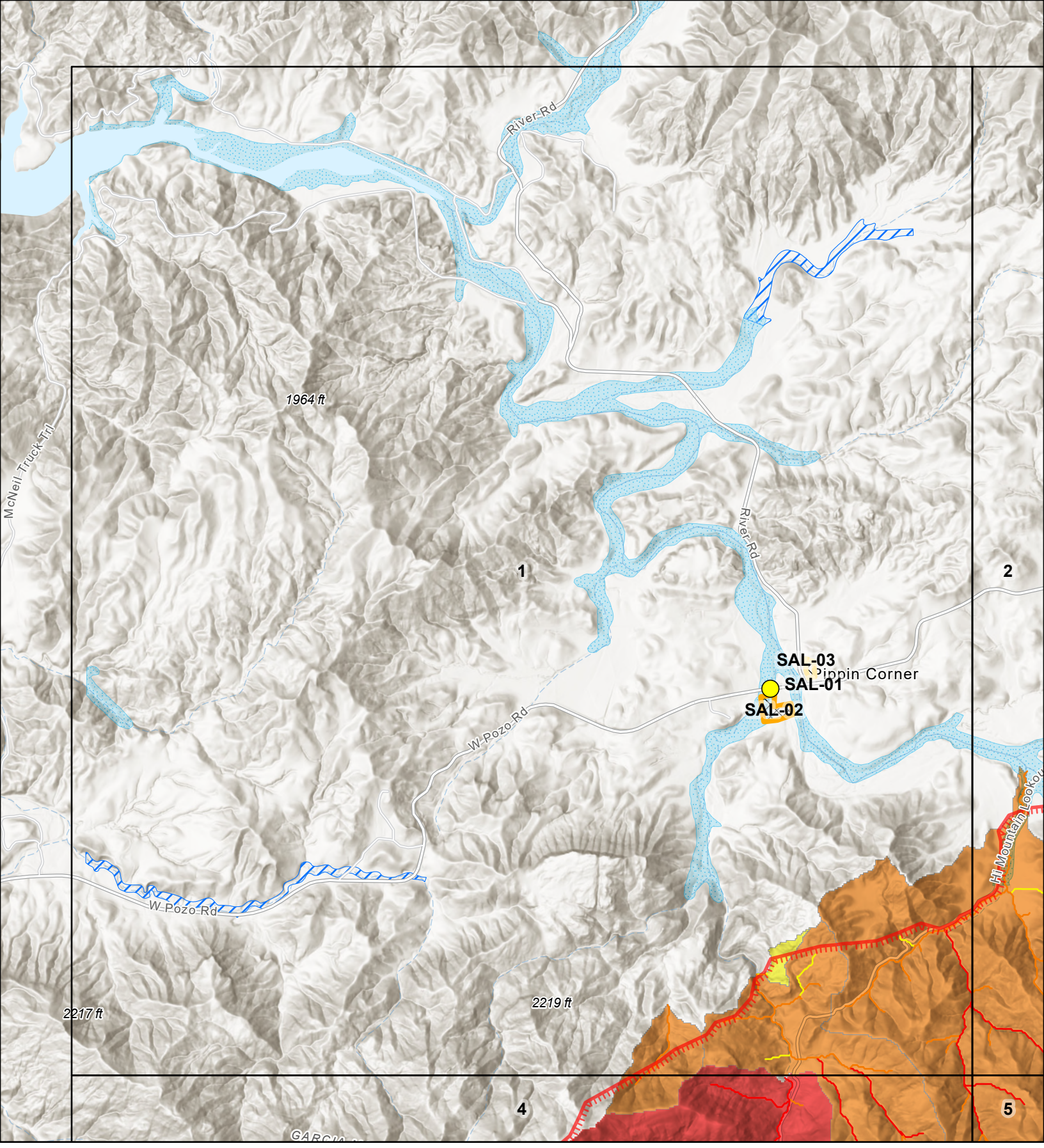
Combined Hazard (Segment)
15 min 24 mm/h
- Low
- Moderate
- High

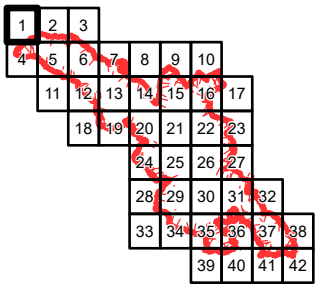
N

0 10,000 20,000 ft

0 2,000 4,000 m

- Fire Perimeter
- FEMA Special Flood Hazard Areas
- DWR 100yr Awareness Floodplains





Incident: Gifford Fire (CA-LPF-002181)

Values at Risk (Polygon)

Risk Level

- Very low
- Low
- Intermediate
- High
- Very high

Value at Risk (Point)

Risk Level

- Very low
- Low
- Intermediate
- High
- Very high

Combined Hazard (Basin)

15 min 24 mm/h

- Low
- Moderate
- High

Combined Hazard (Segment)

15 min 24 mm/h

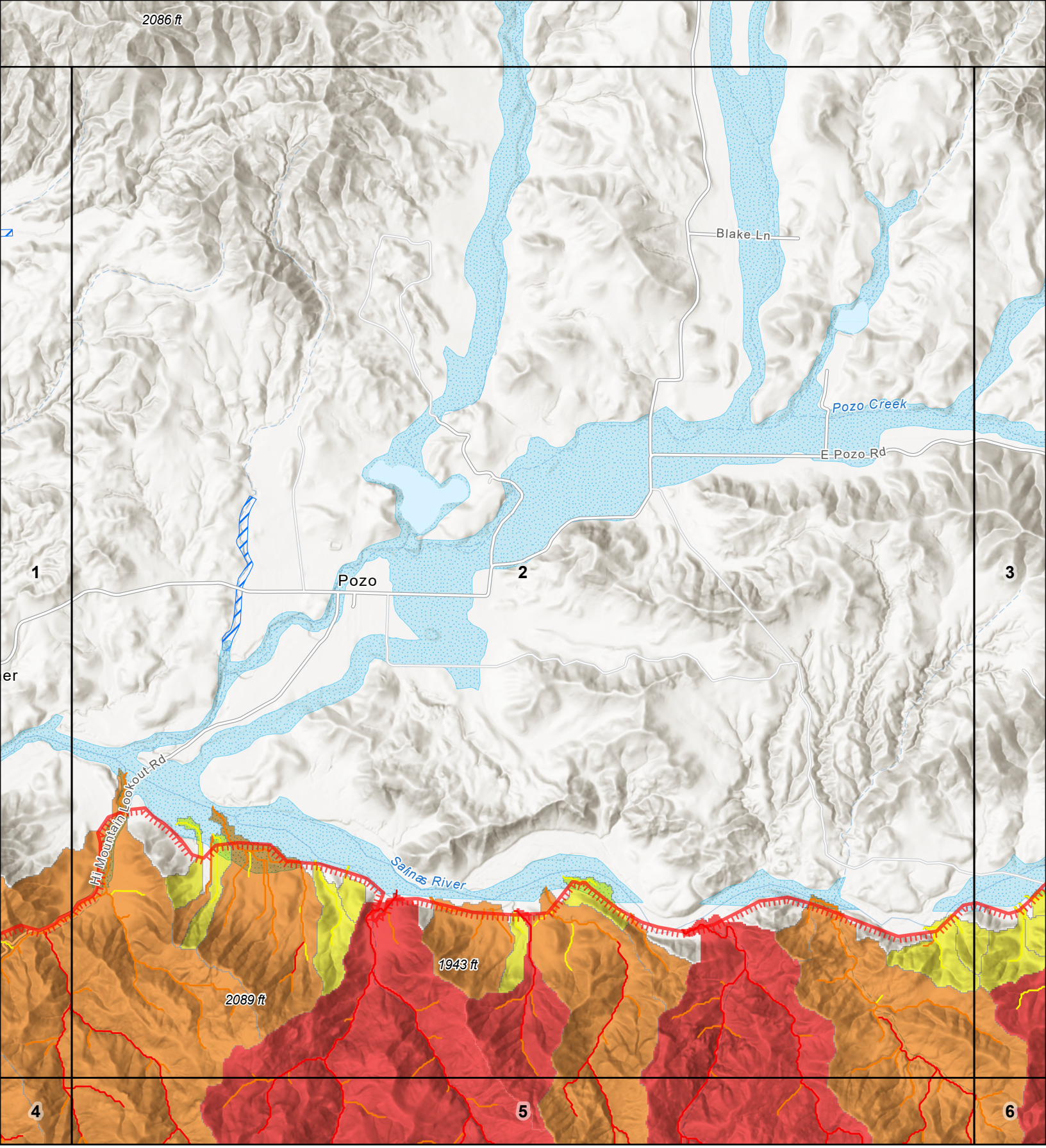
- Low
- Moderate
- High

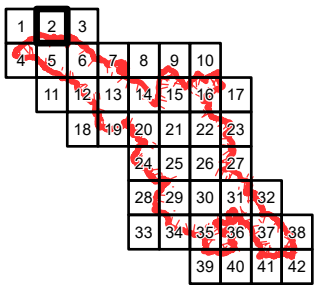
N

0 1,000 2,000 ft

0 260 520 m

- Fire Perimeter
- FEMA Special Flood Hazard Areas
- DWR 100yr Awareness Floodplains





Incident: Gifford Fire (CA-LPF-002181)

Values at Risk (Polygon)

Risk Level

- Very low
- Low
- Intermediate
- High
- Very high

Value at Risk (Point)

Risk Level

- Very low
- Low
- Intermediate
- High
- Very high

Combined Hazard (Basin)

15 min 24 mm/h

- Low
- Moderate
- High

Combined Hazard (Segment)

15 min 24 mm/h

- Low
- Moderate
- High

N

0 1,000 2,000 ft

0 260 520 m

- Fire Perimeter
- FEMA Special Flood Hazard Areas
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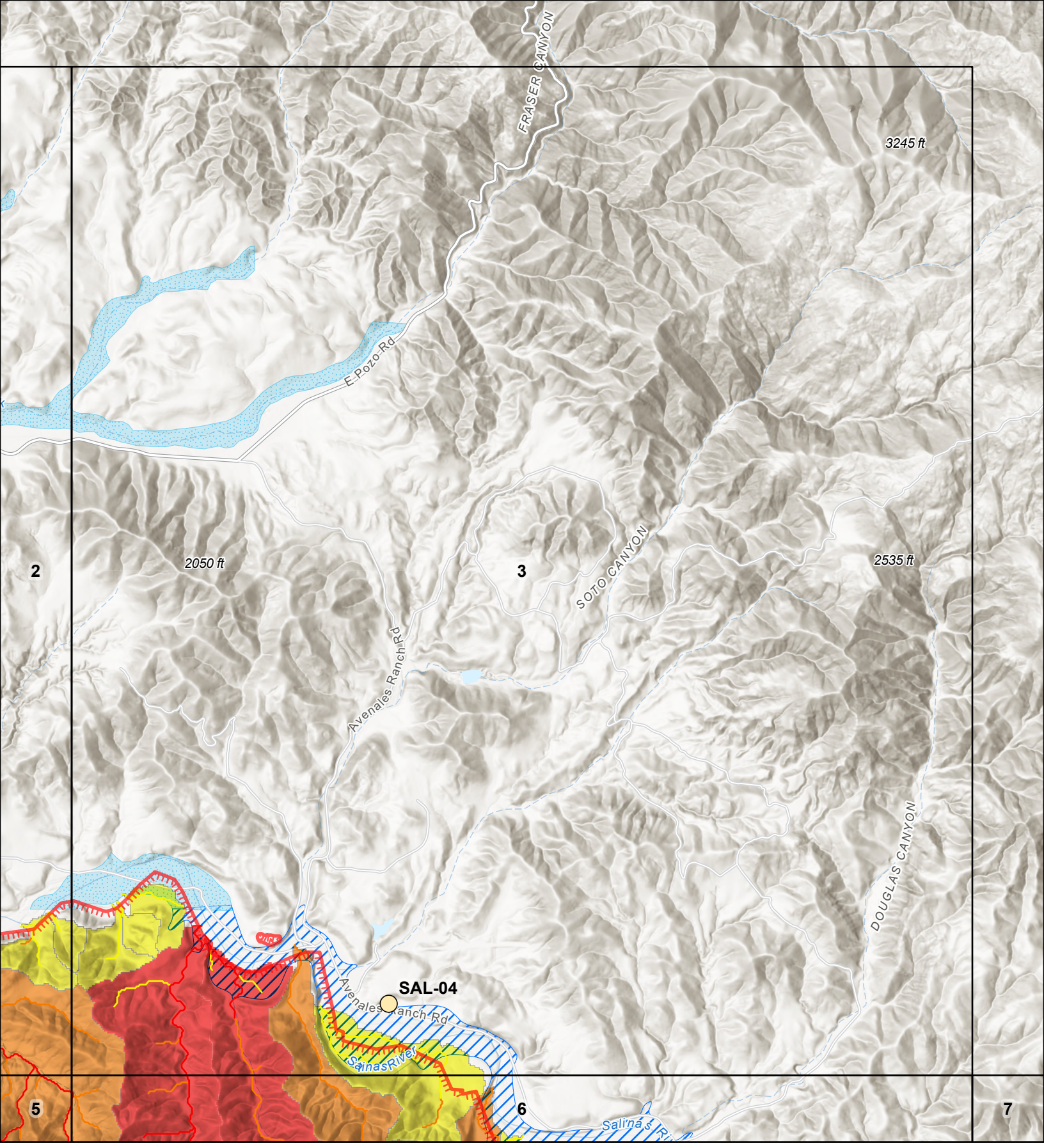

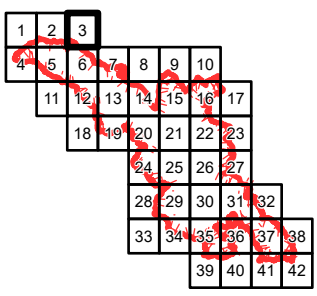

Incident: Gifford Fire (CA-LPF-002181)

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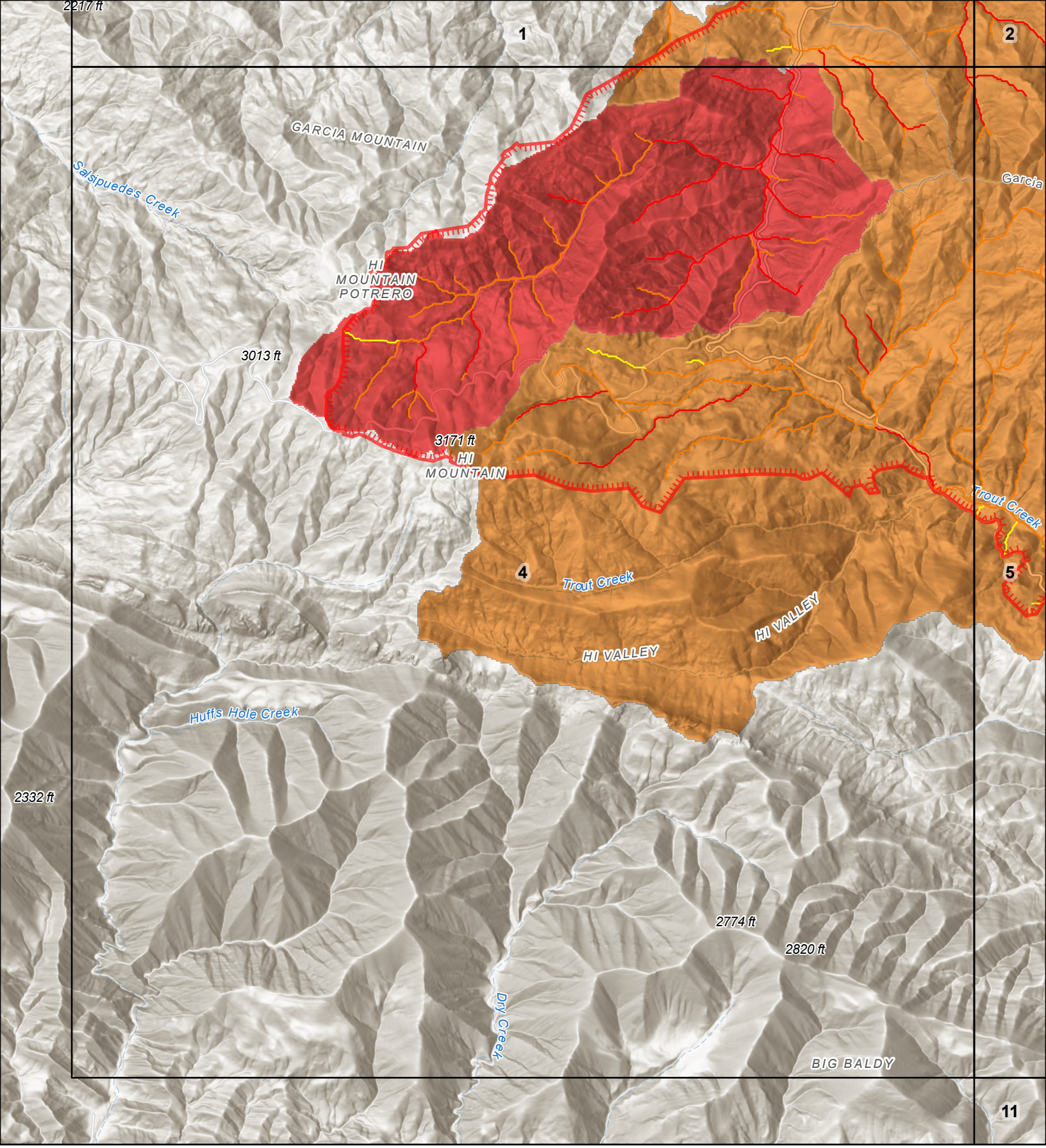

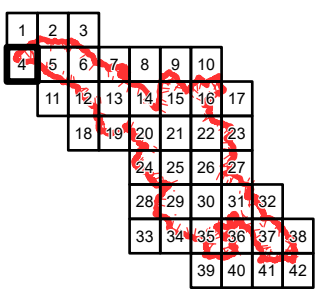

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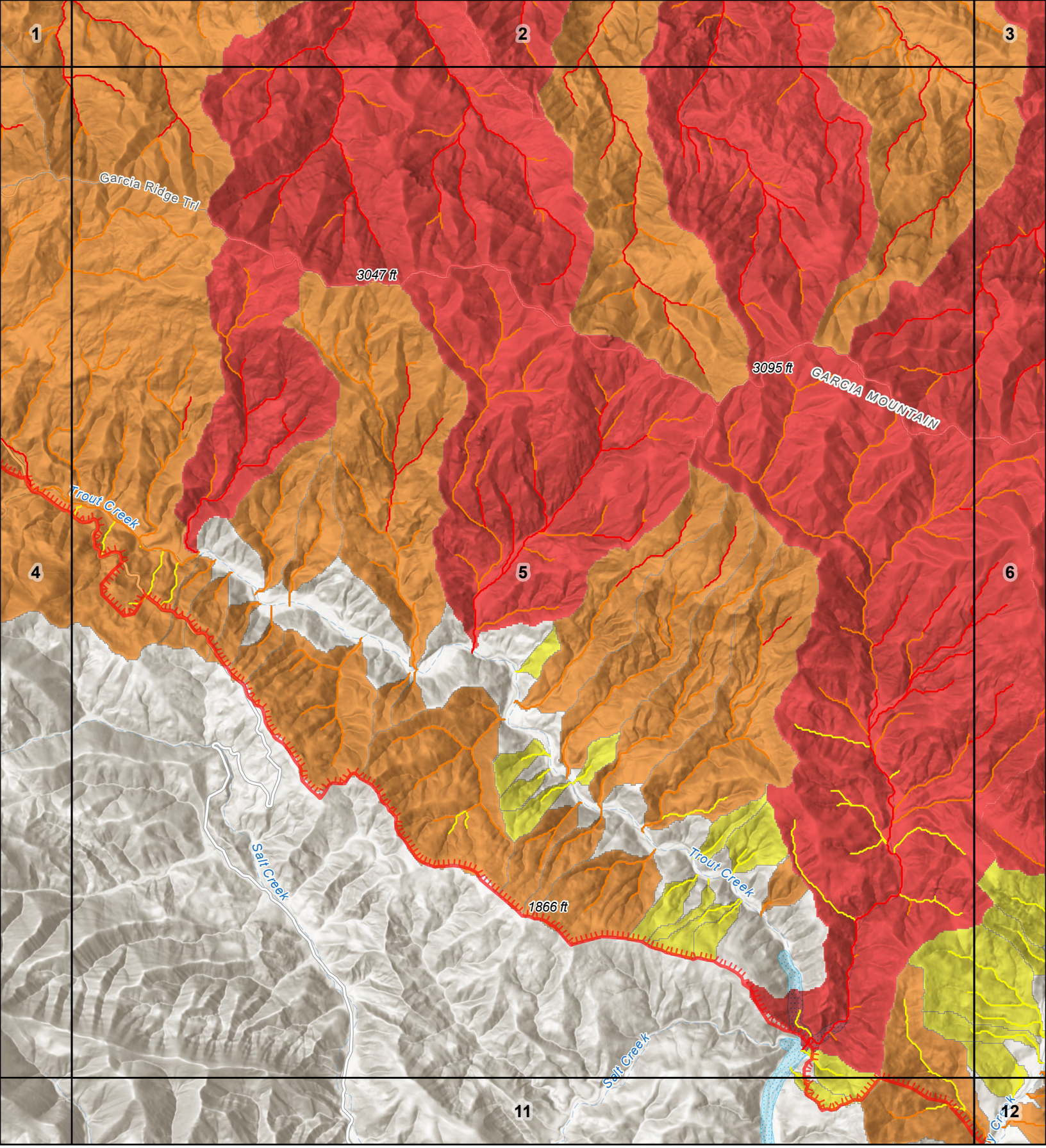

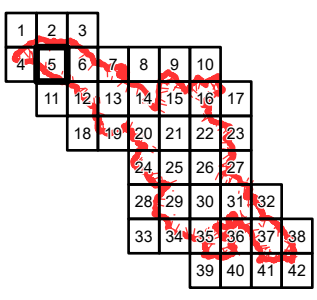

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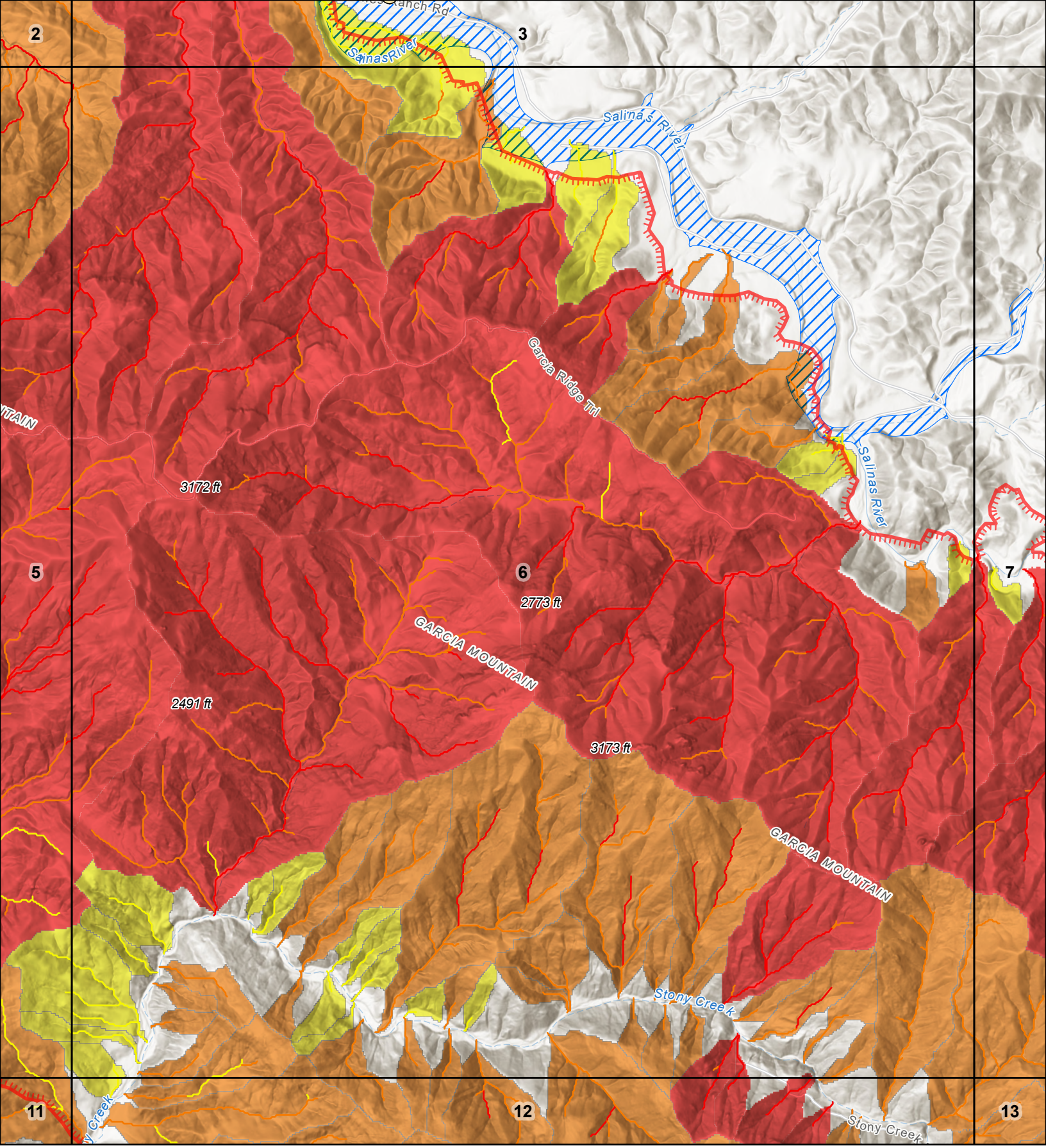

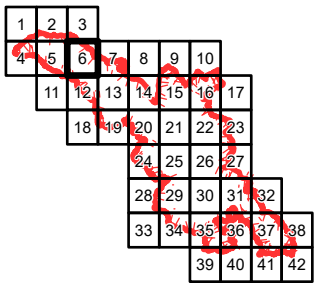

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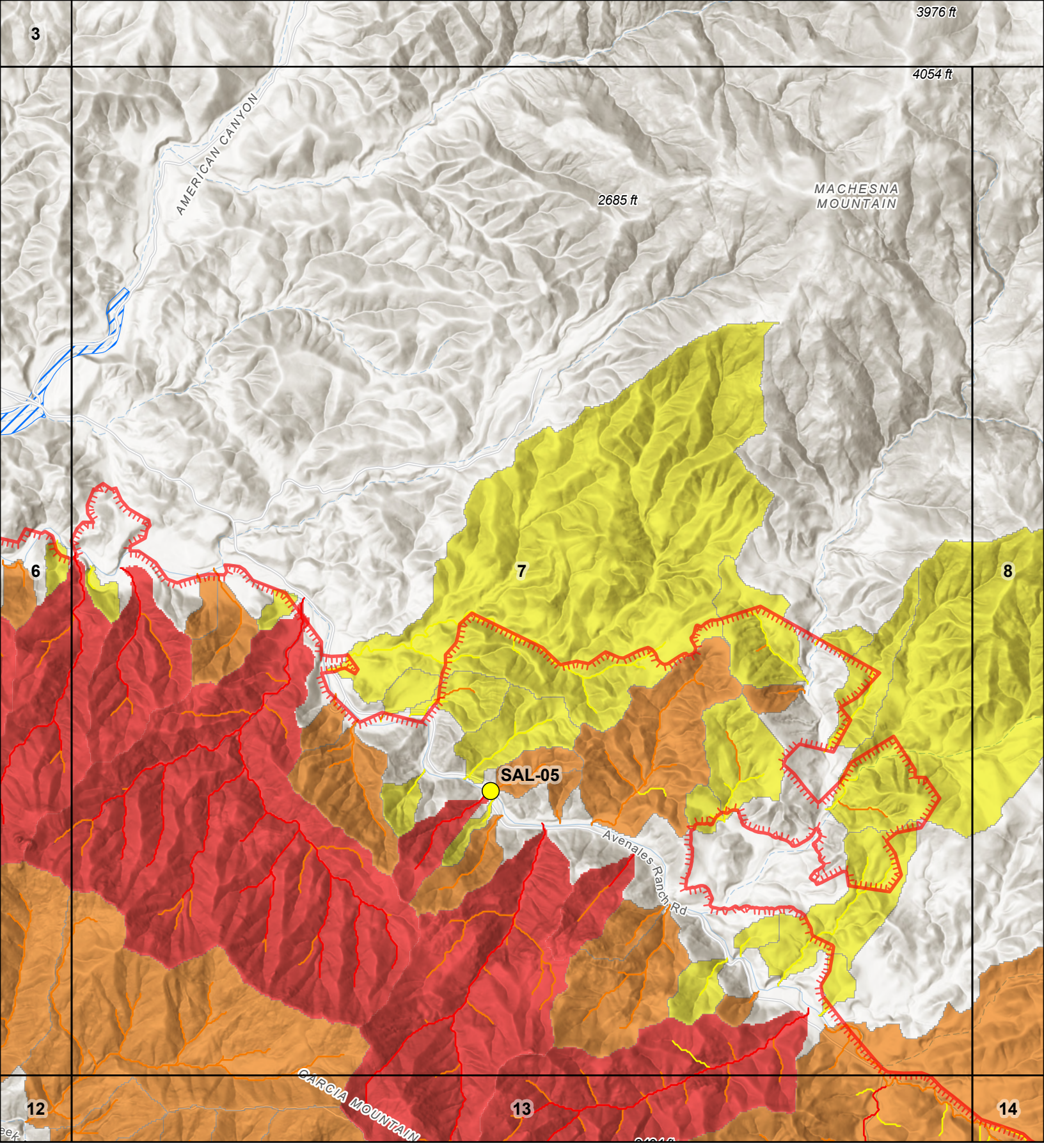

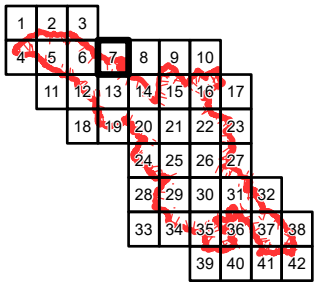

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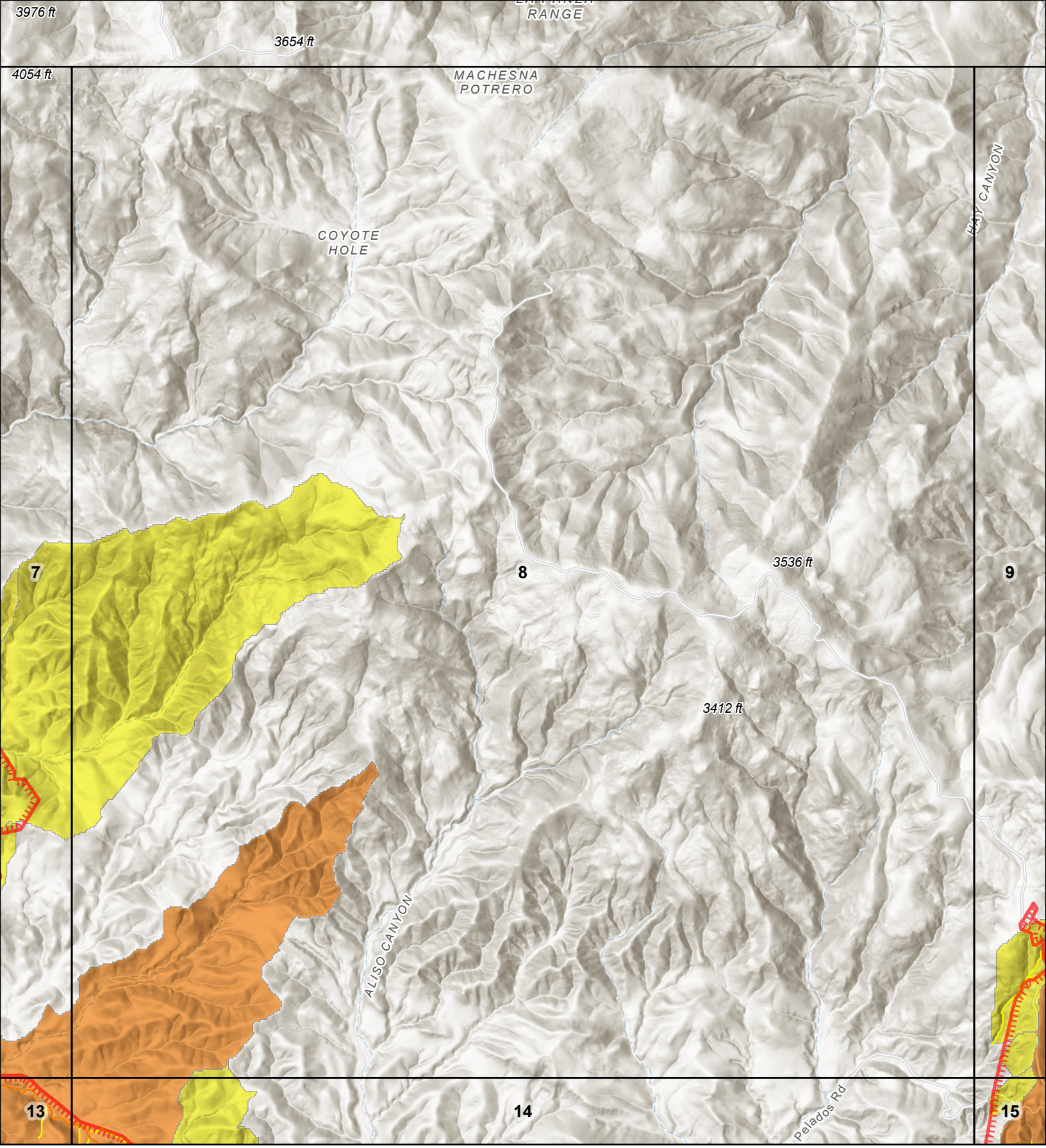

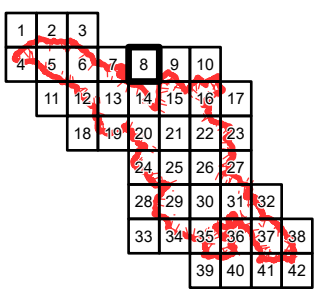

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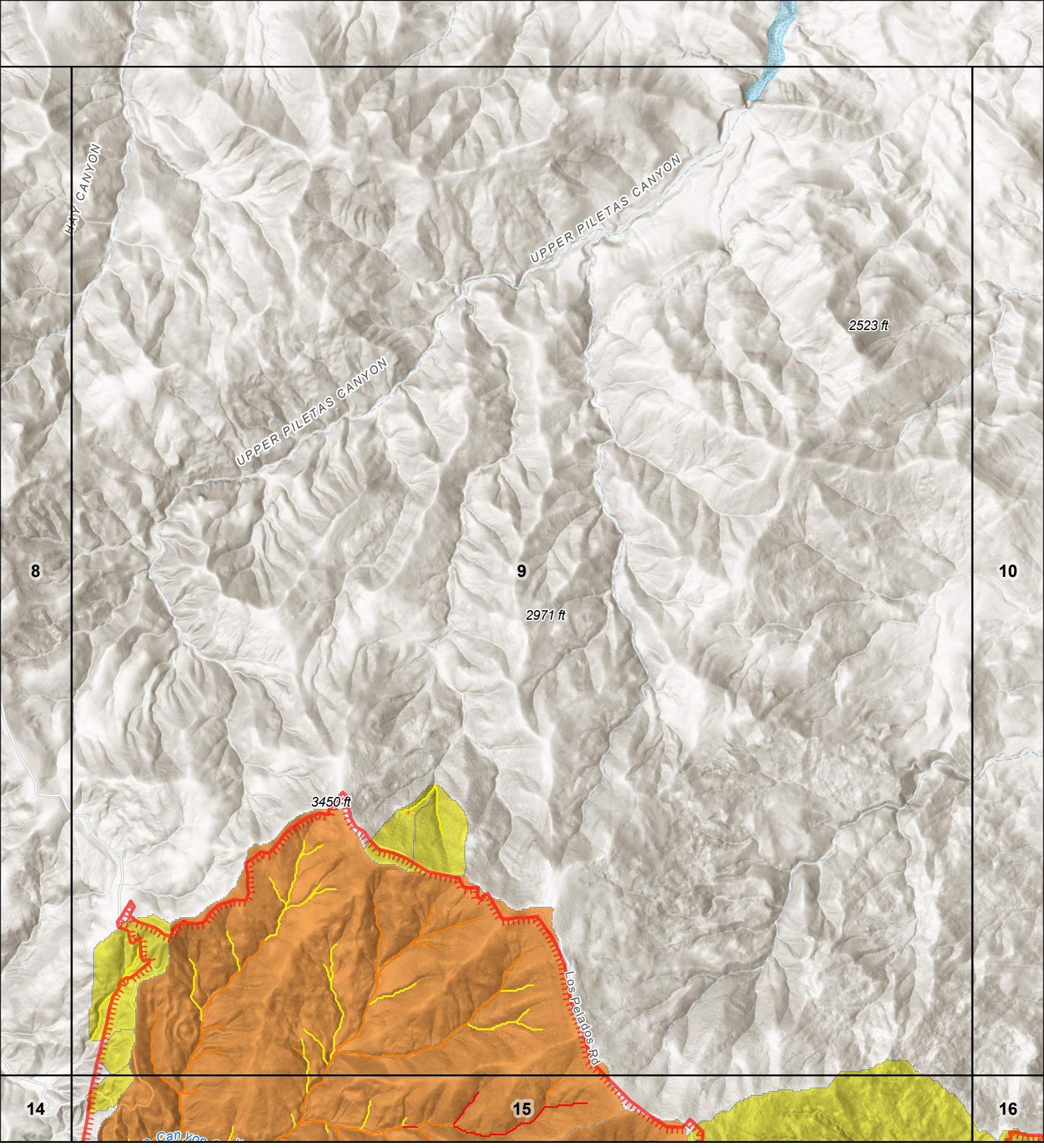

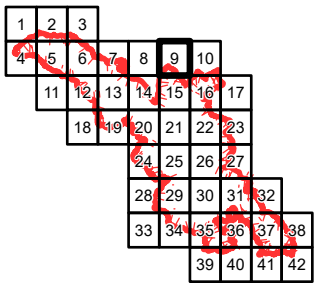

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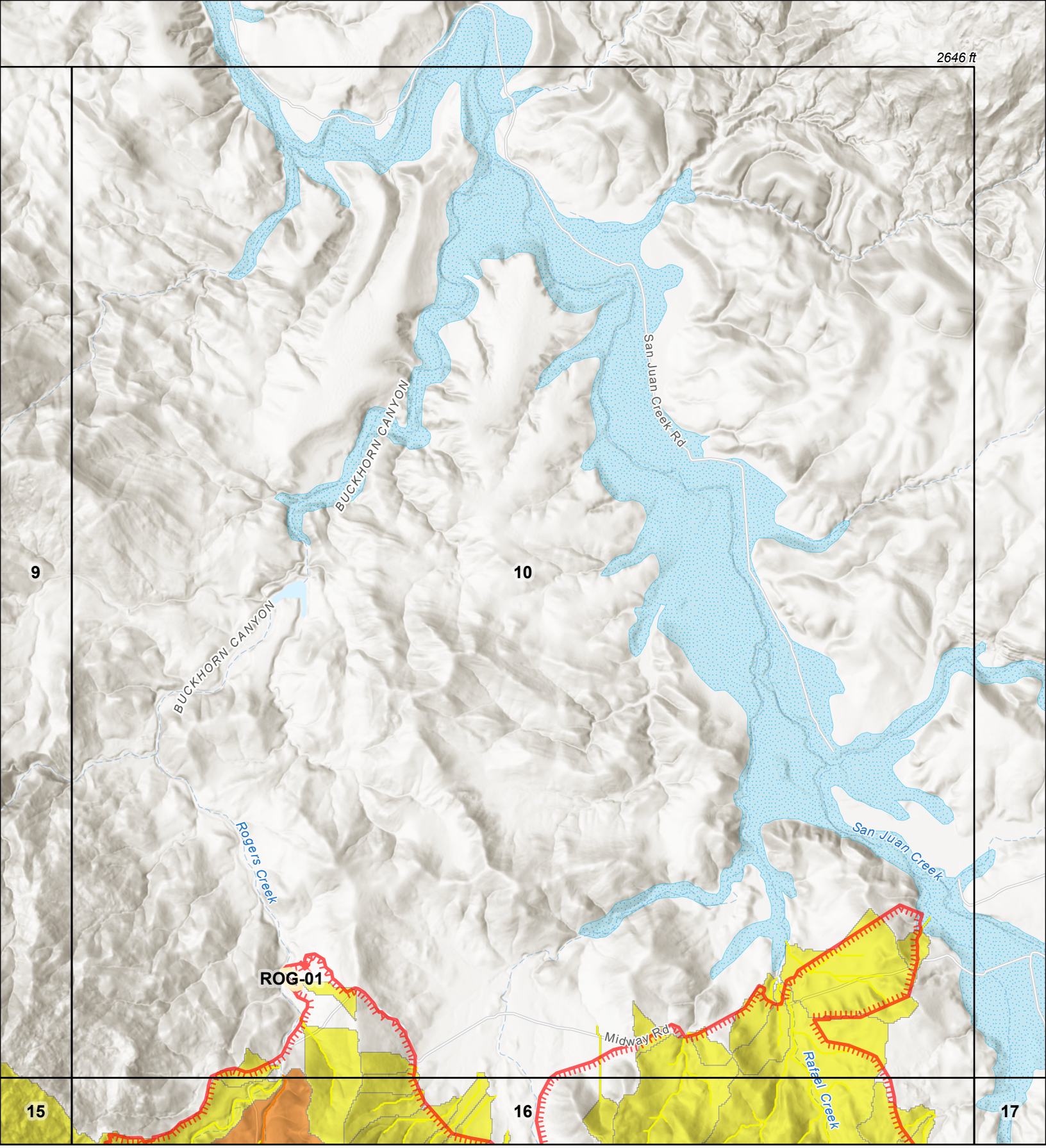

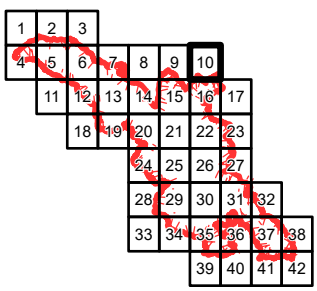

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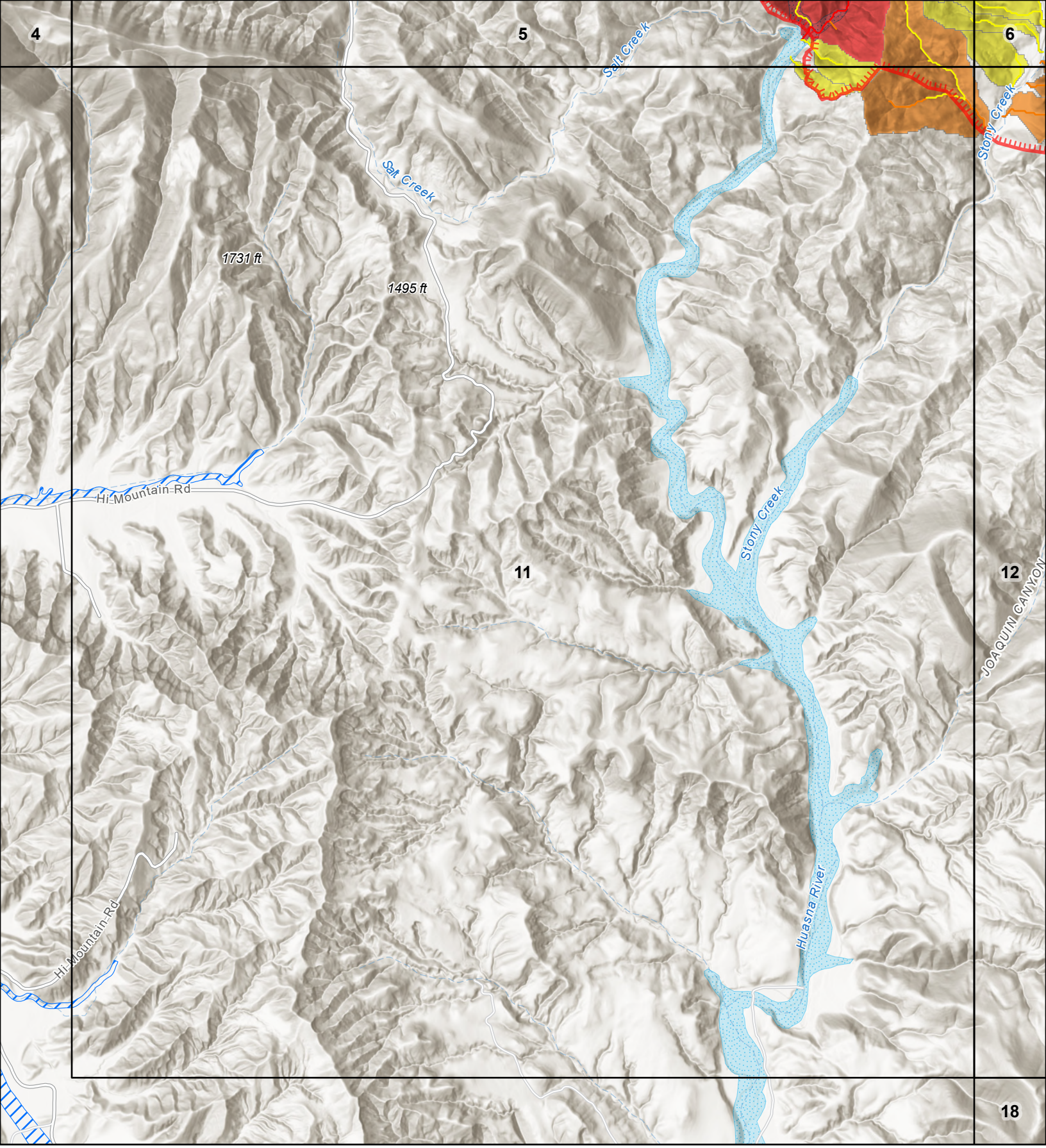

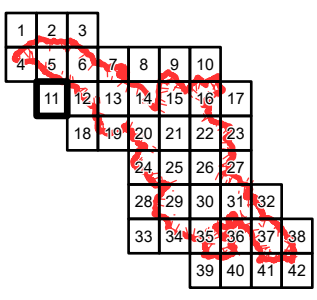

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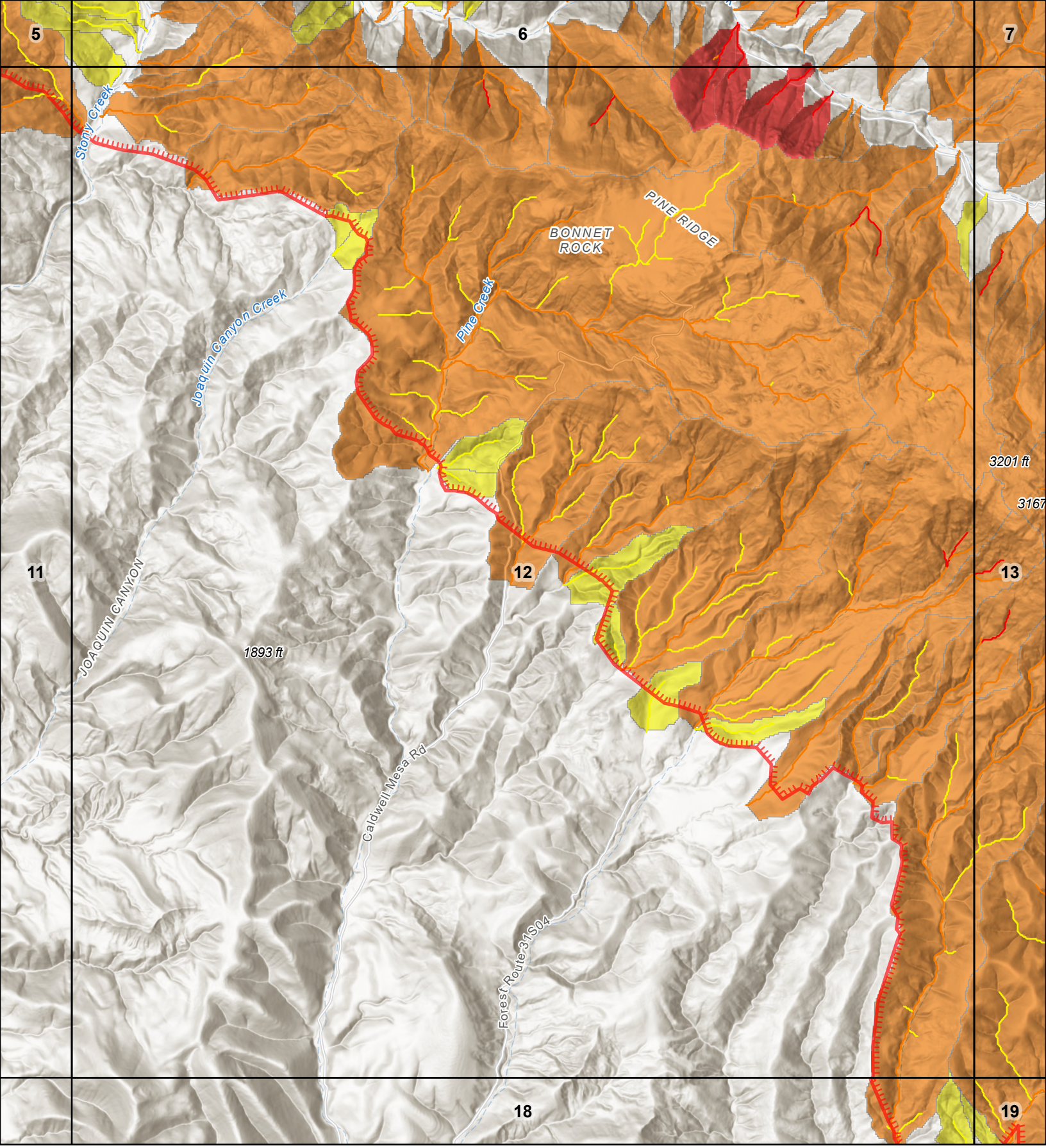

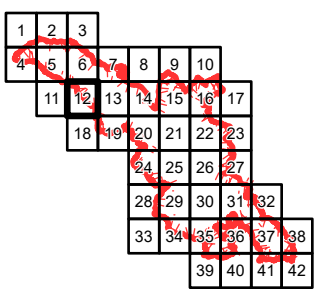

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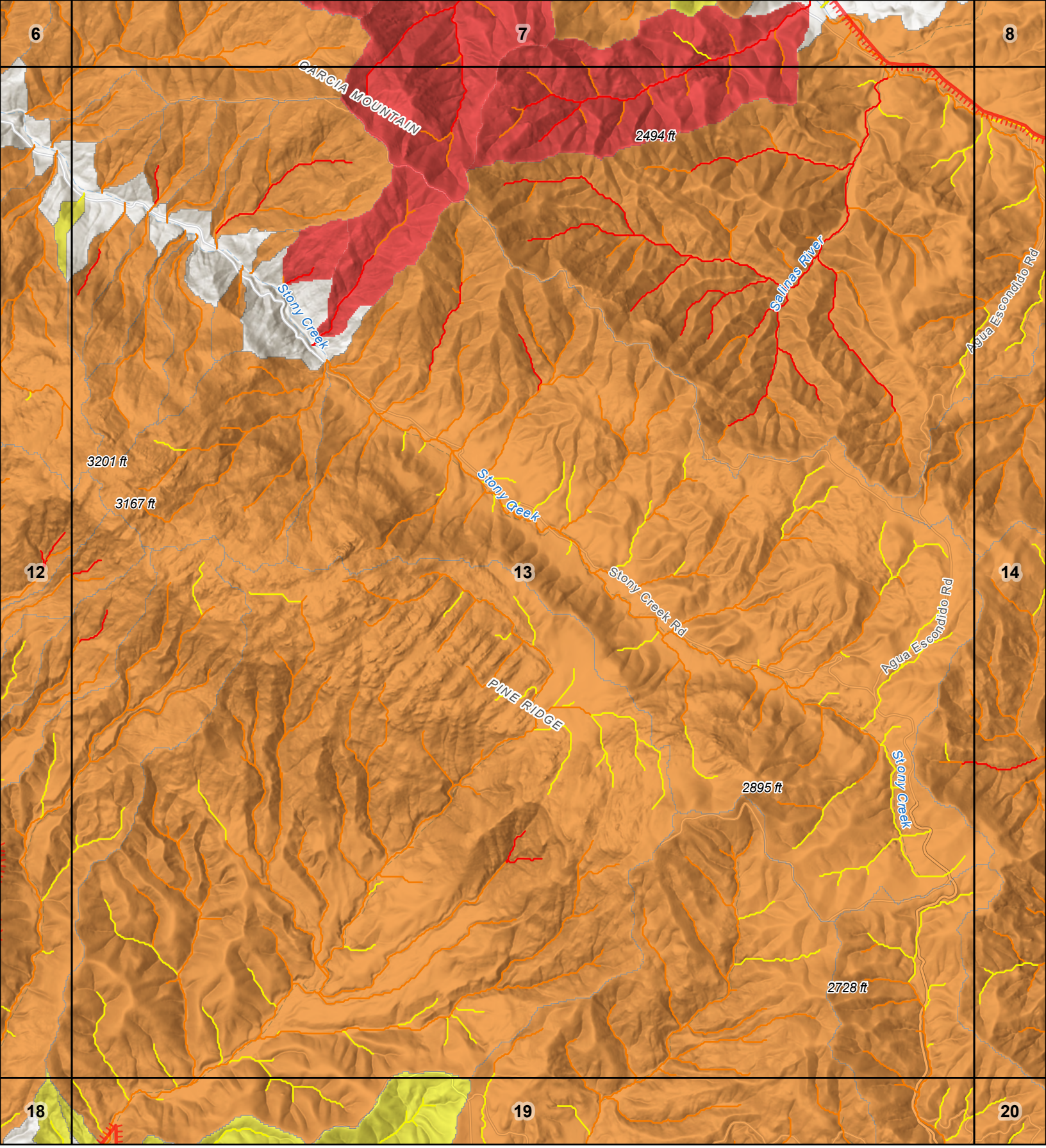

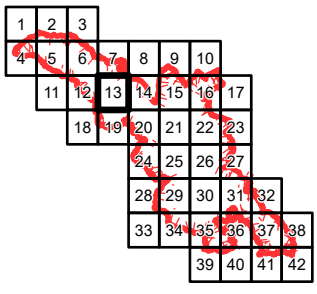

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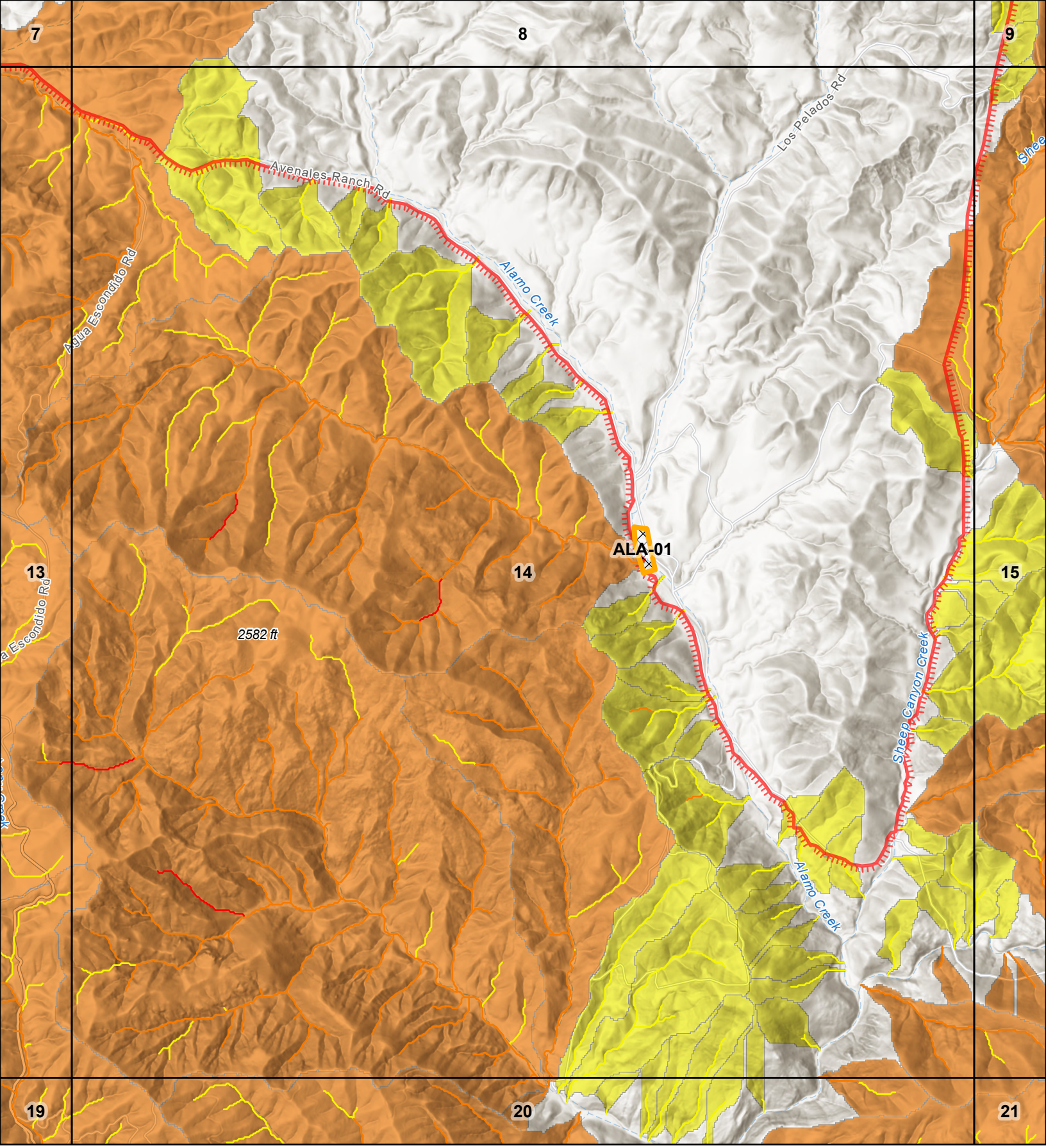

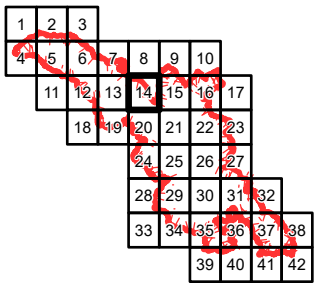

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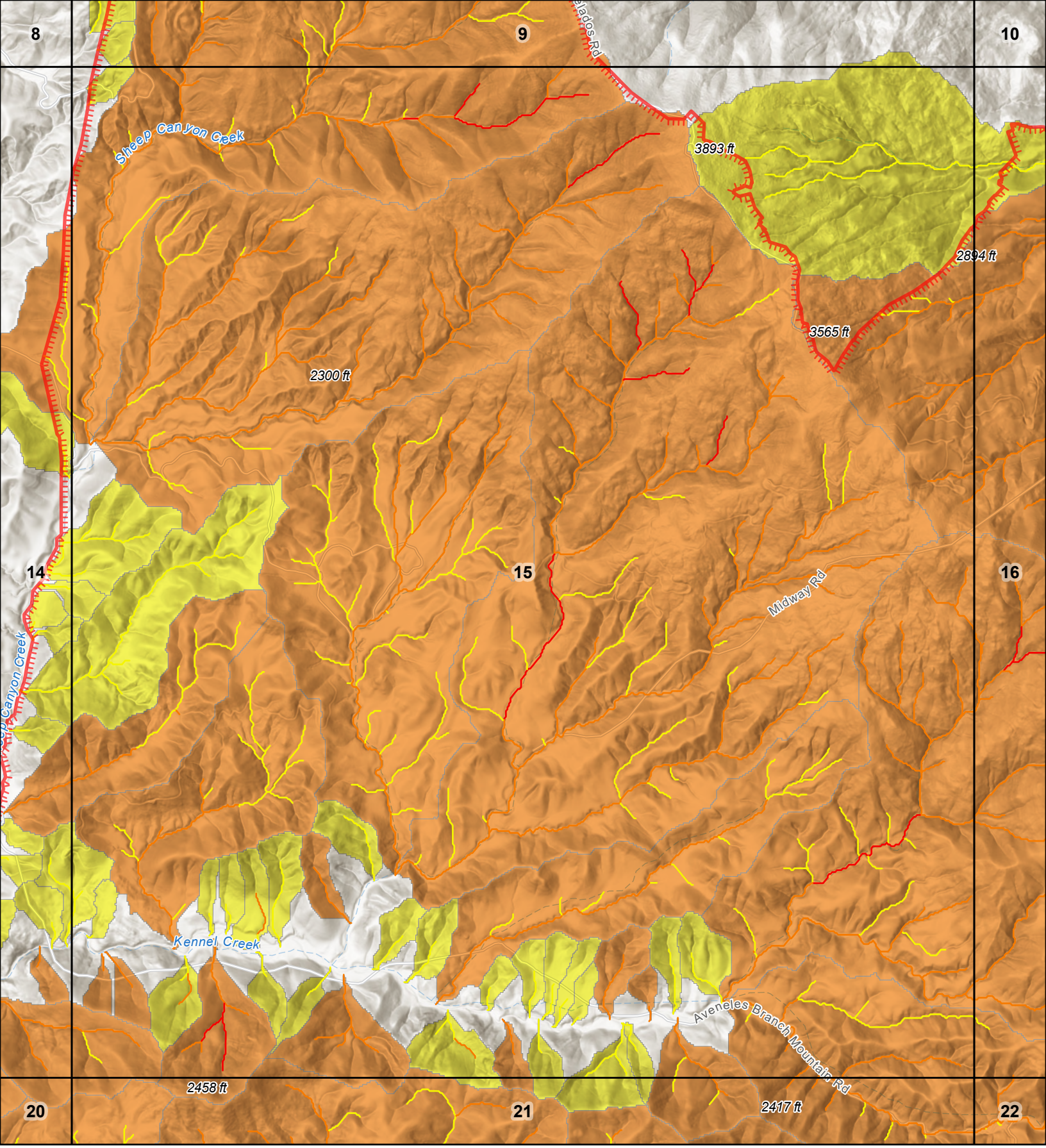

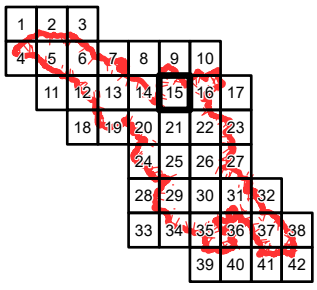

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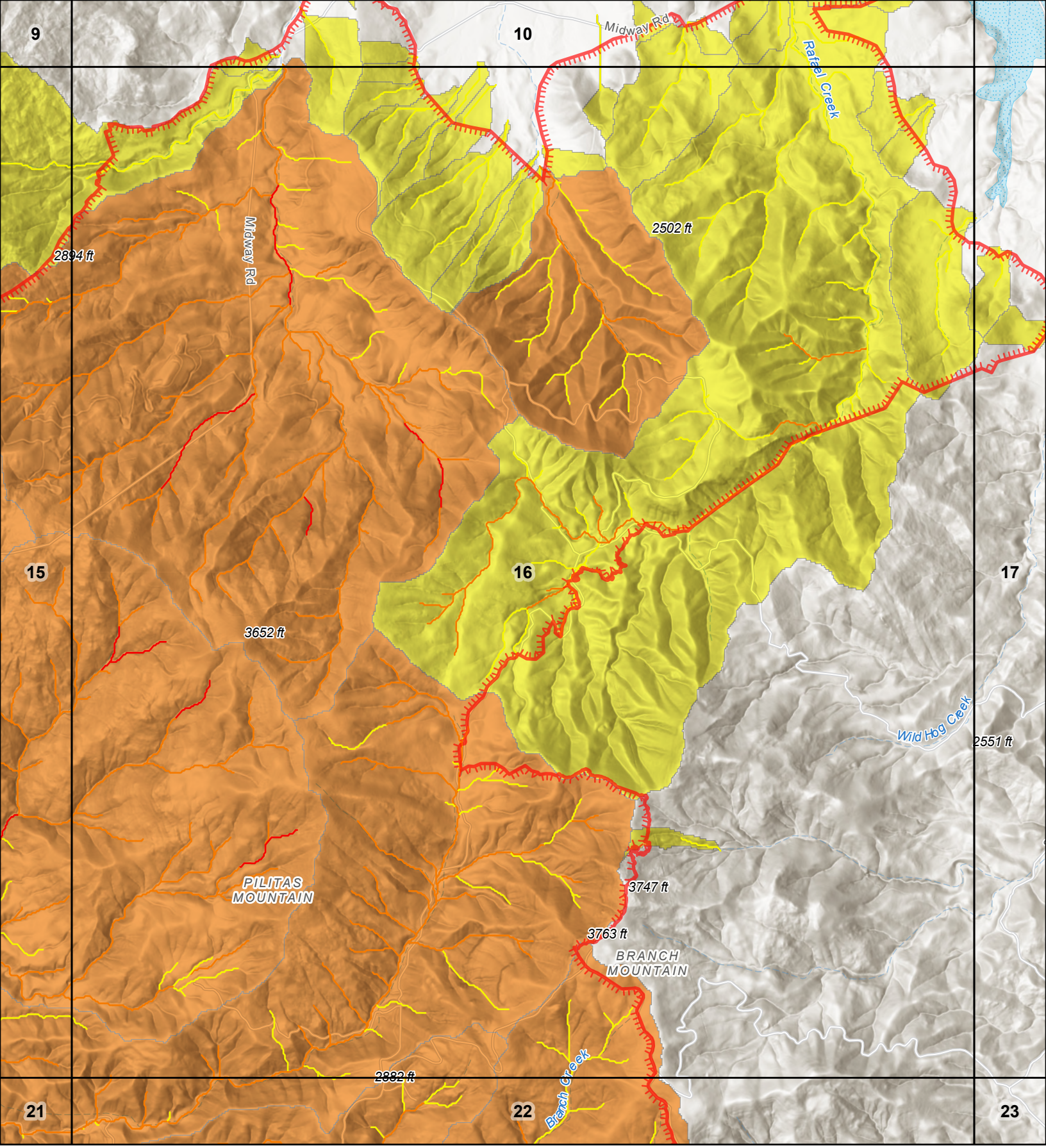

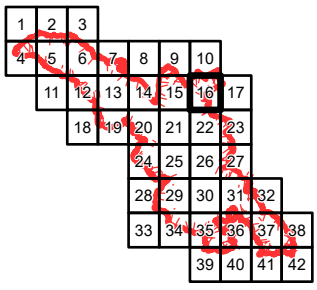

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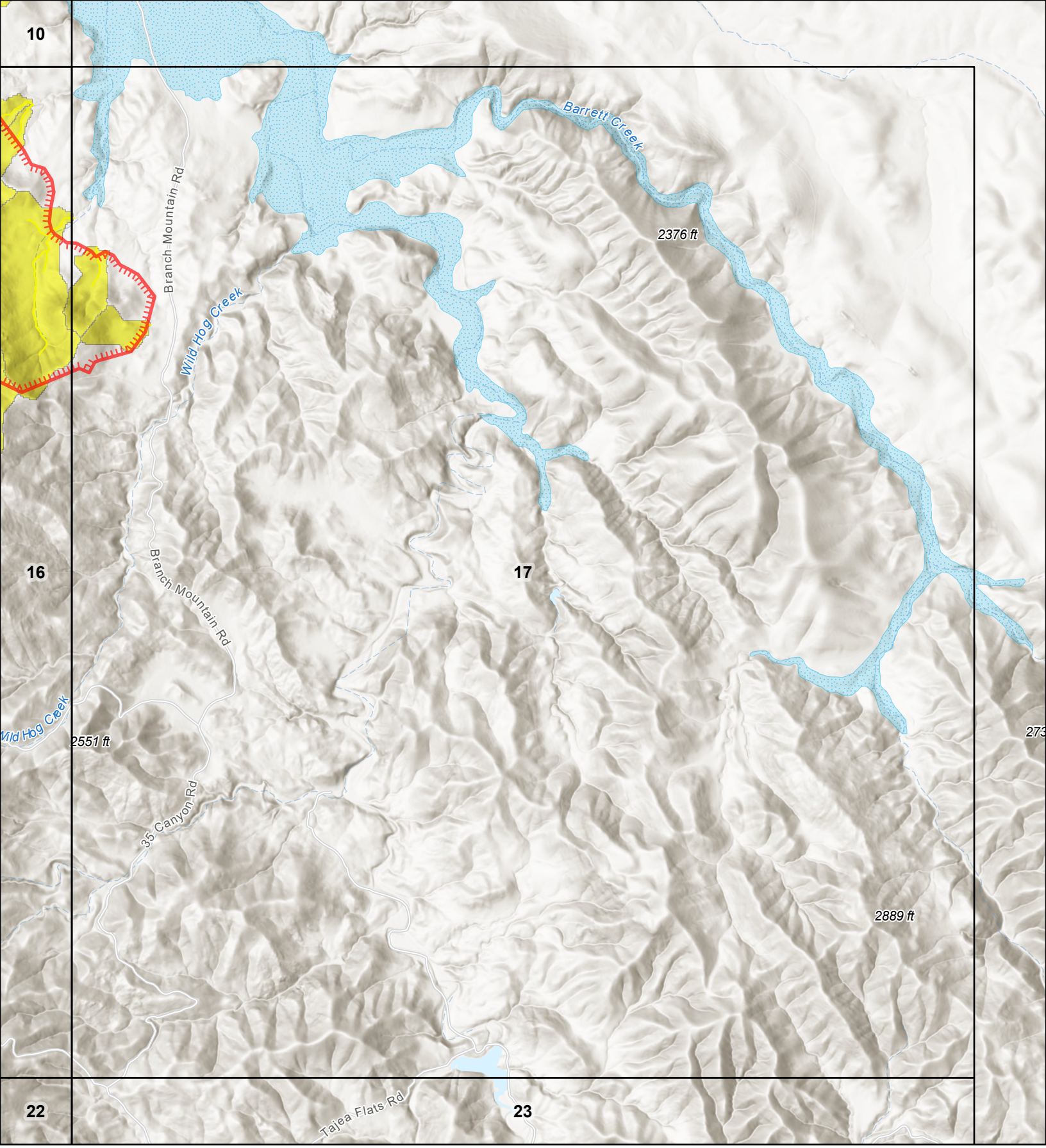

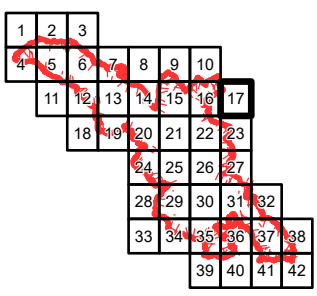

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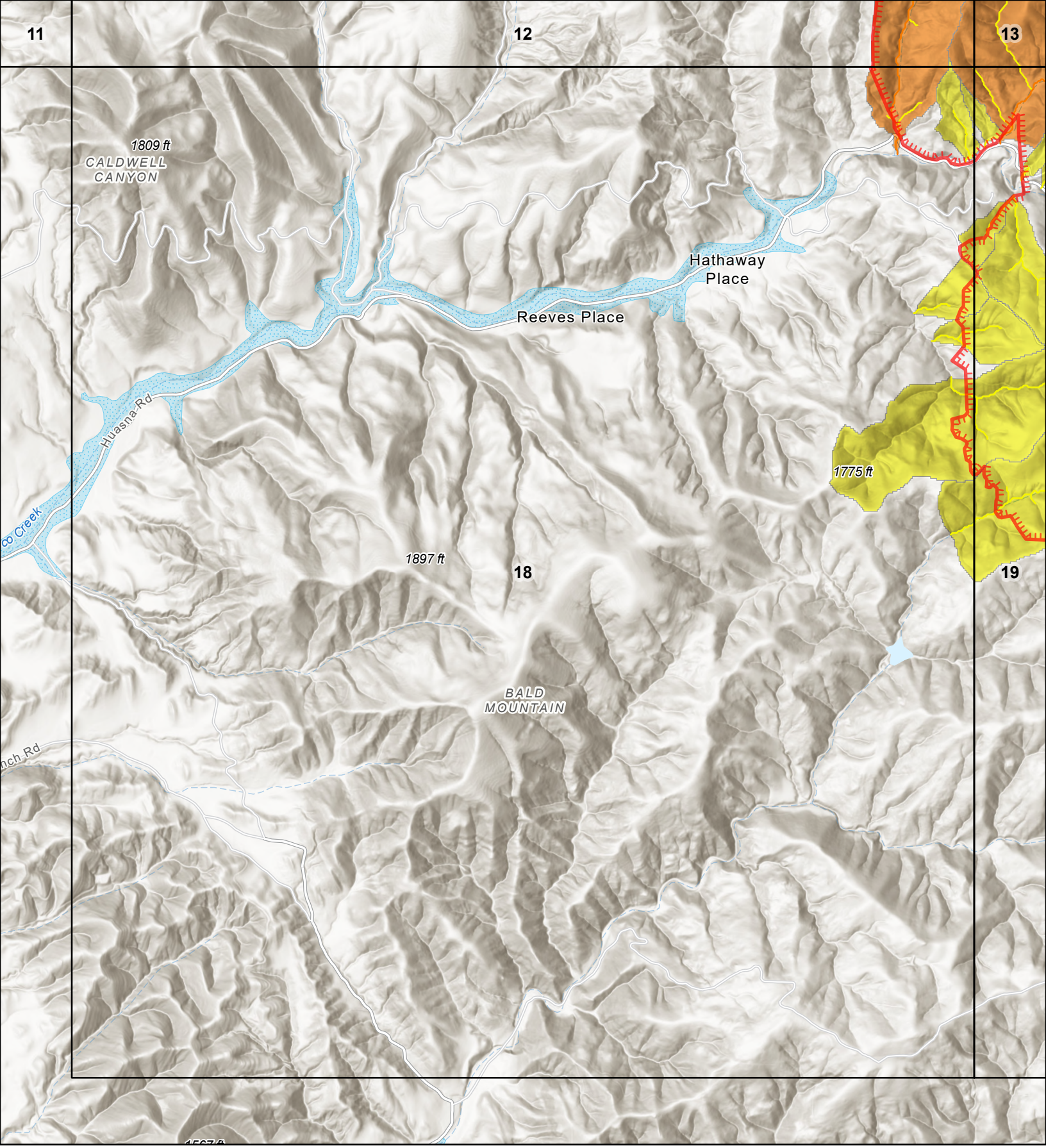

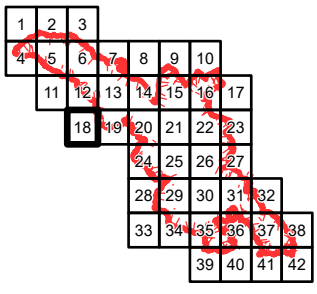

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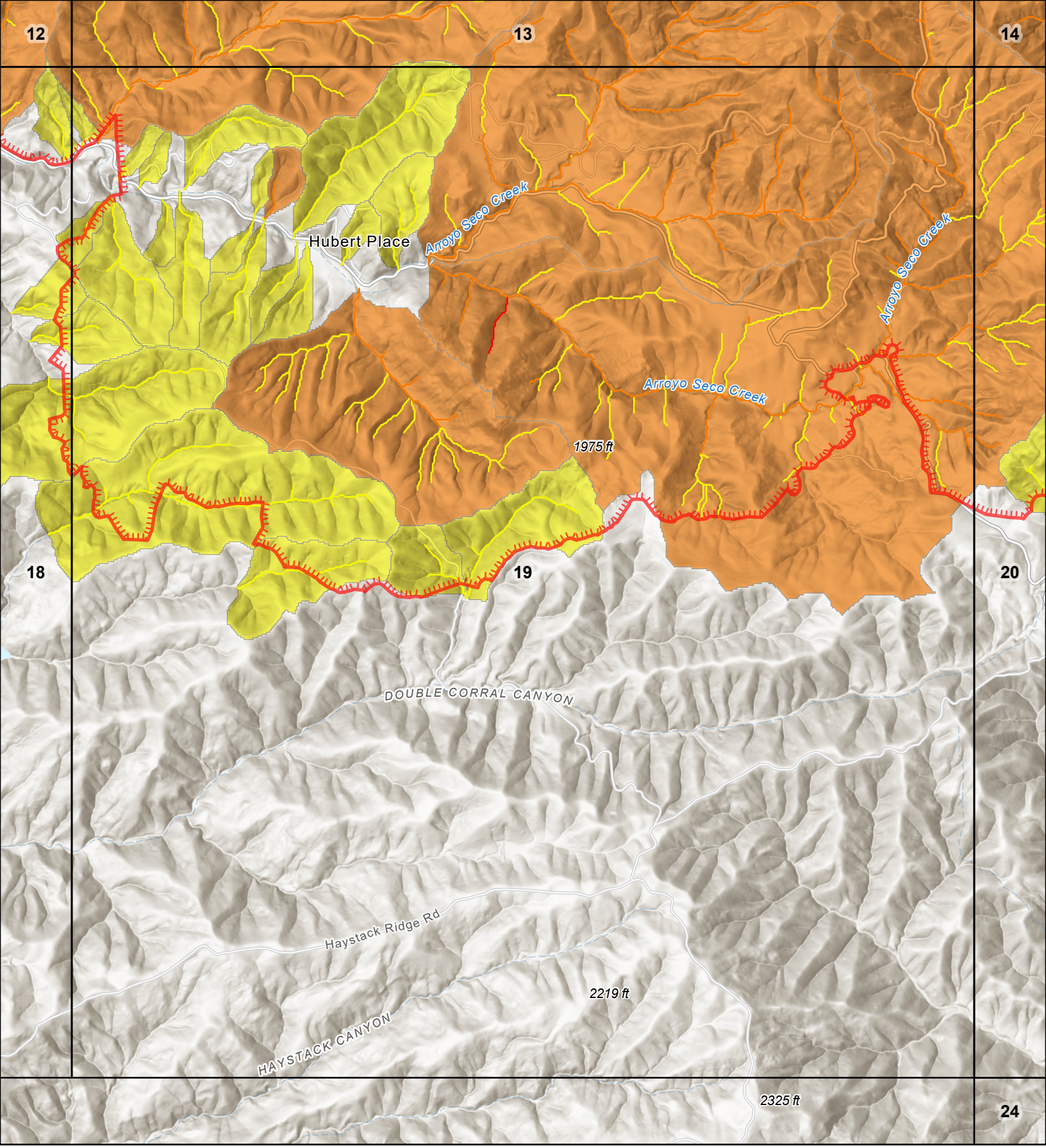

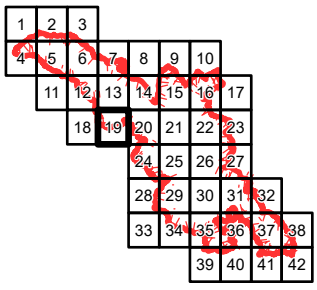

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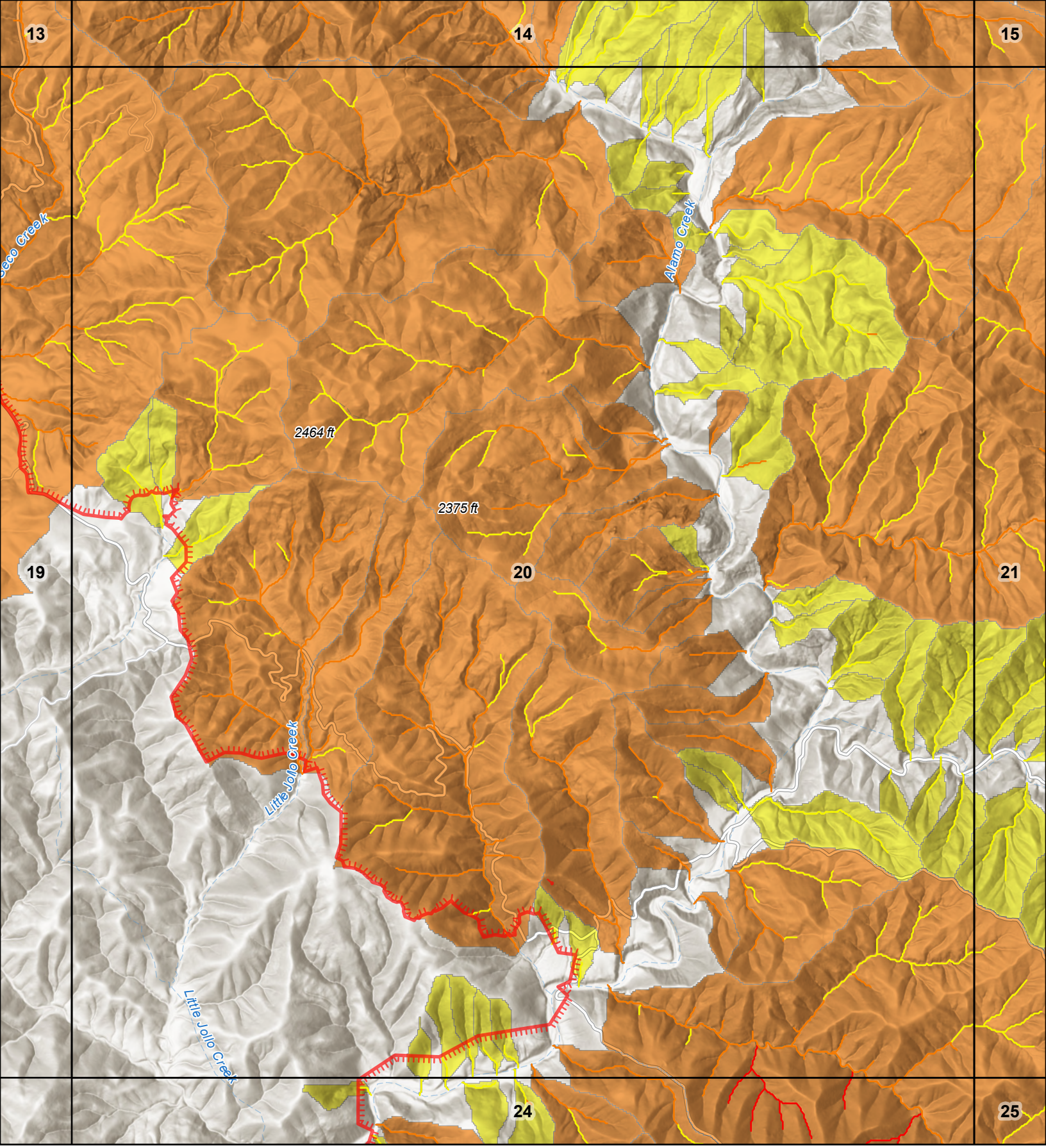

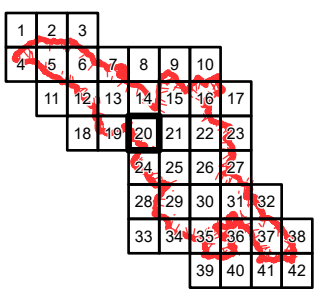

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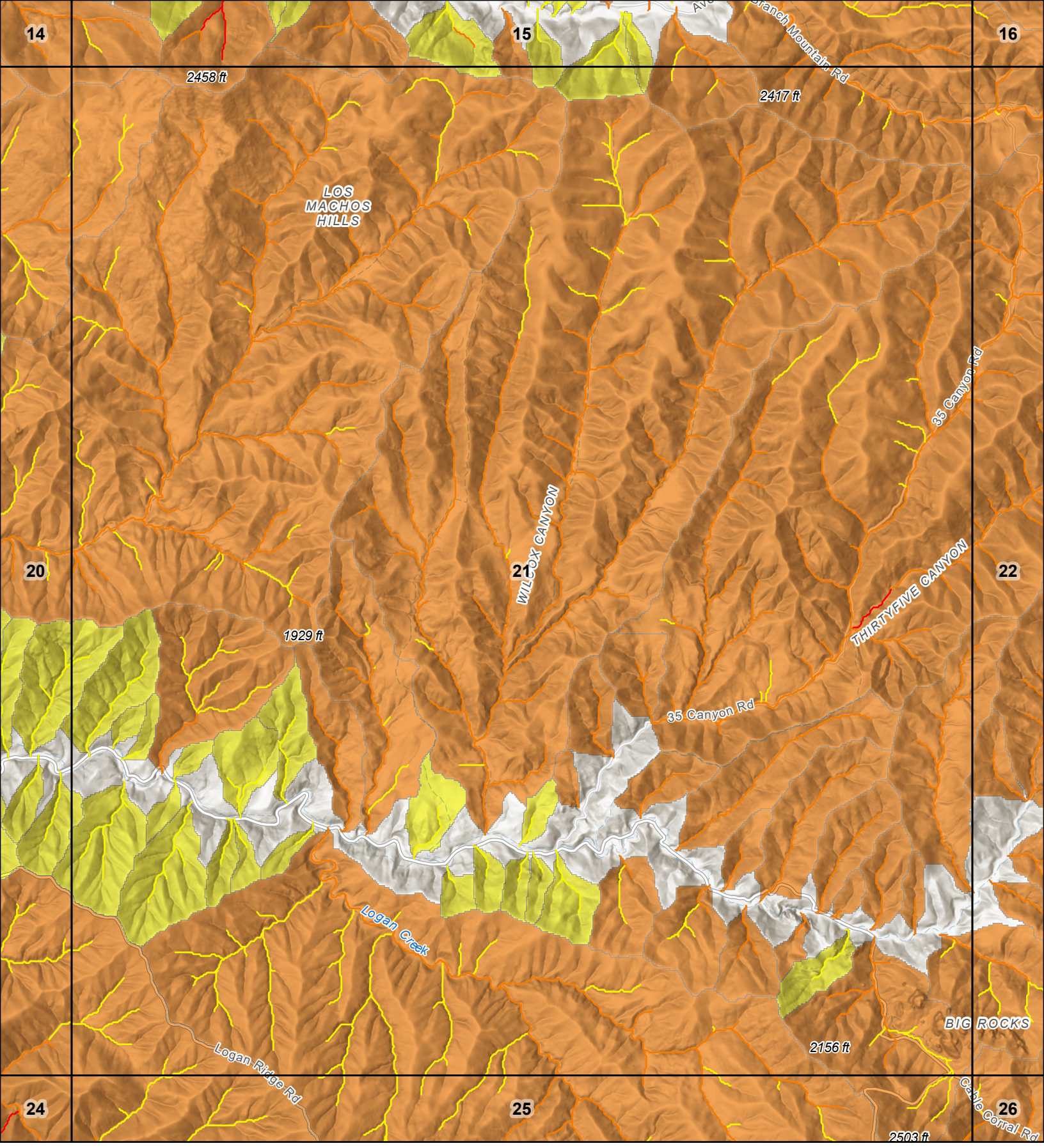

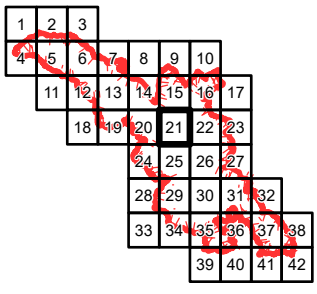

Incident: Gifford Fire (CA-LPF-002181)

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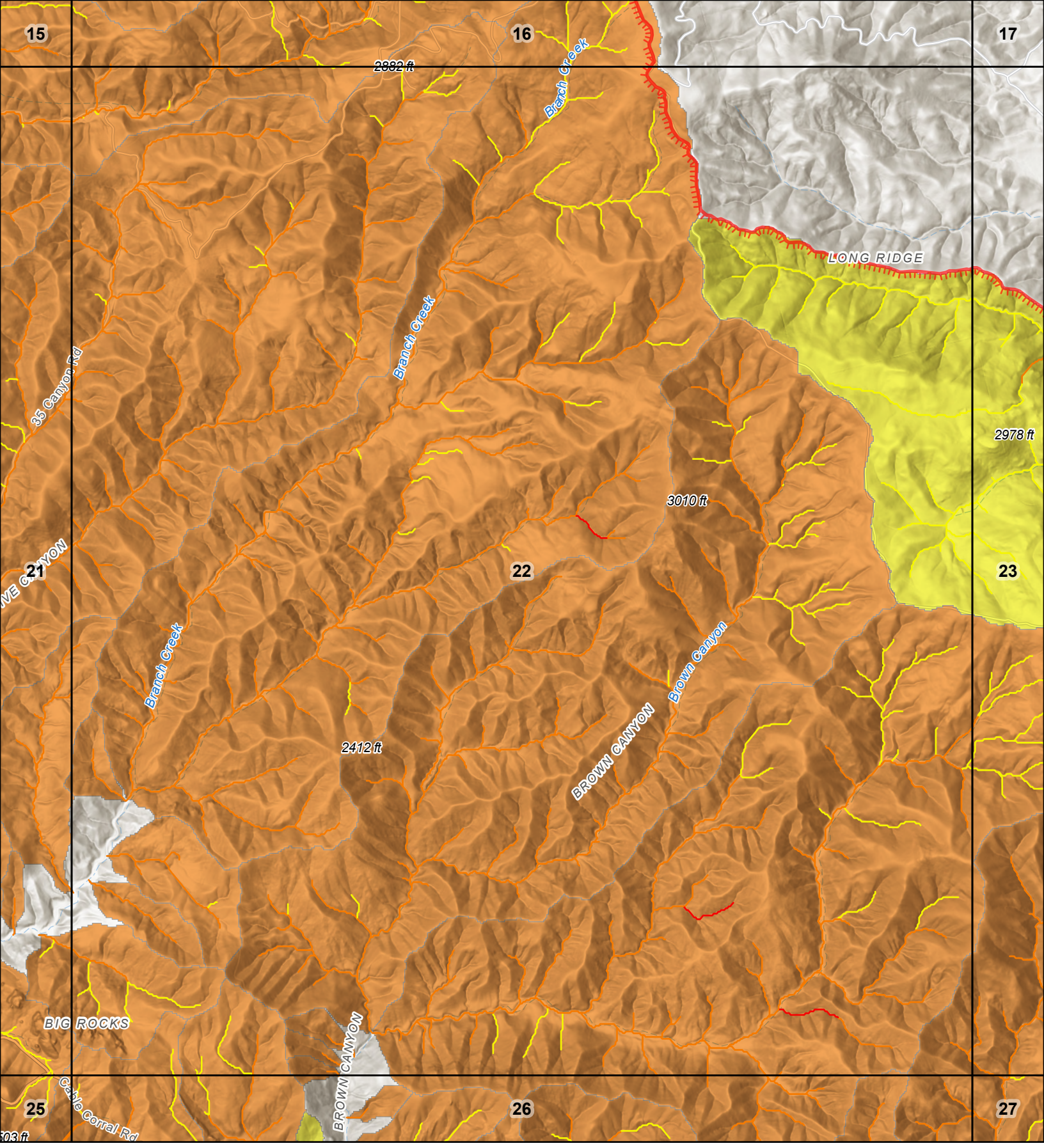

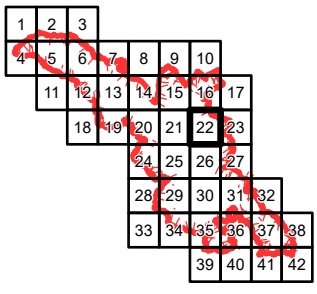

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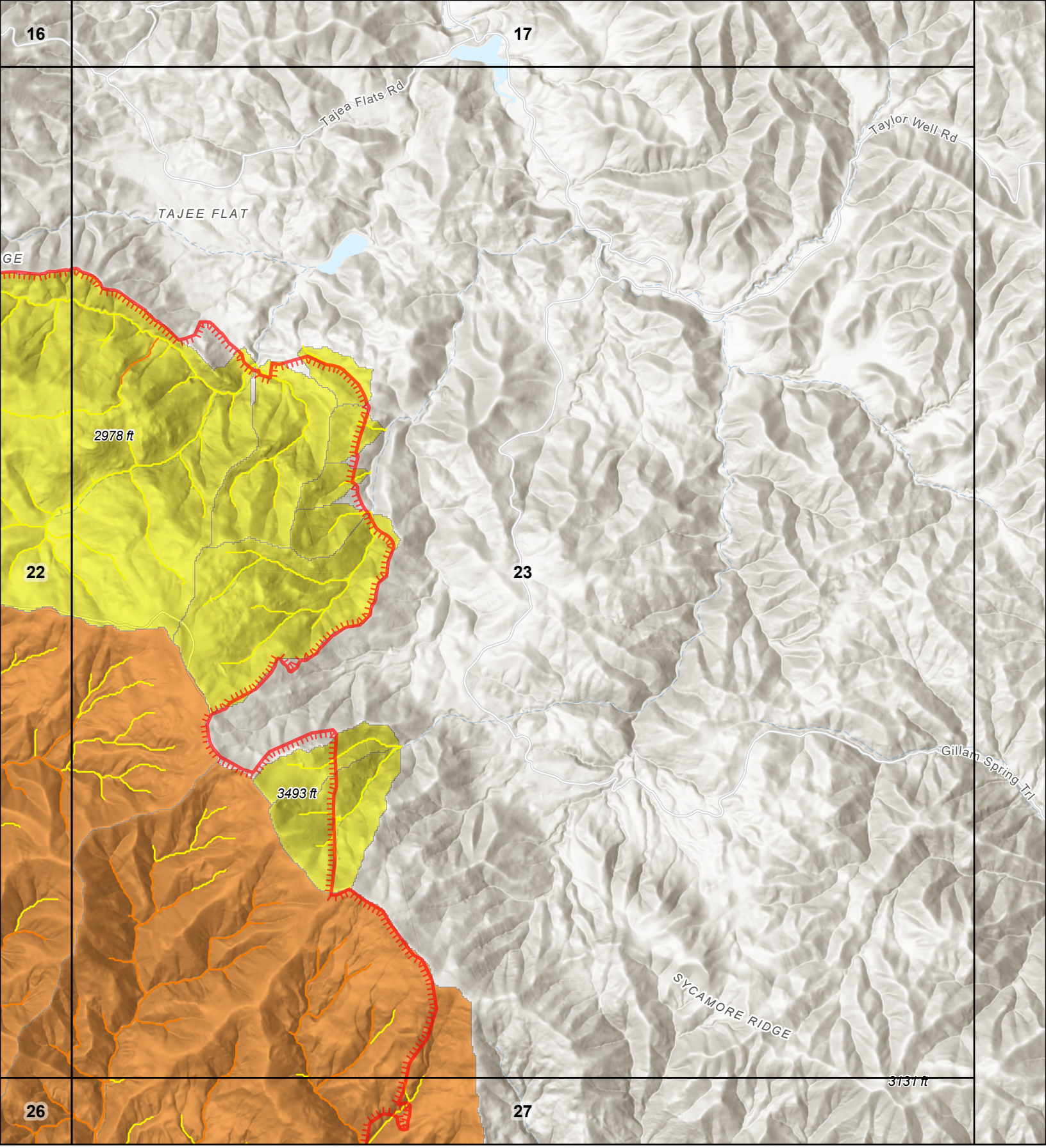

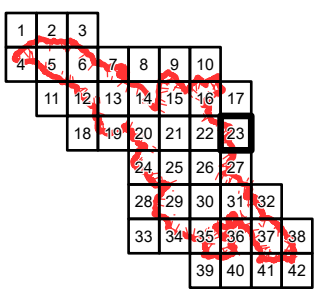

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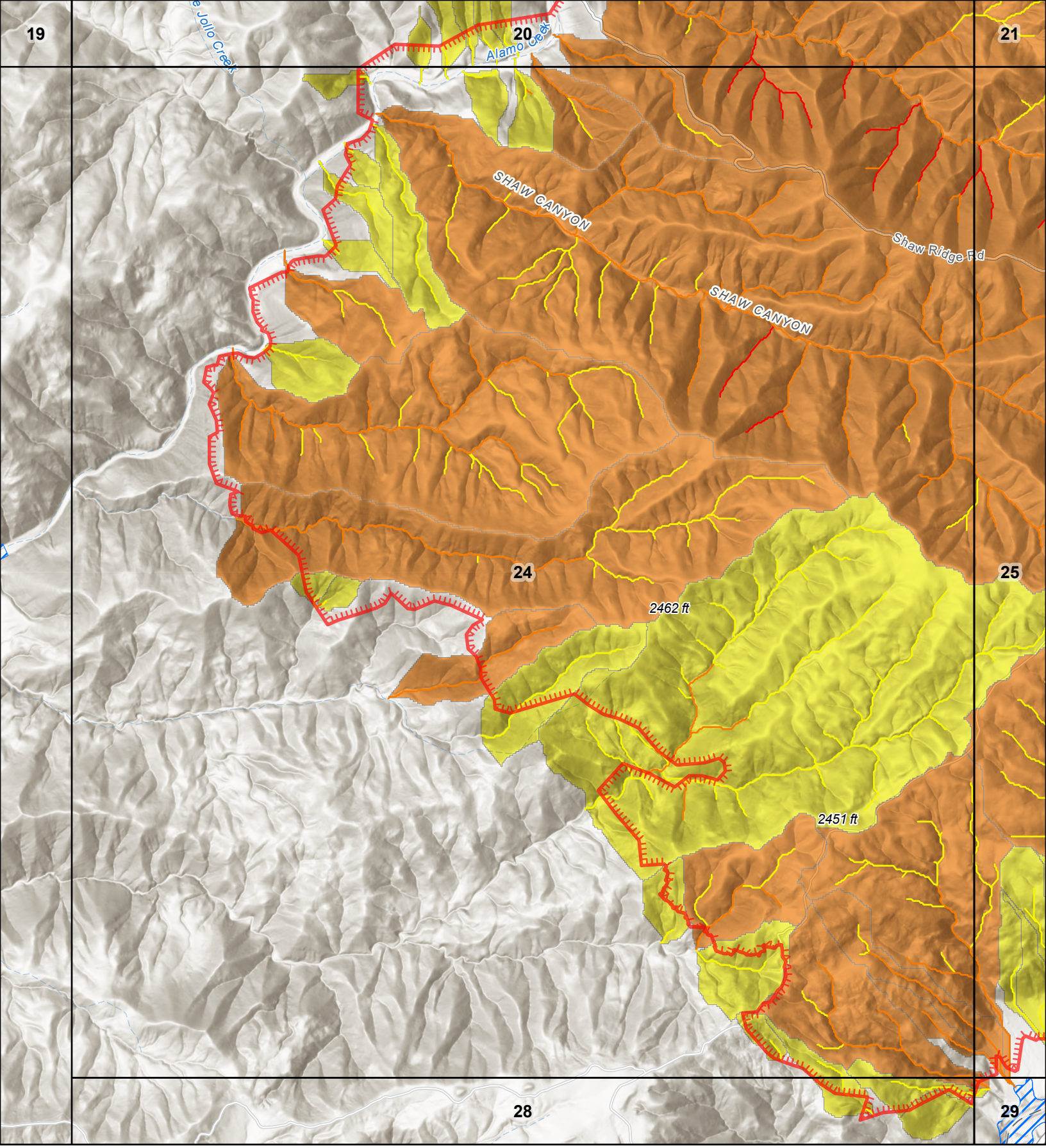

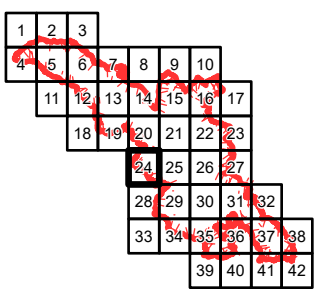

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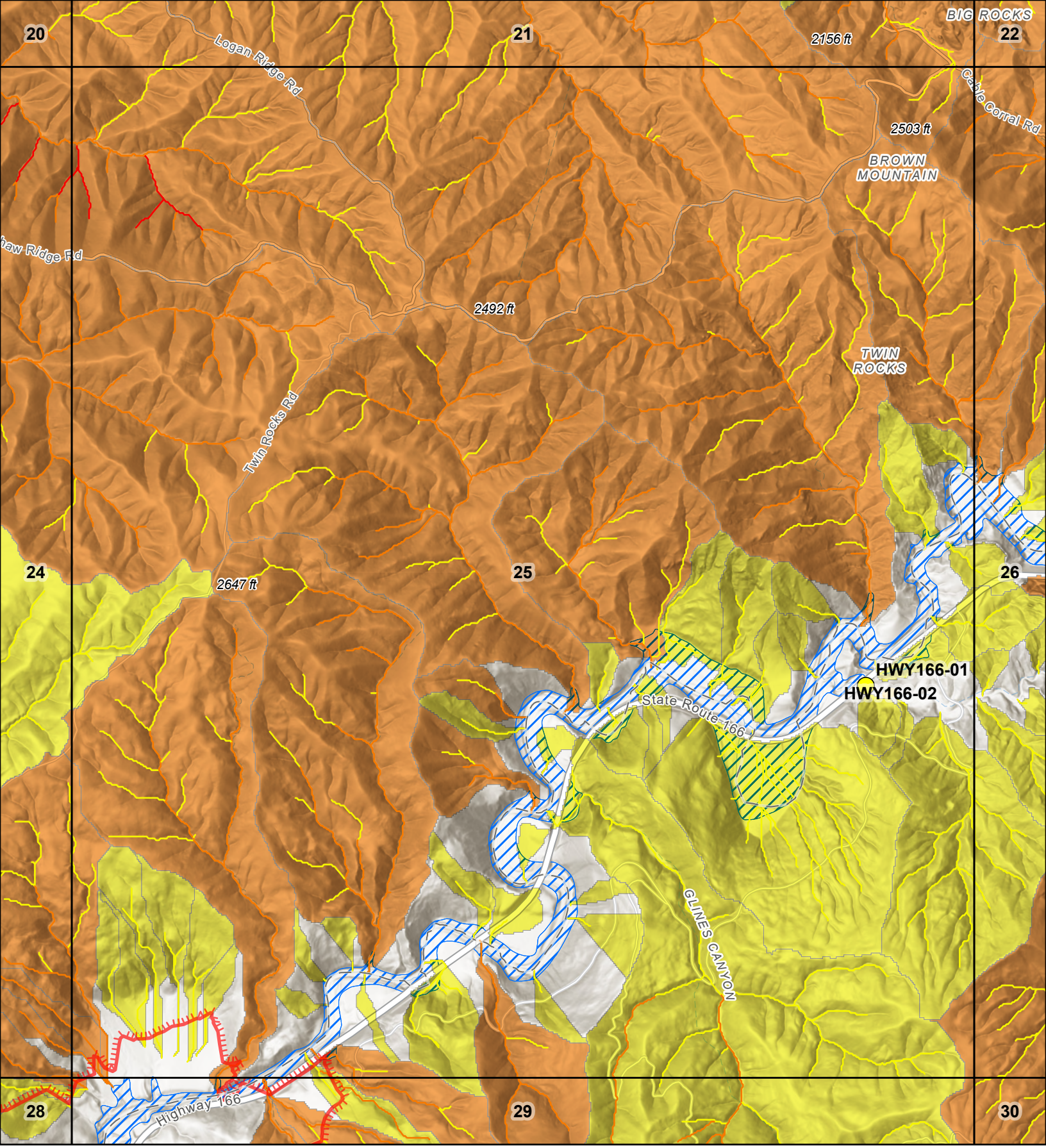

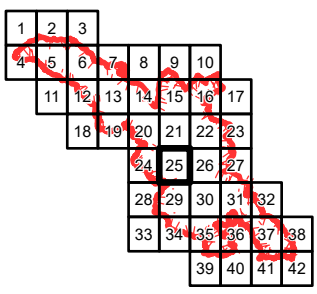

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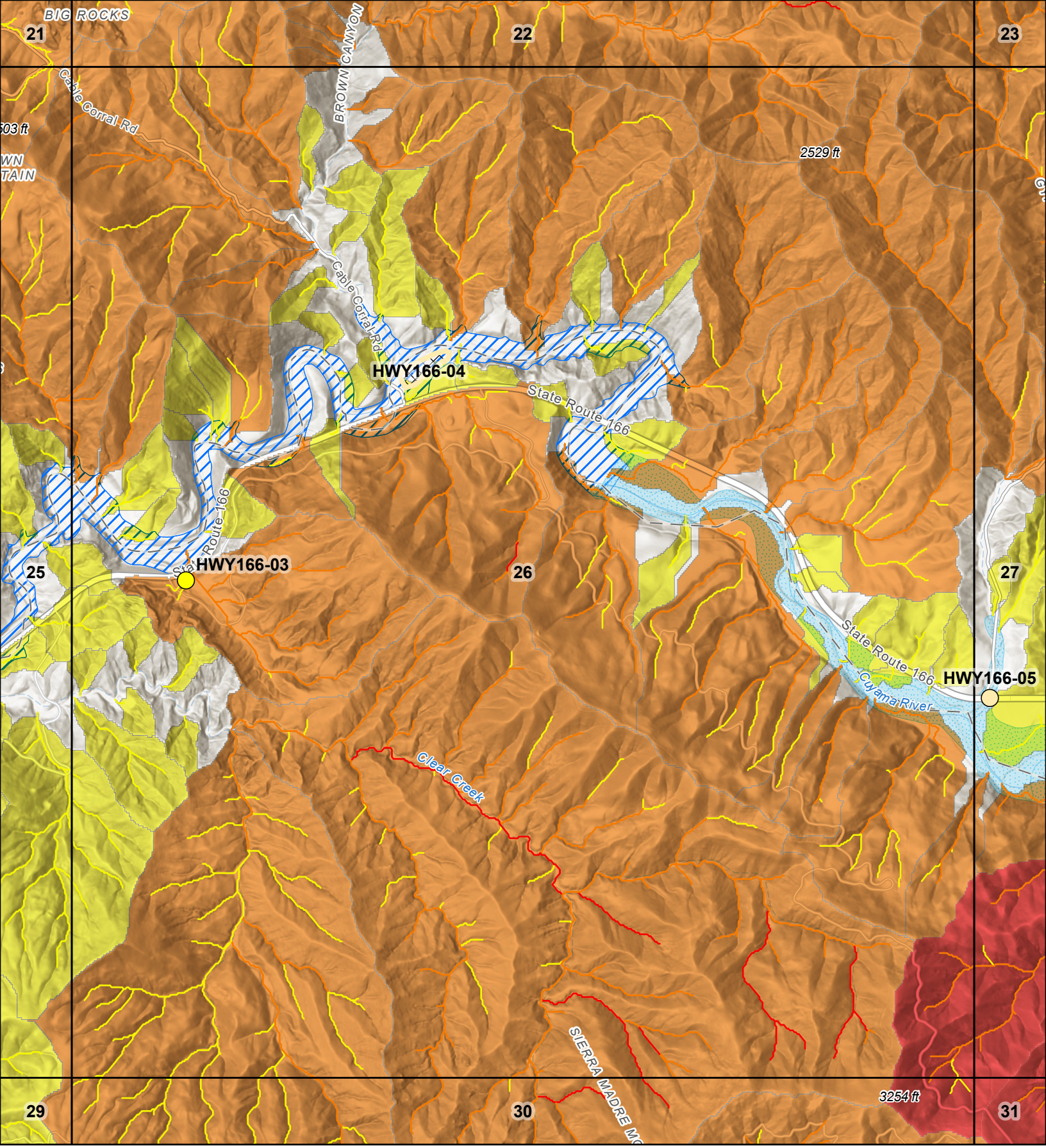

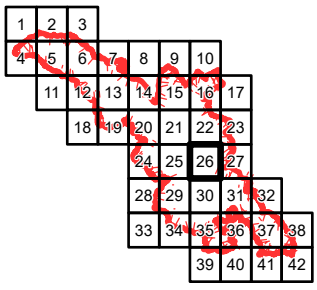

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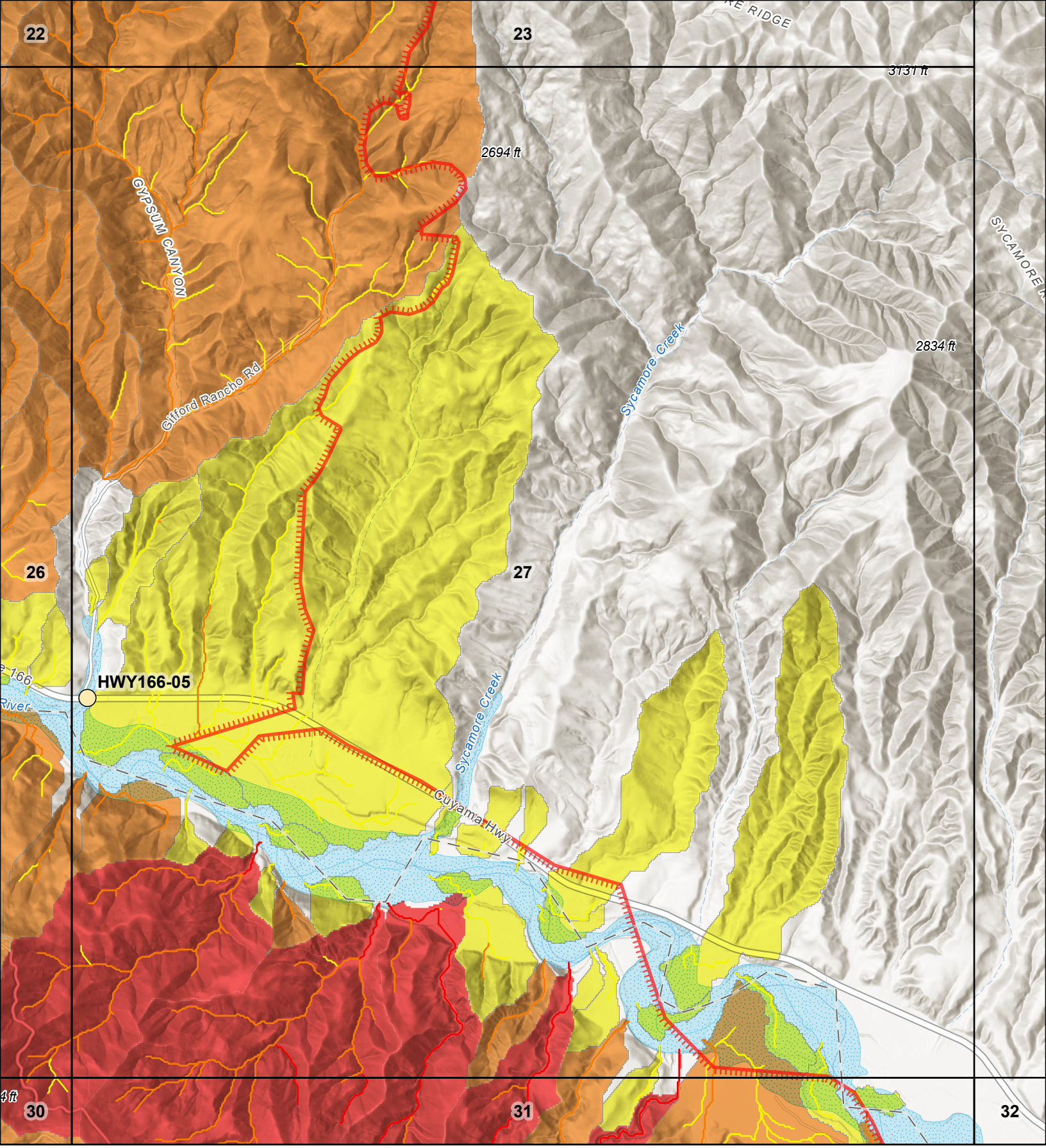

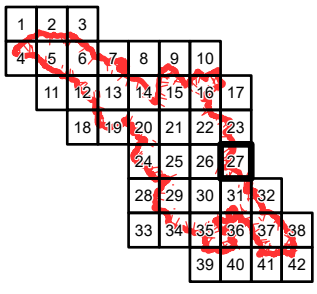

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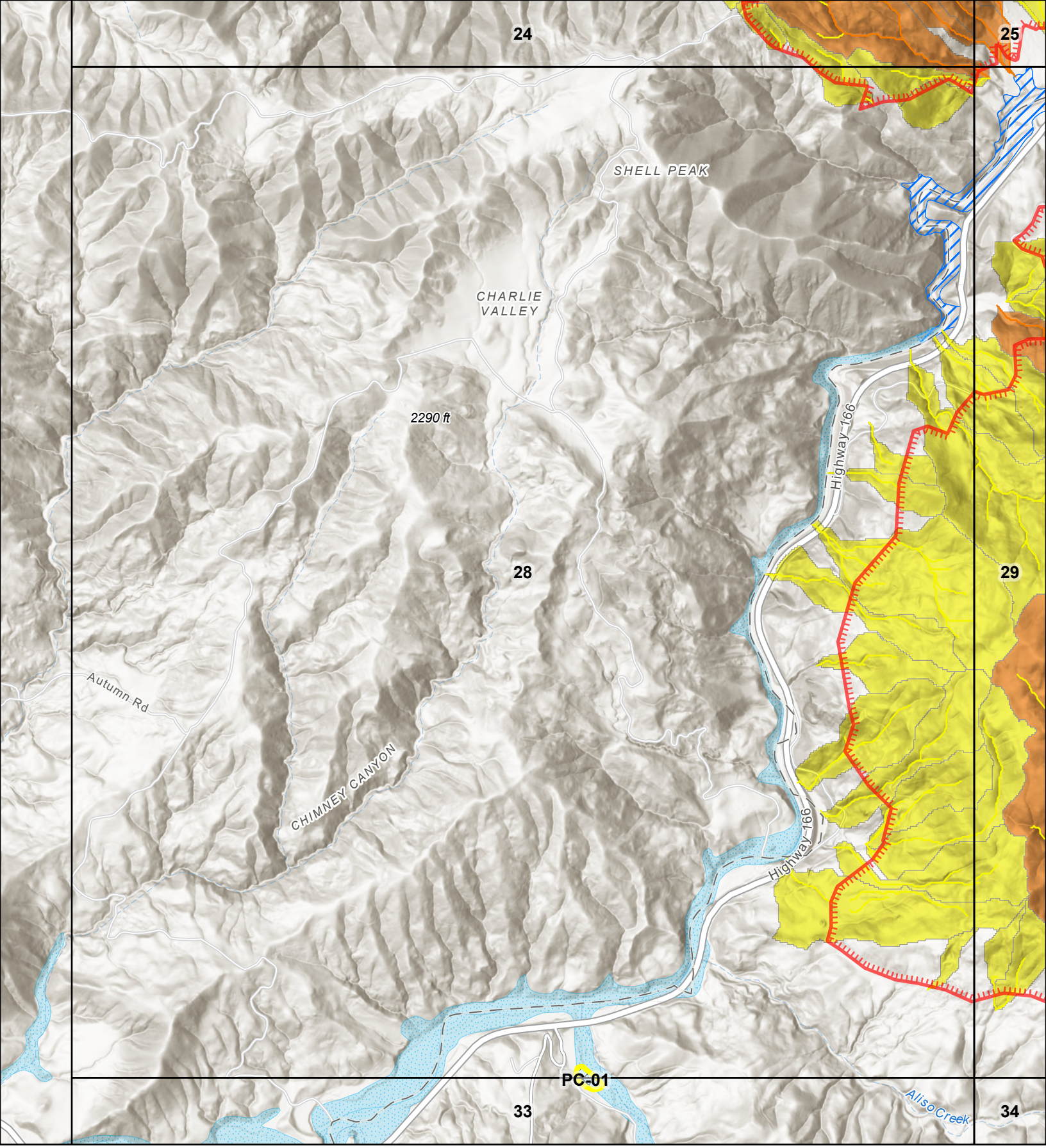

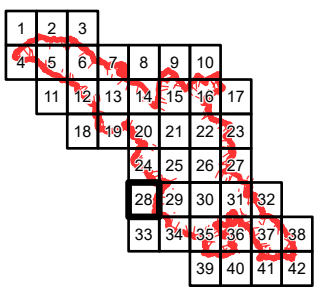

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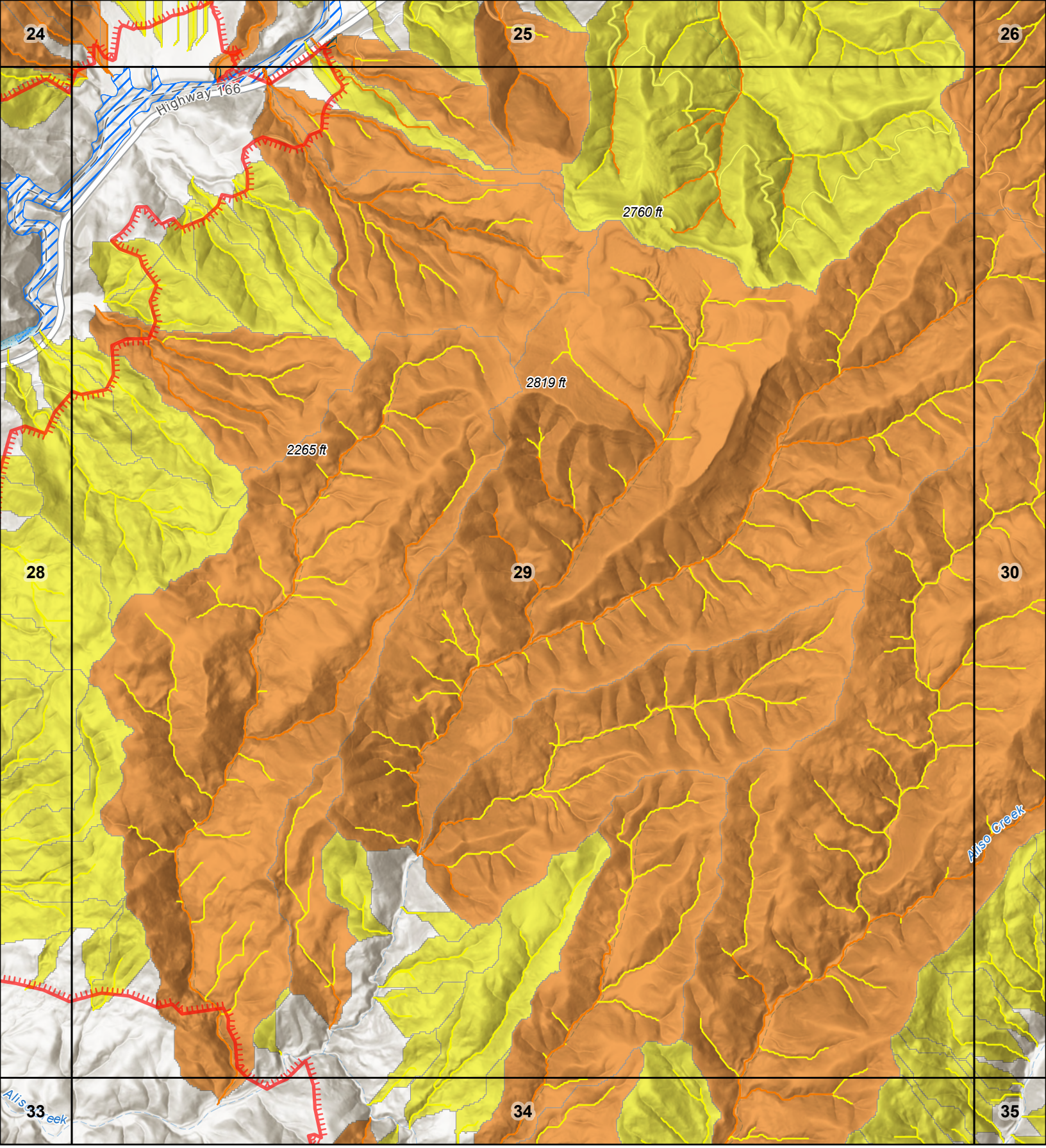

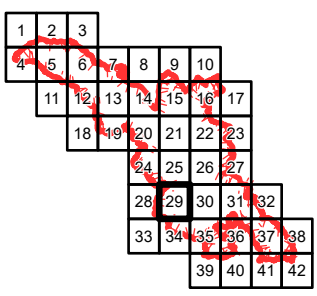

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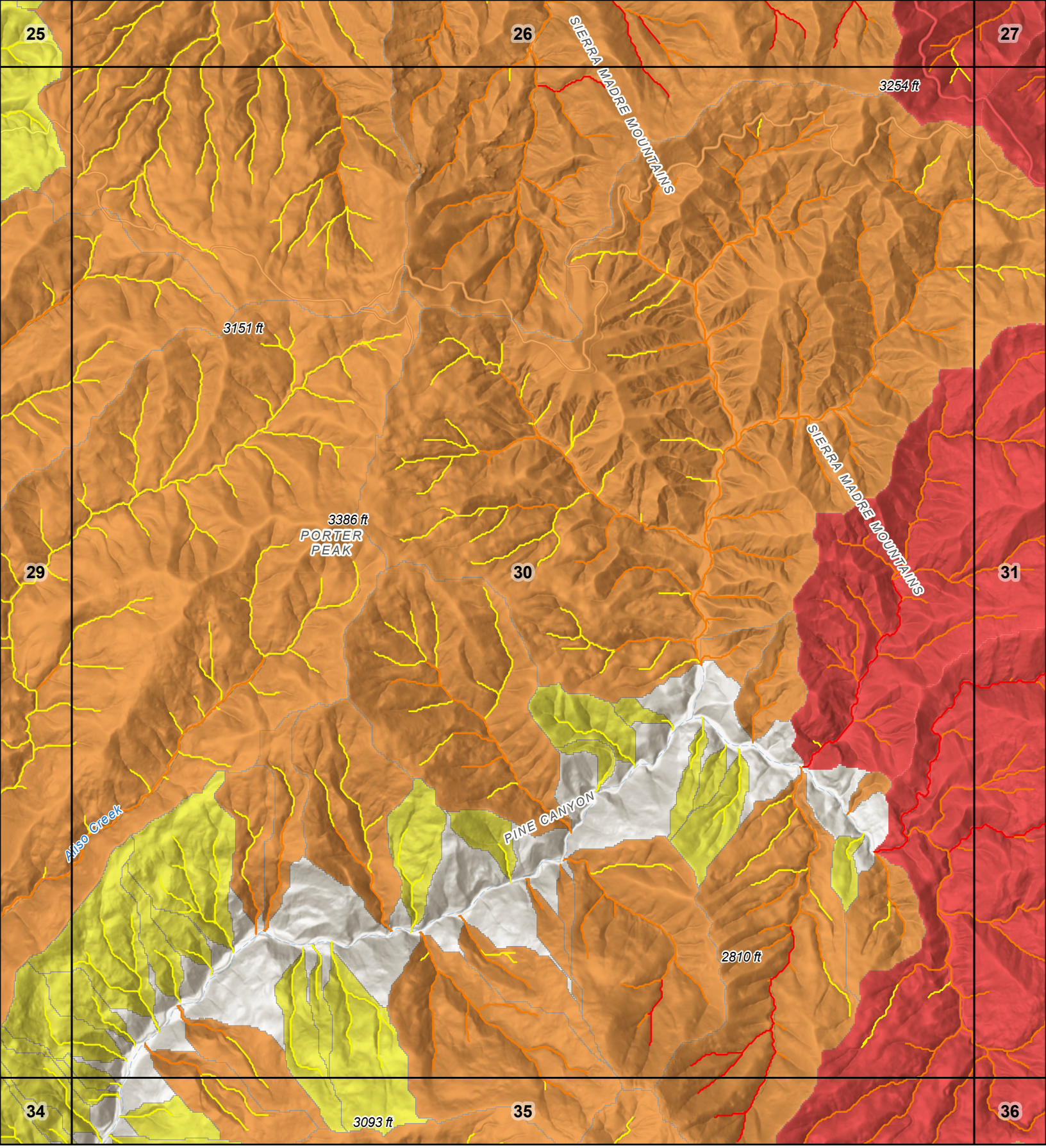

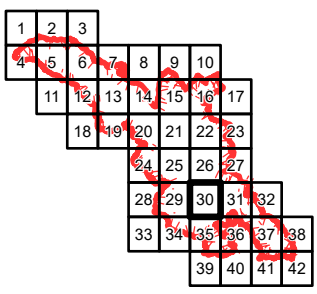

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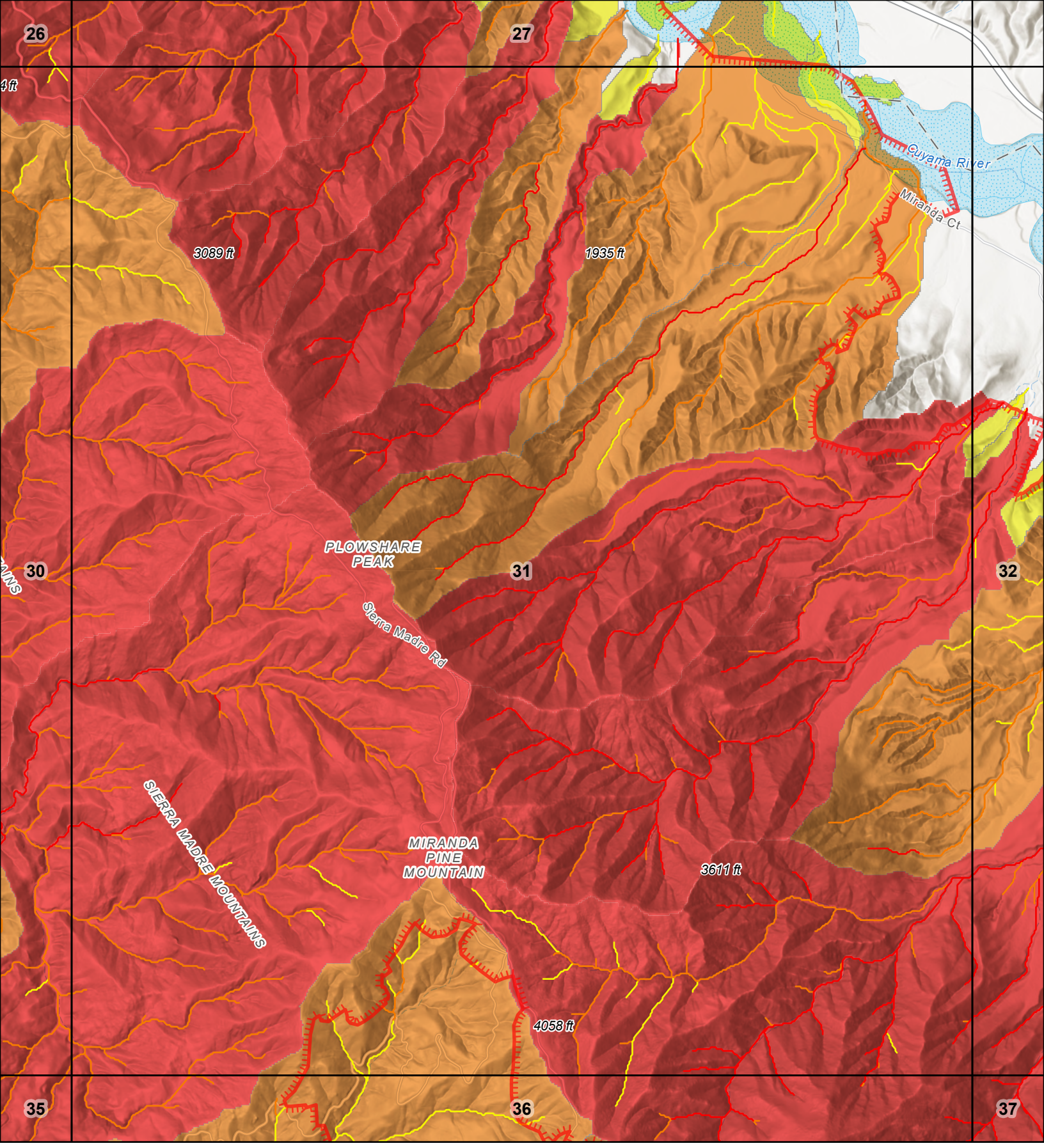

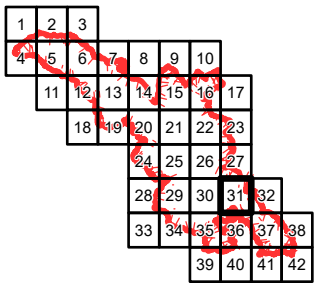

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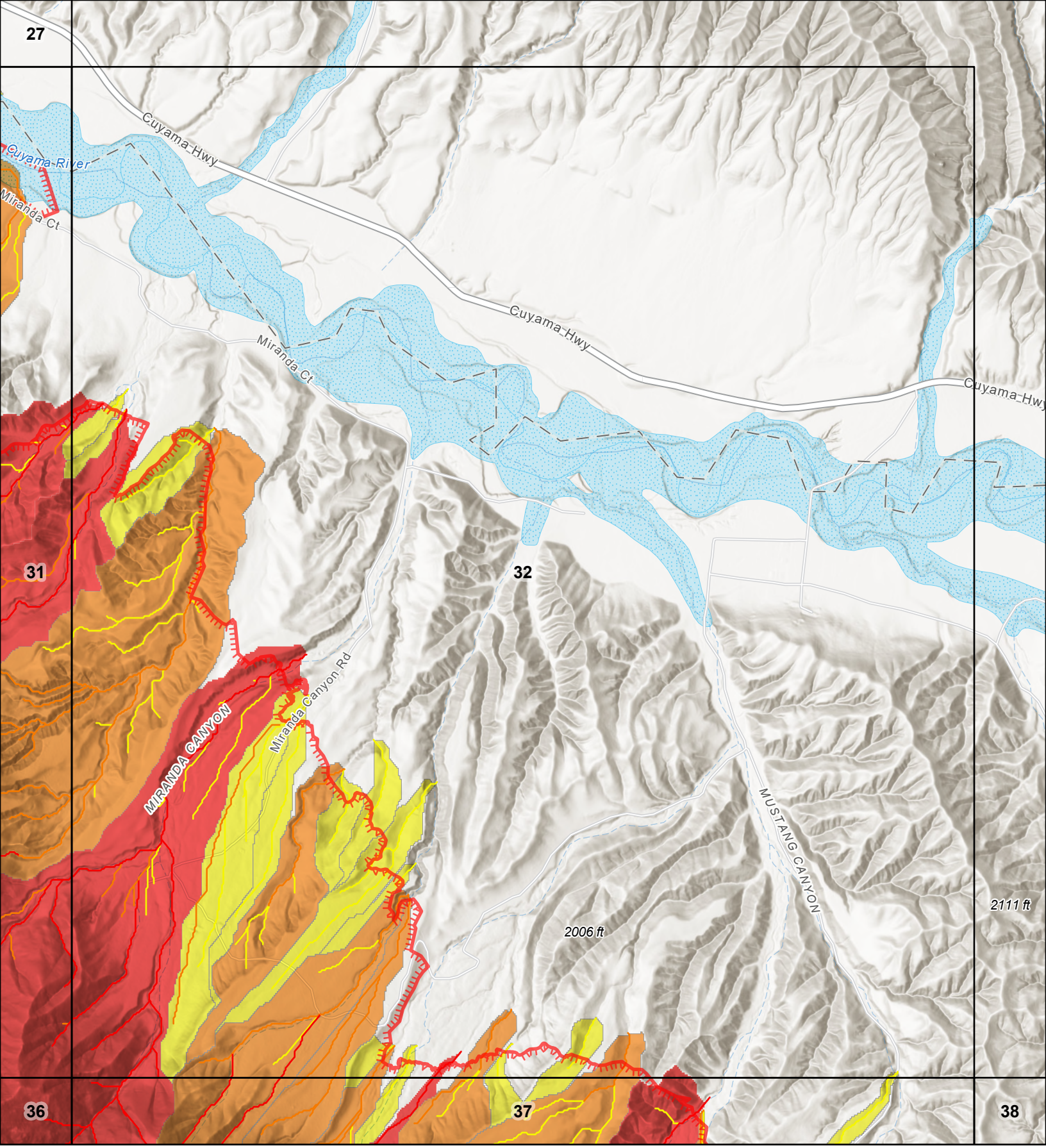

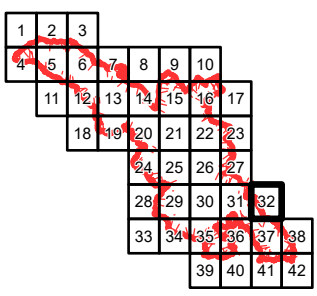

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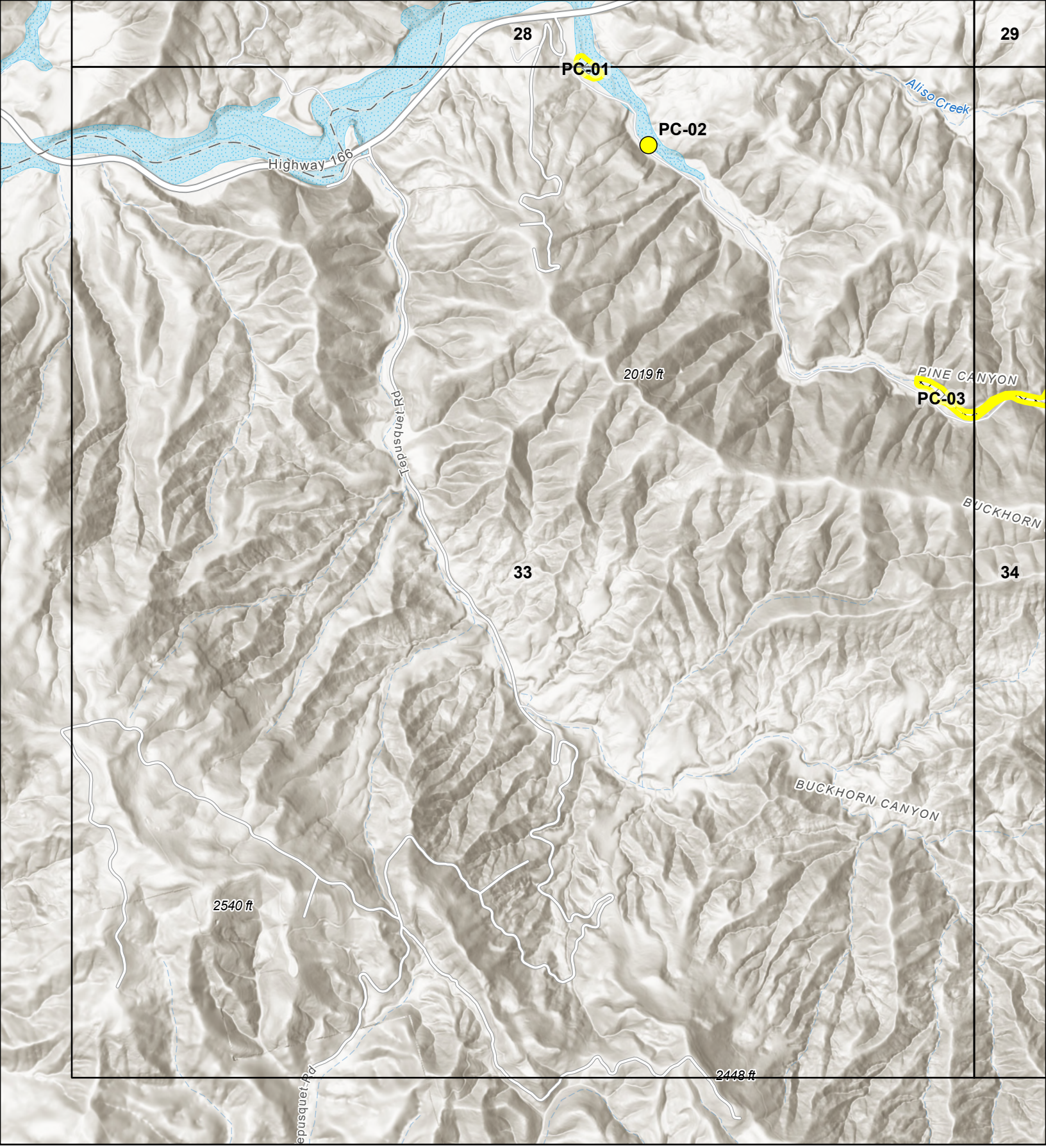

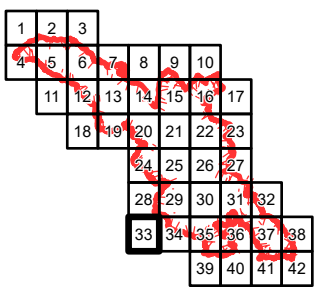

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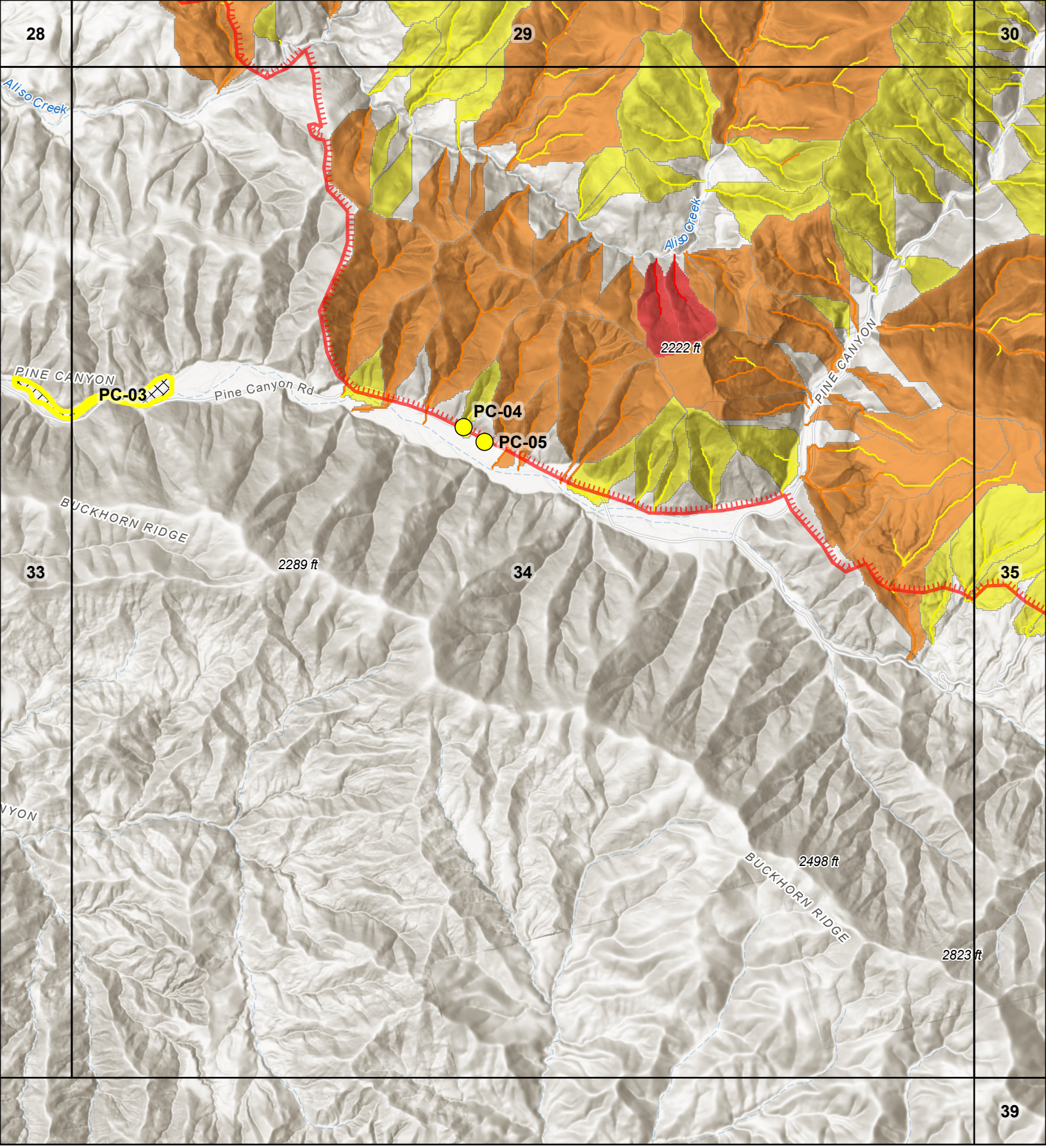

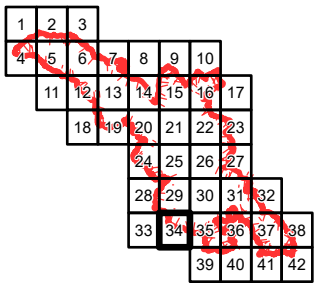

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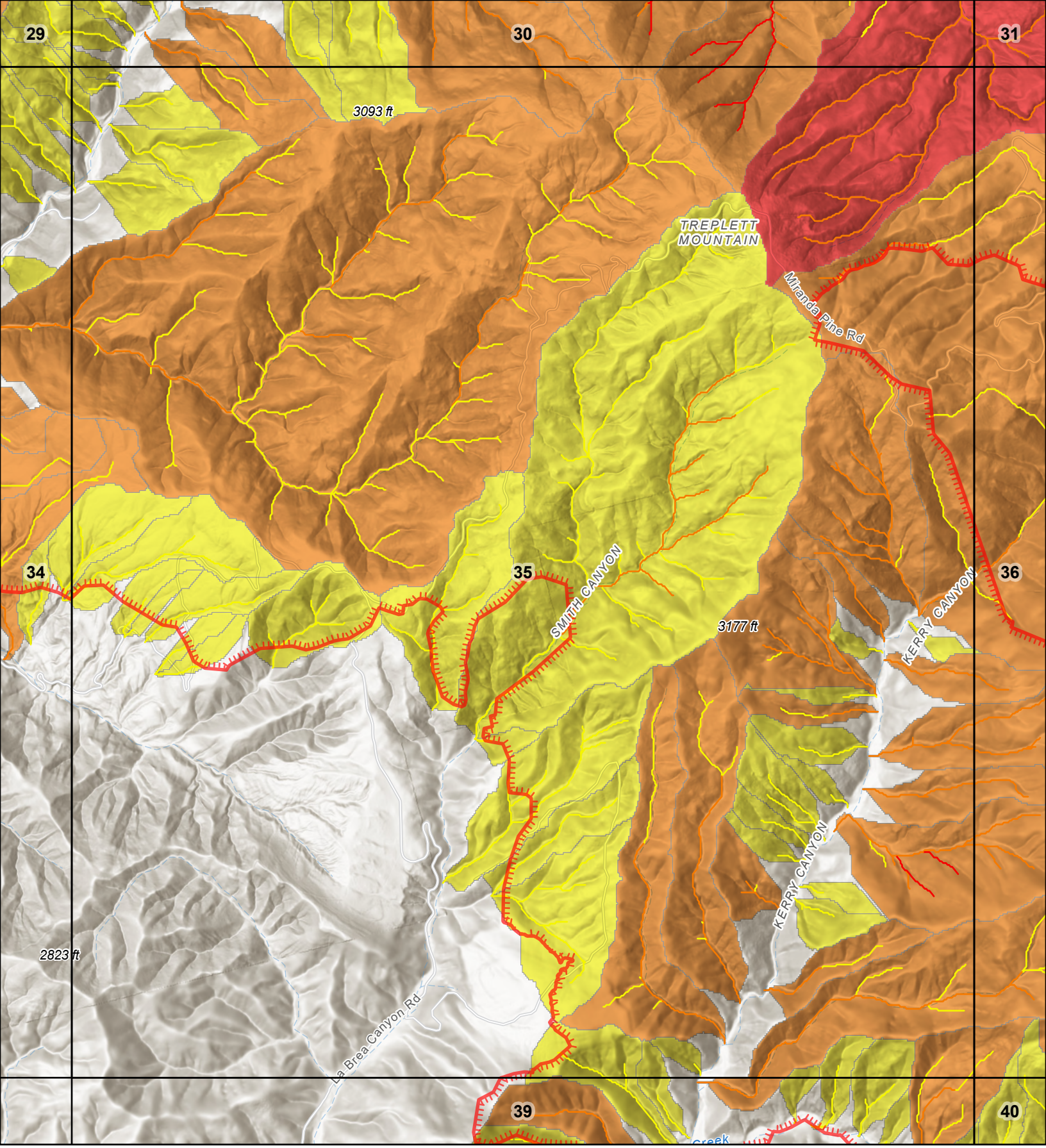

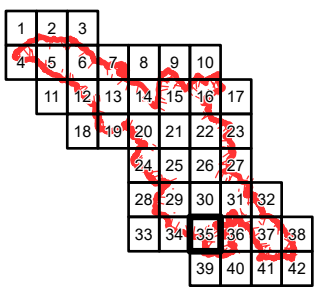

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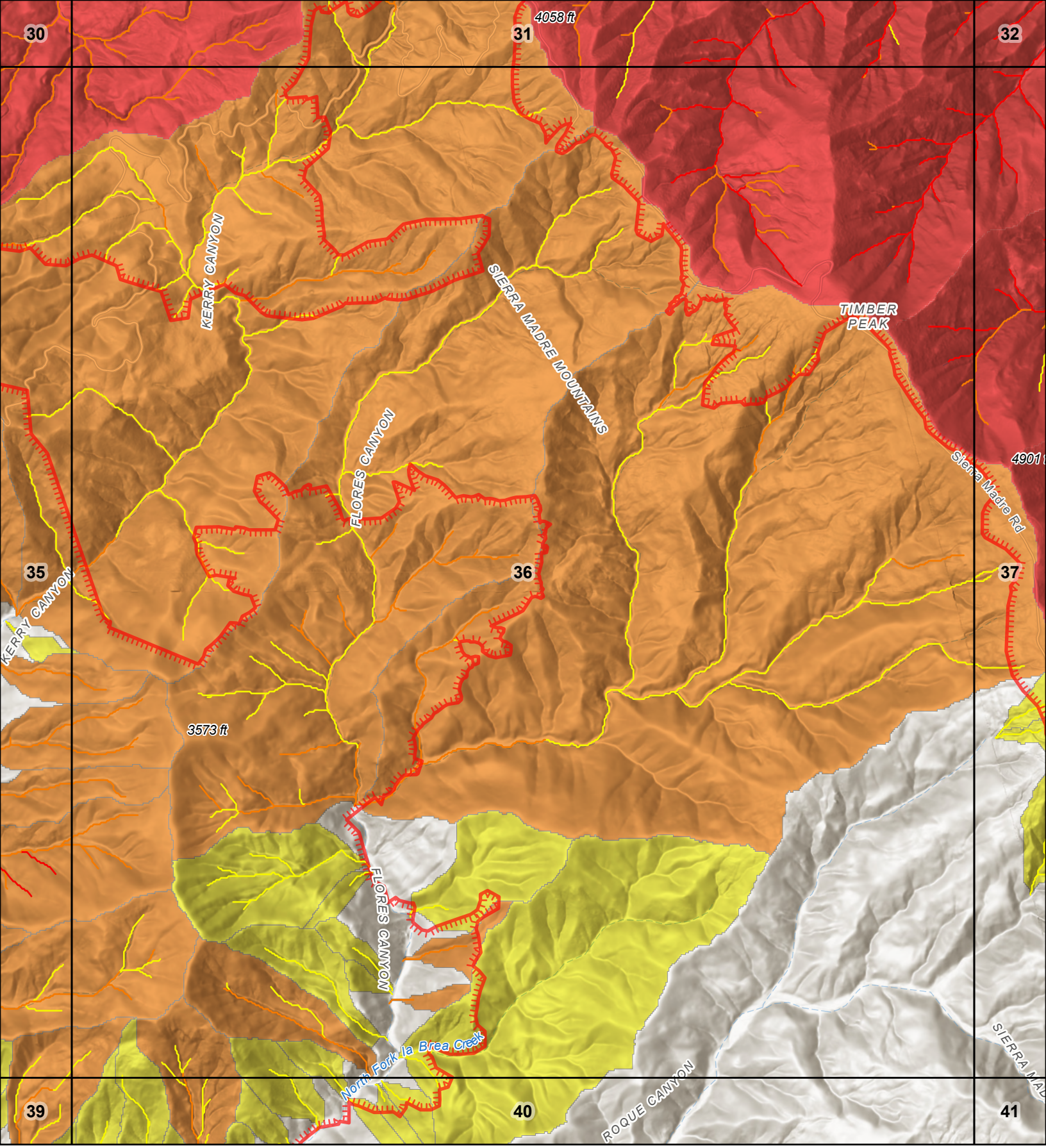

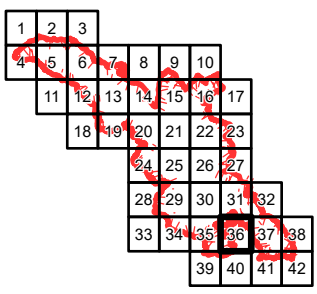

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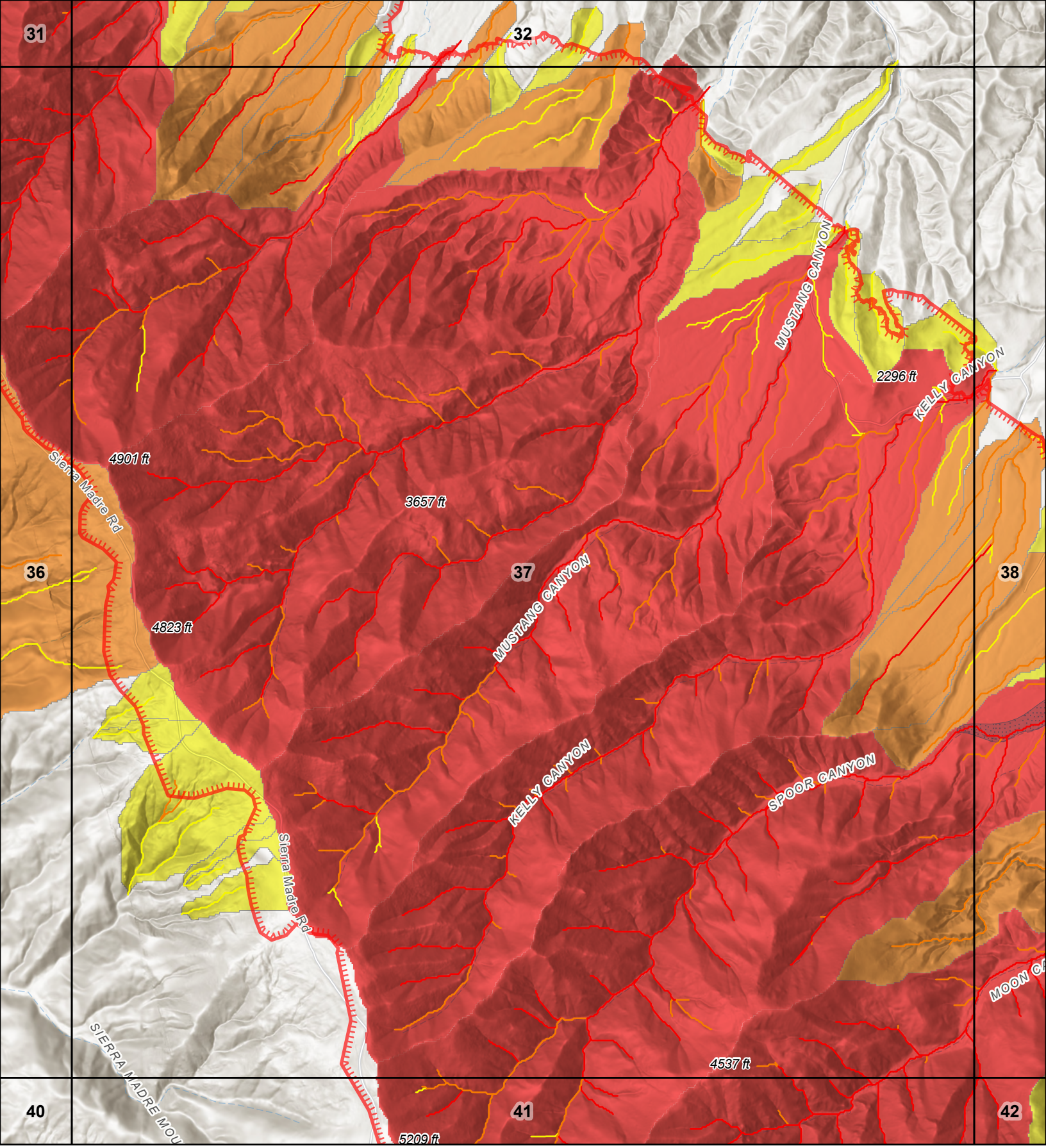

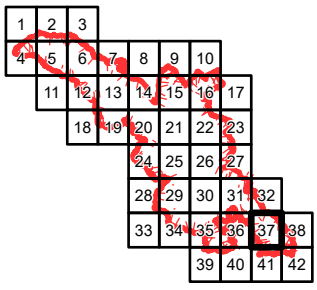

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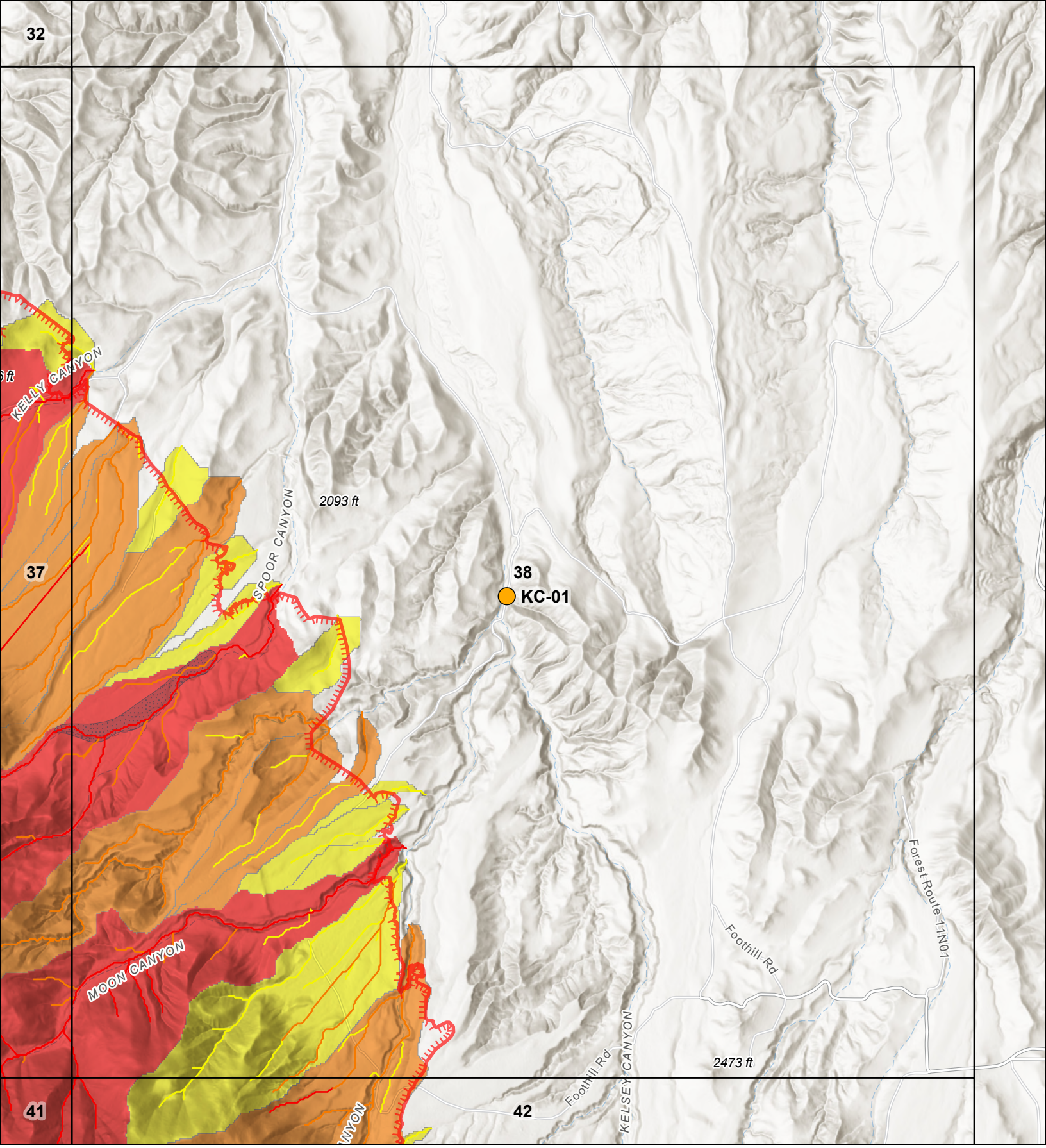

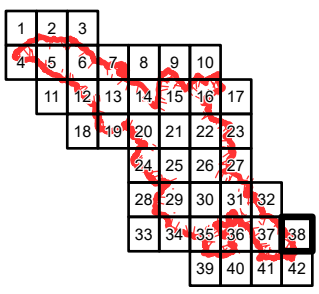

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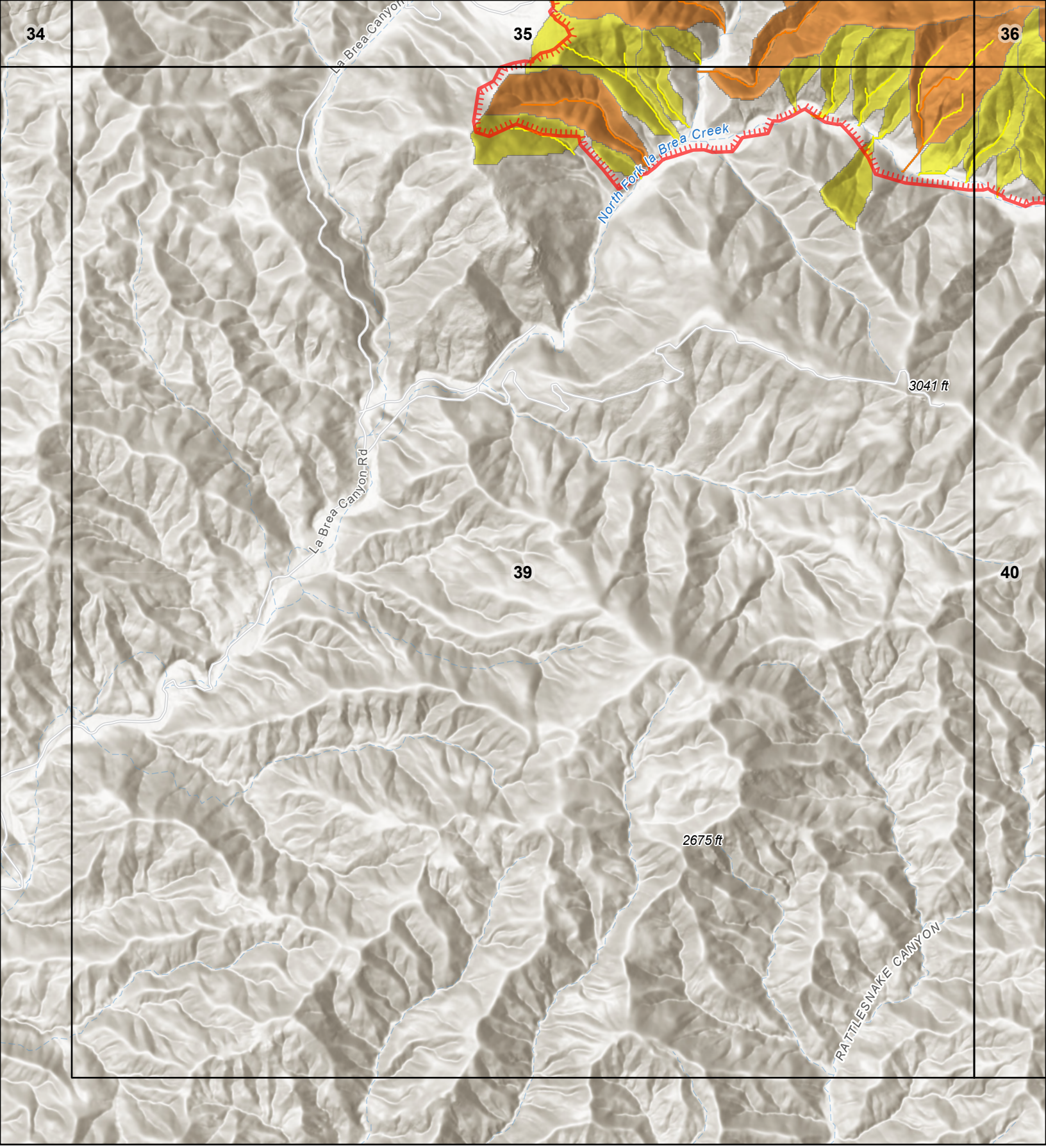
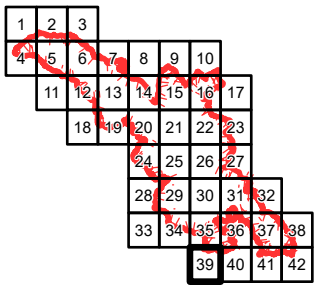
- Fire Perimeter
- FEMA Special Flood Hazard Areas
- DWR 100yr Awareness Floodplains





Incident: Gifford Fire (CA-LPF-002181)

Values at Risk (Polygon)

Risk Level

- Very low
- Low
- Intermediate
- High
- Very high

Value at Risk (Point)

Risk Level

- Very low
- Low
- Intermediate
- High
- Very high

Combined Hazard (Basin)

15 min 24 mm/h

- Low
- Moderate
- High

Combined Hazard (Segment)

15 min 24 mm/h

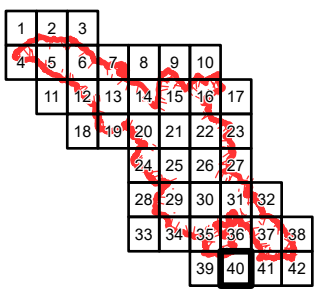
- Low
- Moderate
- High

N

0 1,000 2,000 ft

0 260 520 m

- Fire Perimeter
- FEMA Special Flood Hazard Areas
- DWR 100yr Awareness Floodplains



Incident: Gifford Fire (CA-LPF-002181)

Values at Risk (Polygon)

Risk Level

- Very low
- Low
- Intermediate
- High
- Very high

Value at Risk (Point)

Risk Level

- Very low
- Low
- Intermediate
- High
- Very high

Combined Hazard (Basin)

15 min 24 mm/h

- Low
- Moderate
- High

Combined Hazard (Segment)

15 min 24 mm/h

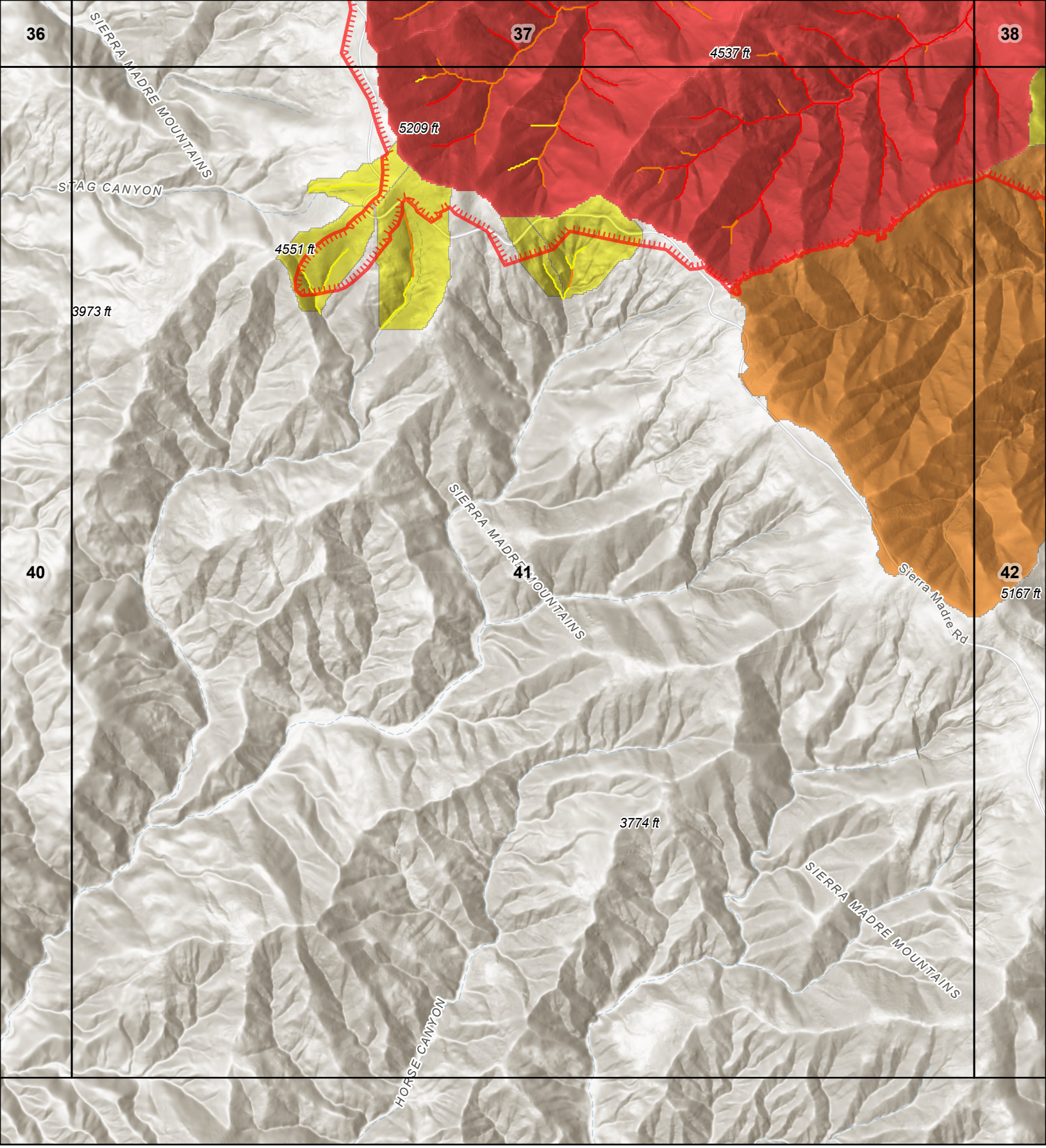
- Low
- Moderate
- High

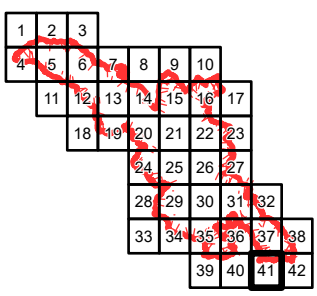
N

0 1,000 2,000 ft

0 260 520 m

- Fire Perimeter
- FEMA Special Flood Hazard Areas
- DWR 100yr Awareness Floodplains





Incident: Gifford Fire (CA-LPF-002181)

Values at Risk (Polygon)
Risk Level
- Very low
- Low
- Intermediate
- High
- Very high

Value at Risk (Point)
Risk Level
- Very low
- Low
- Intermediate
- High
- Very high

Combined Hazard (Basin)
15 min 24 mm/h
- Low
- Moderate
- High

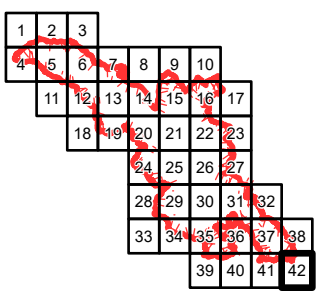
Combined Hazard (Segment)
15 min 24 mm/h
- Low
- Moderate
- High

N

0 1,000 2,000 ft

0 260 520 m

- Fire Perimeter
- FEMA Special Flood Hazard Areas
- DWR 100yr Awareness Floodplains



Incident: Gifford Fire (CA-LPF-002181)

Values at Risk (Polygon)
Risk Level
- Very low
- Low
- Intermediate
- High
- Very high

Value at Risk (Point)
Risk Level
- Very low
- Low
- Intermediate
- High
- Very high

Combined Hazard (Basin)
15 min 24 mm/h
- Low
- Moderate
- High

Combined Hazard (Segment)
15 min 24 mm/h
- Low
- Moderate
- High

N

0 1,000 2,000 ft

0 260 520 m

- Fire Perimeter
- FEMA Special Flood Hazard Areas
- DWR 100yr Awareness Floodplains

Appendix D – Values-at-Risk Detail Sheets

VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Highway 166**

Site Number: **HWY166-01**

Feature: **Culvert**

Feature Category: **drainage structure**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of blockage at the culvert inlet. Possible probability of occurrence with minor consequence = LOW RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **moderate**

Expected Probability: **possible**

Expected Consequences: **minor**

Risk Level: **low**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **Clear and maintain culvert**

(3) **NA**

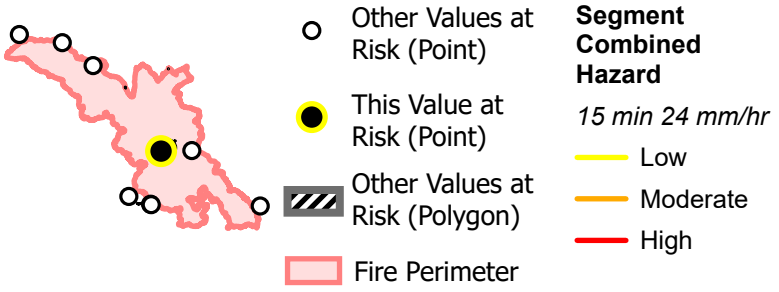
(4) **NA**

Text: NA

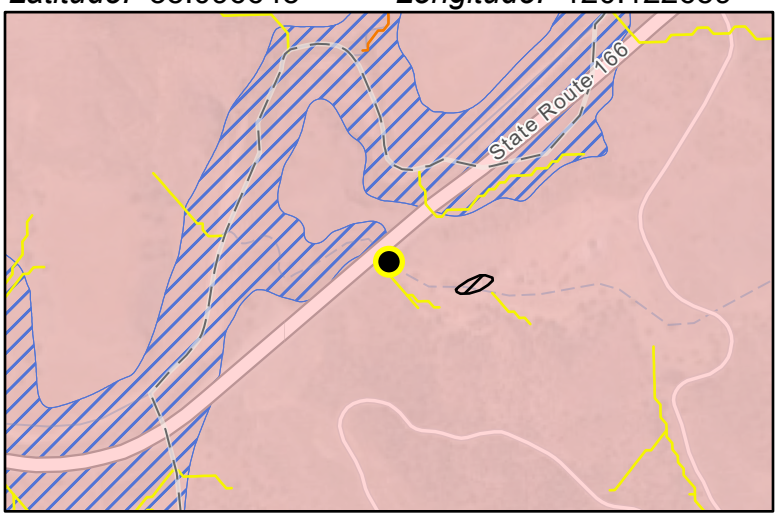
Description of Site:

Box culvert 12 x12 ft with flared headwall inlet. Aggradation directly upstream of culvert, indicating backwater effect.

LOCATION AND PHOTO



Latitude: 35.096645 *Longitude:* -120.122659



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Highway 166**

Site Number: **HWY166-03**

Feature: **Culvert/road prism**

Feature Category: **drainage structure**

Field Observation or Potential Hazard: Potential blockage of culvert could cause flows to back up before draining through secondary culvert. Likely probability of occurrence with minor consequence = LOW RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **low**

Expected Probability: **likely**

Expected Consequences: **minor**

Risk Level: **low**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **Clear and maintain culvert**

(3) **NA**

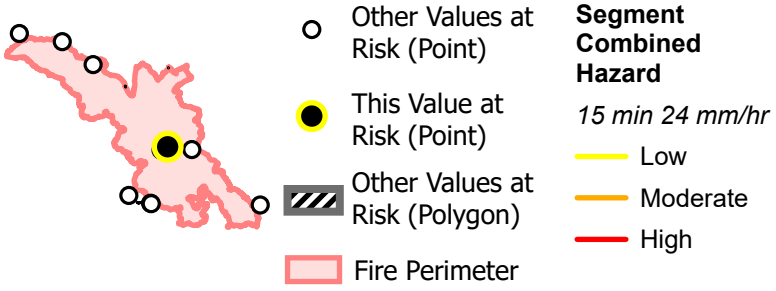
(4) **NA**

Text: NA

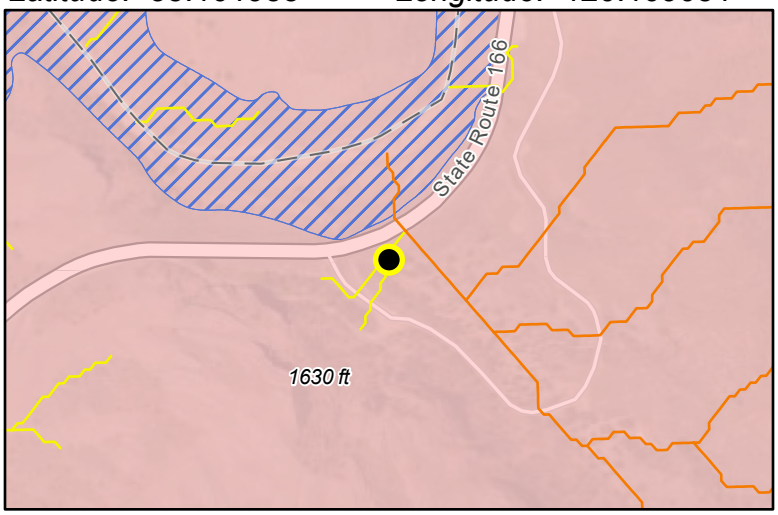
Description of Site:

5 ft CMP with headwall that is partially plugged by 3 ft of aggraded sediment.

LOCATION AND PHOTO



Latitude: 35.101955 *Longitude:* -120.109051



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Highway 166**

Site Number: **HWY166-05**

Feature: **Bridge**

Feature Category: **drainage structure**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flooding to bridge. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.

Potential Hazard to Life: **low**
Potential Hazard to Property: **low**

Expected Probability: **unlikely**
Expected Consequences: **minor**

Risk Level: **very low**

Preliminary Emergency Protective Measures:

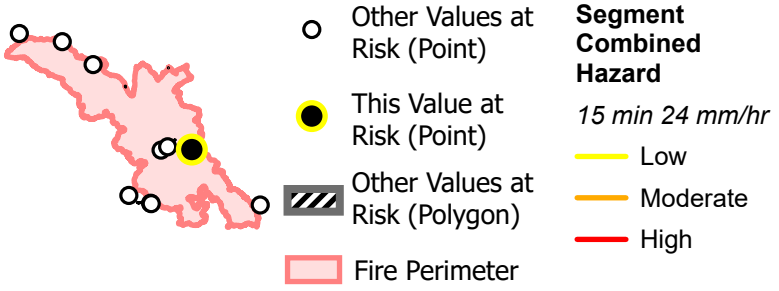
(1) **Early Warning**
(2) **NA**
(3) **NA**
(4) **NA**

Text: NA

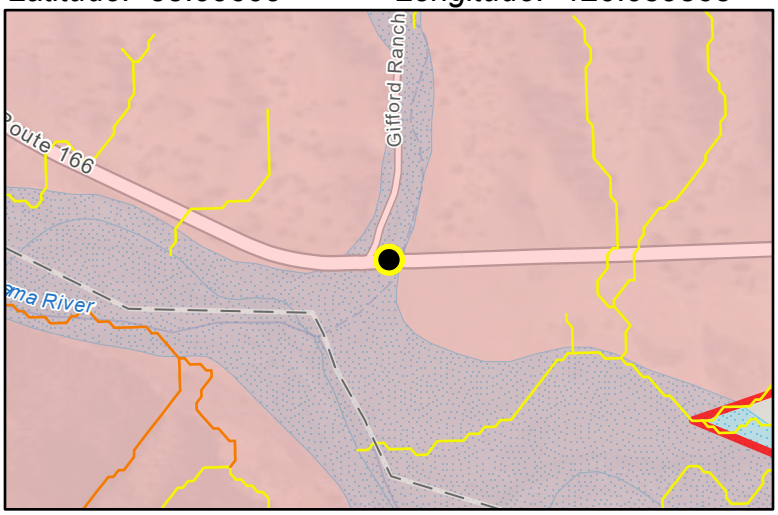
Description of Site:

Free spanning bridge that spans full channel and contains 6-8 ft of freeboard. Recently built bridge with no evidence of recent overtopping.

LOCATION AND PHOTO



Latitude: 35.09609 *Longitude:* -120.059865



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Kelsey Canyon**

Site Number: **KC-01**

Feature: **Home/propane tanks**

Feature Category: **home**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flood or debris flood impacting propane tanks and house located at top of bank. Possible probability of occurrence with moderate consequence = INTERMEDIATE RISK

Potential Hazard to Life: **low**

Potential Hazard to Property: **moderate**

Expected Probability: **possible**

Expected Consequences: **moderate**

Risk Level: **intermediate**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **Deflection structure**

(3) **NA**

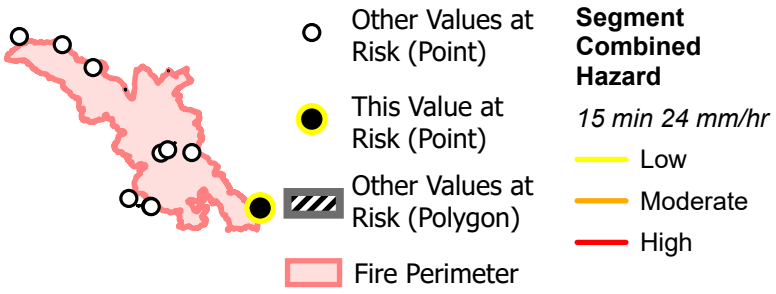
(4) **NA**

Text: NA

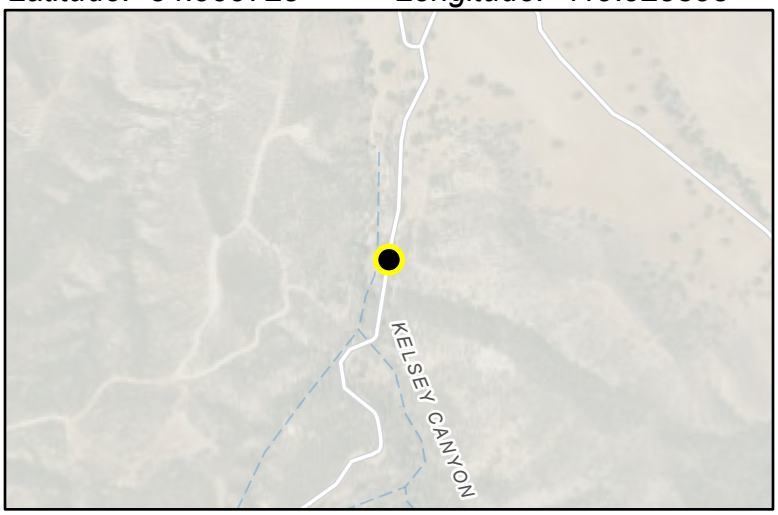
Description of Site:

Clear large woody debris in channel.

LOCATION AND PHOTO



Latitude: 34.999725 *Longitude:* -119.923898



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Pine Canyon**

Site Number: **PC-02**

Feature: **RV trailer/picnic area**

Feature Category: **home**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flooding to RV trailer/picnic area. Possible probability of occurrence with minor consequence = LOW RISK.

Potential Hazard to Life: **low**
Potential Hazard to Property: **low**

Expected Probability: **possible**
Expected Consequences: **minor**

Risk Level: **low**

Preliminary Emergency Protective Measures:

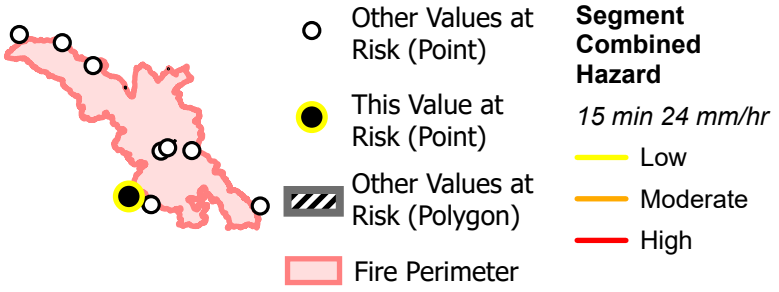
(1) **Early Warning**
(2) **Deflection structure**
(3) **NA**
(4) **NA**

Text: NA

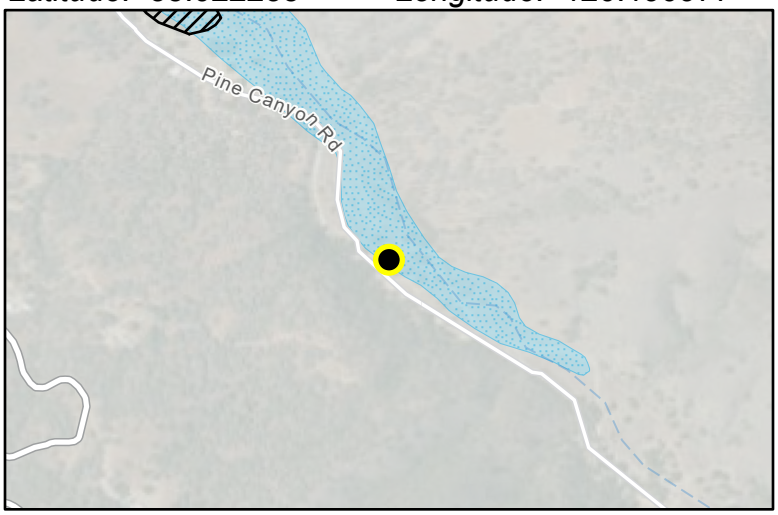
Description of Site:

Channel and bank have been modified to increase channel capacity. RV trailer is elevated above incised channel bank. Mapped in DWR 100 year floodplain.

LOCATION AND PHOTO



Latitude: 35.022235 *Longitude:* -120.190977



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Pine Canyon**

Site Number: **PC-04**

Feature: **Water tank**

Feature Category: **utilities**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flooding/debris flow to water tank at outlet of burned drainage. Possible probability of occurrence with minor consequence = LOW RISK.

Potential Hazard to Life: **low**
Potential Hazard to Property: **low**

Expected Probability: **possible**
Expected Consequences: **minor**

Risk Level: **low**

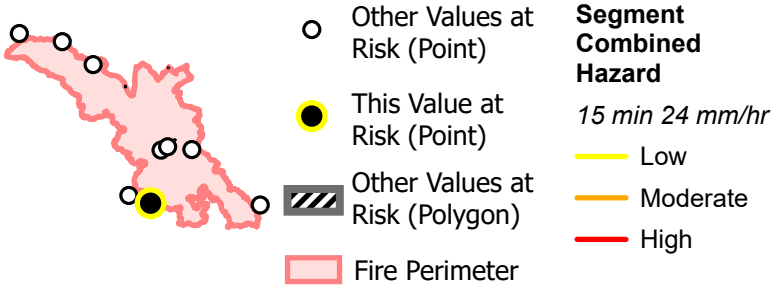
Preliminary Emergency Protective Measures:

(1) **Deflection structure**
(2) **NA**
(3) **NA**
(4) **NA**

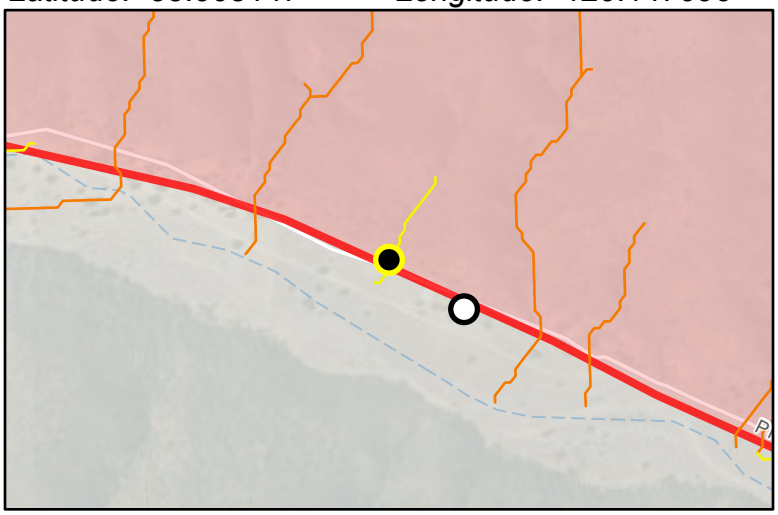
Text: NA

Description of Site:
Adjacent channel is incised. Shallow slope instability upslope of tank.

LOCATION AND PHOTO



Latitude: 35.008147 *Longitude:* -120.147096



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Pine Canyon**

Site Number: **PC-05**

Feature: **Mobile home**

Feature Category: **home**

Field Observation or Potential Hazard: Shallow slope instability upslope of mobile home. Possible probability of occurrence with minor consequence = LOW RISK.

Potential Hazard to Life: **low**
Potential Hazard to Property: **low**

Expected Probability: **possible**
Expected Consequences: **minor**

Risk Level: **low**

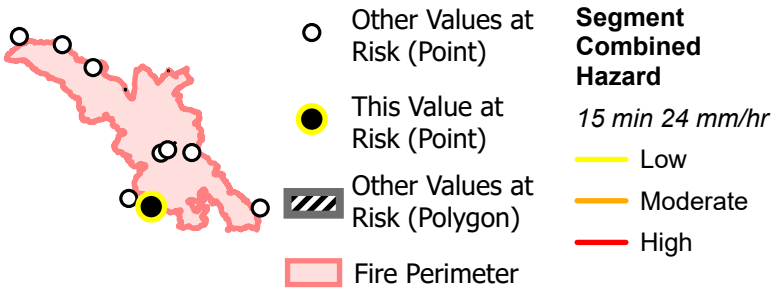
Preliminary Emergency Protective Measures:

(1) **Deflection structure**
(2) **NA**
(3) **NA**
(4) **NA**

Text: NA

Description of Site:
Mobile home at base of shallow translational slide that likely had failure pre-fire.

LOCATION AND PHOTO



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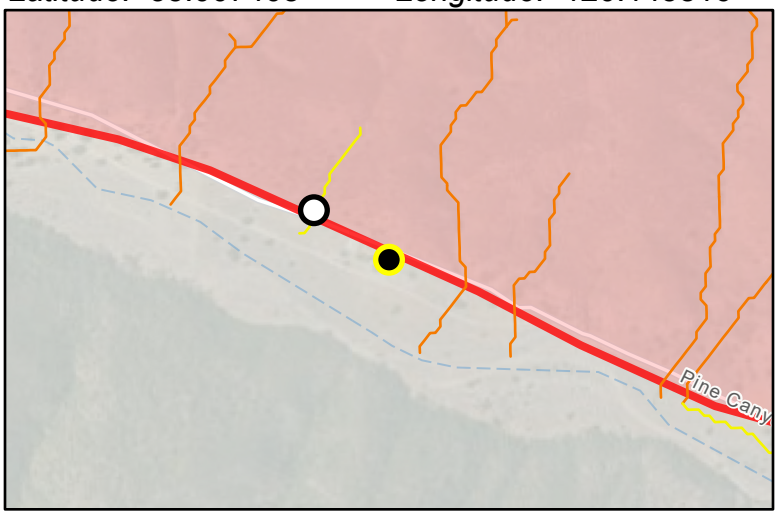


VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Pippin Corner on the Salinas River**

Site Number: **SAL-01**

Feature: **Bridge**

Feature Category: **drainage structure**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential for overtopping or damage to bridge. Possible probability of occurrence with minor consequence = LOW RISK.

Potential Hazard to Life: **low**
Potential Hazard to Property: **low**

Expected Probability: **possible**
Expected Consequences: **minor**

Risk Level: **low**

Preliminary Emergency Protective Measures:

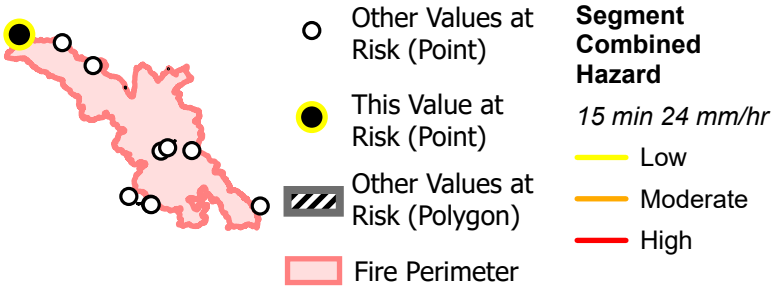
(1) **Early Warning**
(2) **Monitor and maintain**
(3) **NA**
(4) **NA**

Text: NA

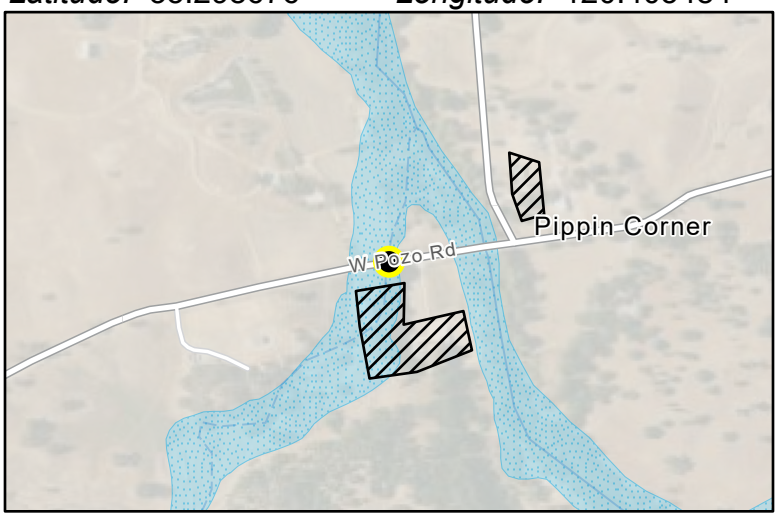
Description of Site:

Bridge was previously flooded (storm on ~9 January 2023). Increased postfire runoff, sediment and woody debris transport will increase the potential of damage to the bridge.

LOCATION AND PHOTO



Latitude: 35.298676 *Longitude:* -120.405484



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Salinas River**

Site Number: **SAL-04**

Feature: **House**

Feature Category: **home**

Field Observation or Potential Hazard: Low increase in postfire runoff expected for the Salinas River. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.

Potential Hazard to Life: **low**
Potential Hazard to Property: **low**

Expected Probability: **unlikely**
Expected Consequences: **minor**

Risk Level: **very low**

Preliminary Emergency Protective Measures:

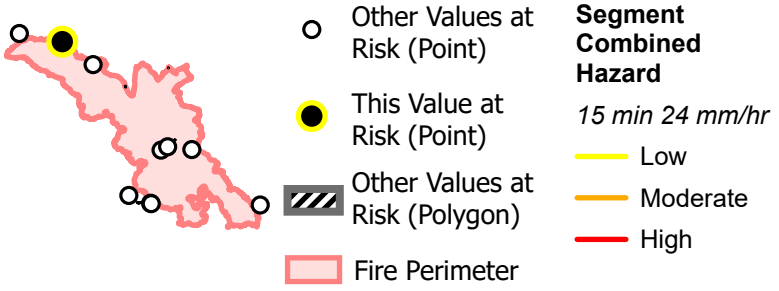
(1) **Early Warning**
(2) **NA**
(3) **NA**
(4) **NA**

Text: NA

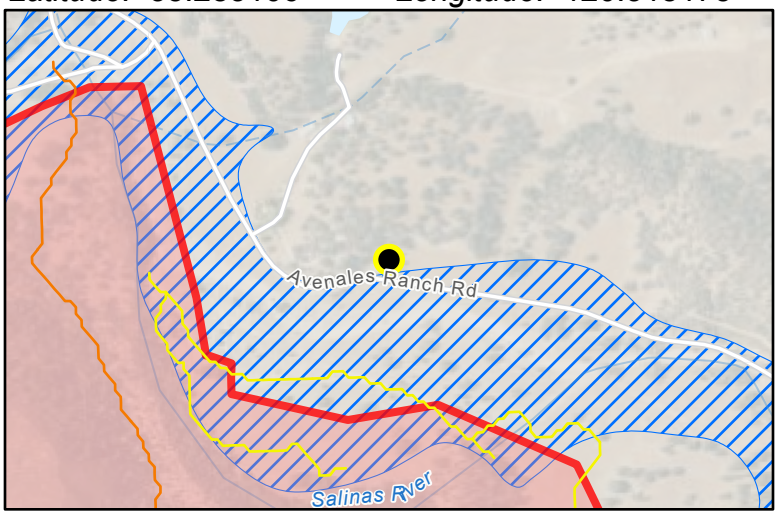
Description of Site:

A house is located on the outside bend of the Salinas River and the channel bank has been reinforced. There is approximately 5-10 ft of elevation difference from the channel to the terrace surface where the house was built. The house is mapped just outside the DWR 100 yr floodplain. Because the majority of the upstream area is not burned and the drainage area is high, increases to postfire runoff are expected to be low. Future flooding potential should be considered slightly elevated relative to prefire conditions.

LOCATION AND PHOTO



Latitude: 35.283106 *Longitude:* -120.318175



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Salinas River**

Site Number: **SAL-05**

Feature: **Bridge**

Feature Category: **drainage structure**

Field Observation or Potential Hazard: Damage to bridge on Avenales Ranch Road. Unlikely probability of occurrence with moderate consequence = LOW RISK.

Potential Hazard to Life: **low**
Potential Hazard to Property: **moderate**
Expected Probability: **unlikely**
Expected Consequences: **moderate**

Risk Level: **low**

Preliminary Emergency Protective Measures:

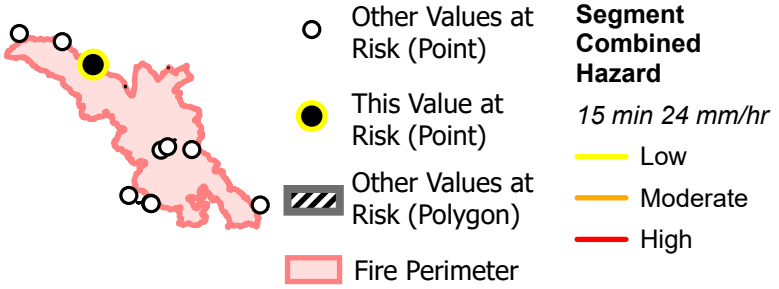
(1) **Early Warning**
(2) **Monitor and maintain**
(3) **NA**
(4) **NA**

Text: Fire damage should be repaired.

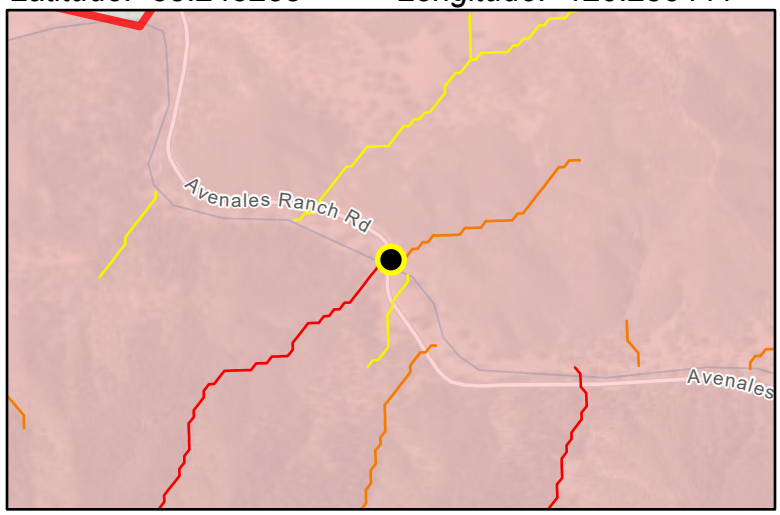
Description of Site:

The bridge was damaged and partially burned in the fire. The Salinas River was dry in August 2025 and vehicles were able to drive across the channel. Access will be blocked when the Salinas River is flowing. Bridge could experience additional damage due to its burned state.

LOCATION AND PHOTO



Latitude: 35.243235 *Longitude:* -120.256441



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Avenales Ranch Rd**

Site Number: **ALA-01**

Feature: **House and outbuildings**

Feature Category: **multiple**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flooding to homes and outbuildings. Possible probability of occurrence with moderate consequence = INTERMEDIATE RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **moderate**

Expected Probability: **possible**

Expected Consequences: **moderate**

Risk Level: **intermediate**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **Deflection structure**

(3) **Sandbags**

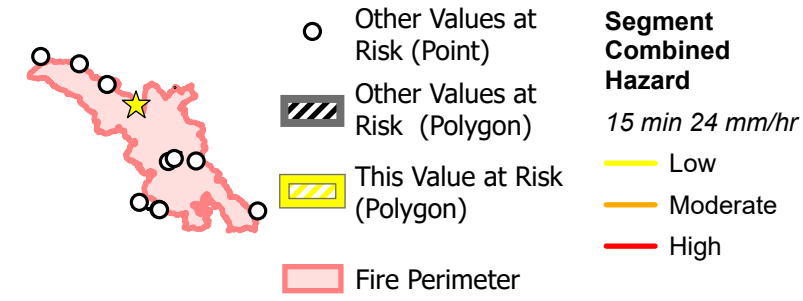
(4) **NA**

Text: NA

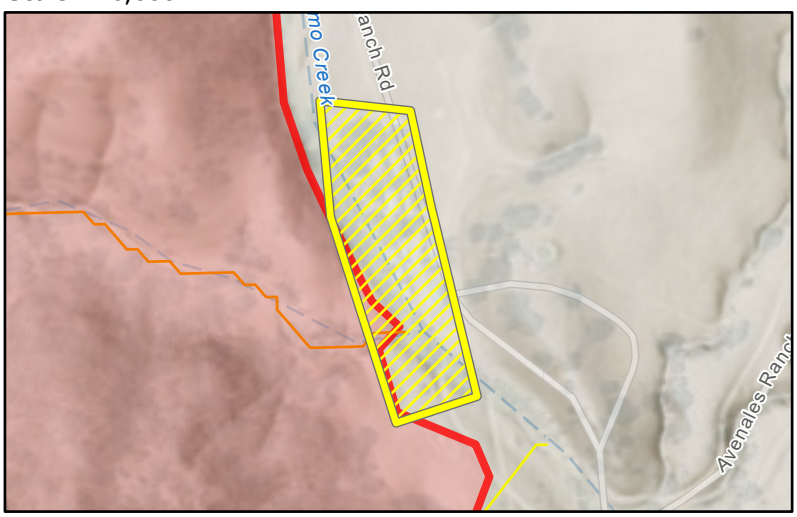
Description of Site:

Alamo Creek is immediately behind homes and outbuildings. No evidence of recent flooding to structures.

LOCATION AND PHOTO



Scale: 1:6,000



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Highway 166**

Site Number: **HWY166-02**

Feature: **Barn/outbuildings**

Feature Category: **other**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flooding to base of barn and fence. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **low**

Expected Probability: **unlikely**

Expected Consequences: **minor**

Risk Level: **very low**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **Deflection structure**

(3) **NA**

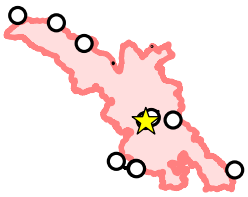
(4) **NA**

Text: NA

Description of Site:

If downstream culvert becomes blocked and back water occurs the risk to barn could be elevated.

LOCATION AND PHOTO



Other Values at Risk (Point)

Other Values at Risk (Polygon)

This Value at Risk (Polygon)

Fire Perimeter

Segment Combined Hazard

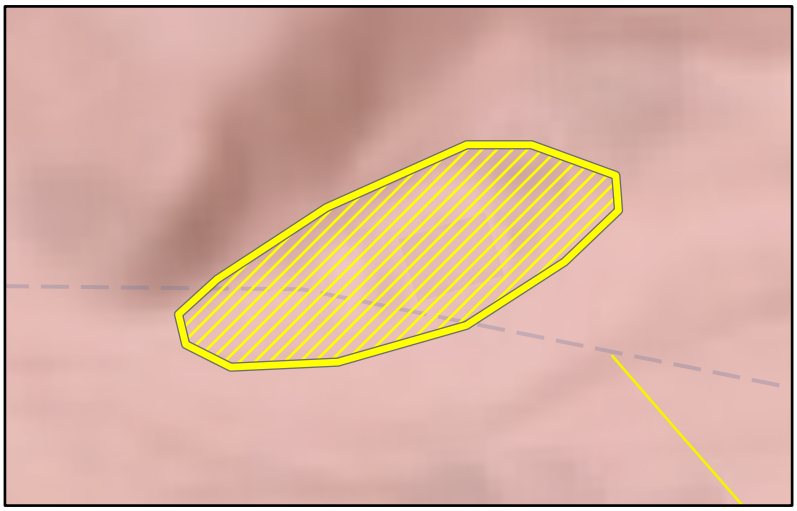
15 min 24 mm/hr

Low

Moderate

High

Scale: 1:1,000



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Highway 166/Rock Front Ranch**

Site Number: **HWY166-04**

Feature: **Horse stables/corrals**

Feature Category: **multiple**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flooding horse stables/ corrals. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **low**

Expected Probability: **unlikely**

Expected Consequences: **minor**

Risk Level: **very low**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **NA**

(3) **NA**

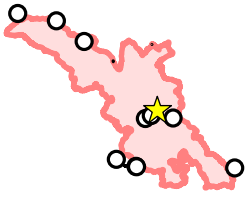
(4) **NA**

Text: NA

Description of Site:

Multiple structures above channel on terrace are located within the DWR 100 year awareness floodplain.

LOCATION AND PHOTO



Other Values at Risk (Point)

Other Values at Risk (Polygon)

This Value at Risk (Polygon)

Fire Perimeter

Segment Combined Hazard

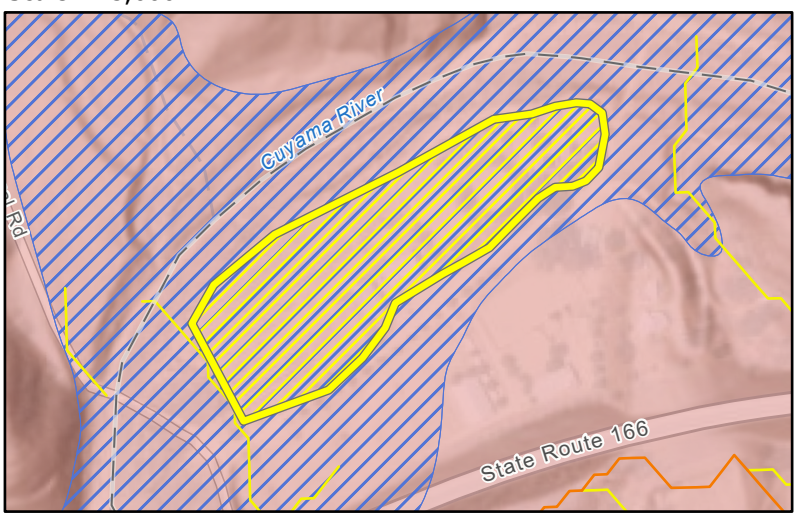
15 min 24 mm/hr

Low

Moderate

High

Scale: 1:5,000



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Pine Canyon**

Site Number: **PC-01**

Feature: **Residential structures/out buildings**

Feature Category: **home**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flooding to homes and outbuildings. Unlikely probability of occurrence with moderate consequence = LOW RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **low**

Expected Probability: **unlikely**

Expected Consequences: **moderate**

Risk Level: **low**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **Deflection structure**

(3) **NA**

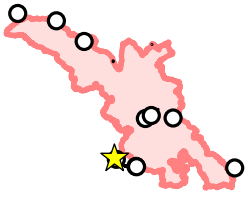
(4) **NA**

Text: NA

Description of Site:

Structures elevated above active channel on floodplain terrace. Large portion of upslope drainage area burned. Mapped in DWR 100 year floodplain.

LOCATION AND PHOTO



Other Values at Risk (Point)

Other Values at Risk (Polygon)

This Value at Risk (Polygon)

Fire Perimeter

Segment Combined Hazard

15 min 24 mm/hr

Low

Moderate

High

Scale: 1:3,000

VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Pine Canyon**

Site Number: **PC-03**

Feature: **Outbuilding/fencing**

Feature Category: **multiple**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flooding to outbuilding, fences, and cattle corral. Possible probability of occurrence with minor consequence = LOW RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **low**

Expected Probability: **possible**

Expected Consequences: **minor**

Risk Level: **low**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **NA**

(3) **NA**

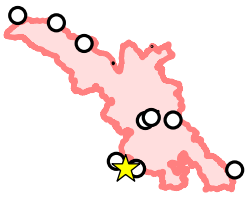
(4) **NA**

Text: NA

Description of Site:

Multiple features within potential flow paths include shade structures, cattle corral, and fencing adjacent to active channel.

LOCATION AND PHOTO



Other Values at Risk (Point)

Other Values at Risk (Polygon)

This Value at Risk (Polygon)

Fire Perimeter

Segment Combined Hazard

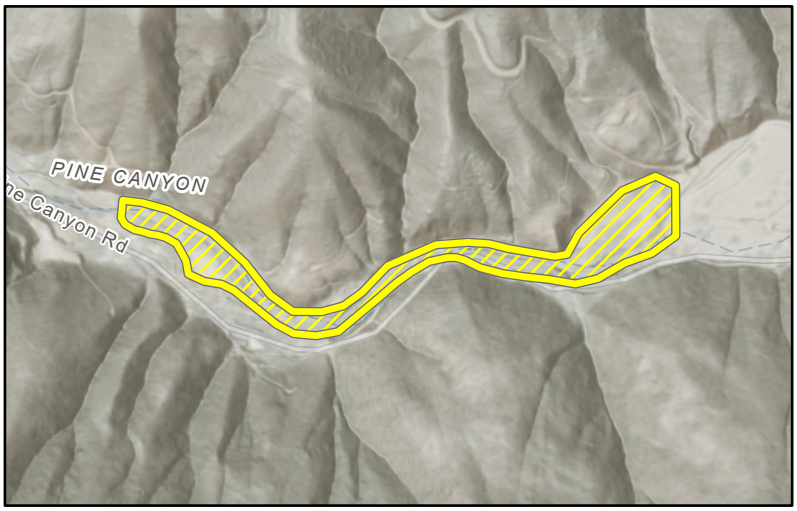
15 min 24 mm/hr

Low

Moderate

High

Scale: 1:12,000



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Rogers Creek**

Site Number: **ROG-01**

Feature: **Houses and outbuildings**

Feature Category: **multiple**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport that will increase the potential of flooding to homes and outbuildings. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **low**

Expected Probability: **unlikely**

Expected Consequences: **minor**

Risk Level: **very low**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **Deflection structure**

(3) **NA**

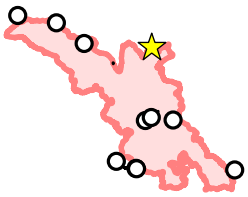
(4) **NA**

Text: NA

Description of Site:

Minor flooding in January 2023 that did not impact structures. A large portion of the upstream area was burned at moderate.

LOCATION AND PHOTO



Other Values at Risk (Point)

Other Values at Risk (Polygon)

This Value at Risk (Polygon)

Fire Perimeter

Segment Combined Hazard

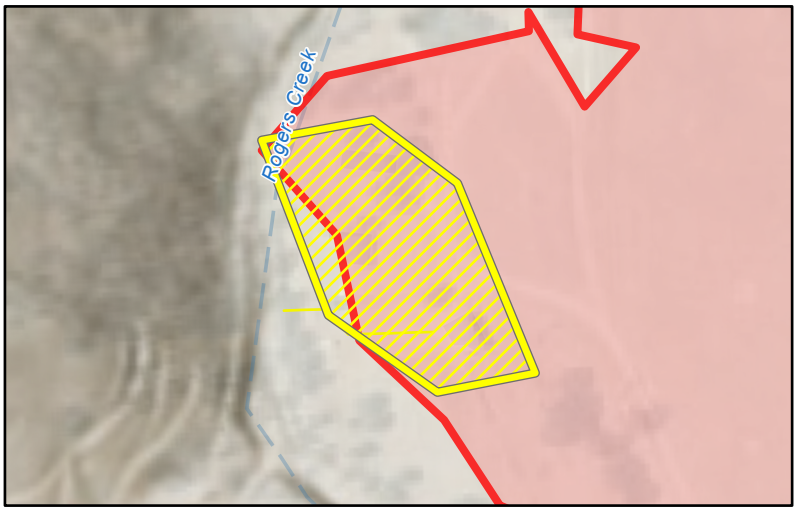
15 min 24 mm/hr

Low

Moderate

High

Scale: 1:3,000



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Pippin Corner on the Salinas River**

Site Number: **SAL-02**

Feature: **House, barns, outbuildings**

Feature Category: **multiple**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential of flooding to house and outbuildings. Possible probability of occurrence with moderate consequence = INTERMEDIATE RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **moderate**

Expected Probability: **possible**

Expected Consequences: **moderate**

Risk Level: **intermediate**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **NA**

(3) **NA**

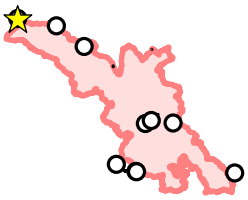
(4) **NA**

Text: NA

Description of Site:

Two outbuildings were flooded during the 9 January 2023 storm. One was flooded by Dry Creek and the other was flooded by the Salinas River. Flooding possible from both Salinas River and Dry Creek. Increased postfire runoff and sediment transport will increase the likelihood of flooding. Multiple outbuildings are mapped within the DWR 100 yr floodplain.

LOCATION AND PHOTO



Other Values at Risk (Point)

Other Values at Risk (Polygon)

This Value at Risk (Polygon)

Fire Perimeter

Segment Combined Hazard

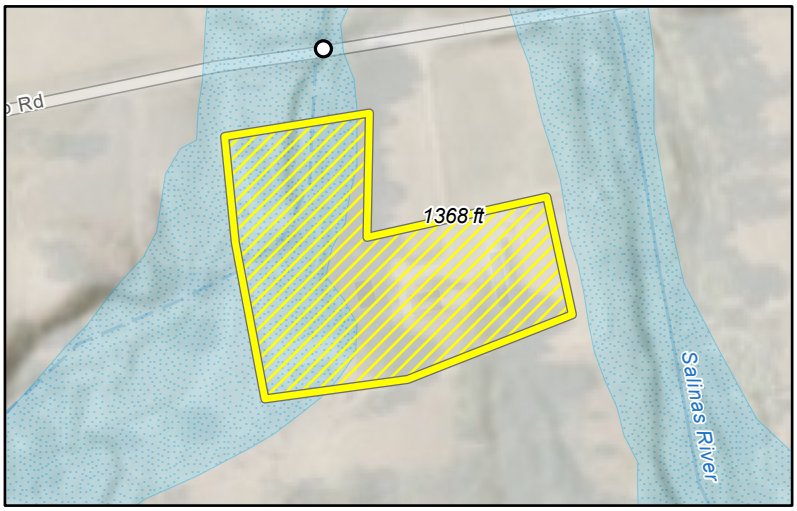
15 min 24 mm/hr

Low

Moderate

High

Scale: 1:4,000



VALUE AT RISK DETAIL

Incident: Gifford Fire *Incident Number: CA-LPF-002181*

Community: **Pippin Corner on the Salinas River**

Site Number: **SAL-03**

Feature: **House. Well near River Road.**

Feature Category: **home**

Field Observation or Potential Hazard: Increased postfire runoff and sediment transport will increase the potential for flooding of home and well site. Unlikely probability of occurrence with minor consequence = VERY LOW RISK.

Potential Hazard to Life: **low**

Potential Hazard to Property: **low**

Expected Probability: **unlikely**

Expected Consequences: **minor**

Risk Level: **very low**

Preliminary Emergency Protective Measures:

(1) **Early Warning**

(2) **Deflection structure**

(3) **Sandbags**

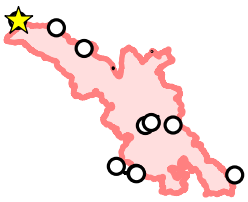
(4) **NA**

Text: NA

Description of Site:

Driveway and well flooded in January 2023 storm. Flooding occurred up to house. Water was a couple feet deep in driveway.

LOCATION AND PHOTO



Other Values at Risk (Point)

Other Values at Risk (Polygon)

This Value at Risk (Polygon)

Fire Perimeter

Segment Combined Hazard

15 min 24 mm/hr

Low

Moderate

High

Scale: 1:3,000