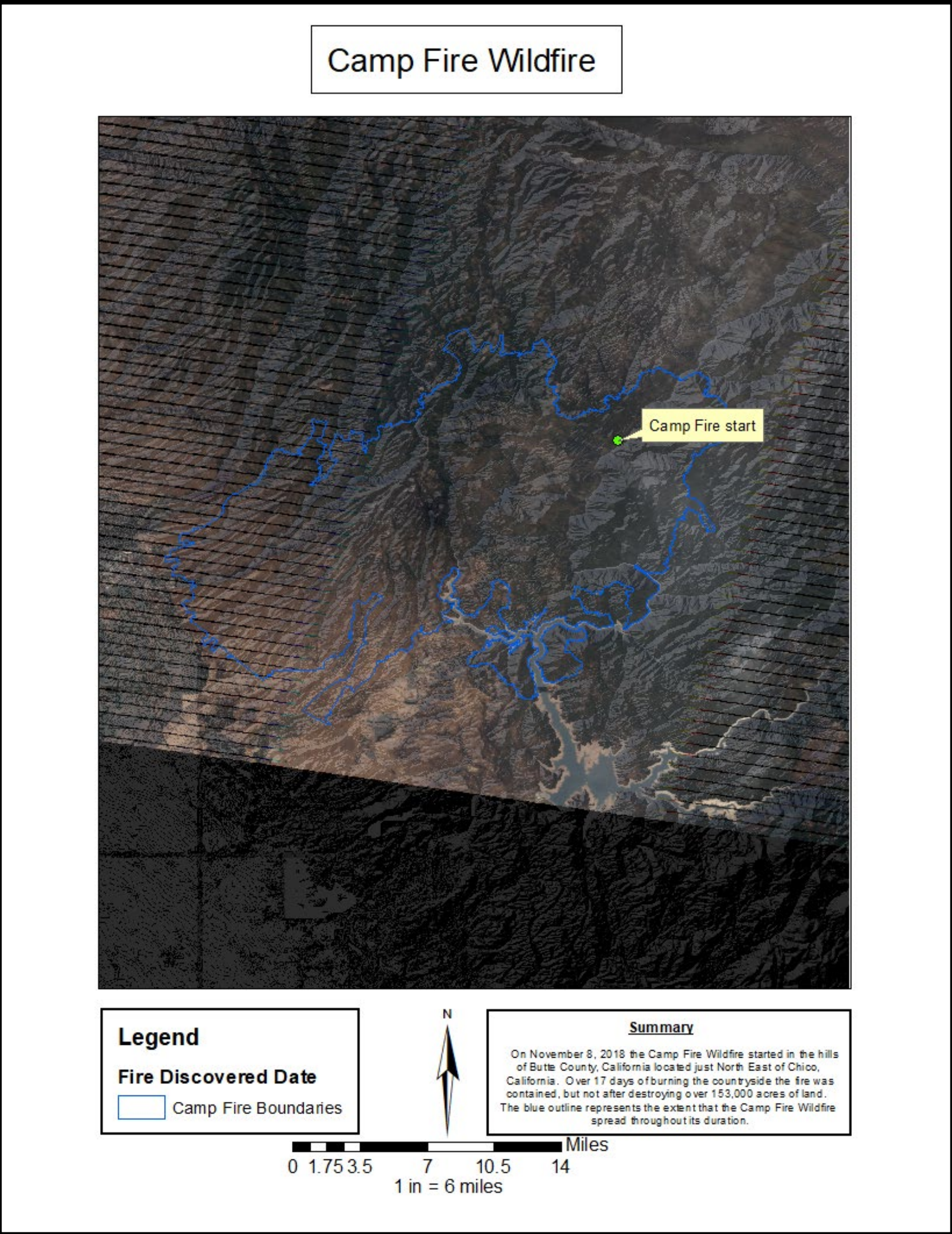
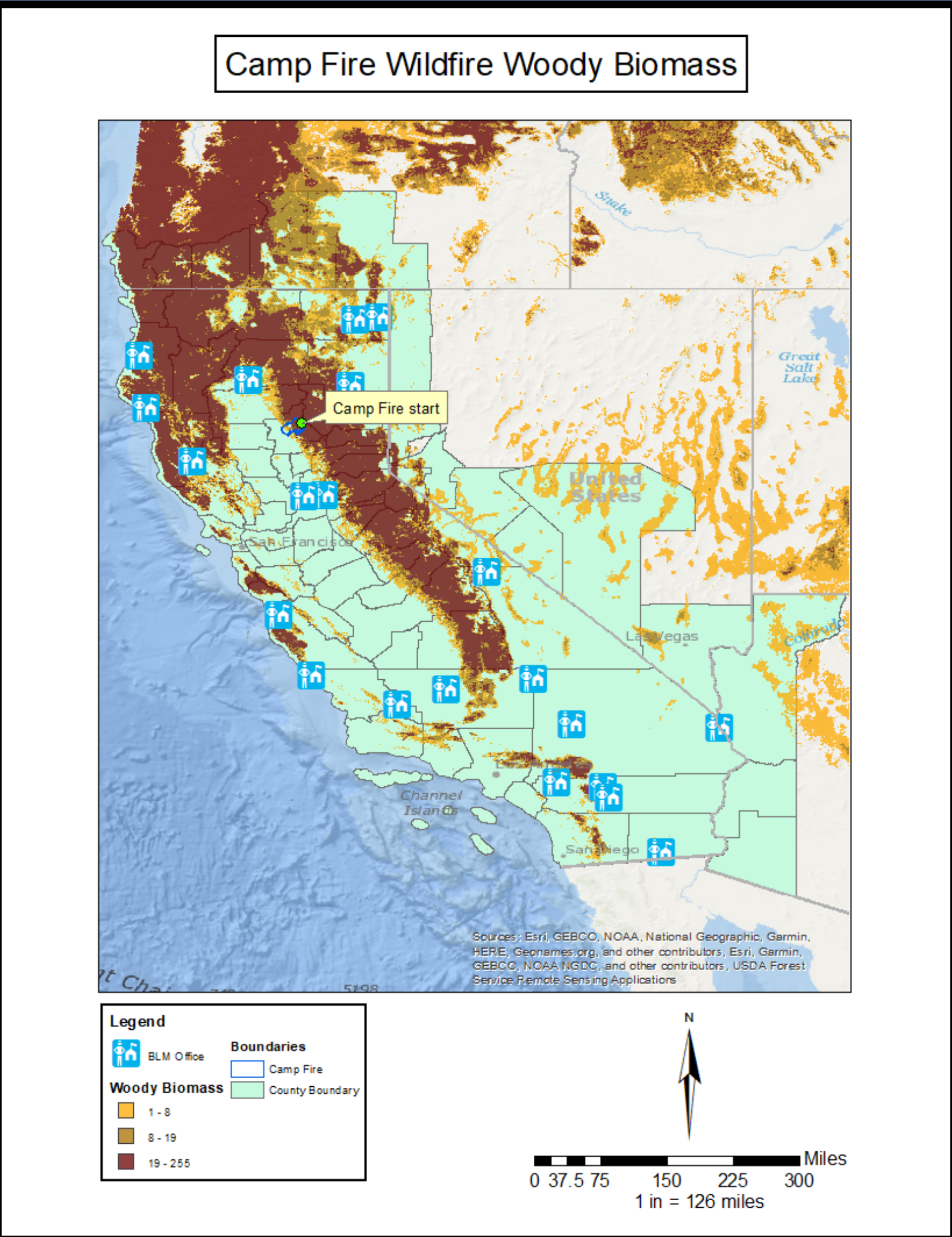


# Camp Fire Wildfire Analysis November 8, 2018

## Camp Fire Overview



## Camp Fire Woody Biomass



November 8, 2018 was the start of the deadliest fire in the history of California wildfires, when a Pacific Gas and Electricity (PG&E) power line sparked igniting local shrubbery and quickly grew out of control. This fire would be known as the “Camp Fire Wildfire” named after Camp Creek Road, where the fire initially started. Over the next couple weeks both residents and emergency responders were working around the clock to protect themselves and their homes from this raging epidemic. By the time the fire was contained on November 25, 2018 the fire had claimed 85 lives, 153,336 acres of land and 18,084 buildings were destroyed. In total it is estimated that the “Camp Fire” wildfire caused over \$16.5 billion in damages. In order to understand what made the Camp Fire wildfire so deadly it is important to look at several underlining factors such as slope analysis of the area, route analysis and vegetation of the starting location.

In order to better understand the Camp Fire wildfire, I decided to focus on several key components. I started by creating an overlay of how far the fire spread throughout Butte County before delving in depth into three main factors of the fire. First, I created a hill shade and slope analysis of the starting location of the fire, which was located in the hills of Butte County, California. The steep incline in hills, made it easier for the fire to spread, while making it more difficult for emergency responders to reach the target area. Next, I located existing field offices and response stations of the United States Forest Service (USFS) and Bureau of Land Management (BLM) to calculate the distance between the fire-starting location and field offices. I used the transportation files to build a network of existing trails, roads and railways that could be used to reach the starting location and ran a network analysis to see the best possible routes to reach the fire start location. Lastly, I identified areas with a high concentration of woodland biomass to determine how combustible the area was before the start of the fire and how it could have easily spread.

Quick Stats:

Location: Paradise, Butte County, California

Coordinates: 39°48’37”N 121°26’14”W

Date Started: November 8, 2018

Date Contained: November 25, 2018

Burned Area: 153,336 acres

Buildings Damaged: 18,084

Cause: PG&E Power Lines

Deaths: 85 Civilians

Non-Fatal Injuries: 12 Civilians, 5 Firefighters

Missing People: 1

Evacuated: 52,000

Cost: \$16.5 billion (est)

With the conditions set the way they were in Butte County, California, it is no wonder the Camp Fire Wildfire was as devastating as it was. According to data collected from ESRI most of Northern California is covered with a variety of woody biomass. Woody biomass is any type of combustible material that can cover the area, such as vegetation, trees or shrubs. The highest concentration of woody biomass is located completely throughout the area where the Camp Fire Wildfire burned. With so much fuel for the fire to feed off, it was able to spread quickly throughout the rugged terrain. After running a slope analysis, most of the damage done by the campfire was in extremely steep terrain. With such steep terrain it made it easier for the fire to spread, while slowing down responders. This steep terrain not only made it difficult for emergency responders to arrive on scene, but also made it difficult for them to maneuver their equipment and establish ways to fight the fire. After running a route analysis from the offices of The Bureau of Land Management to the starting location of the fire, it was surprising how close the closest field office was. Out of the four closest offices, the closest one was in Eagle Lake which was located 89 miles away by road and trail. The furthest office was the Mother Lode field office which was 115 miles away from the start of the fire. The two other offices I looked at were equally 99 miles from the start of the fire. After taking all these into considerations, the devastation of the Camp Fire Wildfires that took place in November 2018 is understandable.

In order to prevent something like this from happening again we need to recognize the factors that made it so deadly and address them. Managing the growth of woody biomass is an important step. By reducing the amount of dead or dying vegetation through methods such as controlled burns can help fires from spreading and growing so quickly. Also, by building more field offices in the area would be important, or just improve the means of transportation to aviation to avoid things such as traffic, terrain and even elevation challenges. The Camp Fire Wildfire was one of the deadliest wildfires in the history of California, so now that we understand it a bit better, we can take preventive measures to ensure it doesn’t happen again.

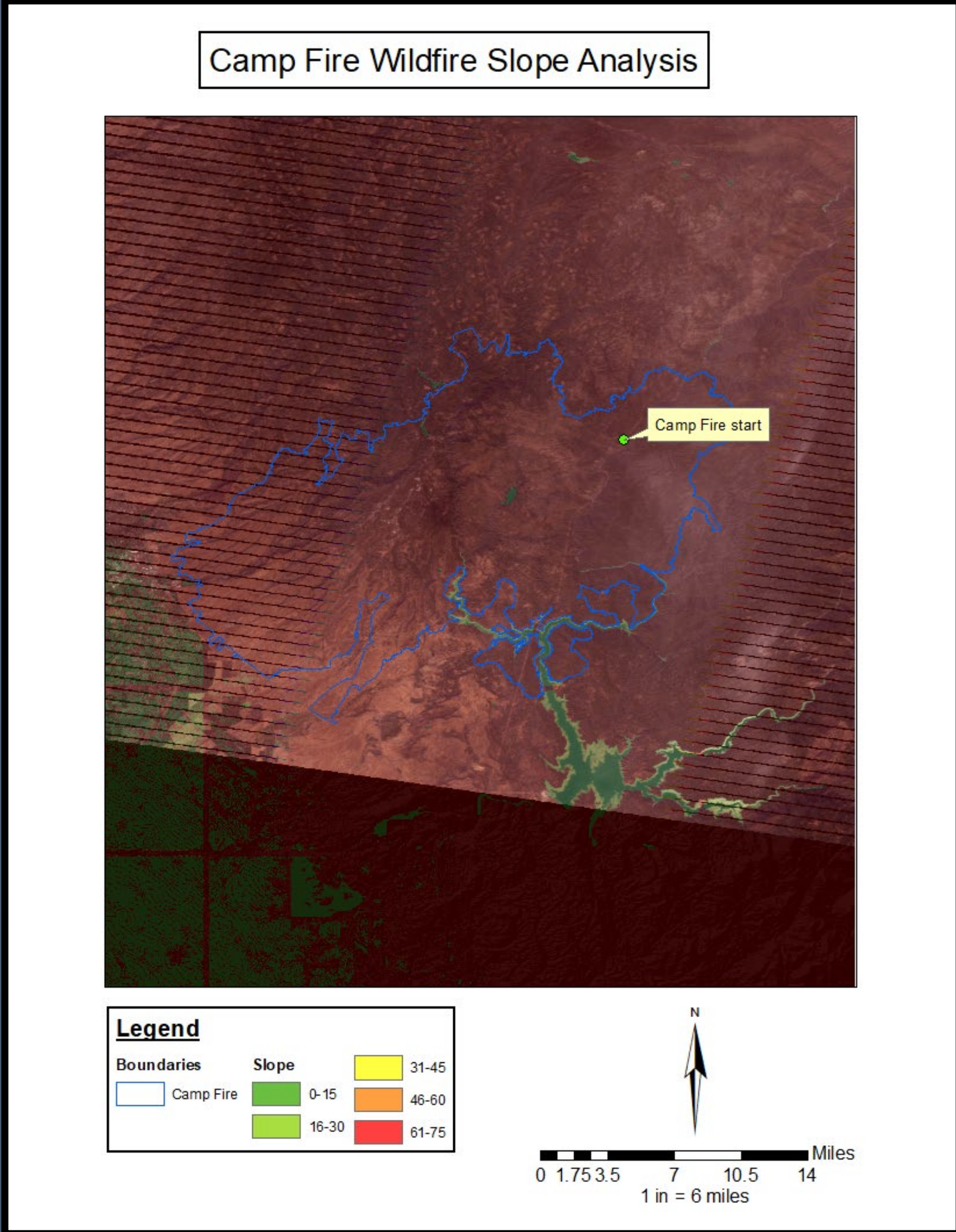
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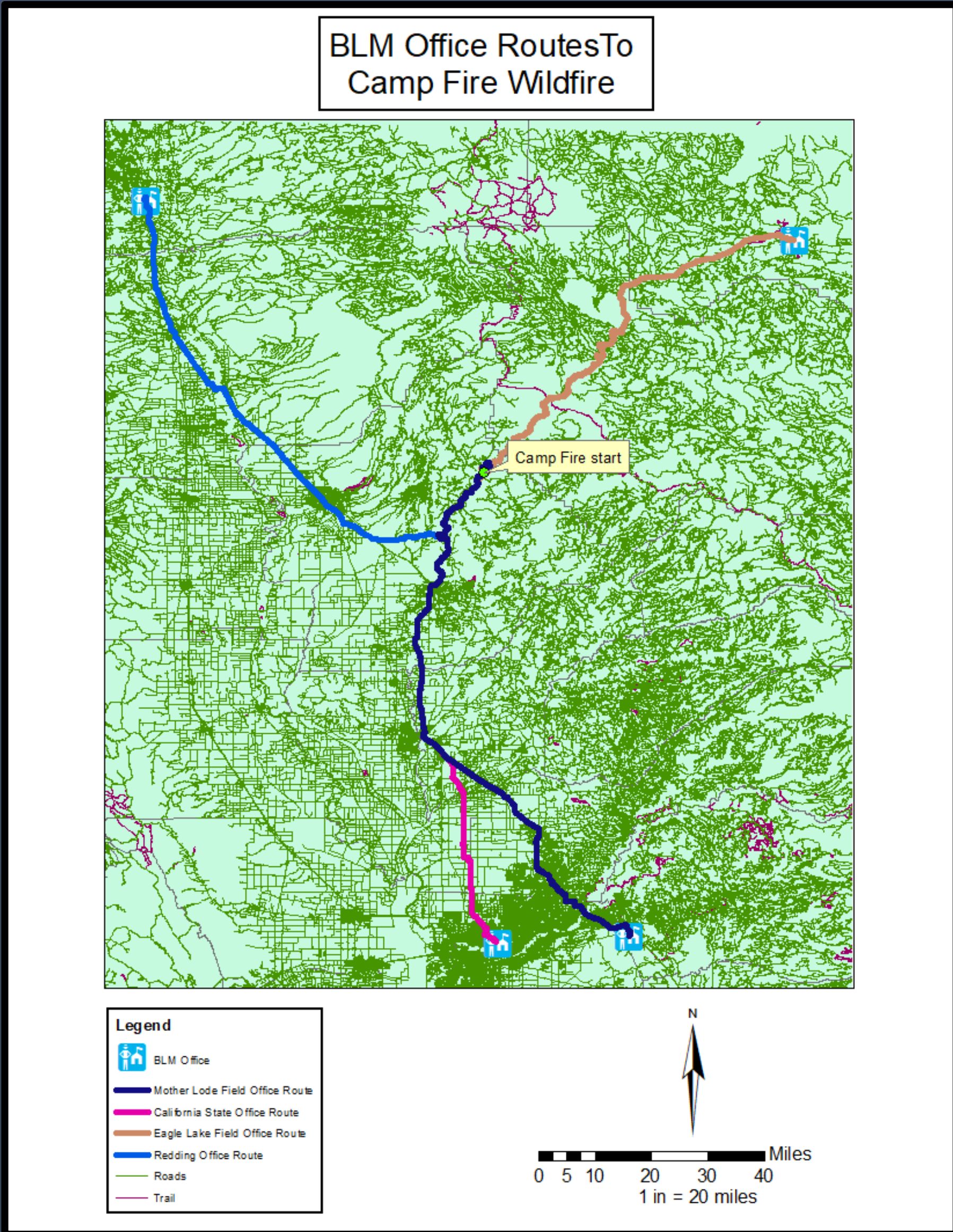
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## Camp Fire Slope Analysis



## Camp Fire Route Analysis



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