Timber Harvesting Plan of Jacoby Creek Tract

GSP 270

Team Ellipsoid

Celina Montes, Zachary Erickson, Noah Yaylian

12/16/18

Abstract

Humboldt State University is currently in the process of acquiring an 884 acre parcel (Humboldt State Now, 2018) with plans to use it for student enrichment. The university also plans to harvest timber from the land to supplement some departments. When one is planning to harvest timber in California, a timber harvesting plan (THP) is required (wildcalifornia.org). There are many pieces to a THP and one of the primary components that CAL FIRE requires is extensive mapping of the area to be harvested. The goal of this project was to create a series of maps that CAL FIRE would require in a THP. Our team used a variety of methods to complete our goal including buffering streams, digitizing maps, calculating area, and adding contour lines. We created a series of maps which one would expect to find in an actual THP, however, we were not able to create all the maps we wanted to as access to the property was restricted. Future project endeavors would include visiting the site to gather more data and conduct various surveys to add additional maps to the project.

Introduction

Timber harvesting has been done in California for centuries and is a significant part of Humboldt County's economy. With modern timber harvesting CAL FIRE requires extensive mapping of the area to make sure there aren't any potential issues with the area and to make it clear what is being harvested. Furthermore, accurate and thorough mapping of the harvest area can reduce risks to the environment along with avoiding any potential confusion on what is to be done during timber operations. Maps that are required include soil types, archeological sites, and slopes. The tract we mapped out is approximately 92 acres and located near Jacoby

Creek and just off of Fickle Hill Road. We wanted to create a variety of easy to interpret maps that showcased the conditions of the harvesting area as best as possible. To complete this goal we relied on multiple datasets from various sources. However, we weren't able to groundtruth the data as we weren't allowed onto the property.

Methods

We acquired the base map of the tract area through a forestry professor and then digitized it into ArcMap to get a shapefile. A roads layer from the Humboldt County GIS website was used as a visual background for our map and in the locator map. A DEM of Arcata from a previous lab was used to calculate the slopes of the area. However, two DEMs were used to get the correct area for our map. The DEM was then clipped to only have the harvest area. A soil database was then acquired and incorporated into the map to get the different soil types in the harvest area which is used to determine the erosion hazard rating (EHR) of a site. Stream buffers were put in using the "Buffer" tool in ArcMap and varied between the type of class the stream was. Buffer widths were either 25 feet, 50 feet, or 75 feet. The locator map was made using an outline of California and zoomed in on the greater Eureka area. Contour lines were also added to better visualize the slope of the area.

Results

We produced several maps like one may see in a THP in California. The data presented in each of the maps serves an individual purpose to different aspects of the THP. While the initial determination of slope and proximity to stream drove decisions for harvest methods, total area for each section will allow financial analysis for plans.

The total area within the harvest boundary was 92.3 acres. Harvestable area within these boundaries include those outside of the stream buffers and at a distance of greater than 200 ft from Fickle Hill Road. The sum of all the harvestable areas was 92.3 acres (Figure 2). Within this harvestable area different harvest units were delineated utilizing slope (Figure 3). For areas that contained slopes >50% we designated a tethered feller buncher/forwarder operation which would minimize soil disturbance on the steep slopes (Figure 6). The total tethered operations area was equal to 47.3 acres. For less steep slopes, non-tethered operations were utilized and had a total area of 36.6 acres. We assigned different silvicultural prescriptions to the two different harvest operations, group selection and variable retention (Figure 6).

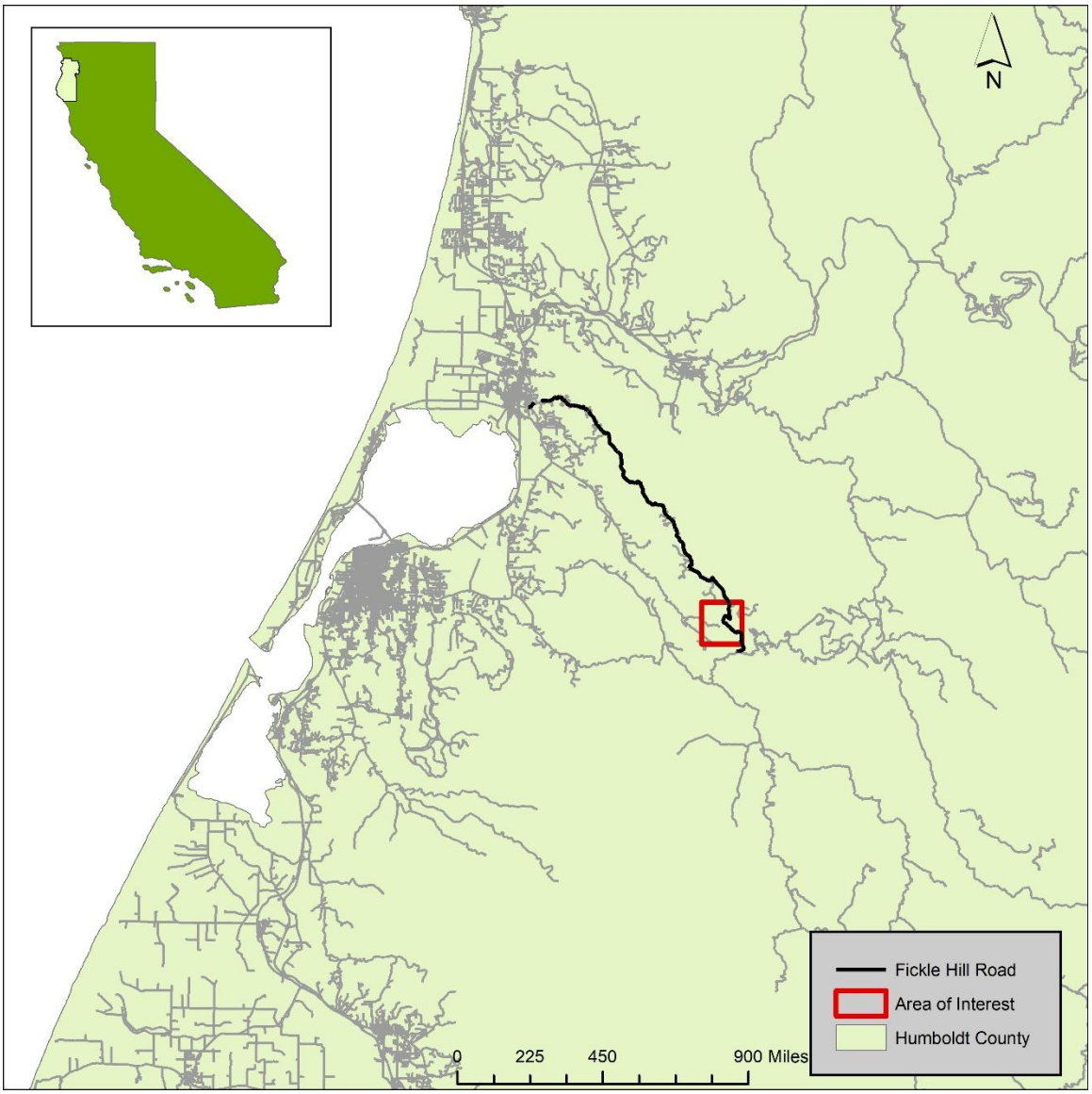


Figure 1. Locator map of the greater Eureka/Arcata area along with the harvest area.

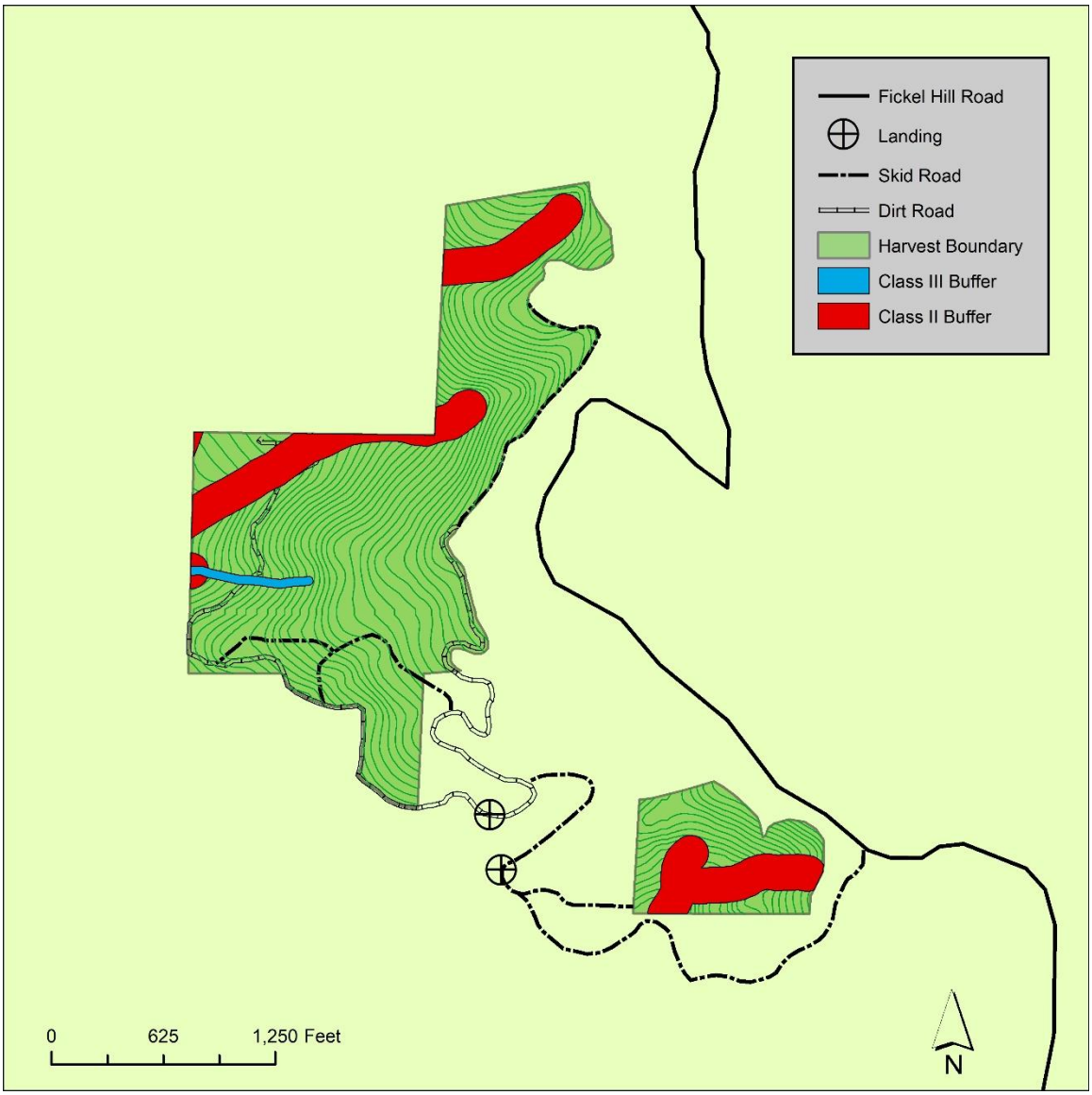


Figure 2. The Jacoby Creek tract harvest area including stream buffers and contour lines. The total harvest area is approximately 92 acres.

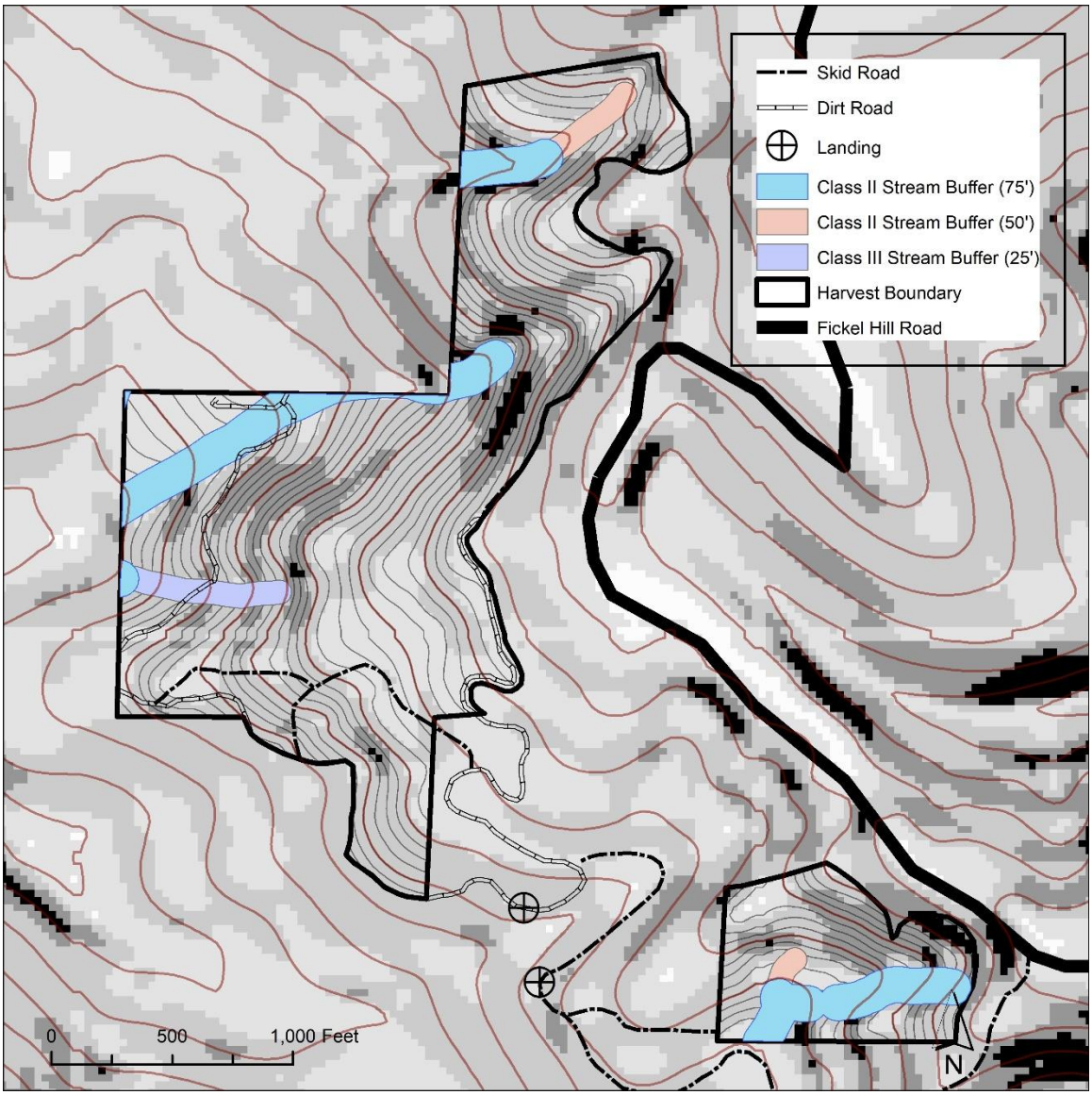


Figure 3. This map includes the different slopes of the harvest area along with stream buffers. Darker areas denote steeper slopes.

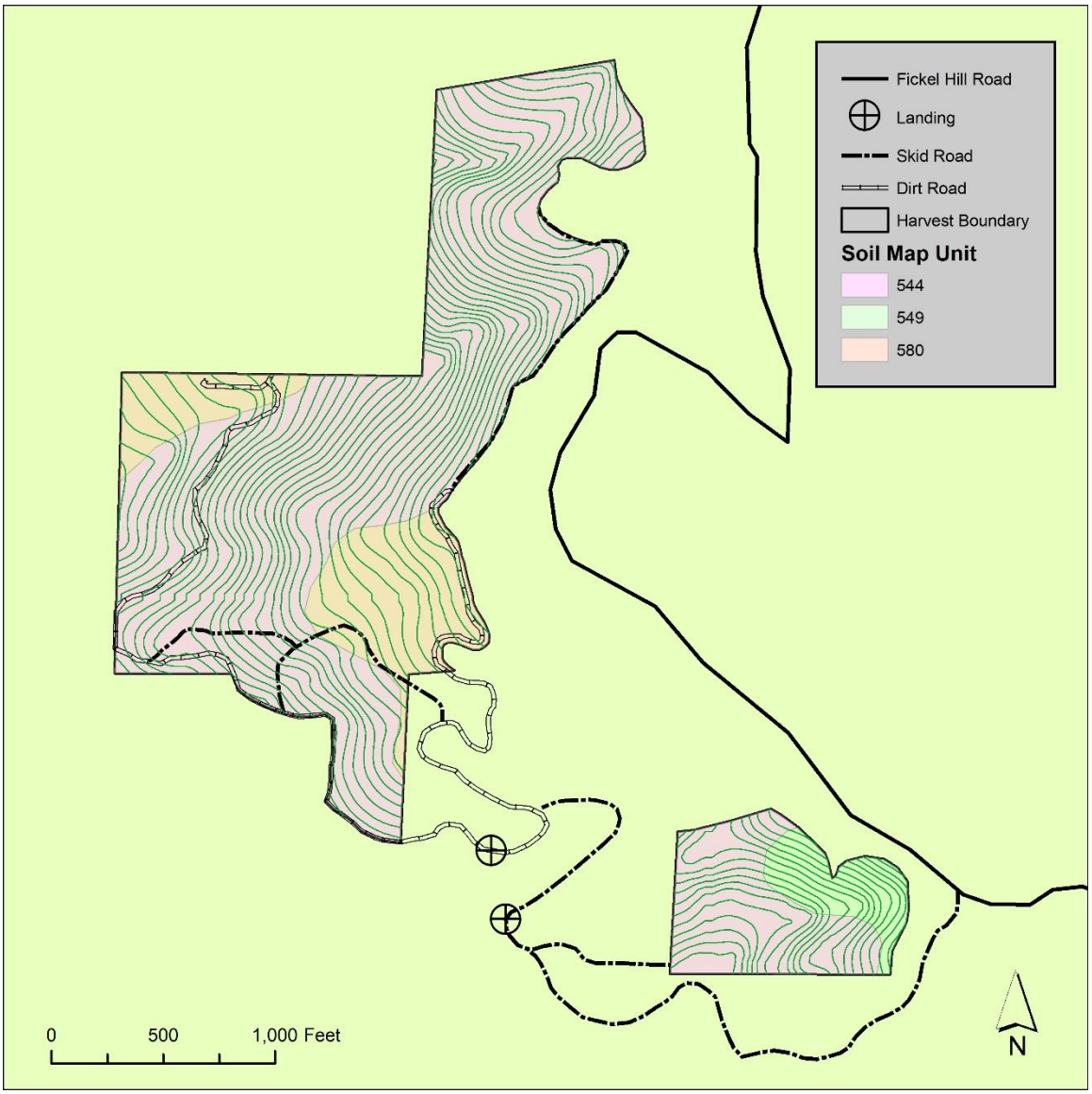
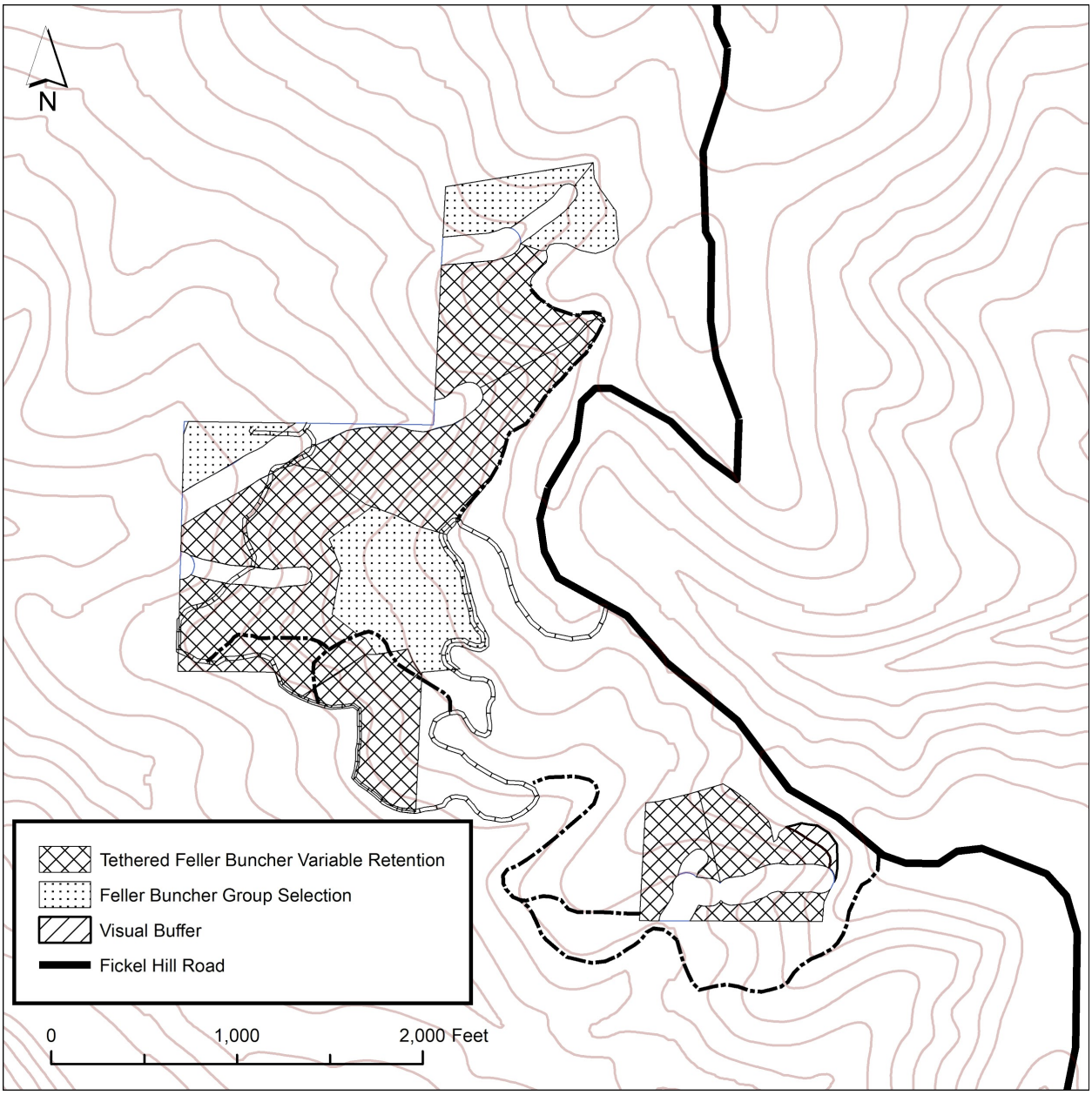


Figure 4. A map of the different soils present in the harvest area. Soil types are used in determining the erosion hazard rating of a harvesting area.



Discussion

Timber harvesting plans require a significant amount of time to complete and include many different parts, especially mapping. The maps we created are an example of what one has to create for a THP, however, every THP will have different elements in it that may require different mapping techniques from those we used. However, sometimes THP maps can be incorrect and ground truthing is sometimes required, which we were unable to do. An

excellent future project would be to return to the site once Humboldt State University officially acquires the land and collect our own data to ground truth the current data, and complete various surveys to add more maps. In addition, we could manipulate the harvest boundaries to either increase or decrease the harvest area to make logical sense. For example, shrink the boundaries to make the streams the boundaries for the harvest unit. Our maps were created with the explicit intention to be easily interpretable by someone unfamiliar with maps as THPs are also subject to public review and this means that the average person must be able to determine what one's map is trying to convey.

Citations

"How a Timber Harvest Plan Works." Wildcalifornia.org, Environmental Protection Information Center, www.wildcalifornia.org/how-a-timber-harvest-plan-works/.

"HSU Set to Receive 884-Acre Forest." Now.humboldt.edu, Humboldt State University, 14 Nov. 2018, now.humboldt.edu/news/hsu-set-to-receive-884-acre-forest/.