Ranch Fire Hazard Tree Abatement

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Executive summary

The Mendocino National Forest experienced the biggest wildfire in California's history, the Ranch Fire. It was apart of the Mendocino Complex Fire and that was the largest fire recorded in California's history. It burned Mendocino, Lake, Colusa, and Glenn Countries in the State of California. The Ranch fire itself burned 410,203 acres of land. Combined with the River fire, making up the Mendocino Complex Fire, it burned 459,123 acres. Together the fires destroyed up to 280 structures and damaged 37 others, causing a total of $267 million US dollars in damage. The project that we have been tasted with is to help the forest become safe after the fire so the public can have access to it once again.

The project is called the Ranch Fire Hazard Tree Abatement project. This work is taking place along the forest roads of the M5, M10, and the M3. This project, as the name suggests, is in charge of removing the hazard trees that have been left behind by the Ranch Fire. A hazard tree is categorized as a tree that has 50% or more of its body burnt and subsequently dead and not likely to recover. These trees also need to be within 200 feet of the road to pose a threat and therefore need removal.

This tree removal is going to be done by a commercial harvester. They do not take trees that are smaller then 12 inches. The trees that are too small are not actually considered hazard trees so they are left alone. The larger ones are still hazardous to the road so they are simply cut down and left along the road or in the forest. The other restriction the harvesting crews face is the slop of the mountains. The ground equipment cannot travel on slopes that are greater then 35% so alternative methods will be used to harvest those trees.

The focus of my internship was working for the hydrologist on the first so the part of the Ranch Fire Hazard Tree Abatement project that I worked on was the hydrological side, which focused on the recovery and protection of the streams and other water sources. In order to do so we set up a buffer around the streams that fell within the 200-foot boundary that the hazard trees fell in.

The streams that are in the boundary are lower order streams such as ephemeral and supported low vegetation; the few intermittent and perennial streams did have a wider variety of vegetation around it. Even with the wider variety of vegetation it only spans a few feet from the channel. These areas where affected by the fire with most experiencing a low burn severity with only a few experiencing a high burn severity. The areas with higher burn severity are naturally going to take longer to recover from the affects of the fire; the main effects that the streams are going to have to recover from are elevated erosion and sedimentation. This causes an issue when the sediment goes downstream and makes its way into valuable aquatic habitats.

We set up buffers around the streams to try and keep further compaction and erosion from occurring during the commercial harvest of the trees. With the buffers that are set up it keeps ground equipment from crossing streams and causing more undesirable erosion to effect the sediment and therefore the aquatic life downstream. The compaction of the soils are a concern because once they are compacted they loose hydraulic conductivity and this is also undesirable. The buffers also protect the groundcover around the streams; with groundcover intact erosion of the surrounding sediment is reduced.

Another effect on the streams by putting up the buffers is that it protects the vegetation inside of the buffer. When the vegetation is protected it helps to maintain stream stability and therefore can reduce the effects of high-energy flows reducing the undesired erosional effects. It does this by having a strong coverage of root support around the streams, these roots help keep the soils together while intercepting precipitation and increasing the transpiration of excess ground water.

Project Objectives

The objective of our everyday work was to protect the streams of the Mendocino National Forest. In order to protect the streams from the hazards mentioned above we where in charge of setting up the buffers around the stream. There is a set distance from the stream that we are supposed to use in order to set up the buffers properly. The distance is predetermined by our supervisor, which is the Forest Hydrologist, John Kelley, along with others in the Forest Service.

Project Approach

Our method for performing the buffers is to go out onto the forest floor to set up the buffers. We drive around the forest assessing mapped and unmapped streams to see which ones need to have a buffer established. We do this by assessing the following criteria that was mentioned above. We look at the stream and try to classify the stream type, this tells us what kind of buffer we will be applying if the stream needs one (*refer to Figure 1.).* Once the stream as been identified we see if the slope is below 35% and has the proper trees that are desirable for harvest we go around and put up flagging at the designated distance. We record the flagging that is put up with an app called Survey123 and this allows us to put the information of where the flags are onto a computer.

Part of the project was to produce maps for the harvesting companies to go out and use as guides. So I would take the data that was collected in Survey123 and put it into ArcMap Pro. With the base map that was provided by John Kelley I would draw lines from the different points that we collected and would make the barriers on the map more visible.

Side Project 1

I had the pleasure of going into the field with the Forest Geologist for two days to see what it is like to be a geologist for the Forest Service. The objectives for the day was to assess slides to see whether or no they are active or inactive, to mark outcrop locations within the boundaries that the other project was established under, and look for caves within those outcrops.

The assessment of slides was an exciting one that called upon what I had learned in the past semester. We would look on the map that Ryan had produced before going into the field that displays slides that could be seen form areal photography. We would also look for certain features along the road that would signify a slide was not seen on the map, such as pistol butted trees and scarps that would be visible from the road. Once a slide was identified we looked for further indicators that could tell us if the slide is active or inactive. We would look for seeps or small pools of water near the head of the slide, below the scarp, this would be an indicator that the slide was active. Any rotated trees, or low vegetation, and a toe that bulged out at the end would be a sign that it was active. If the side had straight trees, was dry, and was heavily vegetated would be signs that it was an old slide and was not something we where concerned with. If the slide did turn out to be active then we would flag it to avoid having nay heavy machinery drive across it to avoid risk of them being destabilized.

When looking for outcrops we would drive on the road and pull over when we found one. We also used Survey123 when documenting the outcrops; we would identify the rock type and take pictures of the outcrop from several different angles. If the rocks where heavily jointed then we would look for caves. Only heavily jointed outcrops where candidates to have caves, when we found a cave we also used

Survey123. We marked the spot where it was at and then took pictures of it to make sure it was properly documented.

Project Outcomes

The outcomes of my experience over the course of this internship where extremely valuable in terms of skills learned and inside knowledge. I was able to use several tools that I had only used briefly in classes and really gained experience with them, as well as new tools I had not used before.

The total tools that I used where a clinometer (used to determine percent slope), compass (learned to take azimuths and orient myself), and a range finder (used to determine your distance from an object you point it at). The programs that I learned how to use where Survey123, Avenza (an app that allows us to use digital maps), and ArcMap (a program for making maps). Some general skills that I developed over the summer are as follows: the ability to drive a two-wheel drive truck on native surface roads and Forest Service road, some in very poor condition. I learned proper Forest Service dispatch protocols.

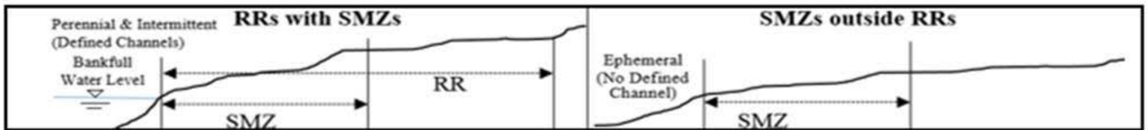
I was able to meet several individuals within the Forest Service that where able to tell me about the different kinds of tasks that are expected of them on a daily bases. I was able to see what it would be like to work for the government, along with all the benefits and annoyances that come along with working for the government.

Conclusions

For this project we put up buffers in order protect the streams during the timber harvest. These buffers where set up under the regulations that are specified in *Figure 1.* and only on the streams that qualify under the specifications written out in the Executive Summary. I was also able to spend a day with a Forest Geologist, which is my major, doing what they do on a normal day.

This was extremely educational. I was able to see how working for the government could be like. I was able to see what the process is for certain projects to go through and all the different steps that have to be taken in order for them to go through. I was also able to see what it is like to try and get supplies, which I felt, was important because that would be apart of my everyday routine. This has shown me that working for the Forest Service would be something I would be interested in doing in the future.

Appendices



RR and SMZ width for each streamclass: (All distances are by Slope)			
Stream	Riparian Reserve Buffer	SMZ in RR	SMZ outside RR
Fish Per	600 feet (300 ft/side)	50 ft/side or to the slope break if greater	N/A
Perennial	300 feet (150 ft/side)	50 ft/side or to the slope break if greater	N/A
Intermittent	200 feet (100 ft/side)	50 ft/side or to the slope break if greater	N/A
Springs	100 feet	50 ft/side or to the slope break if greater	N/A
Wetlands	100 ft (<1ac) 150 ft (>1ac)	50 ft/side or to the slope break if greater	N/A
Ephemeral	N/A	20 feet	20 feet

Figure 1. This chart explains the different buffer distances from the stream according to the kind of stream channel it is.

Works Cited

DRAFT Hydrology Report of Ranch Fire Hazard Tree Abatement on the M3-Felkner, M5 and M10 Road Segments

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Northwest Forest Plan: FSEIS ROD (Final Supplement EIS – Record of decision) Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl