SCI 120

Fire Detection at Fairfield Osborn Preserve

- Perla Marquez (Student)
- Georgio Errico (Student)
- Sam Giovannelli (Student)
- Diego Cabrera (Student)

- Out of two possible sites, which is the best to install a fire detection camera at the Fairfield Osborn Preserve?

Background/Motivation

Importance:
- Maintaining safety and protecting the preserve, SSU, and the surrounding environment
- Can prevent loss of property and life

Background:
- 2 extremely destructive fires in the past 2 years shows the need for better fire detection technology.
- Sonoma county is currently focused on improving their fire-detection methods and implementing a network (Morris).
- LIDAR systems, that measure laser rays reflected from the smoke particles (Alkhatib).

Methods

- Prior to February 23rd, we used satellite maps to locate two potential locations with high elevation and a clearing of vegetation
- On the 23rd we hiked up to the ridge and the viewpoint.
  - Meadow later found
- Used cell phone compass to note the coordinates, elevation, and direction of visibility
- Captured 180° panoramic photos
- Tested signal strength through Verizon 4G cellular service
- Attempted to test WiFi strength but not strong enough to stay connected throughout testing at any location.
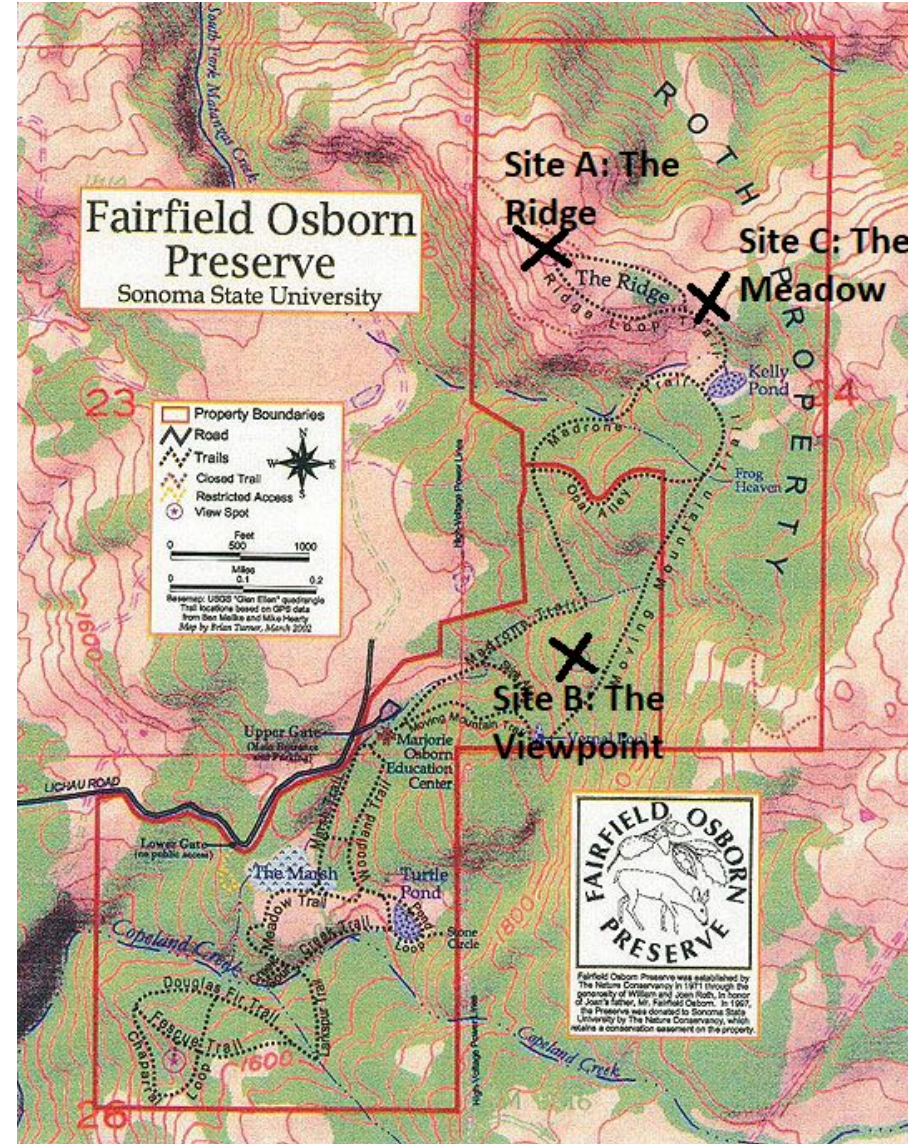
Results I

Ridge

658m elevation

Can see everything except East

Power Lines East to West

Viewpoint
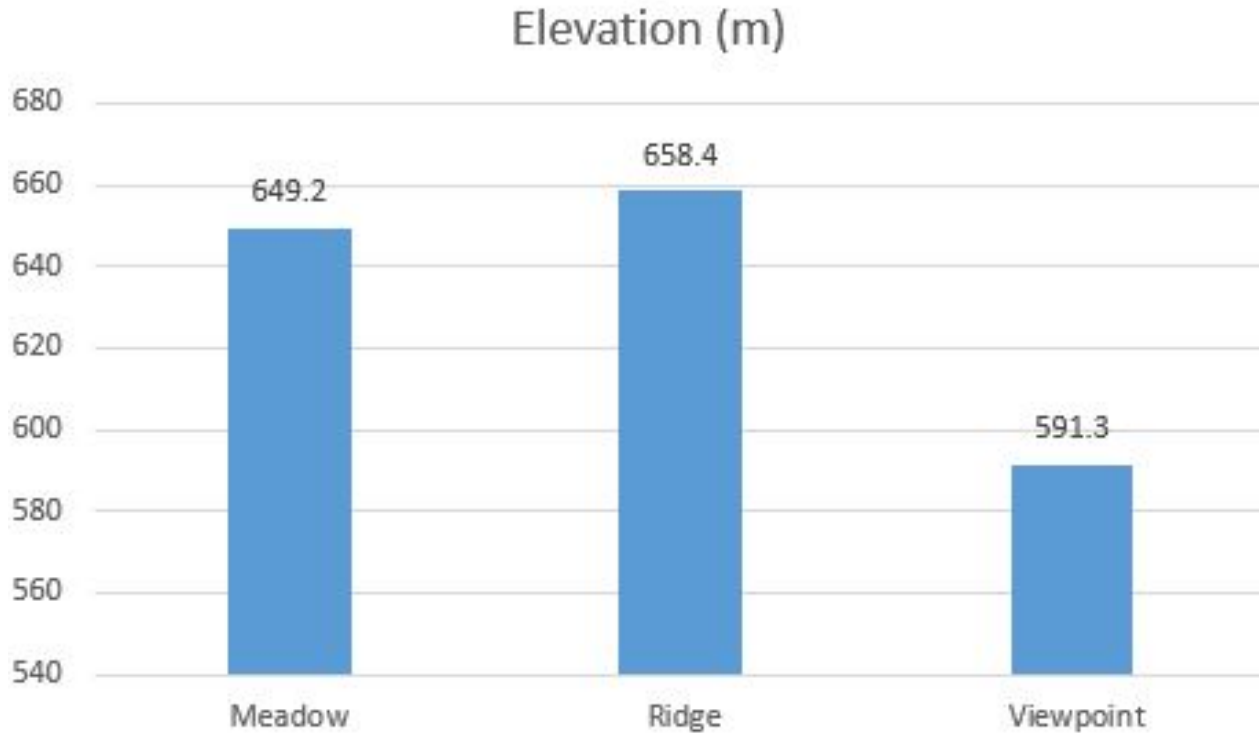
591m elevation

Can see West, Northwest, Southwest

The Meadow

649m elevation

Can see North and South, trees blocking other directions.

Results II

Elevation (m)

- Elevation is highest at the Ridge.
- Greatest number of visibility points.
  - Good visibility all directions except East.

Site	Meadow	Ridge	Viewpoint
Signal Strength (Verizon 4G Bars)	2	3	3

- Signal Strength measured out of 4 potential bars.

Conclusion

Our hypothesis was that the Ridge was going to be the best, and based on our results it had the best visibility, and 4g signal strength.

The potential impact of our project is the ability to detect and stop wildfires as early as possible using fire detection software and camera/sensors.

The Ridge:

The Viewpoint:

The Meadow:

Works Cited

Alkhatib, A. (2014, March 4). A Review on Forest Fire Detection . In *Sage Journals*.
Retrieved from https://journals.sagepub.com/doi/full/10.1155/2014/597368

Crowley, M. A. (2018, May 1). Multi-sensor, multi-scale, Bayesian data synthesis for
mapping within-year wildfire progression. In *Taylor and Francis*. Retrieved from
https://www.tandfonline.com/doi/full/10.1080/2150704X.2018.1536300

Morris, J. (2018, July 6). Wildfire-watch camera network may launch in Sonoma
County this fall. The Press Democrat.

Sonoma State University. (2015, May 11). Retrieved March 6, 2019, from
http://web.sonoma.edu/cei/osborn/projects/