

# Environmental Analysis of Trail Development at Thurston Hills Natural Area



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## Abstract

Willamalane Parks and Recreation District's 20-year plan for the Thurston Hills Natural Area (THNA) includes the development of a cost-effective baseline monitoring criteria for the impacts of trails on vegetation, wildlife, and hydrology. We implemented wildlife cameras, plant surveys, bird surveys, and clinometers to document wildlife use, vegetation, and slope, and to predict the impacts of current and future trails on habitat. Using GPS, we determined assemblages of native and invasive plant populations and used GIS to map those locations. We determined areas of ecological sensitivity to be considered by Willamalane when implementing their site management plan. Additionally, we gave baseline feedback on areas where trail plan modifications would benefit target species and promote the advancement of management goals. Our research, in concert with future ecological monitoring, will help develop valuable adaptive management strategies for decades to come.



## Introduction

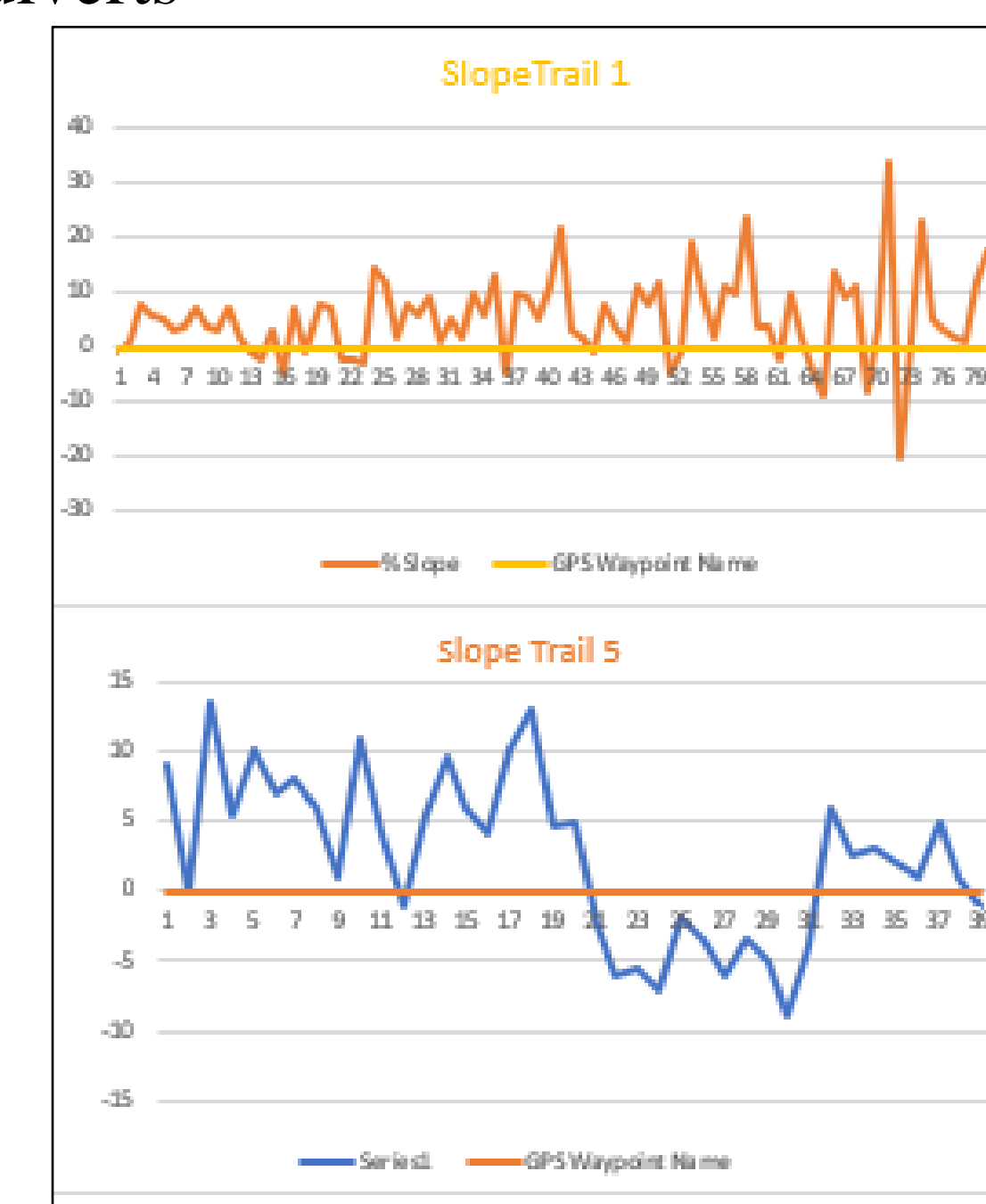
- 665 Acres of Oak Woodlands, Grasslands, and Rock Outcrops
- Purchased by Willamalane Parks and Recreation District in 2006
- Goals to preserve target habitats while creating a new system of trails
- Consideration of how wildlife, invasive species spread, & conservation goals will be Impacted by implementing trails
- Our group worked to establish baseline conditions & monitoring protocols for Willamalane to track both positive and negative impacts over time.

## Methodology

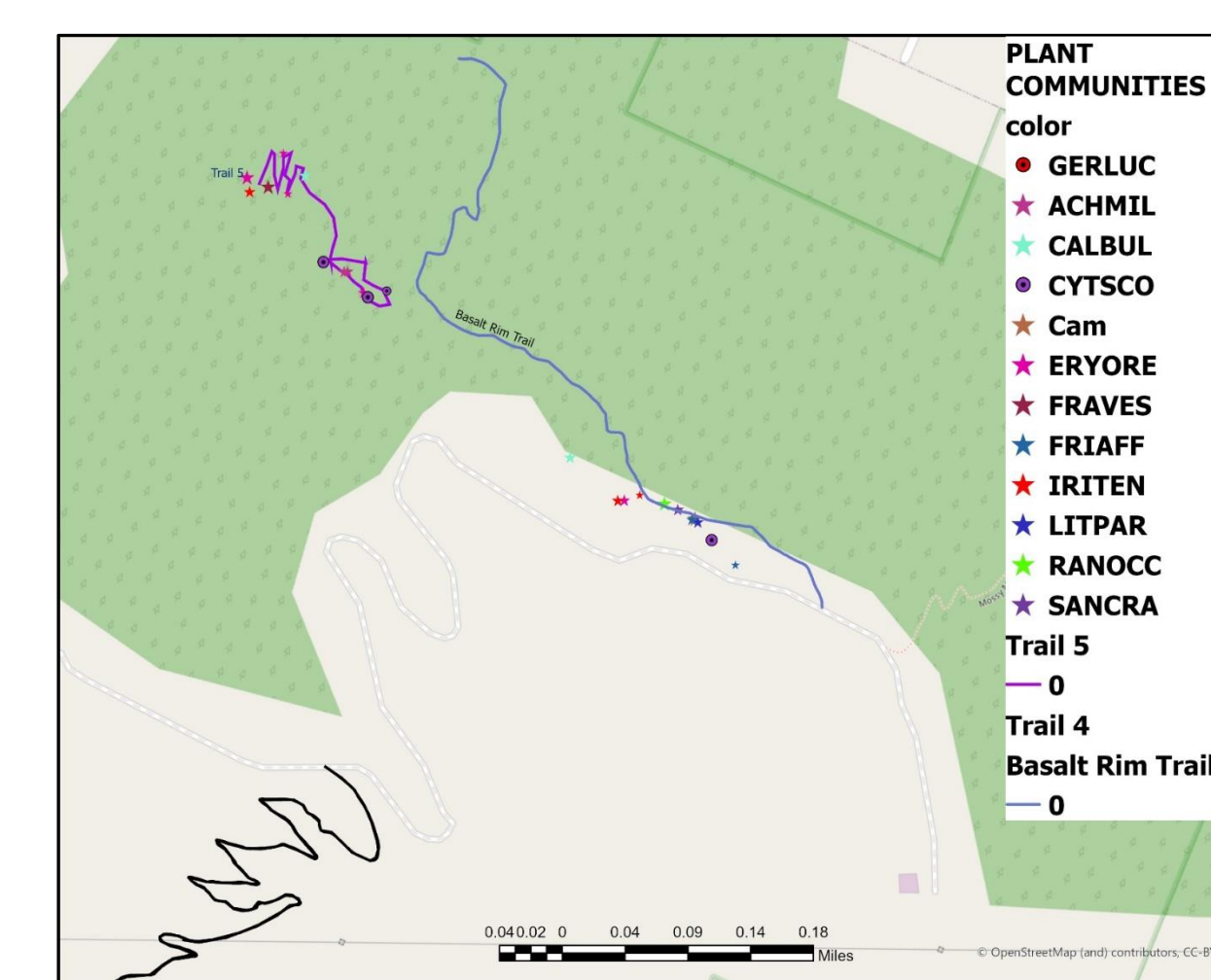
- **Plant Surveys-** Along each trail native wildflowers larger than 1 cm species were noted with a priority on the species: *Achillea millefolium*, *Camas spp*, *Eriophyllum lanatum*, *Erythronium oregonum*, *Iris tenax*, *Mimulus guttatus*, *Ranunculus occidentalis*, *Sidalcea malviflora ssp. virgata*, *Wyethia angustifolia*. Invasive species were noted as well with a priority on the species: *Brachypodium sylvaticum*, *Cirsium vulgare*, *Carduus pycnocephalus* and *C. tenuiflorus*, *Cytisus scoparius*, *Dipsacus fullonum*, *Geranium lucidum*, *Leucanthemum vulgare*, *Senecio jacobaea*, *Silybum marianum*. Occurrences of any of these species was noted with details on the size of the population, approximate area, density of population, as well as GPS location within the site.
- **Slope-** Starting at the beginning of each trail, percent slope was recorded for each segment with similar observable grade of slope. GPS waypoints were marked at the end of each segment.
- **Wildlife Cameras-** Wildlife camera locations were determined using animal tracks, and identification of high traffic areas such as streams, grazing areas, and well-established game trails. Cameras were put in camouflage cages and were strapped to trees along the side of corridors. Photos were examined after 2-3 weeks, then the camera was moved to observe activity on all the trails
- **Photopoint Monitoring-** Camera points were identified by areas that were likely to experience change with the introduction of trails increasing their vulnerability to invasive species encroachment, erosion, or possible social trails. Baseline photos were then taken and photopoints were marked with GPS points to be able to be located in future data collection.
- **Bird Point Counts** Point counts were done in the peak of breeding season for many migratory and native birds and were performed in optimal weather conditions. Counts were conducted from 7am-9am in the most active time for the majority of birds to ensure the most accurate and abundant counts. At fixed points along the trail, marked with GPS points, each unique bird or bird call was recorded. Observers stayed at each point for 10 minutes before moving to the next point. Points were spaced with a minimum of 30 meters between one another to ensure birds were not being double counted and that each point was producing unique data

## Results

- Using slope surveys, we determined the parts of the trail that are most susceptible to erosion and made suggestions for rerouting the trail and/or installing barriers to erosion, such as culverts



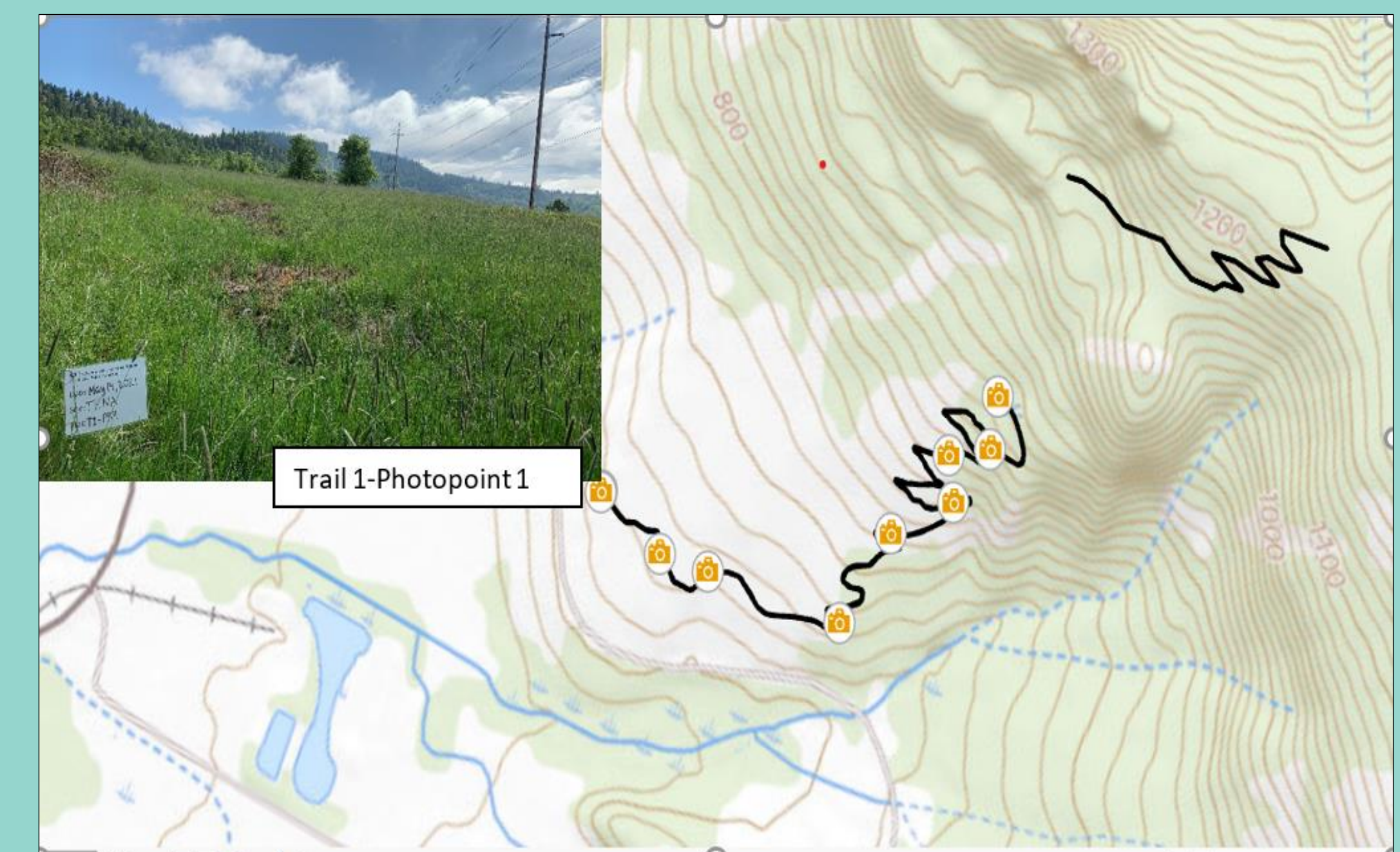
- By implementing plant surveys, we discovered which parts of the trail contain sensitive native species that may serve to attract visitors but will also need to be protected by human traffic; and invasive species that will need to be removed before they can spread or managed if they have already spread.



- Our photopoint data will be used by Willamalane to view changes to the trails over time. This will help inform them of when and where social trails, dog activity, and invasive species are negatively impacting the trails.
- Conducting bird point counts and implementing wildlife cameras informed us of the bird and large mammal species in THNA that may be negatively affected by trail development and may also attract visitors to the site.
- The result of our research will be a dynamic monitoring tool which Willamalane Parks and Recreation District will use to ensure the long-term sustainability of trail development at THNA.

## Conclusion

- Once the trails are developed, the potential for social trails and humans/dogs to act as vectors for invasive plant species increases substantially. This adds to the degradation of a site.
- Limitations included: time constraints, small survey window, safety concerns so slope and plant data was not collected for the entirety of the trail.
- We hope that our recommendations to Willamalane Parks and Recreation District will improve the trail design and help protect the vulnerable plants, animals, and habitat types that can be found within the Thurston Hill Natural Area.
- In the future, our research will be mimicked based on the protocols that we designed and will be used to track the impacts on the site over time.



## Acknowledgements

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