Goats on the Riverfront

University of Oregon 2022

By the Numbers

- More than a dozen students volunteered over 70 hours within the course of a month on this project
- Approximately 86 ft. of fencing was temporarily installed and removed to restrict access to the site and protect native vegetation
- Volunteers removed approximately 9 invasive and/or toxic plant species from the browsing plots
- Volunteers actively conserved over 8 native woody species at the site
- Volunteers removed over 30 lbs. of litter from the site
- Site observations suggest that over 40 species of wildlife use the site
    - Approximately 32 species of birds, 7 species of mammals, honey bees and at least three species of native bees
- Over 60 people were in attendance for the Willamette River Natural Area Kick-off Event, with over a third of the audience being students
- Hundreds of public passersby showed interest and excitement for the use of goats
- 10 goats grazed approximately 1/5 of an acre, or over 942 sq. yards, over a three-day period
- The goats were able to significantly remove 30 % of vegetation and 26% of Himalayan blackberry within the treatment plots (see figures on page 6)

Leadership Team

Cal Penkauskas, Dr. Bitty Roy, Steve Mital, Sarah Erskine, Dr. Laurel Pfeifer-Meister, and Dr. Lauren Hallett

Community Partners

- Courtney and Jalen Brooks, Creekside Land Management LLC.
- Office of Sustainability, University of Oregon

Data Accessibility

https://drive.google.com/drive/folders/1nr3b5zKtsIjFiVyJGHsWCKMvrXgQDq7z?usp=sharing

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Project Synthesis

The use of goats to clear brush has been an economical and increasingly ecologically-friendly technique for institutions in the past decade to manage their landscapes (Marchetto et al. 2021, NRCS 2017, Rathfon 2021). This is most notable on sites that are unsuitable for mowing, such as rocky, steep, or wooded areas. Although best used in combination of other restoration practices, goats can be an effective tool to adaptively manage invasive species (Marchetto et al. 2021). This persistent browsing is in contrast to mechanical treatments, such as a string-trimmer, and provides a more ecologically intensive disturbance on the site, as goats preferentially browse woody species (Brown 2019, Marchetto et al. 2021, NRCS 2017, Rathfon 2021). Goats can also be welcomed by students and the general public through increasing visibility around sustainability efforts, and can increase the sense of place within a community of people. The aim/goal of this project is to both restore the riverfront landscape as well as engage both the UO and broader community in the restoration of this landscape. The end goal for the site, as part of the Willamette River Natural Area (WRNA), is for native plant communities to persist and increase recreation/community enjoyment and access.

Working in partnership with the Office and Sustainability and Creekside Land Management, the Society for Ecological Restoration Student Association at University of Oregon (SER-UO) lead site preparation, vegetation monitoring, and overall project implementation of a goat-browsing treatment within a section of the WRNA between May 23rd and 25th 2022. Goats were strategically placed within a woodland along the riverfront, on 15 ft. cables with water, separated by at least 30 ft., and left to browse for three days. Toxic plants from within each plot were removed prior to the introduction of goats (Brown 2019). Goat-fencing was installed at key places to mitigate human traffic through the site and around native woody plants in plots for conservation (NRCS 2017). Additionally, vegetation was sampled before and after goat-browsing via drone photography and visual percent of cover and blackberry was estimated.

Site Description

The WRNA incorporates approximately 24 acres of a designated open-space along almost a mile of the Willamette River in Eugene, Oregon. The WRNA is intended to help increase access for outdoor instruction and river-related recreation on the UO campus while improving ecological processes of river habitat through restoration practices. Currently, the Habitat Advisory Team is finalizing the Habitat Management Plan for the WRNA and proposed projects that improve ecological function and return portions of the river's edge to a more natural condition align well with desired outcomes. Additionally, the WRNA has a 200 ft. developmental setback from the river as part of the Willamette Greenway.

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The goat-grazing site is located along the southern bank of the Willamette River, approximately 600 ft. downstream from the Frohnmayer footbridge; next to the Riverfront Field and adjacent to the Landscape Architecture Department's Land Lab. Vegetation consists of a cottonwood and mixed maple/Oregon ash overstory with a highly invaded middle-canopy of Himalayan blackberry and pasture grasses – some Oregon-grape and Pacific sword fern throughout. Poison hemlock starts to dominate in the sunny areas with high cover of pasture grasses. Some weedy forbs are found throughout, with galium and geranium in the woodland understory. Some scotch broom is found in at least one pocket on the northern extent of the site. The site has a residual road that is partially paved that runs east-west here, which is frequented for river access and as an alternative route from the bike path (see map on page 5). The site encompasses a total of 3.5 acres with large meadows, mowed regularly, in its core, and on its eastern and western extents, with the newly built bike path along the southern edge.

Lessons and Take-aways

- Involvement of leadership team, SER-UO, community partners, and student volunteers was successful at minimizing risks associated with operating in a public space
- Working closely with community partners during the design phase and implementation improved management objectives and practical outcomes
- Older goats have a more significant effect on vegetation cover than younger goats
- Goats are social creatures, as are humans
- Shade/shelter increases productivity of goat browsing (Kerr et al. 2015, Marchetto et al. 2021, Rathfon et al. 2021)
- Goats become more productive on the second and third day on-site (Rathfon et al. 2021)
- Browsing behavior altered with human interactions and proximity from other goats
- More extensive area and time needed for desired effect on vegetation
- Cable leashes not desirable, some goats got caught up on occasion
- Human traffic through the site was greatly reduced, but there was still periodic access around the fences
- Use of goats was well received and were very impressionable with students
- String trimming after browsing could result in a more significant inter-annual effect (Kerr et al. 2015, NRCS 2017, Rathfon et al. 2021)
    - Potential restoration experiments involving combined use of mechanical treatments, browsing, and/or prescribed fire

Recommendations

- Larger scale treatment at a stocking rate of 8 – 12 goats per acre for about a week, done at least twice a year, for up to 3 years (NRCS 2017)
- Use of semi-permanent and/or electric fencing to create paddocks for rotational browsing, conservation exclusions, and goat safety (fence set-backs from the bike path)
- Successional grazing with sheep in-between and/or after goat-browsing prescription (Kerr et al. 2015, NRCS 2017)
- Flattening of blackberry thickets with plywood or fencing to increase goat access (Marchetto et al. 2021, NRCS 2017)
- Expansion of drift-mowing technique used in the Land Lab – where applicable
- Use of a mobile trailer for additional shelter (Kerr et al. 2015, NRCS 2017)
- Addition of safe-play elements, like boulders, logs, or stumps for goat enrichment (Kerr et al. 2015)
- Continued use of night security and daily check-ins
- Possible use of security/wildlife cameras
- Use of public outreach, such as ambassadors, workshops, and/or “goat socials”
- Use of interactive signs and advisory signs
- Collaboration with Oregon State University
- Continued work parties for other invasive species control and litter pick-up
- Continued student-led vegetation monitoring of the site


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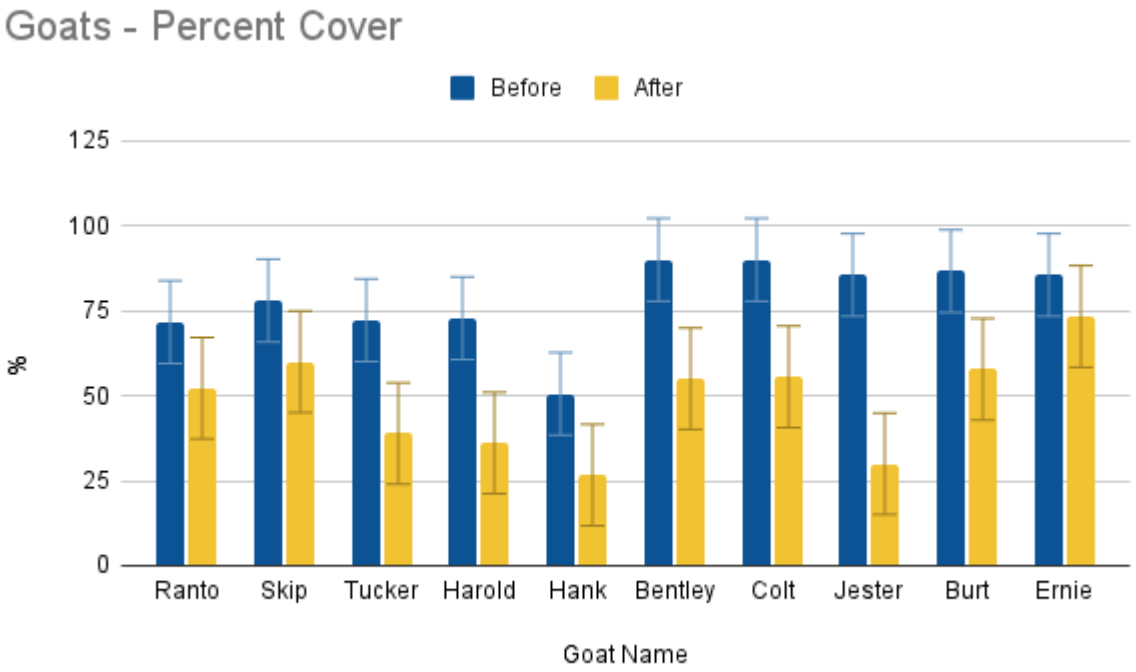
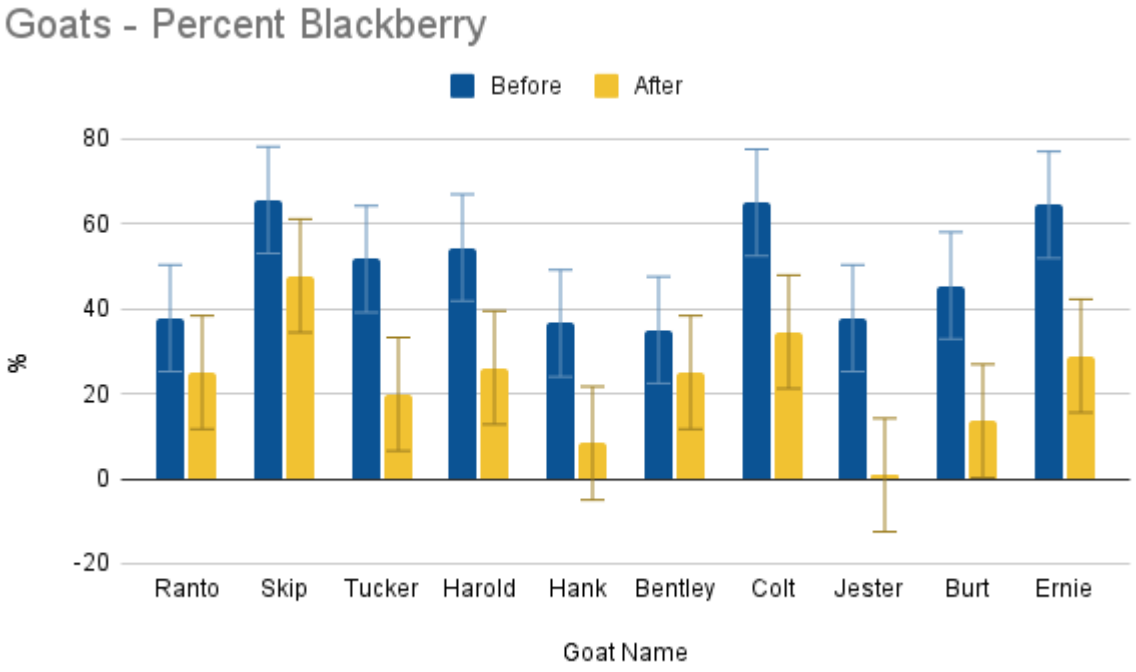
Between 5/22 - 5/25, 5 control plots and 10 goat plots were strategically placed within a woodland in the WRNA. The goats were tethered by 15-foot cables, had access to water, and were separated from each other by at least 30 feet. A potential follow-up expremiment includes string-trimming 5 goat plots and 5 addtional plots for compasrison.
Legend
Potential Treatment Plots
Control
Fence
Goat Browsing Plot
Google Earth
N
100 ft

Goats on the Riverfront 2022





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