PINA Permaculture Design Contest
Aprovecho's Integrated Water Harvesting Earthworks

Narrative Project Description

Aprovecho recently completed a Land Stewardship Plan (see accompanying document), which integrates soils, water, access, disaster preparedness, habitat enhancement, timber stand improvement, and agroforestry developments throughout the 40-acre site. My company, Resilience Permaculture Design, LLC, wrote the plan using data collected in the 2017 Advanced Permaculture Practicum in Forestry and Water Systems held at Aprovecho facilitated by my husband Abel Kloster. The design for this project is shown in the series of maps that were developed as part of the Stewardship Plan. Map 2 shows existing site features, Map 5 shows future forestry access and waterways, Map 6 shows the overall fire resilience plan for the site, and Map 7 shows the site master plan.

One of the goals of developing this Stewardship Plan was to create an integrated earthworks design for the site that would improve access for Aprovecho's small-scale sustainable woodlot, while also increasing its water harvesting potential and fire resilience. Keyline design principles were used to integrate water harvesting, access, and fire mitigation planning within the context of a working forest. We have secured a water right from the Oregon Water Resources Department to build earthen water storages throughout the eastern drainage. As an interesting aside, the Water Master had never in his career worked with people who were interested in rehydrating the landscape, and though the Department rarely gives out water rights anymore, we were able to secure one based on our long-term goals of improving the site's hydrology and riparian habitat, as well as getting the creek that runs through the site to run year round again.

We have already installed 4 ponds on the site (see Map 2), and would use the funds from this contest to continue earthworks development on a larger pond near the top of the site (highlighted in dark blue on Maps 5, 6, and 7) and linking it to already established ponds in the same drainage.

The proposed pond will serve as the largest, highest water storage on Aprovecho's site, representing the greatest capacity for gravity fed irrigation water and fire mitigation. A hand built Keypoint pond above the proposed pond site has held water through Oregon's increasingly hot, dry, and smoky summers, and based on flow analyses we are confident that the new pond will also fill and maintain water through the dry season. This pond will be located in a shaded area and care will be taken in construction to maintain canopy cover to minimize evaporation. The hydrostatic pressure of this pond will also contribute to maintaining water in ponds downhill, increasing the "sponge ladder" effect observed in well-designed water harvesting systems.

As an established educational facility with nearly 40 years of history engaging with students, volunteers, agencies, and the general public, Aprovecho is uniquely situated to demonstrate the efficacy and importance of these Permaculture practices as they relate to mitigating the effects of a changing climate. We are committed to continuing to raise awareness of these strategies and techniques on the site, and look forward to utilizing the funds from this contest to further enhance Aprovecho's educational impact, while also making significant improvements to the habitat value, ecosystem function, and overall resilience of the site. We also plan to offer a workshop near the end of the pond building process to demonstrate the process and potential of pond building in this climate and context.

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Budget and Timeline

Budget:

Equipment Rental - $2,000
Labor – Surveying and Clearing Site - $1,000
Labor – Excavation - $1,500
Materials - $500

- Baffled pipe and associated infrastructure to go through dam and allow for quick gravity-fed water access
- Diesel for excavator
- Straw and seed for soil cover after pond construction.

Timeline:

May 2019 – Clear site and survey for final pond dimensions.

June 1 - 15, 2019 – Excavate pond and build dam, spillway, and install baffled pipe infrastructure.

June 15, 2019 – Host workshop at Aprovecho about Permaculture earthworks. Participants will help with hand work in finishing up the project.

July – October 2019 - Monitor pond level throughout summer dry season. Test out baffled pipe system.

October 2019 – March 2020 – Monitor pond level through winter wet season and make necessary adjustments.