

Designing and Installing a Native Bioswale for Stormwater Infiltration and Habitat Value

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Background:

- Conventional water management systems rapidly direct stormwater away from urban areas to local watersheds to reduce flooding.
- In a changing climate with increasingly frequent extreme rain events and longer dry periods, we must adapt to instead slow, spread, and sink our rain water.
- The first few inches of stormwater are the most polluted with hydrocarbons and sediment.
- Bioswales are planted basins that absorb and filter stormwater.
- Deeply rooted native plants and biochar increase water and pollutant absorption.

Objectives:

- Improve Copeland Creek water quality by diverting and filtering stormwater runoff from parking lot R1 entering storm drain
- Increase water infiltration and water table recharge in the Agroecology Garden
- Add to the habitat corridor with a diversity of host and pollinator plants to feed fauna

Process:

- Consult experts and stakeholders, observe water flow in lot, determine size of basin
- Draw design, acquire plants, compost, biochar, rocks, cardboard, mulch, and wattles
- Secure a dig permit, remove old irrigation, advertise for volunteer days with free lunch
- Lead five, 2 hour work days for volunteers to help dig, level, add biochar and compost, sheet mulch, and plant
- Install drip irrigation, monitor during rainfall, and weed

Native Plants:

- Perennials and shrubs: *Erythranthe cardinalis*, *Achillea millefolium*, *Salvia spathacea*, *Symphytotrichum chilense*, *Asclepias fascicularis*, *Apocynum cannabinum*, *Diplacus ‘Eleanor,’* *Artemisia douglasiana*, *Euthamia occidentalis*, *Ribes sanguineum*, *Calycanthus occidentalis*, *Lonicera involucrata*, *Cornus sericea*
- Grasses and grass-like: *Carex barbarae*, *Juncus patens*, *Elymus triticoides*, *Festuca californica*, *Stipa pulchra*



Results:

- The volume of the basin below the grade of the storm drain is 150 ft³, holding 1122 gallons of water at a time. This is absorbed in less than an hour but with varying results depending on the time between rainfall.
- Around 90% of the runoff from the 24,750 ft² lot is draining to this area, totaling to about 13,880 gallons of water per inch of rain.
- While not able to absorb all of the the runoff from the parking lot, absorption will increase as the plants set their roots and soak up more water and create pathways for water to infiltrate deeper into the soil.
- This project is an example of how native plants, biochar, and bioswales are not only beneficial to our ecosystems, but are effective infrastructure.
- Further research and educational events will be held around the bioswale to increase awareness of how more small projects like this can make a large impact in protecting our watershed.

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