Arcata Marsh and Wildlife Sanctuary

Pilot projects started in 1979. Construction on the marsh was completed in 1986.

Arcata, Humboldt County, California

City of Arcata

100 acre constructed wetland that serves as secondary and tertiary treatment for the city’s wastewater. Secondary treatment utilizes oxidation via algae and bacteria. A visitors’ center and nature trails provide information about the marsh and its wildlife inhabitants.

The AMWF serves Arcata’s population of 15,000 people and the marsh has become a widely recognized success story of effective wastewater treatment. The marsh has also been recognized for its value as habitat for over 200 species of birds.

EPA’s website on constructed wetlands:
http://www.epa.gov/owow/wetlands/construc/arcata/11intro.html
City of Arcata:
http://www.arcatacityhall.org/arcata_marsh.html
History of the Arcata Marsh Project:
http://sorrel.humboldt.edu/~ere_dept/marsh/history.html
Plant-based Research & Application in the Northwest

PROJECT
Bureau of Environmental Services Water Pollution Control Laboratory

START/COMPLETION
1995/1997

LOCATION
Portland Oregon

OWNER/
City of Portland, Bureau of Environmental Services

AGENCY

DESCRIPTION
Integrated stormwater treatment ponds and swales filter stormwater from 50 acres of pervious and impervious surfaces. Planted with native and non-native species including Oregon Ash, Red Alder, Red Maple, Redtwig Dogwood, Douglas Spirea, Oregon Grape, and wetland perennials and grasses.

PERFORMANCE
Accurate information on performance is hampered by additional surface and sub-surface flows. P and N are occasionally high, possibly from neighboring residential areas.

LINKS:
EPA’s website on constructed wetlands:
http://www.epa.gov/owow/wetlands/construc/arcata/11intro.html
City of Portland, Bureau of Environmental Services
http://www.portlandonline.com/bes/
PROJECT Northeast Siskiyou Green Street
START/COMPLETION NE 35th and Siskiyou Street, Portland, Oregon
LOCATION NE 35th and Siskiyou Street, Portland, Oregon
AGENCY City of Portland, Bureau of Environmental Services
DESCRIPTION Integrating stormwater capture and filtration in a street curb extension (traffic calming) project. Curb extensions are planted with native species. Stormwater flows into the planted areas, allowing it to seep into the ground or be filtered by the plants before it enters the storm drain.
PERFORMANCE tba
LINKS Portland's Bureau of Environmental Services www.portlandonline.com/bes/
Plant-based Research & Application in the Northwest

North Park Square, Portland Oregon

PROJECT      North Park Square
START/       Design: 2003
COMPLETION   Construction: 2004
LOCATION     NW 11th and Marshall Street, Portland, Oregon
AGENCY       Waterscapes, Inc.; Greenworks, PC (landscape architects)
              City of Portland

DESCRIPTION  “Cleansing biotopes” in this urban park filter stormwater as it flows through each section of the park. A progression of plant communities from lawn (on the west side) to native and wetland emergent plants (on the east side) allows for heavy uses as well as more passive participation in the park. A shallow pond recirculates water captured during winter months and will be augmented with additional water during the summer months.

PERFORMANCE  tba

LINKS:        www.
Plant-based Research & Application in the Northwest

Buckman Terrace Stormwater Swales, Portland Oregon

| PROJECT | Stormwater swales at Buckman Terrace Apartments |
| START/ | 1997 |
| COMPLETION | 1999 |
| LOCATION | 303 NE 16th St. Portland, Oregon |
| AGENCY | City of Portland, Bureau of Environmental Services |
| Prendergast Associates, developer |

DESCRIPTION Landscaped swales capture stormwater from roof drains. Swales are planted with sedges, miscanthus, spirea, Oregon grape, and Japanese iris. Swale is 300' long, 6' wide and 3" deep with rock check dams every 15'. The swale gradient is 2% for the first 200’, then increases to 4%. All flows that exceed filtration capacity of the swale, are discharged into a catchbasin. Pea gravel mulch slows the flow and allows for increased infiltration and settling of sediments.

PERFORMANCE Most flows successfully infiltrated into the soil except in the steeper section where it entered the catch basin. Pea gravel is an effective mulch and has successfully protected the swale and assisted in filtering water flows. Construction quality is critical to the success of stormwater projects; some elements were incorrectly installed resulting in poor swale performance.

LINKS: Portland’s Bureau of Environmental Services
www.portlandonline.com/bes/
Project: Stormwater gardens at Eppler/Portland State University, Portland Oregon

Start: 1997
Completion: 1999
Location: City of Portland, Bureau of Environmental Services, Portland State University

Description:
Landscaped swales capture stormwater from roof drains. Swales are planted with sedges, miscanthus, spirea, Oregon grape, and Japanese iris. Swale is 300’ long, 6’ wide and 3” deep with rock check dams every 15’. The swale gradient is 2% for the first 200’, then increases to 4%. All flows that exceed filtration capacity of the swale, are discharged into a catchbasin. Pea gravel mulch slows the flow and allows for increased infiltration and settling of sediments.

Performance:
Most flows successfully infiltrated into the soil except in the steeper section where it entered the catch basin. Pea gravel is an effective mulch and has successfully protected the swale and assisted in filtering water flows. Construction quality is critical to the success of stormwater projects; some elements were incorrectly installed resulting in poor swale performance.

Links:
Portland’s Bureau of Environmental Services website
www.portlandonline.com/bes/
Plant-based Research & Application in the Northwest

PROJECT  Arlecho Creek Watershed conservation easement
START/  2002
COMPLETION  Ongoing/100-year lifespan
LOCATION  Mt. Vernon, Washington
OWNER/  Lummi Indian Tribe
AGENCY  The Climate Trust; Klamath Cogeneration Project

DESCRIPTION  1654 acres of northwest forest will be reforested, preserved through a conservation easement and used as a laboratory by Northwest Indian College of the Lummi Indian Tribe.

RESULTS  Anticipated to sequester 350,000 metric tons of CO₂ over the next century (equivalent to CO₂ of 50,000 cars traveling 15,000 miles.

LINKS  The Climate Trust
        www.climatetrust.org
Lummi Indian Tribe
        www.lummi.nsn.org
Northwest Indian College
        www.nwic.edu
PROJECT Deschutes Riparian Reforestation and Carbon Offset Project

START/COMPLETION By 2008; 52-year duration

LOCATION Deschutes River Basin, Oregon

OWNER Private landowners

AGENCY Deschutes Resource Conservancy; The Climate Trust; Klamath Cogeneration Project

DESCRIPTION 1500 to 1800 acres of riparian habitat along the Deschutes River will be restored with native vegetation. Financial incentives will be offered to private landowners in the Deschutes river Basin to encourage them to restore riparian areas on their property. Additional benefits include improved wildlife habitat, improved water quality and improved aesthetics.

RESULTS Anticipated to sequester 233,333 metric tons of CO₂ over the next century (equivalent to removing 43,000 from the road for one year).

LINKS The Climate Trust
www.climatetrust.org
Deschutes Resource Conservancy
http://www.deschutesrc.org/
Hamilton West Apartments Green Roof, Portland Oregon

**PROJECT**
Hamilton West Apartments Green Roof, Portland Oregon

**START/COMPLETION**
1999

**LOCATION**
Portland Oregon

**AGENCY**
Portland Bureau of Environmental Services
Housing Authority of Portland

**DESCRIPTION**
Hamilton West Apartments is a ten-story mixed use building in downtown Portland. The roof is 8700 square feet of which 5100 square feet are planted in sedums, delosperma, sempervivum, native and non-native wildflowers. Two different substrate depths were used: 3” and 5”. The roof is irrigated during the summer. Weeding is done once/year. Water quality, stormwater detention and attenuation are monitored.

**PERFORMANCE**
100% retention for summer storm events; 53.5% over a 27-month period. Some grasses and weeds have established themselves on the roof.

**LINKS:**
Portland’s Ecoroof website
www.portlandonline.com/bes/
Plant-based Research & Application in the Northwest

PROJECT: Ecotrust/Jean Vollum Natural Capital Center Green Roof
START: 1999
COMPLETION: 2001
LOCATION: Portland, Oregon
OWNER/AGENCY: Ecotrust/City of Portland, Office of Sustainable Development

DESCRIPTION: 6500 square foot green roof initially planted with grasses, sedums, and a wildflower mix. Substrate is 2" deep; slope is 2%. Supplemental irrigation during summer months. Overflow drains through downspouts to parking lot bioswales (See SPROUT Stormwater Cases).

PERFORMANCE: Poor performance of plant material. Subsequent planting of wetland prairie species.

LINKS: Portland’s Ecoroof website
www.portlandonline.com/bes/
Ecotrust website
www.ecotrust.org
Plant-based Research & Application in the Northwest

PROJECT  Native American Student and Community Center, PSU Green Roof
START/COMPLETION  2003
LOCATION  710 SW Jackson Street, Portland, Oregon
OWNER/ AGENCY  Portland State University / Native American Student and Community Center

DESCRIPTION  4000 square foot green roof planted with native evergreen and deciduous shrubs, sedum, bulbs, grasses, and perennials. Substrate is 6-30” deep. Automatic irrigation is installed. Overflow drains into city stormwater system after filtering.

PERFORMANCE  tba

LINKS:  Bureau of Environmental Services Ecoroof website
        www.portlandonline.com/bes/

        Native American Students Center, Portland State University
        www.nativecenter.pdx.edu/index.htm