Stop 3: OSU Oak Creek Center for Urban Horticulture

Oak Creek at Urban Hort. Center
Note the remnant of dam and severely undercut bank.

Location: The Center is located on the east side of SW 35th St., just north of SW Western Blvd. by the creek crossing and south of the railroad tracks. Please contact Oregon State University for access; (541) 737-2503.

As Oak Creek crosses under 35th Street it becomes increasingly urbanized. At this stop you can see the effects of numerous urban stressors such as roadways and other hardscapes, channelization, residential and commercial development, and adjacent landscaping. Other signs of urbanization in this reach include the placement of significant amounts of bank riprap at the Bee Farm site as well as portions of the Forest Research Laboratory (FRL) buildings and parking lot that were constructed adjacent to the edge of Oak Creek. These and many other human activities have resulted in reduced functionality of the Oak Creek system. A symptom of this degradation is the significantly incised channel in this reach.

The Oak Creek Center for Urban Horticulture is exploring ways to mitigate these negative impacts on our waterways. You can see demonstrations of plant-based technologies such as green roofs, rain gardens, and bioswales that slow down and improve the quality of stormwater runoff before it enters streams. You can also see a working rainwater catchment system designed to supply irrigation water for landscaping. In the creek you can see a remnant of a dam that was removed in 2007 to improve in-stream habitat. Future restoration plans call for planting native riparian vegetation and restoring a small area of native prairie.

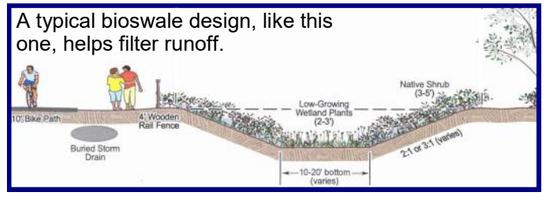
Stop 4: OSU Reser Stadium Bioswale

Location: Park in the westernmost section of the Reser parking lot along 30th, between SW Western Blvd. & SW Washington Way.

After the 35th St. crossing, the lower reach of Oak Creek flows southeast and enters a more urbanized stretch. Beginning with settlement by pioneers in the mid-1800's, Oak Creek became increasingly channelized, moving from a braided, sinuous channel to a more confined system. The high banks along the stretch of creek passing by the coliseum might have been caused by the channel being filled in at one time. These human-caused changes to Oak Creek have resulted in reduced riparian habitat diversity, less passive flood storage and "flashier" responses to storm events. Increased runoff from impervious surfaces such as parking lots and roofs further aggravates the situation. Impermeable surfaces (like the Reser parking lot) increase volume and decrease quality of stormwater flowing into streams. Some common urban pollutants include: hydrocarbons, nutrients, bacteria, temperature and litter. Hydrocarbons from vehicles persist in the environment and interfere with plant photosynthesis. Nutrients from yard debris and pet waste fertilize aquatic plants in stream, causing a condition known as eutrophication, which can deprive aquatic organisms of oxygen. Elevated levels of *E. coli* bacteria are found in Oak Creek, probably from agricultural runoff and pet waste. Impervious surfaces can cause thermal pollution in the stream by heating up stormwater runoff. Water temperature is also increased in the absence of streamside vegetation in some stretches of Oak Creek. Litter, as well as being unsightly, can introduce metals and toxic substances that break down in the stream.

Fortunately, as part of the 2002 Reser Stadium expansion, OSU constructed a bioswale to compensate for increased stormwater runoff and pollution in Oak Creek. A bioswale performs some of the valuable ecological services provided by wetlands and riparian buffers, such as cleaning water and minimizing flood risk. In the swale's gently sloping vegetated ditch, runoff is slowed and cleaned by biological methods, and silt settles out. Piping runoff to the swale from the paved lot minimizes surges in Oak Creek during storm events, releasing it slowly to the creek as it would in an undisturbed setting. For more information on OSU's sustainability efforts, take OSU's Sustainability Tour. Brochure available online: fa.oregonstate.edu/sustainability/information/visitors

A typical bioswale design, like this one, helps filter runoff.



Stop 5: Culvert and Fish Passage Project

Location: Intersection of Philomath Blvd. & SW Brooklane Dr.

In 2006, Oregon Department of Transportation undertook a major project to restore fish passage and improve fish habitat in Oak Creek near the confluence of Marys River. To allow fish passage in times of low water levels, a four-foot scour at the concrete apron was fixed with a roughened chute of rock. Also, the box culverts that allow Oak Creek to flow under Philomath Blvd. were outfitted with weirs. Rocks and large woody debris provide rearing habitat for resident trout and potential habitat for juvenile spring Chinook salmon. Looking down from above, this site appears natural, but it has been highly engineered to improve water quality and fish habitat. Please enjoy but do not tamper with rocks, vegetation or woody debris.

The new culvert allows more fish to access Oak Creek for summer refuge.

Learn More About Oak Creek Watershed

Benton Soil and Water Conservation District
www.bentonswcd.org

City of Corvallis Public Works Stormwater Program
corvallisoregon.gov/publicworks/page/stormwater-program

Corvallis Sustainability Coalition Natural Areas & Water Action Groups
www.sustainablecorvallis.org

Marys River Watershed Council www.mrwc.org

OSU Oak Creek Website ARCHIVE
ir.library.oregonstate.edu/concern/defaults/ws859k30s?locale=en

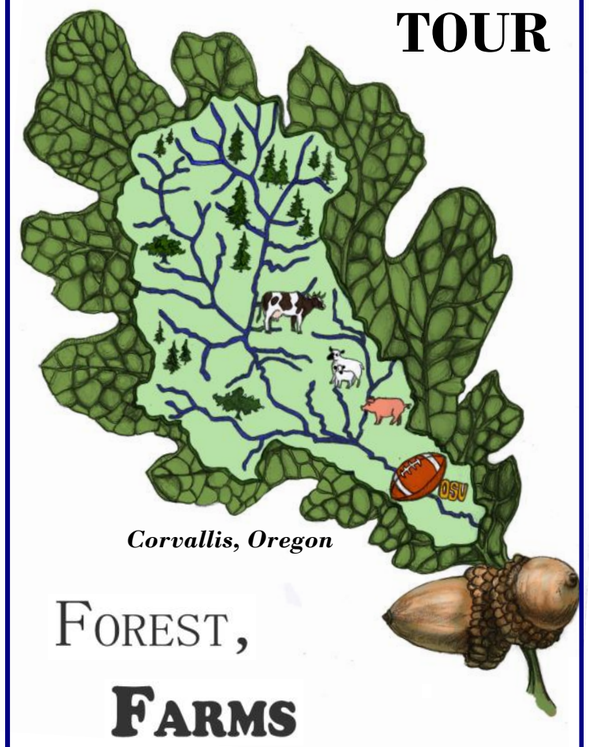
Fish found in Oak Creek

juvenile Chinook salmon, Pacific lamprey, mountain whitefish, rainbow trout, largescale sucker, mountain sucker, speckled dace, redside shiners, reticulate sculpin and torrent sculpin

Tour Sponsors

Brochure created May, 2009; updated 2013 and 2021 for the Self-Guided Tour and electronic version .

OAK CREEK TOUR



Corvallis, Oregon

FOREST, FARMS & FOOTBALL

Explore Oak Creek.

Discover how forests, farms and football affect the water quality and stream dynamics of Oak Creek. Learn how past and present management practices along the Creek continue to transform the landscape.

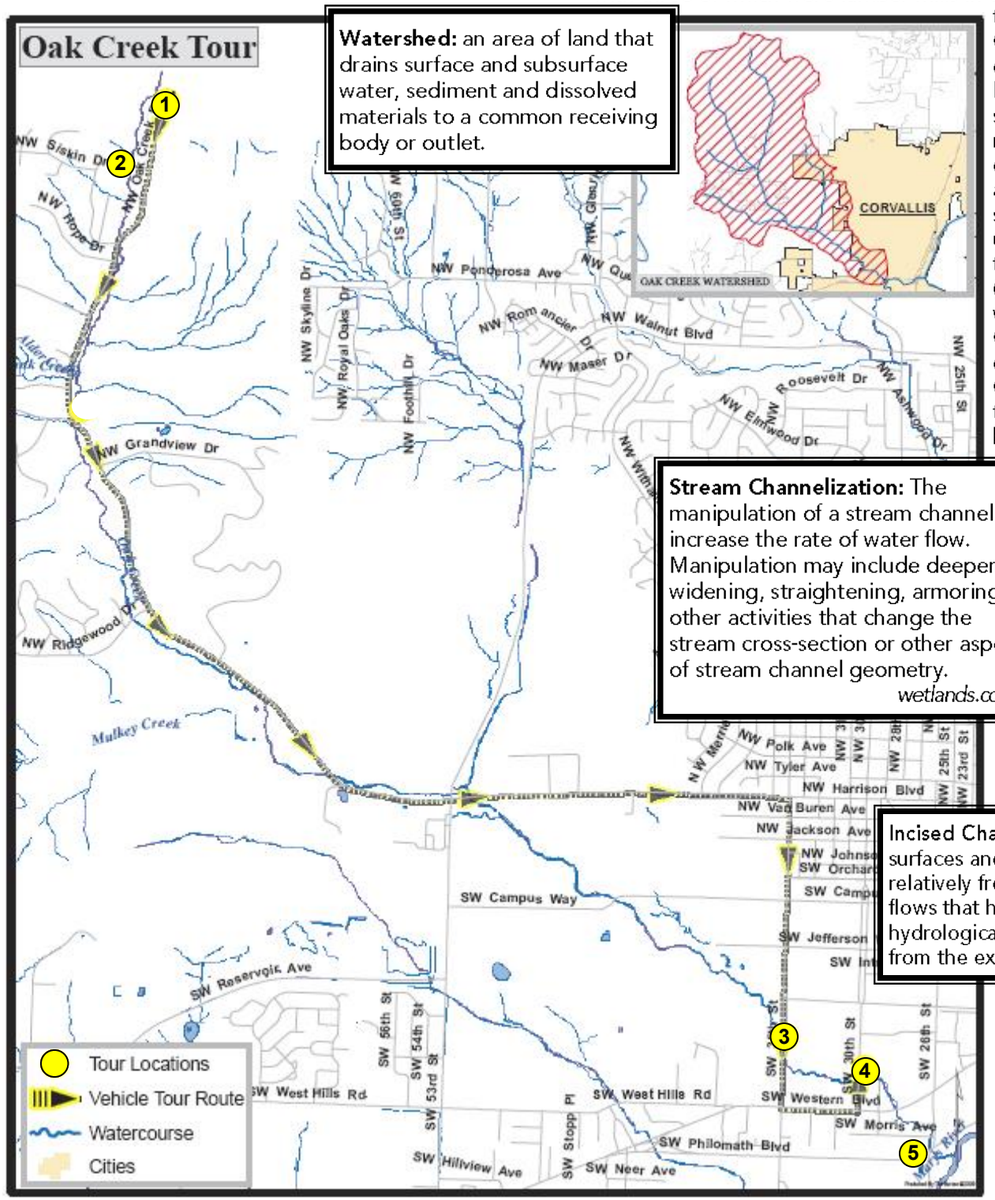
Contributors: Gail Glick Andrews, Taylor Bortz, Sarah Dyrdahl, Heath Keirstead, Pete Klingeman, Gwenn Kubeck, John Lambrinos, Donna Schmitz, Amy Simmons, Nick Testa, Brandon Trelstad, and Taylor Williams.

Tour stops correspond to numbers on the map below. Please contact Oregon State University for permission to access site 3; (541) 737-2503.

Introduction to the Oak Creek Watershed

The Oak Creek watershed begins in the McDonald Dunn Forest, and traverses forested, agricultural, residential and urban areas before emptying into the Marys River. Oak Creek makes up about 4% of the Marys River Basin. The watershed covers 8,300 acres, and travels 3.5 miles from headwaters to mouth, with an elevation change of 1915 feet. Including its tributaries of Alder, Skunk and Mulkey Creeks, Oak Creek is 8 miles long. Its average discharge is approximately 0.5 cubic feet per second (cfs) in summer and more than 5 cfs in winter, with flood discharges exceeding 100 -200 cfs. Oregon State University manages roughly 40% of the entire Oak Creek basin, with private lands interspersed in the middle and lower portions of the basin.

Survey notes from the 1850's indicate that a riparian forest of ash, maple, alder, and cottonwood lined the stream from the headwaters down to 35th Street, from which point on the stream flowed through prairie habitat. Approximately 6 mills were located along Oak Creek between the 1850s and 1920s, with three of which were lumber mills in operation around the time of World War I. One seasonal dam, owned by OSU, is located on the main stem of Oak Creek, near the intersection of Harrison and 53rd, and a second dam structure is located up in the Forest. At the time of this tour (2009), Oak Creek was 303d listed by Oregon Department of Environmental Quality (DEQ) for temperature and bacteria.



Information in Introduction section taken from P. Benner, 1984 *(Oregon Explorer Natural Resources Library)*, Marys River Watershed Council, and Department of Environmental Quality.

Stop 1: Oak Creek Trailhead

Location: The trailhead at the top of NW Oak Creek Dr. by the informational kiosk.

Oak Creek originates in the low-mountain terrain that is now part of McDonald Forest. The upper elevations of the watershed are about 2,000 feet above sea level. Oak Creek flows southward out of its forested headwater zone, leaving the forest at about 500 feet elevation. The headwater zone is relatively unaltered second-growth forest land. The forest roads and trails are heavily used by hikers and bikers at all times of year. Wildlife is abundant but usually hidden. A hiker might see beaver ponds, plentiful deer, and on rare occasions a bear or cougar.

Oak Creek in McDonald Forest. Notice the multiple impacts: impervious road surface, rip-rapped bank, and invasive species (false brome, lower left corner).

The headwaters have many miles of road drained by 116 culverts. Stream-crossing and drainage relief culverts allow the stream to pass under the road or move rainwater from the road or ditch to the forest floor.

Forest roads serve many functions, including access for fire protection, recreation, and timber harvest. Forest roads are designed to minimize erosion from rainwater and safely allow vehicle and foot traffic. Historically, forest management decisions have been made with little knowledge regarding how road drainage affects stream flow and sediment yield. OSU's College of Forestry has taken steps to better inform these decisions. From 2001-2008 scientists conducted research on the interaction of the road system with Oak Creek. They examined sediment transport and peak flow during storms. Surprisingly, most of the runoff comes from a small percentage of the road segments.

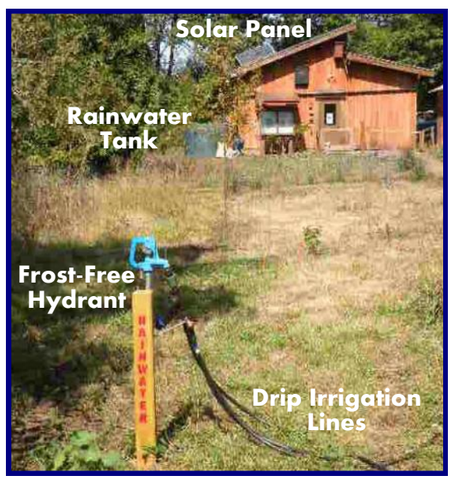
Other research initiatives have benefitted from having Oak Creek and McDonald Forest so close to the OSU campus. OSU has conducted sediment transport research in Oak Creek intermittently since 1968. This research focuses on the transportation of organic matter and aquatic life with stream gravel. Leaves, twigs, snails, worms, small fish, and even large trout have been collected with the sand and gravel that Oak Creek transports during storms. These are all separated out so that the sand and gravel can be measured and weighed in relation to the instantaneous water flow rate. This sediment transport research is world famous and is used as a model for gravel-bed studies as far away as Italy and New Zealand.

Stop 2: Audubon Society of Corvallis%Hesthavn Nature Center

Location: 8590 NW Oak Creek Dr.

Alan and Helen Berg donated the 5.75-acre parcel of land on Oak Creek west of Corvallis to the Audubon Society of Corvallis in 1993. Horses remained on the property until 1997. Since then, many volunteer hours have gone into restoring native vegetation in the former pasture and riparian areas. The barn was renovated as an educational facility housing meeting space and a museum for wildlife specimens. In 2009, work began on a rainwater catchment system featuring a solar pump and gravity fed irrigation. The public is welcome to visit the site during daylight hours.

In the summer of 2009 volunteers worked on restoring riparian vegetation at the Hesthavn Nature Center. With the help of a grant from the Department of Environmental Quality, Benton SWCD, the Audubon Society of Corvallis, and many hardworking volunteers planted over 100 native trees and shrubs, sowed native seeds in areas where blackberry and other invasive plants had been removed and planted Camas bulbs to increase riparian vegetation along Oak Creek. A serious threat to restoration plantings is an inadequate water supply. To increase survival rates of the new restoration plantings a two-tank rainwater catchment system with a solar pump was installed, as well as six frost-free hydrants and a low-flow drip irrigation system.



Hesthavn restoration site