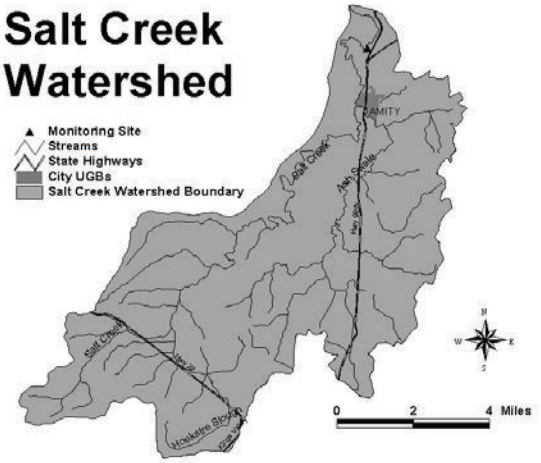
Salt Creek Watershed Assessment Summary

Yamhill Basin Council

Yamhill & Polk Counties, Oregon

Background



- Rain that falls in the watershed flows into Salt Creek, then into the South Yamhill, the Yamhill, the Willamette, and finally the Columbia River.
- 78% of the 63,000-acre watershed is in Polk Co. while the remaining 22% is in Yamhill Co. Major streams include Salt Creek and Ash Swale.
- Amity has 1,478 residents, a 25.8% increase from 1990.
- Climate is marine-influenced, rainfall amounts vary and snow & ice do not accumulate often. Soils have volcanic and sedimentary parent material and vegetation correlates well with geology.

Native Peoples and Fire History

- Indigenous Che-ahm-ill people were a sub-group of the Kalapuyan culture. Plants such as camas, tarweed and berries accounted for more of their nutritional intake than meat.
- For at least 4,000 years their regular burning maintained the oak savanna and prairies while preventing Douglas-fir forests from developing.
- Since the 1930s fire suppression crews have become better trained and organized.

Land Use

- Approximately 70% of the land is used for agriculture. Varied topography allows water to be channeled into streams for cultivation during the wetter part of the year, but also alters hydrology.
- Forests are the 2nd highest land use, about 29%.
- Three quarry permits are held in the watershed.

Wetlands and Forests

- Wetlands have abundant water, hydric soils, and specially adapted wetland plants.
- Wetlands connect ecosystems and bodies of water, capture sediment, consume nitrogen from agricultural runoff, slow peak flows, and provide habitat.
- Approx. 1/3 of the prairie that used to dominate the Willamette Valley was "wet prairie" and home to species such as tufted hairgrass. Today, most of the wetlands have been drained and cultivated.
- Current fire suppression has resulted in much less oak savanna & prairie, more Douglas-fir, and contributes to a fire hazard in the forested areas of the watershed.
- Historically, open oak savanna covered at least 25% of the watershed. Small mammals and 28 cavity-seeking birds are common in oaks. Today, approx. 8% of the watershed is oak forest, mostly with Douglas-fir.

- Historically, pure conifer stands accounted for less than 5% of the watershed. Today, approximately 16% of the watershed is conifer forest.

Exotic and Rare Species

- Non-native species introduced from other regions or continents occasionally do extremely well and become invasive. The OR Department of Agriculture identifies noxious weeds as plants having the potential to cause economic losses. Cost is high to eliminate weeds once they are established.
- English ivy is a noxious weed spread by birds that can grow in deep shade, choking out native vegetation, including tree seedlings. Vines break tree branches.
- The federal or state government lists 9 species native to the watershed as rare, threatened or endangered. The BLM lists 16 additional species as special status and 7 species as sensitive.

Riparian Zones

- Riparian zones have higher moisture levels that support a more diverse and productive ecosystem. Vegetation provides shade, stream bank stabilization, habitat for insects and macro-invertebrates, nutrients and large wood. Large woody debris provides fish cover, diverts channels, increases pool depth, reduces erosion, and adds in-channel habitat diversity.
- Today, 10.2% of streams and in-stream reservoirs in the watershed lack riparian vegetation, 38.9% have only brush or grass and 29.5% have only hardwoods. Ideally, all of these areas should have some mature conifers.
- Landowners grazed riparian areas so they could grow crops on the more level tillable land, used them as a source of lumber and used creeks for power and transportation. In the past, the area would re-seed itself, but in 1940s foresters introduced the idea of actively replanting trees.

Channel Habitat & Modification

- Many streams are incised, greatly impacting natural meandering and seasonal flooding. Stream incision results from: dredging, dike building, straightening, damming, draining, removing large woody debris, hardening banks with rip-rap (rocks) or concrete. Constraining streams results in high velocities during heavy flows that erode channels and lead to incision.
- Many of the bottomland areas would naturally be in the flood plain category but are now low gradient moderately confined streams due to downcutting of stream banks.
- Natural meandering finds the stream's natural curvature to best dissipate energy and decrease erosion.
- Agriculture has had the greatest impact on stream modification in the Salt Creek watershed. Building roads by streams and stabilizing the banks with rip-rap prevents natural channel movement.
- Fish barriers such as culverts, dams, waterfalls, logjams, and beaver ponds prevent fish from moving upstream and downstream to adjust to changing habitat conditions such as temperature. Barriers separate fish populations and prevent escape or repopulation from catastrophic events. There are 27 barriers on public roads and 26 dams in the watershed.

Sediments

- Major sources of runoff include cultivated fields, construction sites, landslides, roads, pavement, and insufficiently vegetated stream banks.
- Impervious surfaces and rural road ditches collect oil, gas, steering fluid, exhaust particulates, rubber from tires, and anti-freeze from cars. Agricultural land runoff contains nitrogen and phosphorus from fertilizers. Industry and consumer products also pollute runoff.
- Contaminants are most effectively removed by passing through an area where plant uptake of nutrients is significant and where heavy metals and toxins can either settle out or be consumed in a safe way before entering a stream.
- Sediment catch techniques include straw bales, silt fences, woven matting, detention ponds, and temporary swales. Gravel exit routes help remove mud from tires and keeps soil off of pavement and thus out of streams.

Hydrology & Water use

- Streams are influenced by precipitation, withdrawals for irrigation and drinking water, stream & wetland modifications, changes in land use, and water-related technology and removal or addition of vegetation.
- Streams left in natural state exhibit greater meandering, greater water exchange with wetlands and riparian areas, deeper flood plain soils for water storage and plant growth, increased number and depth of pools, less flows fluctuation, more minor localized flooding, and less major flooding.
- Water needs are increasing due to the rapidly growing population.
- Many lowland areas are of low permeability, so recharge during winter and spring is low. Columbia River Basalt Group groundwater levels are subject to long-term water-level declines due to pumping at a rate higher than annually recharged by direct infiltration of precipitation.
- Parts of the watershed are classified as a "Ground Water Limited Area."
- Amity's drinking water is from the South Yamhill R. and is treated with chlorine, aluminum sulfate, and soda ash.
- Area land yields 15 inches of runoff in an average year that is mostly gone by irrigation time.
- Under Oregon law all water is publicly owned. Water rights are required prior to use or consumption. Streams in the watershed are over appropriated and would run dry during the low flow time of year if everyone exercised their water rights simultaneously. Low streamflow harms aquatic life and prevents sufficient dilution of pollutants.

Water Quality

- Benefits of the watershed are domestic and industrial water supply, irrigation, livestock watering, fish passage and rearing, resident fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, aesthetic quality, and hydro power.
- Cutthroat trout presence and health indicates the overall health of the watershed's streams.
- Streams that do not meet set standards of water quality are listed under section 303(d) rules. Salt Creek, from mouth to headwaters, is listed for bacterial pollution,

low dissolved oxygen, warm summer temperature levels and chlorophyll a pollution. Other contaminants that are tested for include nutrients, sediment, organic compounds and solvents and metals.

- Elevated levels of nutrients such as phosphorus and nitrates can cause plant growth increases. Growth lowers dissolved oxygen levels and can be toxic.
- High temperatures result in stress, increased metabolism, decreased competitiveness, decreased appetite, and even death of native fish. DEQ's maximum seven day average temperature standard for streams is 64°F.
- Minimum concentrations of dissolved oxygen are essential to support aquatic life and particularly for salmonid species. The screening level of this assessment desired 8 mg/l. In the Yamhill basin, samples range from 8.5-13.5 mg/L.
- Water pH is an important indicator of the chemical forms and availability of nutrients, as well as the presence of toxic chemicals in the system. Oregon Water Quality standards specify the approved pH range as 6.5-8.5.
- Turbidity is a measurement of water clarity, with high values indicating high amounts of suspended sediments or particles in the system that can damage fish gills and/or reduce their ability to see prey. Sediments can clog spawning gravel.
- Several pesticides are likely to exist in the streams and rivers of the watershed. There are likely to be a number of agricultural contaminants in the water. Residents likely contribute significant amounts of lawn or garden chemicals.

Fish

- Cutthroat trout are the most plentiful and widespread native salmonid in the Yamhill basin. It is probably the only year-round salmonid in the upper reaches of streams due to water quality and habitat diversity needs.
- Cutthroat trout, bullhead catfish, bluegill, largemouth bass, sculpin, and redside shiners were trapped in Ash Swale near Amity during an ODFW survey in 1999.
- Stocking programs did not release fish in the streams of the watershed for reasons of water quality and habitat.
- The lower 7.5 miles of Salt Creek are used by spring Chinook salmon and winter steelhead for rearing and migration.

Restoration & Enhancement

- Passive restoration can simply mean end disturbance and allow nature to recover on its own. Active restoration rebuilds natural functions but is more complicated.
- Gradual restoration is preferable to a quick, machinery-intensive makeover.
- James Stonebridge built 6 ponds on his field with the help of cost-share funding from the federal government. He succeeded in his goal of attracting waterfowl.
- Doug Rasmussen planted native trees & shrubs along a stream and established a wet prairie plant community with the financial assistance of the Conservation Reserve Enhancement Program.
- Ted Gahr restored 30 acres of wetland on his land.
- Kareen Sturgeon diverts gutter runoff into her backyard where she planted water-loving natives.
- Jacqueline Groth gradually turned her small lot into an island of native vegetation.