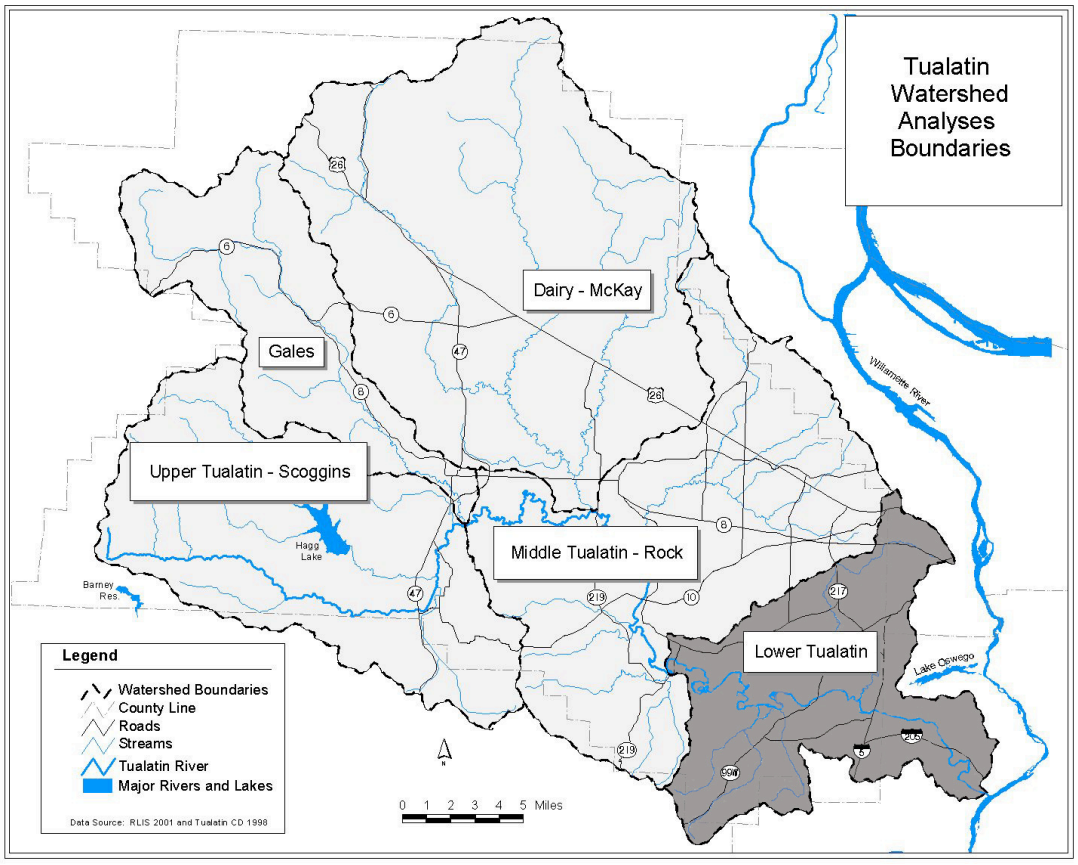
TUALATIN RIVER WATERSHED COUNCIL

Lower Tualatin



WATERSHED CHARACTERIZATION

Physical

The Lower Tualatin Watershed (watershed) drains 97 square miles (62,300 acres) in the southeastern part of the Tualatin River subbasin. It includes the Tualatin River and its tributaries downstream of (but excluding) McFee Creek. The watershed is drained by the main-stem Tualatin River and two fourth-order tributaries, Fanno and Chicken creeks. Fanno Creek drains the Portland West Hills (Tualatin Mountains) and the urbanized northern portion of the watershed, while Chicken Creek drains the Chehalem Mountains and Parrett Mountain in the southwestern portion of the watershed.

The watershed consists of ranges of hills separated by the Tualatin Plain. The Portland Hills in the northern portion, the Chehalem Mountains and Parrett Mountain to the southwest, and Bull Mountain and Cooper Mountain to the northwest. Between these hills, the Tualatin Plain provides an extensive area of flat to rolling terrain. About 63% of watershed area is included in this alluvial plain. The river gradient is 0.013% in the alluvial plain and is characterized by low velocity flow and pool stratification. Downstream of river mile 3.4, mean gradient averages 0.19% as the river enters an area of pools and riffles. Ultimately, the

Watershed Analysis Summary

What is a Watershed Analysis?

A watershed analysis is a process for evaluating how well a watershed is working. This process includes steps for identifying issues, examining the history of the watershed, describing its features, and evaluating various resources within the watershed.

This summary contains:

- a watershed characterization
- a description of major issues
- key recommendations

The full report can be downloaded from our website.

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Tualatin River flows into the Willamette River at an approximate elevation of 60 feet.

Land Use

More than ninety percent of the watershed is in private ownership.

Current zoning regulations provide for 16.2% of the watershed to remain in agricultural use, 9.2% in mixed forestry-agricultural use, and 0.42% in forestry, with 52.4% allocated for urban use and 21.6% in rural residential uses. Population within the lower Tualatin watershed is concentrated in the urbanized northeastern portion of the watershed.

Incorporated cities wholly or partially within the watershed include Beaverton, Sherwood, Tualatin, Tigard, Lake Oswego, Portland and West Linn.

DESCRIPTION OF MAJOR ISSUES

Erosion

Under natural conditions, a heavy forest cover moderated erosion in these areas. Where human activities lead to clearing and soil disturbance, erosion rates can be quite high. Erosion processes are strongly influenced by the watershed soils, geology and slope. Due to the moist climate, most upland rocks have weathered to deep, fine-grained soils.

Slope is an important indicator of landslide susceptibility within the watershed. Only 4% of the watershed has slopes that exceed 30%. Where erosion takes place far from stream channels and roadside ditches, eroded soils are usually deposited prior to delivery to the streams. Localized erosion and delivery to streams occurs on both terraces and streambanks.

Stream incision and associated streambank erosion are documented in urban portions of the watershed. Erosion on these banks was found to be most influenced by 1) over steepened bank angels caused by incision, 2) diminished bank surface protection by vegetation, and 3) low root densities within the banks. Although streambank erosion occurs under natural conditions, the magnitude of erosion has been increased due to altered hydrology, channelization and destruction of riparian vegetation.

Sheet, rill and gully erosion, likely pose more important threats to water quality and long term agricultural productivity than does stream bank erosion.

Hydrology

The Tualatin subbasin lies in a region of moderate climate. Summers are warm and generally dry, while winters are cool and wet. Roughly 67% of precipitation occurs between November and March. Annual precipitation ranges from 39 inches to 55 inches.

Streams within the lower Tualatin watershed are subject to seasonal variations in discharge, with high peaks in winter and very low flows in summer. The natural flow characteristics, of the Tualatin River, have been modified by the Scoggins Creek and Trask River projects. They alter the timing of the discharge by storing water in winter and releasing water in the summer low flow season by the use of dams.

Lack of summer streamflow is an important concern in the Tualatin subbasin. The Oregon Water Resources Department has determined that surface water sources are over allocated in the watershed. Irrigation accounts for much of the surface water diversion within the watershed. Decreased infiltration rates due to urbanization increases peak runoff rates and decreases low flow rates in the summer.

Stream Channels

Channelization has straightened the naturally sinuous streams in the alluvial portion of the watershed. This has reduced flood plain connectivity and riparian area, and resulted in a general loss of habitat for aquatic and riparian-dependent species, reduced water detention, and increased downstream flooding.

Water Quality

Although the DEQ Water Quality Index (WQI) for all sites continued to indicate poor to very poor water quality, there appears to be a demonstrable trend toward improvement of water quality.

High bacteria levels in urban areas were strongly associated with runoff. Pet waste, illegal dumping, septic system failure and sanitary sewer storm water cross-connections with their associated overflows were identified as potential bacteria sources. Livestock farms with inadequate manure storage, manure management, or grazing management, hobby farms and ranchettes are also potential sources of bacteria.

High temperature and sediment oxygen demand (SOD) are primary contributors to dissolved oxygen deficits in streams in the watershed.

High water temperature reduces the fitness of streams to provide suitable conditions for cold-water aquatic species, such as salmonids. Streams are exposed to large amounts of summer heating because of impaired riparian canopy.

Aquatic Species and Habitat

Salmonid habitat in the lower Tualatin watershed is more limited than it is in the Upper Tualatin watershed. Winter steelhead trout spawn and rear in Fanno and Chicken Creeks. They use the Tualatin River for migration. Resident cutthroat trout are distributed throughout the watershed.

The greatest hazard faced by salmonids is the lack of quality habitat. For anadromous fish, in particular, habitat is limited and impaired.

Coho salmon, steelhead trout, and cutthroat trout vary in their seasonal habitat utilization but all require structurally diverse channels for the maintenance of healthy populations. Most existing data indicate that large woody debris (LWD) is far below optimal levels throughout the watershed. The current characteristics of riparian vegetation further indicate that LWD recruitment potential is poor in most parts of the watershed.

Terrestrial Species and Habitat

Exotic weeds, which out-compete native species, have become established throughout the watershed resulting in diminished populations and diversity of native species. The following weeds are pervasive throughout the watershed: Himalayan blackberry, Reed canary grass, Purple loosestrife, Scotch Broom, English ivy and Japanese knotweed.

Other non-native nuisance species that occur in the watershed are the bullfrog and the nutria.

Geographic Areas to be Addressed

Approximately 52% of the watershed is presently developed and/or zoned for urban uses. Urbanization within these portions of the watershed will continue to alter the regions hydrology and place new demands on infrastructure. Most growth in southwestern portions of the watershed is expected to be associated with rural residential uses. Although rural land use is less intensive than urban is, rural residential uses provide their own challenges.

KEY RECOMMENDATIONS

Erosion Control

Erosion control efforts in the foothills of the lower Tualatin watershed are best concentrated in areas of steep slope and subbasins with high densities of roads and stream crossings.

- Avoid cuts and fills on unstable lands.
- Maintain vegetative cover on roads and drainage ditches.
- Minimize connectivity between drainage ditches and streams to reduce sediment delivery potential.

Restore Hydrology

Watershed hydrology should be maintained or improved by restoring and protecting floodplain and wetland resources:

- Design culverts that are installed to withstand the 100-year flood event and to provide fish passage.
- Encourage impervious surface reduction.
- Protect existing flood plain and wetland resources and prevent encroachment of activities that are incompatible with flood plain and wetland function.
- Where willing landowners are available, agencies should acquire property or habitat conservation easements to protect or expand existing wetlands.
- Improve the process associated with permits for wetland restoration so these types of projects are encouraged.
- Encourage irrigation water management, through the use of technological soil moisture sensing devises and the conversion of sprinkler to drip systems on appropriate crops.
- Limit water-loss by management of leaks in existing systems, the timing of large crop watering to night time and at times of low wind or no wind.

Stream Channels

Instream restoration strategies should focus on restoring channel structure, roughness elements, and habitat diversity. Partners should work together to preserve existing salmonid spawning and rearing habitat. Channel structure throughout the watershed would benefit from placement of large wood. The greatest direct benefit would likely be wood placement in Chicken Creek.

Water Quality

Intensify efforts to identify and improve faulty septic systems near streams. Intensify efforts to keep sources of animal waste from entering streams. Improve fertilizer management for urban, agricultural, and forestry applications. Avoid practices that re-suspend stream bottom sediments. Restore riparian canopy and lease water rights so consumption uses can be converted to instream uses to reduce temperature.

Riparian Management

- Restore riparian vegetation, plant appropriate native tree species where the natural riparian canopy has been removed.
- Replace non-native shrub and herb species with appropriate native trees and shrubs. Landowners should be encouraged to reestablish native conifers on sites where hardwoods have invaded.
- Large landowning partners are encouraged to manage currently mature stands of private forests to develop late-

successional characteristics including stand complexity, snags and down wood.

Near stream recreational activities can lead to disturbance of the riparian zone. Measures should be taken to minimize the effects of recreational activities upon streams. Managers of these facilities should be encouraged to develop conservation plans.

STRATEGIES

Watershed needs and opportunities are most effectively addressed by a consistent, cooperative effort, between landowners and government agencies. Successful habitat management depends upon cooperation between landowners. Groups of individuals, grassroots organizations, and corporations can also play an important role. The Tualatin River Watershed Council acts as facilitator to promote implementation of these recommendations. In this role, the council acts to coordinate efforts between partners to achieve beneficial watershed objectives.

The Lower Tualatin Watershed Analysis was prepared through a partnership of Washington County Soil and Water Conservation District and the Tualatin River Watershed Council.

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