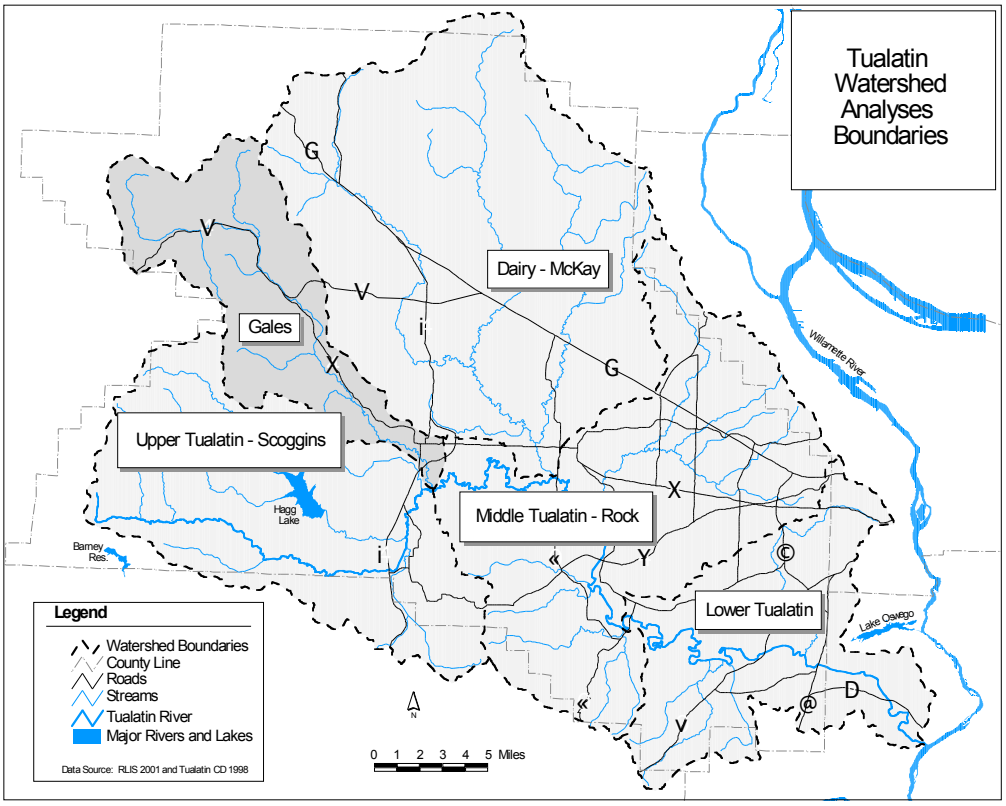
TUALATIN RIVER WATERSHED COUNCIL

Gales



WATERSHED CHARACTERIZATION

Physical

The Gales Creek Watershed (watershed) drains 77.9 square miles in the western part of the Tualatin River Watershed. The watershed is drained by Gales Creek and includes nine sub-watersheds. The watershed is located on the eastern side of the Coast Range Mountains and is entirely within the northwestern edge of Washington County, except for two small portions in Tillamook County. The main steam of Gales Creek is 23.5 miles long and flows in a southeasterly direction entering the Tualatin River about 1.5 miles south of the City of Forest Grove.

The Coast Range forms the upper northern and western boundaries, with the mountain slopes steep with high gradient stream. The hillsides then transition into low rolling hills with medium gradient and s-shaped streams. The landscape then gradually levels off to form fluvial terraces, which historically included wetlands and ponds with flat, sluggish and meandering streams. The main stem of Gales Creek is low gradient and slow moving ten miles from its confluence with the Tualatin River. Above the community of Gales Creek, the stream slope increases 12 foot in elevation per mile. In the upper watershed, the gradient is over 15%.

Land Use

About 66% of the watershed is privately owned, either as industrial forestry land (26%) or

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.

Tualatin River Watershed Council

P.O. Box 338
Hillsboro, OR 97123

Phone: (503) 846-4810
Fax: (503) 846-4845

Email:
trwc@easystreet.com

Website:
www.trwc.org

private agricultural or rural residential lands. The Oregon Dept. of Forestry (ODF) owns and manages 28% of the watershed as part of the Tillamook State Forest. The City of Forest Grove owns approximately eight percent of the land.

The majority of land uses in the watershed include forestry, agriculture, scattered rural residences and rural services. Industrial activity is limited to resource extraction (gravel mining and rock quarries), staging areas for industrial forestry and agricultural activities, urban development in the city of Forest Grove. The city of Forest Grove is the only incorporated city in the watershed.

DESCRIPTION OF MAJOR ISSUES

Sediment Sources/Erosion

Potential sediment sources from various types of roads were analyzed for other outside projects. The Upper Gales Creek sub-watershed appears to have the highest potential for mass wasting and sediment contribution. Sediment contribution from other sources (i.e., agricultural, urban, bank erosion) has not been fully researched.

Hydrology

The Gales Creek watershed is marine-influenced with an extended winter rainy season. Streams are fed mainly by precipitation. Annual rainfall ranges from 110 inches in the higher western parts of the watershed to about 45 inches in the lowest areas near Forest Grove. Many streams exhibit "flashy" characteristics in which high rainfall quickly elevates water levels that drop just as quickly when storms pass. December, January and February are the wettest months, and the driest, July, August and September.

There are no large-scale storage reservoirs in the watershed. The main uses for water in the watershed are: irrigation, 71%; domestic water supply, 6%; storage, 6%; nursery, 3%; municipal 3%, fish, 2%, supplemental irrigation, 2%, in-stream use, 2%, livestock 1% and other, 4%. There are approximately 75 diversion points in Gales Creek, mainly for irrigation purposes. Out of stream water withdrawals reduce stream flows that may have an adverse effect on aquatic species. Low flows during the summer months are more likely to have higher temperatures and may prevent fish passage to spawning areas. Individual or combined water rights may substantially reduce flows during the low flow season of July through October. If enough senior water rights holders used their full entitlement, some streams could be completely de-watered. The stream water rights in Gales Creek have a much newer (junior) priority date than most of the significant out-of-stream users so there is a high potential for dewatering.

Stream Channels

Stream channel modification has included draining wetlands for agriculture, dynamiting natural log jams to clear paths for log driving, dredging streams for gravel, construction of culverts and bridges, water diversions and ditches, as well as removal of large woody debris and riparian vegetation.

Years of logging and gravel production in the watershed has changed the streams and damaged their ability to provide habitat for fish and other aquatic life. Removal of large woody debris and dredging of streambed gravel has damaged and removed essential habitat for fish and other aquatic life. Riparian vegetation has been cut back along many stretches of the waterway, weakening the stability of the banks and increasing erosion into the waterway. A few dams have been placed throughout the watershed, creating pools and changing the water flow. Riprap has been used in some places along Gales Creek to stabilize the de-vegetated banks. The waterway is flat and slow in the lower reaches, but steeper and fast in the upper reaches of the watershed.

Water Quality

Natural conditions such as low gradient, low summer flows, and high summer temperatures make the lower mainstem of Gales Creek prone to poor water quality. Heavy sedimentation, high temperatures, and low dissolved oxygen levels reduce the watershed's water quality. These problems are mainly due to human activities such as removal of riparian vegetation, and agricultural practices. High fecal coliform levels are also present, and can be dangerous to water contact recreation.

Throughout the watershed, sediments are drawn into streams due to a minimal amount of riparian vegetation, roads, and agriculture. These sediments can carry chemicals from agricultural sources such as fertilizers and animal waste, as well as from forestry and urban activities. Much erosion in the upper reaches is from poor road construction/maintenance, and abandoned logging roads as well as upslope and instream mining, all of which contribute to increased sediments in the water.

The lack of riparian vegetation reduces shade for the waters, resulting in higher water temperatures. Diversions from the waterways for irrigation and municipal purposes lower the water levels, which take away from natural low flows during summer months making the waters even warmer. The increase in temperature, sediment, and loss of dissolved oxygen in the water has led to the listing of Gales Creek on the Oregon Department of Environmental Quality's (ODEQ) 303(d) list of substandard waters required by the Clean Water Act.

Aquatic Species and Habitat

Not much is known as to the use of the watershed by anadromous and resident fish in the upper reaches. The lower

flatter reaches of the watershed have less fish habitat due to poor riparian and water conditions. Low large woody debris placement, lack of adequate spawning, rearing and overwintering habitat, high water temperatures and the presence of introduced species reduce the chances of survival for aquatic species in the watershed. Continued dredging of stream bed gravel and increased sedimentation in the water are major factors in reducing vital spawning habitat.

Coho salmon, steelhead and cutthroat trout are the anadromous fish most affected by the low water quality and declining habitat since they need cool, shaded, low silt water to spawn. Culverts and dams create obstacles fish have a hard time passing. There are lamprey and other species of fish in the watershed, but they are not harmed as much as the trout and salmon by the water conditions.

Terrestrial Species and Habitat

Forested lands in the watershed are dominated by intensively managed stands of Douglas-fir. The upper riparian zone of Gales Creek contains black cottonwood, big leaf maple, Oregon ash, vine maple, and elderberry. The lower reaches are a mix of many native and invasive species. However, riparian areas have low vegetation and are in poor condition in the lower reaches of the watershed, and near clear-cuts in the forested areas. Invasive species, such as Himalayan blackberry can be found along stream banks, and quickly move in where the native riparian vegetation has been reduced and removed.

Geographic Areas to be Addressed

Much of the watershed is privately owned for forestry practices, primarily in the upper reaches. When clearcuts are done in high grade areas, there is an increased potential for mass wasting into the waterway. When trees are removed from the riparian area, the stream loses large woody debris and the water warms up, both of which are detrimental to fish activities. Private agricultural land in the flat areas that has removed the riparian vegetation is a contributor of chemicals from fertilizer in runoff, as well as fecal coliform and other bacteria from animal waste. Water diverted for irrigation magnifies the already low flows during hot summer months, and the form of diversion can sometimes cause barriers for fish migration. The chemicals and bacteria that cause low dissolved oxygen and the warmer water degrade aquatic habitat.

KEY RECOMMENDATIONS

Erosion Control

Erosion is one of the major causes of sedimentation for the Gales Creek watershed. There are measures that should be taken in order to minimize erosion such as

- Manage and retire old logging, haul, skid, and railroads with an emphasis on restoring road and stream crossings.
- Maintain native vegetation along riparian zones to prevent mass wasting and other forms of erosion into the waterway, especially in steep grade areas.
- Remove invasive plants in watershed to help manage invasive growth and strengthen stream banks and keep a wide riparian area to stabilize soil and prevent regular and contaminated sediment from entering waterway
- Conduct better monitoring to ensure BMPs are taken into account

Culverts

Culverts in the watershed should be inspected and improved in order to provide easy passage for fish and other aquatic species. Culverts and bridges should be managed in order to provide improved drainage, prevent washouts, and create a free-flowing waterway.

Restore Hydrology

Diversion of water from Gales Creek leads to warmer water and poor aquatic and terrestrial habitat, especially during low flow months. There are a few things to do that help maintain and improve the hydrology.

- Secure minimum stream flows for fish and other species.
- Provide incentives for private water right holders to keep their some of their water instream.
- Screen off channel ponds so non-native species cannot be introduced into the streams.
- Purchase or lease senior water rights and keep the water instream in order to secure adequate water flows, a common practice.

Stream Channels

In order to create a watershed with healthy habitat and restore the geomorphology of the waterways;

- Restore floodplain perennial riparian vegetation including trees to increase bank stability.
- Improve riparian vegetation to increase large woody debris and retain sediment, reduce erosion, and provide shade to help cool down the streams.
- Eliminate fish barriers and improve or maintain fish habitat for steep narrow valley channels.
- Steep slopes should be managed in order to avoid mass wasting, and logging roads need to be managed to improve sediment retention.

Water Quality

Since most of the water quality issues are derived from sediment and vegetation issues, the most beneficial solutions

are to remove invasive species and replant native plants along riparian zones in order to help minimize erosive runoff, and prevent agricultural wastes and sediment from entering the waterway. By planting trees along the water, shade will be provided in order to help lower the temperature. By increasing the amount of water held instream, low flow times will not have as significant of an effect in raising temperature.

Riparian Management

Plant native tree and shrub species in riparian areas after removing invasive species. The Best Management Practices (BMP) should be undertaken to maintain and improve riparian sites. Fencing, tree planting, blackberry removal, retiring cropland, limiting road construction near streams, and improving irrigation efficiency are some practices that should be considered.

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 among landowners. Groups of individuals, grassroots organizations, governments, 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.