



Middle Tualatin – Rock Creek

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.

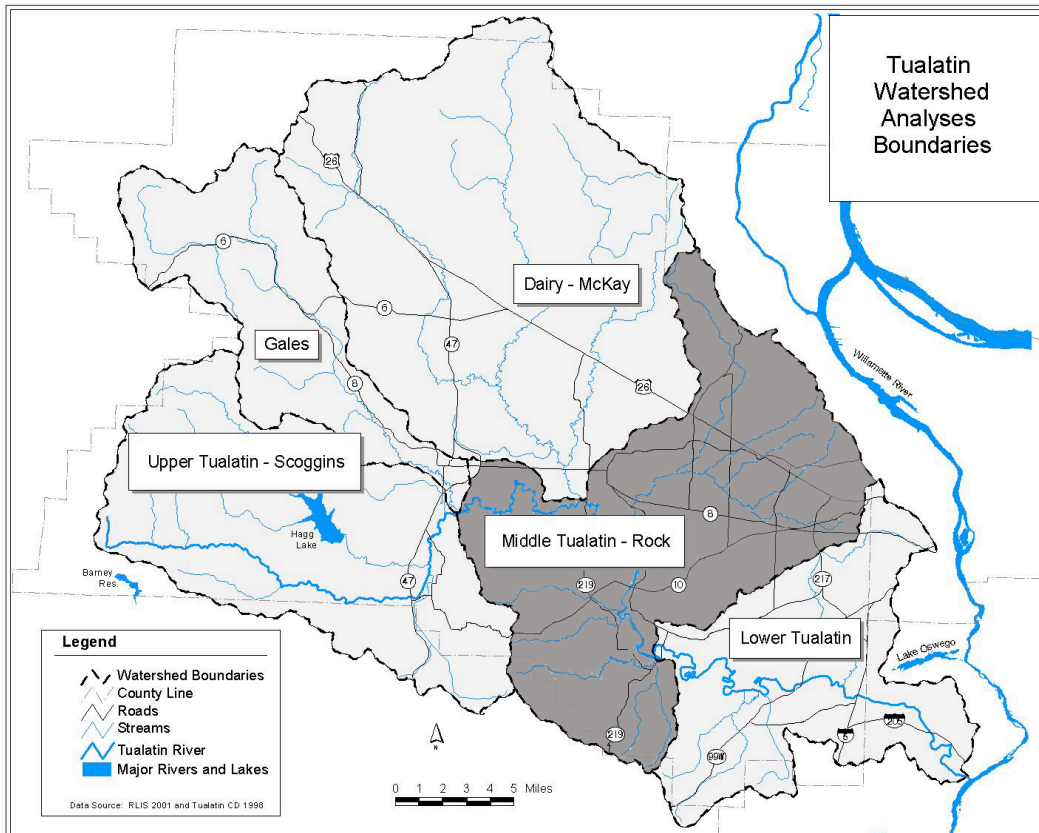
Tualatin River Watershed Council

P.O. Box 338
Hillsboro, OR 97123

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

Email:
trwc@easystreet.com

Website:
www.trwc.org



WATERSHED CHARACTERIZATION

Physical

The Middle Tualatin-Rock Creek Watershed (watershed) is 169 square miles and includes 29 miles of the Tualatin River and its tributaries between Gales Creek and McFee Creek. The Tualatin Mountains are located in the north portion of the watershed drained by Rock Creek. The Chehalem Mountains are to the southwest of the watershed drained by McFee, Christensen and Burris Creeks. The Tualatin Plain lies between the two mountain ridges comprising about 60% of the watershed. Cooper Mountain is also a prominent mountain ridge within the watershed drained by Johnson and Butternut Creeks. The dominant elevation in the area is Bald Peak, at 1,633 feet.

Land Use

Land in the watershed is in 90% private ownership. Most public lands lie within the Urban Growth Boundary (UGB) and less than 1% of the public land in the watershed is outside of the UGB. This land is primarily administered by the Bureau of Land Management (BLM).

Agriculture has traditionally been the predominate land use in the watershed. Urban lands are concentrated in the northeastern half of the watershed generally delineated by Cooper Mountain to the southeast and Bethany

Creek to the north.

Forestry and recreation uses are relatively minor within the watershed and the majority of the BLM land is considered riparian reserve.

Incorporated cities wholly or partially within the watershed include Hillsboro, Beaverton, Forest Grove, and Cornelius.

DESCRIPTION OF MAJOR ISSUES

Erosion

Reduction in vegetation due to human activities like urbanization and agriculture has resulted in an altered erosion regime within the watershed.

Agricultural practices loosen the soil and reduce vegetative cover increasing surface erosion, particularly on steeper slopes. Without adequate vegetative buffers, agricultural practices near streams can increase stream sedimentation.

Rural residential activities tend to remove portions of slopes above roads or buildings making the slopes less capable of bearing weight above. Also, they fill portions of slopes adding to the existing burden of the slopes, increase the potential for surface erosion by removing the vegetative surface cover, and create drainage ditches that concentrate runoff, resulting in increased erosive power and sediment delivery to streams.

Natural slope and soil erodibility coupled with lack of riparian vegetation can also lead to erosion and sedimentation by the stream itself.

Hydrology

In comparison to reference conditions, stream hydrology has been altered with increased winter peak flows, decreased summer flows, reduced water recharge, and increased surface runoff.

Channelization has hydrologically disconnected streams from the extensive system of floodplains and wetlands that moderated the volume and velocity of flows in the past. In many channelized areas, excess water is no longer “stored” to recharge groundwater or streams in times of low flow. Straightening and debris removal also increases stream flow velocities.

Surface runoff has increased in the watershed in response to urbanization and associated impervious surfaces. Runoff is also greater on agricultural lands with moderate to steep slopes and limited vegetative cover. The effects are seen through increased peak discharges, decreased base flows, decreased groundwater recharge and erosion from agricultural lands.

Flow regulation through engineered forces has changed the natural hydrology of the Tualatin River mainstem. Scoggins Dam facilitates the storage of peak season water in Henry Hagg Lake during the winter reducing the volume of peak flows down downstream. The water is then released in the summer increasing the flow volume. There are also instream diversions used for municipal and agricultural purposes and during the summer, and where the flow has not been augmented by water from Henry Hagg Lake, these diversions diminish flows below natural conditions.

Stream Channels

Human influence has altered stream channel conditions. The type and amount of stream change is related to the altered hydrological, land use, and sediment delivery regimes. Although conditions vary locally, channel effects within the watershed are felt regionally, and include stream incision that now occurs in urbanized portions of the watershed with increased peak discharges. Also, pool fill and shallower streams occur in urban and rural stream reaches resulting from sediment increases and reduced riparian vegetation.

Where stream banks are made of soft material, streams have likely become wider. hydraulic conditions suitable for pool formation and increased hydraulic diversity have been affected by the lack of large woody debris in the streams. In valley reaches, naturally meandering channels have been replaced by relatively straight, confined channels. This has contributed to a loss of structural diversity in these streams.

Water Quality

Temperature has increased and dissolved oxygen has decreased due to the lack of riparian shading along waterways.

Turbidity and suspended solids have increased due to lack of riparian forests to provide stream bank stability and runoff filtration.

Bacteria, nutrient, and other pollutant input to streams has also increased from agricultural and livestock activity, and urban storm water runoff.

Streams receive chronic phosphorus input from fertilizers, construction site sediments, and animal grazing.

Recreational opportunities, such as swimming and fishing, are limited by bacteria levels unsafe for humans and/or water quality. Water quality conditions can also impact aquatic species survival and reproduction.

Aquatic Species & Habitat

Cutthroat and steelhead trout are sensitive to changes in habitat and water quality, and have a limited range in the watershed. Spawning, rearing and migratory habitat is limited

to within the most urbanized and severely impacted watershed streams. Cutthroat trout are also indicators of the stream ecosystem health and their population is declining as a result of reduced ecosystem health.

Lamprey species are susceptible to increased tributary stream temperatures in their larval stages, but the cool water conditions created by summer flow releases from Scoggins Dam may promote population development in the Tualatin River above Rock Creek.

Wetlands have been significantly reduced in number from reference conditions and those that remain have limited support for amphibian species.

Riparian habitat has been reduced to thin strips which represent a large loss of riparian habitat relative to reference conditions.

Terrestrial Species & Habitat

The vegetation pattern in the watershed is highly fragmented with limited early to mid-successional forested and riparian areas, some possible migratory corridors, and severely deficient late-successional habitat.

Native species richness and diversity is being lost due to habitat fragmentation, and invasive exotic and noxious flora and fauna.

Social Issues

All the beneficial uses within the watershed are often not compatible with each other. Effects of some uses, such as erosion, water consumption, and inputs of sediments, nutrients and other pollutants into streams affect other uses. Better effort can be made to mitigate or lessen negative human impacts on the watershed.

Population increases keep placing more demands on watershed resources.

Public and private land management strategies are sometimes not compatible, resulting in competing resource objectives in specific stream reaches and/or watershed areas.

Geographic Areas To Be Addressed

The upper portion of the Tualatin Mountains has the potential for increased landslide hazard. The greatest stream sedimentation hazard occurs near where streams cross roads on steep slopes.

McFee Creek upstream of Gulf Canyon has over-allocated water rights in all months except October. Rock Creek is over-allocated July through October.

Canopy restoration and stream bank protection are needed to promote temperature moderation.

Improved habitat for both resident and steelhead and cutthroat trout along Beaverton Creek, Cedar Mill Creek, and lower Rock Creek is needed.

Suitable steelhead and cutthroat trout spawning habitat exists along Rock Creek above Beaverton Creek and along McFee Creek below Finnegan Hill Dam. These two stream reaches should be considered priority habitat restoration areas for this listed threatened species.

Beaverton Creek, Johnson Creek (South), and portions of Bronson Creek have the greatest overall impairment of water quality.

KEY RECOMMENDATIONS

Erosion Control

Prevent erosion in the valleys and adjacent foothills:

- Remove unnecessary, undesirable, or obsolete roads and maintain or improve road drainage and vegetative cover on drainage ditches.
- Create better monitoring of construction sites to ensure the Best Management Practices (BMPs) are used correctly.
- Create more outreach to farmers to facilitate agricultural BMP implementation.
- Restore, enhance, and protect riparian vegetation.
- Work cooperatively to develop and maintain a standardized database of practices to determine their effectiveness
- Create more education about conditions prohibited by the Tualatin River Sub-basin Agricultural Water Quality Management Act.

Restore Hydrology

Maintain or improve watershed hydrology by restoring and protecting floodplain and wetland resources:

- Restrict further development within the 100 year floodplain.
- Identify priority sites for preservation of historic floodplain and wetland function.

- Acquire habitat to protect and expand wetlands and promote research to improve the effectiveness and success of wetland restoration.
- Minimize irrigation water usage to ensure enough flow to support all beneficial uses.

Stream Channels

Facilitate stream channel improvement by managing riparian areas to develop late-successional characteristics for potential large woody debris delivery to streams.

Educational and Financial Incentives

Provide educational and financial incentives for landowners to use land management practices that would improve water quality and species habitat such as:

- Implement BMPs that would minimize sediment delivery to streams, reduce nutrients such as fertilizer in runoff, keep animal and human wastes from entering the streams, and reduce organic debris runoff from urban areas.
- Facilitate riparian buffer restoration through re-vegetation with appropriate species.
- Avoid re-suspension of stream bottom sediments.
- Contribute to additional in-stream flows.
- Create, protect, or restore vegetated buffer strips and/or wetlands.
- Re-establish native conifers on sites where hardwoods have invaded or manage currently mature stands to develop late-successional characteristics including snags and large woody debris.
- Form partnerships to combat noxious weeds.

Interagency Partnerships

Form interagency partnerships to accomplish improvements in water quality and species habitat and:

- Identify and improve faulty septic systems near streams and study the role of inadequate septic systems in

contributing to the water quality and phosphorous load in the watershed streams.

- Locate, restore, and/or preserve existing spawning and rearing habitat to improve declining salmonid populations.
- Determine the extent of wetland dependent species in the watershed and evaluate the effectiveness of programs to restore wetland functionality.
- Advertise the availability of educational information for eradication of noxious weeds and determine potential future noxious weeds in the watershed.
- Survey and gain knowledge of sensitive species and their distribution.
- Facilitate cooperative efforts between timber, agricultural, domestic and industrial land management.

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, 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 Middle Tualatin-Rock Creek Watershed Analysis was prepared through a partnership of Washington County Soil and Water Conservation District, the Bureau of Land Management, the Oregon Watershed Enhancement Board, and the Tualatin River Watershed Council.