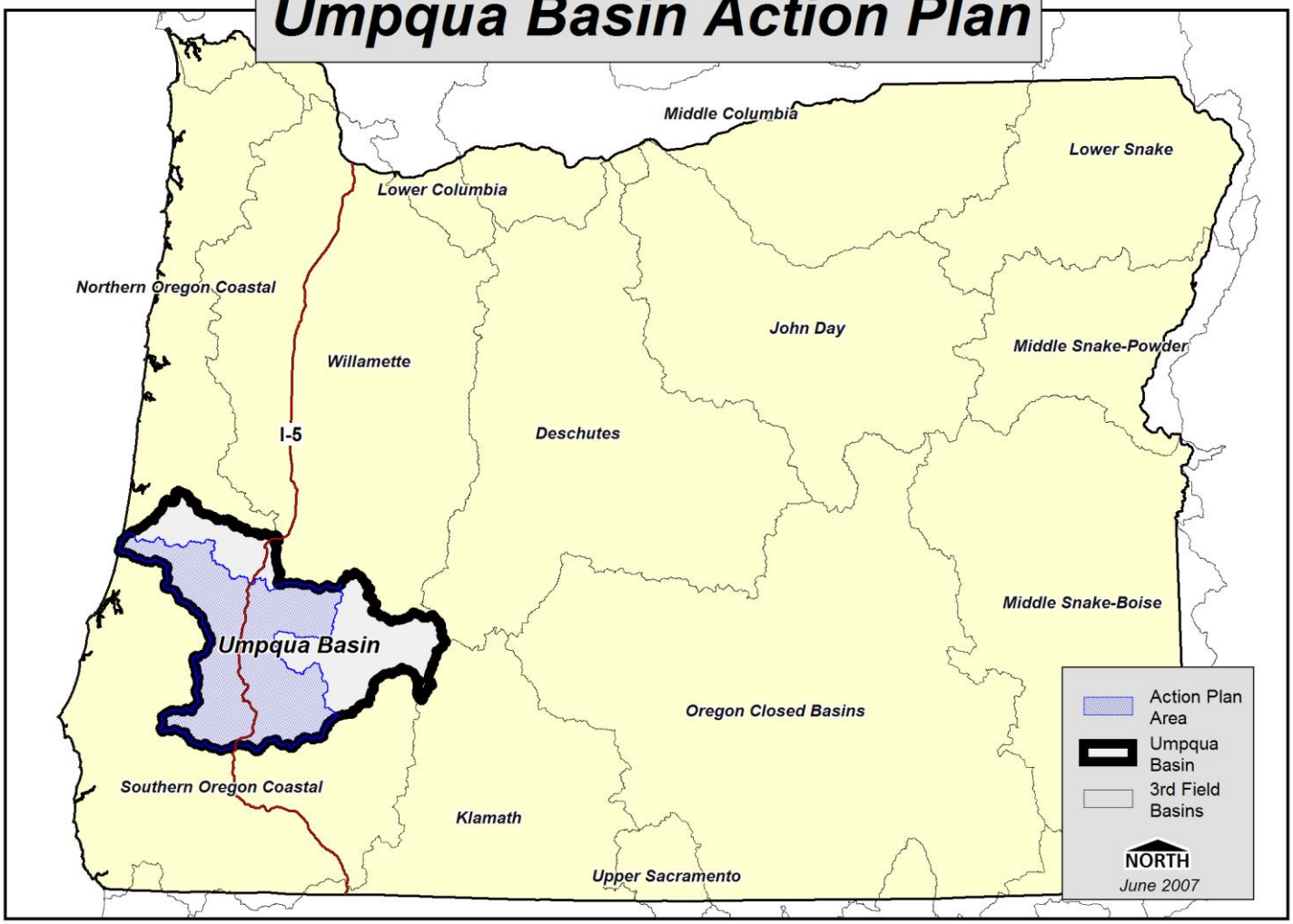
Umpqua Basin Action Plan



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for

Partnership for the Umpqua Rivers

Your Watershed Council

June 2007

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List of Acronyms and Abbreviations

<	less than
>	greater than
<=	less than or equal to
>=	greater than or equal to
ag.	agriculture
BLM	Bureau of Land Management
DO	dissolved oxygen
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FPB	fish passage barrier
HUC	hydrologic unit code
HUC3	third-field watershed, or basin
HUC4	fourth-field watershed, or subbasin
HUC5	fifth-field watershed, or watershed
HUC6	sixth-field watershed, or subwatershed
inc.	including
LCC	Lower Cow Creek Watershed
LNU	Lower North Umpqua River Watershed
LSU	Lower South Umpqua River Watershed
LUR	Lower Umpqua River Watershed
LWD	large woody debris
MCC	Middle Cow Creek Watershed
MSU	Middle South Umpqua River Watershed
MUR	Middle Umpqua River Watershed
mgmt.	management
mod.	modification
NBHMA	North Bank Habitat Management Area
ODEQ	Oregon Department of Environmental Quality
O/L	Olalla/Lookingglass Watershed
OWEB	Oregon Watershed Enhancement Board
PUR	Partnership for the Umpqua Rivers
RV	riparian vegetation
Res.	reservoir
RMA	riparian management area
stds.	standards
SHS	stream habitat survey
SUR	South Umpqua River Watershed
TAC	technical advisory committee (a committee of the PUR)
temp.	temperature
trib.	tributary
veg.	vegetation
UBFAT	Umpqua Basin Fish Access Team
UBFRI	Umpqua Basin Fisheries Restoration Initiative

UBWC	Umpqua Basin Watershed Council
UCC	Upper Cow Creek Watershed
UGB	urban growth boundary
USFS	USDA Forest Service
UUR	Upper Umpqua River Watershed
WA	watershed assessment
WAB	water availability basin
WFCC	West Fork Cow Creek Watershed

Umpqua Basin Action Plan
Partnership for the Umpqua Rivers
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1. Background Information

In 1997, the board of directors for the Partnership for the Umpqua Rivers (PUR) watershed council and approximately 100 members of the community met in Elkton to develop an action plan to direct the council's work. This plan was based primarily on local knowledge and assumptions about conditions within the Umpqua Basin. The PUR recognized the need for more information to accurately assess restoration priorities in the basin. In 1999, the PUR launched its watershed assessment and action plan program to thoroughly research fish habitat and water quality conditions in the Umpqua Basin. The last watershed assessments and action plans were published in May 2006.

The assessments were completed in four phases. In chronological order, those phases were:

- Watershed Assessment and Action Plan Phase I – Deer Creek and Middle Cow Creek.
- Watershed Assessment and Action Plan Phase II – Calapooya Creek, Lower North Umpqua River, Lower South Umpqua River (minus Deer Creek), Middle South Umpqua River, and Myrtle Creek.
- Watershed Assessment and Action Plan Phase III – Lower Cow Creek, West Fork Cow Creek, Upper Cow Creek, South Umpqua River, Olalla/Lookingglass, and the Tiller region.
- Watershed Assessment and Action Plan Phase IV – Rock Creek Region, Lower Umpqua River, Mill Creek, Middle Umpqua River, and Upper Umpqua River.

The PUR completed assessments for only those areas within the Umpqua Basin that are: 1) entirely within the PUR's exclusive area of operation, and 2) privately owned or a matrix of public and private lands. Further, the Little River watershed was excluded because of its status as an adaptive management area by the federal government. Although all 18 watershed assessments were published under the name Umpqua Basin Watershed Council (UBWC), this document will use the current name, Partnership for the Umpqua Rivers (PUR), when discussing the organization's past activities and publications.[1]

[1] The Partnership for the Umpqua Rivers (PUR) was formed in 1992 as the Umpqua Basin Fisheries Restoration Initiative (UBFRI). On March 5, 1997, UBFRI changed its name to the Umpqua Basin Watershed Council (UBWC). UBWC was incorporated as a 501c(3) in 2000. Because of on-going public confusion between the UBWC and other local organizations with similar acronyms, the UBWC changed its name to the Partnership for the Umpqua Rivers (PUR) in December 2005.

2. Introduction

The intent of this action plan is to help guide the future restoration efforts of the PUR. Although the PUR operates throughout the Umpqua Basin, this action plan is limited to the areas within the Umpqua for which the PUR has completed comprehensive watershed assessments.

This action plan is based on two primary components:

- PUR's restoration principles – a prioritized classification of watershed restoration activities.
- Limiting factors – watershed conditions limiting the quantity and quality of fish habitat and streamflow in the Umpqua Basin.

The action plan's restoration principles are based upon the principles originally developed by the Oregon Watershed Enhancement Board (OWEB). The limiting factors are derived from the watershed assessments published by the PUR from 2002 through 2006.

Recommended restoration practices and restoration sites are presented for each watershed along with the limiting factors. As part of the action plan development, a team of technical specialists updated the limiting factors – including the restoration practices and the recommended sites – to current conditions.

This plan recognizes the dynamic nature of aquatic and riparian conditions in the Umpqua Basin. Habitat and water quality conditions are constantly changing, both by natural and human disturbance. Restoration activities continue to improve habitat conditions, too. This Umpqua Basin Action Plan calls for periodic updates to capture these changes in order to make restoration efforts most effective.

2.1 Description of Partnership for the Umpqua Rivers

The PUR is a 501c(3) non-profit organization formed to restore and enhance water quality and fish habitat within the Umpqua Basin in southwestern Oregon. The PUR works in partnership with local landowners, local businesses, and state, federal, and tribal agencies to fund and implement projects and programs benefiting the Umpqua Basin's river system.

Since its establishment in 1992, the PUR has been the only avenue by which the Umpqua Basin's diverse interest groups come together to develop effective watershed restoration approaches. The board of directors, which operates by consensus, has 17 members representing the major stakeholders in the basin: 1) agriculture and livestock; 2) timber, aggregate, construction, and mining; 3) fishing, recreation, and conservation; 4) cities, special districts, and public utilities; 5) counties; 6) tribes; and 7) members-at-large.

2.2 The PUR's Mission Statement

"Through collaboration with diverse participants, the Partnership for the Umpqua Rivers maintains and improves water quality and fish populations from source to sea in the streams of the Umpqua.

We educate people about the value of healthy streams; we work with willing landowners to improve stream conditions; we monitor the health of the streams and their fish populations.

Through these actions the Partnership contributes to the ecological and economic well-being of the basin."

2.3 Description of Umpqua Basin

The Umpqua Basin covers 2,996,000 acres and shares the same general geographic boundary as Douglas County. It is the largest watershed draining into the Oregon Coast south of the Columbia and is one of two Oregon basins with headwaters in the Cascades (the Rogue Basin is the other).

The Umpqua is one of Oregon's most important producers of spring chinook, fall chinook, winter steelhead, summer steelhead, coho, and sea-run cutthroat trout. The Umpqua system accounts for more total and wild coho spawners than any other river system in Oregon and about 15% of coho spawners coast-wide.

The Umpqua "Basin" is part of the larger Southern Oregon Coastal Basin, or third-field watershed (HUC3). The Southern Oregon Coastal Basin includes the drainages of the Umpqua, Rogue, and several coastal rivers. The Umpqua Basin itself is comprised of three subbasins, or fourth-field watersheds (HUC4s): Umpqua (the main stem downstream of the confluence of the north and south forks), North Umpqua, and South Umpqua.

Within these three fourth-field watersheds are 33 fifth-field watersheds (HUC5s): 13 watersheds in the South Umpqua Subbasin, 12 watersheds in the North Umpqua Subbasin, and eight watersheds in the Umpqua Subbasin.

Douglas County encompasses most of the Umpqua Basin, but headwater reaches also extend into Coos (West Fork Cow Creek Watershed), Lane (Steamboat Creek and Canton Creek watersheds), Klamath (Diamond Lake Watershed), and Jackson and Josephine counties (minor portions of several watersheds).

See Figure 1 for a map of the Umpqua Basin and the PUR's assessment areas along with cities, counties, major roads, and major streams.

2.4 Purpose and Geographic Scope of Action Plan

2.4.1 Purpose

The purpose of the Umpqua Basin Action Plan is to provide the PUR a tool by which to focus restoration efforts in the basin. As noted in the introduction above, restoration efforts may be targeted by implementing the highest priority activities on those watershed conditions identified as limiting fish habitat and water quality. Therefore, priority actions across the basin, i.e. the PUR's restoration principles, and limiting conditions on a watershed-by-watershed basis are the key components of this action plan document. This action plan is not designed to prioritize or rank one watershed against another for project funding.

2.4.2 Geographic Scope

This action plan covers the areas within the Umpqua Basin that have been assessed by the PUR. Between April 2002 and May 2006, the PUR published 18 assessments following Oregon Watershed Enhancement Board protocol:[2]

- 14 - complete fifth-field watersheds
- 2 - "regions" spanning all or parts of multiple fifth-field watersheds (Tiller Region and Rock Creek Region)
- 1 - area spanning two-sixth-field watersheds (HUC6s) (Deer Creek Watershed)
- 1 - partial fifth-field watershed (Lower South Umpqua HUC5 less the Deer Creek Watershed)

These assessment areas, the subbasins in which they fall, and assessment area acreages are listed in Table 1 below. See Figure 1 for a map of the assessment areas.

[2] The PUR's assessments are available at: http://www.umpquarivers.org/Assessments.php.

Table 1. PUR Assessment Areas and Acres by Subbasin.

Name	Level of PUR Assessment	Acres
Umpqua Subbasin		
Calapooya Creek	HUC5	157,282
Lower Umpqua River	HUC5	67,930
Middle Umpqua River	HUC5	63,505
Mill Creek	HUC5	86,039
Upper Umpqua River	HUC5	169,676
North Umpqua Subbasin		
Lower North Umpqua River	HUC5	106,260
Rock Creek Region	Rock Creek/N. Umpqua River HUC5 (all) Canton Creek HUC5 (all) Middle N. Umpqua River HUC5 (western 1/2)	154,215
South Umpqua Subbasin		
Deer Creek	2 – HUC6 watersheds	43,090
Lower Cow Creek	HUC5	102,537
Lower South Umpqua River	HUC5 less Deer Creek Watershed	67,329
Middle Cow Creek	HUC5	113,023
Middle South Umpqua River	HUC5	59,441
Myrtle Creek	HUC5	76,322
Olalla-Lookingglass	HUC5	103,000
South Umpqua River	HUC5	141,575
Tiller Region	Elk Creek/S. Umpqua River HUC5 (all) Jackson Creek HUC5 (western 1/3) Middle S. Umpqua River HUC5 (western 2/3)	151,137
Upper Cow Creek	HUC5	47,482
West Fork Cow Creek	HUC5	55,914
Total acres assessed in the Umpqua Basin		*1,765,757*

The 1,765,757 assessed acres represents approximately 59% of the Umpqua Basin's 2,996,000 acres.

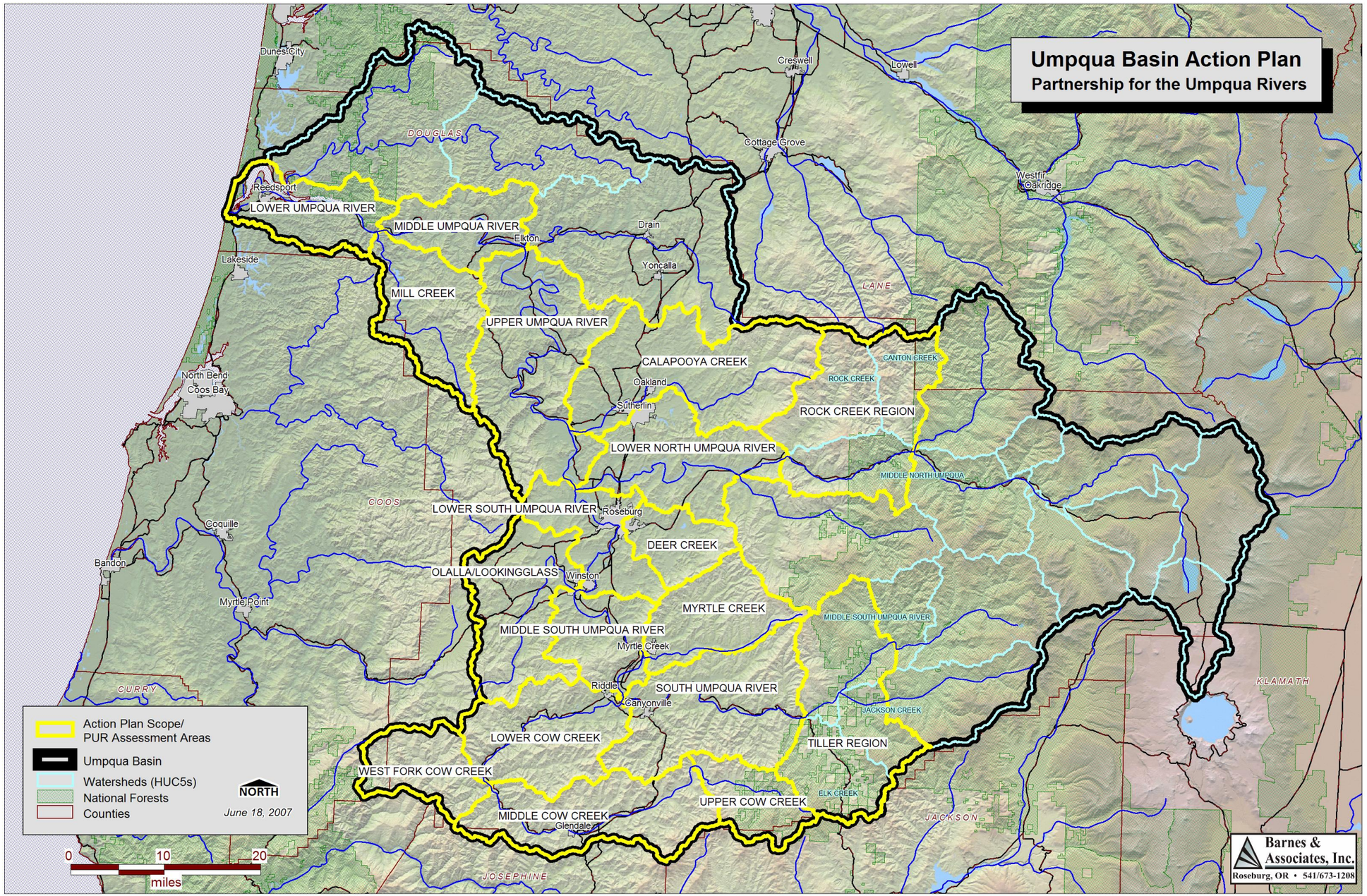

Figure 1. Umpqua Basin and PUR Assessment Areas.

2.5 Action Plan Development Process

The primary source for the limiting factors charts was the current conditions chapters from the PUR's watershed assessments. All 18 assessments used the same basic format, allowing evaluation of a consistent set of current conditions elements.[3]

Limiting factors were identified for each current condition element in each watershed. Each current conditions element was classified as to its certainty as a known limiting factor. The classifications and corresponding chart color codes are:

Known limiting factor/high priority
Suspected limiting factor
Not a likely limiting factor
No data or inconclusive data

The classifications were assigned based on the amount and nature of data (large scientific sample vs. anecdotal evidence) as well as any evaluations stated in the assessment.

Specific recommended (restoration) practices intended to address the identified limiting factors were pulled from the watershed assessments and listed in the limiting factors charts. Finally, specific sites identified in the assessments as recommended implementation sites were also listed in the limiting factors charts. These limiting factors, specific recommended practices, and specific recommended sites are organized by each of the 18 assessment areas and included in the "limiting factors charts," an integral part of this document.

Because much of the data upon which the original watershed assessments were built is now dated, a major component of this action planning effort included updates to listings of water-quality limited streams, specific recommended restoration sites, and other current conditions factors. A team of specialists with restoration experience in the basin was assembled to update the lists of recommended sites for each watershed. These updates were based on the specialists' knowledge of additional sites in need of restoration (shown in blue, e.g. Marsh Cr) and already-restored sites (shown in blue with strikethrough, e.g. ~~Beaver Cr~~).

[3] The watershed council's first assessments – Deer Creek and Middle Cow Creek – had a slightly different set of current conditions section headings, but the subject matter was consistent with the other 16 assessment documents.

A second revision included updates to the Oregon Department of Environmental Quality's (ODEQ) 303(d)-listed, water quality-limited streams to reflect the 2004 – 2006 list, the most current listing available. This set of updates included the following categories in the limiting factors charts:

- stream morphology ("habitat modification" listings)
- temperature
- surface water pH, DO, nutrients, bacteria, toxics
- sedimentation and turbidity
- streamflow and flood potential ("flow modification" listings)

In the charts, red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR watershed assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR watershed assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR watershed assessment and still on the 303(d) list for 2004 – 2006.

As a point of information, most of the Umpqua Basin's 2004 – 2006 303(d) listings currently have total maximum daily load pollution limits (TMDL) approved by the Environmental Protection Agency (EPA). EPA approved the TMDLs on April 12, 2007. The TMDLs have an associated Water Quality Management Plan that provides general guidance for implementing the TMDLs. There are no TMDLs for streams identified as water quality limited for toxics, habitat modification,[4] and flow modification.[5] Further, there are a small number of pH, temperature, and dissolved oxygen listings not included in the TMDLs.

Finally, the limiting factors charts were updated with the results of the PUR's water quality monitoring for bacteria within the Umpqua Basin. The PUR has conducted bacteria monitoring and other water quality monitoring in nine of the 18 watersheds covered by this action plan. Green text identifies the PUR's bacteria monitoring results.

Practices without specific recommended sites were not included in the limiting factors charts. These practices lacking site-specificity can be considered "best management practices" and should be implemented as appropriate when the limiting condition is encountered in the watershed. These practices are included in Section 6, "Other Worthwhile Actions," of this action plan. Also included in Section 6 are suggestions for education, outreach, and monitoring.

The Umpqua Basin Fish Access Team (UBFAT) is currently working to inventory, assess, and prioritize for repair fish passage barrier culverts in the Umpqua Basin. The culvert scores and rankings for restoration are available in draft form, but not yet

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[4] Habitat modifications are not a result of a pollutant. Therefore, streams determined to be water quality-limited for habitat modification do not require a TMDL.
[5] Flow modifications are not a result of a pollutant. Therefore, streams determined to be water quality-limited for flow modification do not require a TMDL.

finalized for public distribution. When final, UBFAT's culvert score output will be useful for identifying specific stream connectivity sites for restoration. As of the date of this document, preliminary culvert rankings are available for culverts in the following watersheds covered by this action plan:

- Umpqua Subbasin
  - Upper Umpqua River
  - Calapooya Creek
- North Umpqua Subbasin
  - Rock Creek (part of Rock Creek Region)
  - Canton Creek (part of Rock Creek Region)
  - Middle North Umpqua River (part of Rock Creek Region)
- South Umpqua Subbasin
  - Lower Cow Creek
  - Myrtle Creek
  - Olalla/Lookingglass
  - South Umpqua River
  - Middle South Umpqua River

3. PUR's Restoration Principles

OWEB developed a set of restoration principles designed to prioritize watershed restoration activities.[6] These restoration priorities classify potential restoration activities into five groups. The groupings are ranked to indicate "default" priorities for watershed restoration.

The PUR's restoration principles are the same as those developed by OWEB with two important changes. First, the PUR removed all references to wildlife to reflect its focus on aquatic ecosystems. Second, the PUR rearranged the principles to better fit the restoration needs of the Umpqua Basin.

The PUR moved OWEB's principle #5, "Address the symptoms of disturbance that impact fish populations and water quality-limited streams," to principle #1. The PUR implements many of its in-stream restoration projects in the Umpqua's mid- and upper elevations. The streams in these areas provide key salmonid spawning and rearing habitat and are often within woodlands and conifer forests.[7] Since 1972, the Oregon Forest Practices Act has required leave tree buffers, known as riparian management areas (RMAs), when harvesting timber along fish-bearing and domestic use streams. In time, these forested buffers will provide the long-term mechanism for restoring many key watershed processes by providing beneficial shade and a continuous source of in-stream large woody debris for fish habitat. However, in many areas the riparian trees are not yet large enough to fulfill these watershed functions. Since the restoration of watershed processes has already been set in motion, the PUR believes the more immediate need in the Umpqua Basin is to address the symptoms of past disturbance.

OWEB identifies as its highest priority the need to "restore watershed connectivity limiting key fish populations." While reestablishing stream connectivity is key to strengthened fish populations, the PUR places this restoration strategy as principle #2. Much work has been completed over the last 10 years to identify and correct fish passage barriers in the Umpqua Basin. As a result, stream connectivity is not the pressing need it was a decade or more ago. Nonetheless, the restoration of access to quality aquatic habitat, together with addressing the lack of in-stream structure and other disturbance symptoms, are the two primary priorities in the Umpqua Basin.

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[6] OWEB's restoration principles are available at: http://www.oregon.gov/OWEB/GRANTS/docs/grants_restoration_prioritization_frmwork.pdf.

[7] Low elevation streams and rivers also provide important salmonid habitat and serve as migration corridors for all anadromous fish. These streams usually flow through cities, other population centers, and rural residential developments. As the number of landowners per stream mile increases, implementing large-scale restoration projects becomes more difficult and less likely to be successful. Experience demonstrates that it is more effective to conduct single-site restoration, e.g. replacing a passage barrier culvert, than to conduct in-stream structure placement in areas with a high population density.

Finally, the PUR made OWEB's Endangered Species Act (ESA)-related principle #3 its lowest ranked priority. There are no aquatic species currently ESA-listed in the Umpqua Basin. Therefore, there is no need to place a priority on restoration practices targeted at a specific species. Implementation of higher priority actions will benefit species of concern in the Umpqua Basin such as the Oregon Coast steelhead.

The PUR's priorities, along with specific recommended restoration practices taken from the limiting factors charts, are as follows:

PUR Principle #1 (OWEB Principle #5): Address the symptoms of disturbance that impact fish populations and water quality-limited streams.

Rationale:
Addressing the symptoms of human-related disturbance can help provide important habitats while key watershed processes are recovering. Many functions that create habitat operate at very long time scales. Many decades may be needed, for example, before large wood delivery to stream channels can be restored to appropriate levels to provide quality aquatic habitats. In the short-term, habitat quality can be improved by placing wood in stream channels to improve pool complexity and accelerate other processes such as capturing and retaining spawning gravels. Symptoms of human-related disturbance, for example, can include elevated levels of fine sediments, the lack of large wood in the stream from poor riparian conditions, altered peak flows, and confined stream channels from bank alteration. These types of projects often have a short response time, but the costs can vary widely (potentially high), and they are most effective when linked to watershed process improvement projects.

OWEB project examples:

- Placing large wood in streams.
- Creating natural channel and bank structure in an altered section of stream.
- Installing water / sediment control basins to protect the riparian area.
- Construction of bioswales in urban areas.

PUR project examples from watershed assessments:

- Add large woody debris (LWD) and boulders to improve pools, collect gravel, and provide other benefits of in-stream structures.
- Restore natural meanders.
- Add LWD in flood plain areas to reduce scouring and other negative impacts of peak flows.
- Create off-channel refuge (not specifically noted in watershed assessments).

PUR Principle #2 (OWEB Principle #1): Restore watershed connectivity limiting key fish populations.

Rationale:
Restoring access to portions of the watershed with quality habitat is the appropriate initial strategy for the long-term improvement of watershed health. This approach provides access to suitable habitats for native aquatic species because it restores such connectivity. These types of projects typically have a high probability of success in a short time frame with relatively low cost, low variability between projects, and a low risk of failure.

OWEB project examples:

- Riparian corridor restoration.
- Restoring fish passage by removing barriers.
- Restoring stream flows by reducing or eliminating water diversions.
- Restoring connectivity between the aquatic system and the floodplain.

PUR project examples from watershed assessments:

- Remove fish passage barriers, giving priority to those opening the most miles of upstream habitat.

PUR Principle #3 (OWEB Principle #2): Restore watershed processes impacting the aquatic system and water quality-limited streams.

Rationale:
In the long term it is important to address the causes of habitat degradation as a higher priority than restoring symptoms of disturbance. Restoring watershed processes that form, connect, and sustain habitats and water quality supports improving the long-term health of a watershed. Key watershed processes include the delivery and movement of sediment, wood, water, and nutrients to the aquatic system. Restoring watershed processes often has a delayed response time. Costs of these projects can vary. However, they have a high probability of success and low variability between projects.

OWEB project examples:

- Restoring hydrology to reestablish wetlands in the landscape.
- Controlling sediment delivery to stream channels from roads and other sources.
- Restoring native vegetation to lands with crop or exotic vegetation.
- Removal of human structures that confine channels.
- Removing roads or road related runoff.

PUR project examples from watershed assessments:

- Remove blackberries, plant conifers in riparian areas.
    - Long-term LWD recruitment
    - Shade for warm streams
- Manage riparian area forests for uneven-aged stands and large diameter trees.

- Create or improve wetlands.
- Where pH is a problem, increase shade by encouraging wide riparian buffers and managing for full canopies.
- Convert cleared lands to wetland prairie by plugging drain ditches and eliminating livestock access.
- Replace under-sized or failing culverts that may fail and deliver sediment to streams.
- Discharge ditch relief culverts onto slopes, not into streams.

PUR Principle #4 (OWEB Principle #4): Reduce or eliminate harmful human impacts and inputs into watersheds from land use activities in the basin. This principle is applied in the context of recognizing PUR's mission to contribute to both the ecological and economic well-being of the basin.

Rationale:
People manage the working landscapes of Oregon for different purposes. Many land management choices have different watershed impacts. Activities that reduce or eliminate human inputs (e.g., water, nutrients, sediment, and pesticides) to the watershed are important for maintaining watershed ecological functions. These types of projects address the effects of human use of the landscape on watershed functions. These types of projects often have a short-term response, but the costs can vary widely, and the probability of success depends on the specific goals identified.

OWEB project examples:
- Pesticide use alternatives (e.g., Integrated Pest Management and changes in application methods).
- Irrigation water use efficiency with in-stream flow protection.
- Conservation tillage to eliminate sheet and rill erosion.
- Irrigation water reuse to eliminate discharges.
- Improvement of streams impacted by winter cattle feeding areas where cattle are managed.

PUR project examples from watershed assessments:
- Fence / exclude livestock from riparian areas.
- Relocate structures and situations that concentrate domestic animals near streams, or establish dense / wide riparian vegetation zones to filter fecal material where relocation is not possible.
- Repair failing septic tanks / drain fields.
- Use wastewater treatment plant effluent for irrigation.
- Reduce chemical nutrient sources.
- On streams with irrigation rights, install efficient irrigation systems and encourage in-stream water leasing.
- Screen unscreened water diversions to protect fish.

PUR Principle #5 (OWEB Principle #3): Restore key habitats and water quality for Endangered Species Act (ESA)-listed species.

Rationale:
Improving habitats for ESA-listed species addresses both political and ecological priorities, since many ESA-listed species are indicators for the broader ecological health of a watershed. Restoring these fish populations should focus on addressing watershed connectivity and the habitat-forming processes that sustain all of parts of their life cycle: adult and juvenile migration, spawning, and juvenile rearing. It is important, for example, to restore juvenile rearing habitat in concert with providing access (connectivity) throughout the watershed for migration and spawning. These actions, while focused on areas with current and historical populations of ESA-listed fish, will benefit other fish populations.

OWEB project examples:

- Improving fish passage barriers to allow access to high-quality spawning habitat for adult coho salmon.
- Reconnecting historic river side channels provides winter juvenile rearing habitat for spring chinook.
- Improving in-stream flows to improve water temperatures for bull trout.
- Reducing road-related sedimentation that impacts spawning gravels.
- Providing proper fish screens at points of water diversion to improve juvenile fish survival.

PUR project examples from watershed assessments:
There are currently no ESA-listed fish species or other aquatic organisms in the Umpqua Basin. The Oregon Coast steelhead is a “species of concern,” though it is not listed under the ESA. Restoration and enhancement activities that generally improve fish habitat and water quality will also benefit the Oregon Coast steelhead.

This action plan is intended to be dynamic. The priority level of Principle #5 can be changed in the future if any Umpqua Basin aquatic species become listed under the ESA.

4. Notes on Limiting Factors Charts

The limiting factors charts described in Section 2.5 above are included in Section 7, "Limiting Factors Charts," of this document. A basin-wide chart summarizing the limiting factors for each watershed included in this action plan is presented at the front of Section 7.

There are differences in the limiting factors charts' level of detail for the specific recommended sites and specific recommended practices. These differences are a function of readily available data, the focus of the various assessment authors, and the amount of landowner input received during each assessment's development. A greater level of detail should not be construed as signifying a higher priority than a site or practice with less detail.

Note that some of the limiting factor designations in this action plan are based on monitoring of a limited geographic scope within a watershed. A limiting factor designation for a stream in a watershed does not necessarily apply to other streams in the watershed. Water quality monitoring, and monitoring of other watershed health parameters, is oftentimes limited to a select number of streams in a watershed. Those streams that have not been monitored may or may not be similar to those with monitoring data.

5. Notes on the Use of this Action Plan

This action plan is a component of the PUR's process in deciding whether or not to pursue specific restoration projects. Figure 2 illustrates the PUR's project proposal flow chart and the action plan's role in the process.

This action plan is intended to be dynamic. Newly-identified limiting factors, specific restoration practices to treat those limiting factors, and specific sites for restoration or enhancement should be updated as frequently as practical in order for this plan to remain viable. At this time, the PUR anticipates annual updates to this plan. Umpqua Basin technical specialists will be a cornerstone of these periodic updates.

Any future ESA listings might also necessitate updates to this plan. For example, the listing of an Umpqua Basin aquatic species would likely prompt an increase in priority for PUR Principle #5.

This action plan is not intended to disqualify restoration or enhancement projects proposed by willing landowners. As with any potential project – including those of a top-ranking PUR restoration principle addressing a known limiting factor – project implementation depends on many variables, including landowner willingness, technical feasibility, funding availability, and other factors.

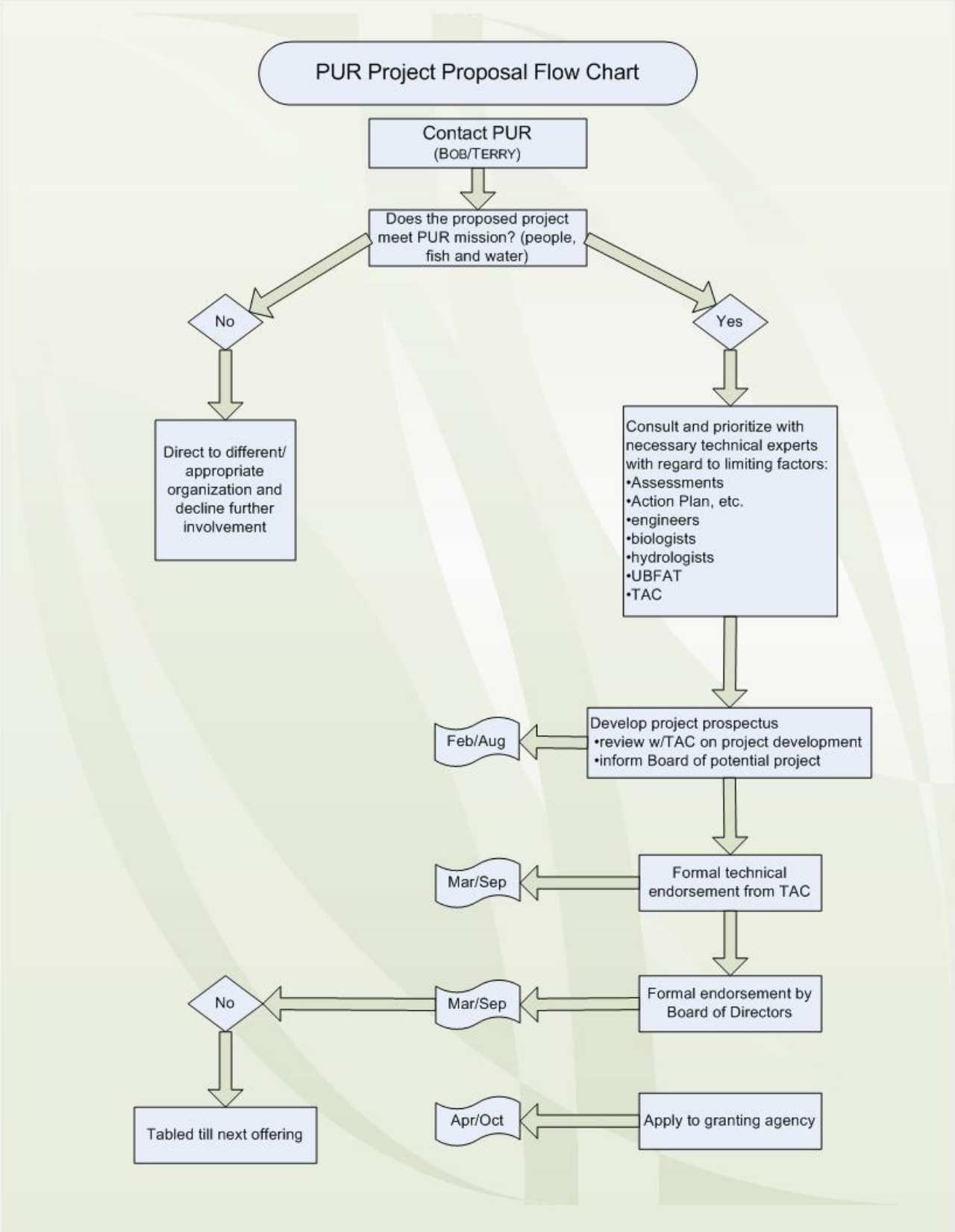


Figure 2. PUR Project Proposal Flow Chart.

6. Other Worthwhile Actions

The following items were identified as worthwhile actions in PUR's assessments. They were not included in this action plan's limiting factors charts because they were not "attached" to specific sites on the ground. However, they are included here as recommendations to be considered when appropriate for the watershed conditions and situation at hand.

The worthwhile actions are divided into two groupings: restoration practices and education, outreach, and monitoring opportunities. Each grouping is further divided into the five major assessment headings in the limiting factors charts: stream function, riparian zones and wetlands, water quality, water quantity, and fish populations.

6.1 Restoration Practices

6.1.1 Stream Function

- Identify mouths of tributaries, side channels, and other habitat that can serve as over-wintering habitat for fish during high-flow events.

- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouths of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve in-stream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel. Particularly worthy stream "oases" are reaches that have proportionately high groundwater influx and shade within otherwise-warm streams.

6.1.2 Riparian Zones and Wetlands

- Maintain riparian zones that are two or more trees wide and provide more than 50% cover.

6.1.3 Water Quality

- Identify stream reaches that may serve as "oases" for fish during the summer months, such as at the mouths of small or medium-sized tributaries. Protect or enhance these streams' riparian buffers and, when appropriate, improve in-stream conditions by placing logs and boulders within the active stream channel to create pools and collect gravel. Of particular note as stream "oases" are reaches that have proportionately high groundwater influx and shade, and thus cooler stream temperatures, within otherwise-warm streams.

- Identify tributaries with bedrock substrates as areas to focus riparian management and develop more gravel via in-stream wood placement to encourage cooler temperatures where appropriate.

- Where data show that stream sediment or turbidity levels exceed established water quality standards, identify sediment sources such as urban runoff, failing culverts or roads, landside debris, construction, burns, or excessive streambank erosion. Take action to remedy the problem or seek assistance through organizations such as the PUR and Soil and Water Conservation Districts. Appropriate actions might include:
    - Provide sediment filtration mechanisms at construction sites and projects involving exposed soil to keep sediment from entering waterways.
    - Seed and water-bar fire trails and temporary roads to keep freshly exposed soil from being washed into the creeks when it rains.
    - Inspect roads and ditches for erosion problems, especially during winter rains. One option for treating sediment-producing roads no longer important for forest management is to close or decommission those roads.
    - Minimize ditch flow to active streams by draining relief culverts onto stable slopes away from active streams.
    - Manage grazing areas to minimize exposed soil, particularly near streams.
    - Maintain vegetated buffer strips to intercept pollutants carried in runoff.
    - Provide construction site erosion control measures to limit the transfer of sediment into storm drains and creeks.

6.1.4 Water Quantity

None identified.

6.1.5 Fish Populations

None identified.

6.2 Education, Outreach, and Monitoring Opportunities

The Olalla-Lookingglass Watershed Assessment includes recommendations for monitoring at specific sites within the watershed. These recommendations include monitoring for water quality parameters and past restoration project effectiveness, among others. Please see the Olalla-Lookingglass Watershed Assessment for details: http://www.umpquarivers.org/Assessments.php. It is outside the scope of this action plan to present those site-specific monitoring recommendations in this document.

6.2.1 Stream Function

- Educate streamside landowners about the impacts of channel modification activities. While specific sites are mostly unidentified in the assessment documents, it is generally believed that activities such as placement of rip-rap, digging out gravel bars, and making pools for irrigation pumps are fairly common in the basin, particularly in larger streams. The suspected common occurrence of these activities is a signal that landowners may be unaware of the regulations regarding such projects and the potential downstream negative effects. One specific education opportunity is to provide to purchasers of creek-front property, at the time of purchase, information about the benefits of stream meanders and the laws pertaining to activities within the active stream channel.

- Support the efforts of UBFAT to measure, assess, and prioritize the repair of culverts serving as fish passage barriers.

- Design engaging educational displays about fish passage barriers for community events such as the Douglas County Fair.

6.2.2 Riparian Zones and Wetlands

- Provide information to landowners explaining the benefits of restricting livestock access to streams, establishing buffer zones, the importance of wetlands within watersheds, and the effects of in-stream activities on downstream conditions. In particular, raise landowner awareness of riparian zone/wetland-friendly practices such as off-channel livestock watering, building hardened crossings, improving irrigation efficiency, livestock exclusion (part or all of the year), and providing upland shade.

- Promote public involvement in the conservation of wetland resources by educating members of the local community as to the importance of maintaining natural heritage and diversity.

- Educate landowners, policy makers, and community members on the educational, recreational, and aesthetic values of wetlands for the local community and the importance of properly-functioning wetlands for healthy watersheds. Heightened awareness of what defines wetlands, along with their functions and benefits, is a fundamental step in creating landowner interest and developing landowner appreciation for wetland conservation.

6.2.3 Water Quality

- Encourage landowner practices that will maintain already-low bacteria and nutrient levels in streams. Such practices include:
    - Limit livestock access to streams by providing stock water systems and shade trees outside of the stream channel and riparian zones. Fence riparian areas as appropriate.
    - Relocate structures and situations that concentrate domestic animals near streams, such as barns, feedlots, and kennels. Where these structures cannot be relocated, establish dense and wide riparian vegetation zones to filter fecal material.
    - Repair failing septic tanks and drain fields.
    - Use wastewater treatment plant effluent for irrigation.
    - Reduce chemical nutrient sources.

- Encourage land managers to complete road maintenance inventories to identify problem areas producing excessive runoff and sediment so that those areas may be repaired. Especially critical are dirt or gravel roads within 200 feet of a stream.

- In areas with high landslide and debris flow hazards, encourage landowners to identify the specific soil types, slopes, and topographic features that make their properties more susceptible to landslides, and include this information in their land management plans. The Oregon Department of Forestry's debris flow hazard model may be one way to pinpoint areas that are naturally prone to erosion.

- Educate landowners about water quality concerns and potential improvement methods:
    - Improve dirt and gravel road drainage to minimize sediment delivery to streams.
    - Enhance soil infiltration by leaving vegetation litter on the ground after timber and crop harvests.
    - Plant bio-swales near streams in urban and suburban areas to catch urban runoff.

- Develop educational materials and/or outreach programs to educate target audiences about fish habitat and water quality-related issues:
    - Create educational brochures about bank erosion, the problems associated with channel modification, and the importance of riparian areas. These could be given to new landowners through real estate agents.
    - Develop public service announcements about ways of improving or maintaining riparian and in-stream conditions, such as the benefits of riparian fencing and how to use fertilizers and pesticides in a stream-friendly fashion.

- Continue monitoring streams already monitored for water quality. Expand monitoring efforts to include key streams not currently monitored.

- Provide a training program that teaches landowners practical means of monitoring and controlling nutrient contamination, and encourages implementation of these techniques on private land.

- Support local water quality research:
    - Train and encourage landowner and resident volunteers to conduct water quality monitoring and research.
    - Provide the equipment necessary for local water quality research and monitoring.
    - Encourage school and student participation in monitoring and research.

- Educate policy makers about the obstacles preventing greater landowner participation in voluntary fish habitat and water quality improvement methods.

6.2.4 Water Quantity

- Continue and/or begin monitoring peak flow trends. Determine the role of vegetative cover, flooding, road density, and the transient snow zone on water volume.

- Educate landowners about proper irrigation methods and the benefits of improved irrigation efficiency.

6.2.5 Fish Populations

- Conduct landowner education programs about the potential problems associated with introducing non-native fish species into Umpqua Basin rivers and streams.

- Encourage landowner participation in activities that improve freshwater salmonid habitat conditions.

- Support local fish habitat research:
    - Train and encourage landowner and resident volunteers to conduct fish monitoring and research.
    - Survey long-term landowners and residents about historical and current fish distribution and abundance.
    - Encourage school and student participation in monitoring and research.

- Survey fish rearing areas to establish presence/absence of salmonids and use that data for prioritization of areas needing stream enhancements.

7. Limiting Factors Charts

The following pages include the limiting factors charts for each of the 18 PUR-assessed watersheds and regions. A map is included for each area. The limiting factors charts and maps are arranged in alphabetical order by watershed or region name.

A single chart summarizing the limiting factors for each of the watersheds and regions precedes the 18 individual charts. The text within this summary chart gives an explanation for the limiting factor designation.

Umpqua Basin Limiting Factors from PUR's Watershed Assessments

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	Stream Connectivity	Channel Modification	Riparian Zones	Wetlands	Temperature	Surface Water pH, DO, Nutrients, Bacteria, Toxics	Sedimentation and Turbidity	Water Availability and Water Rights by Use	Streamflow and Flood Potential	Fish Populations
Umpqua Subbasin											
Lower Umpqua River	SHS/habitat mod.	culverts				303(d)	303(d) - bacteria			flow mod.	
Middle Umpqua River	SHS/habitat mod.	culverts / dam(s)				303(d)	bacteria?/DO?				
Mill Creek **No anadromous fish above natural cascades below Loon Lake.**	SHS/habitat mod.	natural barrier below Loon Lk.				303(d)	DO?				
Upper Umpqua River	SHS/habitat mod.	culverts / dam(s)				303(d)	303(d) - bacteria			flow mod.	
Calapooya Creek	SHS/habitat mod.	culverts / dam(s)				303(d)	303(d)–pH, DO, bacteria, toxics			flow mod.	
North Umpqua Subbasin											
Lower North Umpqua	SHS/habitat mod.	culverts / dams				303(d)	303(d) - toxics			flow mod.	
Rock Creek Region	SHS/habitat mod.	culverts / hatchery dam				303(d)	303(d) – toxics natural arsenic?			flow mod.	
South Umpqua Subbasin											
Deer Creek	SHS/habitat mod.	culverts				303(d)	303(d) - bacteria			flow mod.	
Lower Cow Creek	SHS/habitat mod.	culverts				303(d)	303(d) – toxics (Formosa mine)			flow mod.	
Lower South Umpqua	few SHS / habitat mod.	culverts / dams				303(d)	303(d)–pH, DO, bacteria, toxics, nutrients			flow mod.	
Middle Cow Creek	SHS/habitat mod.	culverts / dam(s)				303(d)	DO 303(d) – pH			flow mod.	
Middle South Umpqua	SHS/habitat mod.	culverts / dams				303(d)	303(d)–pH, DO, bacteria			flow mod.	
Myrtle Creek	SHS/habitat mod.	culverts / dams				303(d)	303(d) - bacteria			flow mod.	
Olalla-Lookingglass	SHS/habitat mod.	culverts / dams				303(d)	303(d) - toxics			flow mod.	
South Umpqua River	SHS/habitat mod.	culverts / dams				303(d)	303(d)–pH, DO, bacteria			flow mod.	

Umpqua Basin Limiting Factors from PUR's Watershed Assessments

Known limiting factor/high priority	Suspected limiting factor	Not a likely limiting factor	No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Tiller Region	SHS/habitat mod.					303(d)	303(d) – pH	303(d)		flow mod.	
Upper Cow Creek **No anadromous fish above Galesville Dam.**	SHS/habitat mod.	culverts (for resident fish)				303(d)	303(d) – pH, toxics (merc., Galesville fish)			flow mod.	
West Fork Cow Creek	SHS/habitat mod.	culverts				303(d)				flow mod.	

Notes:

- Limiting factors of mixed certainty within a current condition element are shown as the most certain of the limiting factors. For example, in the Calapooya Creek watershed, pH and other water quality parameters are identified as "known limiting factors/high priority," while nutrients are a "suspected limiting factor." In this basin-wide chart, water quality for Calapooya Creek is shown as a "known limiting factor/high priority."

Calapooya Creek Watershed, Umpqua Subbasin, PUR's July 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of LWD, poor riffles, poor riparian tree composition limit fish habitat (SHS '93-'95). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth for fish, other aquatic life (ODEQ '02).	Dams and culverts reduce connectivity, affect fish production. *Note: UBFAT is now complete for Calapooya Cr.*	Likely much non-permitted channel mod. work.	Poor riparian tree composition limits fish habitat (SHS '93-'95). Hardwoods dominate most riparian areas. Almost half of Calapooya Cr riparian areas have buffers that are 1 tree wide. >20% of riparian areas for Calapooya Cr and its tribs have no trees or very scattered trees.	None identified.	Surface water temps exceed 303(d) '98 standards. Streams with warmer temps often lack shade.	1. pH, DO, bacteria, toxics (manganese copper, iron, lead, beryllium) exceed 303(d) '98 standards (2002 and '04-'06 for toxics). 2. Nutrients (phosphorus) is a potential concern.	Usual turbidity levels likely not a limiting factor. Turbidity during and after storm events is heavy and may be a limiting factor. Developed areas within the watershed, e.g. runoff from roads and roofs, may impact water quality.	In-stream water rights and consumptive use meet or exceed avg. streamflows during the summer months in some WABs.	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" for sub-standard flows for fish, other aquatic life (ODEQ '02).	Non-native fish live and reproduce in N. Umpqua R., but small tribs too cold; data on salmonid distribution and abundance in the watershed are incomplete.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Calapooya Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Practices	1. Add LWD and boulders to improve pools, collect gravel, and provide other structure benefits. 2. Plant riparian veg. where current trees <= 1 tree wide, exclude livestock from riparian areas; maintain areas with good native riparian veg.	1. Remove fish passage barriers, give priority to those opening most miles of upstream habitat	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	None identified.	Increase shade with wide buffers and full canopies on very warm streams.	Increase shade with wide buffers and full canopies on streams with pH or DO problems. For streams w/ bacteria issues: Limit livestock stream access by providing water, shade away from riparian areas, fence riparian areas, relocate structures and situations that concentrate domestic animals near streams or establish dense/ wide riparian veg. zones to filter fecal material where relocation not possible, repair failing septic tanks/drain fields, use wastewater treatment plant effluent for irrigation, reduce chemical nutrient sources.	None identified.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

Calapooya Creek Watershed

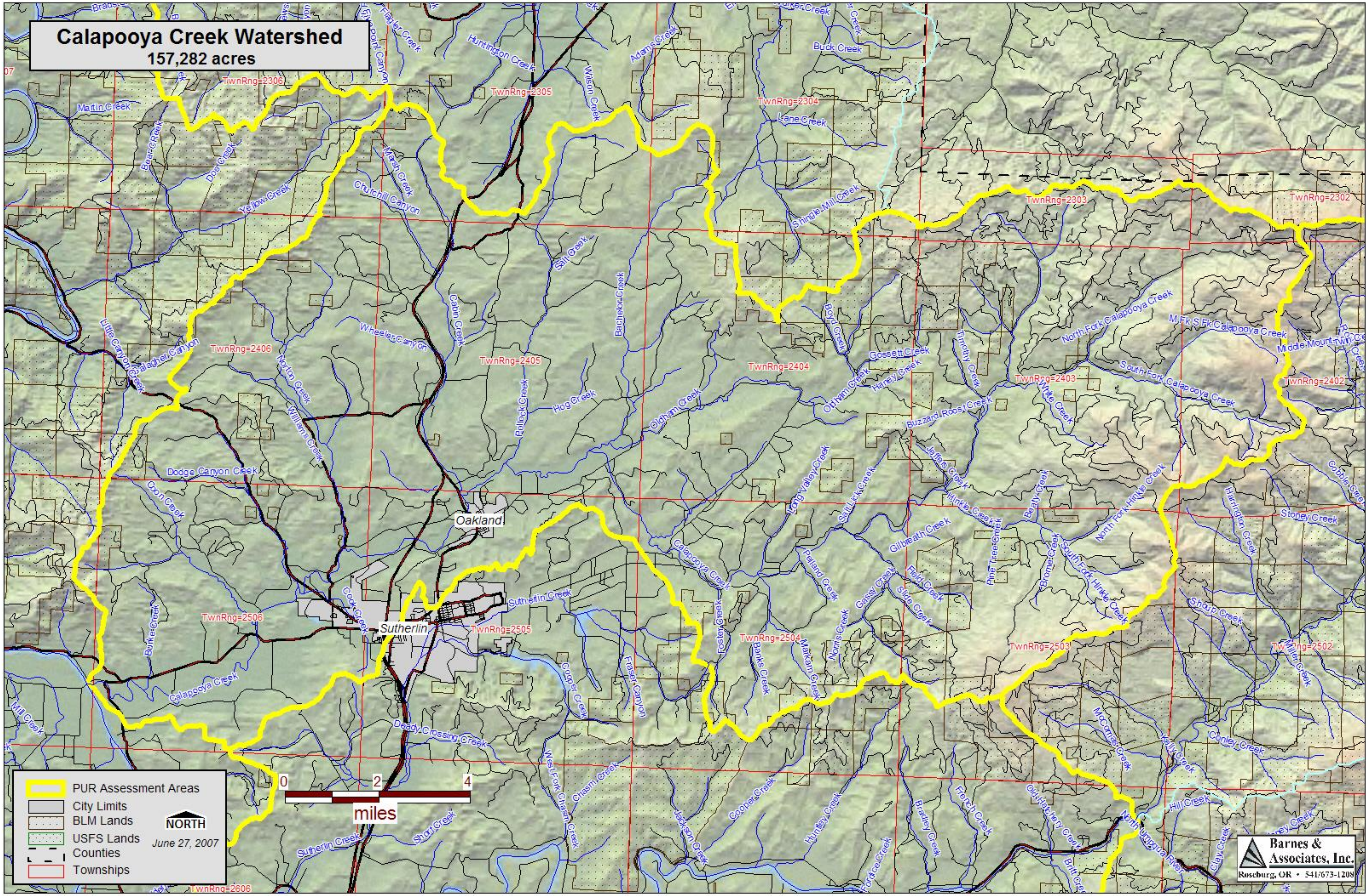
	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. Hinkle Cr, streams above Gassy Cr including Calapooya Cr. Bachelor Cr, Banks Cr, Calapooya Cr (from Nonpariel upstream), Coon Cr, Gassy Cr, Markham Cr, Marsh Cr, Oldham Cr, Pollock Cr, Slide Cr, Williams Cr ODEQ "habitat mod.": Calapooya Cr, Dodge Canyon Cr, Williams Cr	None identified. Bachelor Cr (at Hogan Rd), Banks Cr, Calapooya Cr (near Old Pioneer Rd), Dodge Canyon Cr, N.Fk. Hinkle Cr, S.Fk. Hinkle Cr, Markham Cr, Wheeler Canyon (I-5 culverts)	Banks Cr (lower), Calapooya Cr (Fair Oaks area down to mouth), Cabin Cr, Cook Cr, Coon Cr	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible; Bachelor Cr, Banks Cr, Cabin Cr, Calapooya Cr (from ~~Dodge Canyon~~ mouth to Oldham Cr), Gassy Cr, Oldham Cr, Pollock Cr, Williams/Norton Cr.	None identified. Cabin Cr, Calapooya Cr (lower main stem from Fair Oaks down-stream), Cook Cr, Coon Cr (beaver pond), Driver Valley, Fords Pond, Gassy Cr (lower), Marsh Cr,	303(d): Calapooya Cr	1. 303(d) for pH, DO, bacteria: Calapooya Cr at mouth (monitoring suggests bacteria may also be a problem else-where in water-shed) toxics: Cook Cr, Calapooya Cr (iron only). 2. nutrients (phosphorus): Calapooya Cr. See notes below for PUR bacteria monitoring results.	None identified.	All streams with water rights, such as Bachelor Cr and Oldham Cr.	All streams with water rights, such as Bachelor Cr and Oldham Cr. ODEQ "flow mod.": Bachelor Cr, Calapooya Cr, Coon Cr, Dodge Canyon Cr, Oldham Cr, Pollock Cr, Williams Cr	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

Notes:

- Text in black was taken from the original PUR watershed assessment.
- Blue text indicates April 2007 input by team of technical experts. ~~Blue text~~ indicates April 2007 judgment by technical experts that site has been restored or is otherwise not in need of restoration.
- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR watershed assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR watershed assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR watershed assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: Calapooya Cr. (near Sutherlin drinking water intake), Bachelor Cr. @ Elkhorn Rd., Oldham Cr. @ Elkhorn Bridge, Foster Cr. @ Nonpareil.
  - Streams identified with high levels of E. coli at times: Calapooya Cr. @ Fort McKay Rd., Dodge Canyon Cr. @ mouth, Cook Cr. @ mouth, Williams Cr. @ mouth, Banks Cr. @ Nonpareil Rd., Cabin Cr. @ Old Town Rd.
- Oregon Water Trust has been active in buying water rights for in-stream use in the Calapooya Creek Watershed.


Calapooya Creek Watershed
157,282 acres
PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships
NORTH
June 27, 2007
0
2
4
miles
Barnes & Associates, Inc.
Roseburg, OR • 541/673-1208
Oakland
Sutherlin
TwnRng=2306
TwnRng=2305
TwnRng=2304
TwnRng=2303
TwnRng=2302
TwnRng=2406
TwnRng=2405
TwnRng=2404
TwnRng=2403
TwnRng=2402
TwnRng=2506
TwnRng=2505
TwnRng=2504
TwnRng=2503
TwnRng=2502
TwnRng=2606
Calapooya Creek
North Fork Calapooya Creek
South Fork Calapooya Creek
M Fk S Fk Calapooya Creek
Sutherlin Creek
Cabin Creek
Hog Creek
Oldham Creek
Buck Creek
Lane Creek
Shingle Mill Creek
Gossett Creek
Buzzard Roost Creek
Gilbreath Creek
Stoney Creek
Shoup Creek
Conley Creek
Hill Creek
Cooper Creek
Deady Crossing Creek
Dodge Canyon Creek
Coon Creek
Martin Creek
Yellow Creek
Churchill Canyon
Wheeler Canyon
Norton Creek
Williams Creek
Long Valley Creek
Pine Tree Creek
Field Creek
Slide Creek
Casey Creek
Norris Creek
Banks Creek
Foster Creek
Fraser Canyon
Cooper Creek
Chasm Creek
West Fork Chasm Creek
Short Creek
Hinkle Creek
North Fork Hinkle Creek
South Fork Hinkle Creek
Harrington Creek
McComas Creek
Kelly Creek
French Creek
Bradley Creek
Jackson Creek
Salt Creek
Wilson Creek
Adams Creek
Huntington Creek
Bachelor Creek
Pollock Creek
Timothy Creek
Boyd Creek
Little Canyon Creek
Gallagher Canyon
Burke Creek
Mill Creek
North Umpqua River

Deer Creek Watershed, South Umpqua Subbasin, PUR's April 2002 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Lack of adequate large woody material and poor riparian areas limit fish habitat (SHS '93 – '94). Water quality limited for "habitat modification" for sub-standard LWD and pools (ODEQ '98).	Culverts reduce connectivity, affect fish production. *Note: UBFAT is not complete for Deer Creek.*	Rip-rap, roads built near streams, log placements have altered channels. Ditched stream channel on trib. to Deer Cr.	Poor riparian areas limit fish habitat (SHS '93 – '94). 31% of riparian areas are <= 1 tree width. 40% of streams have <50% cover. Note: historical data states there were areas of brush along Deer Creek. There-fore, brushy areas might reflect historical conditions.	Development of agriculture (grazing/hay) and urban Roseburg have altered or eliminated wetlands that were historically present in the area.	Surface water temps exceed 303(d) '98 standards.	1. DO, bacteria, exceed 303(d) '98 standards. 2. Nutrients – unknown. 3. pH	Insufficient data. High sediment levels in mainstem Deer Cr. (SHS '93 – '94).	Water availability is a concern; there is not enough natural stream flow in S. Fk. Deer Cr to meet consumptive use demands in August.	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" (ODEQ '04 – '06).	Deer Cr may support year-round populations of smallmouth bass, though the tribs would be too cold for smallmouth bass. Not all potential salmonids streams have been surveyed for presence/absence.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Deer Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Practices	1. Add LWD to collect gravel, provide other structure benefits. 2. Plant trees in riparian areas.	Improve culverts for passability.	1. Restore meanders. 2. Remove fill and concrete from stream-banks. 3. Mitigate effects of past riprap. 4. Control streambank erosion w/ bioengineering.	1. Plant conifers, remove blackberries (as necessary), manage for tree crown growth. 2. Exclude livestock from riparian areas.	1. Reconnect creek to historic floodplains. 2. Restore farmed wet pasture to wet prairie by filling/ blocking ditches, removing or blocking drains, removing fill to restore micro-topography. Plant ash trees in the wetter areas adjacent to the creek. 3. Purchase greenway easement. 4. Enhance created wetlands.	Establish tall, dense shade wall along the streams. Use selective thinning to encourage full crowns. Establish trees in open and brushy areas along the stream.	1. For streams with bacteria issues: Use exclusion fencing and off-channel watering for livestock to keep livestock wastes out of streams, check septic tanks and drainfields, remove and dispose of pet wastes, maintain buffer strips along streams to filter water entering the creek (note that buffer strips alone cannot remove all bacteria from a large source).	None identified.	None identified.	1. Encourage landowners to meter water intakes. 2. Secure water right leases or purchase water rights for conversion to in-stream use. 3. Improve irrigation efficiency.	Survey fish rearing areas in September to establish presence/absence of salmonids and to use for prioritization of areas needing stream enhancements.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Deer Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. N.Fk. Deer Cr (entire length, but higher priority upstream of Strader Rd.), Middle Fk. of S.Fk. Deer Cr, S.Fk. Deer Cr (above Middle Fk. of S.Fk. Deer Cr.) ODEQ "habitat mod.": Deer Cr	Trib. to Middle Fk. of S.Fk. Deer Cr.	1. Ramp Cr, trib. to Middle Fk. of S.Fk. Deer Cr. 2. Deer Cr. (w/in Roseburg UGB). 3. Deer Cr. (N. side of creek, Buckhorn Rd. to the N./S. forks). 4. S.Fk.Deer Cr. Trib. to Deer Cr at Temple Brown Rd.	1. Streams w/ canopy cover <50% and/or heavy to black-berries, e.g Deer Cr, DaMotta Branch, Shick Cr, N.Fk.Deer Cr., S.Fk.Deer Cr. 2. Damotta Branch, Deer Cr (tribs + N. side from UGB to N./S. forks), N.Fk.Deer Cr., S.Fk.Deer Cr.	1. Deer Cr. 2. Ramp Cr/Canyon; farmed wet pastures along Deer Cr, N.Fk. Deer Cr (upstream of Livingston Cr), S.Fk. Deer Cr; Dixonville millpond; DaMotta Branch; trib. to Middle Fk. of S.Fk. Deer Cr. 3. Deer Cr (w/in Roseburg UGB). 4. Shick Cr	303(d): Deer Cr, N. Fk. Deer Cr	1. 303(d) for DO: Deer Cr 303(d) for bacteria: Deer Cr, N. Fk. Deer Cr See notes below for PUR bacteria monitoring results.	None identified.	None identified.	1. S. Fk. Deer Cr. ODEQ "flow mod.": Deer Cr	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

Notes:

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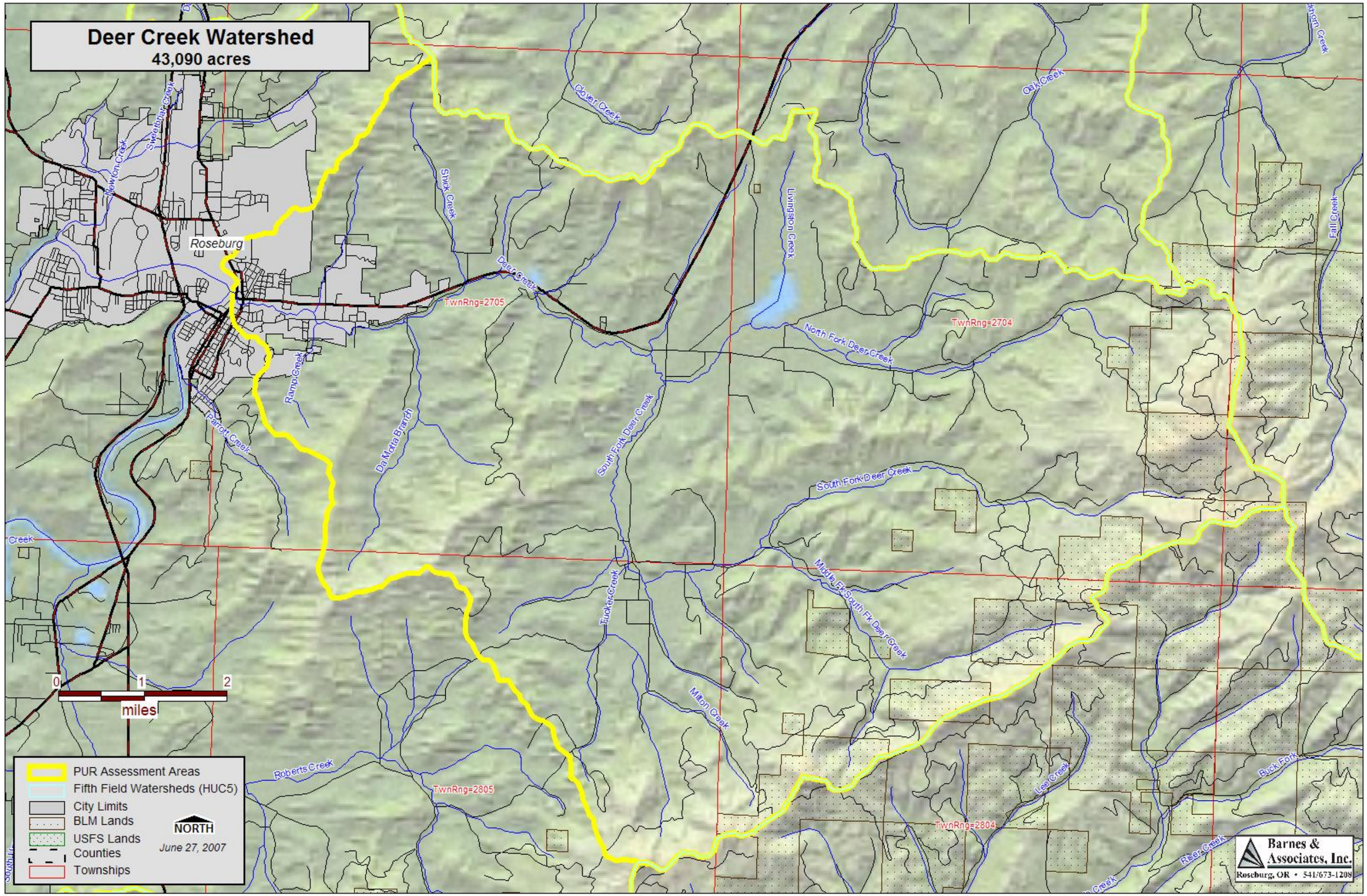
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: N. Fk. Deer Cr. near mouth
  - Streams identified with high levels of E. coli at times: Deer Cr. @ Highway 138, S. Fk. Deer Cr. near S. Umpqua R., Deer Cr. near Dixonville, N. Fk. Deer Cr. @ mile 2.9


Deer Creek Watershed
43,090 acres
Roseburg
Newton Creek
Sweetbriar Creek
Shick Creek
Clover Creek
Oak Creek
Livingston Creek
North Fork Deer Creek
Fall Creek
Ramp Creek
Parrott Creek
Da Motta Branch
South Fork Deer Creek
Tucker Creek
Middle Fk South Fk Deer Creek
Milton Creek
Roberts Creek
Lee Creek
Buck Fork
Reese Creek
TwnRng=2705
TwnRng=2704
TwnRng=2805
TwnRng=2804
0
1
2
miles
PUR Assessment Areas
Fifth Field Watersheds (HUC5)
City Limits
BLM Lands
USFS Lands
Counties
Townships
NORTH
June 27, 2007
Barnes & Associates, Inc.
Roseburg, OR • 541/673-1208

Lower Cow Creek Watershed, South Umpqua Subbasin, PUR's November 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of LWD, poor riparian tree composition, poor pools limit fish habitat (SHS '93-95). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '02).	1. Culverts reduce connectivity, affect fish production. *Note: UBFAT is now complete for LCC.* 2. Gravel diversion dam is concern for juvenile fish at low flows.	Existing data do not indicate a limiting factor.	Over 1/2 of Cow Cr's riparian buffers are one tree wide. Over 1/4 of Cow Cr's riparian buffers have no trees. 99% of Cow Cr is less than half covered by vegetation or infrastructure. Poor riparian tree composition (SHS '93-'95).	Development, long-term agriculture have affected wetlands.	1. Surface water temps. exceed 303(d) '02 standards. 2. Streams with warmer water temps often lack shade.	~~1. pH & chlorine exceed 303(d) '02 standards.~~ 2. Ammonia is a potential concern, but not on 303(d) '02 list. 3. Toxics (heavy metals from Formosa Mine) are seasonally toxic to aquatic life, ~~but not on 303(d) '02 list.~~ Toxics exceed 303(d) '04 - '06 standards.	Existing data do not indicate a limiting factor.	In-stream water rights are close to or exceed average streamflow during one or more months of the year in both Lower Cow Creek WABs. *(Note: Water availability concerns pertain only to natural stream-flow and do not factor in water released from Galesville Reservoir.)*	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" on Cow Cr, (ODEQ '02) *(Note: Water availability concerns pertain only to natural stream-flow and do not factor in water released from Galesville Reservoir.)*	Non-native fish live in Cow Cr, but water is too cold for reproducing populations. More quantitative data are needed to evaluate salmonid abundance and the distribution and abundance of non-salmonid fish in the watershed. .
Specific Recommended Practices	1. Add LWD and boulders to improve pools and provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, fence riparian areas; maintain areas with good native riparian veg.	Remove fish passage barriers, give priority to those opening most miles of upstream habitat.	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	Create or improve wetlands, esp. where evidence suggests historical wetlands may have been located.	Increase shade on small and medium-sized streams to reduce stream warming rates and improve habitat for salmonids.	Where pH is a problem, increase shade by encouraging wide riparian buffers and managing for full canopies. The Formosa Mine is a proposed EPA superfund project site.	None identified.	None identified.	Install efficient irrigation systems and encourage in-stream water leasing on streams with irrigation rights, such as Cow Cr.	Support salmonid and non-salmonid distribution and abundance research activities in the watershed, especially at the local level.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Lower Cow Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide and with good riparian zones, e.g.: Beatty Cr, Cattle Cr, Catching Cr, Council Cr, Doe Cr (lower reaches below falls), Iron Mtn Cr, Jerry Cr (lower reaches), Panther Cr, Russel Cr, Salt Cr, Table Cr ODEQ "habitat mod.": Cow Cr, Middle Cr	1. Buck Cr, Doe Cr, Darby Cr, Mitchell Cr, Peavine Cr, Salt Cr, Shoestring Cr 2. Cow Cr. just below Shoestring Cr	Jerry Cr (re-routed), Small tribs flowing into lower half of Cow Cr	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible, inc.: Catching Cr, Council Cr, Iron Mtn. Cr, Jerry Cr, Russell Cr, mouths of small tribs flowing into Cow Cr, Shoestring Cr	Copper Cr, Cow Cr (lower reaches from Beatty Cr down-stream, esp. between Russell & Catching creeks), Mitchell Cr, Rail Gulch (below smelter site)	1. 303(d): Cattle Cr, Cow Cr, Doe Cr, ~~Iron Mt. Cr~~, ~~Martin Cr~~, Middle Cr, S.Fk. Middle Cr, Union Cr	1. ~~303(d) for pH & chlorine – Cow Cr~~ 2. Ammonia – Cow Cr 3. ~~Toxics from Formosa Mine - Middle Cr, S.Fk. Middle Cr~~ 303(d) for toxics: Middle Cr (arsenic, cadmium, copper, manganese, nickel, zinc), S.Fk. Middle Cr (cadmium, copper, manganese, zinc) See notes below for PUR bacteria monitoring results.	None identified.	None identified.	Cow Cr ODEQ "flow mod.": Cow Cr, Middle Cr	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: Iron Mountain Creek, ~~Table Creek~~
Top priority streams for projects: Catching Creek, Cattle Creek, Council Creek, Mitchell Creek, Panther Creek, Russell Creek, Shoestring Creek, Table Cr, tribs and mainstem Cow Creek from Salt Creek downstream.

Notes:

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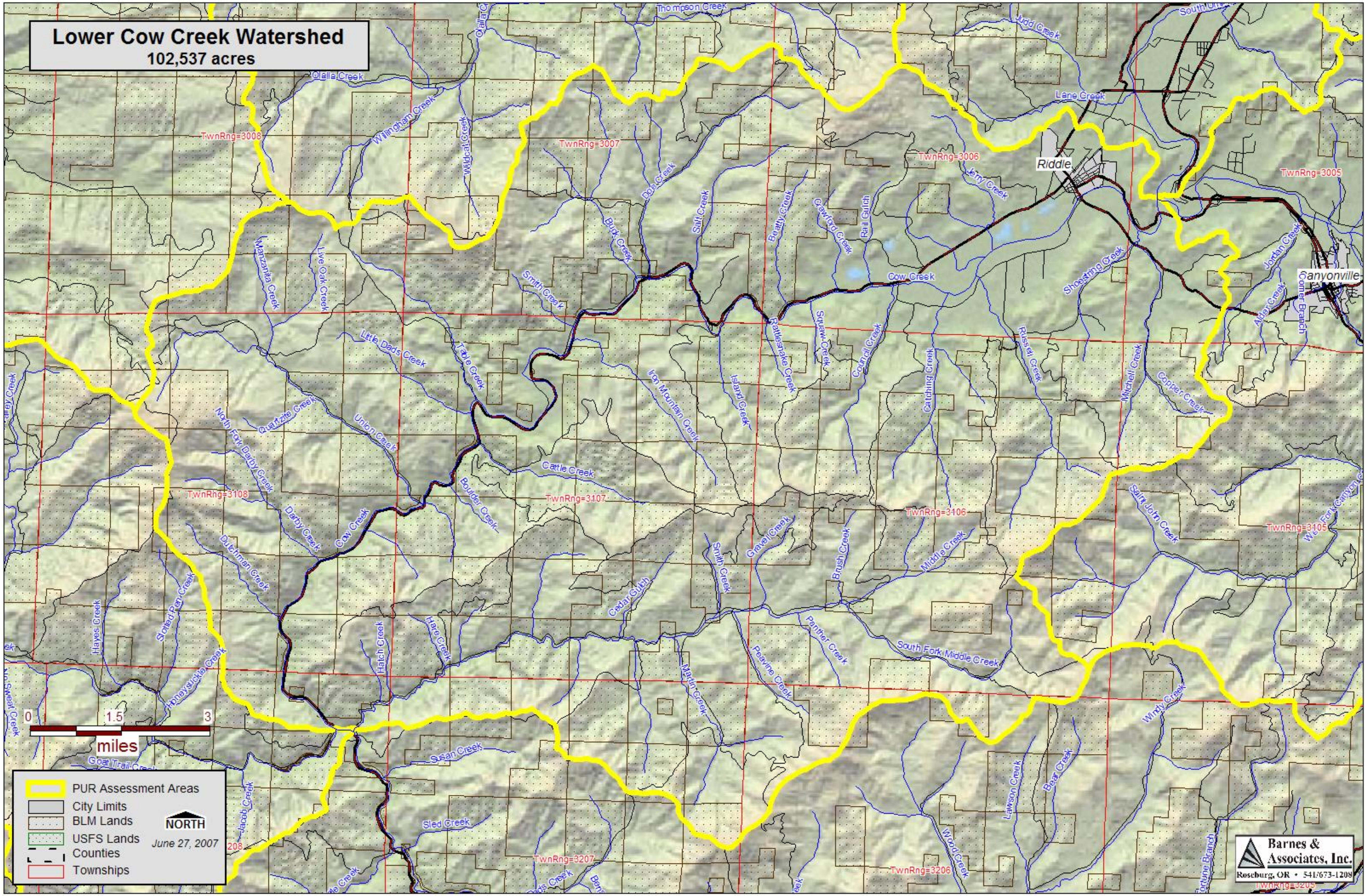
- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR watershed assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR watershed assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR watershed assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: none identified.
  - Streams identified with high levels of E. coli at times: Cow Cr. @ Yokum Rd.


Lower Cow Creek Watershed
102,537 acres
PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships
NORTH
June 27, 2007
0
1.5
3
miles
Barnes & Associates, Inc.
Roseburg, OR • 541/673-1208
Riddle
Canyonville
TwnRng=3008
TwnRng=3007
TwnRng=3006
TwnRng=3005
TwnRng=3108
TwnRng=3107
TwnRng=3106
TwnRng=3105
TwnRng=3207
TwnRng=3206
Cow Creek
Olalla Creek
Thompson Creek
Judd Creek
Lane Creek
Willingham Creek
Wildcat Creek
Doe Creek
Buck Creek
Salt Creek
Beatty Creek
Crawford Creek
Rail Gulch
Jerry Creek
Shoestring Creek
Jordan Creek
Smith Creek
Manzanita Creek
Live Oak Creek
Little Dads Creek
Table Creek
Rattlesnake Creek
Squaw Creek
Council Creek
Catching Creek
Russel Creek
Mitchell Creek
Copper Creek
Iron Mountain Creek
Island Creek
Quartzite Creek
North Fork Darby Creek
Union Creek
Cattle Creek
Boulder Creek
Darby Creek
Dutchman Creek
Saint John Creek
Middle Creek
Brush Creek
Gravel Creek
Smith Creek
Cedar Gulch
Hayes Creek
Honeysuckle Creek
Hatch Creek
Hare Creek
Panther Creek
South Fork Middle Creek
Peavine Creek
Martin Creek
Windy Creek
Susan Creek
Goat Trail Creek
Jacob Creek
Sled Creek
Lawson Creek
Bear Creek
Wood Creek
Fortune Branch
Corner Branch

Lower North Umpqua Watershed, North Umpqua Subbasin, PUR's July 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of LWD, poor riffles, poor pools, poor riparian tree composition limit fish habitat (SHS '92-'94). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '02).	Culverts and dams reduce connectivity, affect fish production. *Note: UBFAT is not complete for LNU.*	Many projects have modified stream channels, esp. in Sutherlin Cr.	Poor riparian tree composition limits fish habitat (SHS '92-'94). >1/3 of N. Umpqua River and tributary riparian zones have no trees, another 30% are only one tree wide. Almost half of LNU tributary reaches are mostly exposed.	Development has affected wetlands, most notably in the City of Sutherlin.	Surface water temps exceed 303(d) '02 standards. Streams with warmer temps often lack shade.	1. Toxics exceed 303(d) '02 standards. 2. Nutrients (nitrates) are a potential concern. 3. Bacteria, pH, turbidity, DO not a concern, but have been measured at only 1 site in LNU (N. Umpqua at Garden Valley Rd).	Usual turbidity levels likely not a limiting factor. Developed areas within the watershed, e.g. runoff from roads and roofs, may impact water quality. Turbidity has been measured at only 1 site in LNU (N. Umpqua at Garden Valley Rd).	None identified.	Water quality limited for "flow modification" (ODEQ '02).	N. Umpqua R. is generally too cold for non-native fish, but some may enter the mouth of the river; data on salmonid distribution and abundance in the watershed are incomplete.
Specific Recommended Practices	1. Add LWD and boulders to improve pools, collect gravel, provide other structure benefits. 2. Plant riparian veg. where current veg. is poor or fair, exclude livestock from riparian areas; maintain riparian areas with tree buffers >= 2 trees wide (and that, on tribs, provide >50% cover).	1. Remove fish passage barriers, give priority to those opening most miles of upstream habitat	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for large diameter trees.	Expand forested riparian zones, riverine wetlands by planting hydrophytic tree species in at a high density.	Increase shade on small and medium-sized streams.	None identified.	None identified.	None identified.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Lower North Umpqua Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, inc: Britt Cr, Cooper Cr (east of NBHMA), Cooper Cr (above Cooper Cr Reservoir), French Cr, Huntley Cr, Jackson Cr (east side of NBHMA), Oak Cr, Sutherlin Cr ODEQ "habitat mod.": N. Umpqua R.	None identified. Bradley Cr, Cooper Cr (east of NBHMA, fish ladder barrier), Dixon Cr (concrete slab culvert), Chasm Cr (creek on west side of NBHMA), Oak Cr, Plat I Reservoir (ineffective fish ladder)	None identified. Cooper Cr (below Cooper Cr Reservoir), Oak Cr (main stem + both forks), Sutherlin Cr	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible; Bradley Cr, Britt Cr, Clover Cr, Cooper Cr (creek east of NBHMA and creek in Sutherlin area), Dixon Cr, French Cr, Huntley Cr, W. Fk. Chasm Cr, Oak Cr (and its tribs), Sutherlin Cr	None identified. Cooper Cr, Deady Crossing Cr, Jackson Cr, Oak Cr, Sutherlin Cr, Turkey Cr, Whistlers Bend Reservoir	303(d): Clover Cr, N. Umpqua R	1. toxics: Cooper Cr / Cooper Cr Reservoir (iron, mercury), ~~N. Umpqua R.,~~ Plat I Reservoir (mercury), Sutherlin Cr (arsenic, beryllium, copper, iron, lead, manganese), unnamed trib to Sutherlin Cr (arsenic, iron, lead) See notes below for PUR bacteria monitoring results.	None identified. Bradley Cr, Huntley Cr, Oak Cr, Sutherlin Cr	None identified.	All streams with water rights. ODEQ "flow mod.": Cooper Cr, N. Umpqua R, Sutherlin Cr	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

Notes:

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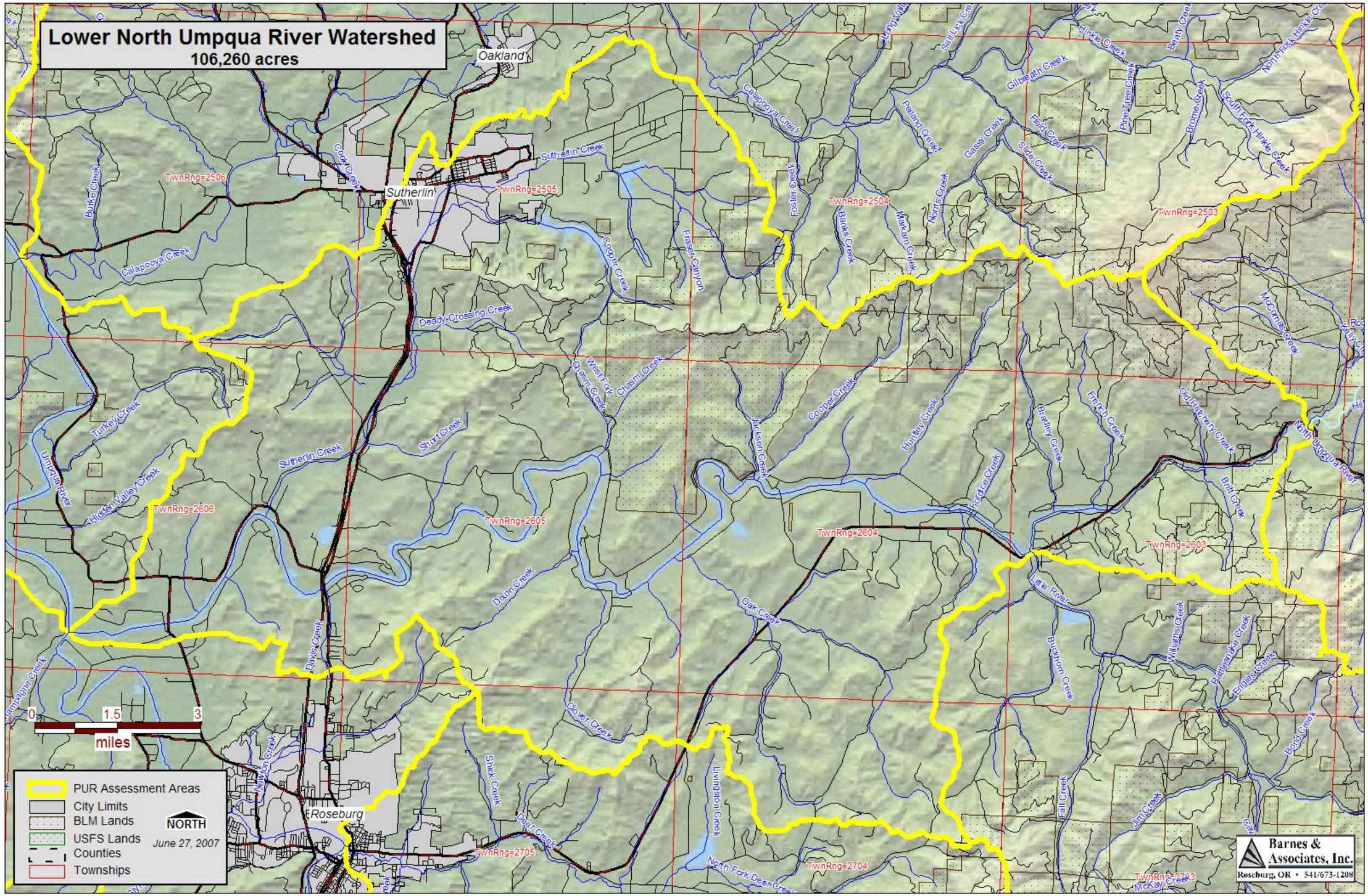
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: none identified
  - Streams identified with high levels of E. coli at times: Sutherlin Cr. @ Wilbur bridge

Lower North Umpqua River Watershed

106,260 acres



Lower South Umpqua Watershed, South Umpqua Subbasin, PUR's July 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of adequate large woody material, poor quality pools, and poor riparian tree composition limit fish habitat (projection from MSU and Deer Cr SHS, as only Newton Cr has had SHS in LSU). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '02).	Culverts and dams reduce connectivity, affect fish production. *Note: UBFAT is not complete for LSU.*	None identified.	Hardwoods are dominant veg. type; brush/ berries is the second most common veg. type. Approx. 60% of riparian zones are treeless or one tree wide. Almost 1/3 of tribs are mostly exposed to direct sunlight.	Development of Roseburg, Green, and Winston has altered and eliminated all types of wetlands that were historically present in the area.	Surface water temps exceed 303(d) '02 standards. Streams with warmer temps often lack shade.	pH, DO, nutrients (phosphorus), bacteria, toxics (~~chlorine~~, arsenic, cadmium) exceed 303(d) '02 standards.	More data is needed to determine if a limiting factor.	In-stream water rights meet or exceed avg. streamflows from August to October.	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" (ODEQ '02).	Non-native fish live and reproduce in S. Umpqua R., but small tribs too cold; data on salmonid distribution and abundance in the watershed are incomplete.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Lower South Umpqua Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Practices	1. Add LWD and boulders to improve pools, collect gravel, and provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas; maintain areas with good native riparian veg.	Remove fish passage barriers, give priority to those opening most miles of upstream habitat	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	Enhance riverine and palustrine wetlands through high-density planting and seeding. Convert cleared lands to wetland prairie by plugging drain ditches and eliminating livestock access.	Increase shade with wide buffers and full canopies on very warm streams.	For streams w/ bacteria issues: Limit livestock stream access by providing water, shade away from riparian areas, fence riparian areas, relocate structures and situations that concentrate domestic animals near streams or establish dense/ wide riparian veg. zones to filter fecal material where relocation not possible, repair failing septic tanks/drain fields, use wastewater treatment plant effluent for irrigation, reduce chemical nutrient sources.	None identified.	None identified.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

Lower South Umpqua Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. Callahan Cr, Champagne Cr, Marsters Cr, Roberts Cr, Stockel Cr ODEQ "habitat mod.": S.Umpqua R.	None identified. Newton Cr, Stockel Cr (lower)	None identified. Newton Cr, Parrott Cr, Roberts Cr	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible; esp.: Champagne Cr, Marsters Cr, Roberts Cr, S. Umpqua R, Stockel Cr	Areas having lost wetland functions, including: Happy Valley, Newton Cr, S. Umpqua R. (near Shady Drive at Melrose and along Winston Section Rd. in Winston)	303(d): ~~Callahan Cr~~ (see note below regarding this Callahan Cr), S.Umpqua R.	303(d): S. Umpqua R. (it is unknown if these water quality parameters are a concern else-where in LSU) See notes below for PUR bacteria monitoring results.	None identified.	All streams with water rights.	ODEQ "flow mod.": Champagne Cr, Roberts Cr, S.Umpqua R.	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

Notes:

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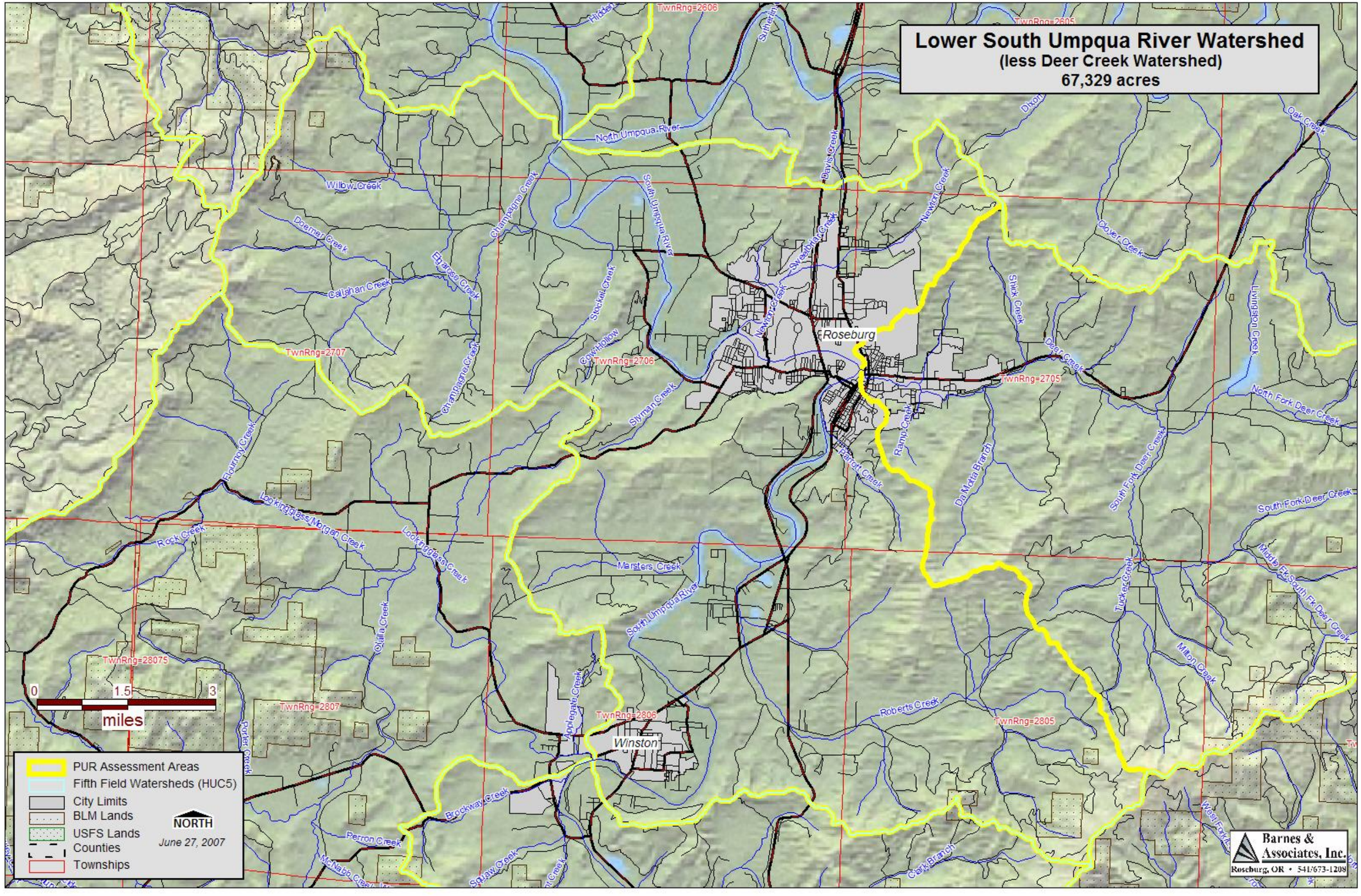
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: none identified.
  - Streams identified with high levels of E. coli at times: Newton Cr. @ Albertsons, Sweetbrier Cr. @ Mercy Hospital, Newton Cr. @ Jefferson, South Umpqua R. @ Stewart Park, South Umpqua R. @ Melrose.
- Callahan Cr was erroneously listed in PUR's 2003 watershed assessment as a water quality listed stream for temperature.

Lower South Umpqua River Watershed
(less Deer Creek Watershed)
67,329 acres



Lower Umpqua River Watershed, Umpqua Subbasin, PUR's May 2006 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Lack of LWD, poor riffles, poor/fair pools limit fish habitat (SHS). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '04 – '06).	Culverts reduce connectivity, affect fish production. *Note: UBFAT is not complete for LUR.* Extent of unscreened irrigation ditch barriers is unknown.	Likely much non-permitted channel mod. work.	Poor/fair riparian areas limit fish production (SHS). Riparian cover over streams is rated as "low" or "no cover" for half the length of streams in watershed.	Development, long-term ag. have probably resulted in loss of wetland areas. *Note: The PUR watershed assessment covered freshwater wetlands only. Tidal wetlands were assessed by USFWS and Green Point Consulting.*	Surface water temps exceed 303(d) standards.	1. Bacteria (fecal coliform) exceeds 303(d) standards. Main sources are non-point livestock, wild-life, and residential septic. 2. DO a possible concern. 3. pH, nutrients, toxics not likely problems	Existing data do not indicate a limiting factor.	In-stream water rights are less than average streamflow during all months of the year in all three Lower Umpqua River WABs,. *(Note: Above key finding is consistent with "water use is not a significant issue…" statement, but is counter to water availability data in WA.)*	Water use is not a significant issue of concern in this watershed. *(Note: Water availability data suggest low streamflow could be a limiting factor.)* Water quality limited for "flow modification" (ODEQ '04 – '06).	Data on salmonid distribution and abundance in the watershed are incomplete. In-stream complexity and water quality are the most important limiting factors for coho in LUR.
Specific Recommended Practices	1. Add LWD and boulders to improve pools and riffles, and provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas, maintain areas with good native riparian veg.	Remove fish passage barriers, give priority to those opening most miles of upstream habitat.	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	None identified.	Increase shade by encouraging development of riparian buffers and managing for full stream canopy coverage.	1. Limit livestock access to streams by fencing and providing stock water systems, shade trees outside of the riparian area. Relocate barns, other structures, and situations that concentrate domestic animals near streams; establish dense riparian veg. filters where relocation not possible. Repair failing septic tanks and drain fields.	None identified.	None identified.	None identified.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Lower Umpqua River Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. none identified. Butler Cr, Charlotte Cr, Dean Cr, Harvey Cr, Luder Cr, Scholfield Cr, Winchester Cr 2. See "Riparian Zones." ODEQ "habitat mod.": Oar Cr	None identified. Tide gate issues: Dean Cr, Scholfield Cr Culvert issues: Butler Cr, Dean Cr?, Charlotte Cr (culvert on Hwy. 38 passable at high tides only), Luder Cr (culvert on Hwy. 38 passable at high tides only)	None identified.	Streams w/ canopy cover <50%; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible. Butler Cr, Dean Cr, Harvey Cr (lower), Providence Cr, Scholfield Cr, Winchester Cr	None identified. Butler Cr, Dean Cr, Harvey Cr (lower), Providence Cr, Scholfield Cr, Winchester Cr *Note: The PUR watershed assessment covered freshwater wetlands only. Tidal wetlands were assessed by USFWS and Green Point Consulting.*	303(d): Franklin Cr, Umpqua R.	1. 303(d) for bacteria: Schofield Cr, Umpqua R, Umpqua R estuary, Winchester Cr 2. DO: Schofield Cr See notes below for PUR bacteria monitoring results.	None identified.	None identified.	None identified. ODEQ "flow mod": Oar Cr, Umpqua R	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

Notes:

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- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR watershed assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR watershed assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR watershed assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: As of May 2007, PUR has not conducted water quality monitoring in this watershed.
  - Streams identified with high levels of E. coli at times: As of May 2007, PUR has not conducted water quality monitoring in this watershed.

Lower Umpqua River Watershed
67,930 acres

Umpqua River
TwnRng=2112
TwnRng=2113
Frantz Creek
Hudson Slough
West Fork Joyce Creek
Joyce Creek
Noel Creek
Cassady Creek
Murphy Creek
Wassen Creek
Brainard Creek
Black Creek
Otter Slough
Otter Creek
TwnRng=2111
Perkins Creek
TwnRng=2110
Providence Creek
Reedsport
Bitter Creek
Scholfield Creek
Cedar Creek
Harvey Creek
Bear Creek
Fischer Creek
Little Franklin Creek
Pacific Ocean
Winchester Creek
Oar Creek
Koerpke Slough
Hakki Creek
Johnson Creek
Dean Creek
Franklin Creek
Dewis Cluib Creek
TwnRng=2213
TwnRng=2212
Wind Creek
Scholfield Creek
Miller Creek
TwnRng=2211
Indian Charlie Creek
TwnRng=2210
South Fork Wind Creek
Dry Creek
Adams Creek
Charlotte Creek
Luder Creek
Fourbit Creek
Mill Creek
Scholfield Creek
Rucker Creek
Double Barrel Creek
0 1 2
miles

PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships

NORTH
June 27, 2007

Barnes & Associates, Inc.
Roseburg, OR • 541/673-1208

Middle Cow Creek Watershed, South Umpqua Subbasin, PUR's April 2002 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data.

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Data indicates limitations, but no specific conclusions were drawn (SHS '93-'97). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '98).	Culverts and at least one dam reduce connectivity. *Note: UBFAT is not yet complete for MCC.* Several push-up dams on Cow Cr.	Some channel modification, inc. rip-rap and gravel bar removal, over the years. Car bodies in Quines Cr.	About 10% of riparian areas lack trees. Location of Fortune Branch power lines requires riparian tree pruning/limits riparian development.	Loss of connectivity between Cow Cr and adjacent wetlands due to grading and filling reduced hydrologic control functions of the floodplain.	Surface water exceeds 303(d) '98 standards during summer (>64º). Mouths of certain streams too warm, limit summer fish rearing (WA).	1. DO levels limit salmonid egg survival, as well as cold-water aquatic life in Cow Creek near the dam (DO samples vs. ODEQ stds.). . 2. ~~pH - data do not indicate limiting factor.~~ pH on 303(d) '04 – '06 list 3. nutrients - no data, toxics - no data. 4. bacteria - data do not indicate limiting factor.	Concern for high turbidity (based on old data or observations only)	Water availability is a concern in each WAB at some time during the summer & fall. Whitehorse and Riffle WABs - no consumptive use. Starvout and Quines WABs - minimal consumptive use. Windy Creek WAB - consumptive use is greater than the natural stream flow. *(Note: Water availability concerns pertain only to natural stream-flow and do not factor in water released from Galesville Reservoir.)* Streamflow less of a concern than in some watersheds.	Low summer flows in Cow Cr have increased since 1992 with releases from Galesville Res. Still, water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" (ODEQ '04 – '06). *(Note: Water availability concerns pertain only to natural stream-flow and do not factor in water released from Galesville Reservoir.)*	Existing data do not indicate a limiting factor.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

Middle Cow Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Practices	1. Place LWD in streams.	1. Replace or retrofit fish barriers (all are culverts except as noted). 2. Screen all unscreened diversions to protect fish.	1. Exclude livestock from riparian areas. 2. Perform streambank erosion control emphasizing bioengineering techniques. 3. Remove car bodies from Quines Cr.	Plant trees and shrubs in riparian areas, manage for large crowns, exclude livestock. Move Fortune Branch power lines. .	Fill and block ditches, remove or block drains, and remove fill to restore the microtopography. .	Plant native veg to establish tall/ dense shade wall along/over streams. Establish trees in brushy and open areas along streams. Place LWE in streams to accumulate gravels, create sub-surface flows to cool the water.	1. DO: Limit stream temps and nutrients. 4. Manage livestock so animal wastes do not contaminate the riparian area.	Replace under-sized culverts; discharge ditch relief culverts on slopes, not into streams.	Secure water right leases or purchase water rights for conversion to in-stream use, improve irrigation efficiency.	Secure water right leases or purchase water rights for conversion to in-stream use, improve irrigation efficiency.	Complete presence/absence surveys in areas where fish presence/absence is unknown.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Middle Cow Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. Bear Cr, Lawson Cr, Windy Cr, Wood Cr ODEQ "habitat mod.": Cow Cr, Dads Cr, Quines Cr, Whitehorse Cr, Windy Cr	1. ~~Bear Cr~~, Fortune Branch, McCullough Cr, Panther Cr, Perkins Cr, Quines Cr, Rattail Cr, Rattlesnake Cr, Riffle Cr, Totten Cr (dam-add fish ladder) W.Fk.Windy Cr, Wildcat Cr, ~~Woodford Cr~~ 2. None identified.	1. Cow Cr-Fortune Branch HUC6, Windy Cr HUC6, Cow Cr-McCullough Cr HUC6 3. Quines Cr.	For planting, target brush and areas with less than 50% canopy cover and have a channel width for which 50% or greater cover is feasible (82 miles of riparian areas), including: Cow Cr, Quines Cr, Starvout Cr (lower), Windy Cr (below ODF land). Move power lines along Fortune Branch.	Any of the large areas of farmed wet pasture along Cow Creek and its tributaries.	303(d): Cow Cr, Dads Cr, Fortune Cr, Quines Cr, Riffle Cr, Skull Cr, Windy Cr, Wood Cr, Woodford Cr WA: Dads Cr, Skull Cr, Quines Cr, Windy Cr, Fortune Branch	1. Cow Cr near dam. As of 4/26/07, Douglas County is undertaking structure placement project below Galesville Dam to increase DO levels in Cow Cr. 2. 303(d) for pH: Cow Cr See notes below for PUR bacteria monitoring results.	Dads Cr, Quines Cr, Starvout Cr	Quines, Windy, and the two Cow Creek WABs.	ODEQ "flow mod": Cow Cr, Quines Cr, Windy Cr	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

Notes:

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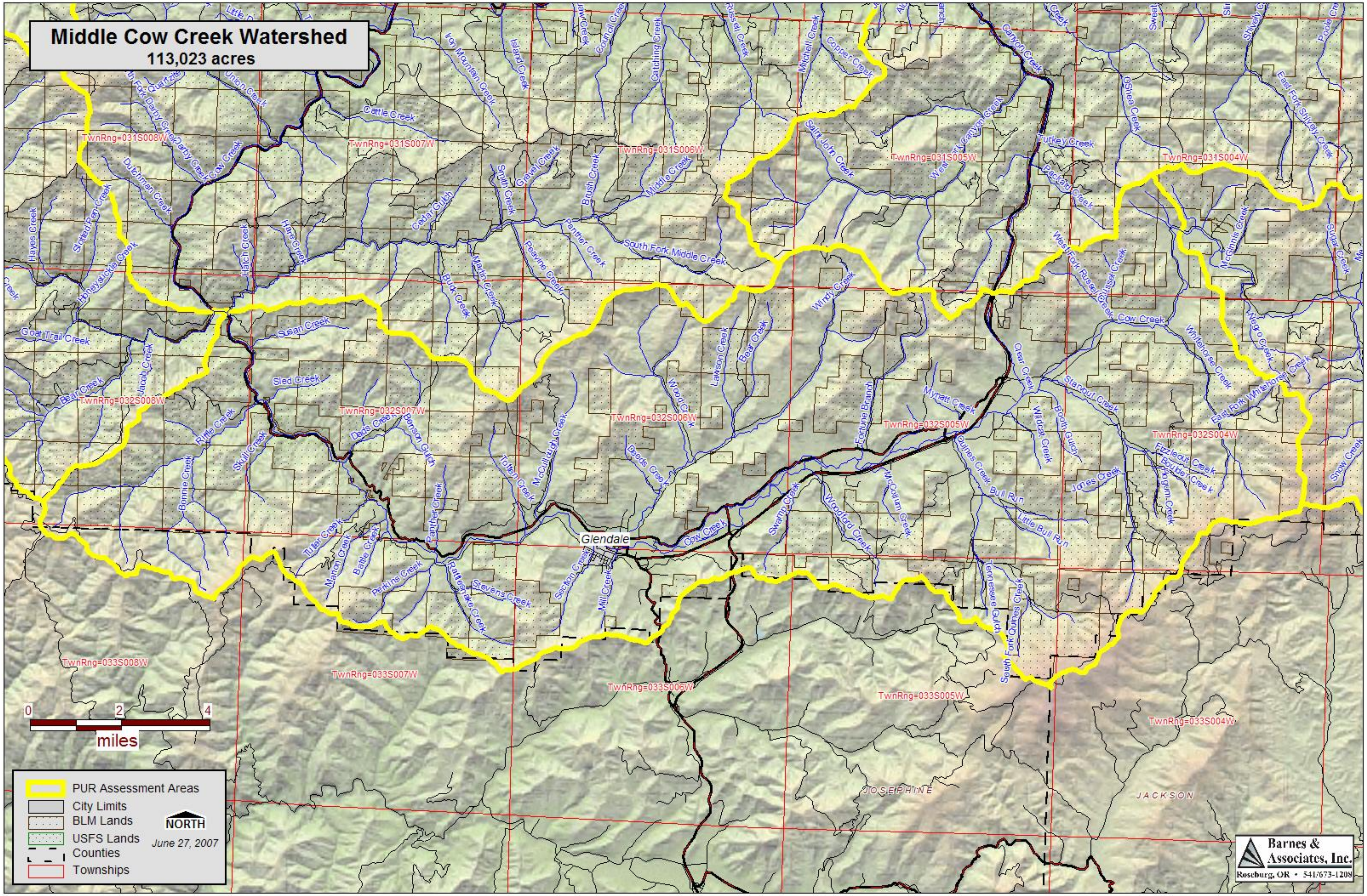
- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR watershed assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR watershed assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR watershed assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: none identified from one-time monitoring at 17 different sites in watershed.
  - Streams identified with high levels of E. coli at times: none identified from one-time monitoring at 17 different sites in watershed.
- The following suggestion appeared in Section 5.2, "Enhancement Activities," of the watershed assessment: "Seek alternative to runoff from industrial sites." This activity may have merit; however, this recommendation is not substantiated by the assessment's "Current Conditions" discussion.
- A gravel removal operation to be situated on the floodplain of Cow Creek near Woodford Creek is pending.
- There is plenty of gravel for spawning habitat in Cow Creek.


Middle Cow Creek Watershed
113,023 acres
TwnRng=031S008W
TwnRng=031S007W
TwnRng=031S006W
TwnRng=031S005W
TwnRng=031S004W
TwnRng=032S008W
TwnRng=032S007W
TwnRng=032S006W
TwnRng=032S005W
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TwnRng=033S008W
TwnRng=033S007W
TwnRng=033S006W
TwnRng=033S005W
TwnRng=033S004W
Glendale
Cow Creek
South Fork Middle Creek
Middle Creek
Susan Creek
Sled Creek
Goat Trail Creek
Bear Creek
Windy Creek
Lawson Creek
Fortune Branch
Quines Creek
Bull Run
Little Bull Run
Whitehorse Creek
East Fork Whitehorse Creek
Wildcat Creek
Clear Creek
Stevens Creek
Rattlesnake Creek
Perkins Creek
Panther Creek
Totten Creek
McCullough Creek
Dads Creek
Benson Gulch
Skull Creek
Rifle Creek
Bonnie Creek
Tuller Creek
Marion Creek
Battle Creek
Section Creek
Mill Creek
Swamp Creek
Woodford Creek
McCollum Creek
Tennessee Gulch
South Fork Quines Creek
Jones Creek
Booth Gulch
Stanout Creek
Myrtle Creek
Turkey Creek
Packard Creek
West Fork Russell Creek
Russell Creek
Saint John Creek
Mitchell Creek
Copper Creek
Canyon Creek
Catching Creek
Iron Mountain Creek
Island Creek
Cattle Creek
Union Creek
Dutchman Creek
Hare Creek
Hatch Creek
Cedar Gulch
Smith Creek
Gravel Creek
Brush Creek
Panther Creek
Peavine Creek
Martin Creek
Birch Creek
Honeysuckle Creek
Hayes Creek
Starveout Creek
Jacob Creek
Snow Creek
Sugar Creek
Negro Creek
JOSEPHINE
JACKSON
0
2
4
miles
PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships
NORTH
June 27, 2007
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Middle South Umpqua Watershed, South Umpqua Subbasin, PUR's July 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of LWD, poor pools, poor riparian tree composition limit fish habitat (SHS '94-'96). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '02).	Culverts and dams reduce connectivity, affect fish production. *Note: UBFAT is now complete for MSU.*	None identified, though suspected.	Poor riparian tree composition limits fish habitat (SHS '94-'96). Hardwoods and brush dominate riparian areas. Over 85% of S.Umpqua R. buffers are treeless or <= 1 tree wide; tribs are 20% tree-less.	Development has impacted wetlands.	Surface water temps exceed 303(d) '02 standards. High temps may limit fish production in some reaches. Streams with warmer temps often lack shade.	1. pH, bacteria, ~~chlorine~~ exceed 303(d) '02 standards. 2. ~~Ammonia, phosphorus potential concerns~~. 3. ~~DO once listed, no longer a concern.~~ DO levels do not meet 303(d) '04 – '06 standards.	Existing data do not indicate a limiting factor for the S. Umpqua River.	In-stream water rights exceed avg. streamflow all year during the summer and fall seasons. Consumptive use matches average streamflow, August to Oct.	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" (ODEQ '02).	Non-native fish live and reproduce in S. Umpqua R. Data on salmonid distribution and abundance in the watershed are incomplete.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Middle South Umpqua Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Practices	1. Add LWD and boulders to improve pools, collect gravel, and provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas; maintain areas with good native riparian veg.	Remove fish passage barriers, give priority to those opening most miles of upstream habitat.	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	Expand forested riparian zones and riverine wetlands by planting hydrophytic tree species. Plant or seed native wetland veg.; plug ditches; remove drainage tiles, culverts, unused roads; place LWD and boulders in tributaries; stabilize streambanks.	Increase shade with wide buffers and full canopies on small & medium streams.	For streams with pH, DO issues: Increase shade by planting wide riparian buffers and managing for native trees and full canopies. For streams w/ bacteria issues: Limit livestock stream access by providing water, shade away from riparian areas, fence riparian areas. Relocate structures and situations that concentrate domestic animals near streams or establish dense/ wide riparian veg. zones to filter fecal material where relocation not possible. Repair failing septic tanks/drain fields. Use wastewater treatment plant effluent for irrigation. Reduce chemical nutrient sources.	None identified.	Improve irrigation efficiency and in-stream water leasing.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

Middle South Umpqua Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. Kent Cr, E.Fk. Willis Cr, W.Fk. Willis Cr, Willis Cr (mainstem) ODEQ "habitat mod.": Clarks Br Cr, Kent Cr, Lane Cr, Rice Cr, S. Umpqua R	None identified. Van Dine Cr (low priority), Willis Cr	None identified. Rice Cr (bulldozer work in stream)	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible, esp. Brockway Cr, Clarks Branch Cr, Kent Cr, Rice Cr (from Barrett Cr to S. Umpqua R)[1], Rice Cr, Willis Cr.	Riparian zones and floodplains of S.Umpqua R (near Lane Cr, near Dillard end of Brockway Rd, and along the Missouri Bottom near Myrtle Creek Airport) and Rice Cr. (near Barrett Cr.)	303(d): Francis Cr, Rice Cr, S. Umpqua R.	1. 303(d) for pH, bacteria, ~~chlorine~~: S.Umpqua R 303(d) for bacteria: Rice Cr 2. ~~303(d) for ammonia, phosphorus:~~ ~~S.Umpqua R~~ 3. 303(d) for DO: S.Umpqua R Water quality data lacking for tribs. See notes below for PUR bacteria monitoring results.	None identified.	All streams with water rights.	ODEQ "flow mod.": Kent Cr, ~~Lane Cr~~, Rice Cr, Richardson Cr, S. Umpqua R, Willis Cr.	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

[1] These are the same stream names, only restated from their original order in the watershed assessment.

Notes:

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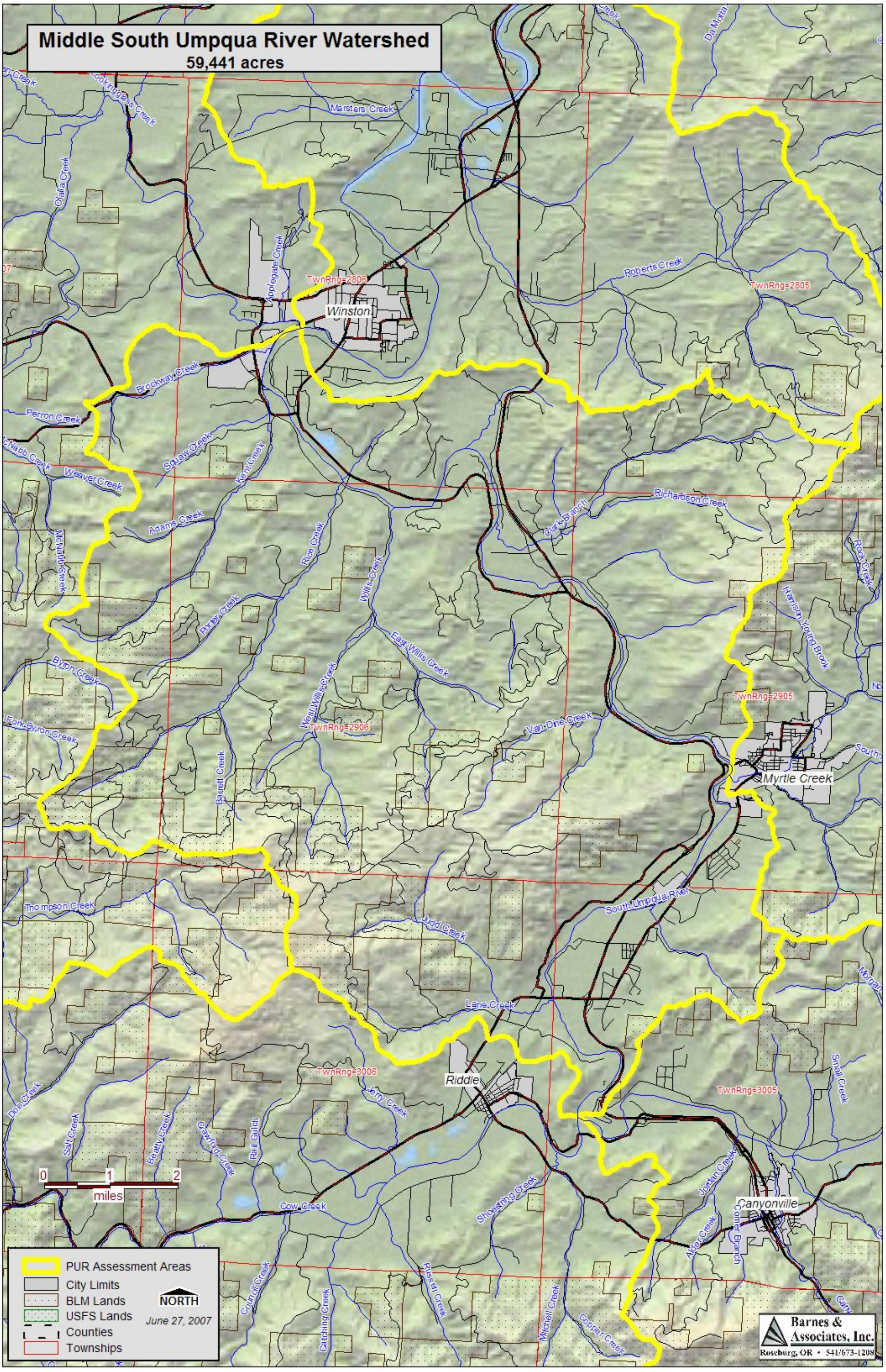
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: South Umpqua R. @ Dillard.
  - Streams identified with high levels of E. coli at times: South Umpqua R. below railroad trestle and above mouth of Myrtle Cr., South Umpqua @ Boomer Hill Rd.

Middle South Umpqua River Watershed

59,441 acres



Middle Umpqua River Watershed, Umpqua Subbasin, PUR's May 2006 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Poor riffles, poor/fair pools, poor/fair LWD, limit fish habitat (SHS). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth for fish, other aquatic life (ODEQ '02).	Culverts and at least one dam reduce connectivity, affect fish production. *Note: UBFAT is not complete for MUR.*	Likely much non-permitted channel mod. work.	Poor/fair riparian areas limit fish production (SHS). Riparian cover over streams is rated as "low" or "no cover" for one-third the length of streams in watershed.	Development, long-term ag. have probably resulted in loss of wetland areas.	Surface water temps exceed 303(d) '98 & '02 standards.	1. Bacteria (fecal coliform) exceed 303(d) '98 standards (but listing is based on samples taken out of watershed near Umpqua). Main sources: non-point livestock, wildlife, residential septic. 2. DO a possible concern. 3. pH, nutrients, toxics not likely problems.	Existing data do not indicate a limiting factor.	In-stream water rights exceed avg. streamflow from late spring through early fall in 2 of 3 WABs (Paradise Cr and Weatherly Cr).	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" for sub-standard flows for fish, other aquatic life (ODEQ '02).	Data on salmonid distribution and abundance in the watershed are incomplete. In-stream complexity and water quality are the most important limiting factors for coho in MUR.
Specific Recommended Practices	1. Add LWD and boulders to improve pools and riffles, provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas, maintain areas with good native riparian veg.	Remove fish passage barriers, give priority to those opening most miles of upstream habitat.	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	None identified.	Increase shade by encouraging development of riparian buffers and managing for full stream canopy coverage.	1. Limit livestock access to streams by fencing and providing stock water systems, shade trees outside of the riparian area. Relocate barns, other structures and situations that concentrate domestic animals near streams; establish dense riparian veg. filters where relocation not possible. Repair failing septic tanks and drain fields.	None identified.	None identified.	None identified.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Middle Umpqua River Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. none identified. Burchard Cr, Purdy Cr, Sawyer Cr ODEQ "habitat mod": Little Paradise Cr, Lutsinger Cr, Paradise Cr, Weatherly Cr	None identified. Golden Cr (dam), Burchard Cr (culvert on Hwy. 38)	None identified.	Streams w/ canopy cover <50%; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible. Golden Cr, Lutsinger Cr, Paradise Cr, Sawyer Cr, Weatherly Cr	None identified. Lutsinger Cr, Paradise Cr (off-channel pond), Sawyer Cr, Umpqua R (water retention pond across from Paradise Cr), Weatherly Cr	303(d): Little Mill Cr, Lutsinger Cr, Umpqua R.	1. 303(d) for bacteria: Umpqua R 2. Jon Cr See notes below for PUR bacteria monitoring results.	None identified.	None identified.	None identified. ODEQ "flow mod": Umpqua R.	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff

Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

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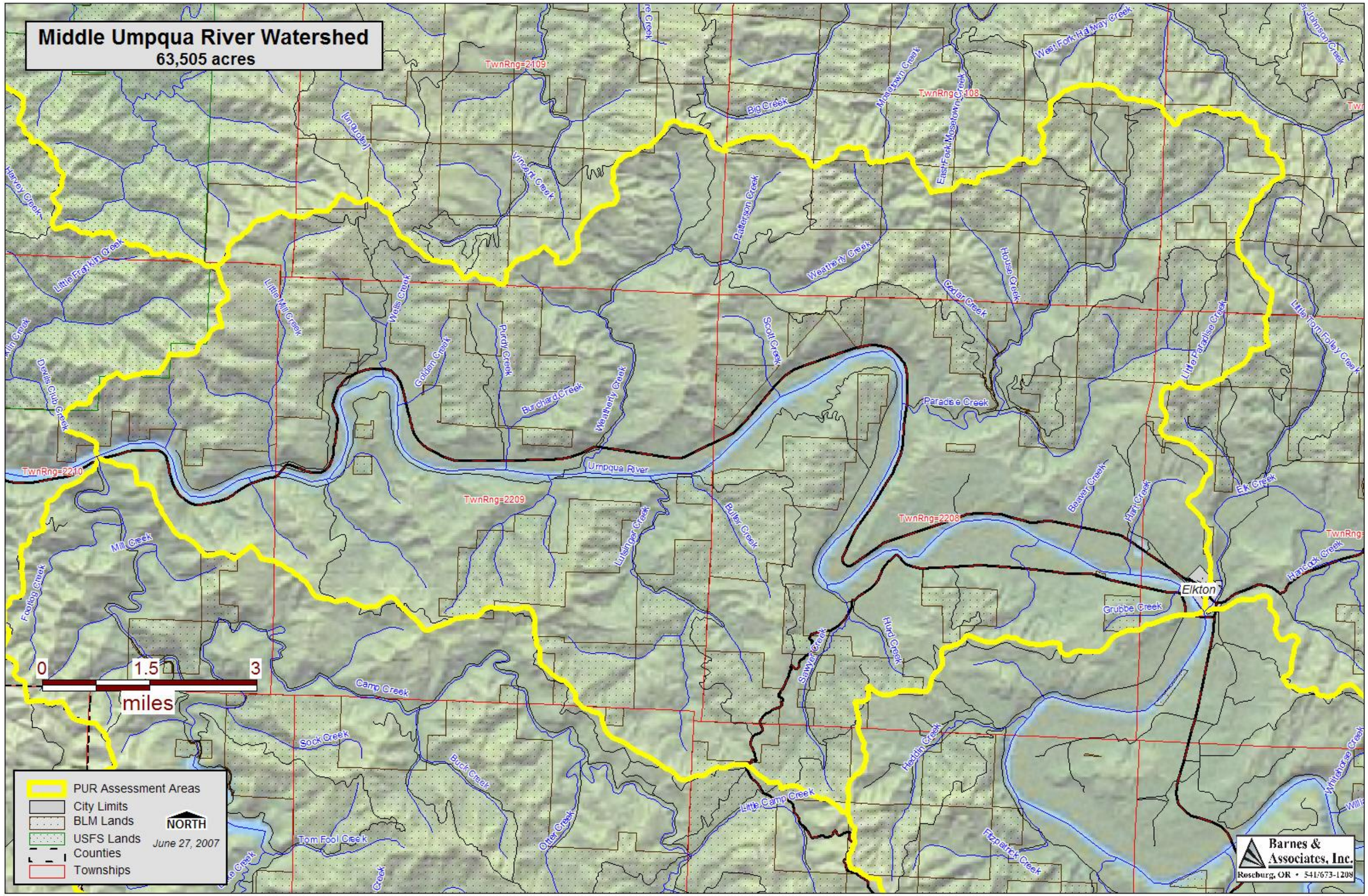
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: As of May 2007, PUR has not conducted water quality monitoring in this watershed.
  - Streams identified with high levels of E. coli at times: As of May 2007, PUR has not conducted water quality monitoring in this watershed.

Middle Umpqua River Watershed

63,505 acres



Mill Creek Watershed, Umpqua Subbasin, PUR's May 2006 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Poor riffles, poor/fair LWD, fair riparian conditions, poor pool conditions in some reaches limit fish habitat (SHS). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth for fish, other aquatic life (ODEQ).	At least one culvert reduces connectivity, affects fish production. *Note: UBFAT is not complete for Mill Creek.* *(Note: A steep gradient/ cascades in Mill Cr below Loon Lake is a natural barrier to fish passage.)*	Likely much non-permitted channel mod. work.	Scarcity of trees in riparian areas limits stream shading, contributes to relatively high stream temps in some streams. Note that across the watershed, 78% of streams have high cover. (This high cover and "fair" riparian conditions led to the "white" rating.)	Development, long-term ag. have probably resulted in loss of wetland areas.	Surface water temps exceed 303(d) standards.	1. DO may be a concern. 2. Nutrients, toxics not likely problems. 3. Bacteria levels are unknown. 4. pH not a likely problem.	Existing data do not indicate a limiting factor.	In-stream water rights meet or exceed avg. streamflows for one or more months of year (both WABs)	Water use is not a significant issue of concern in this watershed. *(Note: Water availability data suggest low streamflow could be a limiting factor.)* ~~Water quality limited for "flow modification" for sub-standard flows for fish, other aquatic life (ODEQ)~~	Data on salmonid distribution and abundance in the watershed are incomplete. In-stream complexity and water quality are the most important limiting factors for coho in Mill Cr.
Specific Recommended Practices	1. Add LWD and boulders to improve pools and riffles, provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas maintain areas with good native riparian veg.	Remove fish passage barriers, give priority to those opening most miles of upstream habitat.	None identified.	Remove blackberries, plant conifers, fence riparian areas.	Wetlands enhancement and protection opportunities	Increase shade by encouraging development of riparian buffers and managing for full stream canopy coverage.	None identified.	None identified.	None identified.	None identified.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Mill Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. none identified. Buck Cr, Footlog Cr, Sock Cr, Soup Cr SHS "poor" rating for LWD: Camp Cr, Mill Cr ODEQ "habitat mod.": Camp Cr, Lake Cr, Mill Cr, ~~Otter Cr~~	None identified.	None identified. Camp Cr oxbow, Lake Cr above Loon Lake – log jam removal by landowners	Streams w/ canopy cover <50%; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible; Lower Lake Cr, Lower Soup Cr Camp Cr – monitor conversions of red alder riparian zones to conifer for regeneration success, Upper Loon Lk.	Palustrine wetlands near Lake Cr and Soup Cr, lacustrine wetlands near Loon Lake. Camp Cr oxbow	303(d): Buck Cr, Camp Cr, Soup Cr	None identified. See notes below for PUR bacteria monitoring results.	None identified.	None identified.	None identified. ~~ODEQ "flow mod.":~~ ~~Otter Cr~~	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

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- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: As of May 2007, PUR has not conducted water quality monitoring in this watershed.
  - Streams identified with high levels of E. coli at times: As of May 2007, PUR has not conducted water quality monitoring in this watershed.

Mill Creek Watershed
86,039 acres

TwnRng=022S010W
TwnRng=022S009W
TwnRng=022S008W
TwnRng=023S010W
TwnRng=023S009W
TwnRng=023S008W
TwnRng=024S010W
TwnRng=024S009W
TwnRng=024S008W
TwnRng=025S009W
TwnRng=025S008W

Umpqua River
Weatherly Creek
Burchard Creek
Paradise Cr
Butler Creek
Luteinger Creek
Lister Creek
Fooling Creek
Pucker Creek
Double Barrel Creek
Mill Creek
Camp Creek
Kelly Creek
Sock Creek
Buck Creek
Sawyer Creek
Hurd Creek
Haddin Creek
Little Camp Creek
Otter Creek
Little Salander Creek
Loon Lake
Salander Creek
Tom Fool Creek
Lake Creek
North Fork Soup Creek
Matson Creek
Soup Creek
Slideout Creek
Surprise Creek
West Fork Lake Creek
Lake Creek
Shade Creek
Hound Creek
Belshazar Creek
Bear Camp Creek
Pheasant Creek
Brush Creek
Wolf Creek
Bull Canyon
Whiskey Camp Creek
Miner Creek
Case Knife Creek
Little Wolf Creek
Lake Creek

0 1.5 3
miles

PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships

NORTH
June 27, 2007

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Myrtle Creek Watershed, South Umpqua Subbasin, PUR's June 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of LWD & poor riffles, pools to a lesser degree, limit fish habitat (SHS '94). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '02).	Culverts (dams to a lesser degree) reduce connectivity, affect fish production. *Note: UBFAT is now complete for Myrtle Creek.*	Existing data do not indicate a limiting factor.	Riparian areas limit fish habitat (SHS '94)	Development has affected once-abundant wetlands in lowland valleys, esp. within Myrtle Creek UGB.	Surface water temps exceed 303(d) '02 standards. Streams with warmer temps often lack shade.	1. Nutrients - limited nitrates sampling results exceed OWEB-recommended levels. 2. Existing data do not indicate pH to be a limiting factor. ~~Ammonia on 303(d) '02 list, but '03 waste-water treatment plant fixes likely resolved.~~ 3. Data do not exist for DO ~~or bacteria.~~ 4. bacteria exceeds 303(d) '04 – '06 standards.	Existing data do not indicate a limiting factor.	In-stream water rights plus consumptive use is close to or exceeds average streamflow during summer months.	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" (ODEQ '02).	Non-native fish live and reproduce in S. Umpqua R., enter Myrtle Cr, but do not reside in Myrtle Cr because of cold waters. Data on salmonid distribution and abundance in the watershed are incomplete.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Myrtle Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Practices	1. Add LWD and boulders to improve pools and collect gravels. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas; maintain areas with good native riparian veg.	1. Remove fish passage barriers, give priority to those opening most miles of upstream habitat.	None identified.	Remove blackberries, plant conifers, exclude livestock from riparian areas, manage for uneven-aged stands and large diameter trees.	Restoration of key wetland areas may provide improved wildlife habitat, hydrologic control, and water quality.	Increase shade with wide buffers and full canopies on small & medium streams.	4. For streams w/ bacteria and nutrient issues: Limit livestock stream access by providing water, shade away from riparian areas, fence riparian areas. Relocate structures and situations that concentrate domestic animals near streams or establish dense/ wide riparian veg. zones to filter fecal material where relocation not possible. Repair failing septic tanks/drain fields. Use wastewater treatment plant effluent for irrigation. Reduce chemical nutrient sources.	None identified.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

Myrtle Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. Ben Branch Cr, Bilger Cr, Buck Fk Cr, Frozen Cr, Lee Cr, Louis Cr [3], N. Myrtle Cr [5], Slide Cr, S.Myrtle Cr [5], Weaver Cr ODEQ "habitat mod.": Myrtle Cr, N. Myrtle Cr	1. Low gradient channels (3% or less), esp. the lower ends of tribs entering N. Myrtle Cr.and S. Myrtle Cr. Frozen Cr, Letitia Cr (irrigation dam ~300' up from mouth)	Bilger Cr (ditched), Weaver Cr (re-routed)	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible; Bilger Cr [1], Frozen Cr [2], Letitia Cr, Louis Cr [4], N. Myrtle Cr [6], School Hollow Cr, Slide Cr [4] S. Myrtle Cr, Weaver Cr, W.Fk. Frozen Cr	None identified S. Myrtle Cr (near golf course)	303(d): Buck Cr, Johnson Cr, Letitia Cr, Louis Cr, Myrtle Cr, N. Myrtle Cr, Riser Cr, School Hollow Cr, Slide Cr, South Myrtle Cr, Weaver Cr	1. OWEB for nutrients (nitrates): Myrtle Cr (mainstem) 2. ~~303(d) for ammonia: Myrtle Cr (mainstem)~~ 4. 303(d) for bacteria: Myrtle Cr, N. Myrtle Cr See notes below for PUR bacteria monitoring results.	None identified	Myrtle Cr (main stem), N. Myrtle Cr, S. Myrtle Cr, and tributaries with irrigation rights, including Bilger Cr, Frozen Cr, Louis Cr	ODEQ "flow mod.": N. Myrtle Cr, S. Myrtle Cr	Tributaries, esp: Big Lick Cr, Cedar Hollow, Harrison Young Brook, Lally Cr, Long Wiley Cr, Short Wiley Cr, Louis Cr [5], School Hollow Cr

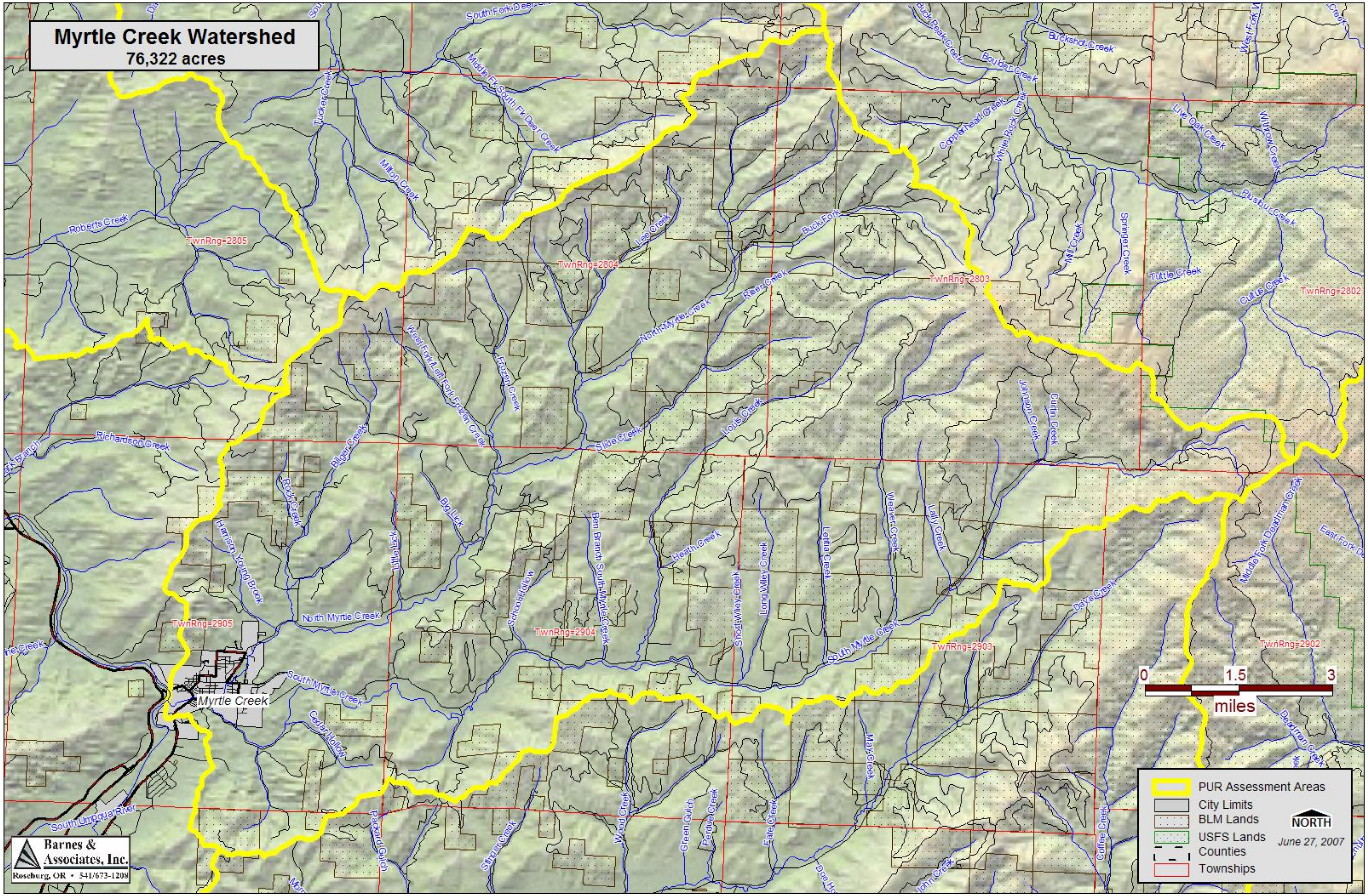
Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

Key:
[1] headwaters and mouth
[2] lower two-thirds
[3] upper two-thirds
[4] lower half
[5] upper reaches
[6] between Lee Creek and Buck Fork Creek and between Frozen Creek and Slide Creek

Notes:

- Text in black was taken from the original PUR watershed assessment.
- Blue text indicates April 2007 input by team of technical experts. ~~Blue text~~ indicates April 2007 judgment by technical experts that site has been restored or is otherwise not in need of restoration.
- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR watershed assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR watershed assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR watershed assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: Weaver Cr. near mouth, Slide Cr., N. Myrtle Cr. @ Buck Fork
  - Streams identified with high levels of E. coli at times: Myrtle Cr. near mouth, N. Myrtle Cr. above Bilger Cr., N. Myrtle Cr. @ Division St., N. Myrtle Cr. @ North Myrtle Park, Letitia Cr. near S. Myrtle Cr., Louis Cr. near S. Myrtle Cr., S. Myrtle Cr. @ stream mile 5.5, S. Myrtle Cr. above golf course, S. Myrtle Cr. @ Neal Lane Bridge, Frozen Cr. @ N. Myrtle Cr., Buck Fork @ N. Myrtle Cr., Bilger Cr. @ mouth.



Myrtle Creek Watershed
76,322 acres
PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships
NORTH
June 27, 2007
0
1.5
3
miles
Barnes & Associates, Inc.
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Myrtle Creek
TwnRng=2805
TwnRng=2804
TwnRng=2803
TwnRng=2802
TwnRng=2905
TwnRng=2904
TwnRng=2903
TwnRng=2902
North Myrtle Creek
South Myrtle Creek
South Umpqua River
Roberts Creek
Richardson Creek
Tucker Creek
Milton Creek
Middle Fk South Fk Deer Creek
South Fork Deer Creek
Buck Peak Creek
Buckshot Creek
Boulder Creek
Copperhead Creek
White Rock Creek
Live Oak Creek
Withrow Creek
Pusbuc Creek
Mill Creek
Springer Creek
Tuttle Creek
Cultus Creek
Buck Fork
Riser Creek
Lee Creek
Frozen Creek
West Fork Left Fork Frozen Creek
Slide Creek
Louis Creek
Johnson Creek
Curtin Creek
Bilger Creek
Rock Creek
Big Lick
Harrison Young Brook
Ben Branch South Myrtle Creek
Schoolhollow
Heath Creek
Short Wiley Creek
Long Wiley Creek
Letitia Creek
Weaver Creek
Lally Creek
Days Creek
Middle Fork Deadman Creek
East Fork Deadman Creek
Deadman Creek
Cedar Hollow
Packard Gulch
Slinger Creek
Wood Creek
Green Gulch
Perdue Creek
Fate Creek
May Creek
Coffee Creek
John Creek

Olalla-Lookingglass Watershed, South Umpqua Subbasin, PUR's August 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of LWD, poor riffles limit fish habitat (SHS '95-'96). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth. (ODEQ '02).	Culverts and dams reduce connectivity, affect fish production. *Note: UBFAT is now complete for O/L.*	None identified.	48% of riparian buffers are treeless or <= 1 tree wide; 24% of streams have <50% cover.	Once-abundant wetlands in lowland valleys have been impacted by development.	Surface water temps exceed 303(d) '02 standards. High temps may limit fish production in some reaches. Streams with warmer temps often lack shade.	1. Toxics exceed 303(d) '04 - '06 standards. 2. pH, nutrients – available data do not suggest a limiting factor. 3. DO, bacteria – potential concerns.	Most data indicates turbidity not a limiting factor. Anecdotal evidence suggests water released from Ben Irving Res. is often turbid with suspended clay.	In-stream water rights exceed avg. streamflow during September and October. Consumptive use matches average streamflow, July to Oct.	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" (ODEQ '02).	Non-native fish at times enter Lookingglass Cr, but too-cold water temps limit them to S. Umpqua R. Data on salmonid distribution and abundance in the watershed are incomplete.
Specific Recommended Practices	1. Add LWD and boulders to improve pools, collect gravel, and provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas; maintain areas with good native riparian veg.	1. Remove fish passage barriers, give priority to those opening most miles of upstream habitat.	Restore natural meanders.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	None identified.	Increase shade by encouraging wide riparian buffers and managing for full canopies.	None identified.	Establish erosion control measures.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Olalla-Lookingglass Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. Bushnell Cr, Byron Cr, N. Fk. Byron Cr, E. Fk. Byron Cr, Coarse Gold Cr, Irwin Cr (may be known as Quarry Cr), Little Muley Cr, Lookingglass Cr, Olalla Cr[2], Porter Cr (upper ¾), Rock Cr, Shields Cr[2], Tenmile Cr, Thompson Cr, ODEQ "habitat mod.": Thompson Cr	1. Low gradient, lower ends of tribs entering Lookingglass Cr. and: Lee's culvert on Archambeau (west side of Flournoy Valley) Bushnell Cr culvert ID'ed by community group Culvert on Upper Tenmile trib. after F. Fork Strickland Canyon unnamed tributary – two possible culvert obstacles Irwin Cr (may be known as Quarry Cr), Olalla Cr (upstream of Redding Cr), Porter Cr (culverts and one dam), Redding Cr	Larson Cr	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible, esp. Lookingglass Cr and its tribs. Applegate Cr, Archambeau Cr, Byron Cr[3], Flournoy Cr, (including berry conversion[3]), Larson Cr, Lookingglass Cr (including berry conversion), Lookingglass Cr[1], McNabb Cr (including berry conversion[3]), Morgan Cr (including berry conversion[3]), Olalla Cr (including berry conversion[3]), Perron Cr (including berry conversion[3]), Porter Cr (including berry conversion, lower ¼), Rock Cr + tribs, Shields Cr[3], Strickland Canyon (lower	None identified. Little Muley Cr, Lookingglass Cr, Olalla Cr, Tenmile Cr, Willingham Cr	303(d): Bear Cr, Lookingglass Cr, Olalla Cr, Thompson Cr	1. 303(d) for toxics (iron): Olalla Cr See notes below for PUR bacteria monitoring results.	Flournoy Cr, Lookingglass Cr, Shields Cr Tenmile Cr,	Lookingglass Cr, Olalla Cr, Morgan Cr, Tenmile Cr	Lookingglass Cr, Olalla Cr, Morgan Cr, Tenmile Cr ODEQ "flow mod": Byron Cr, Lookingglass Cr, Olalla Cr, Tenmile Cr, Thompson Cr	Coarse Gold Cr (BLM & RFP), Larson Cr, Lookingglass Cr[1], Muns Cr[2], Suicide Cr, Tenmile Cr

				1/3 unnamed tribs 3&4), Tenmile Cr (including berry conversion[3], Thompson Cr							

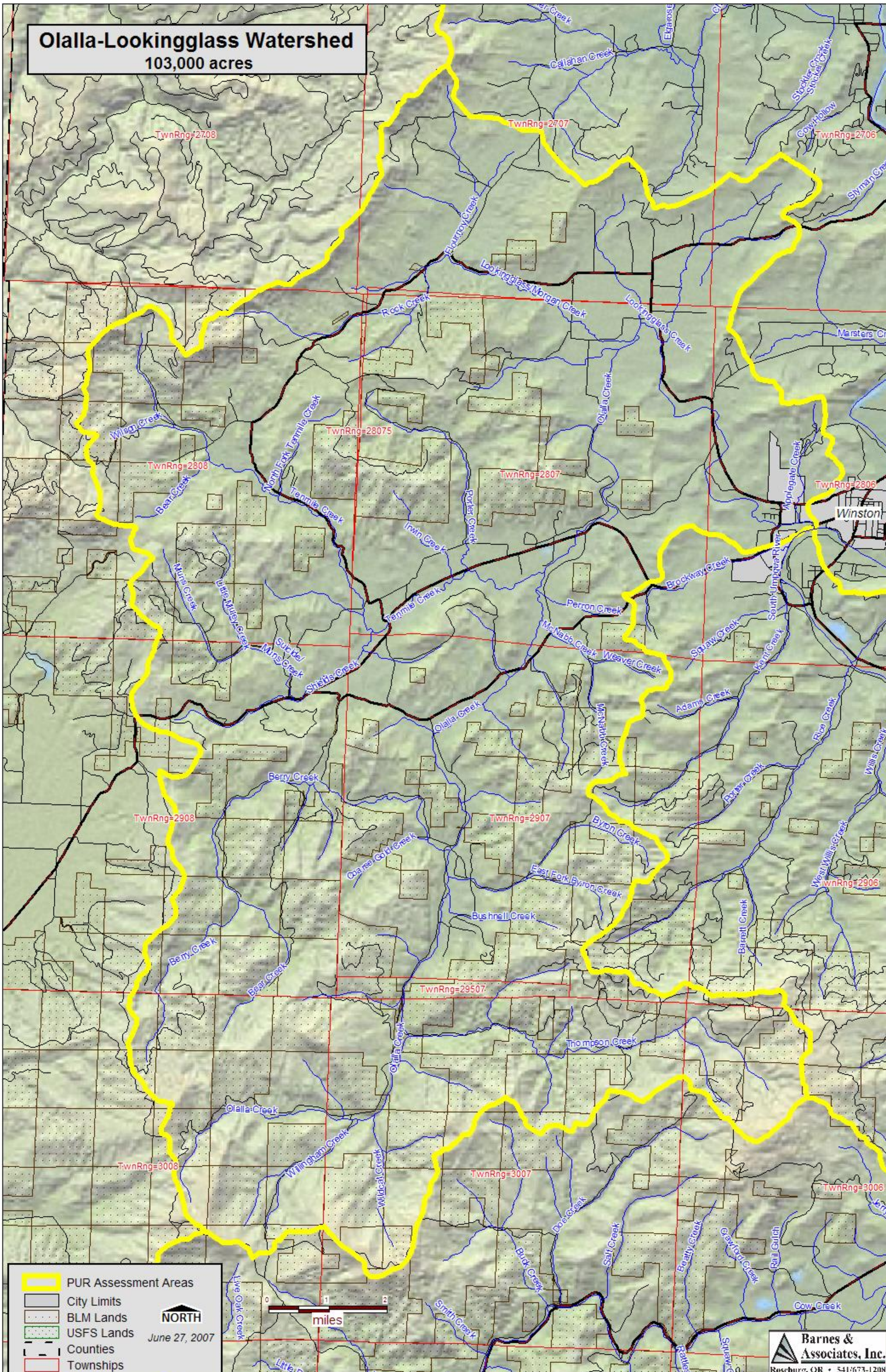
Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

[1] Unnamed tributary at northernmost bend.
[2] Upper half of stream.
[3] Lower half of stream.

Notes:

- Text in black was taken from the original PUR watershed assessment.
- Blue text indicates April 2007 input by team of technical experts. ~~Blue text~~ indicates April 2007 judgment by technical experts that site has been restored or is otherwise not in need of restoration.
- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR watershed assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR watershed assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR watershed assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: As of May 2007, PUR has not conducted water quality monitoring in this watershed.
  - Streams identified with high levels of E. coli at times: As of May 2007, PUR has not conducted water quality monitoring in this watershed.
- "Berry conversion" = removing blackberries and planting native vegetation.


Olalla-Lookingglass Watershed
103,000 acres
TwnRng=2708
TwnRng=2707
TwnRng=2706
TwnRng=28075
TwnRng=2808
TwnRng=2807
TwnRng=2806
TwnRng=2908
TwnRng=2907
TwnRng=2906
TwnRng=29507
TwnRng=3008
TwnRng=3007
TwnRng=3006
Callahan Creek
Elgarose
Stockler Creek
Stocker Creek
Cow Hollow
Slyman Creek
Flournoy Creek
Lookingglass/Morgan Creek
Lookingglass Creek
Rock Creek
Marsters Creek
Olalla Creek
Wilson Creek
North Fork Tenmile Creek
Tenmile Creek
Bear Creek
Irwin Creek
Porter Creek
Applegate Creek
Winston
Muns Creek
Little Muley Creek
Suicide/ Muns Creek
Shields Creek
Perron Creek
McNabb Creek
Weaver Creek
Brockway Creek
South Umpqua River
Squaw Creek
Kent Creek
Adams Creek
Rice Creek
Willis Creek
Berry Creek
Coarse Gold Creek
Byron Creek
East Fork Byron Creek
Bushnell Creek
West Willis Creek
Barrett Creek
Thompson Creek
Willingham Creek
Wildcat Creek
Doe Creek
Salt Creek
Beatty Creek
Crawford Creek
Rail Gulch
Buck Creek
Smith Creek
Cow Creek
Live Oak Creek
Little Dads C
Squaw Cre
Jerry C
PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships
NORTH
June 27, 2007
0
1
2
miles
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Rock Creek Region, North Umpqua Subbasin, PUR's March 2006 Region Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Lack of LWD, poor riffles, poor pools limit fish habitat (SHS '92-'96). Lack of winter habitat and spawning gravels limit fish habitat. Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '02).	Culverts and the diversion dam at Rock Creek Hatchery reduce connectivity, affect fish production. *Note: UBFAT is now complete for Rock Cr Region.*	Historical channel modification impacted stream function. Current channel modification unknown.	Past timber harvest, road construction, noxious weed invasion have impacted riparian areas. Roads near riparian areas have created permanent loss of riparian function. Noxious weeds out-compete native veg., don't provide same functions.	Road construction, development, noxious weeds have changed wetland hydrology in Region.	Surface water temps exceed 303(d) '02 standards. Streams with warmer temps often lack shade.	1. Toxics (arsenic) exceed 303(d) '02 standards (levels may be related to local volcanic geology). 2. DO may be limiting on N. Umpqua R., pH a potential concern on Rock Cr and Canton Cr 3. Nutrients, bacteria not a concern.	None identified.	In-stream water rights are close to or exceed average streamflow during one or more months of the year (all 3 Rock Creek Region WABs).	Peak flood events have scoured away vegetation from streambanks and within riparian areas, exacerbating disturbance in these areas. Water quality limited for "flow modification" (ODEQ '02).	Low numbers of non-natives including brown trout and brook trout may be present in the N. Umpqua R. and some smaller tributaries within the Middle North Umpqua Watershed. More quantitative data are needed to evaluate salmonid and non-salmonid abundance and distribution in the Region.

Note: See notes at bottom of this region's last page for an explanation of blue, red, and green text.

June 2007

Rock Creek Region

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Practices	1. Add LWD and boulders to improve pools and riffles, collect gravel, and provide other structure benefits; 2. maintain areas with good riparian buffers through easements and education. In-stream wood or boulder placement, riparian improvement and protection, and road obliteration are all restoration strategies that can increase winter habitat and spawning gravels.	Remove fish passage barriers, give priority to those opening most miles of upstream habitat. Use UBFAT results and fish bio. expertise to prioritize culverts for replacement. Redesign Rock Cr diversion dam.	None identified.	Plant conifers, other native veg. in poor or fair riparian areas; thin young conifers to encourage un-even aged stands of large diameter trees. broad crowns. Remove or control noxious weeds in recently harvested riparian areas, along roads next to riparian areas.	Enhance and protect wetlands, including forested alder stands and emergent and forested wetlands.	Thin, remove weeds, plant trees, add LWD to reduce stream warming rates during summer. Add LWD to reduce downcutting on tributaries to help reduce the rapid loss of groundwater early in the summer, maintain more constant groundwater inflow throughout the warm season. Increase shade on very warm streams by managing for wide riparian buffers and full canopies.	None identified.	None identified.	Reduce summer water consumption through in-stream water leasing and by improving irrigation efficiency.	Thin, remove weeds, plant trees, add LWD in flood plain areas to reduce scouring, other negative impacts of peak flows.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this region's last page for an explanation of blue, red, and green text.

June 2007

Rock Creek Region

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. broad, low-gradient reaches of: Rock Cr, Canton Cr (from Chilcoot Cr to Scaredman Cr), Conley Cr, Fairview Cr, Harrington Cr, Honey Cr, Mellow Moon Cr, N. Umpqua R, E.Fk. Rock Cr, N.Fk of E.Fk. Rock Cr, Shoop Cr, Susan Cr, Williams Cr ODEQ "habitat mod.": Canton Cr, ~~Pass Cr,~~ N. Umpqua R	Rock Cr diversion dam. UBFAT: Kelly Cr, McComas Cr, Hill Cr, ~~Honey Cr~~, Williams Cr Fish biologists: Surprise Cr, Taylor Cr, (+ Kelly Cr and McComas Cr from UBFAT) Bogus Cr, Clay Cr, Conley Cr, Fairview Cr, Fall Cr, Kelly Cr, McComas Cr, Shoop Cr, Stoney Cr, Williams Cr (at Hwy. 138)	None identified.	Smaller streams w/ anadromous fish presence where channel widths can be more heavily shaded by riparian cover, junctions of tributaries/main channels where anadromous fish use is heavy and channel width and water velocity is lower than in the main streams such as: Rock Cr (from Miller Cr to mouth), Honey Cr	Rock Cr (lower to middle segments – E.Fk. Rock Cr to McComas Cr), Canton Cr (from Wolverine Cr to Scaredman Cr), Pass Cr (along bottom), Cougar Cr (upper reaches), N. Fk. Chilcoot Cr (upper reaches), N. Umpqua R (above Susan Cr and near Bogus Cr), Honey Cr (lower terrace)	303(d): Canton Cr, E. Fk. Rock Cr, E. Pass Cr, Harrington Cr, Honey Cr, ~~MellowMoon Cr~~, ~~Miller Cr~~, N. Umpqua R, NE Rock Cr, N. Fk. of E. Fk. Rock Cr, Pass Cr, Rock Cr, Rock Cr trib near Harrington Cr, Scaredman Cr, Susan Cr	1. 303(d) for toxics (arsenic): N. Umpqua R DO – possible limitation: N. Umpqua R. pH – potential concern: Rock Cr, Canton Cr See notes below for PUR bacteria monitoring results	None identified. Bob Cr (management-related slide)	All streams with water rights.	Canton Cr, E. Fk. Rock Cr, Harrington Cr, Miller Cr, Pass Cr, Rock Cr ODEQ "flow mod.": N. Umpqua R, ~~Pass Cr~~	None identified.

Note: See notes at bottom of this region's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in assessment.
Top priority streams for projects: not addressed in assessment.

Notes:

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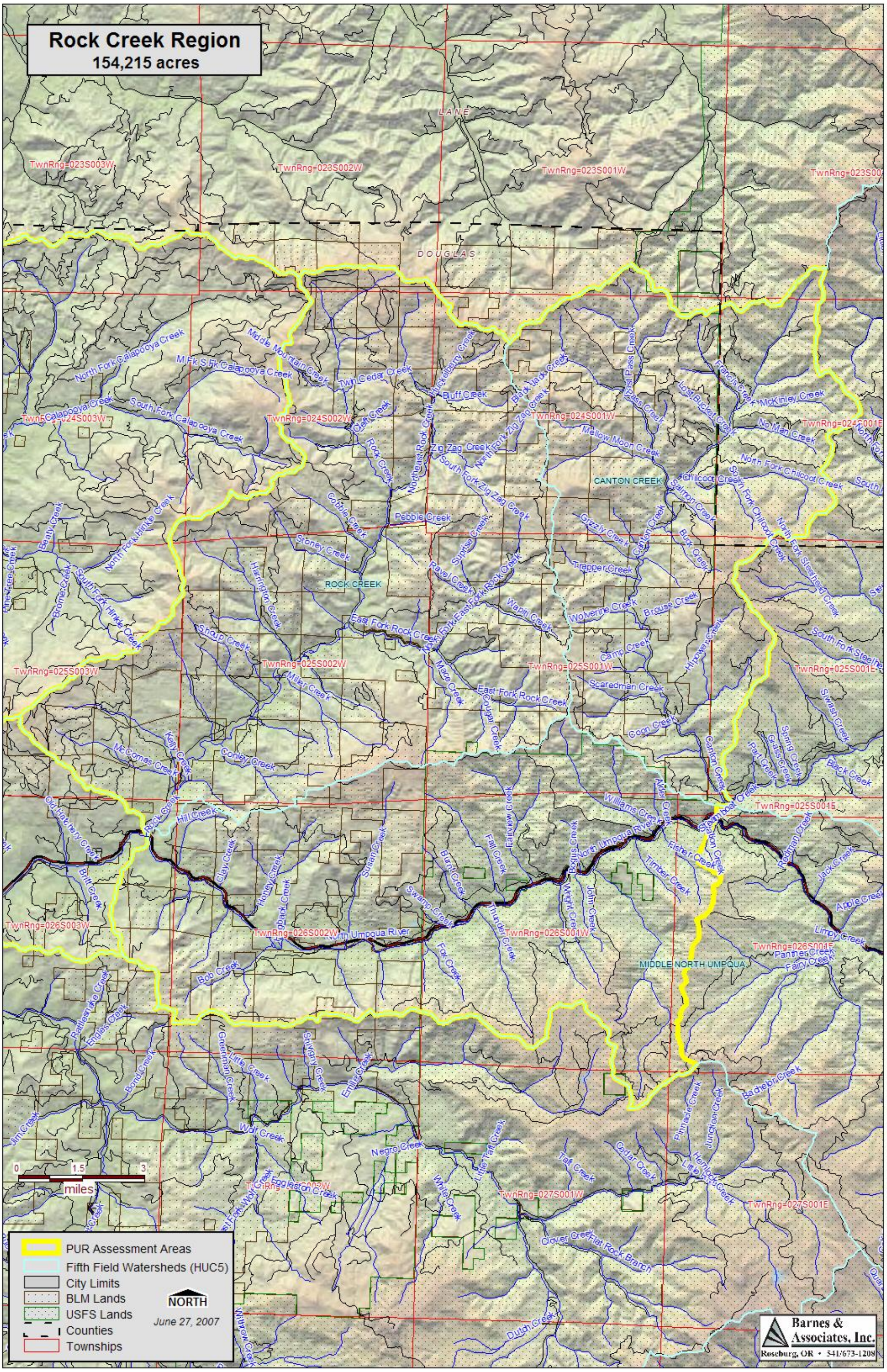
- Blue text indicates April 2007 input by team of technical experts. ~~Blue text~~ indicates April 2007 judgment by technical experts that site has been restored or is otherwise not in need of restoration.
- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR region assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR region assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR region assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: As of May 2007, PUR has not conducted water quality monitoring in this region.
  - Streams identified with high levels of E. coli at times: As of May 2007, PUR has not conducted water quality monitoring in this region.
- Coho are present on the mainstem of Rock Creek up to approximately Pebble Creek.

Rock Creek Region
154,215 acres



South Umpqua River Watershed, South Umpqua Subbasin, PUR's November 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of LWD, poor riffles, poor/fair pools limit fish habitat (SHS '92-'96). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '02).	Dams and culverts reduce connectivity, affect fish production. *Note: UBFAT is now complete for SUR.*	Likely much non-permitted channel mod. work.	Over ⅓ of salmonid streams are less than ½ shaded; some streams have riparian buffers no more than 1 tree wide.	Development, long-term agriculture have affected wetlands.	Surface water temps exceed 303(d) '02 standards. Streams with warmer temps often lack shade.	1. pH, ~~chlorine~~ exceeds 303(d) '02 standards. DO levels do not meet 303(d) '04 – '06 standards. 2. Bacteria exceeds 303(d) standards (ODEQ data is from outside SUR), PUR data seems to validate listing. ~~ammonia a potential concern~~.	Existing data do not indicate a limiting factor.	In-stream water rights meet or exceed avg. streamflows during the summer and fall seasons (both WABs).	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" (ODEQ '02).	Non-native fish live and reproduce in S. Umpqua R., but small tribs too cold; data on salmonid distribution and abundance in the watershed are incomplete.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

South Umpqua River Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Practices	1. Add LWD and boulders to improve pools and riffles, provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas; maintain areas with good native riparian veg.	1. Remove fish passage barriers, give priority to those opening most miles of upstream habitat. 2. evaluate fish passage barriers via UBFAT.	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	Create or improve wetlands.	Increase shade with wide buffers and full canopies on small & medium streams.	1. Increase shade with wide buffers and full canopies on small & medium streams. 2. Limit livestock access to streams by fencing and providing stock water systems, shade trees outside of the riparian area. Relocate barns, other structures and situations that concentrate domestic animals near streams; establish dense riparian veg. filters where relocation not possible. Repair failing septic tanks and drain fields. Use wastewater treatment plant effluent for irrigation. Reduce chemical nutrient sources.	None identified.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Reduce summer water consumption via in-stream leases and improved irrigation efficiency.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

South Umpqua River Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. Beals Cr, Coffee Cr, Morgan Cr, O'Shea Cr (up to City of Canyonville dam), Shively Cr, Stouts Cr, Upper Days Cr, W.Fk. Stouts Cr ODEQ "habitat mod.": Beals Cr, Days Cr, Shively Cr, S.Umpqua R.	1. ~~Beals Cr,~~ Doe Hollow Cr, ~~Fate Cr~~, Morgan Cr, Poole Cr, Small Cr, Stinger Gulch 2. Coffee Cr, Corn Cr, E Fk Shively Cr, Morgan Cr, Upper Days Cr	Beals Cr (down-stream of county bridge re-routed for gravel extraction), Stouts Cr.	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible; Alder Cr, Beals Cr, Canyon Cr, Coffee Cr, Days Cr, Jordan Cr, Morgan Cr, O'Shea Cr, Packard Gulch, Small Cr, Stinger Gulch, Wood Cr	Along South Umpqua River in the Morgan Cr area. Beals Cr, Stouts Cr (off-channel pond opportunity)	303(d): Canyon Cr, Coffee Cr, Days Cr, ~~E.Fk.Shively Cr~~, E.Fk.Stouts Cr, Fate Cr, Lavadoure Cr, Shively Cr, S.Umpqua R, Stouts Cr, W.Fk.Canyon Cr	1. 303(d) for pH, ~~chlorine~~, DO: S.Umpqua R 2. 303(d) for bacteria, ~~ammonia~~: S.Umpqua R See notes below for PUR bacteria monitoring results.	None identified.	Streams with irrigation rights such as South Umpqua River.	ODEQ "flow mod.": Canyon Cr, Days Cr, O'Shea Cr, St. John Cr, S.Umpqua R.	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: Stouts Creek, Shively Creek
Top priority streams for projects: Beals Creek, Upper Days Creek, Corn Creek, Coffee Creek, and Stouts Creek

Notes:

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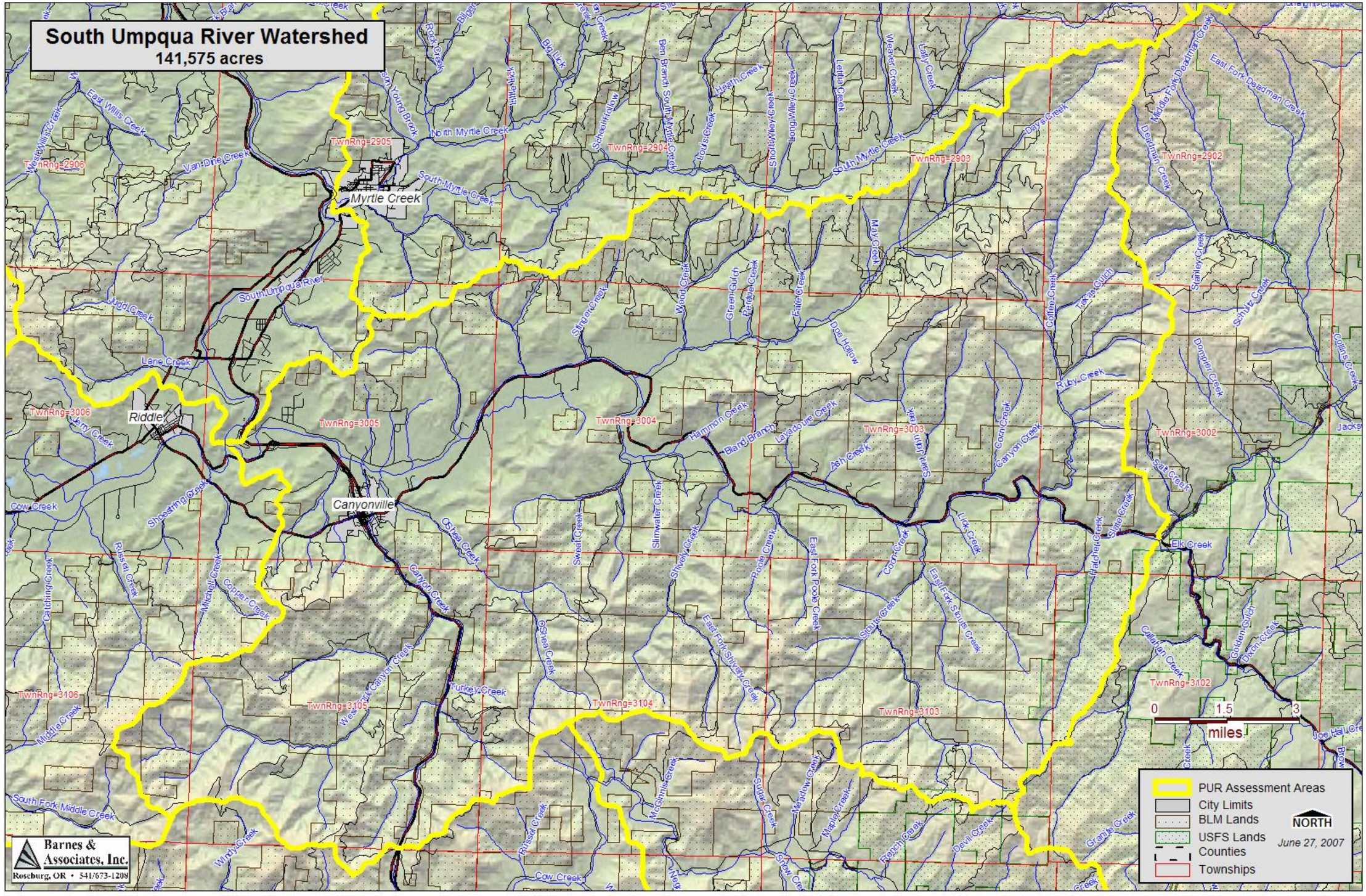
- Blue text indicates April 2007 input by team of technical experts. ~~Blue text~~ indicates April 2007 judgment by technical experts that site has been restored or is otherwise not in need of restoration.
- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR watershed assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR watershed assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR watershed assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: South Umpqua R. @ Stanton Park
  - Streams identified with high levels of E. coli at times: South Umpqua R. @ Days Cr. bridge, Days Cr. @ Woods Cr. bridge, Woods Cr. @ mouth
- A natural fish passage barrier (bedrock chute) exists on Day's Creek just upstream of the Highway 227 bridge.

South Umpqua River Watershed

141,575 acres



Tiller Region, South Umpqua Subbasin, PUR's November 2003 Region Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of LWD, poor riffles limit fish habitat (SHS '92, '93, '96). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth. (ODEQ '02)	Unknown number of culverts that reduce connectivity, affect fish production. *Note: UBFAT is not yet complete for Tiller Region.*	Likely much non-permitted channel mod. work.	Mgmt. activity has altered riparian zone veg. from its natural state. Poor riparian areas in Deadman Cr drainage. (SHS '92, '93, '96). 2002 Boulder Fire damaged riparian areas along Dumont Cr.	Some historical wetlands have been altered by human activities.	High stream temps limit salmonid rearing. Warmer sites often lack shade; more shade on small, medium streams may improve overall stream temp. Surface water temps exceed 303(d) '02 standards.	1. pH – exceeds 303(d) '02 standards. 2. bacteria - existing data do not indicate a limiting factor, but data is limited. 3. DO, nutrients, toxics - existing data do not indicate a limiting factor.	Sediment levels exceed 303(d) '02 standards. Summer '02 burns may increase sediment loads in Dumont Cr.	In-stream water rights exceed natural streamflow during the summer and early fall.	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification." (ODEQ '02)	More quantitative data are needed to evaluate salmonid abundance and the distribution and abundance of non-salmonid fish in the region.
Specific Recommended Practices	1. Add LWD and boulders to collect gravel, improve riffles, and provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, maintain areas with good native riparian veg., exclude livestock from riparian areas.	Remove identified fish passage barriers, give priority to those opening most miles of upstream habitat.	None identified.	Convert areas of brush to wide buffers of native conifers; manage for uneven-aged stands and large diameter trees.	None identified.	Increase shade by encouraging wide riparian buffers and managing for full canopies.	pH: Increase shade by encouraging wide riparian buffers and managing for full canopies. Shade will help moderate excessive pH levels.	Remedy sediment sources such as failing culverts or roads, landside debris, construction, or burns.	None identified.	Reduce summer water consumption through in-stream water leasing and by improving irrigation efficiency. *Note, however, that consump-tive use in region is minimal.*	Support salmonid and non-salmonid distribution and abundance research activities in the region, especially at the local level.

Note: See notes at bottom of this region's last page for an explanation of blue, red, and green text.

Tiller Region

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. Brownie Cr, Deadman Cr, Dompier Cr, ~~Dumont Cr~~, Joe Hall Cr, Straight Cr. (all per SHS) ODEQ "habitat mod": Beaver Cr, Callahan Cr, Deadman Cr, Dumont Cr, Elk Cr, Jackson Cr, S. Umpqua R.	None identified.	None identified.	Poorly-shaded streams or streams w/ narrow riparian zones; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible. SHS: Deadman Cr drainage.	None identified.	303(d): Beaver Cr, Brownie Cr, Callahan Cr, Deadman Cr, Drew Cr, Dumont Cr, E. Fk. Deadman Cr, Elk Cr, Flat Cr, ~~Francis Cr~~, Jackson Cr, Joe Hall Cr, Middle Fk. Deadman Cr, S.Umpqua R.	1. 303(d) for pH: Jackson Cr, ~~S. Umpqua R.~~ (pH high at Elk Cr, too, but not on 303(d) list). See notes below for PUR bacteria monitoring results.	Beaver Cr, Jackson Cr, S. Umpqua R. (all 303(d) listed based on 1995 USFS study). Elk Cr is a chronic source of slides and sediment; Joe Hall Cr is a major source of sediment.	None identified.	ODEQ "flow mod.": Elk Cr, S.Umpqua R.	None identified.

Note: See notes at bottom of this region's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: None identified.
Top priority streams for projects: Lower Deadman Creek, Elk Creek, and the mainstem South Umpqua River have the greatest potential for restoration activities.

Notes:

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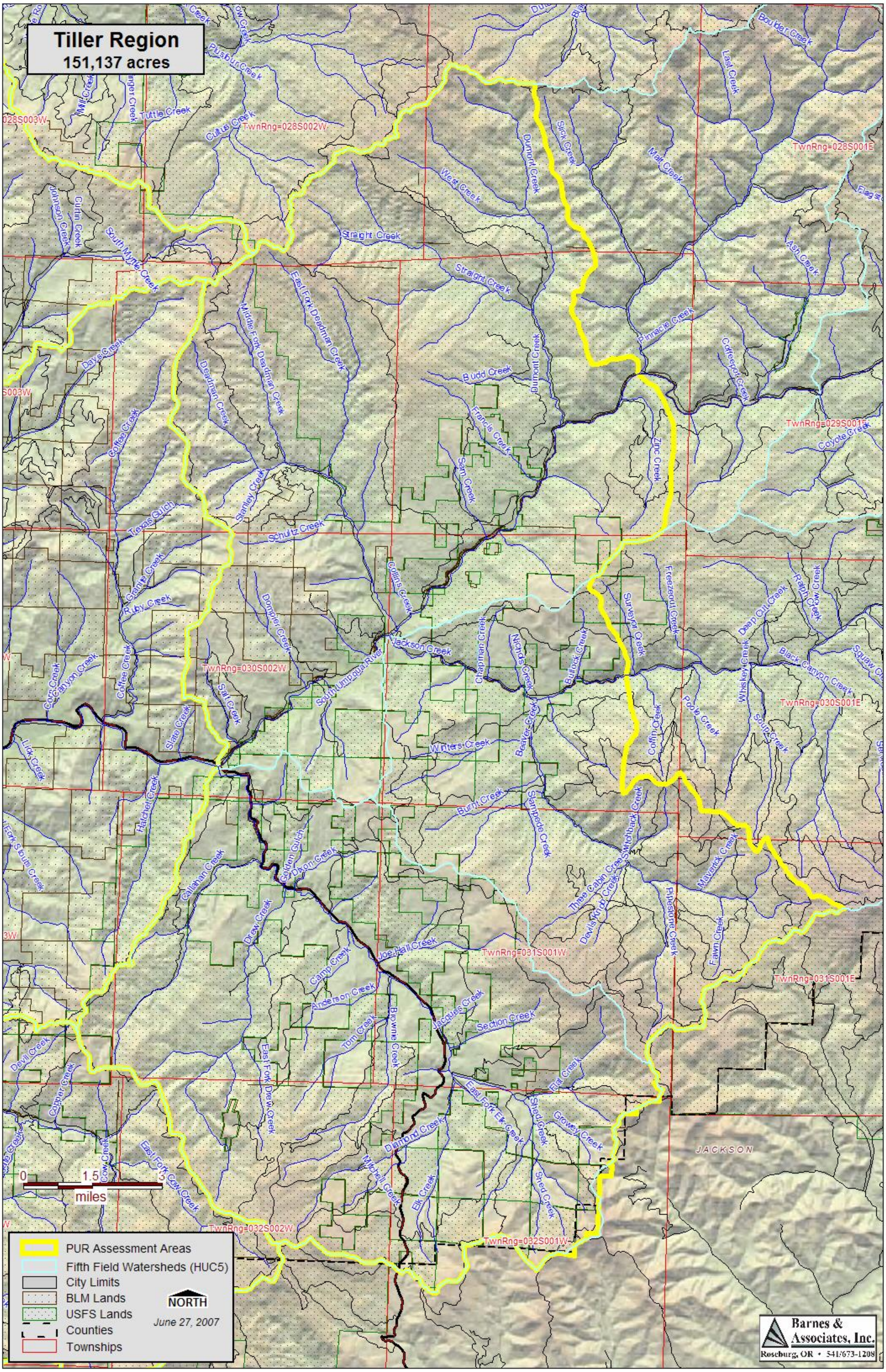
- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR region assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR region assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR region assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: As of May 2007, PUR has not conducted water quality monitoring in this region.
  - Streams identified with high levels of E. coli at times: As of May 2007, PUR has not conducted water quality monitoring in this region.
- The Tiller Region is predominantly federal land with a very small population of resident landowners. Thus, the Tiller Region has been a low priority for PUR improvement projects.



Tiller Region
151,137 acres
TwnRng=028S002W
TwnRng=028S001E
TwnRng=029S001E
TwnRng=030S002W
TwnRng=030S001E
TwnRng=031S001W
TwnRng=031S001E
TwnRng=032S002W
TwnRng=032S001W
Plusbur Creek
Tuttle Creek
Cultus Creek
Johnson Creek
Curtin Creek
South Myrtle Creek
Straight Creek
West Creek
Dumont Creek
Slick Creek
Malt Creek
Last Creek
Boulder Creek
Ash Creek
Pinnacle Creek
Coffeepot Creek
Coyote Creek
Days Creek
East Fork Deadman Creek
Middle Fork Deadman Creek
Deadman Creek
Coffee Creek
Budd Creek
Francis Creek
Sam Creek
Zinc Creek
Stanley Creek
Texas Gulch
Schultz Creek
Granite Creek
Ruby Creek
Dompier Creek
Collins Creek
Jackson Creek
South Umpqua River
Chapman Creek
Nichols Creek
Bullock Creek
Surveyor Creek
Freezeout Creek
Deep Cut Creek
Ralph Creek
Whiskey Creek
Black Canyon Creek
Squaw Cr
Canyon Creek
Salt Creek
Slate Creek
Lick Creek
Hatchet Creek
Winters Creek
Beaver Creek
Coffin Creek
Poole Creek
Soup Creek
Burnt Creek
Stampede Creek
Switchback Creek
Maverick Creek
Three Cabin Creek
Devils Knob Creek
Pipestone Creek
Fawn Creek
Golden Gulch
Dixon Creek
Callahan Creek
Drew Creek
Joe Hall Creek
Camp Creek
Anderson Creek
Tom Creek
Browne Creek
Jacques Creek
Section Creek
Devil Creek
Copper Creek
East Fork Drew Creek
Flat Creek
East Fork Elk Creek
Shed Creek
Growey Creek
Diamond Creek
Mitchell Creek
Elk Creek
Cow Creek
East Fork Cow Creek
JACKSON
0 1.5 3
miles
PUR Assessment Areas
Fifth Field Watersheds (HUC5)
City Limits
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Upper Cow Creek Watershed, South Umpqua Subbasin, PUR's November 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or insufficient data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Poor riffles, lack of LWD, poor/fair pools limit fish habitat (SHS '96). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '02).	Galesville Dam is a complete barrier to anadromous. Culverts reduce connectivity, affect resident fish production. *Note: UBFAT is not complete for UCC yet.*	Existing data do not indicate a limiting factor. Current, small mining operations on Applegate Cr, Dismal Cr. Tailings from past mining on E.Fk. Cow Cr.	Existing data are limited, but do not indicate a limiting factor.	Existing data are limited, but do not indicate a limiting factor.	Surface water temps exceed 303(d) '98 standards during summer (>64º).	1. Toxics (in form of mercury levels in fish) exceed 303(d) '02 standards. pH exceeds 303(d) '04 – '06 standards 2. Data do not exist for bacteria. 3. Existing data do not indicate a limiting factor for ~~pH~~, DO, nutrients.	Existing data do not indicate a limiting factor for sediment alone. However concern is for sediment as vector for mercury input to aquatics.	In-stream water rights exceed average streamflow in October (WAB and HUC5 match).	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" (ODEQ '02).	Galesville Res. is a barrier, so only salmonid is cutthroat trout. Non-native fish live and reproduce in Galesville Res. Data on salmonid distribution and abundance in the watershed are incomplete.
Specific Recommended Practices	1. Add LWD and boulders to improve riffles and provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas; maintain areas with good native riparian veg.	1. Remove fish passage barriers, give priority to those opening most miles of upstream habitat. 2. evaluate fish passage barriers via UBFAT.	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	None identified.	Increase shade with wide buffers and full canopies on small & medium streams.	No actions have been proposed to address mercury contamination in Galesville Reservoir fish. Minimize sediment loss in order to minimize mercury input to aquatics.	None identified. Minimize sediment loss in order to minimize mercury input to aquatics.	Reduce summer water consumption through in-stream water leasing and by improving irrigation efficiency.	Reduce summer water consumption through in-stream water leasing and by improving irrigation efficiency.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

Upper Cow Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. *none identified.* Applegate Cr (below Jack Cr), Dismal Cr, Meadow Cr, S.Fk.Cow Cr, Snow Cr ODEQ "habitat mod.": ~~Applegate Cr,~~ Cow Cr, unnamed trib to Cow Cr, ~~Dismal Cr~~	None identified.	None identified.	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible. Cow Cr (Sugar Cr to E.Fk/S.Fk confluence), Meadow Cr, Snow Cr (lower end)	None identified.	303(d): Applegate Cr, Cow Cr, Dismal Cr, Snow Cr	1. 303(d) for toxics (mercury levels in fish): Galesville Reservoir 303(d) for pH: Cow Cr 2. none 3. none See notes below for PUR bacteria monitoring results.	None identified.	None identified.	ODEQ "flow mod": Cow Cr	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in the best condition: East Fork Cow Creek
Greatest potential for fish habitat and water quality improvement projects: Mainstem Cow Creek, French Creek, Applegate Creek, Snow Creek, and Meadow Creek.

Notes:

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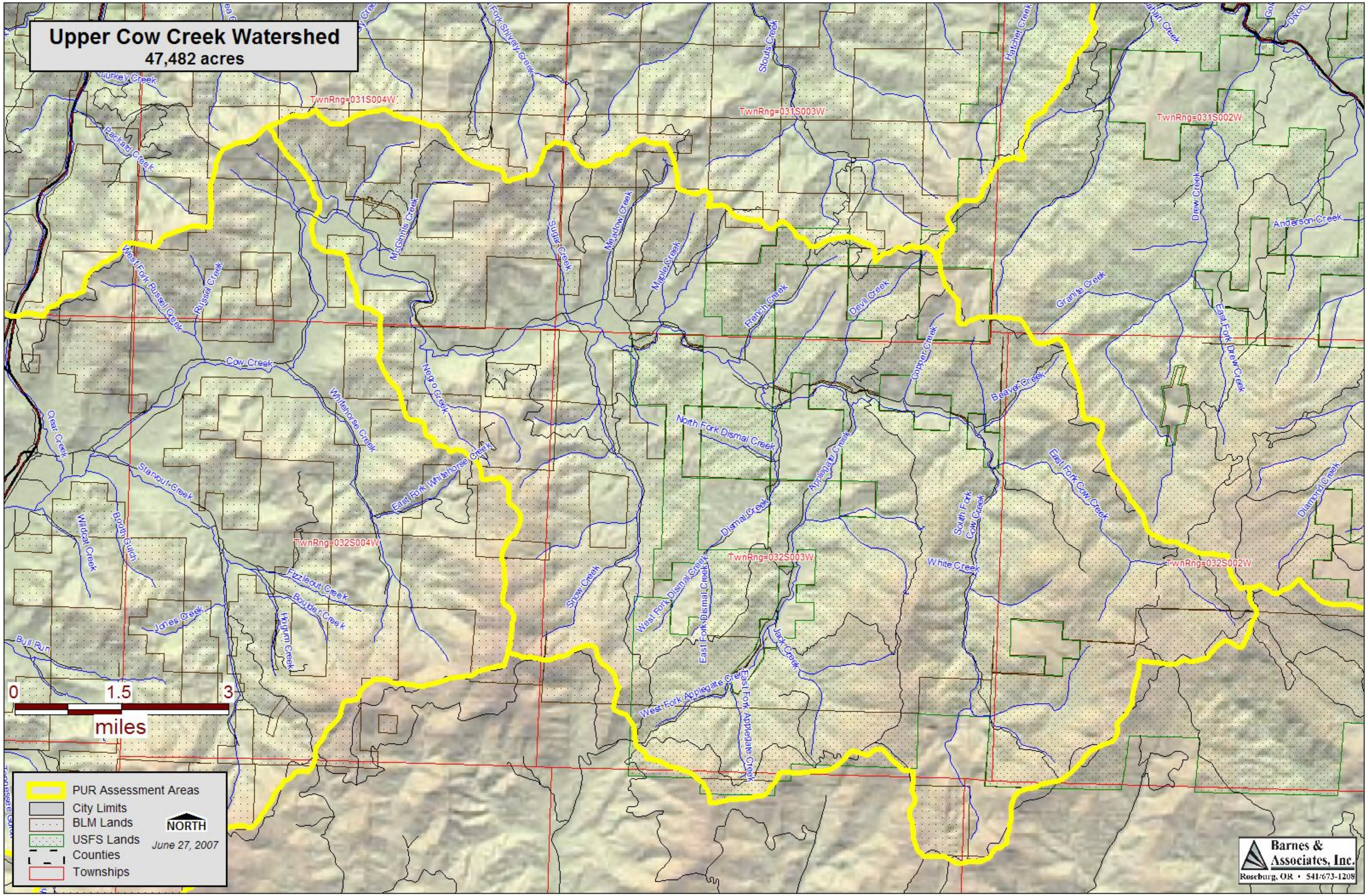
- Red text indicates an ODEQ 303(d) listing from 2004 – 2006 that is new since the original PUR watershed assessment, ~~red text~~ indicates a previously-listed stream reported in the original PUR watershed assessment but delisted for the 2004 – 2006 303(d) list, and black text indicates a listing reported in the original PUR watershed assessment and still on the 303(d) list for 2004 – 2006.
- PUR water quality sampling for bacteria (E. coli):
  - Streams identified with moderate levels of E. coli: As of May 2007, PUR has not conducted water quality monitoring in this watershed.
  - Streams identified with high levels of E. coli at times: As of May 2007, PUR has not conducted water quality monitoring in this watershed.
- Since the Upper Cow Creek Watershed has no anadromous fish due to Galesville Dam, the watershed is a low priority for PUR stream restoration projects.


Upper Cow Creek Watershed
47,482 acres
TwnRng=031S004W
TwnRng=031S003W
TwnRng=031S002W
TwnRng=032S004W
TwnRng=032S003W
TwnRng=032S002W
Turkey Creek
Packard Creek
West Fork Russel Creek
Russel Creek
McGinnis Creek
Sugar Creek
Meadow Creek
Maple Creek
French Creek
Devil Creek
Hatchet Creek
Drew Creek
Anderson Creek
Granite Creek
East Fork Drew Creek
Cow Creek
Whitehorse Creek
Negro Creek
Cooper Creek
Beaver Creek
North Fork Dismal Creek
Applegate Creek
East Fork Cow Creek
Diamond Creek
Clear Creek
Stanbout Creek
East Fork Whitehorse Creek
Dismal Creek
South Fork Cow Creek
White Creek
Wildcat Creek
Booth Gulch
Fizzleout Creek
Boulder Creek
Snow Creek
West Fork Dismal Creek
East Fork Dismal Creek
Jack Creek
Jones Creek
Hogum Creek
Bull Run
West Fork Applegate Creek
East Fork Applegate Creek
0
1.5
3
miles
PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships
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Upper Umpqua River Watershed, Umpqua Subbasin, PUR's May 2006 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Poor LWD, poor riffles, poor/fair pools limit fish habitat (SHS). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '04 – '06).	Culverts and at least one dam reduce connectivity, affect fish production. *Note: UBFAT is now complete for UUR.*	Likely much non-permitted channel mod. work.	Poor/fair riparian areas limit fish production (SHS). Riparian cover over streams is rated as "low" or "no cover" for one-third the length of streams in watershed.	Development, long-term ag. have probably resulted in loss of wetland areas.	Surface water temps exceed 303(d) standards.	1. Bacteria (fecal coliform) exceeds 303(d) standards. Main sources are non-point livestock, wild-life, and residential septic. 2. DO and nutrients (phosphorus) possible concerns. (phosphorus may be from high-phosphorus bedrock). 3. pH, toxics not likely problems.	Existing data do not indicate a limiting factor.	In-stream water rights equal or exceed average streamflow throughout most summer and fall months in 4 of 5 WABs.	Water availability data suggest low streamflow is a limiting factor. Water quality limited for "flow modification" (ODEQ '04 – '06).	Data on salmonid distribution and abundance in the watershed are incomplete. In-stream complexity and water quality are the most important limiting factors for coho in UUR.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Upper Umpqua River Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Practices	1. Add LWD and boulders to improve pools and riffles, provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, exclude livestock from riparian areas; maintain areas with good native riparian veg.	Remove fish passage barriers, give priority to those opening most miles of upstream habitat.	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	None identified.	Increase shade by encouraging development of riparian buffers and managing for full stream canopy coverage.	1. Limit livestock access to streams by fencing and providing stock water systems, shade trees outside of the riparian area. Relocate barns, other structures and situations that concentrate domestic animals near streams; establish dense riparian veg. filters where relocation not possible. Repair failing septic tanks and drain fields .	None identified.	None identified.	None identified.	Support research and work with local specialists and landowners to verify salmonid distribution and abundance.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

Upper Umpqua River Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. none identified. Bear Cr, Brad's Cr, Buffalo Cr, Coles Valley Cr, Cougar Cr, Fitzpatrick Cr, Heddin Cr, Hubbard Cr, Lost Cr, Martin Cr, Mehl Cr, Mill Cr, Rader Cr, Rock Cr X 2 (Hubbard Cr trib and Umpqua R trib), Waggoner Cr, Wolf Cr, Yellow Cr ODEQ "habitat mod": Hubbard Cr, Mehl Cr, Wolf Cr	None identified. Brad's Cr, Cole Valley Cr, Doe Cr, Hubbard Cr tribs, Little Canyon Cr, Mill Cr, Waggoner Cr (upper), Yellow Cr (upper)	None identified. Cole's Valley Cr, Mill Cr	Streams w/ canopy cover <50%; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible. Coles Valley Cr, Fitzpatrick Cr, Heddin Cr, Hidden Valley Cr, Hubbard Cr, Lost Cr, Little Canyon Cr, McGee Cr, Mehl Cr, Mill Cr, Turkey Cr, Waggoner Cr (lower), Yellow Cr (lower)	None identified. Fitzpatrick Cr, Heddin Cr (upper), Hubbard Cr, Little Canyon Cr, McGee Cr, Mehl Cr, Rader Cr, Umpqua R (multiple sites from McGee Cr to Mehl Cr), Waggoner Cr, Wolf Cr	303(d): Heddin Cr, Little Wolf Cr, Lost Cr, Mehl Cr, Miner Cr, Rader Cr, Umpqua R, Wolf Cr, Yellow Cr	1. 303(d) for bacteria: Umpqua R 2. DO concern: Haines Cr nutrients (phosphorus) concern: Umpqua R, Wolf Cr See notes below for PUR bacteria monitoring results.	None identified.	None identified.	None identified. ODEQ "flow mod": Hubbard Cr, Umpqua Cr	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

Notes:

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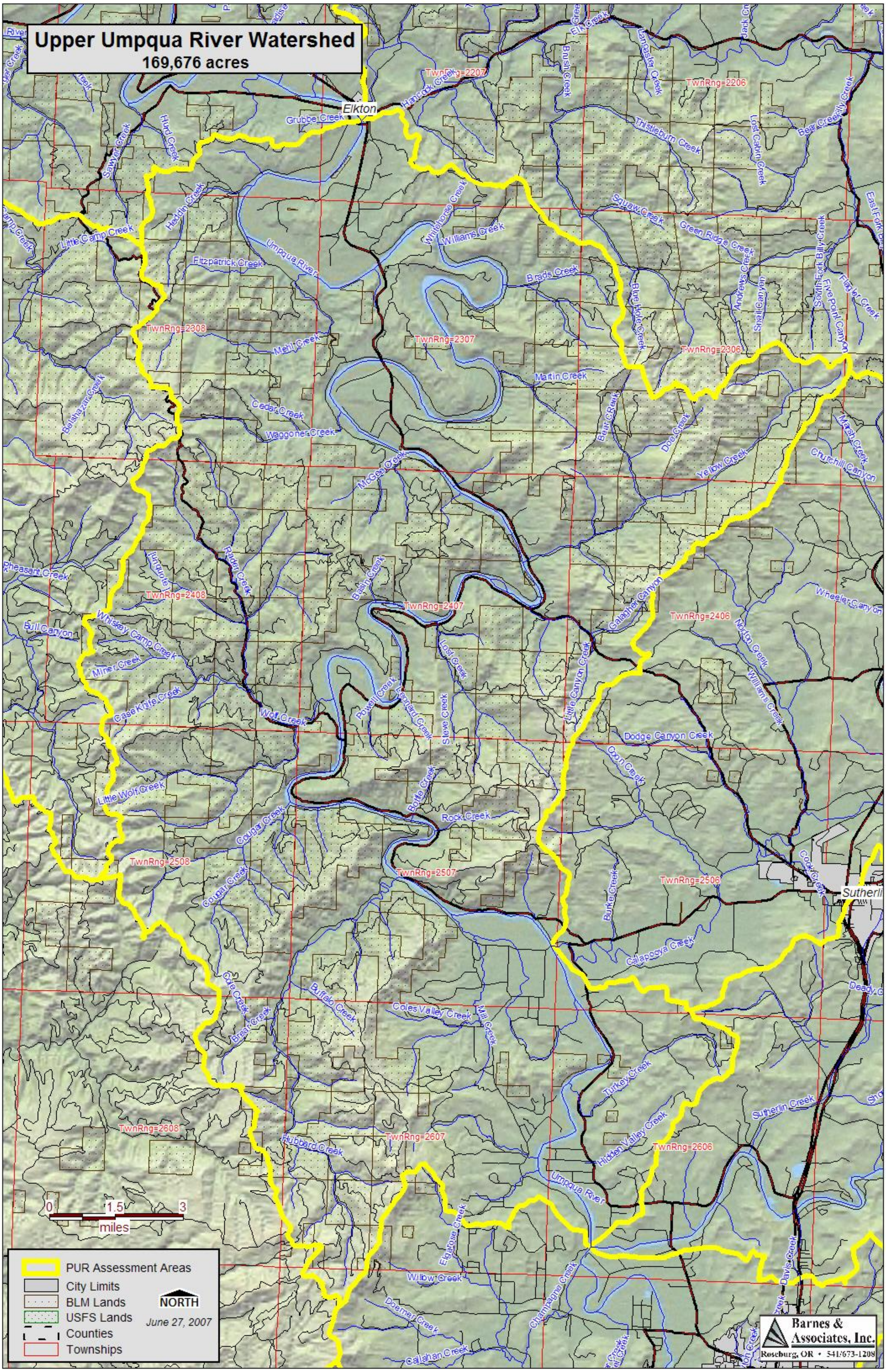

Upper Umpqua River Watershed
169,676 acres
Elkton
Sutherlin
Umpqua River
TwnRng=2207
TwnRng=2206
TwnRng=2308
TwnRng=2307
TwnRng=2306
TwnRng=2408
TwnRng=2407
TwnRng=2406
TwnRng=2508
TwnRng=2507
TwnRng=2506
TwnRng=2608
TwnRng=2607
TwnRng=2606
Grubbe Creek
Hancock Creek
Elk Creek
Brush Creek
Lancaster Creek
Jack Creek
Thistleburn Creek
Lost Cabin Creek
Bear Creek
Hurd Creek
Sawyer Creek
Heddin Creek
Little Camp Creek
Fitzpatrick Creek
Whitehorse Creek
Williams Creek
Squaw Creek
Green Ridge Creek
Brads Creek
Blue Hole Creek
Andrews Creek
Snell Canyon
South Fork Billy Creek
Five Point Canyon
Flagler Creek
East Fork
Mehl Creek
Martin Creek
Belshazzar Creek
Cedar Creek
Waggoner Creek
Bear CReek
Doe Creek
Yellow Creek
Marsh Creek
Churchill Canyon
McGee Creek
Pheasant Creek
Rader Creek
Basin Creek
Galagher Canyon
Wheeler Canyon
Bull Canyon
Whiskey Camp Creek
Miner Creek
Lost Creek
Little Canyon Creek
Norton Creek
Williams Creek
Case Knife Creek
Wolf Creek
Powell Creek
Leonard Creek
Steve Creek
Dodge Canyon Creek
Coon Creek
Little Wolf Creek
Bottle Creek
Rock Creek
Cougar Creek
Cook Creek
Burke Creek
Calapooya Creek
Deady Creek
Cole Creek
Bear Creek
Buffalo Creek
Coles Valley Creek
Mill Creek
Turkey Creek
Hidden Valley Creek
Sutherlin Creek
Hubbard Creek
Elgarose Creek
Willow Creek
Doerner Creek
Champagne Creek
Davis Creek
Callahan Creek
0
1.5
3
miles
PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships
NORTH
June 27, 2007
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West Fork Cow Creek Watershed, South Umpqua Subbasin, PUR's November 2003 Watershed Assessment

Known limiting factor/high priority | Suspected limiting factor | Not a likely limiting factor | No data or inconclusive data

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Limiting Factors	Limited "source" reaches for LWD. Lack of LWD, poor riparian tree composition, poor/fair riffles limit fish habitat (SHS '94-'97). Water quality limited for "habitat modification" for sub-standard LWD, pools, channel width:depth (ODEQ '02).	Culverts reduce connectivity, affect fish production. *Note: UBFAT is not yet complete for WFCC.*	Existing data do not indicate a limiting factor.	Poor riparian tree composition (SHS '94-'97) Conifers are the dominant riparian veg. along most of W.Fk. Cow Cr itself, with small patches of brush, grass, hardwoods (BLM)	Existing data do not indicate a limiting factor.	Surface water exceeds ODEQ standards for summer (>64º) (303(d) '02) 7-day moving avg. max. temps at mouth of W.Fk. Cow Cr were often > 64°F (Smith 2000) Extrapolation from other Cow Creek WAs: Warmer sites often lack shade. More shade on small and medium streams will reduce stream warming rates/ improve habitat for salmonids.	There are insufficient data to draw conclusions.	There are insufficient data to draw conclusions.	In-stream water rights exceed average streamflow in October.	Stream gauge data suggest that peak flows and annual streamflow for the W.Fk. Cow Cr. Watershed are decreasing. Water quality limited for "flow modification" (ODEQ '02).	More quantitative data are needed to evaluate salmonid abundance and the distribution and abundance of non-salmonid fish in the watershed. .
Specific Recommended Practices	1. Add LWD and boulders to improve in-stream habitat and provide other structure benefits. 2. Plant riparian veg. where current veg. is fair to poor, maintain areas with good native riparian veg.	1. Remove fish passage barriers, give priority to those opening most miles of upstream habitat; 2. evaluate fish passage barriers via UBFAT.	None identified.	Remove blackberries, plant conifers, fence riparian areas, manage for uneven-aged stands and large diameter trees.	None identified.	None identified.	None identified.	None identified.	None identified.	None identified.	Support salmonid and non-salmonid distribution and abundance research activities in the watershed, especially at the local level.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text.

June 2007

West Fork Cow Creek Watershed

	Stream Function			Riparian Zones and Wetlands		Water Quality			Water Quantity		Fish
	Stream Morphology	**Stream Connectivity**	**Channel Modification**	**Riparian Zones**	**Wetlands**	**Temperature**	**Surface Water pH, DO, Nutrients, Bacteria, Toxics**	**Sedimentation and Turbidity**	**Water Availability and Water Rights by Use**	**Streamflow and Flood Potential**	**Fish Populations**
Specific Recommended Sites	1. channels <=30' wide, e.g. Elk Valley Cr, Grant Cr, Black Cr, Panther Cr, Slide Cr ODEQ "habitat mod.": W.Fk. Cow Cr.	None identified. Gold Mtn. Cr (barrier culvert noted during mid-90s SHS, unknown current status)	None identified.	Streams w/ canopy cover <50%, riparian buffers <= 1 tree wide; target riparian conifer planting on fish-bearing streams where >=50% canopy cover is possible;	None identified.	303(d): Elk Valley Cr W.Fk. Cow Cr.	None identified. See notes below for PUR bacteria monitoring results.	None identified.	None identified.	ODEQ "flow mod.": W.Fk. Cow Cr.	None identified.

Note: See notes at bottom of this watershed's last page for an explanation of blue, red, and green text. *June 2007*

PUR/ODFW/DSWCD staff
Streams generally in good condition: not addressed in watershed assessment.
Top priority streams for projects: not addressed in watershed assessment.

Notes:

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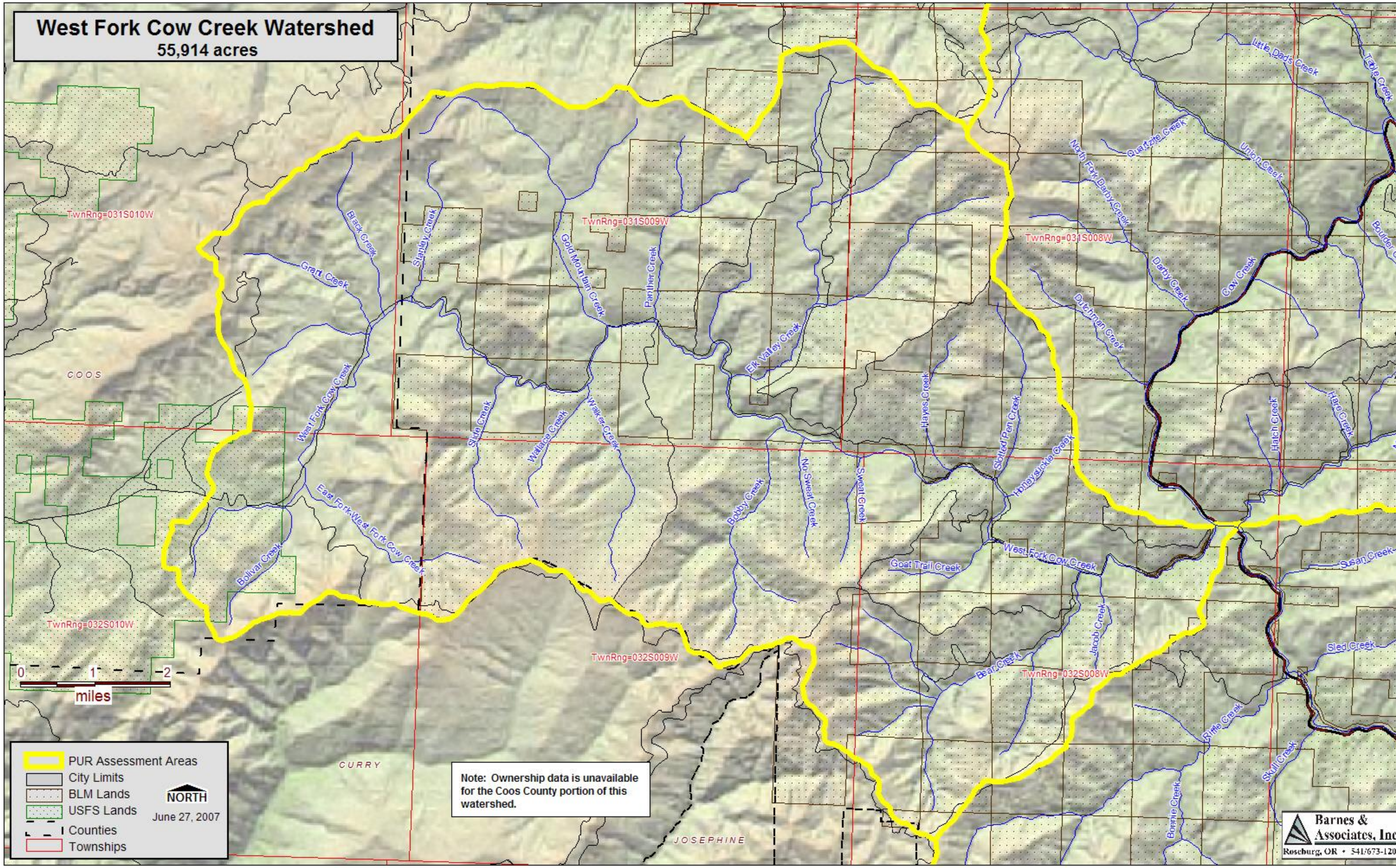
- Compared to other watersheds in the Umpqua Basin, stream conditions in the West Fork Cow Creek Watershed are in good condition.
- Elk Valley Creek is a very high producer of coho redds (Interestingly, SHS results show poor riparian, riffle, and LWD conditions; and fair pool conditions.)
- There is a natural barrier to anadromous on West Fork Cow Creek high up in the watershed.


West Fork Cow Creek Watershed
55,914 acres
TwnRng=031S010W
TwnRng=031S009W
TwnRng=031S008W
TwnRng=032S010W
TwnRng=032S009W
TwnRng=032S008W
COOS
CURRY
JOSEPHINE
Black Creek
Stanley Creek
Grant Creek
Gold Mountain Creek
Panther Creek
Elk Valley Creek
West Fork Cow Creek
East Fork West Fork Cow Creek
Bolivar Creek
Slide Creek
Wallace Creek
Walker Creek
Bobby Creek
No Sweat Creek
Sweat Creek
Hayes Creek
Slotted Pen Creek
Honeysuckle Creek
Goat Trail Creek
Jacob Creek
Bear Creek
Little Dads Creek
Table Creek
Quartzite Creek
Union Creek
North Fork Darby Creek
Darby Creek
Dutchman Creek
Cow Creek
Boulder Creek
Hatch Creek
Hare Creek
Susan Creek
Sled Creek
Rifle Creek
Skull Creek
Bonnie Creek
0 1 2
miles
PUR Assessment Areas
City Limits
BLM Lands
USFS Lands
Counties
Townships
NORTH
June 27, 2007
Note: Ownership data is unavailable for the Coos County portion of this watershed.
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