

Upper Rogue Watershed Assessment

Chapter 5 Riparian/Wetland Conditions



Upper Rogue Watershed Association

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5 RIPARIAN/WETLAND CONDITIONS

5.1 Introduction

This section of the watershed analysis report presents the results of the riparian and wetlands assessment. The assessment uses existing information to summarize what is known about current riparian and wetlands conditions in the Upper Rogue Watershed. The results are followed by recommendations on future monitoring needs to fill data gaps and steps that can be taken to improve riparian and wetland conditions.

5.2 Critical Questions

The riparian/wetlands assessment methodology outlined in the Oregon Watershed Assessment Manual (WPN, 1999) is designed around a series of critical questions that form the basis of the assessment. These critical questions are:

- 1) *What are the current conditions of riparian areas in the watershed?*
- 2) *How do the current conditions compare to those potentially present for this ecoregion?*
- 3) *How can the current riparian areas be grouped within the watershed to increase our understanding of what areas need protection and what the appropriate restoration/enhancement opportunities might be?*
- 4) *Where are the wetlands in this watershed?*
- 5) *What are the general characteristics of wetlands within the watershed?*
- 6) *What opportunities exist to restore wetlands in the watershed?*

5.3 Methods

5.3.1 Riparian Assessment Methods

The purpose of this portion of the assessment was to evaluate current riparian vegetation¹ conditions for their ability to provide recruitment² of large woody material³ and stream shading. The assessment was conducted using the methodology outlined in the Oregon Watershed Assessment Manual (WPN, 1999). Current riparian conditions within the study area were evaluated using color digital orthophoto quads available from Jackson County (2006). Source dates for color digital orthophoto quads used in this assessment were October 2001 for the Shady

¹ Riparian vegetation refers to the vegetation found on stream banks and adjoining floodplains.

² Recruitment, in the context of riparian function, refers to the natural addition over time of new large wood pieces to a stream channel from riparian forests. It is the physical movement of large wood from stream-side forest into the stream channel.

³ Large woody material, as it is used in this context, refers to pieces of wood (tree trunks, stumps, or large branches) important in the formation of channel shape, and consequently, in creating and enhancing fish habitat.

Cove, Trail Creek, and the lower portion of the Elk Creek subwatersheds, and summer 2003 for the Big Butte Creek and upper portion of Elk Creek subwatersheds. The spatial distribution of historic vegetation was estimated using EPA Level IV ecoregions maps (EPA 2003), and descriptions of potential riparian conditions were taken from the Oregon Watershed Assessment Manual (WPN 2001). No field-verification was conducted for this assessment. Because of the size of the Upper Rogue Watershed, relative to the amount of funding allocated, The Oregon Watershed Enhancement Board (OWEB) suggested that this assessment focus on the non-federal lands below Lost Creek Dam. Therefore, the riparian portion of this assessment was limited to fish bearing streams located within the Shady Cove, Big Butte, Trail Creek, and Elk Creek subwatersheds. This comprises a total of 345 miles of stream and is referred to herein as the Upper Rogue assessment area.

5.3.2 Riparian Condition Units

The fundamental mapping unit, for which all information in this portion of the assessment was collected, is the Riparian Condition Unit (RCU). An RCU is a portion of the riparian area for which riparian vegetation type, size, and density remain approximately the same. When riparian characteristics change, a new RCU is defined. A 100-foot-wide riparian zone was first defined along each side of the streams included in this assessment⁴. Additional Federal Emergency Management Agency (FEMA) floodplain areas outside of the 100-foot-wide riparian zone were also included in this assessment. For example, review of Map 10, Riparian Condition Units, shows that the RCUs become wider due to the wider floodplain in the lower reaches mainstem near Shady Cove. Information for each RCU was mapped directly in ArcView GIS, using the digital orthophoto quads as a backdrop. The RCUs were mapped within ArcView as polygons. Vegetation characteristics within each RCU were noted using a three-letter code that describes vegetation type (first letter), vegetation size (second letter), and vegetation density (third letter). The choices are given in Table 5-1. For example, “CSD” would mean a riparian stand that is predominantly conifer, small in size (i.e., 4-12 inch average stand diameter at breast height), and dense. Note that size and density only apply to forested stands. Additional notes were taken describing, to the extent possible from the digital orthophoto quads, other notable features within the RCU, such as dominant vegetation type (e.g., “cultivated fields”), disturbances (e.g., “recently logged”), or sources of permanent discontinuities (e.g., “roads”).

5.3.3 Shade Mapping

Current shade conditions were mapped separately from the RCUs. Riparian shading was estimated from the aerial photographs using the criteria given in Table 5-2. Streams were broken into segments having similar riparian shading using the indicators of riparian shading given in Table 5-2. Other potential affects to shading, such as stream orientation (i.e., the compass direction that the stream runs) and topographic shading (i.e., the shade provided by hills and other landscape features) were not assessed due to the difficulty in evaluating their affects using aerial photographs.

⁴ Although recruitment has the potential to come from as far away from the stream as the site potential tree height, the majority of functional wood is recruited within 100 feet (horizontal distance) or less of the stream's edge (McDade et al. 1990).

Table 5-1. Codes Used to Describe Vegetation

Vegetation Type Code	
Conifer forest	Mostly conifer trees (>70% of area)
Hardwood forest	Mostly hardwood trees (>70% of area)
Mixed forest	Mixed conifer/hardwoods
Shrubs	Shrub species
Grass	Native grass/meadow
No vegetation	No riparian vegetation (e.g., roads, gravel pits, etc.)
Pasture	Pasture/hay
Agricultural	Agricultural Crops
Development	Development (urban, residential, etc.)
Size Class Code (Based on aerial photo interpretation. Applies only to vegetation types C, H, M)	
R	Regeneration (<4-inch average diameter at breast height [DBH])
S	Small (4- to 12-inch average DBH)
M	Medium (>12- to 24-inch average DBH)
L	Large (>24-inch average DBH)
Stand Density Code (applies only to vegetation types C, H, M)	
D	Dense (<1/3 ground exposed)
S	Sparse (>1/3 ground exposed)

NOTE: Modified from WPN 1999.

Table 5-2. Shade Estimation Criteria

Indicator	% Shade
Stream surface not visible	>90%
Stream surface slightly visible or visible in patches	70-90%
Stream surface visible but banks not visible	40-70%
Stream surface visible and banks visible at times	20-40%
Stream surface and banks visible	0-20%

NOTE: From WFPB 1997.

5.3.4 Determination of Current Riparian Large Wood Recruitment Potential

The approach to assessing current riparian large wood recruitment potential⁵ involves 1) defining what historic recruitment potential was likely to have been, 2) characterizing current recruitment potential, and 3) comparing current to historic recruitment potential to evaluate if current

⁵ Large wood recruitment potential refers to the availability of streamside trees that may fall into the channel and ultimately affect/enhance channel conditions.

potential is either “satisfactory” (i.e., defining areas that should be protected and where no enhancement is needed), or “unsatisfactory.” Further, we wish to identify the factors that are limiting current recruitment potential in the areas that are not satisfactory.

The Oregon Watershed Assessment Manual (WPN, 1999) uses U.S. Environmental Protection Agency (EPA) Level IV ecoregions to describe potential streamside recruitment conditions. The portion of the Upper Rogue Watershed that was included in this assessment falls within three Level IV ecoregions (refer to Map 10, Riparian Condition Units). Potential streamside vegetation descriptions for these three ecoregions are given in Table 5-3. Potential conditions would vary within an ecoregion depending on the geomorphic conditions of a given reach, as well as varying over time in response to disturbance. For example, in the absence of fire suppression, only approximately two-thirds of the forested area in Western Oregon might be expected to be in an old-growth condition in any given year, due to fire re-setting the growth cycle. Old growth of early seral species, such as Ponderosa Pine, are more resistant to fire, and may be relatively more abundant than other old growth species. The potential conditions listed in Table 5-3 can perhaps be considered a “most probable condition” of the riparian vegetation, recognizing that there would be some variability over time.

Table 5-3. Potential Streamside Vegetation within Three Level IV Ecoregions Found within the Upper Rogue Watershed

Level IV Ecoregion	Potential Vegetation Description	Other Considerations
Southern Cascades (4f)	The immediate streamside area dominated by medium-sized dense stands of hardwoods, and shrub species. Further from the stream the riparian area consists of large-sized, dense, stands of conifers (Douglas-fir, white fir, and incense cedar)	Secondary species like incense-cedar can occupy riparian areas, bogs, seeps, wetlands. White fir is a common streamside species at the lower elevations. Both have potential for streamside rehabilitation.
Rogue/ Illinois Valleys (78a)	The immediate streamside area consists of willows and other shrubs. Further from the stream riparian areas consist of dense, medium-sized stands of mixed conifers and hardwoods (ponderosa pine, cottonwood).	Potential natural vegetation in upland areas includes Oregon white oak, madrone, California black oak, ponderosa pine, incense cedar, and grasslands.
Oak Savanna Foothills (78b)	The immediate streamside area consists of willows and other shrubs. Further from the stream riparian areas consist of dense, medium-sized stands of mixed conifers and hardwoods (Cottonwood & other hardwoods, ponderosa pine; Douglas-fir & incense cedar in wetter locations).	Potential natural vegetation in upland areas includes Oregon white oak, madrone, California black oak, ponderosa pine and Douglas-fir. Drier areas east of Medford dominated by oak woodlands and ponderosa pine. Wetter areas dominated by Douglas-fir and incense cedar.

NOTES: From WPN, 2001.

Qualitative words, such as large, small, dense, and sparse are all defined quantitatively in Table 5.1

The Oregon Watershed Assessment Manual (WPN, 1999) provides a methodology for placing similar RCUs into groupings that can help summarize the major riparian impacts in the watershed. These groupings, called riparian recruitment situations, also provide a way to categorize riparian areas in ways that will respond similarly to restoration treatments.

The first step in developing riparian recruitment situations for the Upper Rogue Watershed was to determine which RCUs currently have satisfactory riparian recruitment. Determination of current satisfactory recruitment potential followed the approach given in the manual (WPN, 1999); current conditions were compared to potential conditions given in Table 5-3. Areas where current riparian vegetation is similar (with respect to type, size, and density) to potential conditions were rated as having “satisfactory” current recruitment potential. The remaining RCUs in the watershed currently have unsatisfactory riparian conditions as compared to the potential conditions shown in Table 5-3. These remaining RCUs were further divided into the remaining riparian recruitment situations described below.

Satisfactory: Current riparian recruitment potential is satisfactory as compared with potential conditions for the ecoregion. RCUs included in this grouping include dense⁶ stands of medium and large sized conifers and mixed conifer/hardwoods, dense stands of medium and large sized hardwoods (ecoregions 78a and 78b), shrub communities, and native grass/meadow communities

Small-sparse: This grouping of RCUs includes both stands of small or regeneration-sized trees, and sparse stands of medium and large sized trees. Current recruitment potential and shade are below potential conditions; however, if protected, these stands will attain potential conditions over time. The RCUs included in this grouping include stands of small and regeneration sized conifers and mixed conifer/hardwood, sparse stands of medium and large sized conifers and mixed conifer/hardwoods, and (in ecoregions 78a and 78b) small or sparse hardwood stands.

Hardwood: Trees within these stands are generally approaching a size that is large enough to provide satisfactory recruitment potential but are dominated by hardwoods where the potential vegetation is conifer or mixed stands. This grouping includes all hardwood stands that occur in ecoregion 4f.

Agriculture: This grouping consists of all RCUs classified as having agricultural crops, pasture, or hay.

Development: These RCUs are dominated by urban or residential development. This grouping also includes development around the Elk Creek Dam site.

Roads: Areas within the assessment area that are currently occupied by roads were broken out as a separate group.

⁶ Qualitative words in this section, such as *dense*, *sparse*, *large*, and *small*, are defined quantitatively in Table 5-1.

5.4 Wetlands Assessment Methods

The methods used in this assessment are described in the Oregon Watershed Assessment Manual (WPN, 1999), with exceptions noted below. The purpose of this assessment was to identify locations of wetlands within the Upper Rogue Watershed and to summarize available data on current wetland conditions.

Information about wetland locations and current conditions used in this assessment was derived from two primary sources. Digital National Wetland Inventory (NWI) data produced by the U.S. Fish and Wildlife Service (USFWS 2006) was available for the entire Upper Rogue assessment area. The dates of the source imagery used to produce the digital NWI maps were July and August 1982. Additional data from Jackson County (2006) on the location and condition of vernal pools⁷ in the Shady Cove subwatershed was also included in this assessment. No additional aerial photo interpretation was performed for this assessment.

The Oregon Watershed Assessment Manual suggests assessing only the wetlands that are greater than 200 feet from the channel to avoid having to examine the very complex NWI mapping that can occur near stream channels. In this assessment all NWI wetland polygons were included regardless of distance from stream channels, however, wetlands that appear in the NWI as line features (i.e., riparian wetlands) were not included.

The Cowardin classification code (Cowardin et al., 1979) was available for each wetland included in the NWI. The System-Subsystem-Class, Water Regime Modifiers, and Special Modifiers for wetlands found within the Upper Rogue area are shown in Table 5-4.

5.5 Results

5.5.1 Current Riparian Vegetation Conditions

Critical Question: What are the current conditions of riparian areas in the watershed?

The material presented in this section of the report summarizes current riparian vegetation conditions as estimated through aerial photo interpretation. Riparian vegetation was mapped for approximately 900 individual RCUs along a total length of approximately 345 miles of stream and pond perimeter within the Upper Rogue assessment area. Current riparian vegetation types are shown on the Riparian Conditions Unit map (Map 10). The distribution of riparian vegetation by type, size, and density classes is summarized in Figure 5-1.

Riparian vegetation conditions varied greatly among the subwatersheds. The proportion of riparian area composed of tree-species ranged from approximately 92% of the total in the Trail

⁷ Vernal pools are wetlands that fill during fall and winter rains, and usually dry completely in summer. Vernal pools support high concentrations of native plants. Regionally it is estimated that 75% of vernal pools have been lost. Critical habitat for Vernal Pool Fairy Shrimp (*Branchinecta lynchi*) has been designated in Jackson County, Oregon, as well as several counties in California. The following website provides an overview: http://www.fws.gov/sacramento/ecosystems/vernal_pools/vernal.htm

Creek subwatershed to 66% in the Shady Cove subwatershed (Figure 5-1, top graph). Of these forested riparian areas, the majority tended to be mixed conifer-hardwood dominated, as opposed to either pure conifer or pure hardwood. The grass/meadow type includes areas that are completely comprised of riparian and upland grasses (or grass-like plants), as well as areas that contain some scattered trees and shrubs, but the dominant vegetation is grass. The grass/meadow type was the least common natural vegetation type found in riparian areas, ranging from being absent in Trail Creek to 5% of the total riparian area found in the Big Butte subwatershed. Shrub-dominated riparian areas were also limited in extent, ranging from 1% in the Shady Cove subwatershed to 12% in the Big Butte subwatershed.

Table 5-4. Classification for NWI Wetlands Found in the Upper Rogue Assessment Area

Code	System-(subsystem)-class
L1UB	Lacustrine (limnetic) unconsolidated bottom
L2AB	Lacustrine (littoral) aquatic bed
L2US	Lacustrine (littoral) unconsolidated shore
PAB	Palustrine aquatic bed
PEM	Palustrine emergent
PFO	Palustrine forested
PSS	Palustrine scrub-shrub
PUB	Palustrine unconsolidated bottom
PUS	Palustrine unconsolidated shore
R2UB	Riverine (lower perennial) unconsolidated bottom
R3RS	Riverine (upper perennial) rocky shore
R3UB	Riverine (upper perennial) unconsolidated bottom
R3US	Riverine (upper perennial) unconsolidated shore
<u>Water regime modifiers:</u>	
A	Temporarily Flooded
B	Saturated
C	Seasonally Flooded
F	Semi permanently Flooded
H	Permanently Flooded
K	Artificially Flooded
<u>Special modifiers:</u>	
b	Beaver
h	Diked/Impounded
x	Excavated

NOTE: Cowardin and others, 1979.

Lacustrine = produced or derived from lakes.

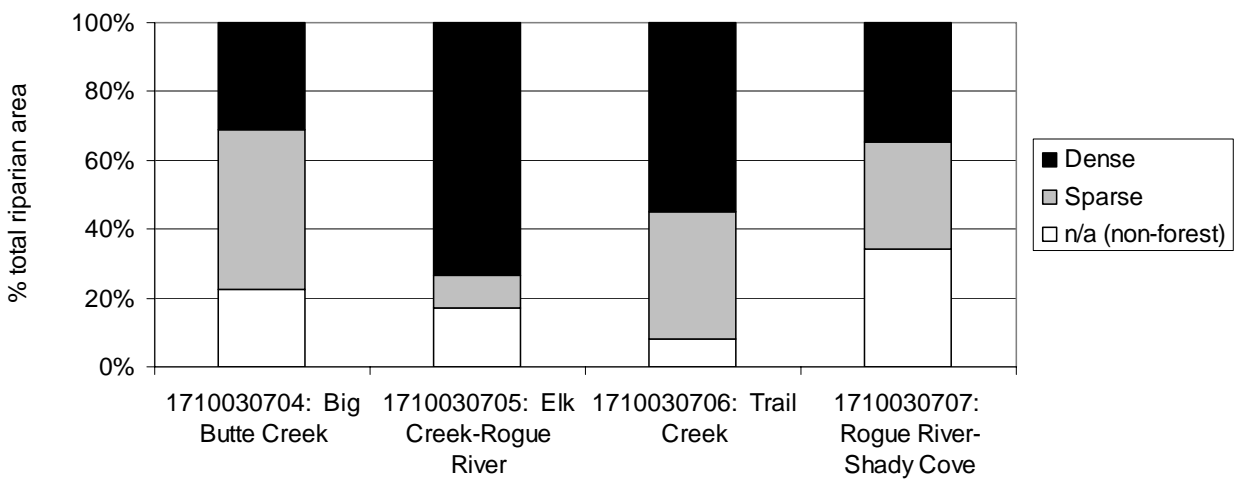
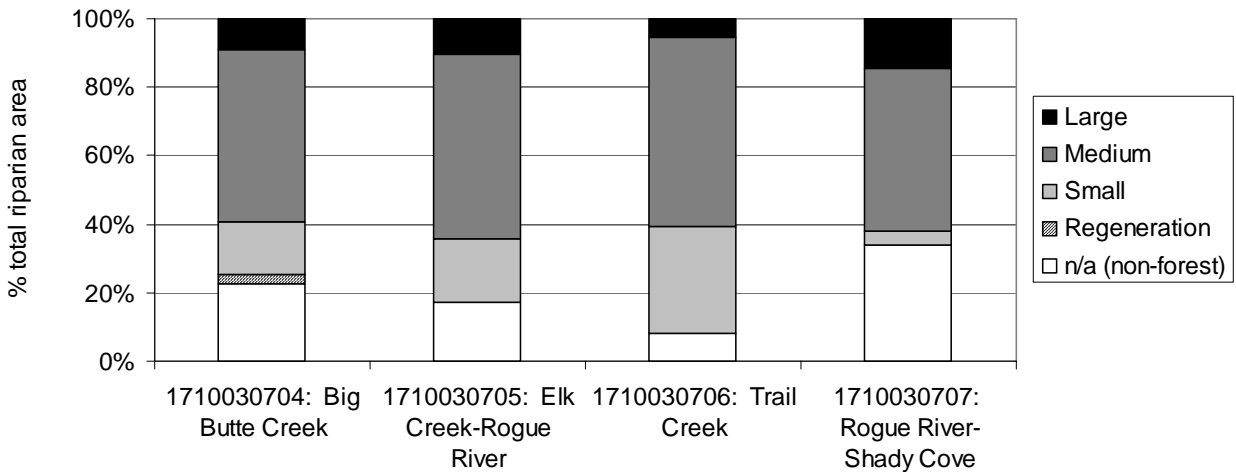
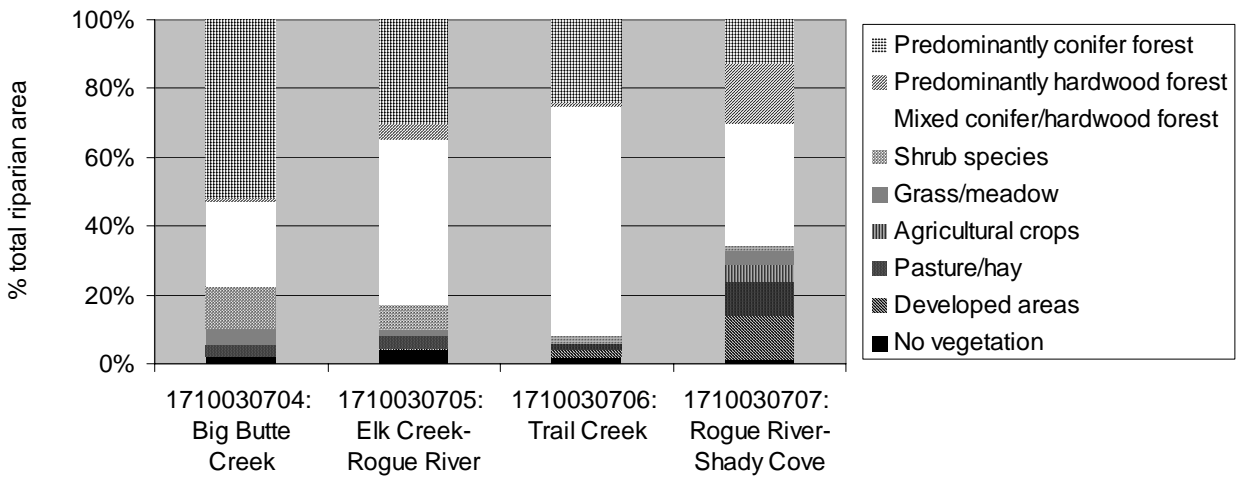
Palustrine = produced or derived from marshes.

Agricultural crops made up approximately 5% of the total riparian area found in the Shady Cove subwatershed but were absent in all other subwatersheds. Pasture/hay fields were found within the riparian zones of all subwatersheds and ranged from 2% in Trail Creek to 10% in the Shady Cove subwatershed. Areas classified as being “developed” include primarily urban and residential development, and are clustered almost exclusively in and upstream of the city of Shady Cove, making up 12% of the total riparian area in the Shady Cove subwatershed. The classification “non-riparian vegetation” includes primarily roads but also includes the non-vegetated areas around the Elk Creek Dam site. The proportion of total riparian area classified as non-riparian vegetation ranged from 1% in Shady Cove to 5% in the Elk Creek subwatershed.

Figure 5-1 (middle graph) shows the distribution of riparian vegetation by size class within the subwatersheds. The size class designation only applies to tree-vegetation. Consequently, from 8% (in Trail Creek) to 34% (in the Shady Cove subwatershed) of the total riparian area is listed as “N/A” in Figure 5-1. The proportion of total riparian area classified in the “regeneration-size” classification is low throughout the watershed, making up 3% of the total riparian area in the Big Butte subwatershed but being 1% or less elsewhere. The majority of forested riparian areas fall within the “medium” size class (~50%), with only a small proportion in either the “large” (6-14%) or “small” (4-31%) classes.

Figure 5-1 (bottom graph) shows the distribution of riparian vegetation by canopy density classes within subwatersheds. The canopy density designation only applies to tree-vegetation. Elk Creek had the highest proportion of dense-canopied stands (74%), and Big Butte the least (31%). The relatively high proportion of “sparse” stands is probably due to inherent site conditions, which favor a more open forest condition.

Figure 5-1. Distribution of Riparian Vegetation within Subwatersheds by Primary Types (top), Size Class (middle), and Canopy Density Class (bottom)



5.6 Riparian Recruitment Potential

Critical Question: How do the current conditions compare to those potentially present for this ecoregion?

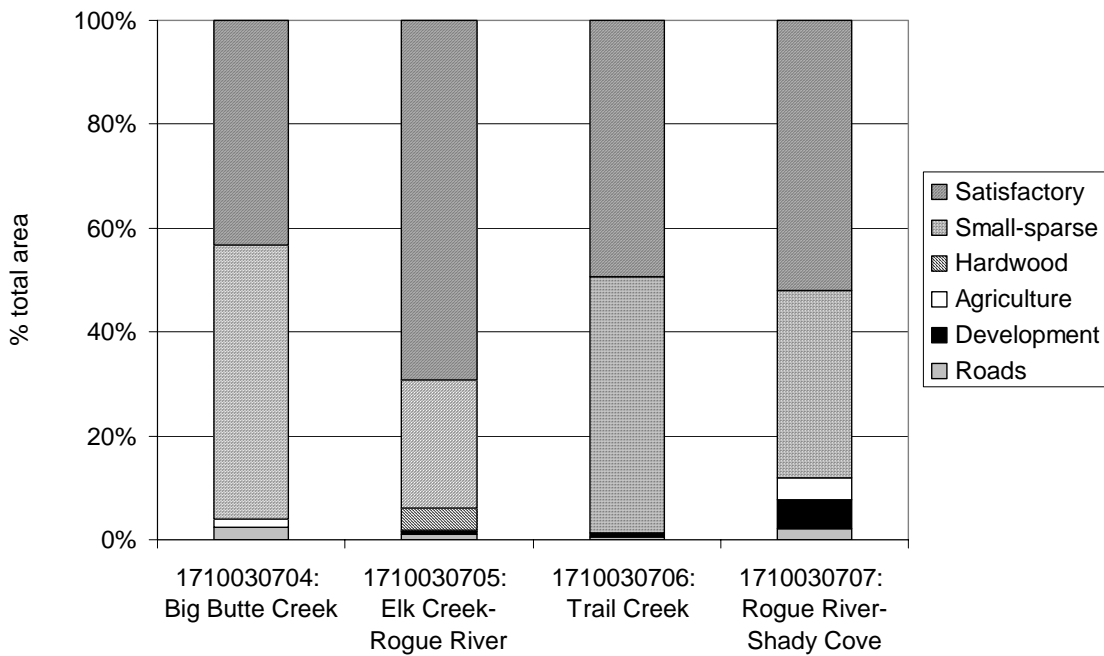
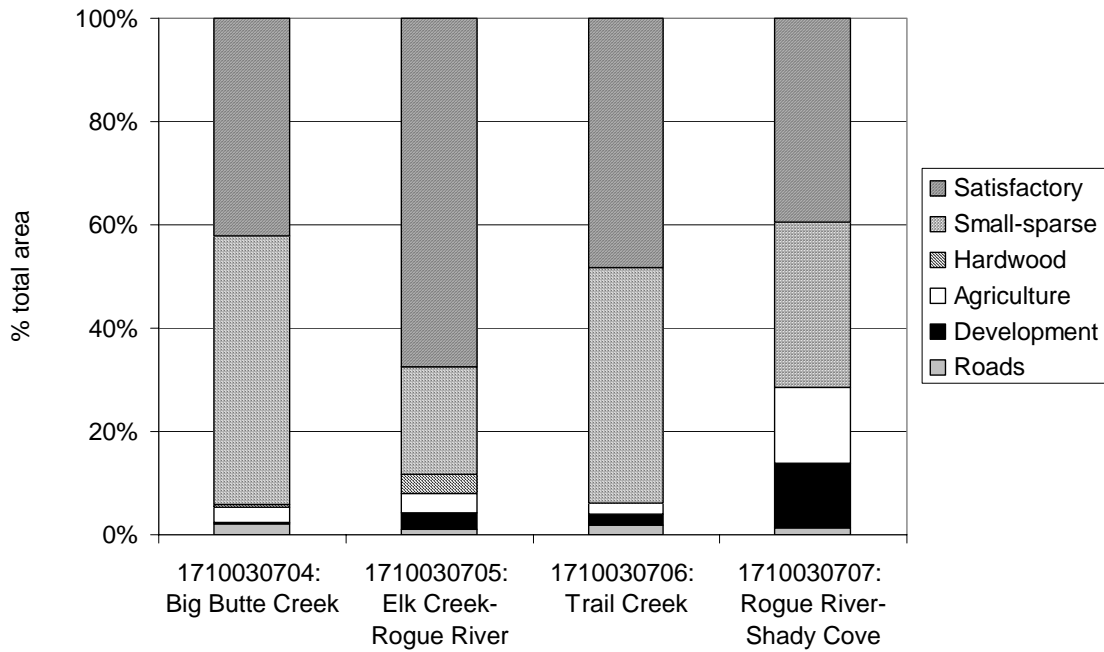
Critical Question: How can the current riparian areas be grouped within the watershed to increase our understanding of what areas need protection and what the appropriate restoration/ enhancement opportunities might be?

Current riparian recruitment potential was organized by the six riparian recruitment situations described in Section 0. Riparian recruitment situations within the subwatersheds are shown on the Riparian Recruitment Situations map (Map 11). A summary of current riparian situations by subwatershed is given in Figure 5-2 for the entire assessment area (i.e., 100-foot buffer and FEMA floodplain) while the bottom graph is only for a 100-foot buffer.

A relatively high proportion of the total riparian area is currently estimated to have satisfactory riparian recruitment potential (Figure 5-2, top graph). When considering only the 100-foot buffer along each side of the stream, the proportion of area having satisfactory riparian recruitment potential is even higher (Figure 5-2, bottom graph). Elk Creek has the highest proportion of riparian area that is currently classed as satisfactory (defined on page 5). As discussed in Section 0, disturbance from natural sources (e.g., fire and floods) would result in riparian conditions being in an earlier seral stage (successive ecological communities) in approximately one-third of the total riparian area in any given year. In other words, at the watershed scale we might only expect to find approximately two-thirds of the total length of riparian areas rated as satisfactory in any given year. Given this assumption, current conditions within the majority of the assessment streams are relatively close to potential conditions (i.e., they are in relatively good shape).

A large proportion of riparian areas fall within the “small-sparse” category, ranging from 21% of total riparian area in Elk Creek to 52% in the Butte Creek subwatershed (Figure 5-2, top graph). The patterns are similar when considering only the 100’ buffer (Figure 5-2, bottom graph). It is difficult to ascertain the sources of limitation to riparian forest development for the “small-sparse” category from the digital orthophoto quads used in the assessment; however, likely sources include forest management, agricultural practices, and residential/commercial development. Sources of limitation are likely to vary in different parts of the assessment area, with development being the likely source of disturbance along the mainstem Rogue River, and the lower portions of tributaries; while forest management is likely the primary source in upper watershed areas.

Figure 5-2. Summary of Current Riparian Recruitment Situations.



NOTES: Top graph is for entire assessment area (i.e., 100-foot buffer and FEMA floodplain); bottom graph is only for 100-foot buffer.

The remaining categories make up relatively small portions of total riparian area. Not surprisingly, agricultural activities are found within floodplain areas in all subwatersheds (Figure 5-2, top graph), but encroach within the 100-foot buffers in relatively few areas (Figure 5-2, bottom graph). Agricultural limitations to riparian development are greatest in the Shady Cove subwatershed. Development impacts follow a pattern similar to agricultural impacts, with the majority of area affected being outside the 100-foot buffer, but on floodplain areas. The proportion of area affected by roads is similar for both floodplain areas and the 100-foot buffer (Figure 5-2); probably because most roads in the assessment area cross the stream and floodplain at right angles, minimizing the area of road in either the 100-foot buffer or the floodplain.

5.7 Riparian shade

Current riparian shade levels within the Upper Rogue assessment area are shown on the Riparian Shade map (Map 12), and are summarized in Figure 5-3. It is difficult to assess if current shade levels are below potential levels and, if so, to what extent. The Oregon Watershed Assessment Manual (WPN, 1999) does not include a methodology for estimating potential shade levels. However, we would generally expect shade levels to be proportional to basin position, with the headwater areas generally better shaded than areas near the mouth of the basin. The relatively low shade levels along the mainstem of the Rogue River and lower Butte Creek are to be expected, given the size of the channel, despite the relatively dense riparian forest that is present in many areas. Conversely, headwater areas have relatively high riparian shade as would be expected. The degree to which riparian areas within the watershed are deficient in terms of recruitment potential (as discussed in Section 5.6) are not necessarily reflected in riparian shade levels because small trees, shrubs, and even dense non-woody vegetation can provide high levels of shade. It is not known to what degree other factors that affect water temperature (such as riparian microclimate) are affected by a change in vegetation composition.

5.8 Wetlands

Critical Question: Where are the wetlands in this watershed?

Critical Question: What are the general characteristics of wetlands within the watershed?

Critical Question: What opportunities exist to restore wetlands in the watershed?

The NWI identified 2,100 wetlands covering 9,365 acres in the Upper Rogue assessment area (USFWS, 2006). Jackson County identifies an additional 1,900 acres of vernal pools, all located within the Shady Cove subwatershed. Wetland and vernal pool locations are shown on the Map 13, Wetlands, and are summarized in Figure 5-4. Wetland density (area occupied by wetlands/area of subwatershed) ranged from 0.1% in the Elk and Trail Creek subwatersheds to 9% in the Lost Creek subwatershed, and was 1% of the overall assessment area.

Figure 5-3. Summary of Current Riparian Shade Levels by Subwatershed

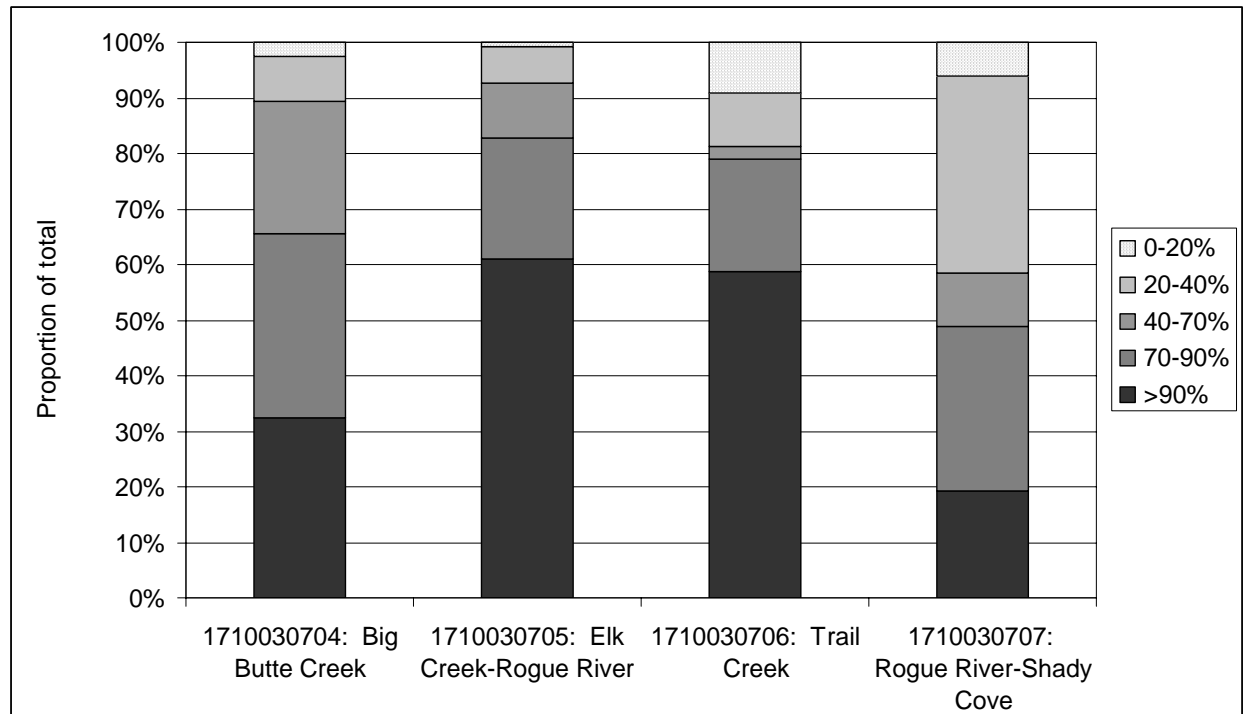
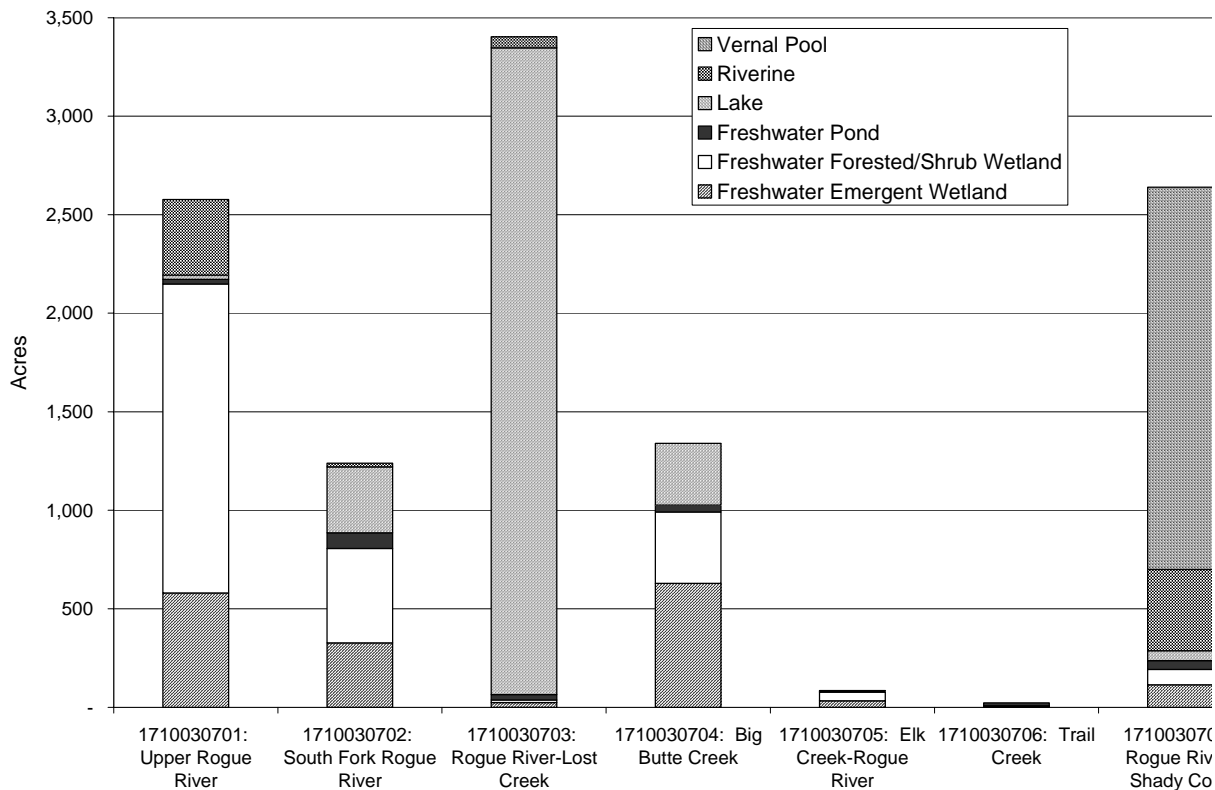


Figure 5-4. Distribution of NWI Wetlands within Assessment Area



Freshwater emergent wetlands includes all wetland classified as Palustrine – Emergent (Figure 5-4). Rooted herbaceous plants, such as cattails and grass, dominate emergent wetlands. Emergent wetlands are found within all subwatersheds and range from 4 acres in Trail Creek to 629 acres in Big Butte Creek. The largest complex of emergent wetlands is found near Big Butte Springs.

Freshwater forested/shrub wetlands include areas classified as Palustrine – Forested, and Palustrine – Scrub/shrub (Figure 5-4). Palustrine forested wetlands are defined as wetlands dominated by trees taller than 20 feet while palustrine scrub-shrub wetlands are defined as wetlands that are dominated by shrubs and saplings less than 20 feet tall. Freshwater forested/shrub wetlands are found within all subwatersheds and range from 4 acres in Trail Creek to 1,568 acres in the Upper Rogue River subwatershed.

Freshwater pond wetlands include areas classified as Palustrine – Aquatic Bed; Palustrine – Unconsolidated Bottom; and Palustrine – Unconsolidated Shore (Figure 5-4). Plants that grow principally on or below the surface of the water for most of the growing season in most years dominate Palustrine aquatic bed wetlands. Palustrine unconsolidated bottom wetlands are those wetlands whose substrate is primarily mud or exposed soils, and have less than 30% vegetative cover. Palustrine unconsolidated shore wetlands occur on pond and lake margins and can include cobble-gravel, sand, mud, organic, and vegetated areas. Freshwater pond wetlands are found in all subwatersheds and range from 5 acres in Elk Creek to 79 acres in the South Fork Rogue River.

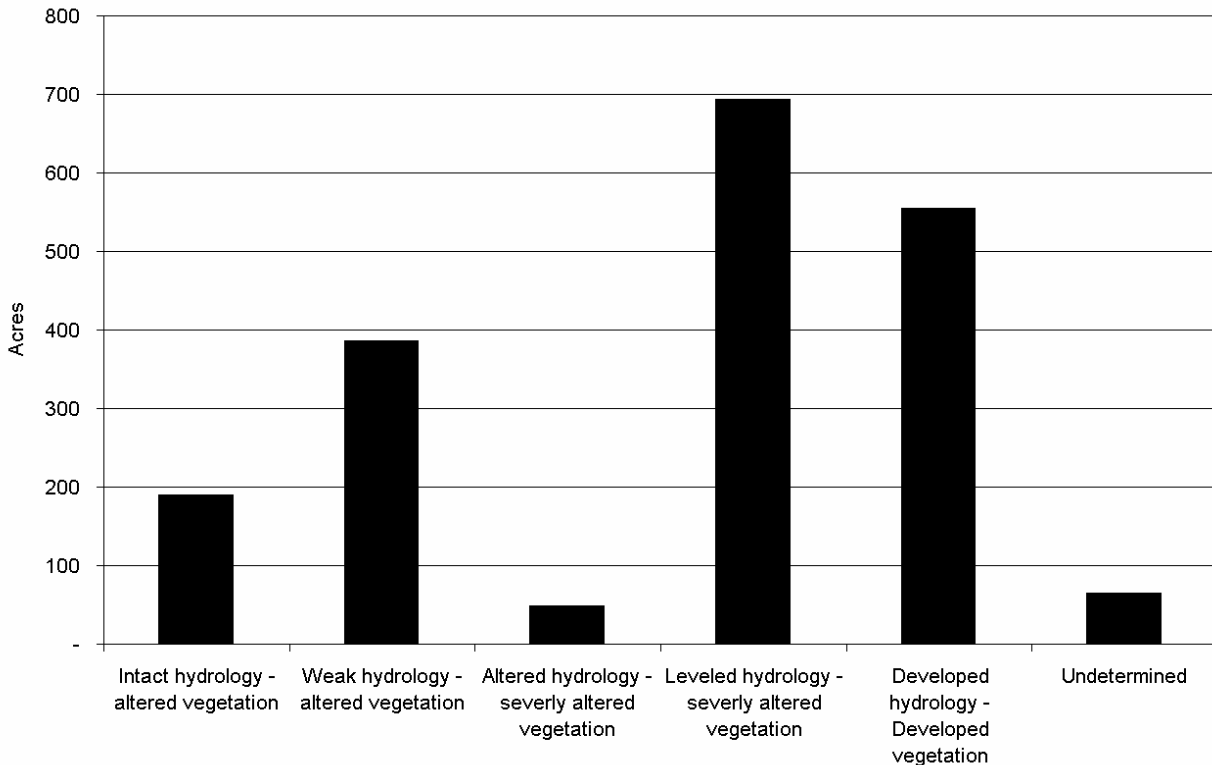
Lake wetlands include all wetlands classified as lacustrine in Figure 5-4. Lacustrine wetlands differ from the freshwater pond wetlands in that they have a wave formed or bedrock shoreline, or if the water depth in the deepest part of the basin exceeds 2 meters at low water. Lacustrine wetlands are found in all subwatersheds with the exception of Trail and Elk Creeks. Acreage of lacustrine wetland ranges from 22 acres in the Upper Rogue to almost 3,300 acres in the Lost Creek subwatershed (Lost Creek Reservoir).

Riverine wetlands include all wetlands classified as riverine in Figure 5-4. The riverine system is characterized by unidirectional flow from upstream to downstream within a channel, with the exception of those wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens (Cowardin et al. 1979). Riverine wetlands are found in all subwatersheds with the exception of Trail and Big Butte Creeks. Acreage of riverine wetland ranges from 3 acres in Elk Creek, to 413 acres in the Shady Cove subwatershed.

Vernal pools are not included as a separate category in the NWI inventory, and the majority of the vernal pool area in the assessment area was not identified as wetland by the NWI. Vernal pools are emergent, non-persistent wetlands dominated by annual plants or perennials whose aboveground biomass does not survive to the beginning of the subsequent growing season. Vernal pools fill during fall and winter rains and usually dry completely in summer. Vernal pools support high concentrations of native plants and at the local level supply critical habitat for Vernal Pool Fairy Shrimp (*Branchinecta lynchi*). Within the Upper Rogue assessment area, vernal pools are found only within the Shady Cove subwatershed.

Vernal pools have been classified with respect to the level of alteration to wetland hydrology and vegetation (Figure 5-5). Only 10% (190 acres) of the vernal pools located within the Shady Cove subwatershed are currently classified as having “intact” hydrology, although the vegetation in all of these is rated as “altered” (Figure 5-5). Approximately two-thirds of the vernal pools (1,250 acres) have lost functional hydrologic conditions, and have either “altered” or “developed” vegetation characteristics (Figure 5-5).

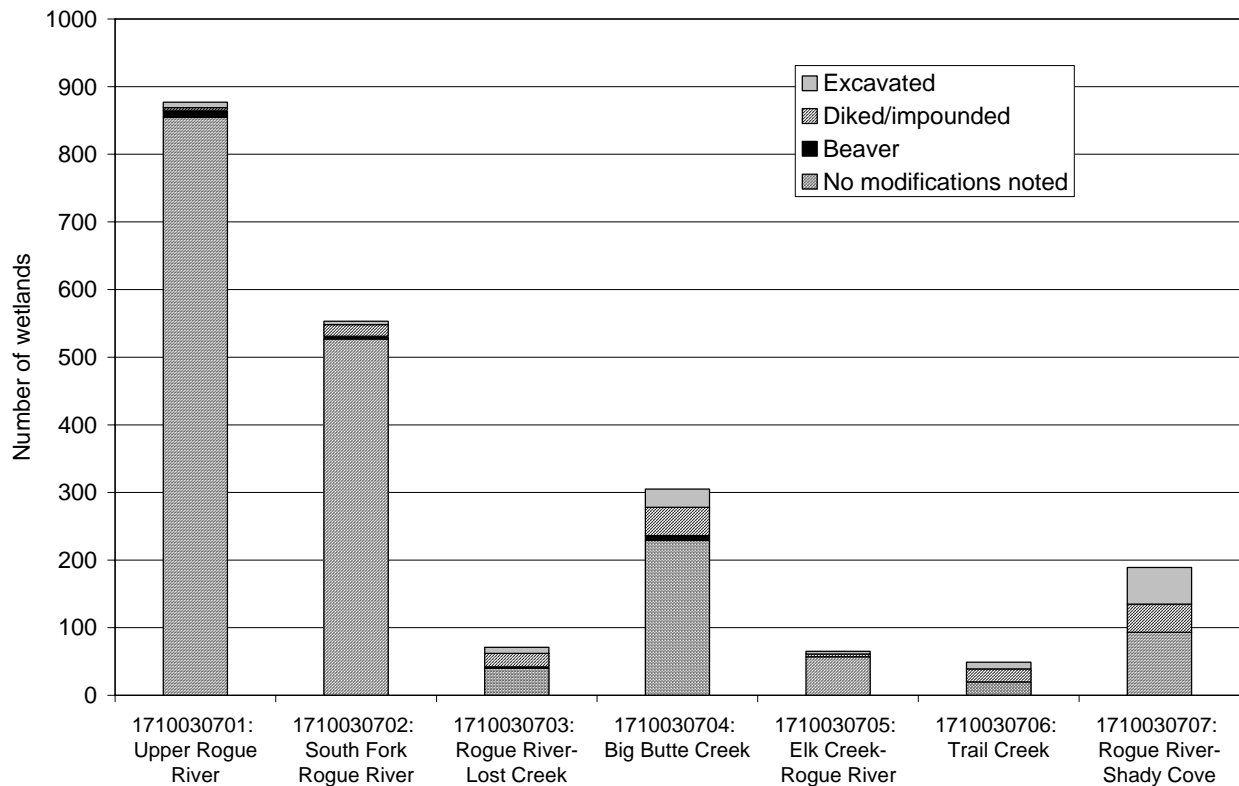
Figure 5-5. Distribution of Vernal Pools within the Shady Cove Subwatershed by Level of Alteration to Hydrology and Vegetation



Many wetlands have been created, modified or destroyed through the intentional or unintentional actions of humans and wildlife. The NWI attempted to identify these modifications where possible. Three of these “special modifiers” (Figure 5-6) were noted for wetlands within the Upper Rogue assessment area:

- Beaver: Wetlands that have been created or modified by beavers.
- Diked/impounded wetlands: Diked wetlands are created or modified by a human-made barrier or dike designed to obstruct the inflow of water. Impounded wetlands are created or modified by a barrier or dam, which purposefully or unintentionally obstructs the outflow of water.
- Partially drained/ditched: The water level in these wetlands has been artificially lowered, but soil moisture is still sufficient to support wetland vegetation.

Figure 5-6. Frequency Distribution of NWI Wetland Modifications



Source: USFWS (2006).

The majority of wetlands within the assessment area had no modifications noted (Figure 5-6). Beaver-related wetland modifications were identified in 23 wetlands, primarily in the Upper Rogue and Big Butte Creek subwatersheds. No beaver-related wetland modifications were identified in the Trail, Elk, or Shady Cove subwatersheds. Excavated wetlands (117 occurrences) were found within all subwatersheds; however, the frequency of occurrence was 10 or less in all subwatersheds with the exception of Shady Cove (54 occurrences) and Big Butte Creek (27 occurrences). Wetland modifications due to dikes and impoundments (148 occurrences) were identified in all subwatersheds, ranging from four occurrences each in the Elk and Upper Rogue to 42 occurrences each in the Big Butte and Shady Cove subwatersheds.

5.9 Information Gaps and Monitoring Needs

The information generated for this report was sufficient to characterize current riparian conditions; consequently, few information gaps are identified here pertaining to riparian conditions. The following are recommendations that address the most significant information gaps affecting the assessment:

- **Quantify current large woody material (LWM) loadings within streams** – Prioritization of riparian enhancement activities should take into consideration current levels of LWM loadings within streams to identify those reaches where enhancement or recruitment potential is most critical. Few data currently exist to describe current LWM loadings (refer to Chapter 4 of this report). A monitoring program should be established to increase our knowledge of LWM loadings. In addition, while quantifying LWM loadings, ground-truthing of riparian vegetation types and shade levels should be conducted.
- **Investigate historical extent of wetlands within the watershed** – The current wetland density within the watershed is very low (approximately 1% of the watershed area is in wetlands). Wetlands may have historically occupied a much larger area within the watershed than they currently do. Further analysis is needed to define the historic extent of wetland area within the watershed.
- **Perform functional assessment of wetlands within the watershed** – More information on wetland condition and function is needed to identify and prioritize wetland enhancement efforts. It is recommended that a comprehensive wetland inventory and functional assessment be conducted for the watershed. Examples of wetland inventories and assistance in developing an inventory for the watershed can be obtained from the Oregon Division of State Lands.

5.10 Summary

The following summary is grouped by the six riparian recruitment situations described in Section 0. Suggested action items that pertain to the different recruitment situations are also included. This summarized information has been incorporated in to the recommendations in Chapter 6.

Satisfactory: Current riparian recruitment potential is satisfactory as compared with potential conditions for the ecoregion. No enhancement is needed to achieve the potential conditions for the portion of the watershed where these RCUs occur. The RCUs included in this grouping generally consist of dense stands of medium to large sized conifers, or mixed conifer-hardwood, within at least a portion of the riparian zone. *Protect these areas.*

Small-sparse: This grouping of RCUs includes both stands of small or regeneration sized trees and sparse stands of medium and large sized trees. Current recruitment potential and shade are below potential conditions. However, if protected, many of these stands will attain potential conditions over time. Active enhancement would benefit some of these stands. *Appropriate enhancement techniques may include releasing the conifer component in small mixed-species stands, under-planting sparse stands, or density management (commercial thinning) to accelerate structural development in conifer stands.*

Hardwood: Trees within these stands are generally approaching a size that is large enough to provide satisfactory recruitment potential, but hardwoods dominate where the potential vegetation is conifer or mixed stands. This grouping includes all hardwood stands that occur in ecoregion 4f. Appropriate enhancement techniques may include conversion of some of these areas over time to conifer or mixed conifer-hardwood stands. However, many of these stands

have some recruitment potential at present, and any conversion should be considered in light of other considerations (e.g., wildlife and aesthetic concerns). *Given that the following categories represent conditions where significantly less riparian recruitment potential currently exists, the hardwood dominated stands should be the lowest priority for active enhancement activities.*

Agriculture: This grouping consists of all RCUs classified as having agricultural crops, pasture, or hay. Vegetation within the RCUs included in this grouping consists primarily of riparian cropland, pasture, and some areas of non-native vegetation. In most cases, these would be the highest priority areas for enhancement. The largest area in agriculture is in the Shady Cove subwatershed and is likely to remain or increase as discussed in Chapter 1. *Appropriate restoration/enhancement techniques would include riparian plantings, cattle fences, improved irrigation techniques, and infrastructure for fish passage at canal diversions.*

Development: This grouping includes RCUs dominated by urban or residential development as well as development around the Elk Creek Dam site. Much of the development in the assessment area is relatively low density, with the opportunity for establishing vegetative buffers within riparian areas. However, development is more significant in the Shady Cove subwatershed and is likely to continue as discussed in Chapter 1. *These areas would also be high priority areas for enhancement. Appropriate restoration/enhancement techniques would include riparian plantings.*

Roads: Areas within the assessment area that are currently occupied by roads were broken out as a separate group. *In many cases, it is not practical to remove these roads; however, an inventory of roads may help to identify roads that may be available for abandonment and removal. Existing riparian conditions should be enhanced in those riparian areas where it is not practical to remove existing roads.*

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