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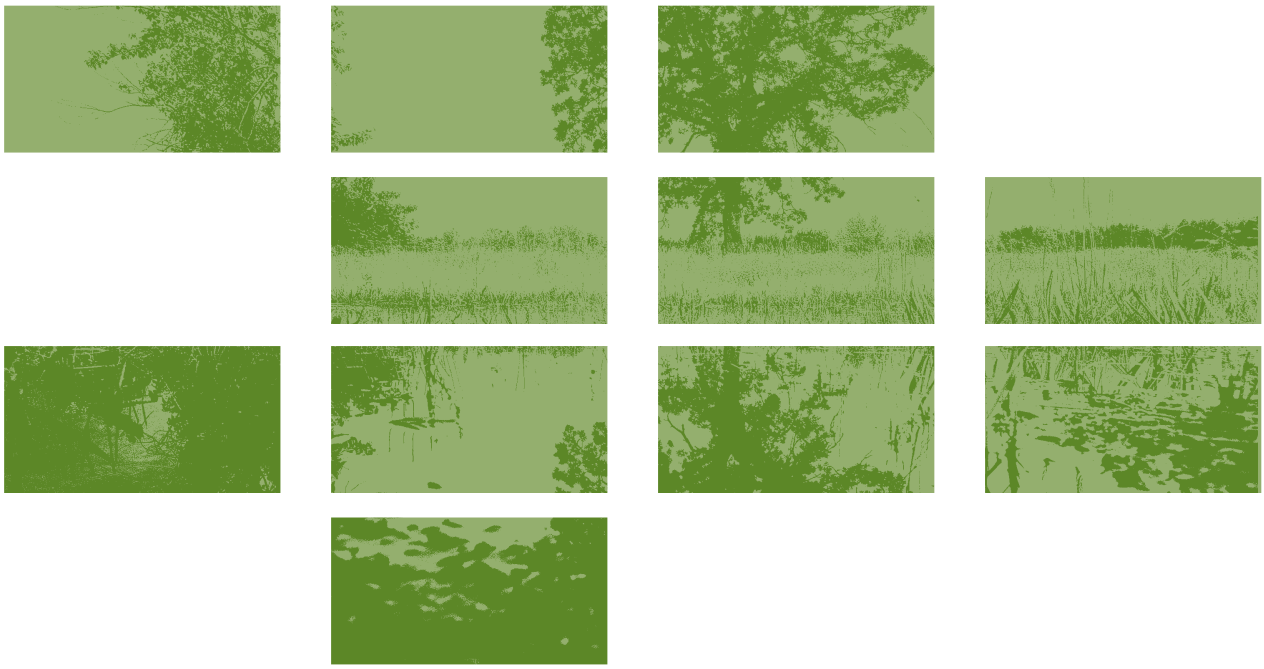

State of the Watersheds

2008

Environmental indicators

Revised June 2009

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About Metro

Clean air and clean water do not stop at city limits or county lines. Neither does the need for jobs, a thriving economy and good transportation choices for people and businesses in our region. Voters have asked Metro to help with the challenges that cross those lines and affect the 25 cities and three counties in the Portland metropolitan area.

A regional approach simply makes sense when it comes to protecting open space, caring for parks, planning for the best use of land, managing garbage disposal and increasing recycling. Metro oversees world-class facilities such as the Oregon Zoo, which contributes to conservation and education, and the Oregon Convention Center, which benefits the region's economy.

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Prepared by

Lori Hennings
Senior Natural Resource Scientist
Nature in Neighborhoods
Metro Sustainability Center
600 NE Grand Avenue
Portland, OR 97232-2736
503-797-1940
lori.hennings@oregonmetro.gov

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EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This is the second biennial State of the Watersheds report for the area within Metro's boundary. The watershed monitoring program was established in 2005 under Metro's Title 13 and includes objectives, 10-year targets and indicators to measure progress. The Metro Council will revisit Title 13 in 2015, and the monitoring results will help the Council determine Title 13's effectiveness and provide an informed opportunity to establish longer term natural resource goals, if the Council so desires.

The 2006 report documented baseline conditions in the Metro region based on the best information available at the time. Since that time, Metro has acquired technology to gather high-quality tree cover data, repeatable over time based on aerial photographs. Staff has re-calculated baseline conditions based on these data and the results are presented in this report. However, two indicators tracking floodplain conditions and Habitats of Concern do not depend on the new data, thus the 2008 report does track 2-year trends for Indicators 6 and 9, as shown in the table below.

Table 1
Summary of Title 13 performance objectives, targets and indicators used in this report and current indicator conditions

Performance objective and target	Indicator	Current condition (% cover or % loss)
Preserve and improve streamside, wetland and flood area habitat connectivity *2015 targets:* • *Increase forest and other vegetation within 50' of streams by 10%, and within 50-150 feet of streams and wetlands by 5%* • *Protect at least 90% of undeveloped floodplain acres*	1. % non-tree vegetation within 50 feet of streams, wetlands	1. 33.6% (59,897 acres)
	2. % trees within 50 feet of streams, wetlands	2. 55.4% (98,660 acres)
	3. % non-tree vegetation within 50-150 feet of streams, wetlands	3. 29.3% (65,838 acres)
	4. % trees within 50-150 feet of streams, wetlands	4. 47.5% (106,572 acres)
	5. Acres Class I, II high value riparian habitat	5. 18.6% (55,956 acres)
	6. Acres of undeveloped floodplain	6. -1.7% (-262 acres)
Preserve large areas of contiguous habitat and avoid fragmentation *2015 targets:* • *Preserve 75% of Class A and B acres* • *Preserve 80% of habitat interior acres*	7. Number of acres of Class A and B high value upland habitat	7. 9.9% (29,749 acres)
	8. Number of acres of interior habitat	8. 5.4% (16,296 acres)
Preserve and improve special habitats of concern *2015 target: preserve 95% of known Habitats of Concern*	9. Number of acres and categorical types of special or at-risk habitats	9. -0.7% (181 acres lost)
Additional measures (not part of Title 13 indicator list) *No targets established.*	10. Tree cover by sub-watershed and jurisdiction	10. 30.5% (88,890 acres)
	11. Stream reach analysis	11. See Table 17

More than 30 percent of the region is covered by trees. Closest to water, 89 percent is vegetated, including 55 percent tree cover. Overall, the results indicate that the region has provided relatively effective riparian protection, although improvement is possible and needed. Similarly, many naturally forested urban areas contain less tree cover than the Metro region, but more trees would improve our water quality and wildlife habitat. While there have been floodplain and Habitats of Concern losses, if the rate of loss does not increase then the region will meet Title 13 targets for these indicators. The 2010 report will provide 2-year comparisons for all indicators.

INTRODUCTION

INTRODUCTION

Purpose and overview

This is the second biennial State of the Watersheds report for the Portland metro region. The watershed monitoring program was established under Metro's Title 13 (Ordinance 05-1077C), described in more detail in the 2006 initial monitoring report. The 2006 and 2008 reports, as well as large format pdfs of the maps in this report, will be available through Metro's ftp site (ftp.metro-region.org/dist/gm/) by April 15, 2009.

The initial report documented baseline conditions in the Metro region (Map 1) based on the best information available at the time. Future monitoring reports will describe qualitative and quantitative changes at the end of each even-numbered year, with a major report to the Metro Council after 10 years, in 2015. The results will help inform the Council about the region's success in meeting Title 13 objectives and provide the opportunity for adaptive management and establishing longer term goals.

Title 13 established the Nature in Neighborhoods program and includes regulatory and voluntary components designed to bring people and governments together to help ensure a healthy urban ecosystem. The Nature in Neighborhoods program includes provisions to monitor and evaluate program performance over a 10-year period to determine whether the program is achieving its objectives and targets (see Appendix 1 in 2006 report).

Table 2 below provides a brief summary of the objectives, targets and indicators documented in this report. For ease of reading, remaining data tables, graphs and maps are referenced in shaded boxes where appropriate, but placed within their own respective sections following the Discussion.

Three key changes have occurred since the initial monitoring report. These changes were anticipated and noted in the initial report.

- Sub-watershed boundaries have changed. The first report was based on draft US Geological Survey (USGS) sub-watersheds (6th field Hydrologic Unit Codes, or HUCs), which USGS has since finalized. This and future monitoring reports will be based on the final sub-watershed delineations, as documented in Table 2 and shown on Map 1.
- Metro has acquired substantially improved GIS data for trees, other vegetation, and the built environment (Map 2). As a result, some of the baseline numbers documented in the initial report are not directly comparable with current and future data. The improved data will be consistently available and used in future monitoring reports, but could not be retroactively collected for the initial 2006 report. Indicator 10, tree cover derived from the new data, was added in this report.
- The current monitoring report includes information collected by sub-watershed and jurisdiction, whereas the initial report did not include data at the jurisdiction level.

Table 2
Title 13 performance objectives, targets and indicators used in this report and current indicator conditions.

Performance objective and target	Indicator	Current condition
Preserve and improve streamside, wetland and flood area habitat connectivity (sub-watershed scale) *2015 targets:* • *Increase forest and other vegetation within 50 feet of streams and wetlands by 10%, and within 50-150 feet of streams and wetlands by 5%* • *Protect at least 90% of undeveloped floodplain acres*	1. % non-tree vegetation within 50 feet of streams and wetlands 2. % trees within 50 feet of streams and wetlands 3. % non-tree vegetation within 50-150 feet of streams and wetlands 4. % trees within 50-150 feet of streams and wetlands 5. Number of acres of Class I and II high value riparian habitat 6. Number of acres of undeveloped floodplain	1. 33.6% (59,897 acres) 2. 55.4% (98,660 acres) 3. 29.3% (65,838 acres) 4. 47.5% (106,572 acres) 5. 18.6% (55,956 acres) 6. -1.7% (262 acres lost in 2 years)
Preserve large areas of contiguous habitat and avoid fragmentation (sub-watershed scale) *2015 targets:* • *Preserve 75% of Class A and B acres* • *Preserve 80% of habitat interior acres*	7. Number of acres of Class A and B high value upland habitat 8. Number of acres of interior habitat	7. 9.9% (29,749 acres) 8. 5.4% (16,296 acres)
Preserve and improve special habitats of concern (sub-watershed scale) *2015 target: preserve 95% of known Habitats of Concern*	9. Number of acres and categorical types of special or at-risk habitats	9. -0.7% (181 acres lost in 2 years)
Additional measures (not part of Title 13 indicator list) *No targets. These measures were added to incorporate new high-quality tree cover data, site-specific information, and available field data, respectively.*	10. Tree cover by sub-watershed and jurisdiction 11. Stream reach analysis 12. Breeding Bird Survey data analysis	10. 30.5% (88,890 acres) 11. See Table 17 12. See pages 12-13

The results given in this report at the sub-watershed and jurisdiction levels should be interpreted with care. For example, Maywood Park actually does not have any riparian habitat, therefore the tables and figures reporting riparian resources show that jurisdiction as having zero percent vegetation near water resources. Some watersheds, such as Molalla River, only have a few acres in the metro region and the data presented here do not provide a representative sample.

Sources used for this report

Data for the 2006 report were described in the baseline monitoring report. The following information resources provided data for the 2008 report:

- Metro's Data Resource Center's Regional Land Information System
- Vegetation derived from 2007 aerial photographs using Feature Analyst software
- 2005 Regionally Significant Fish and Wildlife Habitat inventory (Title 13 inventory)
- 2007 developed/undeveloped lands GIS layer to analyze floodplain development since 2005
- 2005 and 2007 aerial photographs to analyze Habitats of Concern loss since 2005
- Breeding Bird Survey data (Sauer, J. R., J. E. Hines, and J. Fallon. 2008. The North American Breeding Bird Survey, Results and Analysis 1966 - 2007. Version 5.15.2008. USGS Patuxent Wildlife Research Center, Laurel, MD)

The 2007 aerial photos on which vegetation indicators were based did not cover the entire region (see Map 2, areas in gray). Tables in the data table section indicate where data are incomplete.

The next section provides a summary of the findings for each indicator, followed by three sections containing figures, data tables and maps, respectively. These are referenced as appropriate in the Indicator Results section. Summary tables for all indicators are at the beginning of the data tables section.

INDICATOR RESULTS

INDICATOR RESULTS

Indicators 1 and 2: Non-tree vegetation (1) and trees (2) within 50 feet of streams and wetlands
(Baseline from 2007 data)

Trees and other vegetation closest to streams and wetlands are among the region's highest value habitat and are the last defense against pollution and poor water quality. These areas also provide the strongest connection between habitat areas, and more terrestrial wildlife species use riparian habitat than any other habitat type.

Regional numbers:
59,897 acres non-tree vegetation (33.6%)
98,660 acres trees (55.4%)
Total vegetated: 89.0%

See also:
Figures 1 through 4, pages 15-16
Tables 5 and 6, pages 30-31

Region-wide, trees cover about 55 percent of the area within 50 feet of streams and wetlands. Riparian tree cover varies widely among sub-watersheds (range: 0-81 percent) and jurisdictions (range: 0-85 percent). The Molalla River sub-watershed includes only 40 acres in the Metro region, with no riparian resources in that portion of the sub-watershed. The city of Maywood Park comprises 107 acres and also has no riparian resources.

The 2007 aerial photos did not completely cover the Metro region (Map 2). All tables, figures, and references to the 2007 Feature Analyst vegetation data omit the area that was not covered by the aerials as appropriate.

The 55 percent tree cover statistic illustrates a difference between data sources for the 2006 and 2008 reports. The 2006 State of the Watersheds report documented 39 percent tree cover based on hand-digitized, closed canopy forest patches one acre or larger. This missed a lot of single trees, tree clusters of ≤ one acre, and less densely forested patches. The 2008 statistic of 55 percent includes single trees where the trees are of sufficient size for detection via the Feature Analyst software.

Non-tree vegetation covers another 34 percent of the area within 50 feet of streams and wetlands, for a regional total of 89 percent vegetated area. Total vegetation in these areas ranges from 0-81 percent among sub-watersheds and 0-73 percent among jurisdictions.

Tracking percent loss within a sub-watershed or jurisdiction does not tell the whole story. For example, seven of the 28 sub-watersheds contribute more than 60 percent of the tree cover within 50 feet of streams and wetlands, while three jurisdictions contribute 53 percent of the tree cover. Major changes in these areas would disproportionately influence the region's riparian habitat.

Indicators 3 and 4: Non-tree vegetation (3) and trees (4) within 50-150 feet of streams and wetlands
(Baseline from 2007 data)

Although trees and vegetation within 50 feet of streams and wetlands are necessary for stream health, this area alone is not sufficient for fully functioning waterways, particularly in urban areas where high levels of storm water, pollutants and sediments may enter the water. Many US studies and agency recommendations suggest that a width of about 150 feet on each side of streams and wetlands will provide for many of the most important riparian functions, and such areas provide key wildlife movement corridors.

Trees cover approximately 48 percent of the region's overall area within 50-150 feet of streams, ranging from 19-92 percent among sub-watersheds and 11-73 percent among jurisdictions. Non-tree vegetation covers another 29 percent of Zone 2, for a regional total of 77 percent vegetated area, ranging from 0-96 percent vegetated among sub-watersheds and 0-93 percent vegetated among jurisdictions.

Regional numbers:
65,838 acres non-tree vegetation (29.3%)
106,572 acres trees (47.5%)
Total vegetated: 76.8%

See also:
Figures 5 through 8, pages 17-18
Tables 5 and 6, pages 30-31

Indicators 1-4 exclude large rivers such as the Willamette, Columbia, Tualatin, Clackamas and Sandy. As might be expected, there is more vegetation closest to water resources than further away, with 89 percent total vegetation within 50 feet versus 77 percent within 50-150 feet – a difference of 12 percent. Overall, those numbers are rather encouraging and suggest that development along streams and wetlands has been limited to date, primarily through acquisition and local jurisdictions' development codes.

Tree cover is also higher within 50 feet than within 50-150 feet (55 versus 47 percent). Some riparian areas, such as naturally herbaceous wetlands, provide important habitat diversity and should not be forested. However, there is little doubt that more trees in both zones would increase water quality and improve wildlife habitat.

Watershed health would benefit from increasing overall vegetation and increasing the relative proportion of tree cover within 150 feet of streams and wetlands. Some areas provide better opportunities than others to make these improvements, as explored further in Indicator 11 (stream reach results).

Indicator 5: High value riparian habitat (Class I and II) *(Baseline from 2005 data)*

Indicator 5 overlaps spatially somewhat with indicators 1-4. It was inventoried in 2005 based on existing conditions. Habitats of Concern comprise a portion of this habitat. The Regionally Significant Fish and Wildlife Habitat inventory map is part of Title 13 – Nature in Neighborhoods and as such, represents a snapshot in time that will technically remain unchanged until the Metro Council may choose to update the map. We can only document habitat losses until that time.

Regional numbers:
55,956 acres (18.6% of the region)

See also:
Figures 9 and 10, page 19
Tables 7 and 8, pages 32-33
Map 3

Indicators 1-4 complement Indicator 5 by including areas where both habitat losses and gains have been achieved near streams and wetlands. Beginning in 2010, the stream reach analysis (Indicator 11) will provide more spatially explicit information about where changes occur in these areas.

The 2010 State of the Watersheds report will provide the first 2-year comparison of habitat loss within Class I and II habitat based on Feature Analyst data, first collected for the 2007 aerial photos.

Class I and Class II riparian habitat covers 18.6 percent of the Metro region, including open water such as large rivers. This indicator ranges from 3 to 96 percent in sub-watersheds, the latter consisting entirely of river islands in the Columbia River–Hayden Island sub-watershed. Among jurisdictions, Class I and II riparian ranges from 0 to 52 percent.

Five of the region's sub-watersheds contain 54 percent of the region's total Class I and II habitat. Four jurisdictions – the three unincorporated counties and the City of Portland – contribute 73 percent of the region's Class I and Class II riparian habitat.

Indicator 6: Undeveloped floodplain *(Compares 2005 and 2007 data)*

Undeveloped floodplains provide irreplaceable ecological functions for water quality and habitat, but these areas are also flat and therefore often attract development.

The Metro Council's Title 13 goal is no more than 10 percent loss of 2005 undeveloped floodplain acres by 2015. In 2005 there were 15,666 acres of undeveloped floodplain and in 2007 there were 15,404, showing a 262-acre loss to development. At the current rate of 1.7 percent loss during the 2-year period, the region would meet the 2015 Title 13 goal.

Regional numbers:
2005: 15,666 acres undeveloped
2007: 15,404 acres undeveloped
262 acres lost (1.7% of 2005 acres)

See also:
Figures 11 and 12, page 20
Tables 9 and 10, pages 34-35
Map 4

Floodplains are of extraordinary ecological importance, and any loss is significant to the region's water quality, fish and wildlife habitat. The stated goal of limiting loss of this resource reflects the economic importance to the region, often for industrial or commercial uses. Over 6,000 acres of the remaining 15,404 undeveloped floodplain acres are open water, including large rivers. Thus the loss of developable floodplain is actually closer to 3 percent.

Five sub-watersheds contributed 53 percent of the region's 2005 undeveloped floodplain acres. More than half of the floodplain development has occurred in four sub-watersheds. The Columbia Slough sub-watershed provides the highest overall contribution to the region's undeveloped floodplain (16 percent) and was also the highest sub-watershed contributor to the region's floodplain development over the past two years (17.5 percent). In terms of jurisdictions, Portland and Multnomah County together contributed nearly 51 percent of the region's total floodplain developed since 2005.

Indicator 7: High value upland habitat (Classes A and B) *(Baseline from 2005 data)*

Metro's Regionally Significant Fish and Wildlife Habitat Inventory modeled wildlife habitat by measuring key characteristics: habitat patch size, shape, water resources and connectivity to other patches. Class A and B are the highest value upland wildlife habitat classes. Habitats of Concern comprise a portion of Class A habitat, as can be seen in Maps 3 and 4.

Regional numbers:
29,749 acres (9.9% of region)

See also:
Figures 13 and 14, page 21
Tables 7 and 8, pages 32-33
Map 3

High value upland wildlife habitat comprises nearly 10 percent of the region, or 29,749 acres. Clackamas and Multnomah Counties, Damascus, Happy Valley, Lake Oswego and West Linn contain more than 10 percent high value upland habitat each. In terms of contribution to the region's total, Portland, the three unincorporated counties, and Damascus together contribute more than 81 percent of the region's total Class A and B habitat due to large forested areas, including Forest Park, and many of the region's geologically unique buttes.

High value riparian habitat is interspersed throughout these upland areas, providing homes for large mammals and so many of the region's most sensitive wildlife species, and also substantially contributing to the region's water quality. Stream corridors often connect large habitat patches to each other and to important habitat areas outside the region, allowing animals to move back and forth and maintaining the region's biological diversity.

Upland areas are often unprotected and may be particularly vulnerable to development pressure. Indicator 8 will play an important role in measuring the integrity of these patches over time by addressing some of the harmful effects of habitat fragmentation, or the breaking up of large patches into smaller pieces.

Indicator 8: Interior habitat *(Baseline from 2005 data)*

Metro used habitat interior as a criterion in the Title 13 habitat inventory to estimate how much of a habitat patch is at least 200 feet to the inside of the patch's edge, based on information from local studies. Habitat interior is related to Class A and B wildlife habitat but lacks edge habitat.

The total number of species in an area is sometimes higher at the edges of a habitat patch, but the number of sensitive or declining species tends to decrease in edge habitats and these species reproduce less successfully. Urbanization typically increases habitat fragmentation, creating more edge habitat and reducing the amount of high quality interior habitat.

Interior habitat covers 16,296 acres, or 5.4 percent of the region's land. Three of the region's smaller jurisdictions, Cornelius, Johnson City and Maywood Park, contain no interior habitat and five more contain less than one percent. Portland has the most acres (8,072), highest percent cover (8.7 percent), and contributes nearly half of the region's total interior habitat, due in large part to Forest Park. Multnomah and Clackamas counties, Gresham and Damascus provide another 35 percent of the region's total interior habitat.

Regional numbers:
16,296 acres (5.4% of region)

See also:
Figures 15 and 16, page 22
Tables 11 and 12, pages 36-37

Conserving interior habitat and maintaining and improving wildlife connectivity among these habitat areas will help the region's most sensitive wildlife species.

Indicator 9: Habitats of Concern *(Compares 2005 and 2007 data)*

Habitats of Concern include native oak and prairie, riparian habitats such as bottomland forest, wetlands and river islands, and certain areas critical to maintaining functional wildlife habitat systems. Some wildlife species need these specific habitats to survive, and are declining in proportion to habitat loss. Habitats of Concern comprise a sub-set of high value riparian and upland habitat in the Title 13 inventory.

Title 13 set a target of no more than 5 percent loss by 2015. As of 2007, 0.7 percent or 181 acres of habitat were lost. If this rate is maintained or decreased, the region will meet the Title 13 target.

Regional numbers:
2005: 26,856 acres
2007: 26,675 acres
181 acres Habitats of Concern lost
(0.7% of 2005 acres)

See also:
Figures 17 and 18, page 23
Tables 13 and 14, pages 38-39
Map 4

Habitats of Concern were hand-mapped based on expert knowledge (see Map 4). Habitats of Concern loss was calculated by comparing 2005 and 2007 aerial photos and removing the portions that were altered.

The City of Portland contributed over 44 percent of the region's loss. The City's loss amounts to just over 2 percent of all Habitats of Concern within city limits. Gresham, Washington County, Sherwood, Fairview and Multnomah County collectively contributed another 42 percent of the region's loss. Portland comprises about 31 percent of the total Metro region and the others comprise another 26 percent. Thus, six jurisdictions covering 57 percent of the region contributed a majority (86 percent) of the loss of Habitats of Concern acres. Of these six jurisdictions, Washington County's loss was at the regional average of 0.7 percent and the others were substantially higher.

The Columbia Slough sub-watershed, similar to the City of Portland, lost more than 2 percent of its Habitats of Concern and contributed 45 percent of the region's loss. The Willamette River-Columbia River sub-watershed lost less than half a percent of its Habitats of Concern, but that accounted for more than 17 percent of the region's total loss. The Rock Creek-Tualatin River sub-watershed lost more than 5 percent of its total Habitats of Concern, contributing 15 percent to the region's total loss. These three sub-watersheds contributed 77 percent of the region's loss of Habitats of Concern.

The native habitats in this category are already severely reduced from pre-European settlement conditions. However, many agencies, nonprofits and "friends of" groups are working to restore native oak, prairie and wetland habitats, although new habitat areas will not appear on a formal Title 13 habitat map until the Metro Council asks staff to update the inventory. Therefore, depending on the amount that is created or restored outside the current map, in reality the region could achieve no net loss or perhaps even a gain. This is one reason why it is important to document and map restoration efforts.

Indicator 10: Tree cover *(Baseline from 2007 data)*

Several Metro studies correlated tree cover throughout watersheds with stream health, and there is little doubt that more trees would improve watershed health as well as helping wildlife.

Tree cover is a new indicator for the State of the Watersheds report. The Feature Analyst software provides us with the first good tree data ever available at the regional scale (Map 2). It does not distinguish between tree species, but does delineate individual trees of significant size. For example, it will delineate a typical mature back yard or street tree.

More than 30 percent of the region is covered by trees. Tree cover among jurisdictions ranges from 13-54 percent, and among sub-watersheds it ranges from 16-88 percent. Portland, Clackamas and Washington Counties together comprise 56 percent of the region's total tree cover. Among sub-watersheds, Willamette River-Columbia River sub-watershed contributes 16 percent of the region's total tree cover; eight other sub-watersheds contribute between 5 and 10 percent each.

Regional numbers:
88,890 acres of trees (30.5% of region)

See also:
Figures 19 and 20, page 24
Tables 15 and 16, pages 40-41
Map 2

The new data show that many highly developed areas are more vegetated than they appear on most maps. The map also reveals vegetation patterns that differ among jurisdictions and watersheds; tree-planting opportunities are available everywhere, but the type of opportunity varies.

Most jurisdictions and sub-watersheds have areas that can be restored to a forested condition. In highly urbanized areas, trees in yards, parking lots and along streets provide critically important tools to improve watershed health by providing habitat for small mammals and birds, shade to moderate temperatures, and treating large quantities of storm water. Green roofs on buildings may provide a growing opportunity to increase the region's tree cover.

Eleven cities in the Metro region hold the National Arbor Day Foundation's "Tree City USA" designation, some for many years. These include:

- Beaverton (14 years)
- Forest Grove (18 years)
- Happy Valley (4 years)
- Lake Oswego (19 years)
- Portland (31 years)
- Sherwood (3 years)
- Tigard (7 years)
- Troutdale (8 years)
- Tualatin (21 years)
- West Linn (15 years)
- Wilsonville (10 years)

To qualify for Tree City USA, a city must meet four standards established by The Arbor Day Foundation and the National Association of State Foresters (www.arborday.org/programs/treeCityUSA). These standards were established to ensure that every qualifying community would have a viable tree management plan and program; any size city may qualify. To qualify, each city must have a tree board or department, a tree care ordinance, a community forestry program with an annual budget of at least $2 per capita and an Arbor Day Observance and Proclamation.

Metro is currently administering a contract with the Audubon Society of Portland, in partnership with Portland State University, to assess tree protection policies throughout the region. The resulting report will be available by late 2009.

Indicator 11: Stream reach analysis *(Baseline from 2005 and 2007 data)*

Title 13 directed Metro's monitoring program to track conditions at the watershed scale, and also to identify areas where additional resources would help improve ecological conditions. The latter cannot be identified at the watershed, sub-watershed or jurisdiction scale. This indicator provides a closer look at the region's streams to help identify where restoration and enhancement might most effectively improve ecological conditions, and to track conditions over time at a more detailed scale.

Regional numbers:
1,014 stream reaches
- 37% in the highest score range
- 34% in the second-highest range
- 21% in the middle range
- 7% in the second-lowest range
- 1% in the lowest range (poor condition)

See also:
Figure 21, page 25
Table 17, page 42
Map 5

The general approach for analyzing stream reaches was described in Appendix 2 of the 2006 State of the Watersheds monitoring report. The criteria were selected based on a set of field data from watersheds in Clackamas County, which showed statistical relationships between adjacent land conditions and water quality parameters. The results here are not based on actual water quality data because there are no consistently collected water quality data for the region. Regardless of current water quality, if the riparian areas adjacent to stream reaches in degraded condition were improved and healthy areas maintained, the region would likely see an overall increase in water quality.

The region's stream system was divided into reaches to analyze land conditions within 150 feet on either side of streams or rivers (Map 5). Stream reach lengths range from 2,461 feet (750 m) to 6,562 feet (2,000 m), depending on where logical breaks occurred such as tributaries or major roads. Local studies show relationships between land conditions and water quality at multiple scales; the 150-foot distance was selected because that is where many of the key ecological functions relating to stream habitat occur most intensely, and it is also a discrete area where management prescriptions might reasonably be applied.

Tributaries that did not meet the length criterion were omitted from the analysis. Often these are headwater areas and very ecologically important, but the analysis required units that were spatially comparable. However, if several small headwaters together met the distance criterion, they were included in the analysis.

Large rivers were included in the analysis. Large rivers were not part of the pilot study described in the 2006 report, and water quality in rivers is affected more by tributaries' influence than land conditions adjacent to the river. However, habitat along large rivers does contribute to water quality; for example, healthy river riparian areas control sediment inputs, take up excess nutrients and pollutants, and reduce the impacts of storm water. Further, river riparian areas provide essential habitat and movement corridors for fish and wildlife, therefore identifying and tracking areas in need of restoration is desirable. Title 13 is meant to benefit both water quality and wildlife. Protecting these areas will also help protect human health and enhance residents' quality of life.

Using GIS, stream reaches were buffered by 150 feet on each side and the percent cover of the following variables were collected in each stream reach's buffer: tree cover from Feature Analyst data (2007), Class I + II riparian habitat (2005), Class A + B upland habitat (2005), and built or scarified (scraped) land from the 2007 Feature Analyst data. Table 17 provides the scoring system used for each stream reach.

Figure 21 provides the stream reach analysis results. A total of 1,014 of the region's stream reaches were analyzed and the resulting total scores were divided into five equal classes (the highest quality class included one extra point). Higher scores equate to better conditions. Of the 1,014 stream reaches:

- 36.9 percent were in the highest score range
- 34.2 percent in the second range
- 21.1 percent in the third range
- 7.0 percent in the fourth range
- 0.8 percent in the lowest range

Over 71 percent of all stream reaches fell within the top two scoring ranges, indicating that care has been taken in many areas to preserve stream corridors and water quality. Map 5 shows that many of the highest scoring stream reaches fall in Forest Park, but many are also positioned in the urban landscape.

Map 5 suggests areas where improvements might make a significant difference. For example, some streams show high or medium scores in the upper and lower reaches, but lower scores in between. Within a low-scoring reach, closer examination may reveal a relatively undeveloped portion and some areas that are highly developed. The undeveloped portion could be enhanced with native trees and shrubs, whereas the focus on more developed areas would aim toward nature-friendly practices such as storm water retrofits, green roofs and adding trees to streets, yards and parking areas.

Indicator 12: Breeding Bird Survey data *(Baseline from 2007 US Geological Survey/Patuxent Wildlife Center)*

Birds respond to changes in habitat conditions and over time provide appropriate indicators of overall habitat conditions. The long-term Breeding Bird Survey data set provides information about bird population trends at local and statewide scales. The Tualatin Route, surveyed annually since 1966, provides a representative sample of the Metro region's breeding bird communities.

The Breeding Bird Survey is a cooperative effort between the U.S. Geological Survey's Patuxent Wildlife Research Center and the Canadian Wildlife Service's National Wildlife Research Centre to monitor the status and trends of North American bird populations. The data are available for free on the Breeding Bird Survey web site.

See also:
Appendix 10 in the 2006 State of the Watersheds report

Bird presence and abundance varies naturally from year to year, therefore these data are informative for long-term trends, but not necessarily over the short term. Trend changes over the 10-year State of the Watersheds period will be tracked in 2015. Information for selected species of particular interest that are associated with Habitats of Concern or interior habitat, is provided below from 2007 data (**bold** indicates that the species is an Oregon Department of Fish and Wildlife Conservation Strategy species; trend is for local route from 1966-2007):

- **Band-tailed Pigeon –** interior habitat – declining by 3 percent per year
- **White-breasted (Slender-billed) Nuthatch** – Oregon white oak habitat – declining by 12 percent per year

- Swainson's Thrush – interior habitat – declining by 9 percent per year
- Savannah Sparrow – grassland habitat – declining by 7 percent per year
- **Olive-sided Flycatcher** – large habitat patches and snags; also on Audubon Society of Portland's watchlist for Portland bird species – declining by 11 percent per year
- **Willow (Little Willow) Flycatcher** – riparian habitat; also on Audubon Society of Portland's watchlist for Portland species – declining by 9 percent per year
- Killdeer – grasslands – declining by 6 percent per year

Readers interested in viewing data graphs for these or other species are encouraged to visit Patuxent's Breeding Bird Survey website. Graphs for local (Tualatin route), statewide, and national trends are readily available. A more comprehensive species list of Breeding Bird Survey trends in the metro region is available in the 2006 State of the Watersheds report, Appendix 10.

DISCUSSION

DISCUSSION

Research indicates that although conditions throughout a watershed are important, the first 150 feet of land surrounding streams and wetlands provides critical ecological functions for both water quality and wildlife habitat. This research was thoroughly documented in the Title 13 literature review (Metro's Technical Report for Goal 5, April 2005, Attachment 2 to Exhibit F of Ordinance No. 05-1077C).

Overall, the results indicate that for an urban area, our region has provided relatively effective protection for streams, although improvement is possible and needed. Similarly, many large urban areas that are set in naturally forested areas contain less tree cover than the Metro region – trees remain an iconic feature of this region – but more trees would improve our region's health in many ways.

It would be interesting to explore differences in these and other indicators weighted by certain factors such as level of development or population in each jurisdiction or sub-watershed. This could provide an improved indication of the effectiveness of regulatory and non-regulatory measures to protect natural resources. For example, two jurisdictions may consist of similar development patterns but one may have more tree cover. The average tree cover excluding protected natural areas might also be of interest.

However, this type of analysis is complicated because some jurisdictions naturally contain more resources than others – for example, the amount of floodplain in the Columbia Slough or high stream densities in Forest Park. Additionally, baseline conditions are different; the indicators in this report are designed to track Title 13's effectiveness, but most jurisdictions do not anticipate implementing the policy until 2009. Therefore in terms of monitoring Title 13's effectiveness, baseline conditions are actually those documented closest to the time of local implementation.

Some jurisdictions are expected to change more over time than others. For example, at present one would expect to find higher tree cover in Damascus than in more developed jurisdictions and in fact, tree cover there is above the region's average. However, as a new urban area Damascus can be expected to develop over time and meeting the needs of a growing population will increase urban land cover, sometimes at the expense of natural resources. How these tradeoffs are accomplished will influence the extent and impact of these changes.

Tracking how conditions change within a jurisdiction or sub-watershed, and how the overall region's condition changes over time, will provide the most useful information about the effectiveness of Title 13's implementation. This will best illustrate how local policy choices influence natural resource conservation, and will also appropriately acknowledge jurisdictions that are highly developed in certain areas but work hard, for example, to protect remaining streams and increase street trees, or retain significant natural resources despite population increases.

Population in the region is rapidly rising. Metro's Data Resource Center has projected population in the seven-county area (Portland, Beaverton, Vancouver "Primary Metropolitan Statistical Area," or PMSA, including Clackamas, Columbia, Multnomah, Washington and Yamhill counties in Oregon and Clark and Skamania counties in Washington). The 2008 Census data showed 2.2 million people in the PMSA. Depending on growth rate, Metro estimates 2.9 to 3.2 million people in the PMSA by 2030, and by 2060 the total population forecast falls between 3.6 and 4.4 million people. This will place a tremendous amount of pressure on existing natural resources. Where and how we grow will make all the difference. Restoration, natural area protection and environmental education will be key tools to help offset natural resource impacts.

DATA GRAPHS

DATA GRAPHS

Figure 1
Indicator 1, calculated by sub-watershed: percent cover non-tree vegetation within 50 feet of streams and wetlands and each sub-watershed's contribution to the region's total Indicator 1 acres.

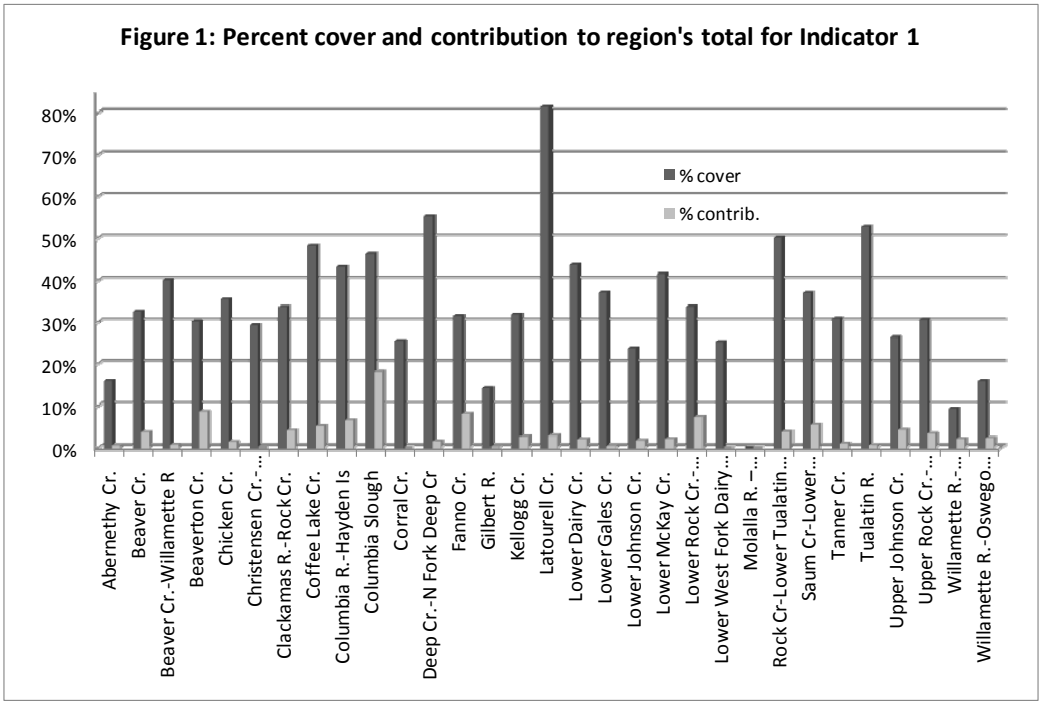


Figure 2
Indicator 1, calculated by jurisdiction: percent cover non-tree vegetation within 50 feet of streams and wetlands and each jurisdiction's contribution to the region's total Indicator 1 acres.

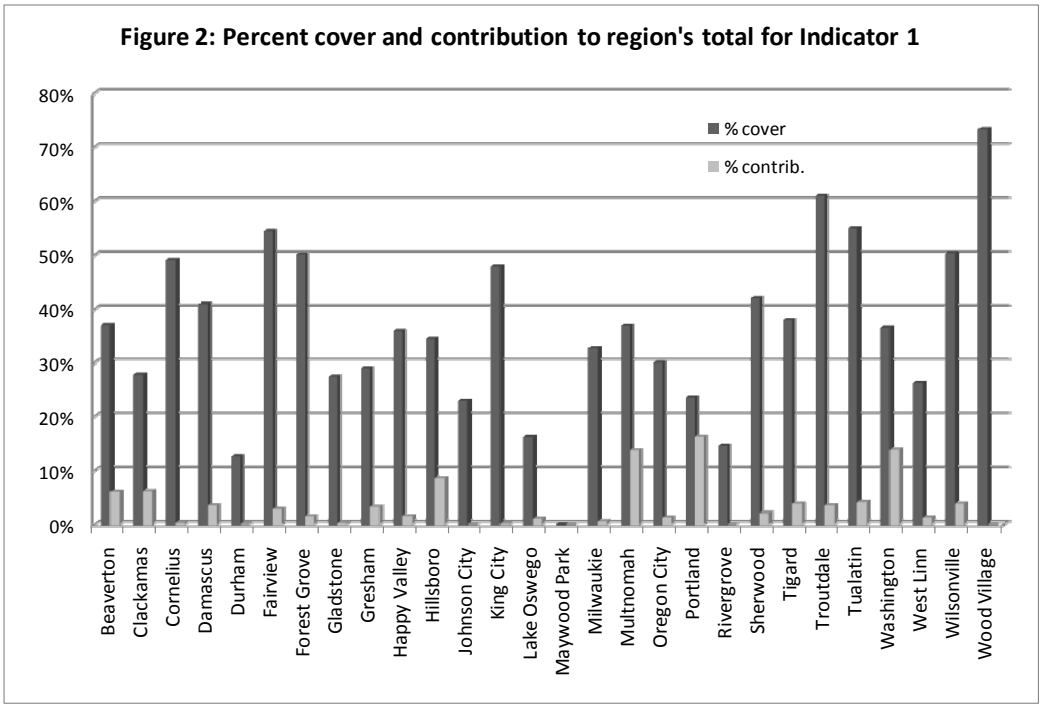


Figure 3
Indicator 2, calculated by sub-watershed: percent cover trees within 50 feet of streams and wetlands and each sub-watershed's contribution to the region's total Indicator 2 acres.

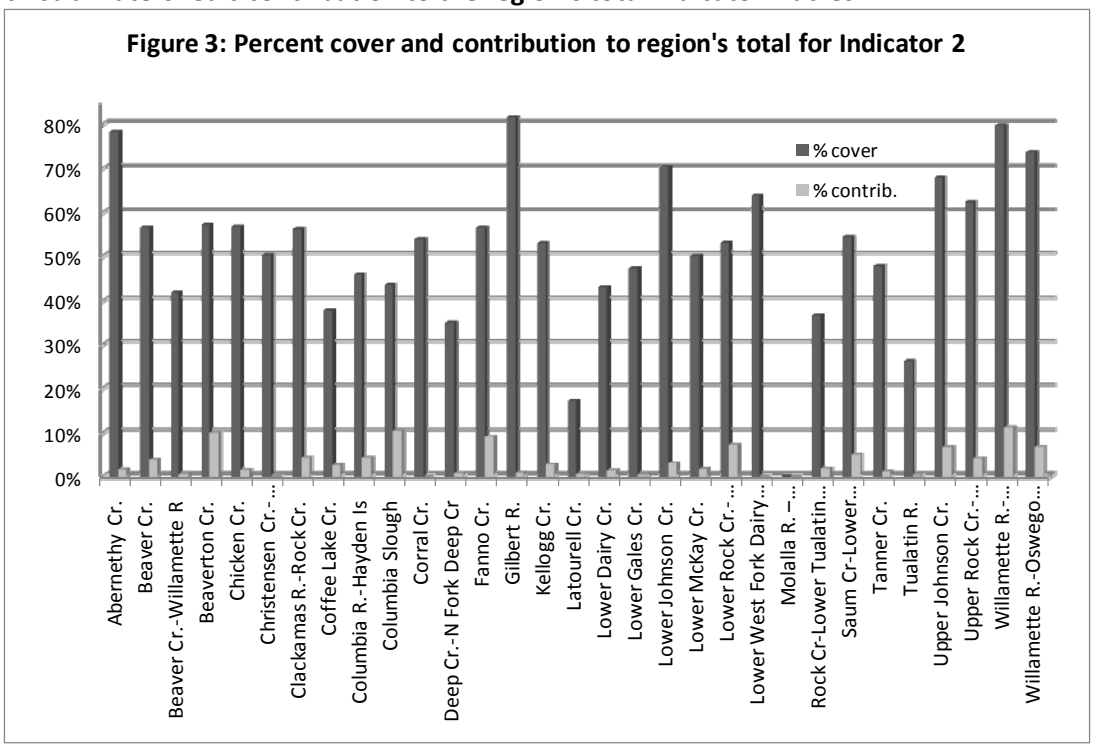


Figure 4
Indicator 2, calculated by jurisdiction: percent cover trees within 50 feet of streams and wetlands and each jurisdiction's contribution to the region's total Indicator 2 acres.

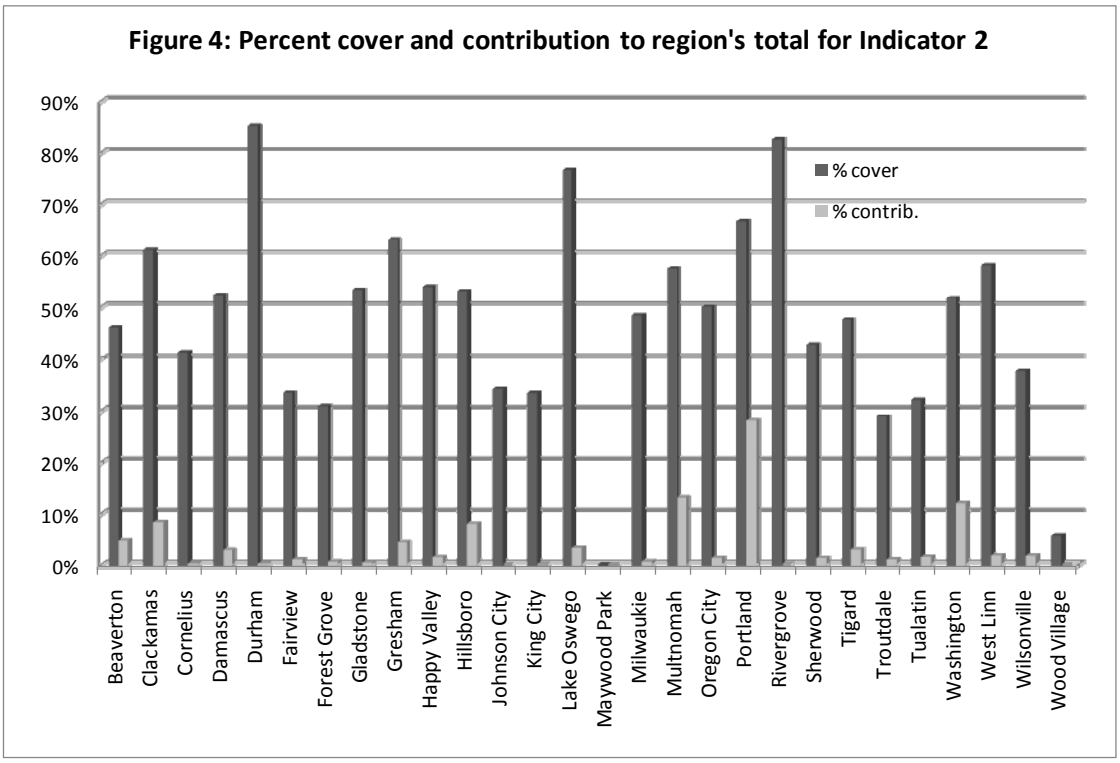


Figure 5

Indicator 3, calculated by sub-watershed: percent cover non-tree vegetation within 50-150 feet of streams and wetlands and each sub-watershed's contribution to the region's total Indicator 3 acres.

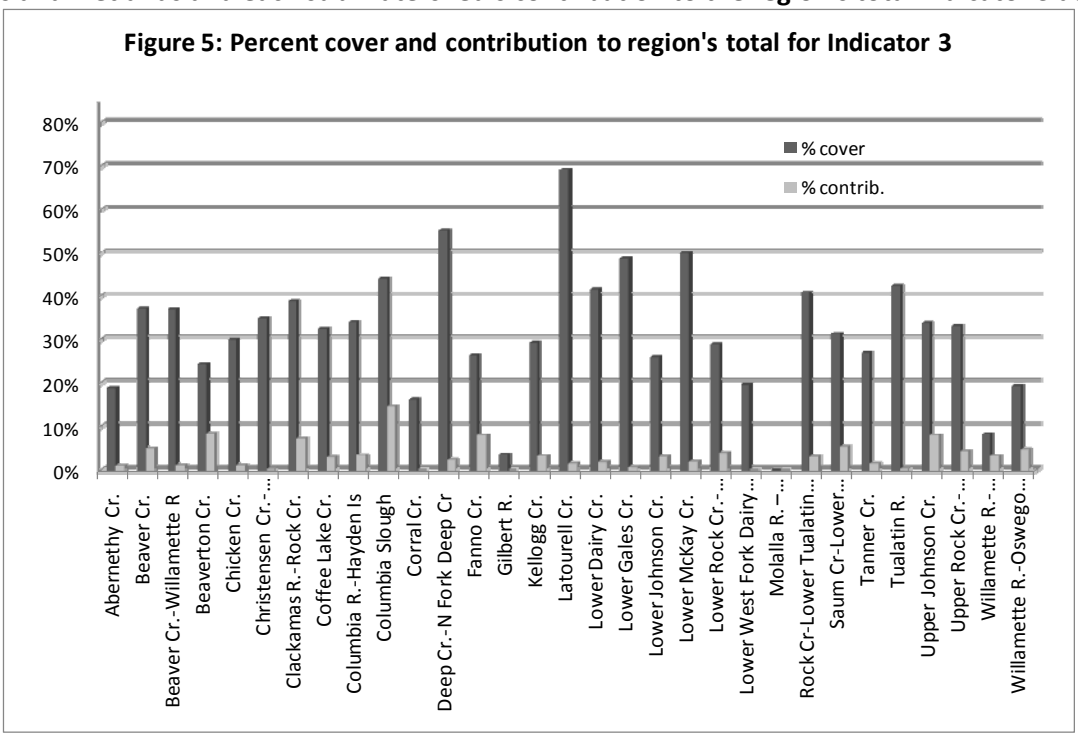


Figure 6

Indicator 3, calculated by jurisdiction: percent cover non-tree vegetation within 50-150 feet of streams and wetlands and each jurisdiction's contribution to the region's total Indicator 3 acres.

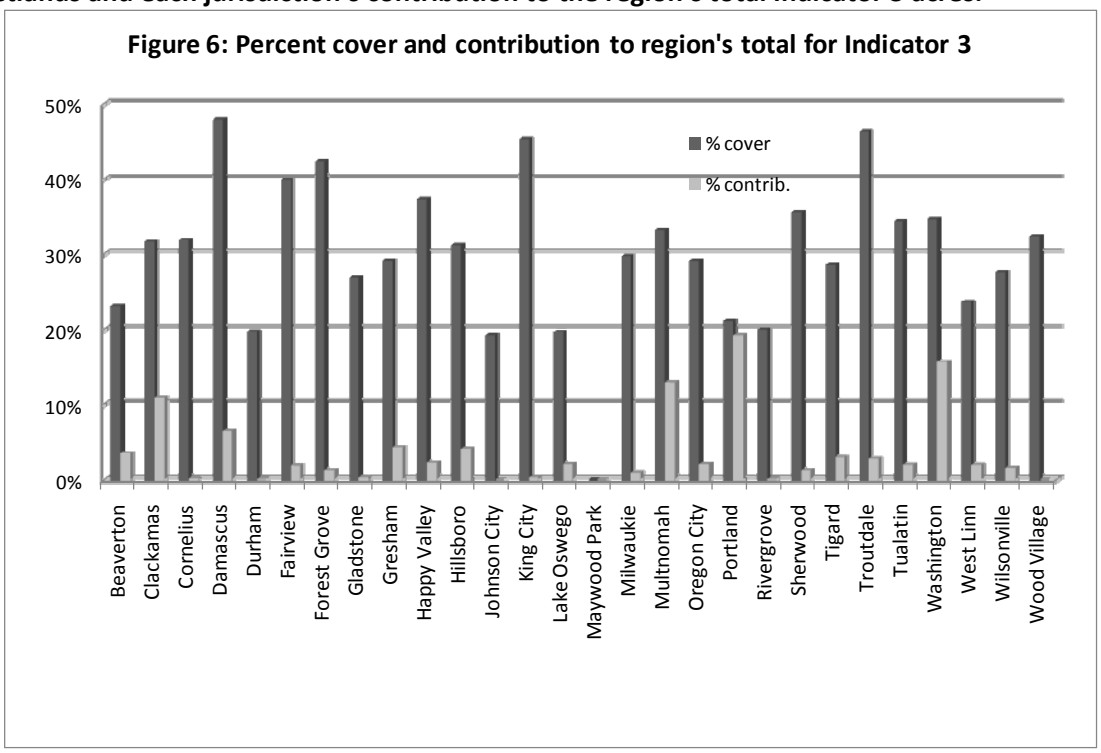


Figure 7
Indicator 4, calculated by sub-watershed: percent cover trees within 50-150 feet of streams and wetlands and each sub-watershed's contribution to the region's total Indicator 4 acres.

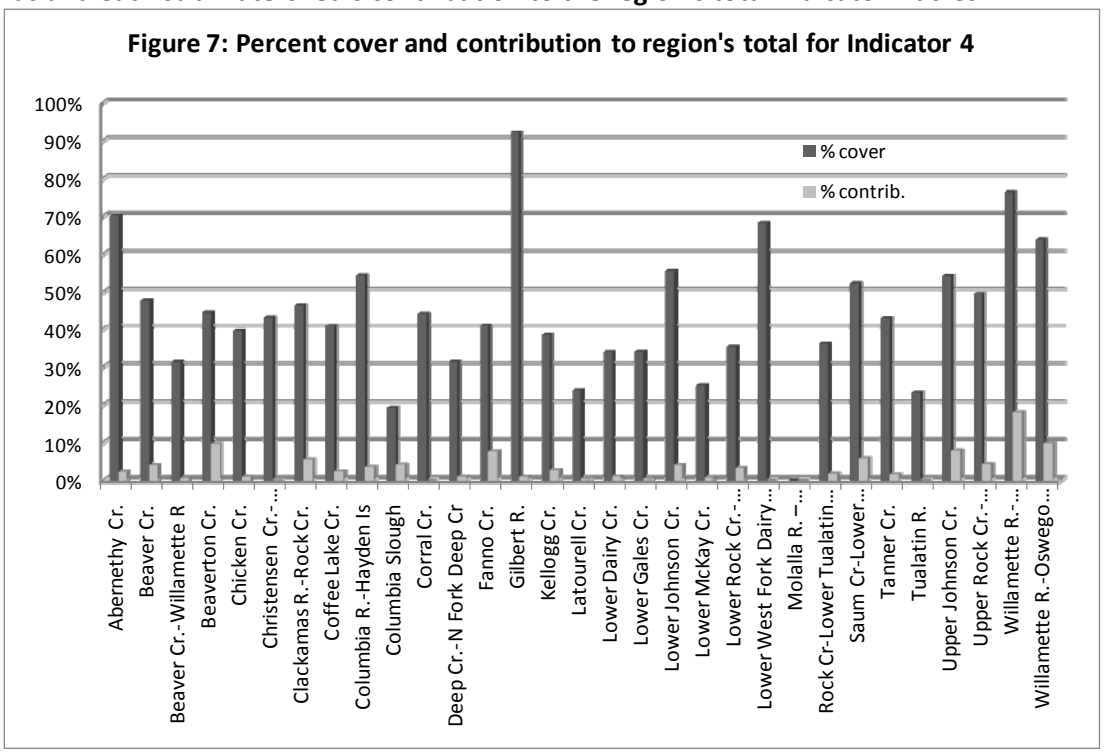


Figure 8
Indicator 4, calculated by jurisdiction: percent cover trees within 50-150 feet of streams and wetlands and each jurisdiction's contribution to the region's total Indicator 4 acres.

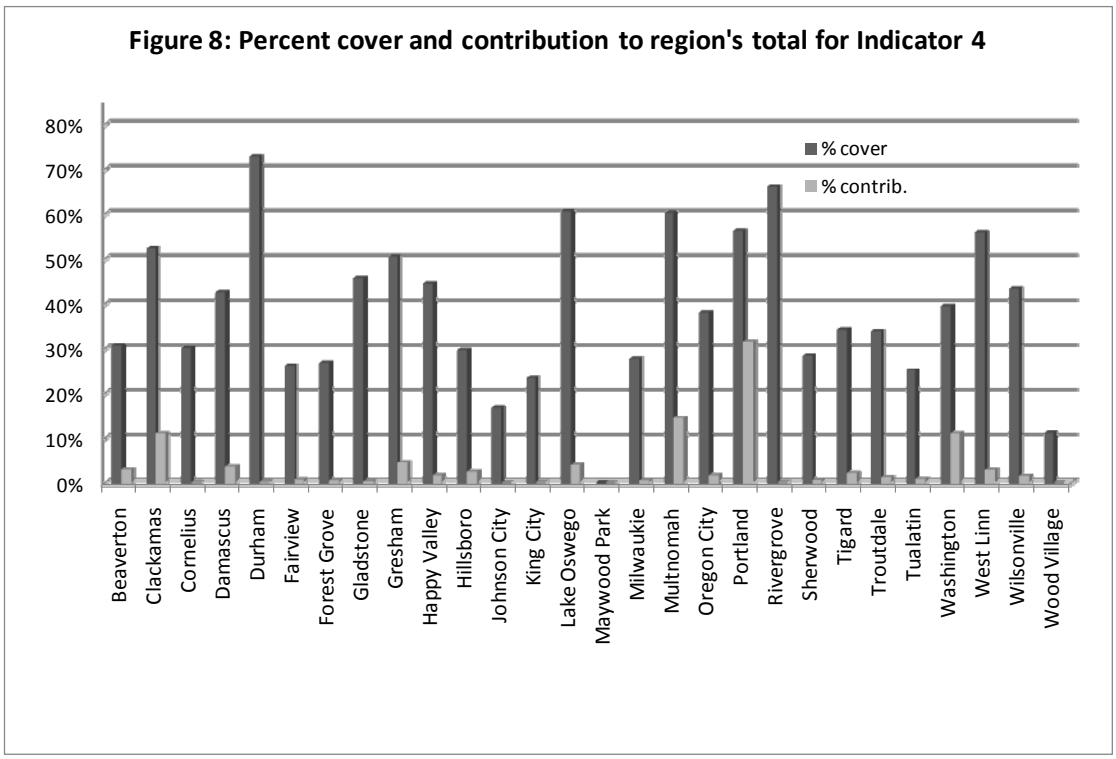


Figure 9
Indicator 5, calculated by sub-watershed: percent cover Class I and Class II riparian habitat and sub-watershed's contribution to the region's total Indicator 5 acres.

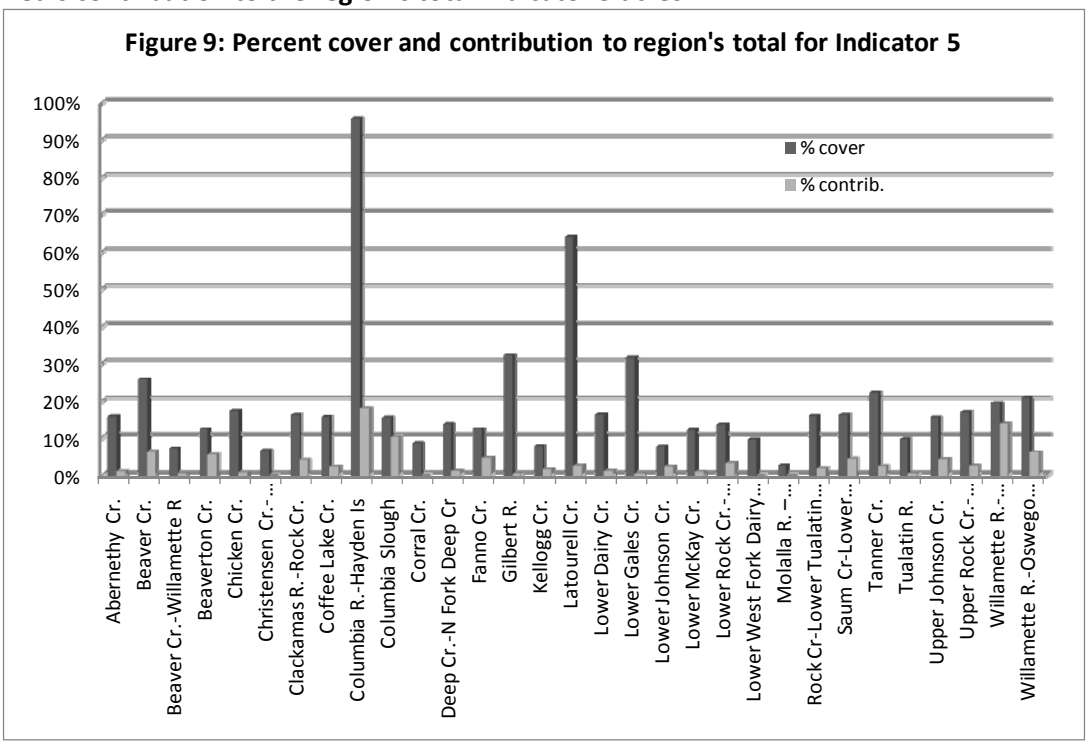


Figure 10
Indicator 5, calculated by jurisdiction: percent cover Class I and Class II riparian habitat and jurisdiction's contribution to the region's total Indicator 5 acres.

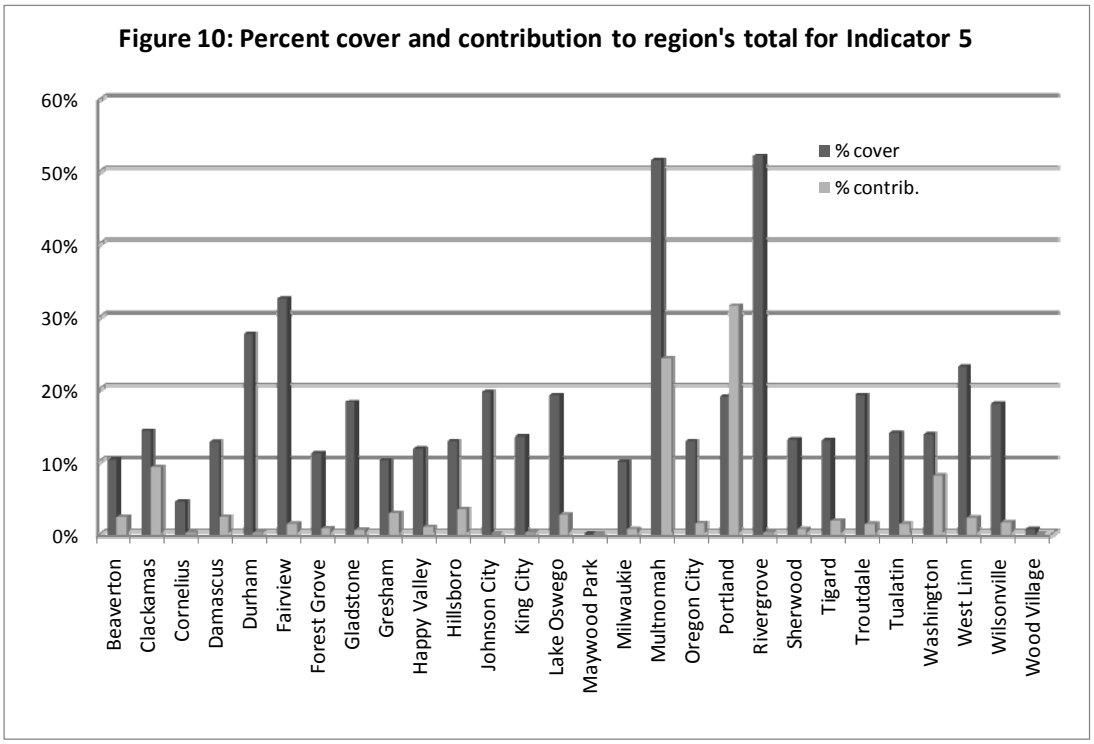


Figure 11
Indicator 6, calculated by sub-watershed: percent loss of undeveloped floodplain between 2005 and 2007 and each sub-watershed's contribution to the region's total newly developed floodplain acres.

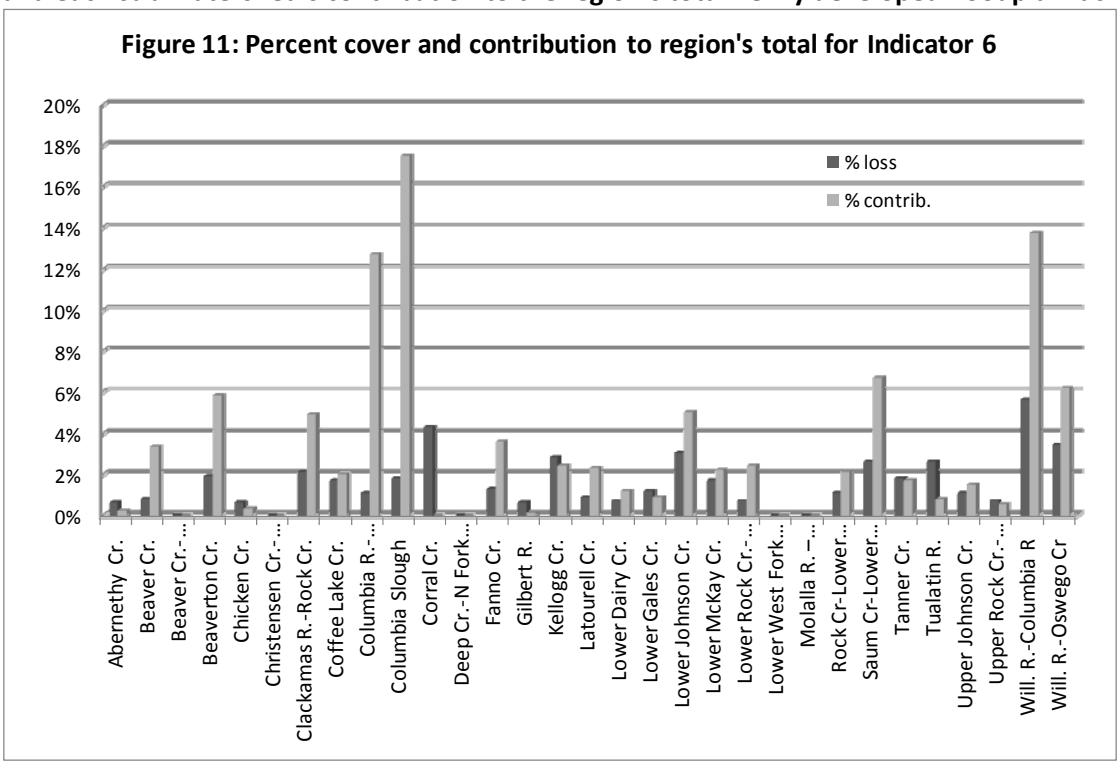


Figure 12
Indicator 6, calculated by jurisdiction: percent loss of undeveloped floodplain between 2005 and 2007 and each jurisdiction's contribution to the region's total newly developed floodplain acres.

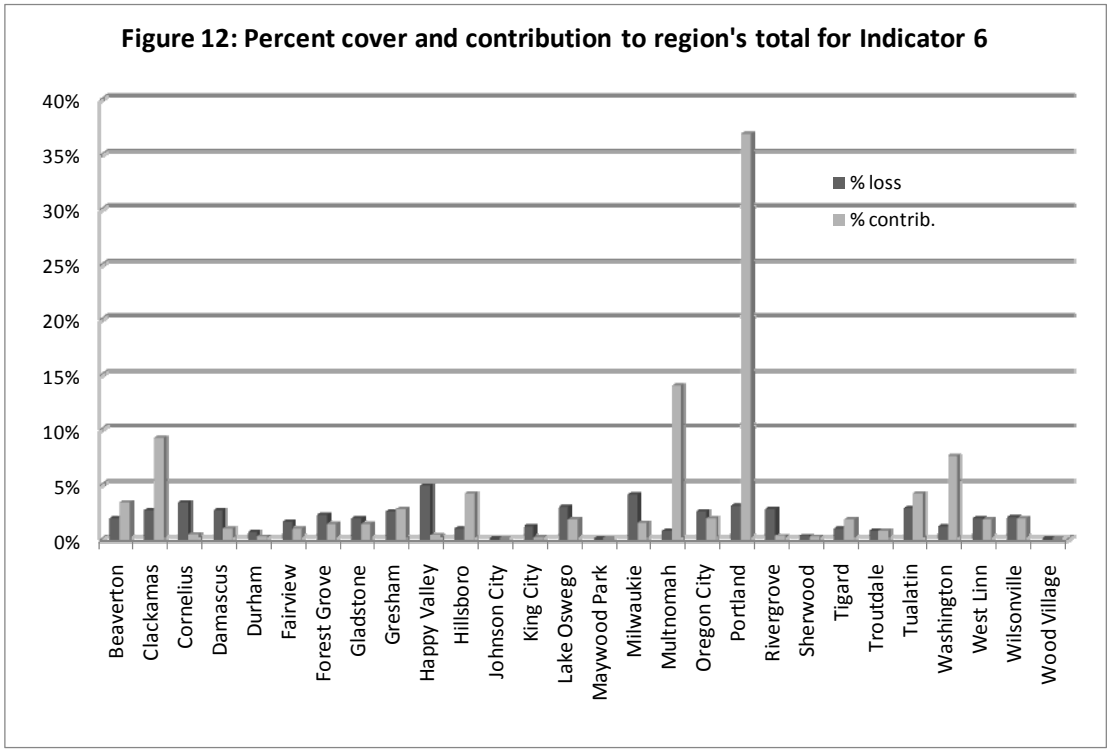


Figure 13

Indicator 7, calculated by sub-watershed: percent cover Class A and Class B upland wildlife habitat and sub-watershed's contribution to the region's total Indicator 7 acres.

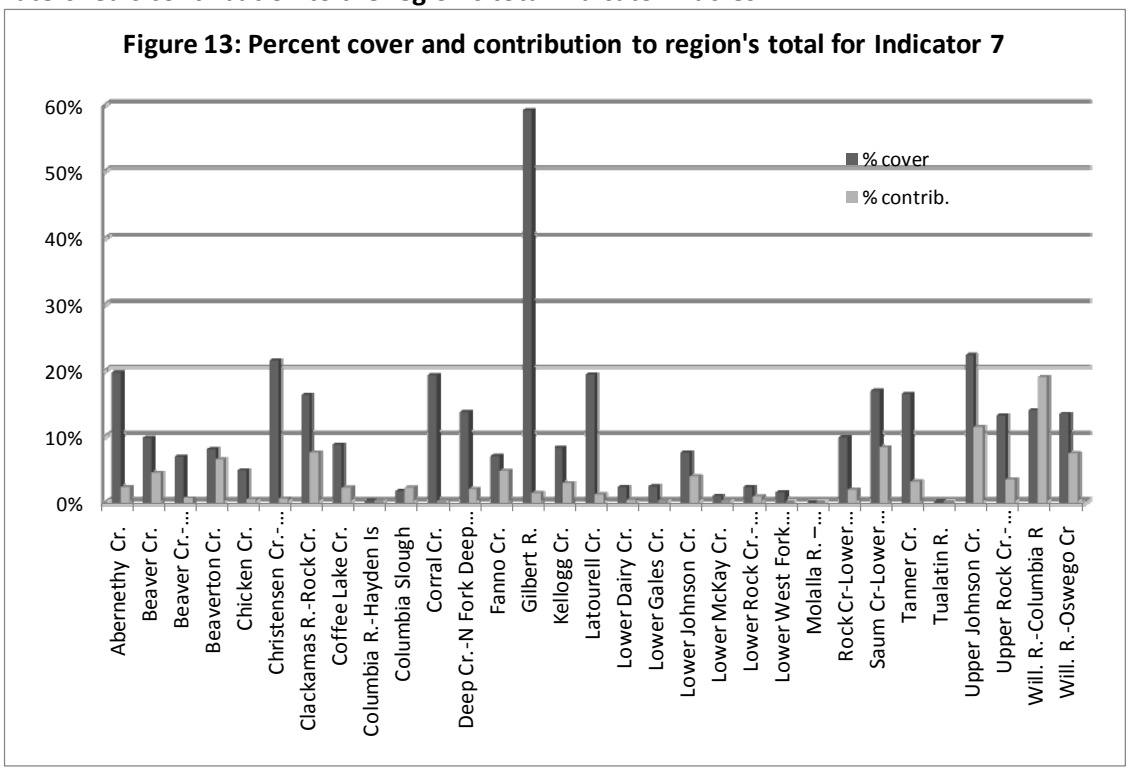


Figure 14

Indicator 7, calculated by jurisdiction: percent cover Class A and Class B upland wildlife habitat and jurisdiction's contribution to the region's total Indicator 7 acres.

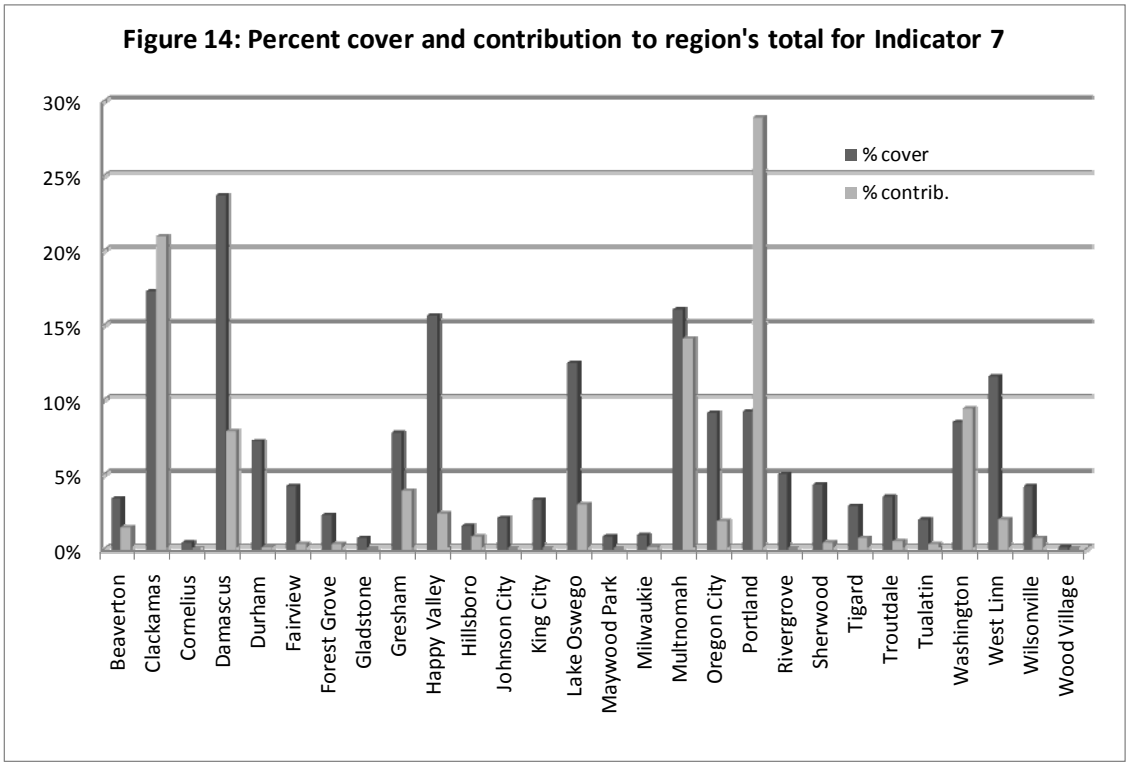


Figure 15
Indicator 8, calculated by sub-watershed: percent cover interior habitat and sub-watershed's contribution to the region's total Indicator 8 acres.

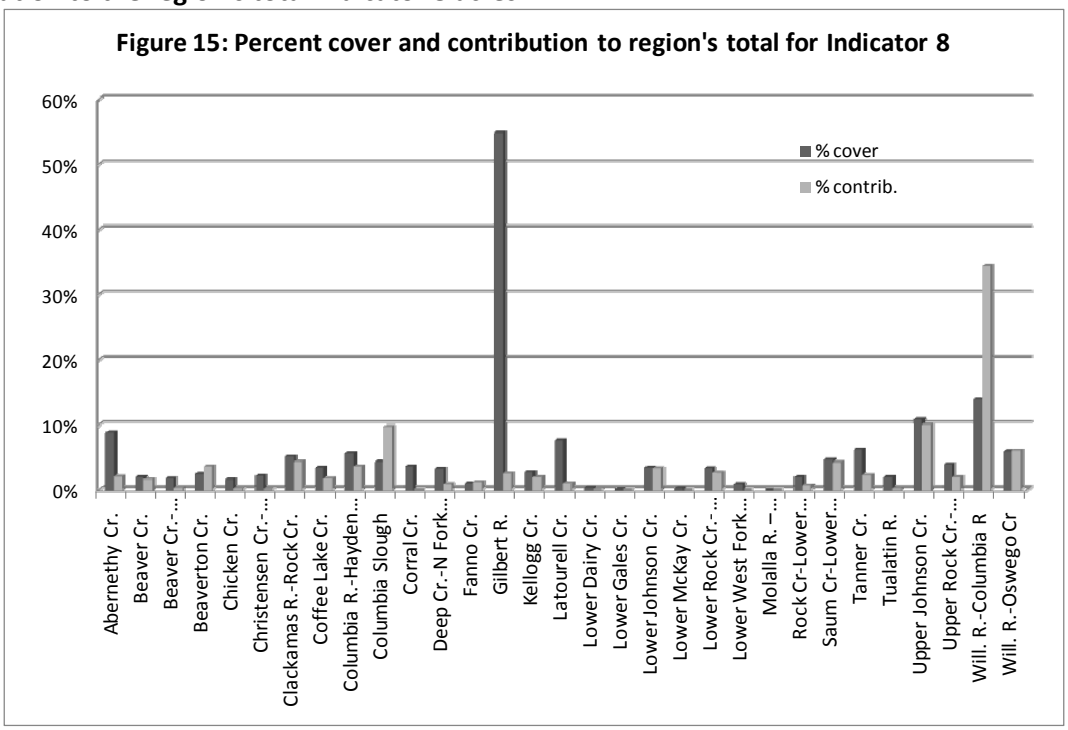


Figure 16
Indicator 8, calculated by jurisdiction: percent cover interior habitat and jurisdiction's contribution to the region's total Indicator 8 acres.

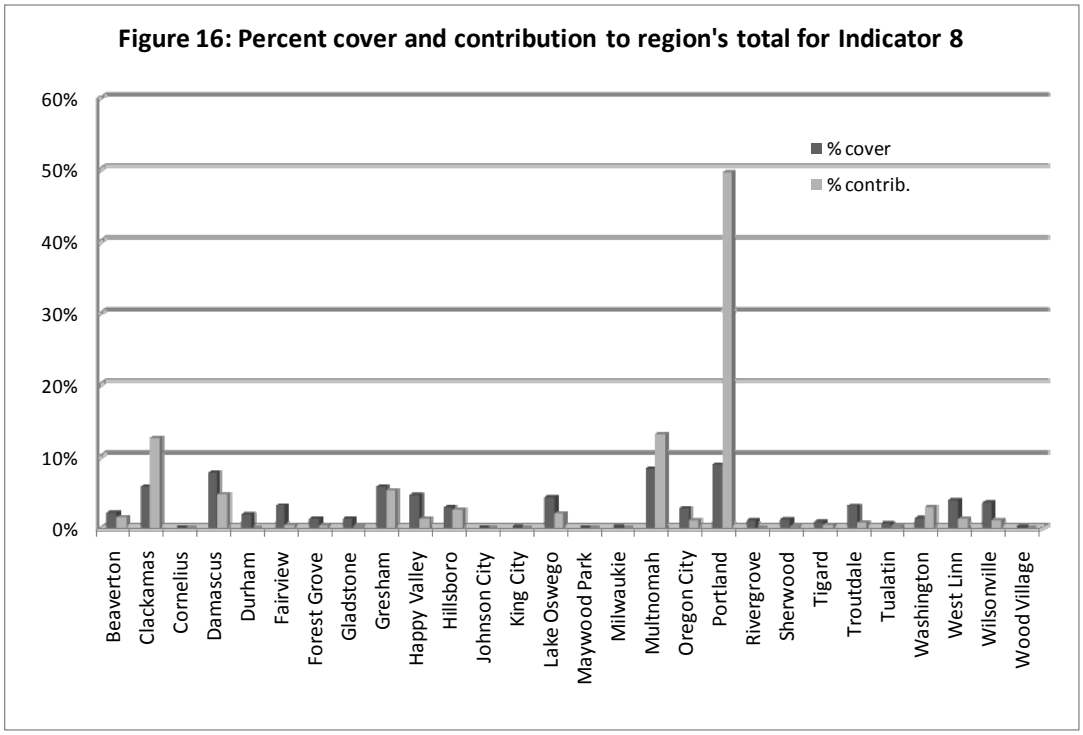


Figure 17
Indicator 9, calculated by sub-watershed: percent loss of Habitats of Concern between 2005 and 2007 and each sub-watershed's contribution to the region's total acres lost.

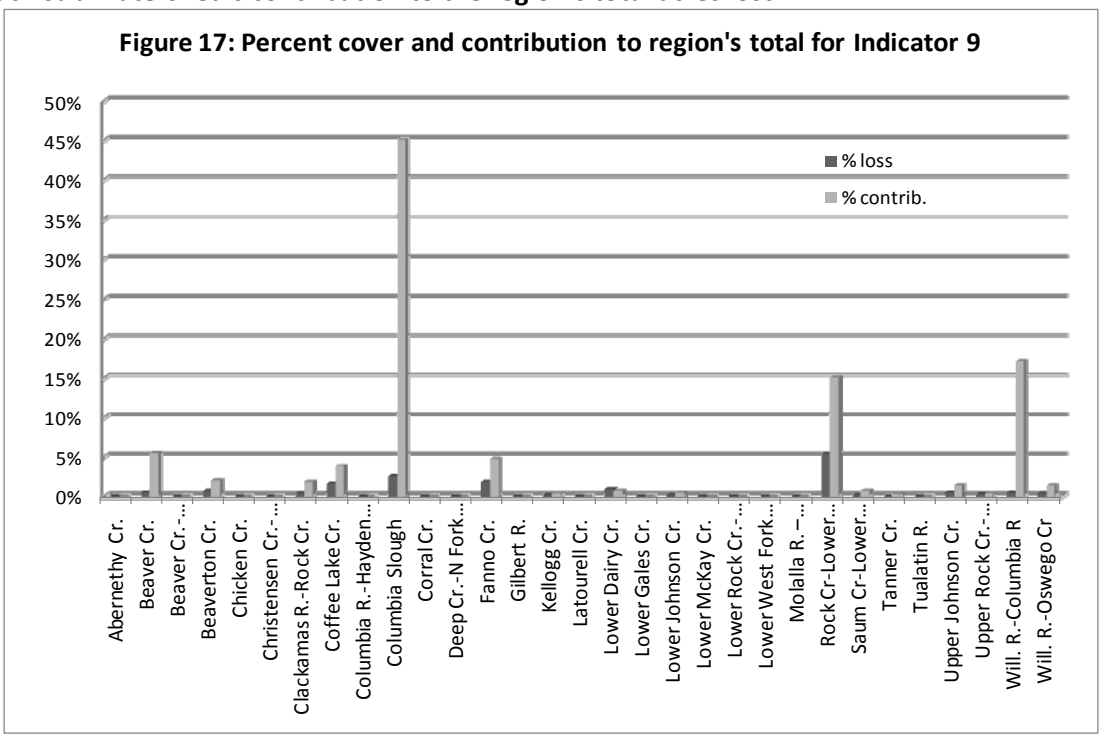


Figure 18
Indicator 9, calculated by jurisdiction: percent loss of Habitats of Concern between 2005 and 2007 and each jurisdiction's contribution to the region's total acres lost.

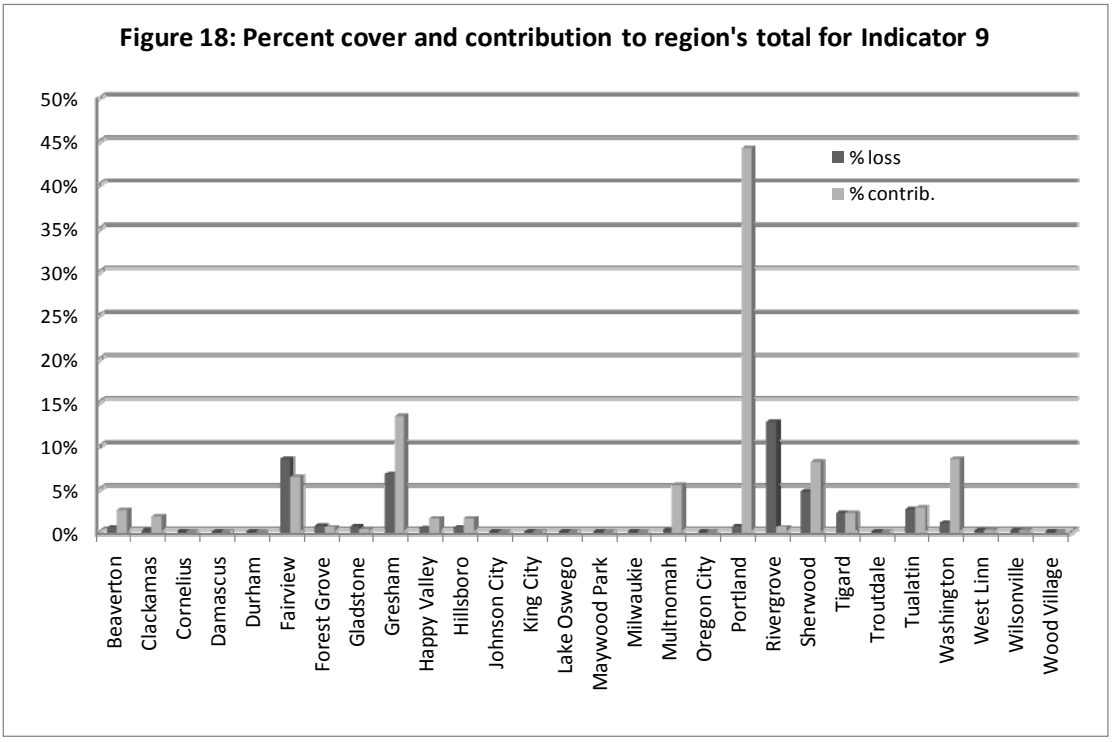


Figure 19
Indicator 10, calculated by sub-watershed: percent tree cover and sub-watershed's contribution to the region's total Indicator 10 acres.

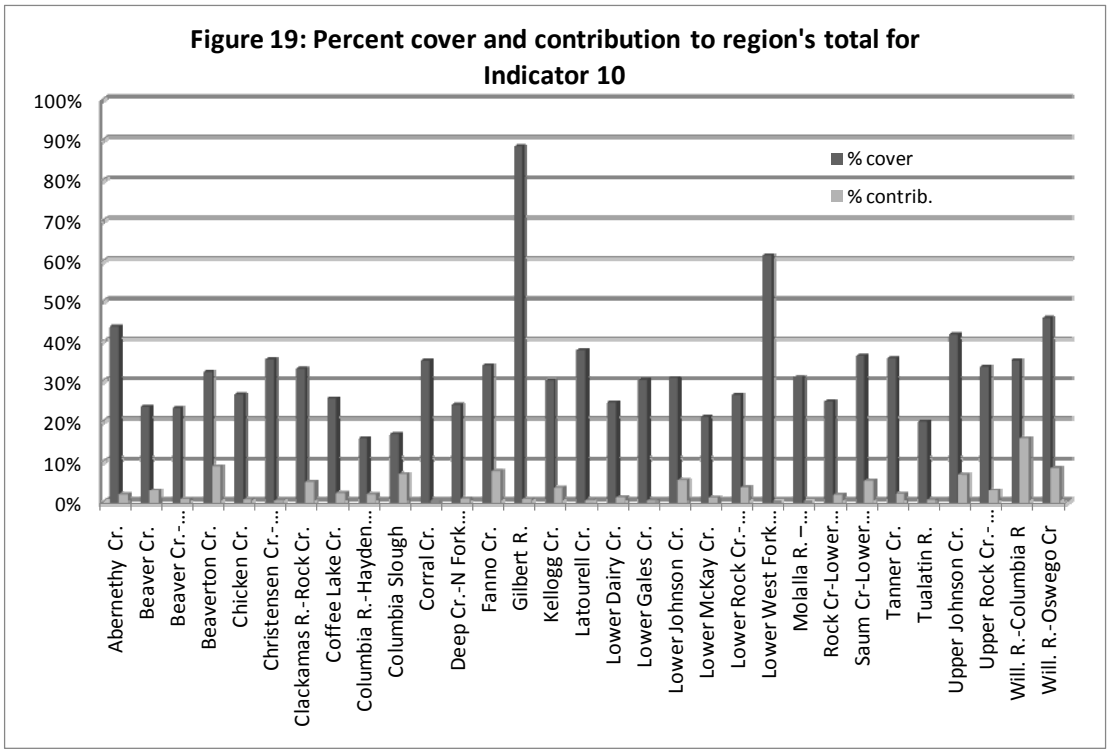


Figure 20
Indicator 10, calculated by jurisdiction: percent tree cover and jurisdiction's contribution to the region's total Indicator 10 acres.

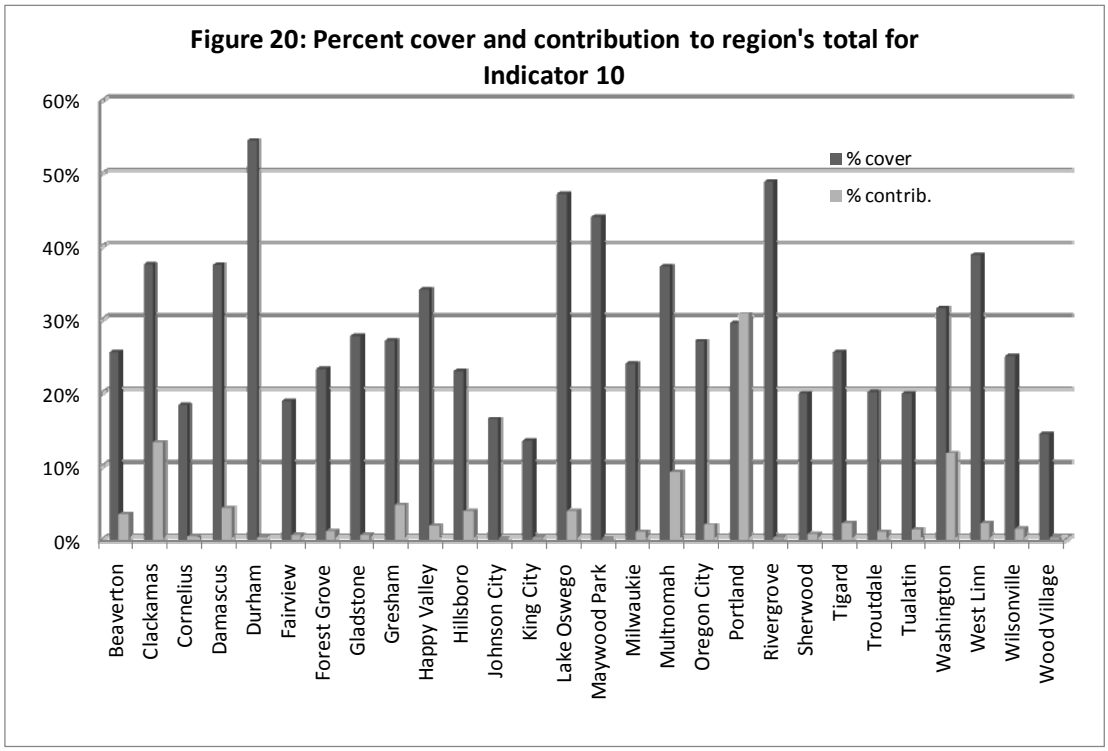
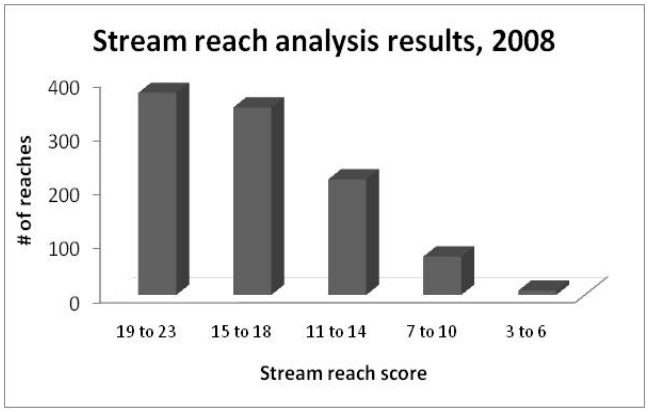


Figure 21

Indicator 11, calculated for the region: scoring ranges and number of stream reaches falling within each scoring category. (Stream reaches were scored based on the percent cover of four characteristics within 150 feet on either side of the stream: tree cover, Class I and II riparian habitat, Class A and B upland wildlife habitat, and developed area. Tree cover and developed area were weighted heavier than the other two variables.)



Score	Number of stream reaches	
19-23 (good)	374	(36.9%)
15-18	347	(34.2%)
11-14	214	(21.1%)
7-10	71	(7.0%)
3-6 (poor)	8	(0.8%)

DATA TABLES

DATA TABLES

Table 3
Sub-basins, watersheds and sub-watersheds in the Portland metro region

Sub-Basin	Watershed	Sub-watershed	12-Digit Code	Acres in Metro	Portion of Metro region
Clackamas	Lower Clackamas R.	Clackamas R. – Rock Cr.	170900110607	13,712	4.6%
		Deep Cr. – N. Fork Deep Cr.	170900110606	4,486	1.5%
Lower Columbia-Sandy	Lower Sandy R.	Beaver Cr.	170800010803	13,827	4.6%
	Columbia Gorge Tributary	Latourell Cr.	170800010704	2,069	0.7%
Lower Willamette	Columbia R. – Hayden Is.	Columbia R. – Hayden Is.	170900120501	10,356	3.4%
	Columbia Slough – Willamette R.	Columbia Slough	170900120301	37,132	12.3%
		Willamette R. – Columbia R.	170900120302	40,181	13.4%
	Johnson Cr.	Kellogg Cr.	170900120103	11,067	3.7%
		Lower Johnson Cr.	170900120102	15,859	5.3%
		Upper Johnson Cr.	170900120101	15,116	5.0%
		Willamette R. – Oswego Cr.	170900120104	16,389	5.4%
	Scappoose Cr.	Gilbert R.	170900120205	741	0.2%
Middle Willamette	Abernethy Cr.	Abernethy Cr.	170900070404	3,615	1.2%
		Beaver Cr. – Willamette R.	170900070403	2,778	0.9%
		Coffee Lake Cr.	170900070402	7,943	2.6%
		Corral Cr.	170900070401	130	0.0%
		Tanner Cr.	170900070405	5,840	1.9%
Molalla-Pudding	Lower Molalla R.	Molalla R. – Willamette R.	170900090607	40	0.0%
Tualatin	Dairy Cr.	Lower Dairy Cr.	170900100108	3,802	1.3%
		Lower McKay Cr.	170900100107	4,069	1.4%
		Lower W. Fork Dairy Cr.	170900100103	64	0.0%
	Gales Cr.	Lower Gales Cr.	170900100203	748	0.2%
		Tualatin R.	170900100204	2,073	0.7%
	Lower Tualatin R.	Chicken Cr.	170900100502	2,144	0.7%
		Fanno Cr.	170900100503	20,184	6.7%
		Rock Cr. – Lower Tualatin R.	170900100501	5,931	2.0%
		Saum Cr. – Lower Tualatin R.	170900100504	14,696	4.9%
	Rock Cr. – Tualatin R.	Beaverton Cr.	170900100403	24,212	8.1%
		Christensen Cr. – Tualatin R.	170900100405	735	0.2%
		Lower Rock Cr./Tualatin R.	170900100401	12,744	4.2%
		Upper Rock Cr./Tualatin R.	170900100402	8,039	2.7%
GRAND TOTALS				300,722	100.0%

Table 4

Jurisdictions and their sub-watersheds in the Portland Metro region. (Note that the total acres in the region varies slightly compared to Table 3 (300,713 vs. 300,722, or 0.003 percent) due to GIS methodologies.)

Jurisdiction	Sub-watershed	Sub-watershed acres in jurisdiction*	Jurisdiction acres in the Metro region	% of jurisdiction comprised of sub-watershed	% of sub-watershed in jurisdiction*
Beaverton	Beaverton Cr.	7,736	11,910	65.0%	32.0%
	Fanno Cr.	4,083		34.3%	20.2%
	Lower Rock Cr.-Tualatin R.	80		0.7%	0.6%
	Upper Rock Cr.-Tualatin R.	12		0.1%	0.1%
Clackamas	Abernethy Cr.	1,728	36,162	4.8%	47.8%
	Beaver Cr.-Willamette R.	691		1.9%	24.9%
	Chicken Cr.	27		0.1%	1.3%
	Clackamas R.-Rock Cr.	4,166		11.5%	30.4%
	Coffee Lake Cr.	902		2.5%	11.4%
	Corral Cr.	8		0.0%	6.2%
	Deep Cr.-North Fork Deep Cr.	3,202		8.9%	71.4%
	Fanno Cr.	310		0.9%	1.5%
	Kellogg Cr.	6,857		19.0%	62.0%
	Lower Johnson Cr.	1,367		3.8%	8.6%
	Molalla R.-Willamette R.	0		0.0%	0.0%
	Rock Cr.-Lower Tualatin R.	0		0.0%	0.0%
	Saum Cr.-Lower Tualatin R.	7,580		21.0%	51.6%
	Tanner Cr.	2,422		6.7%	41.5%
	Upper Johnson Cr.	2,879		8.0%	19.0%
	Willamette R.-Columbia R.	183		0.5%	0.5%
	Willamette R.-Oswego Cr.	3,842		10.6%	23.4%
Cornelius	Lower Dairy Cr.	458	1,281	35.8%	12.0%
	Tualatin R.	823		64.2%	39.7%
Damascus	Clackamas R.-Rock Cr.	6,010	9,924	60.6%	43.8%
	Deep Cr.-North Fork Deep Cr.	1,284		12.9%	28.6%
	Upper Johnson Cr.	2,630		26.5%	17.4%
Durham	Fanno Cr.	110	265	41.5%	0.5%
	Rock Cr.-Lower Tualatin R.	1		0.4%	0.0%
	Saum Cr.-Lower Tualatin R.	154		58.1%	1.0%
Fairview	Columbia R.-Hayden Is.	201	2,280	8.8%	1.9%
	Columbia Slough	2,079		91.2%	5.6%
Forest Grove	Lower Dairy Cr.	1,851	3,704	50.0%	48.7%
	Lower Gales Cr.	640		17.3%	85.6%
	Tualatin R.	1,213		32.7%	58.5%
Gladstone	Clackamas R.-Rock Cr.	635	1,591	39.9%	4.6%
	Kellogg Cr.	101		6.3%	0.9%
	Tanner Cr.	2		0.1%	0.0%
	Willamette R.-Oswego Cr.	853		53.6%	5.2%
Gresham	Beaver Cr.	3,797	14,996	25.3%	27.5%
	Columbia R.-Hayden Is.	45		0.3%	0.4%
	Columbia Slough	4,638		30.9%	12.5%
	Lower Johnson Cr.	1,055		7.0%	6.7%
	Upper Johnson Cr.	5,461		36.4%	36.1%
Happy Valley	Clackamas R.-Rock Cr.	2,030	4,503	45.1%	14.8%
	Kellogg Cr.	1,952		43.3%	17.6%
	Lower Johnson Cr.	191		4.2%	1.2%
	Upper Johnson Cr.	331		7.4%	2.2%

Jurisdiction	Sub-watershed	Sub-watershed acres in jurisdiction*	Jurisdiction acres in the Metro region	% of jurisdiction comprised of sub-watershed	% of sub-watershed in jurisdiction*
Hillsboro	Beaverton Cr.	971	14,798	6.6%	4.0%
	Lower Dairy Cr.	303		2.0%	8.0%
	Lower McKay Cr.	3,653		24.7%	89.8%
	Lower Rock Cr.-Tualatin R.	8,077		54.6%	63.4%
	Upper Rock Cr.-Tualatin R.	1,794		12.1%	22.3%
Johnson City	Kellogg Cr.	43	43	100.0%	0.4%
King City	Rock Cr.-Lower Tualatin R.	447	447	100.0%	7.5%
Lake Oswego	Fanno Cr.	1,041	7,234	14.4%	5.2%
	Saum Cr.-Lower Tualatin R.	590		8.2%	4.0%
	Willamette R.-Oswego Cr.	5,602		77.4%	34.2%
Maywood Park	Columbia Slough	107	107	100.0%	0.3%
Milwaukie	Kellogg Cr.	2,101	3,168	66.3%	19.0%
	Lower Johnson Cr.	849		26.8%	5.4%
	Willamette R.-Columbia R.	68		2.1%	0.2%
	Willamette R.-Oswego Cr.	150		4.7%	0.9%
Multnomah	Beaver Cr.	7,883	26,218	30.1%	57.0%
	Beaverton Cr.	1,211		4.6%	5.0%
	Columbia R.-Hayden Is.	6,773		25.8%	65.4%
	Columbia Slough	232		0.9%	0.6%
	Fanno Cr.	460		1.8%	2.3%
	Gilbert R.	41		0.2%	5.5%
	Latourell Cr.	2,069		7.9%	100.0%
	Lower Johnson Cr.	105		0.4%	0.7%
	Upper Johnson Cr.	3,207		12.2%	21.2%
	Upper Rock Cr.-Tualatin R.	2,318		8.8%	28.8%
	Willamette R.-Columbia R.	1,405		5.4%	3.5%
	Willamette R.-Oswego Cr.	515		2.0%	3.1%
Oregon City	Abernethy Cr.	1,887	6,280	30.0%	52.2%
	Beaver Cr.-Willamette R.	2,088		33.2%	75.2%
	Clackamas R.-Rock Cr.	871		13.9%	6.4%
	Tanner Cr.	1,435		22.9%	24.6%
Portland	Beaverton Cr.	1,320	92,768	1.4%	5.5%
	Columbia R.-Hayden Is.	3,320		3.6%	32.1%
	Columbia Slough	27,762		29.9%	74.8%
	Fanno Cr.	4,648		5.0%	23.0%
	Gilbert R.	700		0.8%	94.5%
	Kellogg Cr.	13		0.0%	0.1%
	Lower Johnson Cr.	12,292		13.3%	77.5%
	Upper Johnson Cr.	609		0.7%	4.0%
	Upper Rock Cr.-Tualatin R.	477		0.5%	5.9%
	Willamette R.-Columbia R.	38,525		41.5%	95.9%
	Willamette R.-Oswego Cr.	3,102		3.3%	18.9%
Rivergrove	Saum Cr.-Lower Tualatin R.	117	117	100.0%	0.8%
Sherwood	Chicken Cr.	1,727	2,739	63.1%	80.6%
	Rock Cr.-Lower Tualatin R.	980		35.8%	16.5%
	Saum Cr.-Lower Tualatin R.	31		1.1%	0.2%
Tigard	Fanno Cr.	6,578	7,545	87.2%	32.6%
	Rock Cr.-Lower Tualatin R.	909		12.0%	15.3%
	Saum Cr.-Lower Tualatin R.	58		0.8%	0.4%
Troutdale	Beaver Cr.	2,141	3,862	55.4%	15.5%
	Columbia R.-Hayden Is.	14		0.4%	0.1%
	Columbia Slough	1,707		44.2%	4.6%

Jurisdiction	Sub-watershed	Sub-watershed acres in jurisdiction*	Jurisdiction acres in the Metro region	% of jurisdiction comprised of sub-watershed	% of sub-watershed in jurisdiction*
Tualatin	Coffee Lake Cr.	331	5,186	6.4%	4.2%
	Fanno Cr.	11		0.2%	0.1%
	Rock Cr.-Lower Tualatin R.	838		16.2%	14.1%
	Saum Cr.-Lower Tualatin R.	4,007		77.3%	27.3%
Washington	Beaverton Cr.	12,975	33,141	39.2%	53.6%
	Chicken Cr.	390		1.2%	18.2%
	Christensen Cr.-Tualatin R.	735		2.2%	100.0%
	Coffee Lake Cr.	2,150		6.5%	27.1%
	Fanno Cr.	2,944		8.9%	14.6%
	Lower Dairy Cr.	1,190		3.6%	31.3%
	Lower Gales Cr.	108		0.3%	14.5%
	Lower McKay Cr.	416		1.3%	10.2%
	Lower Rock Cr.-Tualatin R.	4,587		13.8%	36.0%
	Lower West Fork Dairy Cr.	64		0.2%	100.0%
	Rock Cr.-Lower Tualatin R.	2,756		8.3%	46.5%
	Saum Cr.-Lower Tualatin R.	1,352		4.1%	9.2%
	Tualatin R.	37		0.1%	1.8%
	Upper Rock Cr.-Tualatin R.	3,437		10.4%	42.8%
West Linn	Saum Cr.-Lower Tualatin R.	805	5,111	15.8%	5.5%
	Tanner Cr.	1,981		38.8%	33.9%
	Willamette R.-Oswego Cr.	2,325		45.5%	14.2%
Wilsonville	Coffee Lake Cr.	4,561	4,723	96.6%	57.4%
	Corral Cr.	122		2.6%	93.9%
	Molalla R.-Willamette R.	40		0.8%	100.0%
Wood Village	Columbia Slough	608	608	100.0%	100.0%
GRAND TOTALS		300,713	300,713	100.0%	100.0%

*Within the Metro region; includes open water

Table 5

Indicators 1-4, calculated by sub-watershed: 2007 non-tree vegetation and tree cover within 0-50 feet (Indicators 1 and 2) and 50-150 feet (Indicators 3 and 4) of streams and wetlands.

	Percent vegetation within 50 feet of streams and wetlands (Indicators 1 and 2)		Percent vegetation within 50-150 feet of streams and wetlands (Indicators 3 and 4)		Total percent vegetation near streams and wetlands	
Sub-watershed	**Non-tree vegetation**	**Tree cover**	**Non-tree vegetation**	**Tree cover**	**Total vegetation within 50 feet**	**Total vegetation within 50-150 feet**
Abernethy Cr.	16.0%	78.2%	18.8%	70.1%	94.1%	88.9%
Beaver Cr.	32.5%	56.3%	37.2%	47.4%	88.8%	84.6%
Beaver Cr.-Willamette R	40.0%	41.7%	37.0%	31.1%	81.7%	68.1%
Beaverton Cr.	30.1%	57.0%	24.3%	44.3%	87.1%	68.6%
Chicken Cr.	35.4%	56.5%	29.9%	39.3%	92.0%	69.2%
Christensen Cr.-Tualatin R	29.2%	50.1%	34.8%	43.0%	79.3%	77.8%
Clackamas R.-Rock Cr.	33.6%	56.0%	38.8%	46.1%	89.6%	85.0%
Coffee Lake Cr.	48.3%	37.5%	32.5%	40.8%	85.8%	73.3%
Columbia R.-Hayden Is	43.1%	45.9%	34.0%	54.1%	89.1%	88.1%
Columbia Slough	46.3%	43.4%	43.9%	19.0%	89.7%	62.9%
Corral Cr.	25.5%	53.8%	16.1%	44.0%	79.3%	60.1%
Deep Cr.-N Fork Deep Cr	55.3%	34.9%	55.2%	31.1%	90.3%	86.3%
Fanno Cr.	31.4%	56.3%	26.2%	41.0%	87.7%	67.2%
Gilbert R.	14.2%	81.4%	3.5%	92.1%	95.6%	95.6%
Kellogg Cr.	31.8%	53.0%	29.2%	38.3%	84.8%	67.5%
Latourell Cr.	81.3%	17.1%	69.1%	23.8%	98.5%	92.9%
Lower Dairy Cr.	43.6%	42.8%	41.6%	33.9%	86.5%	75.5%
Lower Gales Cr.	37.0%	47.2%	48.6%	34.0%	84.2%	82.6%
Lower Johnson Cr.	23.7%	70.2%	25.8%	55.3%	93.9%	81.1%
Lower McKay Cr.	41.5%	49.9%	49.8%	25.1%	91.4%	74.9%
Lower Rock Cr.-Tualatin R	33.7%	53.1%	28.9%	35.3%	86.8%	64.1%
Lower West Fork Dairy Cr.	25.2%	63.5%	19.5%	68.1%	88.7%	87.7%
Molalla R. – Willamette R	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rock Cr-Lower Tualatin R.	50.0%	36.5%	40.8%	36.1%	86.5%	76.9%
Saum Cr-Lower Tualatin R	36.9%	54.3%	31.3%	52.1%	91.2%	83.3%
Tanner Cr.	30.8%	47.7%	27.0%	42.9%	78.6%	70.0%
Tualatin R.	52.7%	26.0%	42.4%	22.9%	78.7%	65.3%
Upper Johnson Cr.	26.3%	67.7%	33.8%	54.0%	94.0%	87.8%
Upper Rock Cr.-Tualatin R	30.5%	62.1%	33.1%	49.3%	92.5%	82.4%
Willamette R.-Columbia R	9.3%	79.6%	8.2%	76.3%	88.9%	84.5%
Willamette R.-Oswego Cr	15.9%	73.5%	19.3%	63.6%	89.4%	82.9%
Regional average	**33.6%**	**55.4%**	**29.3%**	**47.5%**	**89.0%**	**76.8%**

Table 6
Indicators 1-4, calculated by jurisdiction: 2007 non-tree vegetation and tree cover within 0-50 feet (Indicators 1 and 2) and 50-150 feet (Indicators 3 and 4) of streams and wetlands.

	Percent vegetation within 50 feet of streams and wetlands (Indicators 1 and 2)		Percent vegetation within 50-150 feet of streams and wetlands (Indicators 3 and 4)		Total percent vegetation near streams and wetlands	
Jurisdiction	**Non-tree vegetation**	**Tree cover**	**Non-tree vegetation**	**Tree cover**	**Total vegetation within 50 feet**	**Total vegetation within 50-150 feet**
Beaverton	36.9%	46.0%	23.0%	30.6%	82.9%	53.6%
Clackamas	27.8%	61.0%	31.6%	52.2%	88.8%	83.8%
Cornelius	49.0%	41.2%	31.9%	30.0%	90.2%	61.9%
Damascus	40.9%	52.3%	47.8%	42.4%	93.2%	90.2%
Durham	12.7%	85.0%	19.7%	72.7%	97.7%	92.4%
Fairview	54.4%	33.4%	39.8%	26.2%	87.8%	66.0%
Forest Grove	50.1%	30.8%	42.3%	26.8%	80.9%	69.1%
Gladstone	27.4%	53.3%	26.8%	45.5%	80.7%	72.3%
Gresham	29.0%	63.1%	29.1%	50.4%	92.1%	79.5%
Happy Valley	35.8%	53.9%	37.3%	44.3%	89.7%	81.6%
Hillsboro	34.5%	53.0%	31.1%	29.6%	87.5%	60.7%
Johnson City	23.0%	34.1%	19.1%	16.8%	57.1%	35.9%
King City	47.8%	33.3%	45.3%	23.3%	81.1%	68.6%
Lake Oswego	16.2%	76.6%	19.6%	60.5%	92.8%	80.1%
Maywood Park	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Milwaukie	32.7%	48.3%	29.7%	27.7%	81.0%	57.4%
Multnomah	36.8%	57.4%	33.2%	60.2%	94.2%	93.4%
Oregon City	30.0%	50.0%	29.1%	38.0%	80.0%	67.1%
Portland	23.6%	66.6%	21.1%	56.0%	90.2%	77.1%
Rivergrove	14.5%	82.4%	20.0%	65.9%	96.9%	85.9%
Sherwood	41.9%	42.7%	35.5%	28.4%	84.6%	63.9%
Tigard	37.9%	47.5%	28.6%	34.0%	85.4%	62.6%
Troutdale	61.0%	28.7%	46.3%	33.7%	89.7%	80.0%
Tualatin	54.9%	32.0%	34.3%	25.1%	86.9%	59.4%
Washington	36.4%	51.7%	34.6%	39.4%	88.1%	74.0%
West Linn	26.2%	58.0%	23.6%	55.7%	84.2%	79.3%
Wilsonville	50.3%	37.5%	27.5%	43.2%	87.8%	70.7%
Wood Village	73.4%	5.5%	32.4%	11.1%	78.9%	43.5%
Regional average	**33.6%**	**55.4%**	**29.3%**	**47.5%**	**89.0%**	**76.8%**

Table 7
Indicators 5 and 7, calculated by sub-watershed: number of acres and percent cover of Class I and II riparian and Class A and B upland habitat for 2007.

Sub-watershed	Highest value riparian habitat		Highest value upland habitat		Total acres Class I and II	% of region's total Class I and II	Total acres Class A and B	% of region's total Class A and B	% sub-watershed comprised of Class I, II, A and B
	Class I	Class II	Class A	Class B					
Abernethy Cr.	381.5	182.4	203.3	504.5	563.8	1.0%	707.8	2.4%	35.2%
Beaver Cr.	3,164.4	366.8	975.6	365.3	3,531.2	6.3%	1,340.9	4.5%	35.2%
Beaver Cr.-Willamette R	82.3	114.6	15.2	177.7	196.9	0.4%	193.0	0.6%	14.0%
Beaverton Cr.	2,185.5	760.5	1,111.2	815.8	2,946.0	5.3%	1,927.0	6.5%	20.2%
Chicken Cr.	292.2	72.3	70.1	34.8	364.5	0.7%	105.0	0.4%	21.9%
Christensen Cr.-Tualatin R	32.4	16.4	151.7	5.4	48.7	0.1%	157.1	0.5%	27.9%
Clackamas R.-Rock Cr.	1,385.1	809.4	1,207.5	1,030.3	2,194.5	3.9%	2,237.8	7.5%	32.3%
Coffee Lake Cr.	917.4	313.7	230.5	460.3	1,231.2	2.2%	690.7	2.3%	24.2%
Columbia R.-Hayden Is	9,799.2	92.9	19.7	0.0	9,892.1	17.7%	19.7	0.1%	95.7%
Columbia Slough	4,509.1	1,159.2	292.2	383.0	5,668.3	10.1%	675.2	2.3%	17.1%
Corral Cr.	10.7	0.2	24.5	0.0	10.9	0.0%	24.5	0.1%	27.7%
Deep Cr.-N Fork Deep Cr	281.0	334.4	93.1	521.2	615.4	1.1%	614.4	2.1%	27.4%
Fanno Cr.	1,829.3	659.1	311.1	1,109.5	2,488.4	4.4%	1,420.6	4.8%	19.3%
Gilbert R.	232.1	4.8	437.7	0.1	236.9	0.4%	437.8	1.5%	91.1%
Kellogg Cr.	585.3	266.1	386.1	517.5	851.4	1.5%	903.6	3.0%	15.9%
Latourell Cr.	1,309.6	7.8	290.1	108.6	1,317.4	2.4%	398.7	1.3%	83.0%
Lower Dairy Cr.	349.1	263.0	17.1	75.7	612.2	1.1%	92.8	0.3%	18.5%
Lower Gales Cr.	154.0	79.6	0.8	17.6	233.6	0.4%	18.4	0.1%	33.8%
Lower Johnson Cr.	920.2	284.9	907.7	283.6	1,205.1	2.2%	1,191.3	4.0%	15.1%
Lower McKay Cr.	360.1	123.4	5.3	39.1	483.5	0.9%	44.4	0.1%	13.0%
Lower Rock Cr.-Tualatin R	1,308.1	426.5	69.1	243.3	1,734.5	3.1%	312.4	1.0%	16.0%
Lower West Fork Dairy Cr.	0.8	4.9	0.0	1.1	5.8	0.0%	1.1	0.0%	11.0%
Molalla R. – Willamette R	0.0	0.9	0.0	0.0	0.9	0.0%	0.0	0.0%	2.5%
Rock Cr-Lower Tualatin R.	677.7	254.9	325.0	257.6	932.6	1.7%	582.6	2.0%	25.5%
Saum Cr-Lower Tualatin R	1,669.2	681.3	778.3	1,699.3	2,350.5	4.2%	2,477.6	8.3%	32.9%
Tanner Cr.	1,032.3	249.7	567.0	388.3	1,282.0	2.3%	955.3	3.2%	38.4%
Tualatin R.	161.0	35.2	1.9	0.0	196.3	0.4%	2.0	0.0%	9.6%
Upper Johnson Cr.	1,640.1	676.2	1,413.8	1,940.7	2,316.4	4.1%	3,354.5	11.3%	37.5%
Upper Rock Cr.-Tualatin R	1,020.3	325.2	617.8	428.3	1,345.5	2.4%	1,046.1	3.5%	29.7%
Willamette R.-Columbia R	7,296.8	414.3	5,433.3	187.8	7,711.1	13.8%	5,621.1	18.9%	33.2%
Willamette R.-Oswego Cr	2,330.1	1,058.2	1,030.3	1,165.6	3,388.2	6.1%	2,195.9	7.4%	34.1%
Regional average	**45,916.8**	**10,039.2**	**16,987.1**	**12,762.1**	**55,956.0**	**100.0%**	**29,749.3**	**100.0%**	**28.5%**

Table 8
Indicators 5 and 7, calculated by jurisdiction: number of acres and percent cover of Class I and II riparian and Class A and B upland habitat for 2007. (These data represent baseline conditions as of 2007.)

Sub-watershed	Highest value riparian habitat		Highest value upland habitat		Total acres Class I and II	% of region's total Class I and II	Total acres Class A and B	% of region's total Class A and B	% of jurisdiction comprised of Class I, II, A and B
	Class I	Class II	Class A	Class B					
Beaverton	903.2	302.1	238.2	165.3	1,205.4	2.2%	403.5	1.4%	13.5%
Clackamas	3,504.6	1,582.3	2,082.2	4,137.8	5,086.9	9.1%	6,219.9	20.9%	31.3%
Cornelius	42.3	14.7	4.4	0.2	56.9	0.1%	4.6	0.0%	4.8%
Damascus	724.3	525.9	1,160.7	1,185.1	1,250.3	2.2%	2,345.8	7.9%	36.2%
Durham	68.2	4.7	18.6	0.4	72.8	0.1%	19.0	0.1%	34.6%
Fairview	610.3	126.5	12.7	83.3	736.7	1.3%	96.0	0.3%	36.5%
Forest Grove	289.1	122.8	13.1	73.2	411.9	0.7%	86.2	0.3%	13.4%
Gladstone	206.4	81.2	4.1	7.1	287.6	0.5%	11.2	0.0%	18.8%
Gresham	1,147.6	355.9	749.6	416.5	1,503.5	2.7%	1,166.1	3.9%	17.8%
Happy Valley	346.3	180.0	366.8	337.3	526.3	0.9%	704.0	2.4%	27.3%
Hillsboro	1,528.7	347.0	48.8	176.8	1,875.7	3.4%	225.7	0.8%	14.2%
Johnson City	6.0	2.4	0.0	0.9	8.4	0.0%	0.9	0.0%	21.6%
King City	30.2	29.1	0.0	14.8	59.3	0.1%	14.8	0.0%	16.6%
Lake Oswego	689.0	694.5	171.4	724.5	1,383.4	2.5%	895.8	3.0%	31.5%
Maywood Park	0.0	0.0	0.0	0.9	0.0	0.0%	0.9	0.0%	0.8%
Milwaukie	237.5	73.8	3.2	26.3	311.3	0.6%	29.5	0.1%	10.8%
Multnomah	12,733.8	730.8	2,799.6	1,395.7	13,464.6	24.1%	4,195.3	14.1%	67.4%
Oregon City	427.5	369.1	132.3	440.4	796.5	1.4%	572.7	1.9%	21.8%
Portland	15,708.3	1,861.1	7,597.8	978.6	17,569.4	31.4%	8,576.4	28.8%	28.2%
Rivergrove	48.3	12.7	2.2	3.7	61.0	0.1%	5.9	0.0%	57.2%
Sherwood	316.4	36.5	97.4	19.1	352.9	0.6%	116.5	0.4%	17.1%
Tigard	707.7	260.7	22.0	198.2	968.4	1.7%	220.2	0.7%	15.8%
Troutdale	589.4	148.7	100.1	34.6	738.1	1.3%	134.7	0.5%	22.6%
Tualatin	541.3	176.6	36.8	66.7	717.9	1.3%	103.5	0.3%	15.8%
Washington	2,936.9	1,556.1	1,081.2	1,727.8	4,493.0	8.0%	2,809.0	9.4%	22.0%
West Linn	892.9	281.0	165.6	424.7	1,174.0	2.1%	590.3	2.0%	34.5%
Wilsonville	679.9	160.1	78.4	121.8	840.0	1.5%	200.2	0.7%	22.0%
Wood Village	0.7	3.0	0.0	0.4	3.7	0.0%	0.4	0.0%	0.7%
Regional average	**45,916.8**	**10,039.2**	**16,987.1**	**12,762.1**	**55,956.0**	**100.0%**	**29,749.3**	**100.0%**	**28.5%**

Table 9
Indicator 6, calculated by sub-watershed: number of acres and percent cover of undeveloped floodplain for 2005 and 2007.

Sub-watershed Name	Undeveloped floodplain 2004	Floodplain developed since 2004	Undeveloped floodplain 2007	Percent floodplain developed	Contribution to region's floodplain developed since 2004
Abernethy Cr.	93.9	0.6	93.3	0.6%	0.2%
Beaver Cr.	1,080.6	8.6	1,071.9	0.8%	3.3%
Beaver Cr.-Willamette R.	0.0	0.0	0.0	0.0%	0.0%
Beaverton Cr.	780.1	15.2	764.9	1.9%	5.8%
Chicken Cr.	154.7	0.9	153.8	0.6%	0.3%
Christensen Cr.-Tualatin R.	0.0	0.0	0.0	0.0%	0.0%
Clackamas R.-Rock Cr.	604.9	12.8	592.1	2.1%	4.9%
Coffee Lake Cr.	308.4	5.2	303.2	1.7%	2.0%
Columbia R.-Hayden Is.	3,010.0	33.3	2,976.7	1.1%	12.7%
Columbia Slough	2,504.6	45.8	2,458.9	1.8%	17.5%
Corral Cr.	1.1	0.0	1.1	4.3%	0.0%
Deep Cr.-N Fork Deep Cr.	0.0	0.0	0.0	0.0%	0.0%
Fanno Cr.	695.9	9.4	686.5	1.3%	3.6%
Gilbert R.	43.4	0.3	43.1	0.6%	0.1%
Kellogg Cr.	228.3	6.3	222.0	2.8%	2.4%
Latourell Cr.	707.8	6.1	701.8	0.9%	2.3%
Lower Dairy Cr.	427.5	3.1	424.4	0.7%	1.2%
Lower Gales Cr.	195.3	2.3	193.0	1.2%	0.9%
Lower Johnson Cr.	434.7	13.0	421.7	3.0%	5.0%
Lower McKay Cr.	349.8	5.8	343.9	1.7%	2.2%
Lower Rock Cr.-Tualatin R.	875.6	6.4	869.2	0.7%	2.4%
Lower West Fork Dairy Cr.	0.0	0.0	0.0	0.0%	0.0%
Molalla R.-Willamette R.	0.0	0.0	0.0	0.0%	0.0%
Rock Cr.-Lower Tualatin R.	518.5	5.6	512.9	1.1%	2.1%
Saum Cr.-Lower Tualatin R.	688.9	17.6	671.3	2.6%	6.7%
Tanner Cr.	244.8	4.5	240.3	1.8%	1.7%
Tualatin R.	77.1	2.0	75.1	2.6%	0.8%
Upper Johnson Cr.	334.8	3.8	331.0	1.1%	1.5%
Upper Rock Cr.-Tualatin R.	191.1	1.3	189.8	0.7%	0.5%
Willamette R.-Columbia R.	642.1	35.8	606.2	5.6%	13.7%
Willamette R.-Oswego Cr.	472.5	16.2	456.2	3.4%	6.2%
Total	**15,666.3**	**262.0**	**15,404.3**	**1.7%**	**100.0%**

Table 10
Indicator 6, calculated by jurisdiction: number of acres and percent cover of undeveloped floodplain for 2005 and 2007.

Jurisdiction	Undeveloped floodplain 2004	Floodplain developed since 2004	Undeveloped floodplain 2007	Percent floodplain developed	Contribution to region's floodplain developed since 2004
Beaverton	461.2	8.6	452.6	1.9%	3.3%
Clackamas	970.3	24.2	946.1	2.6%	9.2%
Cornelius	41.1	1.3	39.8	3.3%	0.5%
Damascus	97.5	2.5	95.0	2.6%	1.0%
Durham	52.5	0.4	52.1	0.7%	0.2%
Fairview	164.5	2.7	161.8	1.6%	1.0%
Forest Grove	172.4	3.7	168.7	2.2%	1.4%
Gladstone	199.4	3.7	195.6	1.9%	1.4%
Gresham	289.2	7.0	282.1	2.5%	2.7%
Happy Valley	24.3	1.1	23.1	4.9%	0.4%
Hillsboro	1,148.0	11.1	1,136.9	1.0%	4.2%
Johnson City	0.0	0.0	0.0	0.0%	0.0%
King City	27.1	0.3	26.8	1.2%	0.1%
Lake Oswego	165.9	4.7	161.2	2.9%	1.8%
Maywood Park	0.0	0.0	0.0	0.0%	0.0%
Milwaukie	100.4	4.0	96.4	4.1%	1.5%
Multnomah	4,738.6	36.3	4,702.3	0.8%	13.9%
Oregon City	208.5	5.1	203.4	2.5%	1.9%
Portland	3,277.9	96.4	3,181.4	3.0%	36.8%
Rivergrove	35.6	0.9	34.7	2.7%	0.3%
Sherwood	143.5	0.5	143.0	0.3%	0.2%
Tigard	463.6	4.6	459.1	1.0%	1.8%
Troutdale	272.1	2.2	269.9	0.8%	0.8%
Tualatin	401.0	11.1	389.9	2.8%	4.2%
Washington	1,701.6	19.8	1,681.9	1.2%	7.6%
West Linn	255.4	4.7	250.7	1.9%	1.8%
Wilsonville	255.0	5.0	250.0	2.0%	1.9%
Wood Village	0.0	0.0	0.0	0.0%	0.0%
Total	**15,666.3**	**262.0**	**15,404.3**	**1.7%**	**100.0%**

Table 11
Indicator 8, calculated by sub-watershed: number of acres and percent cover of interior habitat for 2005.

Sub-watershed	Interior habitat acres 2004	Percent of sub-watershed comprised of interior habitat	Contribution to region's total habitat interior
Abernethy Cr.	319.9	8.8%	2.0%
Beaver Cr.	265.2	1.9%	1.6%
Beaver Cr.-Willamette R.	47.9	1.7%	0.3%
Beaverton Cr.	588.9	2.4%	3.6%
Chicken Cr.	35.1	1.6%	0.2%
Christensen Cr.-Tualatin R.	15.7	2.1%	0.1%
Clackamas R.-Rock Cr.	694.2	5.1%	4.3%
Coffee Lake Cr.	271.3	3.4%	1.7%
Columbia R.-Hayden Is.	583.0	5.6%	3.6%
Columbia Slough	1,580.2	4.3%	9.7%
Corral Cr.	4.7	3.6%	0.0%
Deep Cr.-North Fork Deep Cr	143.8	3.2%	0.9%
Fanno Cr.	201.3	1.0%	1.2%
Gilbert R.	406.2	54.8%	2.5%
Kellogg Cr.	303.6	2.7%	1.9%
Latourell Cr.	155.0	7.5%	1.0%
Lower Dairy Cr.	10.0	0.3%	0.1%
Lower Gales Cr.	0.5	0.1%	0.0%
Lower Johnson Cr.	538.0	3.4%	3.3%
Lower McKay Cr.	7.6	0.2%	0.0%
Lower Rock Cr.-Tualatin R.	421.7	3.3%	2.6%
Lower West Fork Dairy Cr.	0.5	0.8%	0.0%
Molalla R. – Willamette R.	0.0	0.0%	0.0%
Rock Cr.-Lower Tualatin R.	114.0	1.9%	0.7%
Saum Cr.-Lower Tualatin R	677.0	4.6%	4.2%
Tanner Cr.	360.6	6.2%	2.2%
Tualatin R.	39.3	1.9%	0.2%
Upper Johnson Cr.	1,626.3	10.8%	10.0%
Upper Rock Cr.-Tualatin R.	312.9	3.9%	1.9%
Willamette R.-Columbia R.	5,602.1	13.9%	34.4%
Willamette R.-Oswego Cr.	970.0	5.9%	6.0%
Grand Total	**16,296.4**	**5.4%**	**100.0%**

Table 12
Indicator 8, calculated by jurisdiction: number of acres and percent cover of interior habitat for 2005.

Jurisdiction	Interior habitat acres 2004	Percent of jurisdiction comprised of interior habitat	Contribution to region's total habitat interior
Beaverton	235.3	2.0%	1.4%
Clackamas	2,034.8	5.6%	12.5%
Cornelius	0.0	0.0%	0.0%
Damascus	754.2	7.6%	4.6%
Durham	4.9	1.8%	0.0%
Fairview	70.2	3.1%	0.4%
Forest Grove	45.8	1.2%	0.3%
Gladstone	19.2	1.2%	0.1%
Gresham	839.2	5.6%	5.1%
Happy Valley	202.0	4.5%	1.2%
Hillsboro	397.0	2.7%	2.4%
Johnson City	0.0	0.0%	0.0%
King City	0.5	0.1%	0.0%
Lake Oswego	302.8	4.2%	1.9%
Maywood Park	0.0	0.0%	0.0%
Milwaukie	2.0	0.1%	0.0%
Multnomah	2,122.6	8.1%	13.0%
Oregon City	162.0	2.6%	1.0%
Portland	8,072.4	8.7%	49.5%
Rivergrove	1.2	1.0%	0.0%
Sherwood	29.3	1.1%	0.2%
Tigard	59.0	0.8%	0.4%
Troutdale	115.1	3.0%	0.7%
Tualatin	32.5	0.6%	0.2%
Washington	433.5	1.3%	2.7%
West Linn	194.3	3.8%	1.2%
Wilsonville	166.3	3.5%	1.0%
Wood Village	0.4	0.1%	0.0%
Grand Total	**16,296.4**	**5.4%**	**100.0%**

Table 13
Indicator 9, calculated by sub-watershed: number of acres and percent cover of special or at-risk habitats (Habitats of Concern) for 2004 and 2007.

Watershed Name	Acres in 2004	Acres in 2007	Acres of lost habitat	Percent loss
Abernethy Cr.	0.0	0.0	0.0	0.0%
Beaver Cr.	2,613.6	2,603.9	9.7	0.4%
Beaver Cr.-Willamette R.	23.3	23.3	0.0	0.0%
Beaverton Cr.	555.5	552.0	3.5	0.6%
Chicken Cr.	264.2	264.2	0.0	0.0%
Christensen Cr.-Tualatin R.	182.6	182.6	0.0	0.0%
Clackamas R.-Rock Cr.	1,080.8	1,077.4	3.3	0.3%
Coffee Lake Cr.	432.9	425.9	6.9	1.6%
Columbia R.-Hayden Is.	3,272.5	3,272.5	0.0	0.0%
Columbia Slough	3,320.3	3,238.9	81.4	2.5%
Corral Cr.	0.0	0.0	0.0	0.0%
Deep Cr.-North Fork Deep C	140.7	140.7	0.0	0.0%
Fanno Cr.	473.5	465.1	8.4	1.8%
Gilbert R.	531.1	531.1	0.0	0.0%
Kellogg Cr.	531.9	531.4	0.5	0.1%
Latourell Cr.	877.9	877.9	0.0	0.0%
Lower Dairy Cr.	143.6	142.5	1.1	0.8%
Lower Gales Cr.	36.5	36.5	0.0	0.0%
Lower Johnson Cr.	797.6	796.9	0.7	0.1%
Lower McKay Cr.	79.0	79.0	0.0	0.0%
Lower Rock Cr.-Tualatin R.	413.7	413.7	0.0	0.0%
Lower West Fork Dairy Cr.	0.0	0.0	0.0	0.0%
Molalla R. – Willamette R.	0.0	0.0	0.0	0.0%
Rock Cr.-Lower Tualatin R.	515.4	488.3	27.1	5.3%
Saum Cr.-Lower Tualatin R.	933.4	932.3	1.1	0.1%
Tanner Cr.	758.7	758.4	0.3	0.0%
Tualatin R.	121.2	121.2	0.0	0.0%
Upper Johnson Cr.	621.0	618.5	2.5	0.4%
Upper Rock Cr.-Tualatin R.	235.7	235.2	0.6	0.2%
Willamette R.-Columbia R.	6,923.2	6,892.2	30.9	0.4%
Willamette R.-Oswego Cr.	976.2	973.7	2.5	0.3%
Grand Total	**26,856.2**	**26,675.4**	**180.8**	**0.7%**

Table 14
Indicator 9, calculated by jurisdiction: number of acres and percent cover of special or at-risk habitats (Habitats of Concern) for 2004 and 2007.

Jurisdiction	Acres in 2004	Acres in 2007	2004 to 2007 Change	Percent loss
Beaverton	690.7	686.2	4.5	0.7%
Clackamas	2,454.8	2,451.5	3.3	0.1%
Cornelius	24.7	24.7	0.0	0.0%
Damascus	303.5	303.5	0.0	0.0%
Durham	66.1	66.1	0.0	0.0%
Fairview	136.6	125.2	11.4	8.3%
Forest Grove	144.0	142.9	1.1	0.8%
Gladstone	64.2	63.8	0.5	0.6%
Gresham	363.2	339.0	24.2	6.7%
Happy Valley	516.7	513.8	2.8	0.6%
Hillsboro	487.6	484.8	2.8	0.6%
Johnson City	0.0	0.0	0.0	0.0%
King City	0.0	0.0	0.0	0.0%
Lake Oswego	303.8	303.8	0.0	0.0%
Maywood Park	0.0	0.0	0.0	0.0%
Milwaukie	22.5	22.5	0.0	0.0%
Multnomah	7,289.5	7,279.8	9.7	0.1%
Oregon City	93.3	93.3	0.0	0.0%
Portland	10,981.0	10,901.1	79.9	0.7%
Rivergrove	9.1	8.0	1.1	12.1%
Sherwood	312.7	298.0	14.7	4.7%
Tigard	182.9	179.0	3.9	2.1%
Troutdale	411.2	411.2	0.0	0.0%
Tualatin	192.1	187.0	5.1	2.7%
Washington	1,327.3	1,312.1	15.2	1.1%
West Linn	271.8	271.5	0.3	0.1%
Wilsonville	206.8	206.6	0.2	0.1%
Grand Total	**26,856.2**	**26,675.4**	**180.8**	**0.7%**

Table 15

Indicator 10, calculated by sub-watershed: percent tree cover for 2007. (This is a new indicator and was not measured in the initial baseline report.)

Sub-watershed	Acres of tree cover within sub-watershed*	Acres within sub-watershed*	Percent tree cover within sub-watershed*	Percent of region's total tree cover*
Abernethy Cr.	1,576	3,615	43.6%	1.8%
Beaver Cr.	2,619	11,040	23.7%	2.9%
Beaver Cr.-Willamette R.	650	2,778	23.4%	0.7%
Beaverton Cr.	7,838	24,212	32.4%	8.8%
Chicken Cr.	573	2,144	26.7%	0.6%
Christensen Cr.-Tualatin R.	260	734	35.4%	0.3%
Clackamas R.-Rock Cr.	4,548	13,712	33.2%	5.1%
Coffee Lake Cr.	1,878	7,310	25.7%	2.1%
Columbia R.-Hayden Is.	1,643	10,356	15.9%	1.8%
Columbia Slough	6,264	37,132	16.9%	7.0%
Corral Cr.	45	130	35.1%	0.1%
Deep Cr.-N Fork Deep Cr.	749	3,095	24.2%	0.8%
Fanno Cr.	6,863	20,184	34.0%	7.7%
Gilbert R.	655	741	88.4%	0.7%
Kellogg Cr.	3,326	11,067	30.1%	3.7%
Latourell Cr.	362	961	37.6%	0.4%
Lower Dairy Cr.	941	3,802	24.8%	1.1%
Lower Gales Cr.	226	748	30.2%	0.3%
Lower Johnson Cr.	4,861	15,859	30.7%	5.5%
Lower McKay Cr.	854	4,069	21.0%	1.0%
Lower Rock Cr.-Tualatin R.	3,388	12,739	26.6%	3.8%
Lower West Fork Dairy Cr.	39	64	61.3%	0.0%
Molalla R.-Willamette R.	12	40	31.1%	0.0%
Rock Cr.-Lower Tualatin R.	1,483	5,931	25.0%	1.7%
Saum Cr.-Lower Tualatin R.	4,777	13,153	36.3%	5.4%
Tanner Cr.	1,716	4,802	35.7%	1.9%
Tualatin R.	412	2,073	19.9%	0.5%
Upper Johnson Cr.	6,072	14,567	41.7%	6.8%
Upper Rock Cr.-Tualatin R.	2,652	7,903	33.6%	3.0%
Willamette R.-Columbia R.	14,121	40,179	35.1%	15.9%
Willamette R.-Oswego Cr.	7,486	16,389	45.7%	8.4%
Grand Total	**88,890**	**291,529***	**30.5%**	**100.0%**

*Excludes area for which no 2007 aerial photographs were available.

Table 16

Indicator 10, calculated by jurisdiction: percent tree cover for 2007. (This is a new indicator and was not measured in the initial baseline report.)

Jurisdiction	Acres of tree cover within jurisdiction	Acres within jurisdiction*	Percent tree cover within jurisdiction	Percent of region's total tree cover
Beaverton	3,020	11,910	25.4%	3.4%
Clackamas	11,762	36,162	37.5%	13.2%
Cornelius	235	1,281	18.4%	0.3%
Damascus	3,711	9,924	37.4%	4.2%
Durham	144	265	54.3%	0.2%
Fairview	429	2,280	18.8%	0.5%
Forest Grove	858	3,704	23.2%	1.0%
Gladstone	441	1,591	27.7%	0.5%
Gresham	4,064	14,996	27.1%	4.6%
Happy Valley	1,531	4,503	34.0%	1.7%
Hillsboro	3,384	14,798	22.9%	3.8%
Johnson City	7	43	15.1%	0.0%
King City	60	447	13.5%	0.1%
Lake Oswego	3,405	7,234	47.1%	3.8%
Maywood Park	47	107	44.0%	0%
Milwaukie	757	3,168	23.9%	0.9%
Multnomah	8,115	26,218	37.2%	9.1%
Oregon City	1,697	6,280	27.0%	1.9%
Portland	27,231	92,768	29.4%	30.7%
Rivergrove	57	117	48.3%	0.1%
Sherwood	541	2,739	19.8%	0.6%
Tigard	1,920	7,545	25.4%	2.2%
Troutdale	773	3,862	20.0%	0.9%
Tualatin	1,028	5,186	19.8%	1.2%
Washington	10,432	33,141	31.5%	11.7%
West Linn	1,977	5,111	38.7%	2.2%
Wilsonville	1,176	4,723	24.9%	1.3%
Wood Village	87	608	14.3%	0.1%
Grand Total	**88,890**	**291,521***	**30.5%**	**100.0%**

*Excludes area for which no 2007 aerial photographs were available.

Table 17
Variables, variable classes and scoring system used for the stream reach analysis.

Tree cover		Class I and II riparian habitat		Class A and B upland habitat		Built or scarified (scraped)	
% cover	Score	% cover	Score	% cover	Score	% cover	Score
0-25	1	0-25	1	0-10	1	0-10	7
26-50	3	26-50	3	11-20	2	11-25	5
51-75	5	51-75	5	21-30	3	26-50	3
76-100	7	76-100	7	31-100	4	51-75	1
						76-100	0

Table 18
Summary table of indicator results by sub-watershed in acres.

	Ind. 1 2008	Ind. 2 2008	Ind. 3 2008	Ind. 4 2008	Ind. 5 2008	Ind. 6 2006	Ind. 6 2008	Ind. 7 2008	Ind. 8 2008	Ind. 9 2006	Ind. 9 2008	Ind. 10 2008
Abernethy Cr.	284.3	1,390.3	605.9	2,257.6	563.0	93.9	93.3	707.0	319.9	0.0	0.0	1,576.0
Beaver Cr.	2,145.6	3,715.3	3,214.5	4,091.7	3,531.0	1,080.6	1,071.9	1,341.0	265.2	2,613.6	2,603.9	2,619.0
Beaver Cr.-Willamette R	411.7	429.6	683.8	576.1	197.0	0.0	0.0	193.0	47.9	23.3	23.3	650.0
Beaverton Cr.	5,138.2	9,736.5	5,543.5	10,115.1	2,946.0	780.1	764.9	1,927.0	588.9	555.5	552.0	7,838.0
Chicken Cr.	815.1	1,300.7	643.5	845.1	364.0	154.7	153.8	105.0	35.1	264.2	264.2	573.0
Christensen Cr.-Tualatin R	61.9	106.0	157.6	194.5	48.0	0.0	0.0	157.0	15.7	182.6	182.6	260.0
Clackamas R.-Rock Cr.	2,471.0	4,116.8	4,658.4	5,531.3	2,194.0	604.9	592.1	2,237.0	694.2	1,080.8	1,077.4	4,548.0
Coffee Lake Cr.	3,076.8	2,389.6	1,865.0	2,340.2	1,231.0	308.4	303.2	690.0	271.3	432.9	425.9	1,878.0
Columbia R.-Hayden Is	3,876.7	4,124.4	2,188.1	3,486.6	9,892.0	3,010.0	2,976.7	20.0	583.0	3,272.5	3,272.5	1,643.0
Columbia Slough	10,817.8	10,131.4	9,585.7	4,158.0	5,668.0	2,504.6	2,458.9	675.0	1,580.2	3,320.3	3,238.9	6,264.0
Corral Cr.	20.3	42.7	16.2	44.3	11.0	1.1	1.1	25.0	4.7	0.0	0.0	45.0
Deep Cr.-N Fork Deep Cr	915.5	577.9	1,467.6	827.4	615.0	0.0	0.0	614.0	143.8	140.7	140.7	749.0
Fanno Cr.	4,877.6	8,746.1	5,186.4	8,126.4	2,488.0	695.9	686.5	1,421.0	201.3	473.5	465.1	6,863.0
Gilbert R.	118.5	677.8	31.2	826.7	237.0	43.4	43.1	438.0	406.2	531.1	531.1	655.0
Kellogg Cr.	1,568.3	2,612.2	2,045.6	2,678.3	851.0	228.3	222.0	904.0	303.6	531.9	531.4	3,326.0
Latourell Cr.	1,671.1	351.8	923.0	317.6	1,318.0	707.8	701.8	399.0	155.0	877.9	877.9	362.0
Lower Dairy Cr.	1,187.7	1,166.1	1,130.0	921.9	612.0	427.5	424.4	93.0	10.0	143.6	142.5	941.0
Lower Gales Cr.	255.3	325.4	381.9	266.7	234.0	195.3	193.0	19.0	0.5	36.5	36.5	226.0
Lower Johnson Cr.	989.9	2,934.3	1,908.4	4,089.4	1,205.0	434.7	421.7	1,192.0	538.0	797.6	796.9	4,861.0
Lower McKay Cr.	1,229.4	1,477.0	1,214.4	612.4	483.0	349.8	343.9	44.0	7.6	79.0	79.0	854.0
Lower Rock Cr.-Tualatin R	4,383.3	6,917.8	2,587.6	3,161.8	1,734.0	875.6	869.2	312.0	421.7	413.7	413.7	3,388.0
Lower West Fork Dairy Cr.	9.8	24.7	12.4	43.4	6.0	0.0	0.0	1.0	0.5	0.0	0.0	39.0
Molalla R. – Willamette R	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0
Rock Cr-Lower Tualatin R.	2,211.6	1,615.4	1,901.3	1,686.2	933.0	518.5	512.9	583.0	114.0	515.4	488.3	1,483.0
Saum Cr-Lower Tualatin R	3,261.4	4,805.0	3,520.6	5,862.7	2,350.0	688.9	671.3	2,477.0	677.0	933.4	932.3	4,777.0
Tanner Cr.	616.5	955.0	927.1	1,471.2	1,282.0	244.8	240.3	955.0	360.6	758.7	758.4	1,716.0
Tualatin R.	335.6	165.6	217.8	117.8	196.0	77.1	75.1	2.0	39.3	121.2	121.2	412.0
Upper Johnson Cr.	2,498.6	6,434.3	5,231.0	8,365.9	2,316.0	334.8	331.0	3,355.0	1,626.3	621.0	618.5	6,072.0
Upper Rock Cr.-Tualatin R	1,964.3	4,001.6	2,836.9	4,225.3	1,345.0	191.1	189.8	1,046.0	312.9	235.7	235.2	2,652.0
Willamette R.-Columbia R	1,279.7	10,902.3	2,045.8	19,121.8	7,711.0	642.1	606.2	5,621.0	5,602.1	6,923.2	6,892.2	14,121.0
Willamette R.-Oswego Cr	1,403.9	6,486.3	3,107.4	10,209.0	3,388.0	472.5	456.2	2,196.0	970.0	976.2	973.7	7,486.0
Region-wide	59,897.4	98,659.9	65,838.2	106,572.0	55,956.0	15,666.3	15,404.3	29,749.0	16,296.4	26,856.2	26,675.4	88,890.0

Table 19
Summary table of indicator results by sub-watershed in terms of percent cover of indicator within sub-watershed's area of interest.

	Ind. 1 2008	Ind. 2 2008	Ind. 3 2008	Ind. 4 2008	Ind. 5 2008	Ind. 6 2008[1]	Ind. 7 2008	Ind. 8 2008	Ind. 9 2009[1]	Ind. 10 2008
Abernethy Cr.	16.0%	78.2%	18.8%	70.1%	15.6%	0.6%	19.6%	8.8%	0.0%	43.6%
Beaver Cr.	32.5%	56.3%	37.2%	47.4%	25.5%	0.8%	9.7%	1.9%	0.4%	23.7%
Beaver Cr.-Willamette R	40.0%	41.7%	37.0%	31.1%	7.1%	0.0%	6.9%	1.7%	0.0%	23.4%
Beaverton Cr.	30.1%	57.0%	24.3%	44.3%	12.2%	1.9%	8.0%	2.4%	0.6%	32.4%
Chicken Cr.	35.4%	56.5%	29.9%	39.3%	17.0%	0.6%	4.9%	1.6%	0.0%	26.7%
Christensen Cr.-Tualatin R	29.2%	50.1%	34.8%	43.0%	6.5%	0.0%	21.4%	2.1%	0.0%	35.4%
Clackamas R.-Rock Cr.	33.6%	56.0%	38.8%	46.1%	16.0%	2.1%	16.3%	5.1%	0.3%	33.2%
Coffee Lake Cr.	48.3%	37.5%	32.5%	40.8%	15.5%	1.7%	8.7%	3.4%	1.6%	25.7%
Columbia R.-Hayden Is	43.1%	45.9%	34.0%	54.1%	95.5%	1.1%	0.2%	5.6%	0.0%	15.9%
Columbia Slough	46.3%	43.4%	43.9%	19.0%	15.3%	1.8%	1.8%	4.3%	2.5%	16.9%
Corral Cr.	25.5%	53.8%	16.1%	44.0%	8.5%	4.3%	19.2%	3.6%	0.0%	35.1%
Deep Cr.-N Fork Deep Cr	55.3%	34.9%	55.2%	31.1%	13.7%	0.0%	13.7%	3.2%	0.0%	24.2%
Fanno Cr.	31.4%	56.3%	26.2%	41.0%	12.3%	1.3%	7.0%	1.0%	1.8%	34.0%
Gilbert R.	14.2%	81.4%	3.5%	92.1%	32.0%	0.6%	59.1%	54.8%	0.0%	88.4%
Kellogg Cr.	31.8%	53.0%	29.2%	38.3%	7.7%	2.8%	8.2%	2.7%	0.1%	30.1%
Latourell Cr.	81.3%	17.1%	69.1%	23.8%	63.7%	0.9%	19.3%	7.5%	0.0%	37.6%
Lower Dairy Cr.	43.6%	42.8%	41.6%	33.9%	16.1%	0.7%	2.4%	0.3%	0.8%	24.8%
Lower Gales Cr.	37.0%	47.2%	48.6%	34.0%	31.3%	1.2%	2.5%	0.1%	0.0%	30.2%
Lower Johnson Cr.	23.7%	70.2%	25.8%	55.3%	7.6%	3.0%	7.5%	3.4%	0.1%	30.7%
Lower McKay Cr.	41.5%	49.9%	49.8%	25.1%	11.9%	1.7%	1.1%	0.2%	0.0%	21.0%
Lower Rock Cr.-Tualatin R	33.7%	53.1%	28.9%	35.3%	13.6%	0.7%	2.4%	3.3%	0.0%	26.6%
Lower West Fork Dairy Cr.	25.2%	63.5%	19.5%	68.1%	9.4%	0.0%	1.6%	0.9%	0.0%	61.3%
Molalla R. – Willamette R	0.0%	0.0%	0.0%	0.0%	2.5%	0.0%	0.0%	0.0%	0.0%	31.1%
Rock Cr-Lower Tualatin R.	50.0%	36.5%	40.8%	36.1%	15.7%	1.1%	9.8%	1.9%	5.3%	25.0%
Saum Cr-Lower Tualatin R	36.9%	54.3%	31.3%	52.1%	16.0%	2.6%	16.9%	4.6%	0.1%	36.3%
Tanner Cr.	30.8%	47.7%	27.0%	42.9%	22.0%	1.8%	16.4%	6.2%	0.0%	35.7%
Tualatin R.	52.7%	26.0%	42.4%	22.9%	9.5%	2.6%	0.1%	1.9%	0.0%	19.9%
Upper Johnson Cr.	26.3%	67.7%	33.8%	54.0%	15.3%	1.1%	22.2%	10.8%	0.4%	41.7%
Upper Rock Cr.-Tualatin R	30.5%	62.1%	33.1%	49.3%	16.7%	0.7%	13.0%	3.9%	0.2%	33.6%
Willamette R.-Columbia R	9.3%	79.6%	8.2%	76.3%	19.2%	5.6%	14.0%	13.9%	0.4%	35.1%
Willamette R.-Oswego Cr	15.9%	73.5%	19.3%	63.6%	20.7%	3.4%	13.4%	5.9%	0.3%	45.7%
Region-wide	33.6%	55.4%	29.3%	47.5%	18.6%	1.7%	9.9%	5.4%	0.7%	30.5%

[1] Represents the percent lost between 2005 and 2007.

Table 20
Summary table of indicator results by sub-watershed in terms of percent contribution to region's total amount of each indicator.

	Ind. 1 2008	Ind. 2 2008	Ind. 3 2008	Ind. 4 2008	Ind. 5 2008	Ind. 6 2008[1]	Ind. 7 2008	Ind. 8 2008	Ind. 9 2008[1]	Ind. 10 2008
Abernethy Cr.	0.5%	1.4%	0.9%	2.1%	1.0%	0.2%	2.4%	2.0%	0.0%	1.8%
Beaver Cr.	3.6%	3.8%	4.9%	3.8%	6.3%	3.3%	4.5%	1.6%	5.4%	2.9%
Beaver Cr.-Willamette R	0.7%	0.4%	1.0%	0.5%	0.4%	0.0%	0.6%	0.3%	0.0%	0.7%
Beaverton Cr.	8.6%	9.9%	8.4%	9.5%	5.3%	5.8%	6.5%	3.6%	2.0%	8.8%
Chicken Cr.	1.4%	1.3%	1.0%	0.8%	0.7%	0.3%	0.4%	0.2%	0.0%	0.6%
Christensen Cr.-Tualatin R	0.1%	0.1%	0.2%	0.2%	0.1%	0.0%	0.5%	0.1%	0.0%	0.3%
Clackamas R.-Rock Cr.	4.1%	4.2%	7.1%	5.2%	3.9%	4.9%	7.5%	4.3%	1.8%	5.1%
Coffee Lake Cr.	5.1%	2.4%	2.8%	2.2%	2.2%	2.0%	2.3%	1.7%	3.8%	2.1%
Columbia R.-Hayden Is	6.5%	4.2%	3.3%	3.3%	17.7%	12.7%	0.1%	3.6%	0.0%	1.8%
Columbia Slough	18.1%	10.3%	14.6%	3.9%	10.1%	17.5%	2.3%	9.7%	45.0%	7.0%
Corral Cr.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
Deep Cr.-N Fork Deep Cr	1.5%	0.6%	2.2%	0.8%	1.1%	0.0%	2.1%	0.9%	0.0%	0.8%
Fanno Cr.	8.1%	8.9%	7.9%	7.6%	4.4%	3.6%	4.8%	1.2%	4.7%	7.7%
Gilbert R.	0.2%	0.7%	0.0%	0.8%	0.4%	0.1%	1.5%	2.5%	0.0%	0.7%
Kellogg Cr.	2.6%	2.6%	3.1%	2.5%	1.5%	2.4%	3.0%	1.9%	0.3%	3.7%
Latourell Cr.	2.8%	0.4%	1.4%	0.3%	2.4%	2.3%	1.3%	1.0%	0.0%	0.4%
Lower Dairy Cr.	2.0%	1.2%	1.7%	0.9%	1.1%	1.2%	0.3%	0.1%	0.6%	1.1%
Lower Gales Cr.	0.4%	0.3%	0.6%	0.3%	0.4%	0.9%	0.1%	0.0%	0.0%	0.3%
Lower Johnson Cr.	1.7%	3.0%	2.9%	3.8%	2.2%	5.0%	4.0%	3.3%	0.4%	5.5%
Lower McKay Cr.	2.1%	1.5%	1.8%	0.6%	0.9%	2.2%	0.1%	0.0%	0.0%	1.0%
Lower Rock Cr.-Tualatin R	7.3%	7.0%	3.9%	3.0%	3.1%	2.4%	1.0%	2.6%	0.0%	3.8%
Lower West Fork Dairy Cr.	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Molalla R. – Willamette R	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Rock Cr-Lower Tualatin R.	3.7%	1.6%	2.9%	1.6%	1.7%	2.1%	2.0%	0.7%	15.0%	1.7%
Saum Cr-Lower Tualatin R	5.4%	4.9%	5.3%	5.5%	4.2%	6.7%	8.3%	4.2%	0.6%	5.4%
Tanner Cr.	1.0%	1.0%	1.4%	1.4%	2.3%	1.7%	3.2%	2.2%	0.2%	1.9%
Tualatin R.	0.6%	0.2%	0.3%	0.1%	0.4%	0.8%	0.0%	0.2%	0.0%	0.5%
Upper Johnson Cr.	4.2%	6.5%	7.9%	7.8%	4.1%	1.5%	11.3%	10.0%	1.4%	6.8%
Upper Rock Cr.-Tualatin R	3.3%	4.1%	4.3%	4.0%	2.4%	0.5%	3.5%	1.9%	0.3%	3.0%
Willamette R.-Columbia R	2.1%	11.1%	3.1%	17.9%	13.8%	13.7%	18.9%	34.4%	17.1%	15.9%
Willamette R.-Oswego Cr	2.3%	6.6%	4.7%	9.6%	6.1%	6.2%	7.4%	6.0%	1.4%	8.4%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

[1] Represents the percent contribution to the region's total acres lost between 2005 and 2007.

Table 21
Summary table of indicator results by jurisdiction in acres.

	Ind. 1 2008	Ind. 2 2008	Ind. 3 2008	Ind. 4 2008	Ind. 5 2008	Ind. 6 2006	Ind. 6 2008	Ind. 7 2008	Ind. 8 2008	Ind. 9 2006	Ind. 9 2008	Ind. 10 2008
Beaverton	3,649.3	4,546.3	2,331.3	3,100.8	1,205.4	461.2	452.6	403.5	235.3	690.7	686.2	3,020.3
Clackamas	3,729.9	8,199.5	7,106.3	11,735.6	5,086.9	970.3	946.1	6,219.9	2,034.8	2,454.8	2,451.5	11,761.5
Cornelius	178.5	150.1	122.3	114.9	56.9	41.1	39.8	4.6	0.0	24.7	24.7	235.3
Damascus	2,120.3	2,713.4	4,194.7	3,725.3	1,250.3	97.5	95.0	2,345.8	754.2	303.5	303.5	3,710.9
Durham	34.1	227.6	48.6	179.9	72.8	52.5	52.1	19.0	4.9	66.1	66.1	144.1
Fairview	1,653.1	1,014.1	1,155.3	759.8	736.7	164.5	161.8	96.0	70.2	136.6	125.2	429.0
Forest Grove	944.1	580.1	816.6	516.3	411.9	172.4	168.7	86.2	45.8	144.0	142.9	858.2
Gladstone	184.0	357.8	194.6	330.0	287.6	199.4	195.6	11.2	19.2	64.2	63.8	440.8
Gresham	1,929.9	4,193.7	2,848.0	4,939.0	1,503.5	289.2	282.1	1,166.1	839.2	363.2	339.0	4,064.2
Happy Valley	931.6	1,401.8	1,440.3	1,711.4	526.3	24.3	23.1	704.0	202.0	516.7	513.8	1,531.4
Hillsboro	5,119.6	7,860.8	2,705.4	2,571.1	1,875.7	1,148.0	1,136.9	225.7	397.0	487.6	484.8	3,383.9
Johnson City	13.1	19.4	15.3	13.5	8.4	0.0	0.0	0.9	0.0	0.0	0.0	6.5
King City	113.0	78.8	197.6	101.7	59.3	27.1	26.8	14.8	0.5	0.0	0.0	60.5
Lake Oswego	674.9	3,192.8	1,349.1	4,170.1	1,383.4	165.9	161.2	895.8	302.8	303.8	303.8	3,405.4
Maywood Park	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0	47.3
Milwaukie	381.1	563.8	586.1	546.4	311.3	100.4	96.4	29.5	2.0	22.5	22.5	757.5
Multnomah	8,232.3	12,852.5	8,478.8	15,385.1	13,464.6	4,738.6	4,702.3	4,195.3	2,122.6	7,289.5	7,279.8	8,114.9
Oregon City	777.7	1,296.7	1,337.5	1,742.6	796.5	208.5	203.4	572.7	162.0	93.3	93.3	1,697.0
Portland	9,767.4	27,546.1	12,601.7	33,432.3	17,569.4	3,277.9	3,181.4	8,576.4	8,072.4	10,981.0	10,901.1	27,230.8
Rivergrove	16.3	92.2	45.1	148.4	61.0	35.6	34.7	5.9	1.2	9.1	8.0	56.7
Sherwood	1,258.6	1,282.2	795.7	636.8	352.9	143.5	143.0	116.5	29.3	312.7	298.0	541.5
Tigard	2,294.7	2,875.5	1,880.9	2,235.5	968.4	463.6	459.1	220.2	59.0	182.9	179.0	1,920.0
Troutdale	2,093.3	984.5	1,777.6	1,294.0	738.1	272.1	269.9	134.7	115.1	411.2	411.2	772.6
Tualatin	2,472.2	1,440.5	1,218.2	892.0	717.9	401.0	389.9	103.5	32.5	192.1	187.0	1,028.4
Washington	8,236.0	11,720.5	10,300.8	11,735.8	4,493.0	1,701.6	1,681.9	2,809.0	433.5	1,327.3	1,312.1	10,431.9
West Linn	800.5	1,769.2	1,246.4	2,943.9	1,174.0	255.4	250.7	590.3	194.3	271.8	271.5	1,976.9
Wilsonville	2,277.0	1,698.8	1,019.7	1,601.5	840.0	255.0	250.0	200.2	166.3	206.8	206.6	1,176.1
Wood Village	15.1	1.1	24.3	8.3	3.7	0.0	0.0	0.4	0.4	0.0	0.0	86.9
Region-wide	59,897.4	98,659.9	65,838.2	106,572.0	55,956.0	15,666.3	15,404.3	29,749.3	16,296.4	26,856.2	26,675.4	88,890.4

Table 22
Summary table of indicator results by jurisdiction in terms of percent cover of indicator within each jurisdiction's area of interest.

	Ind. 1 2008	Ind. 2 2008	Ind. 3 2008	Ind. 4 2008	Ind. 5 2006	Ind. 6 2008[1]	Ind. 7 2006	Ind. 8 2006	Ind. 9 2008[1]	Ind. 10 2008
Beaverton	36.9%	46.0%	23.0%	30.6%	10.1%	1.9%	3.4%	2.0%	0.6%	25.4%
Clackamas	27.8%	61.0%	31.6%	52.2%	14.1%	2.6%	17.2%	5.6%	0.1%	37.5%
Cornelius	49.0%	41.2%	31.9%	30.0%	4.4%	3.3%	0.4%	0.0%	0.0%	18.3%
Damascus	40.9%	52.3%	47.8%	42.4%	12.6%	2.6%	23.6%	7.6%	0.0%	37.4%
Durham	12.7%	85.0%	19.7%	72.7%	27.5%	0.7%	7.2%	1.8%	0.0%	54.3%
Fairview	54.4%	33.4%	39.8%	26.2%	32.3%	1.6%	4.2%	3.1%	8.4%	18.8%
Forest Grove	50.1%	30.8%	42.3%	26.8%	11.1%	2.2%	2.3%	1.2%	0.8%	23.2%
Gladstone	27.4%	53.3%	26.8%	45.5%	18.1%	1.9%	0.7%	1.2%	0.7%	27.7%
Gresham	29.0%	63.1%	29.1%	50.4%	10.0%	2.5%	7.8%	5.6%	6.7%	27.1%
Happy Valley	35.8%	53.9%	37.3%	44.3%	11.7%	4.9%	15.6%	4.5%	0.5%	34.0%
Hillsboro	34.5%	53.0%	31.1%	29.6%	12.7%	1.0%	1.5%	2.7%	0.6%	22.9%
Johnson City	23.0%	34.1%	19.1%	16.8%	19.5%	0.0%	2.1%	0.0%	0.0%	16.3%
King City	47.8%	33.3%	45.3%	23.3%	13.3%	1.2%	3.3%	0.1%	0.0%	13.4%
Lake Oswego	16.2%	76.6%	19.6%	60.5%	19.1%	2.9%	12.4%	4.2%	0.0%	47.1%
Maywood Park	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%	43.9%
Milwaukie	32.7%	48.3%	29.7%	27.7%	9.8%	4.1%	0.9%	0.1%	0.0%	23.9%
Multnomah	36.8%	57.4%	33.2%	60.2%	51.4%	0.8%	16.0%	8.1%	0.1%	37.2%
Oregon City	30.0%	50.0%	29.1%	38.0%	12.7%	2.5%	9.1%	2.6%	0.0%	27.0%
Portland	23.6%	66.6%	21.1%	56.0%	18.9%	3.0%	9.2%	8.7%	0.7%	29.4%
Rivergrove	14.5%	82.4%	20.0%	65.9%	52.1%	2.7%	5.0%	1.0%	12.6%	48.7%
Sherwood	41.9%	42.7%	35.5%	28.4%	12.9%	0.3%	4.3%	1.1%	4.7%	19.8%
Tigard	37.9%	47.5%	28.6%	34.0%	12.8%	1.0%	2.9%	0.8%	2.2%	25.4%
Troutdale	61.0%	28.7%	46.3%	33.7%	19.1%	0.8%	3.5%	3.0%	0.0%	20.0%
Tualatin	54.9%	32.0%	34.3%	25.1%	13.8%	2.8%	2.0%	0.6%	2.6%	19.8%
Washington	36.4%	51.7%	34.6%	39.4%	13.6%	1.2%	8.5%	1.3%	1.1%	31.5%
West Linn	26.2%	58.0%	23.6%	55.7%	23.0%	1.9%	11.5%	3.8%	0.1%	38.7%
Wilsonville	50.3%	37.5%	27.5%	43.2%	17.8%	2.0%	4.2%	3.5%	0.1%	24.9%
Wood Village	73.4%	5.5%	32.4%	11.1%	0.6%	0.0%	0.1%	0.1%	0.0%	14.3%
Region-wide	33.6%	55.4%	29.3%	47.5%	18.6%	1.7%	9.9%	5.4%	0.7%	30.5%

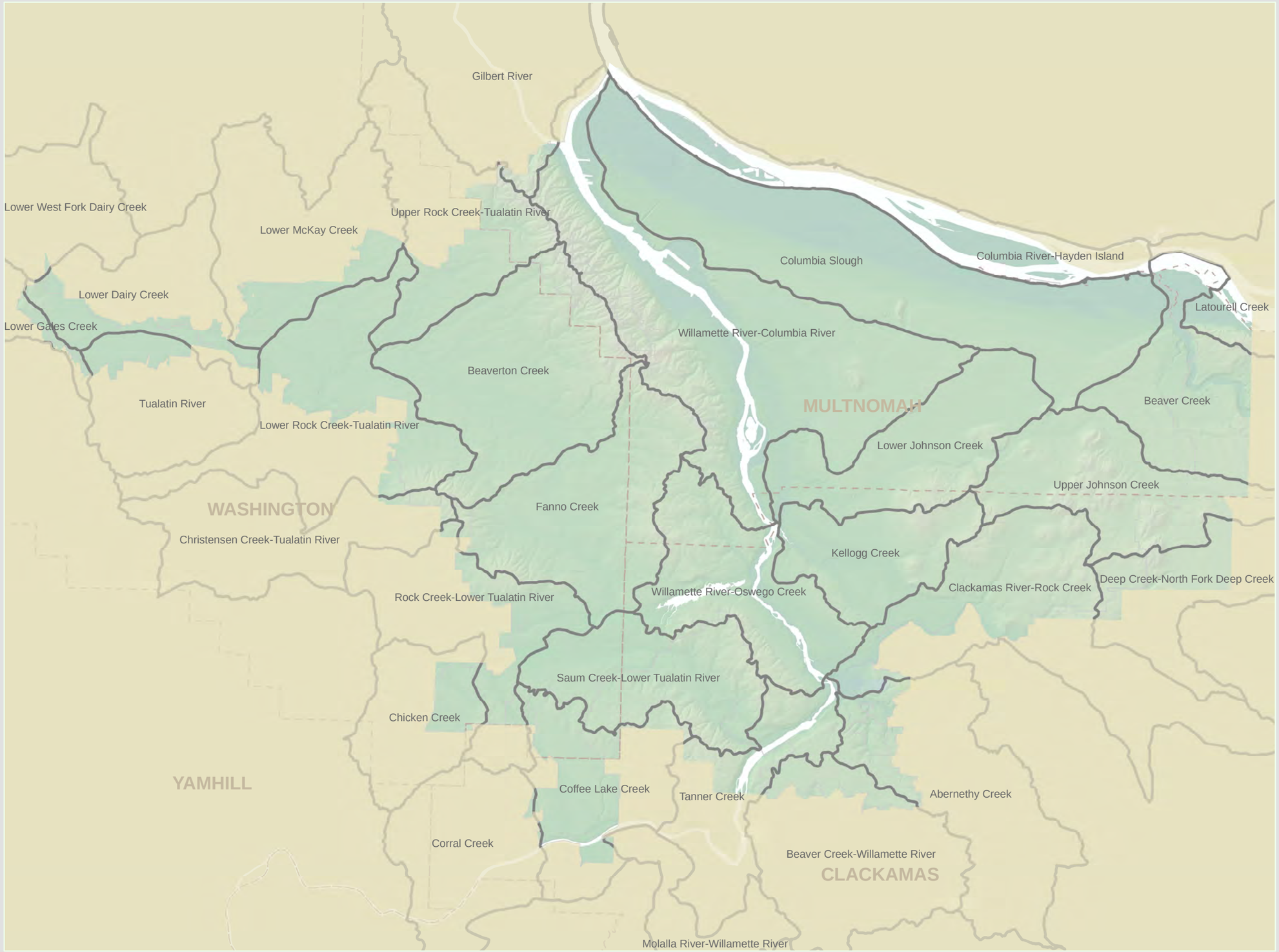
[1] Represents the percent lost between 2005 and 2007.

Table 23
Summary table of indicator results by jurisdiction in terms of percent contribution to region's total amount of each indicator.

	Ind. 1 2008	Ind. 2 2008	Ind. 3 2008	Ind. 4 2008	Ind. 5 2006	Ind. 6 2008[1]	Ind. 7 2006	Ind. 8 2006	Ind. 9 2008[1]	Ind. 10 2008
Beaverton	6.1%	4.6%	3.5%	2.9%	2.2%	3.3%	1.4%	1.4%	2.5%	3.4%
Clackamas	6.2%	8.3%	10.8%	11.0%	9.1%	9.2%	20.9%	12.5%	1.8%	13.2%
Cornelius	0.3%	0.2%	0.2%	0.1%	0.1%	0.5%	0.0%	0.0%	0.0%	0.3%
Damascus	3.5%	2.8%	6.4%	3.5%	2.2%	1.0%	7.9%	4.6%	0.0%	4.2%
Durham	0.1%	0.2%	0.1%	0.2%	0.1%	0.2%	0.1%	0.0%	0.0%	0.2%
Fairview	2.8%	1.0%	1.8%	0.7%	1.3%	1.0%	0.3%	0.4%	6.3%	0.5%
Forest Grove	1.6%	0.6%	1.2%	0.5%	0.7%	1.4%	0.3%	0.3%	0.6%	1.0%
Gladstone	0.3%	0.4%	0.3%	0.3%	0.5%	1.4%	0.0%	0.1%	0.3%	0.5%
Gresham	3.2%	4.3%	4.3%	4.6%	2.7%	2.7%	3.9%	5.1%	13.4%	4.6%
Happy Valley	1.6%	1.4%	2.2%	1.6%	0.9%	0.4%	2.4%	1.2%	1.6%	1.7%
Hillsboro	8.5%	8.0%	4.1%	2.4%	3.4%	4.2%	0.8%	2.4%	1.6%	3.8%
Johnson City	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
King City	0.2%	0.1%	0.3%	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%
Lake Oswego	1.1%	3.2%	2.0%	3.9%	2.5%	1.8%	3.0%	1.9%	0.0%	3.8%
Maywood Park	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Milwaukie	0.6%	0.6%	0.9%	0.5%	0.6%	1.5%	0.1%	0.0%	0.0%	0.9%
Multnomah	13.7%	13.0%	12.9%	14.4%	24.1%	13.9%	14.1%	13.0%	5.4%	9.1%
Oregon City	1.3%	1.3%	2.0%	1.6%	1.4%	1.9%	1.9%	1.0%	0.0%	1.9%
Portland	16.3%	27.9%	19.1%	31.4%	31.4%	36.8%	28.8%	49.5%	44.2%	30.7%
Rivergrove	0.0%	0.1%	0.1%	0.1%	0.1%	0.3%	0.0%	0.0%	0.6%	0.1%
Sherwood	2.1%	1.3%	1.2%	0.6%	0.6%	0.2%	0.4%	0.2%	8.1%	0.6%
Tigard	3.8%	2.9%	2.9%	2.1%	1.7%	1.8%	0.7%	0.4%	2.2%	2.2%
Troutdale	3.5%	1.0%	2.7%	1.2%	1.3%	0.8%	0.5%	0.7%	0.0%	0.9%
Tualatin	4.1%	1.5%	1.9%	0.8%	1.3%	4.2%	0.3%	0.2%	2.8%	1.2%
Washington	13.8%	11.9%	15.6%	11.0%	8.0%	7.6%	9.4%	2.7%	8.4%	11.7%
West Linn	1.3%	1.8%	1.9%	2.8%	2.1%	1.8%	2.0%	1.2%	0.2%	2.2%
Wilsonville	3.8%	1.7%	1.5%	1.5%	1.5%	1.9%	0.7%	1.0%	0.1%	1.3%
Wood Village	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

[1] Represents the percent contribution to the region's total acres lost between 2005 and 2007

MAPS



Map 1: Metro Area Watersheds

2007

State of the Watersheds Monitoring Report 2008

Metro Jurisdiction

Watershed Boundaries

Urban Growth Boundary

statistics

-Part or all of 31 Sub-watersheds

-Total area of 300,722 acres

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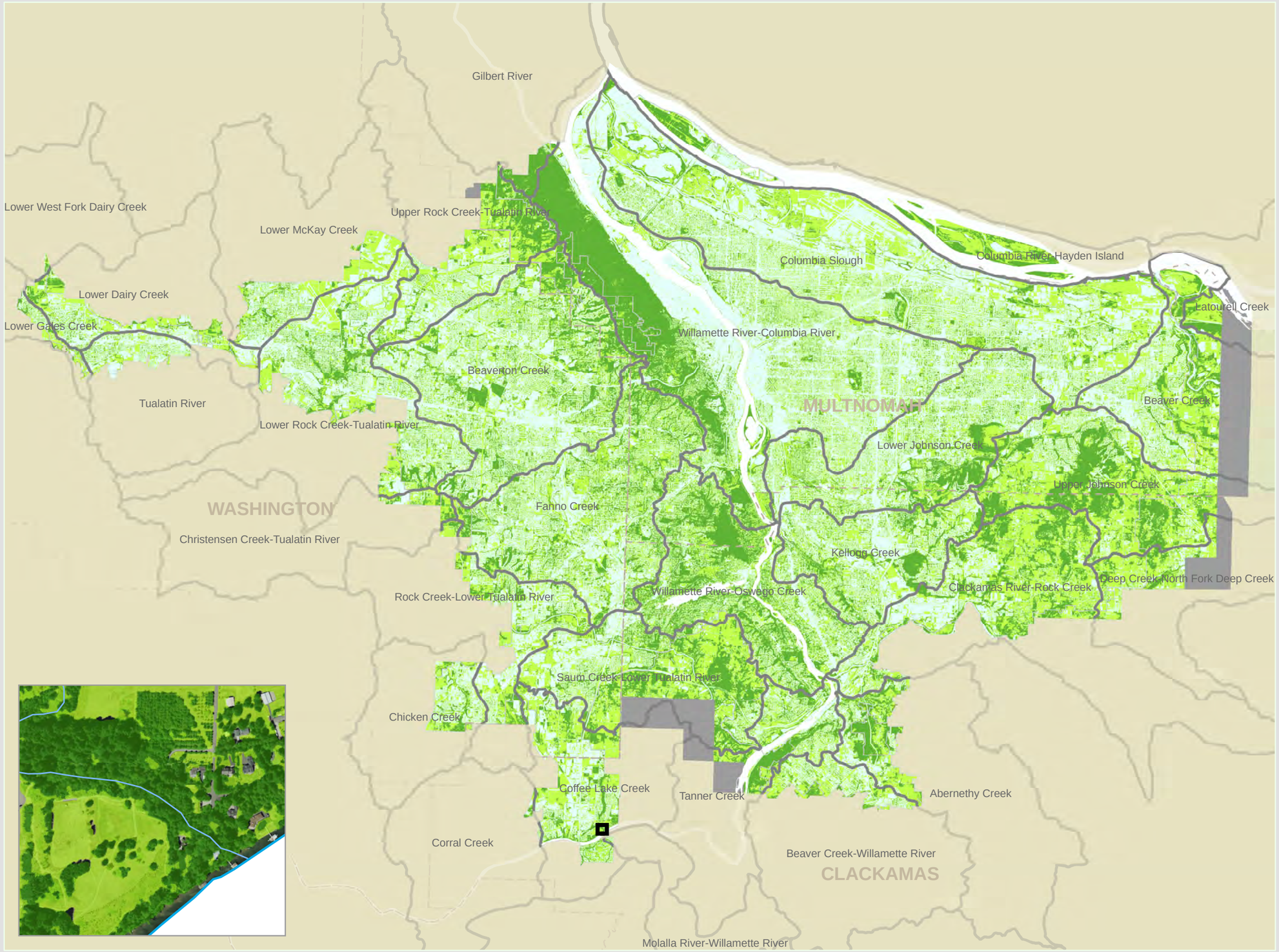
0 1.5 3 Miles

1 inch = 3 miles



Map 2: Vegetation

2007

State of the Watersheds Monitoring Report 2008

Metro Jurisdiction

Watershed Boundaries

Urban Growth Boundary

Vegetation Cover 2007

No Data

Vegetation Class

Trees

Shrubs or Grassland

Other

statistics

-Metro Region is 59.8% vegetated

-88,890 acres of trees (30.5% of region)

-85,405 acres of other vegetation (29.3% of region)

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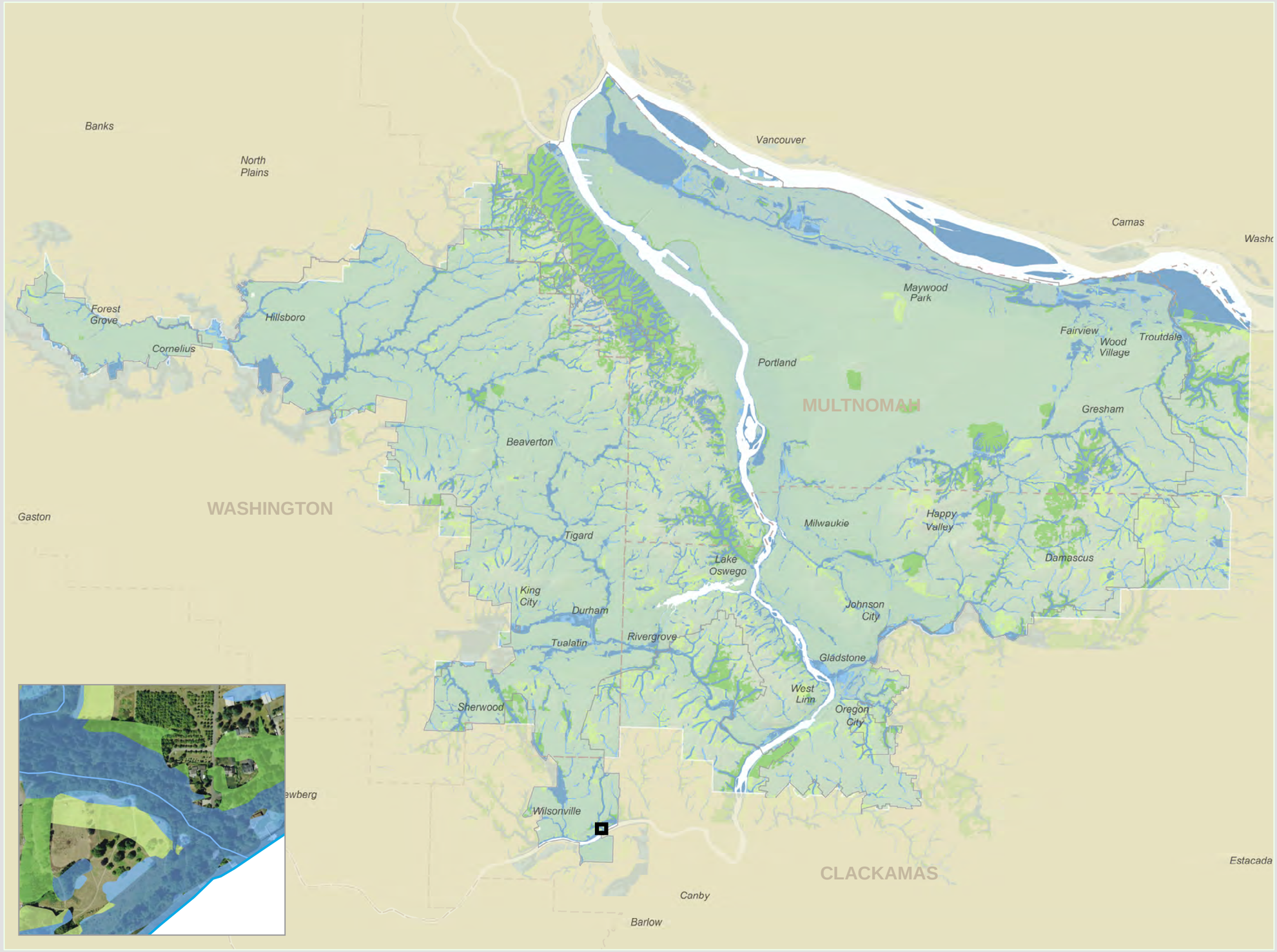

Map 3: Title 13 Habitat Inventory

2005

State of the Watersheds Monitoring Report 2008

Metro Jurisdiction

Watershed Boundaries

2005 Habitat Inventory

Habitat Classes

- Riparian Class I
- Riparian Class II
- Upland Class A
- Upland Class B

statistics

-The Metro area includes 25 cities and the urban portion of 3 counties

-Riparian I & II: 18.6% of Metro region (56k acres)

-Upland A & B: 9.9% of Metro region (30k acres)

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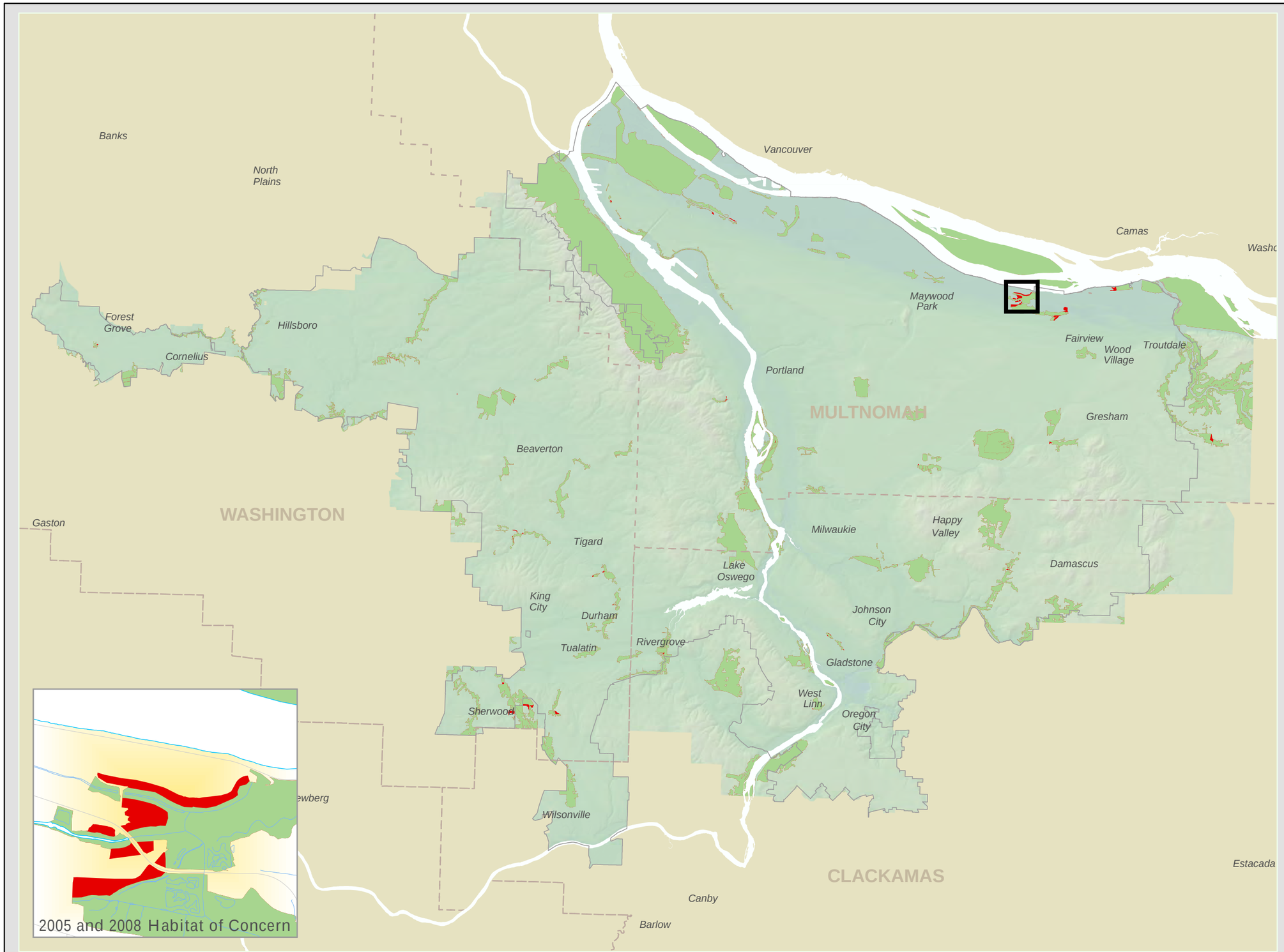

Map 4: Habitats of Concern

2005 - 2007

State of the Watersheds Monitoring Report 2008

Metro Jurisdiction

Watershed Boundaries

Habitats of Concern

Intact in 2007

Disturbed Since 2005

statistics

-Typically floodplain, native oak, wetlands, bottomland hardwood, native prairie

-2007 acres: 26,675

-2005-2007: 0.7% loss (181 acres)

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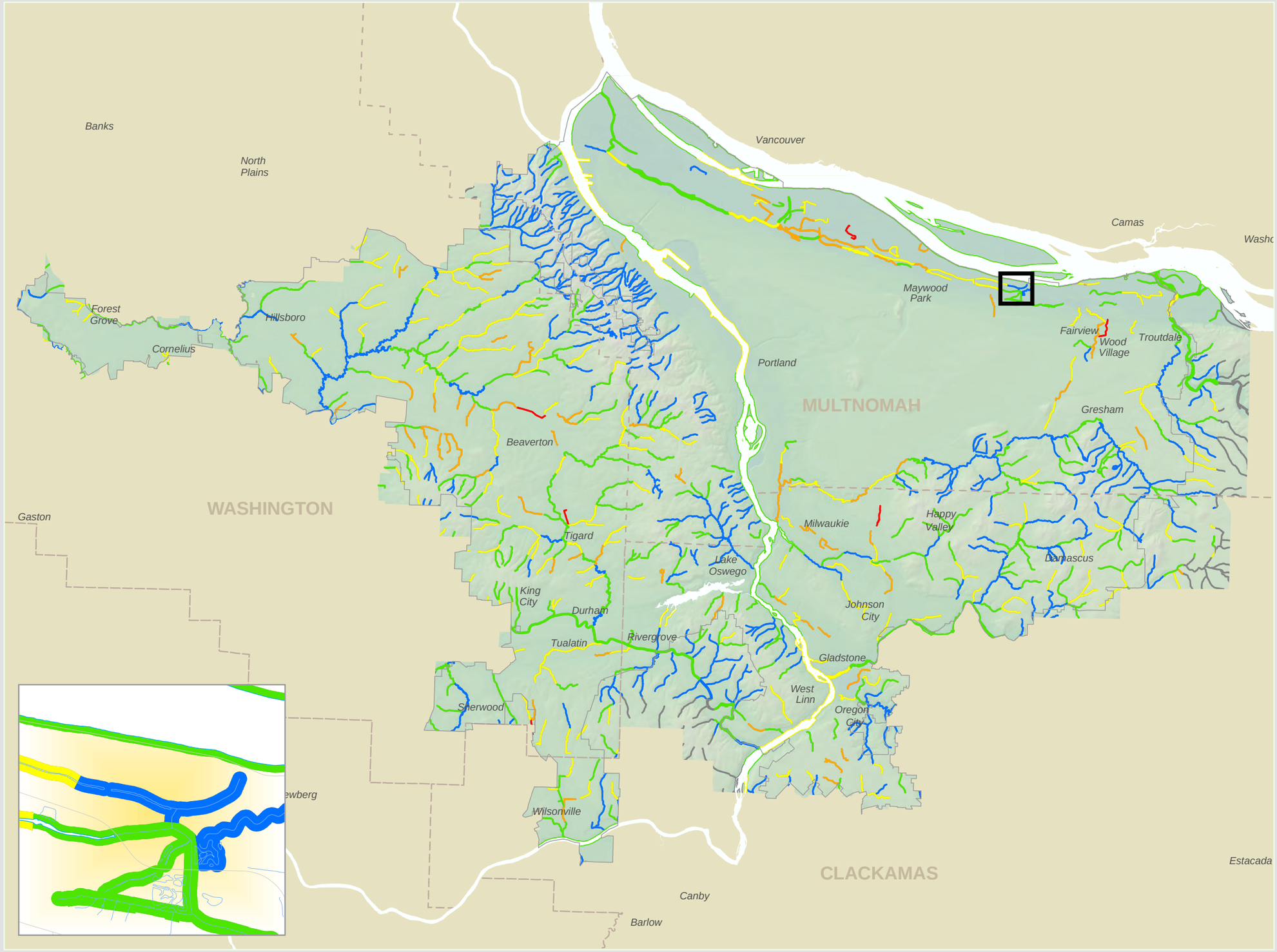

Map 5: Stream Reach Analysis

2007

State of the Watersheds Monitoring Report 2008

Metro Jurisdiction

Watershed Boundaries

Water Quality By Reach

No Data

Relative Stream Health

- 19-23 - High (n=374)
- 15-18 (n=347)
- 11-14 (n=214)
- 7-10 (n=71)
- 3-6 - Low (n=8)

statistics

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