



Willamette Basin Rivers & Streams Assessment

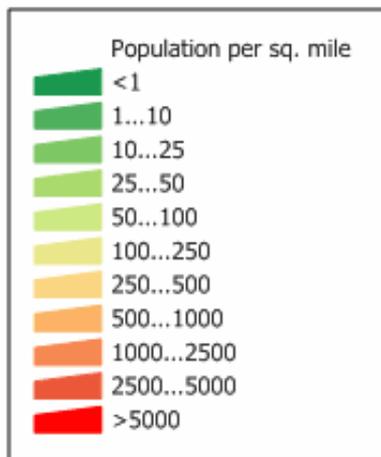


THE OREGON PLAN FOR
salmon & watersheds

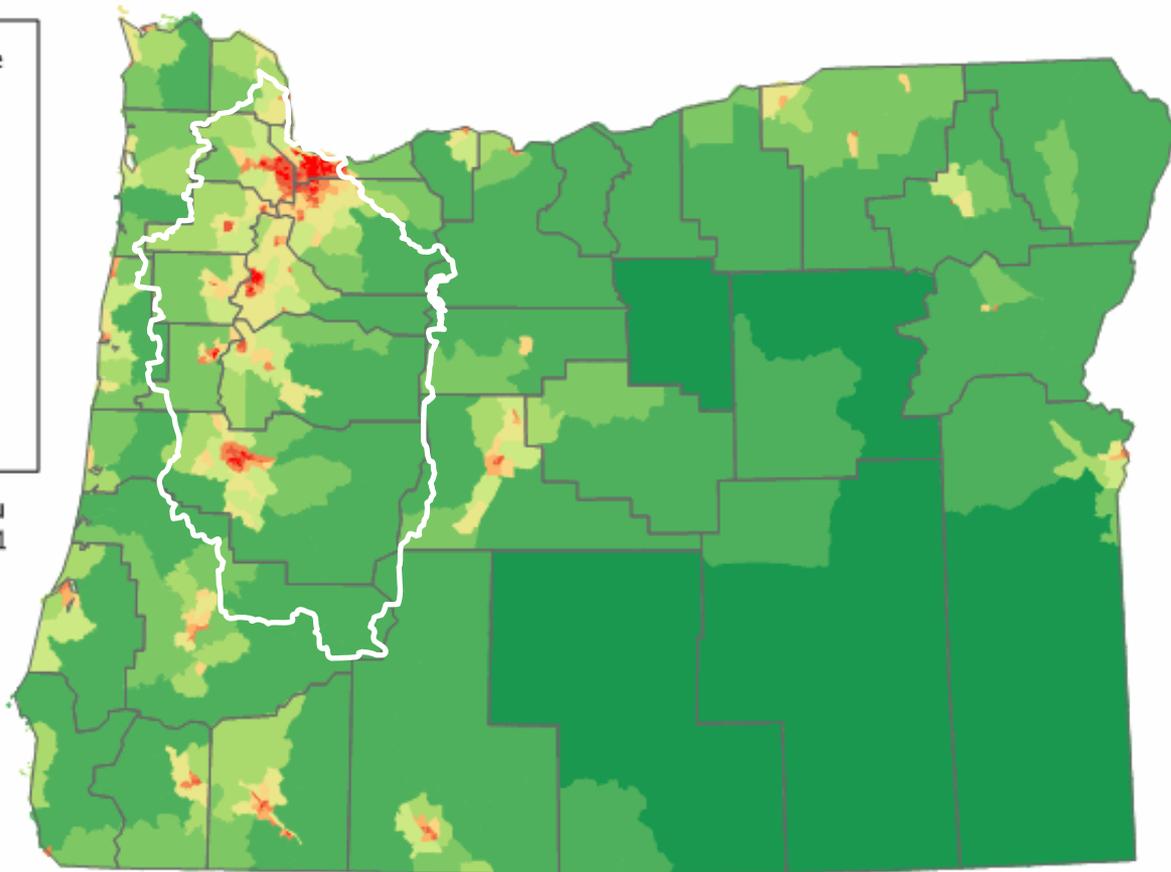
Michael Mulvey
Robin Leferink
Aaron Borisenko

February 2010

Willamette Basin Rivers & Streams Assessment

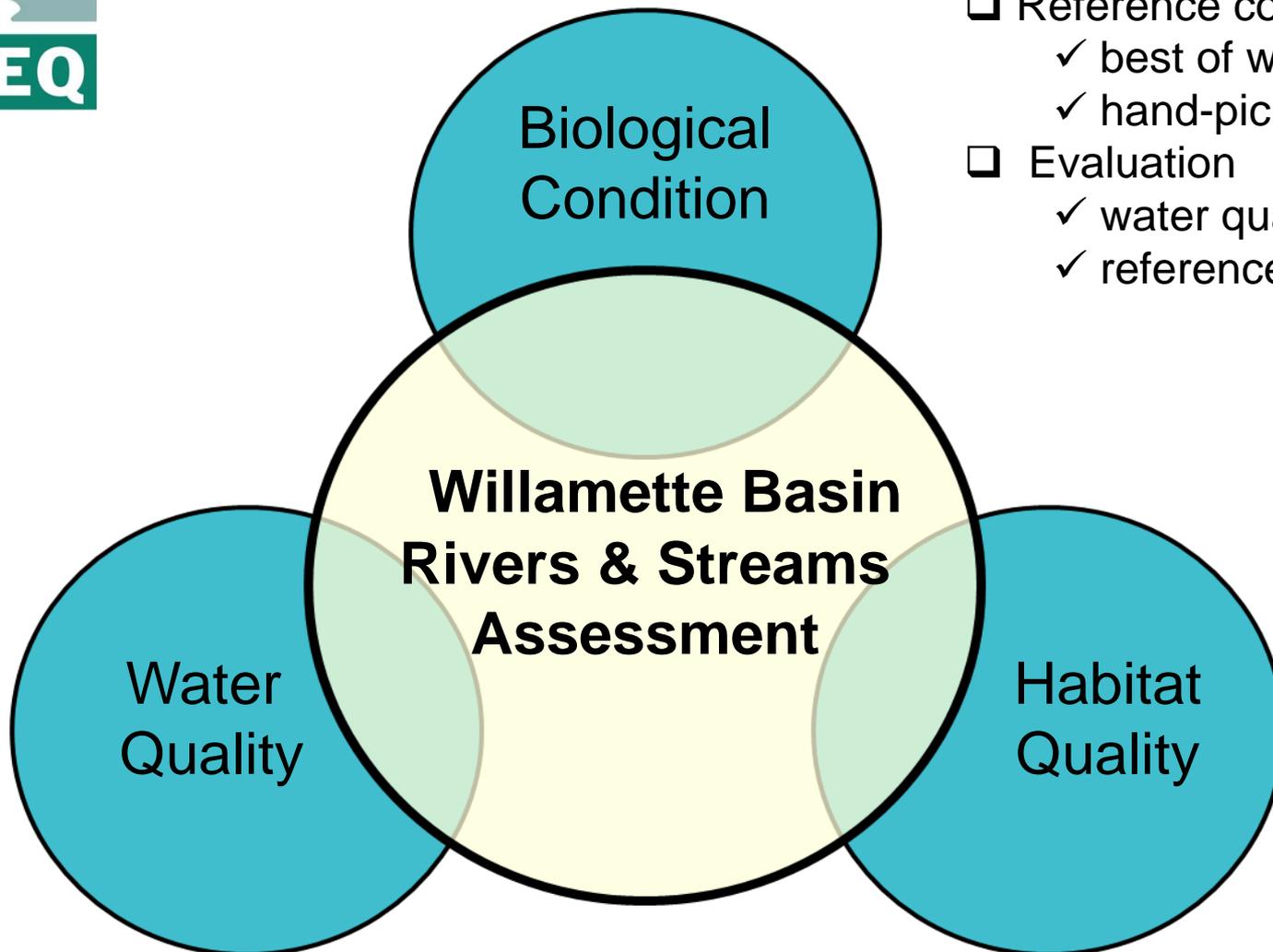


Source: U. S. Census Bureau
Census 2000 Summary File 1
population by census tract.





Components



- River & stream 'poll'
 - ✓ randomly selected sites
- Reference condition sites
 - ✓ best of what's left
 - ✓ hand-picked
- Evaluation
 - ✓ water quality criteria
 - ✓ reference benchmarks



Overview

Random sites and reference sites

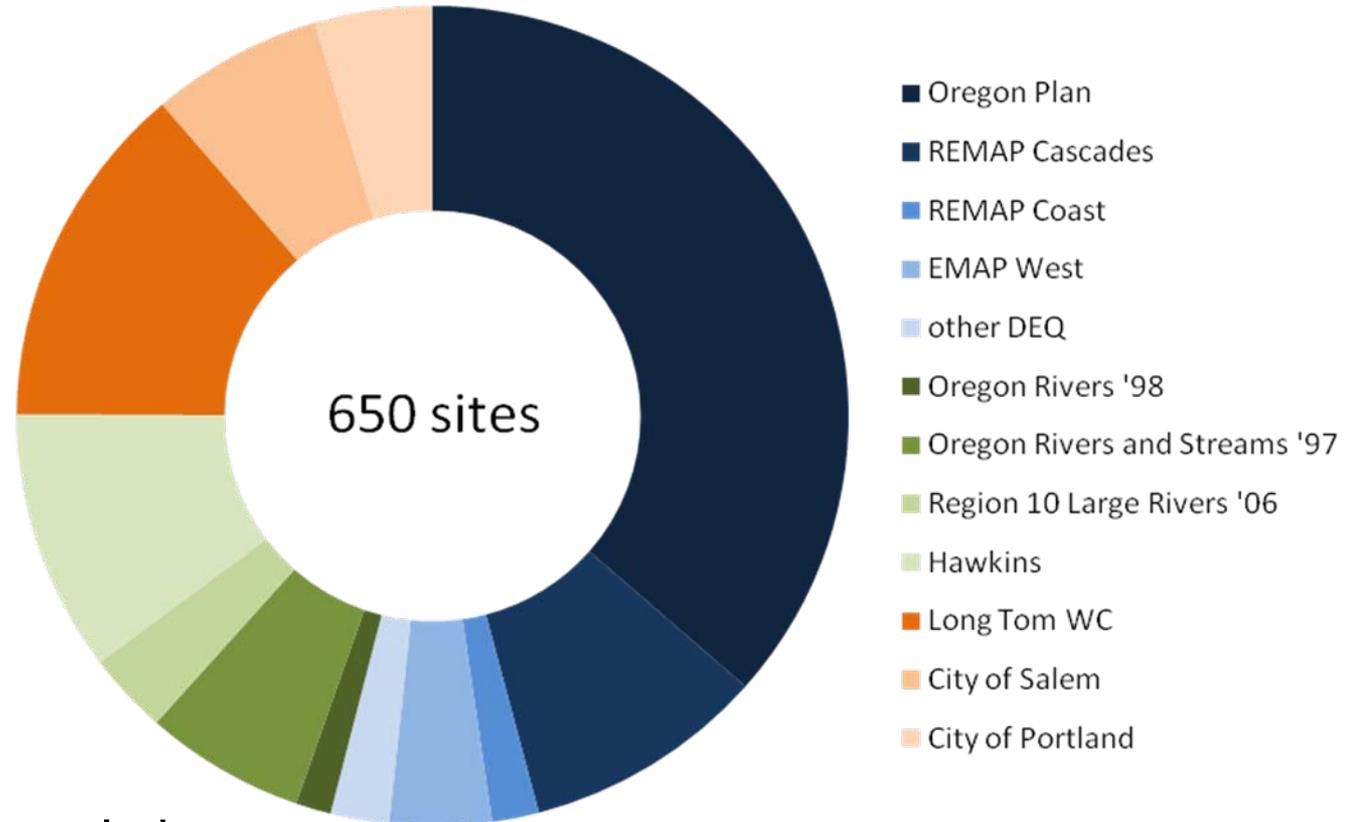
- 450 random sites
- 230 reference sites
- 15 different surveys

Spatial extents

- Willamette basin
- 12 Subbasins
- 3 Major land use categories
 - 8 Minor
- Reference condition of basin and subbasins



Data Sources



- Compatible target populations
- Random site selection
- Standardized field collection
- Compatible laboratory analysis



DEQ

Willamette Basin

Land Use

10%

Urban

30%

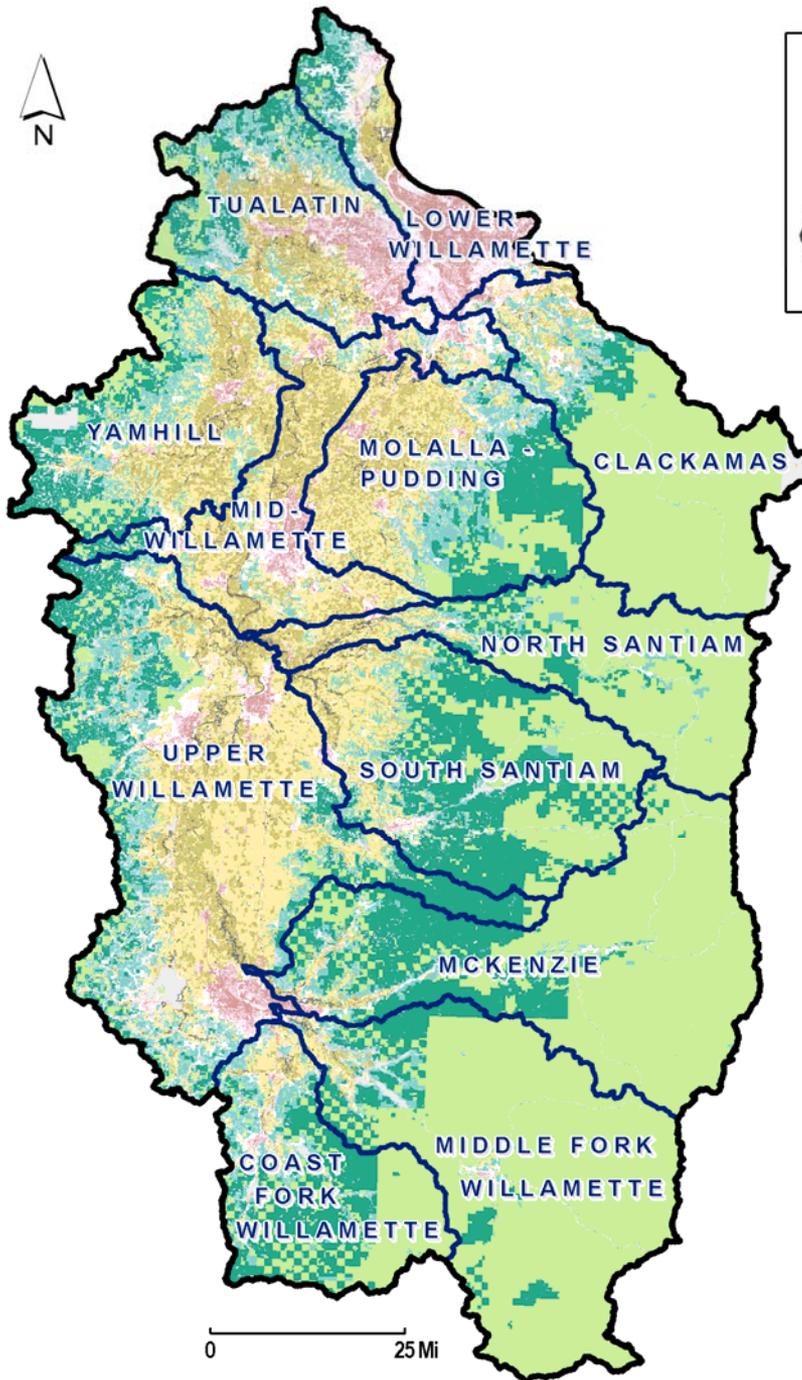
Agriculture

60%

Forest

Subbasins

(12)



Land Use Class

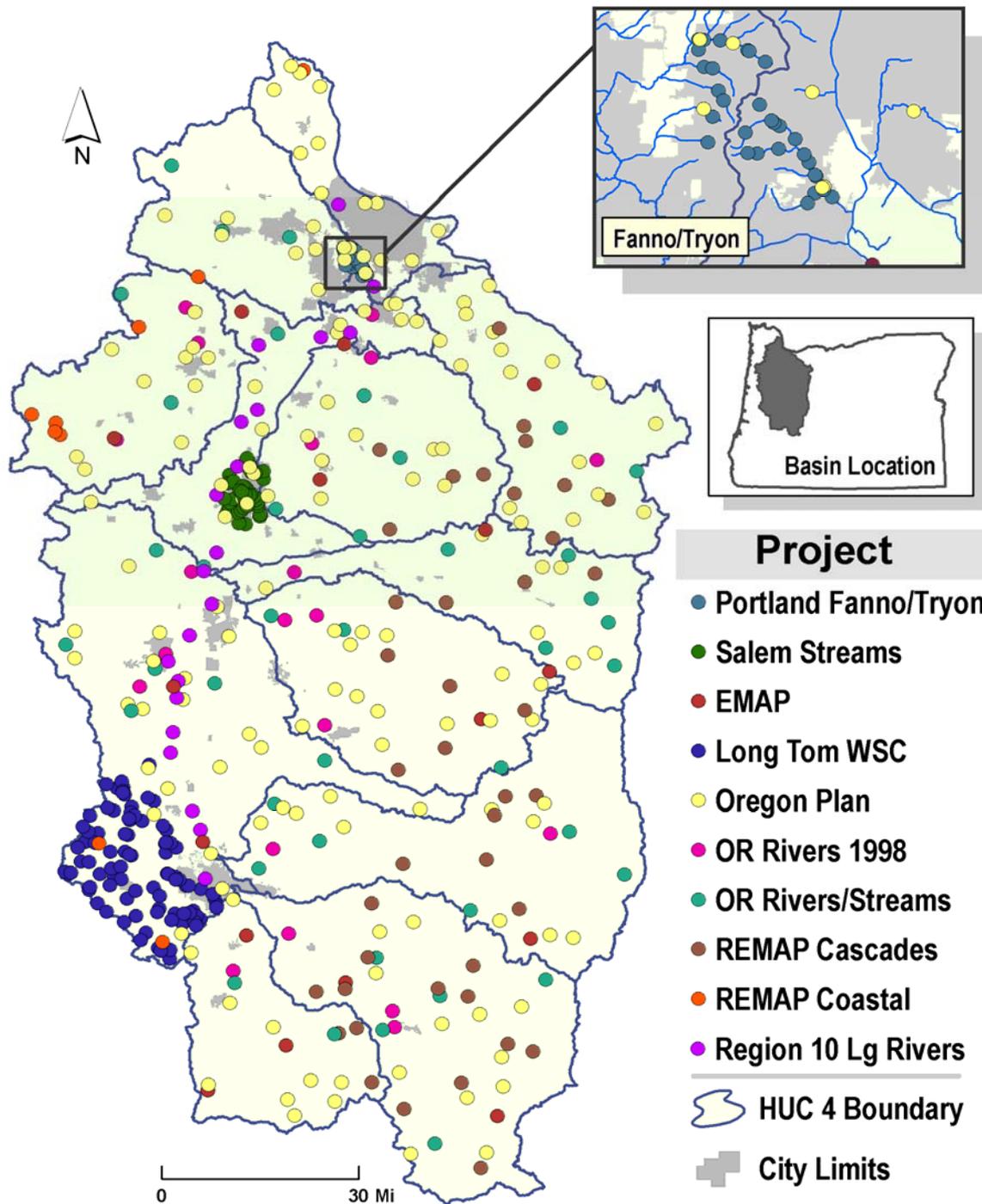
- Public Forest
- Private Industrial Forest
- Private Non-Industrial Forest
- Urban: Medium/High Intensity
- Urban: Low Intensity
- Urban: Open Space
- Agriculture: Cultivated Crops
- Agriculture: Pasture Hay
- Other

Subbasin Boundary

0 25Mi

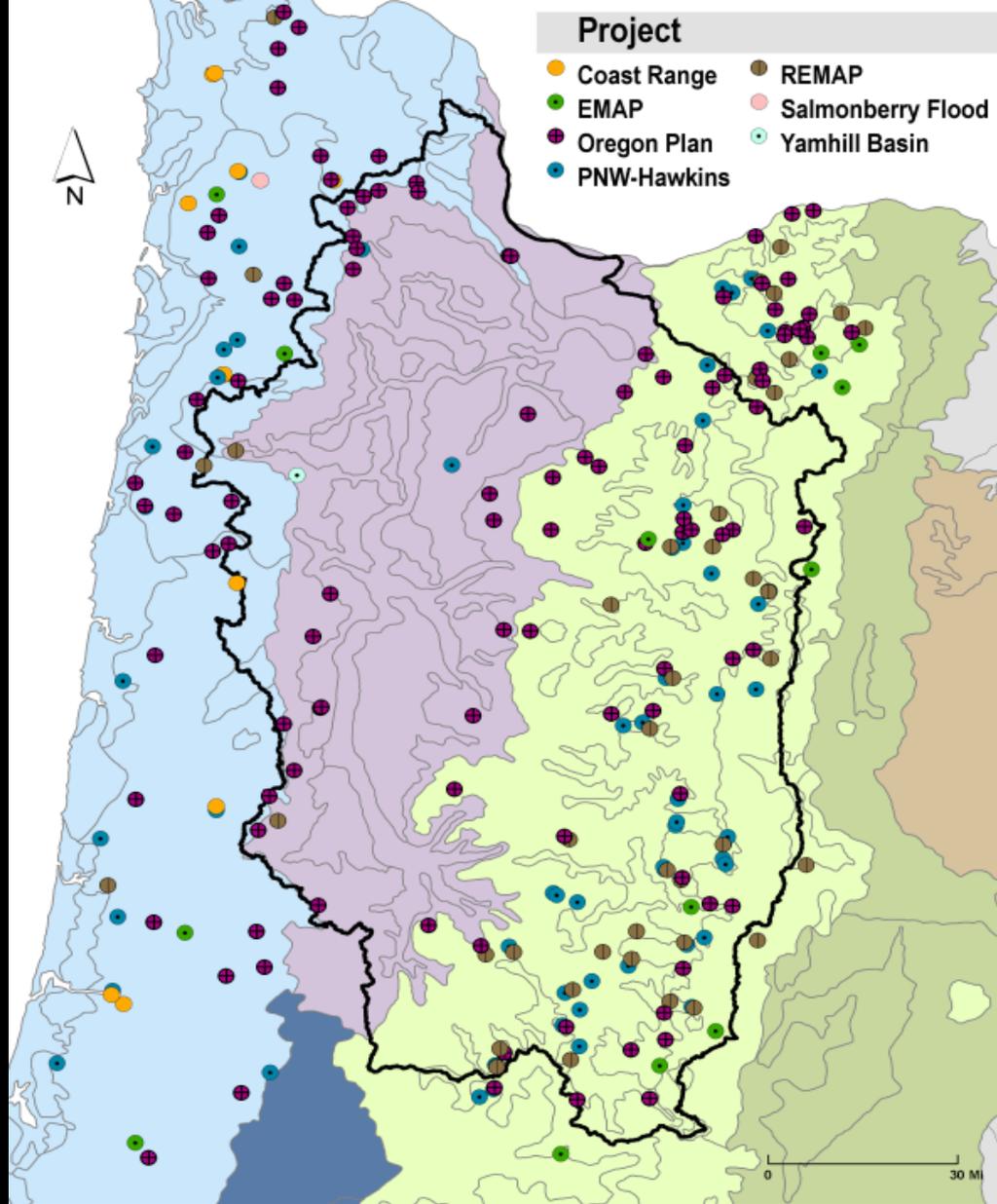


Random Site Locations





Reference Site Locations





Fish and Amphibians



Habitat



Bugs



Chemistry



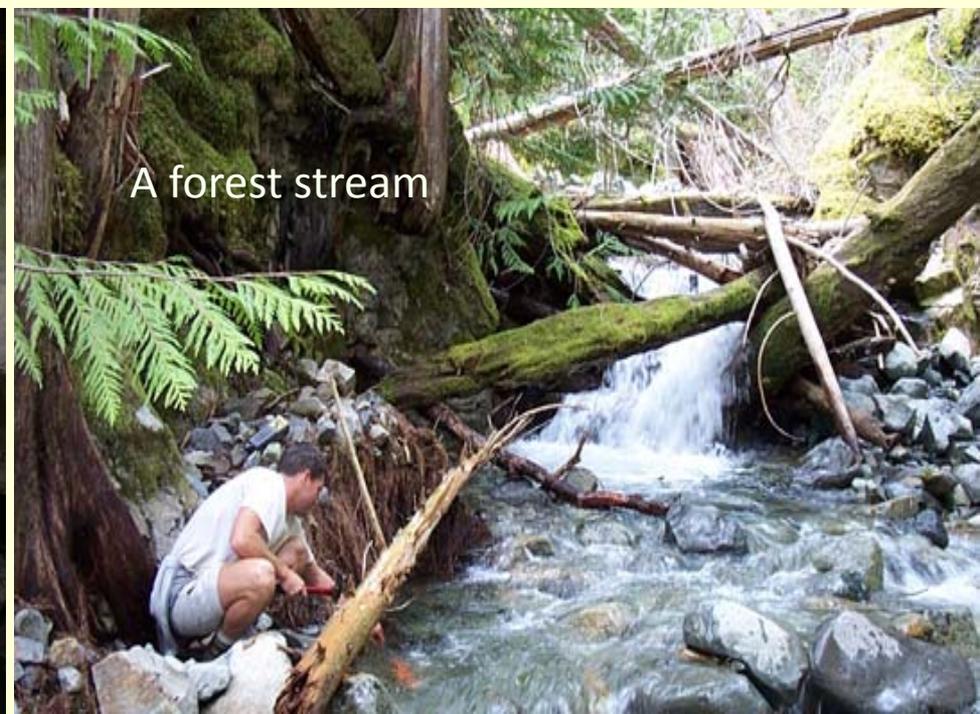
Tualatin River



An agricultural stream



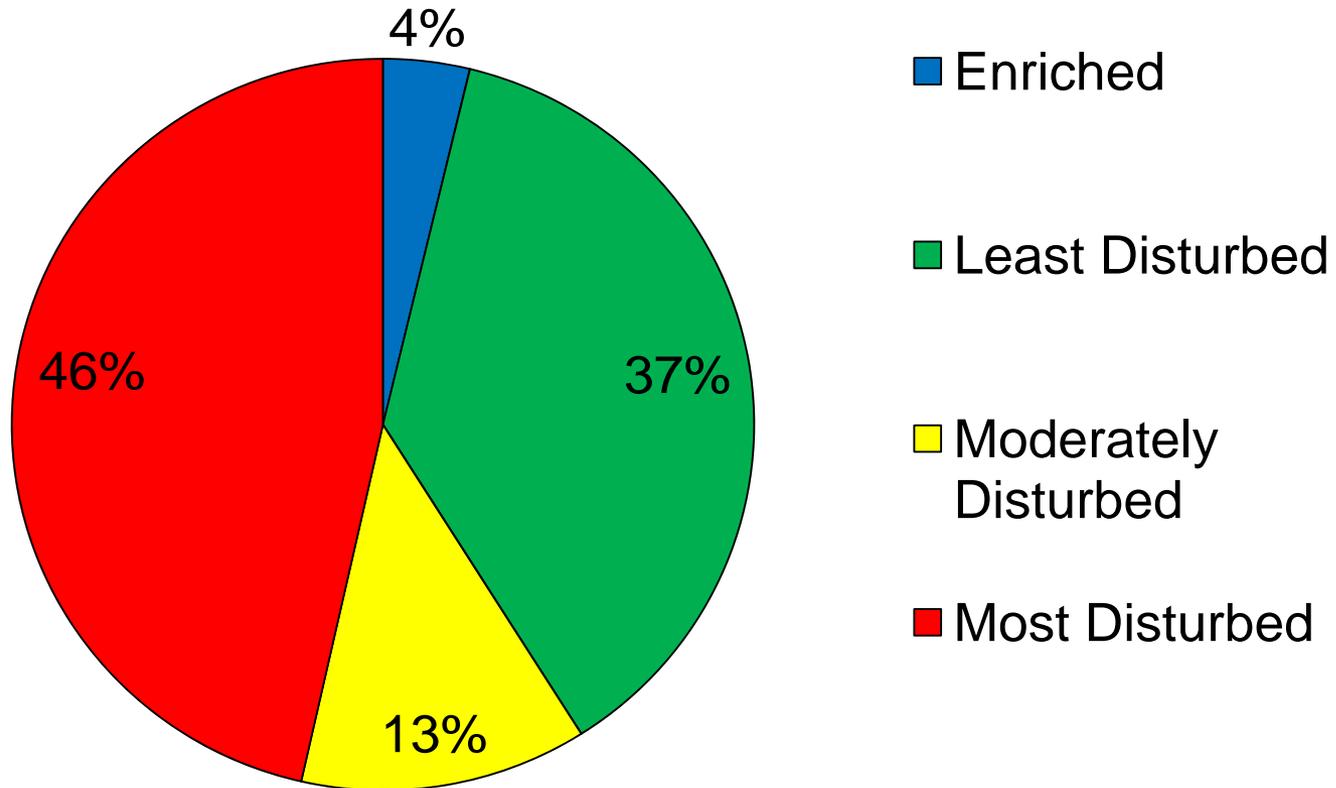
An urban stream



A forest stream

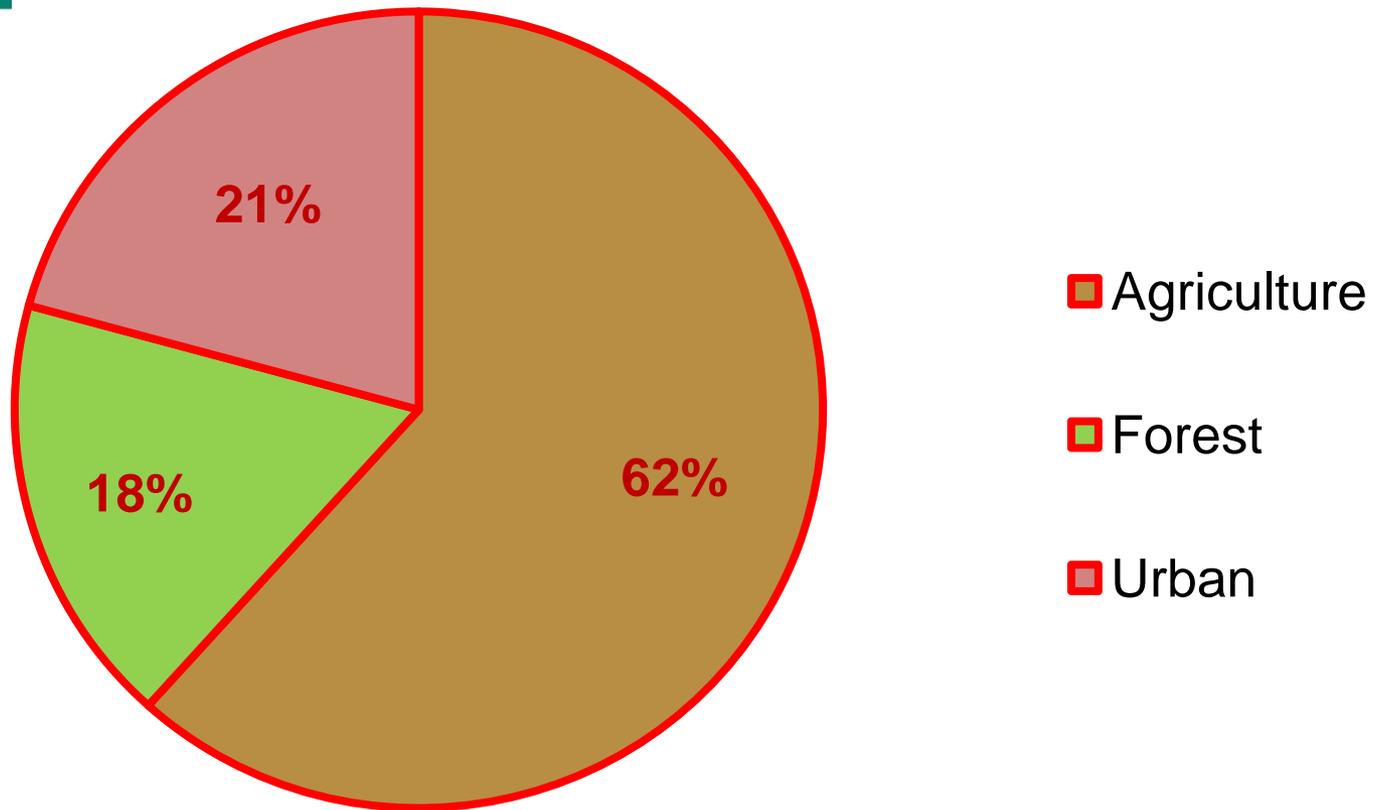


Willamette Basin Biological Condition





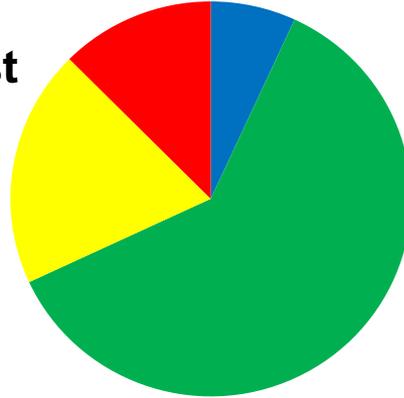
“Most Disturbed” Stream Miles by Land Use



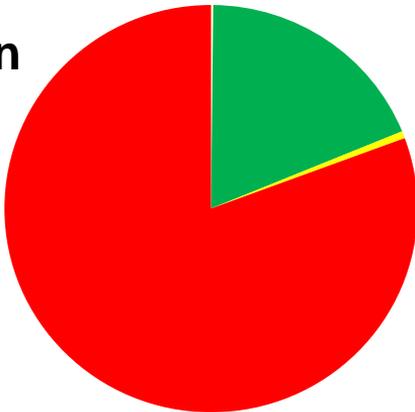


Basin Land Use: Biological Condition

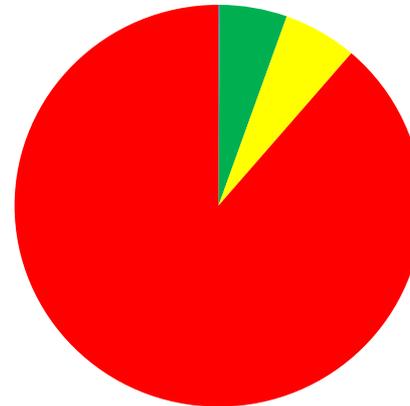
Forest



Urban



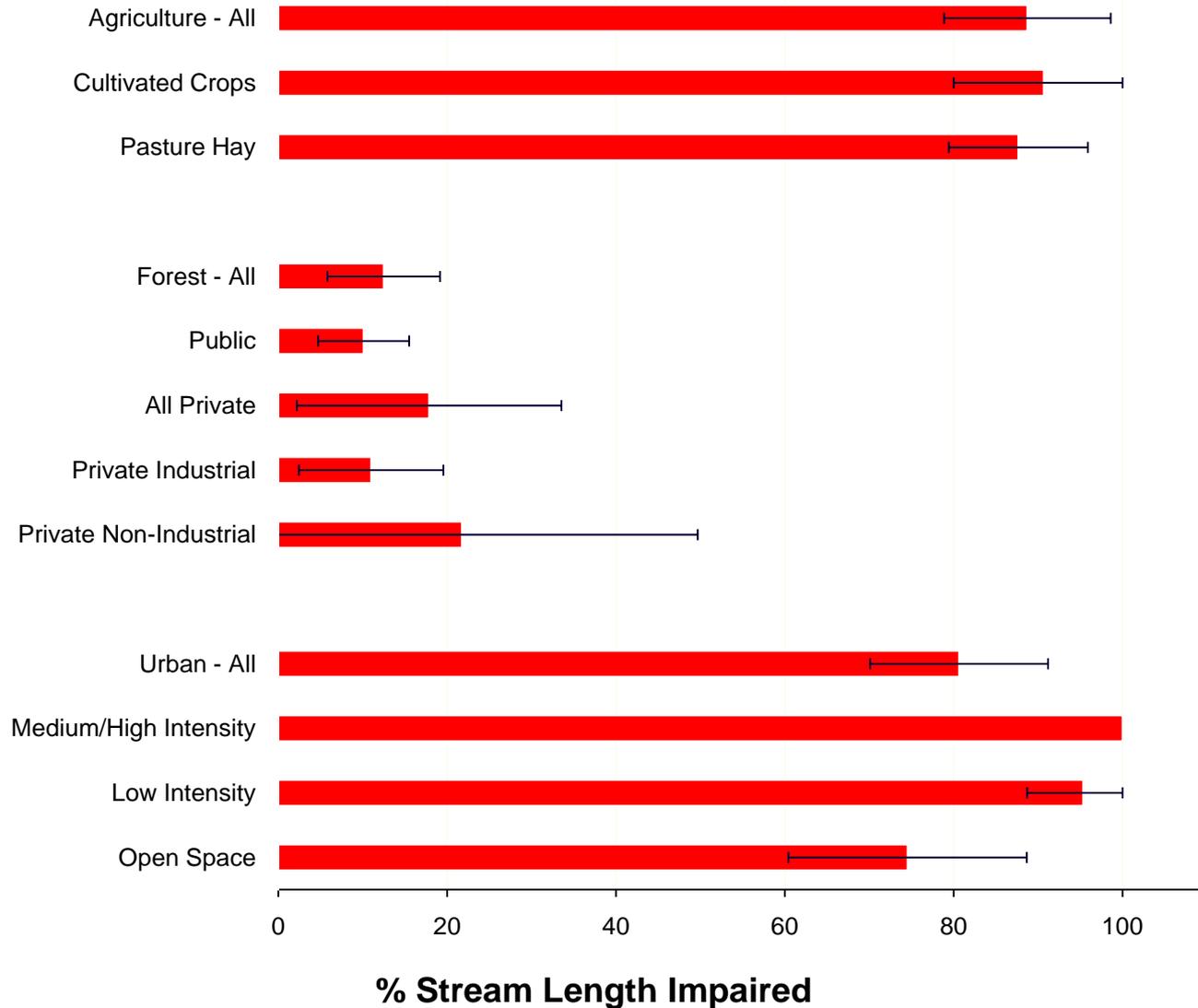
Agriculture



- Enriched
- Least Disturbed
- Moderately Disturbed
- Most Disturbed



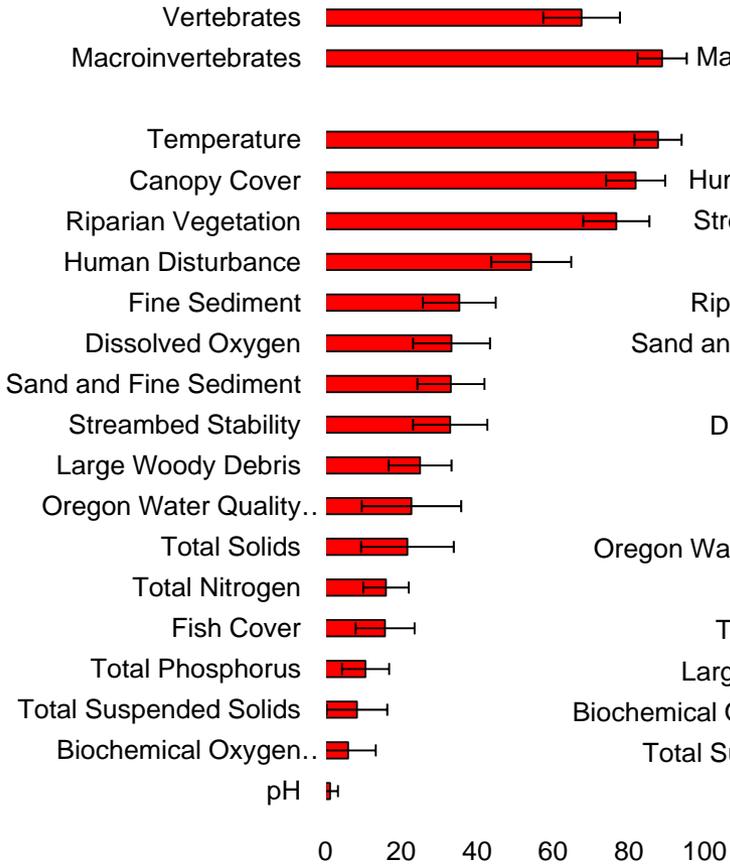
Biological Condition by Land Use



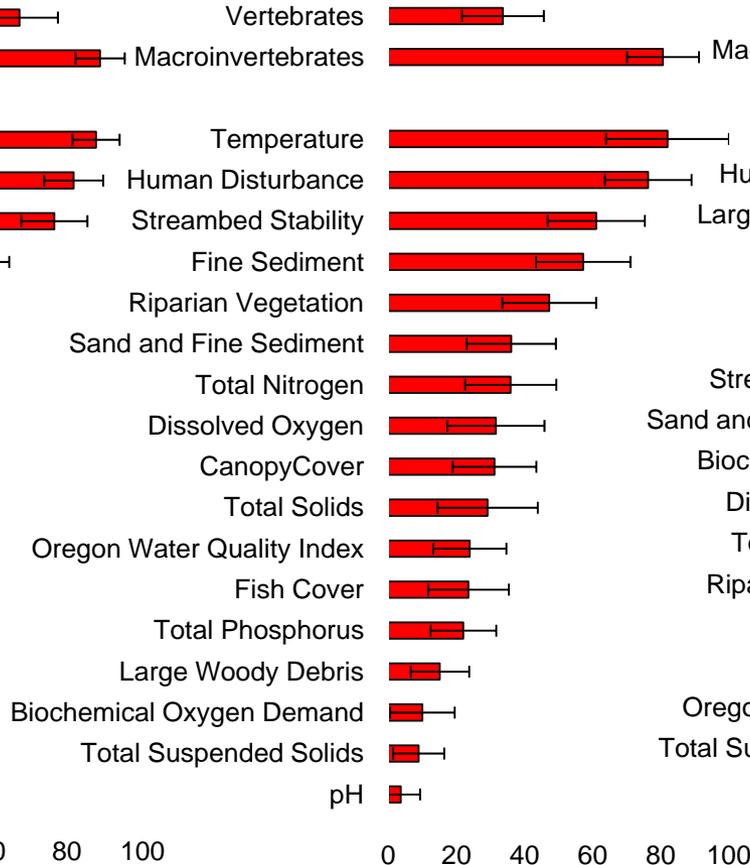
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Major Land Uses

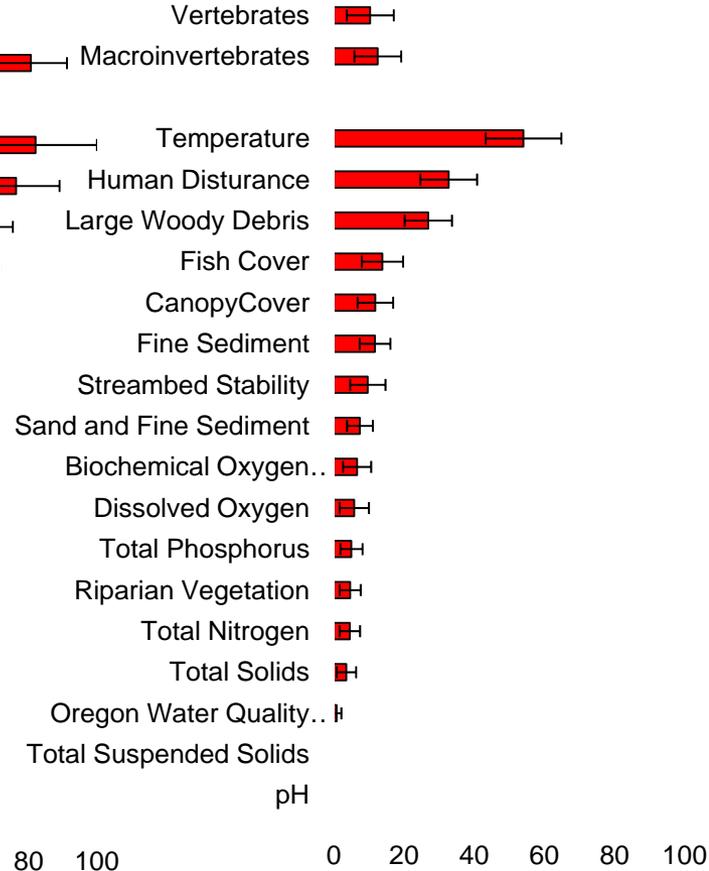
Agricultural Impairment



Urban Impairment



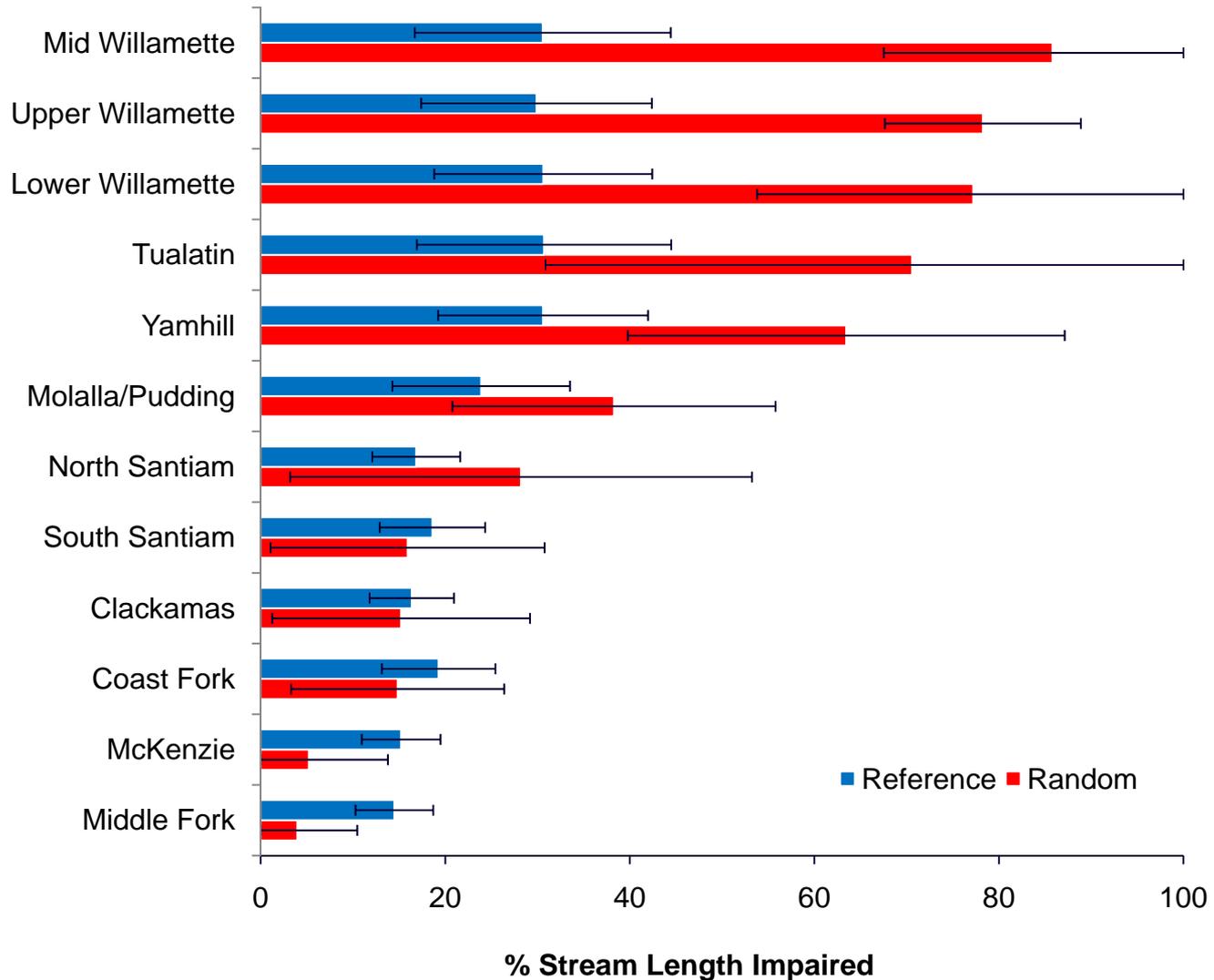
Forest Impairment



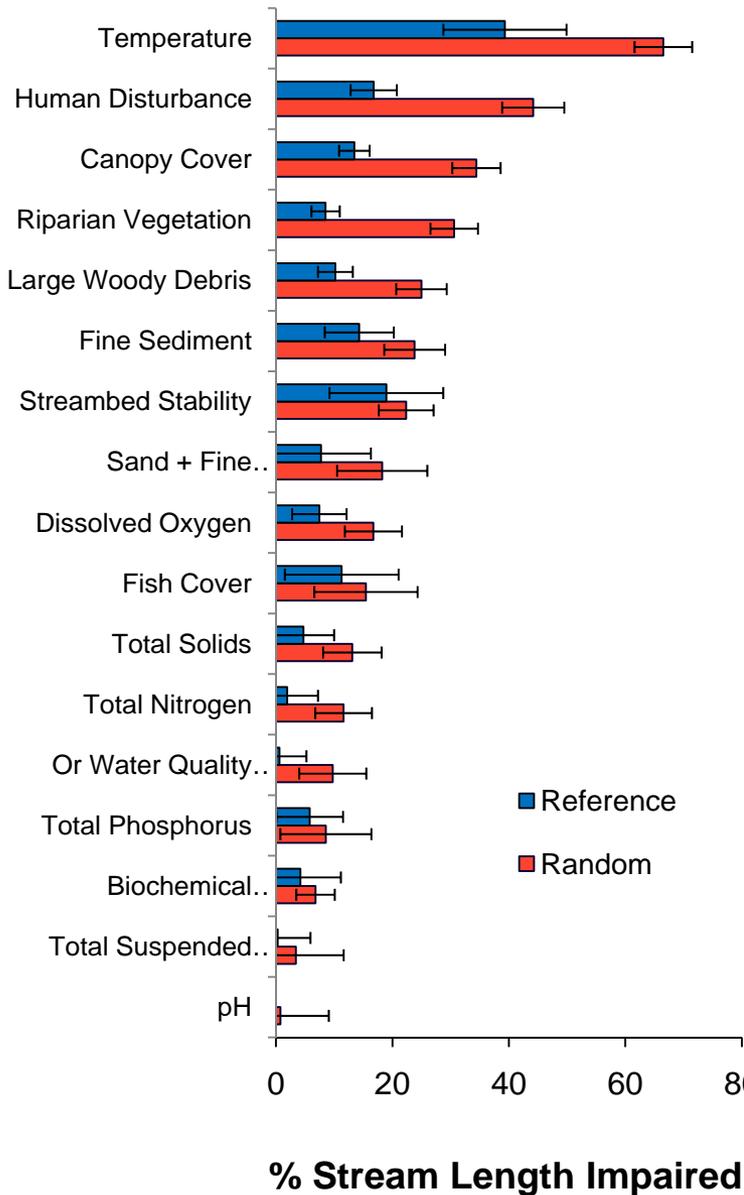
% of Stream Length



Subbasins (biological impairment)

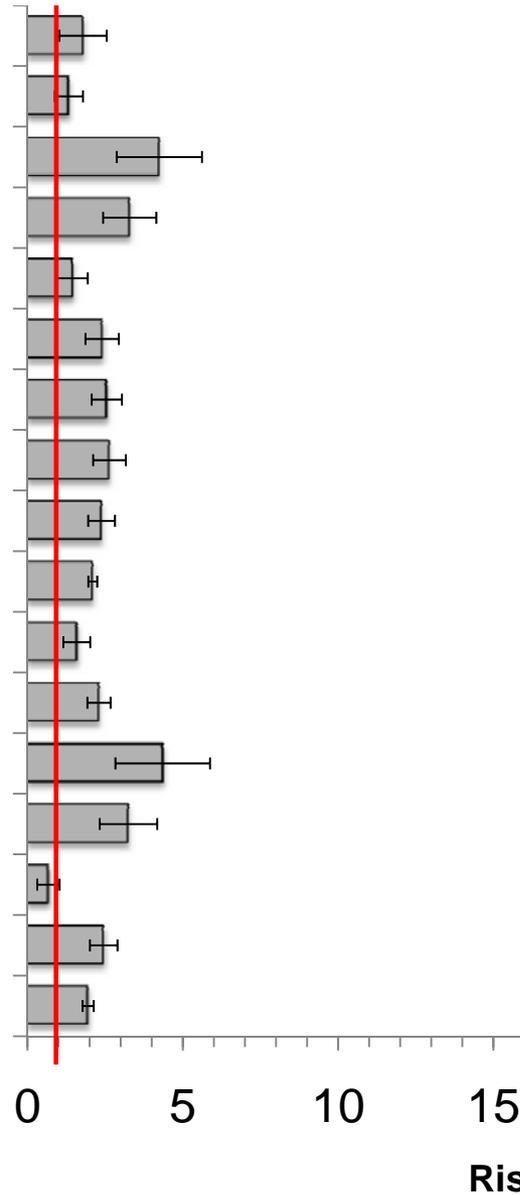


Basin: Stressor Extent

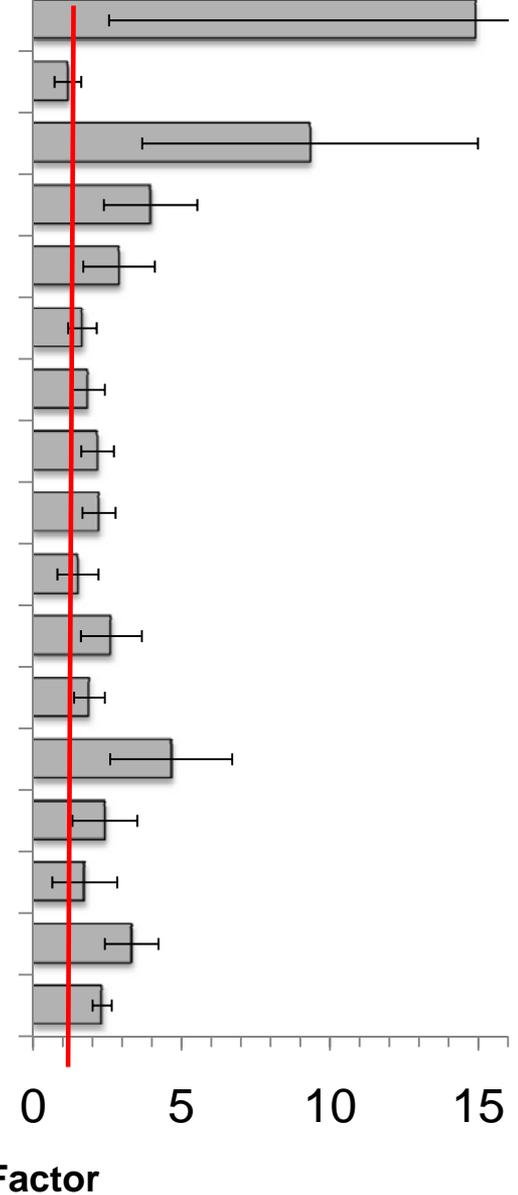


Relative Risk

Macroinvertebrates



Vertebrates



Willamette Basin Rivers & Streams Assessment

www.deq.state.or.us/lab/wqm/assessment.htm



Related Reports

available on DEQ and EPA web sites

United States Environmental Protection Agency | Office of Research and Development | Office of Water | Washington, DC 20460 | EPA 841-G-06-002 | December 2006 | www.epa.gov/waters/streamsurvey

EPA Wadeable Streams Assessment

A Collaborative Survey of the Nation's Streams

EPA United States Environmental Protection Agency | Office of Research and Development | Washington, DC 20460 | September 2005 | EPA 630R-05-005

An Ecological Assessment of Western Streams and Rivers

EMAP Environmental Monitoring and Assessment Program

DEQ State of Oregon Department of Environmental Quality

Wadeable Stream Conditions in Oregon

Shannon Hubier
Oregon Department of Environmental Quality
Laboratory Division—Watershed Assessment Section

DEQ07-LAB-0081-TR
November 2007

DEQ State of Oregon Department of Environmental Quality

Fact Sheet

Oregon's Role in the National Lakes Survey

Background
During the summer of 2007, the Oregon Department of Environmental Quality surveyed lakes across Oregon as part of the National Lakes Survey. The U.S. Environmental Protection Agency (EPA) provided funding for the survey, which was designed to:

- Determine regional and national ecological indicators of water quality, and
- Determine regional and national ecological indicators of water quality, and

Background
During the summer of 2007, the Oregon Department of Environmental Quality surveyed lakes across Oregon as part of the National Lakes Survey. The U.S. Environmental Protection Agency (EPA) provided funding for the survey, which was designed to:

- What percent of the Oregon's lakes are in good, fair or poor condition for key indicators of water quality, ecological health and recreation?
- What is the relative importance of key lake "stress factors" such as nutrients and pathogens?

Background
During the summer of 2007, the Oregon Department of Environmental Quality surveyed lakes across Oregon as part of the National Lakes Survey. The U.S. Environmental Protection Agency (EPA) provided funding for the survey, which was designed to:

- Determine regional and national ecological indicators of water quality, and
- Determine regional and national ecological indicators of water quality, and

DEQ State of Oregon Department of Environmental Quality

Watershed Assessment Summary Report

Lower Columbia Wadeable Streams

DEQ State of Oregon Department of Environmental Quality

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DEQ State of Oregon Department of Environmental Quality

Watershed Assessment Report

Coastal Coho Stream Assessment: Summary Report by DEQ

DEQ State of Oregon Department of Environmental Quality

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Wadeable Stream Conditions in Oregon

Shannon Hubier
Oregon Department of Environmental Quality
Laboratory Division—Watershed Assessment Section

DEQ07-LAB-0081-TR
November 2007

Thank You



Survey Design

- Don Stevens, OSU
- Tony Olson, EPA
- Phil Larsen, EPA

Training & Equipment

- Bob Hughes, OSU
- Phil Kaufmann, OSU
- David Peck, EPA

Data Sources

- Bob Hughes, OSU
- Allen Herlihy, OSU
- Dave Peck, EPA
- Marlys Cappaert, SRA
- Curt Seeliger, SRA
- Chuck Hawkins, USU
- Ken Roley, City of Salem
- Chris Prescott, City of Portland
- Cindy Theiman, Long Tom Watershed Council

Data Analysis

- Don Stevens, OSU
- John Van Sickle, EPA
- Thom Whittier, OSU
- Bill Gaeuman, OSU
- Shannon Hubler, DEQ



Muddy Creek in the Finley National Wildlife Refuge

www.deq.state.or.us/lab/wqm/assessment.htm

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Hypothetical biological response for a disturbed ecosystem

adapted from: E.P Odum, J.T. Finn, and E.H. Franz. 1979. Perturbation Theory and the Subsidy-Stress Gradient. Bioscience. 29 (6) 379-352.



DEQ

Reference

Enriched

Biological Response

Moderately Disturbed

Severely Disturbed

Pristine

Slightly impaired

Moderately impaired

Highly impaired

Lethal

Environmental Disturbance/Impairment Gradient

