

Integrated Water Resources Strategy *2010 Open House*

Ecoregions

Population

Farmlands

Forests

Fish

Instream Needs

Groundwater

Surface Water

Precipitation

Storage

Climate Change

Restoration

Map Gallery



The Oregon Water Resources Department—together with the Department of Environmental Quality, Department of Fish and Wildlife, and Department of Agriculture—has been given responsibility for developing an Integrated Water Resources Strategy for the state of Oregon. The first iteration is due to the Oregon Legislature in 2012, with updates due every five years thereafter.

Water is one of Oregon's most precious natural resources. With more than 100,000 miles of rivers and streams, 360 miles of coastline, and some of the cleanest lakes in the world, Oregon is renowned for its water. Our rivers and streams not only provide natural beauty, but they supply the water necessary for drinking, recreation, industry, agriculture, and fish and wildlife.

Today, however, water resource management in Oregon is facing a number of significant challenges. Surface water is nearly fully allocated during the summer months and groundwater is showing declines in many areas. More than 1,861 water bodies are impaired and not meeting water quality standards. Twenty-four fish species have been identified as Threatened or Endangered under the Federal Endangered Species Act, while another 31 are listed as state sensitive species.

An integrated water resources strategy will provide an action agenda for the state to follow as it prepares to meet Oregon's water needs: instream and out-of-stream; above ground and below ground; now and in the future. The success of such a strategy will hinge on how well it integrates water quantity, water quality and ecological issues. Because these three issues are closely linked, Oregon must examine and address water resource issues in a holistic manner. Such a strategy will also provide a framework for local entities to use as they dedicate their own limited resources to water resource efforts.

The maps in this publication are the same maps featured during our 2010 Open Houses, as well as in our background/issue papers. These maps represent some of the water resource challenges and opportunities facing Oregon communities today. We hope that they spark some creative dialogue during the open houses. From this process, we hope to identify the most urgent challenges that must be addressed and the most promising opportunities that should be pursued.

For more detailed descriptions of these maps, please visit the last page for web links and report titles. Or, visit our project website for ongoing updates, resources, and opportunities to engage.

~ The Project Team

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U.S. Environmental Protection Agency Level III Ecoregions

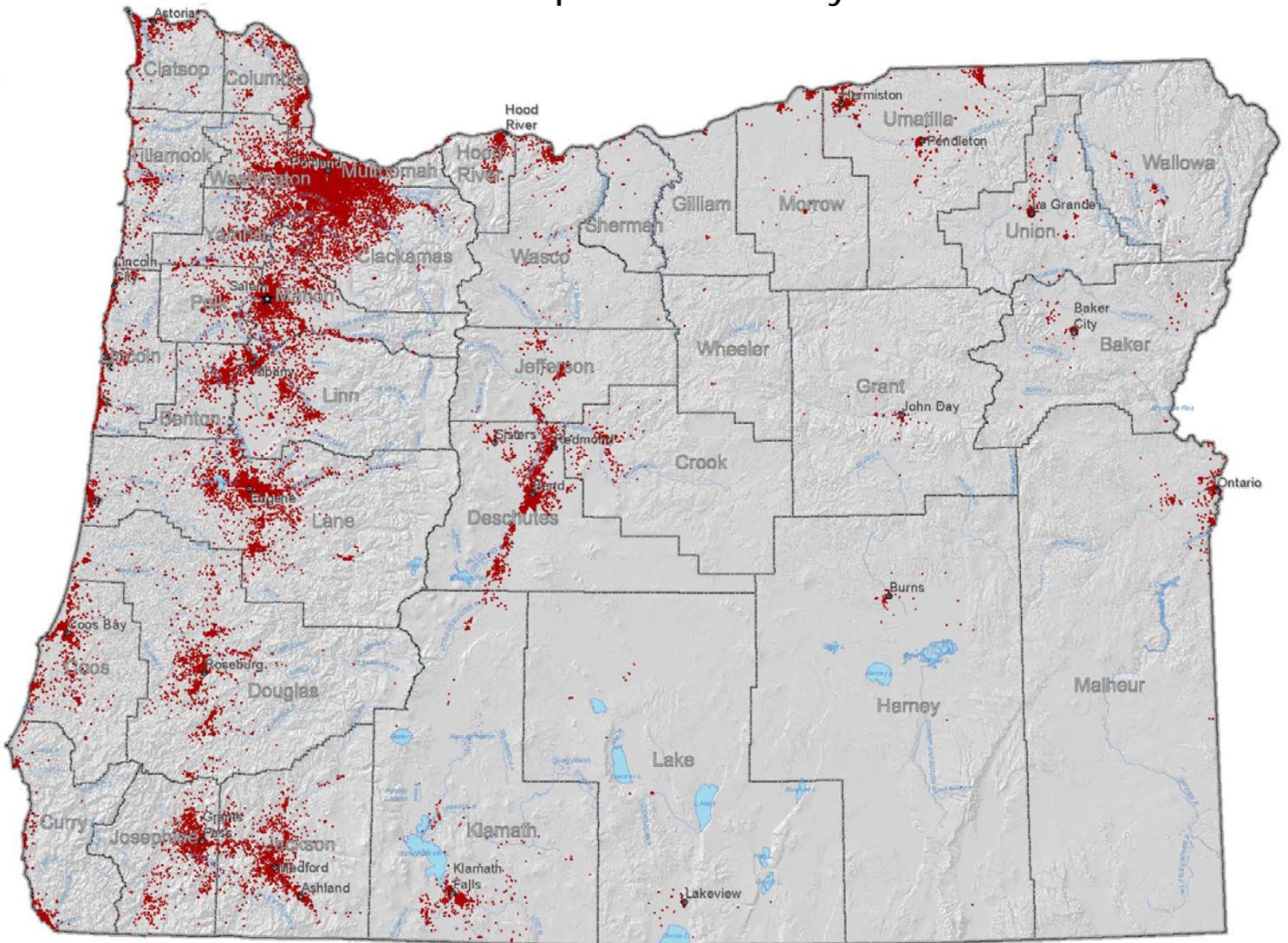


Explanation

-  Ecoregion boundary
-  County

Oregon has nine distinct ecological regions or “ecoregions,” differentiated by their climate, precipitation, plant and animal life, topography, and other factors. The differences between ecoregions means that water resource policies and approaches that work well in one area may not work well in another area.

Current Population Density



Explanation

Census block

1 Dot = 50

Persons

County

River

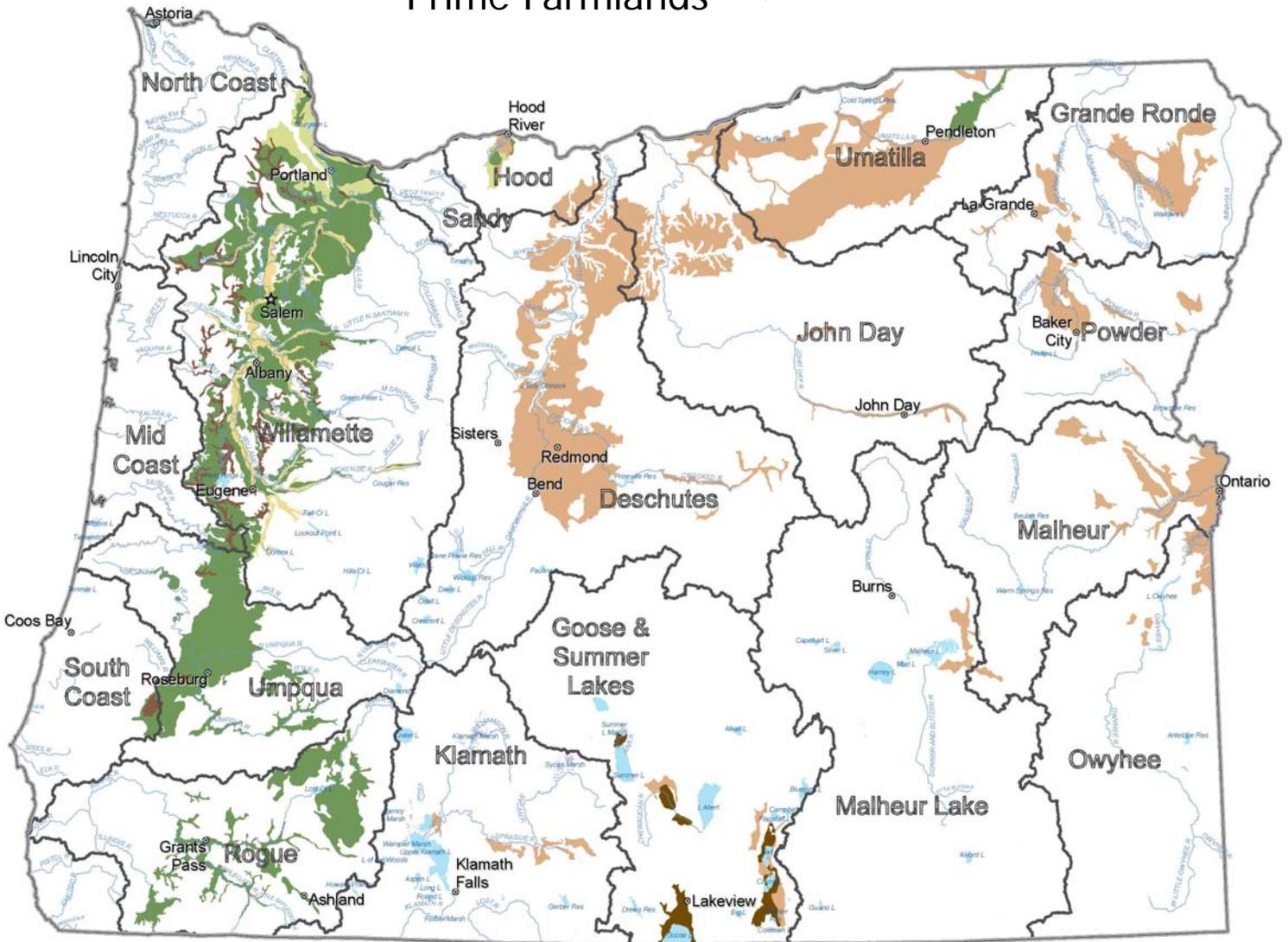
Lake

Marsh

The U.S. Census Bureau projects the arrival of another one million people in Oregon by 2030.

With a population close to 4 million today, a 25 percent increase in Oregon's population could have a significant impact on water supplies. This map shows the distribution and density of Oregon's population today.

Prime Farmlands



Explanation

Prime farmland

- All areas are prime farmland
- Only drained areas are prime farmland
- Only areas protected from flooding are prime farmlands
- Only irrigated areas are prime farmland
- Only drained areas that are protected from flooding
- Only irrigated areas that have been drained

City

River

Lake

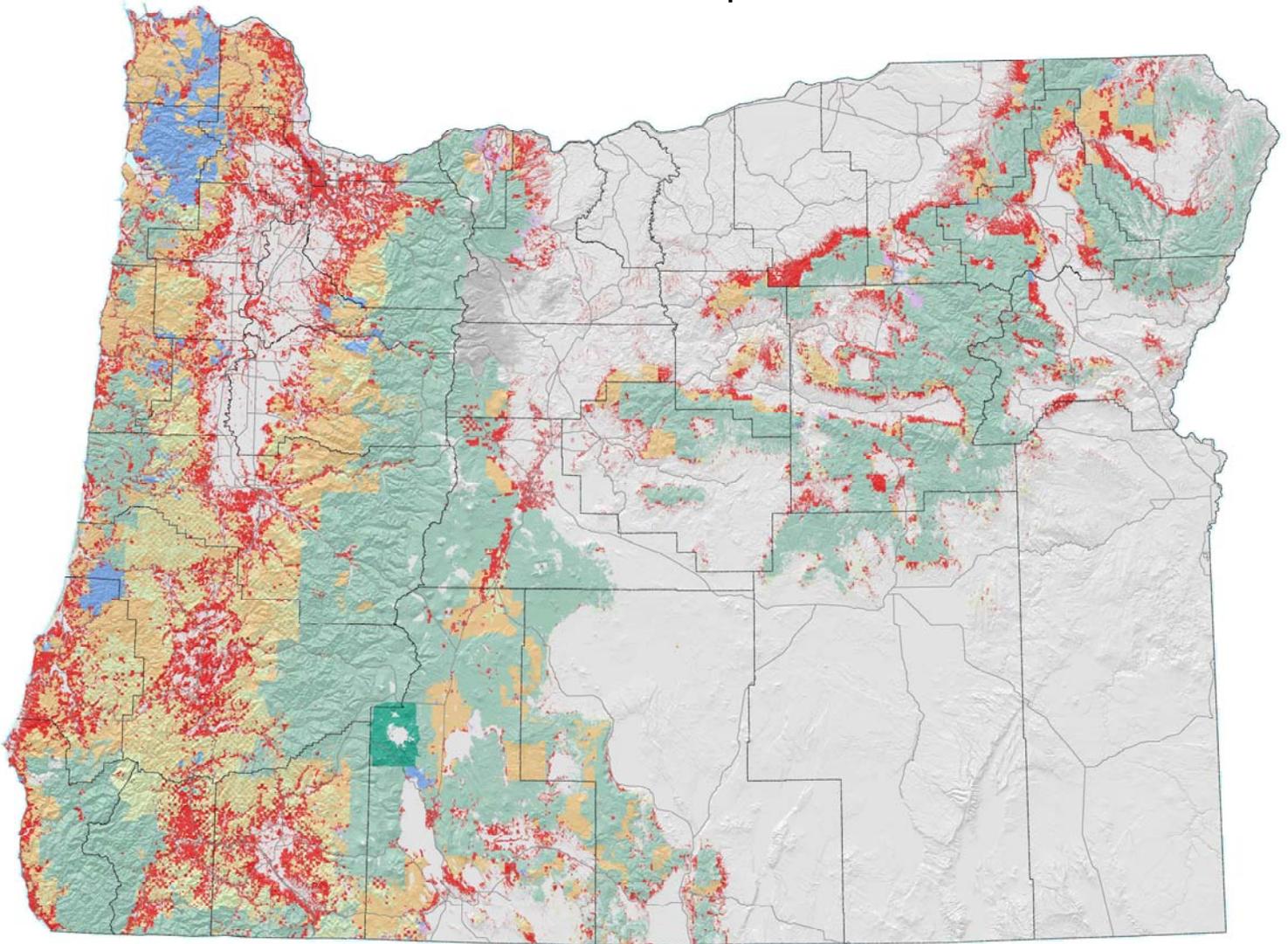
Marsh

Source: NRCS STATSGO 1994

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses. It has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods.

Prime farmland soils as defined in the USDA-NRCS Title 430 National Soil Survey Handbook, issued November 1996.

Forest Ownership



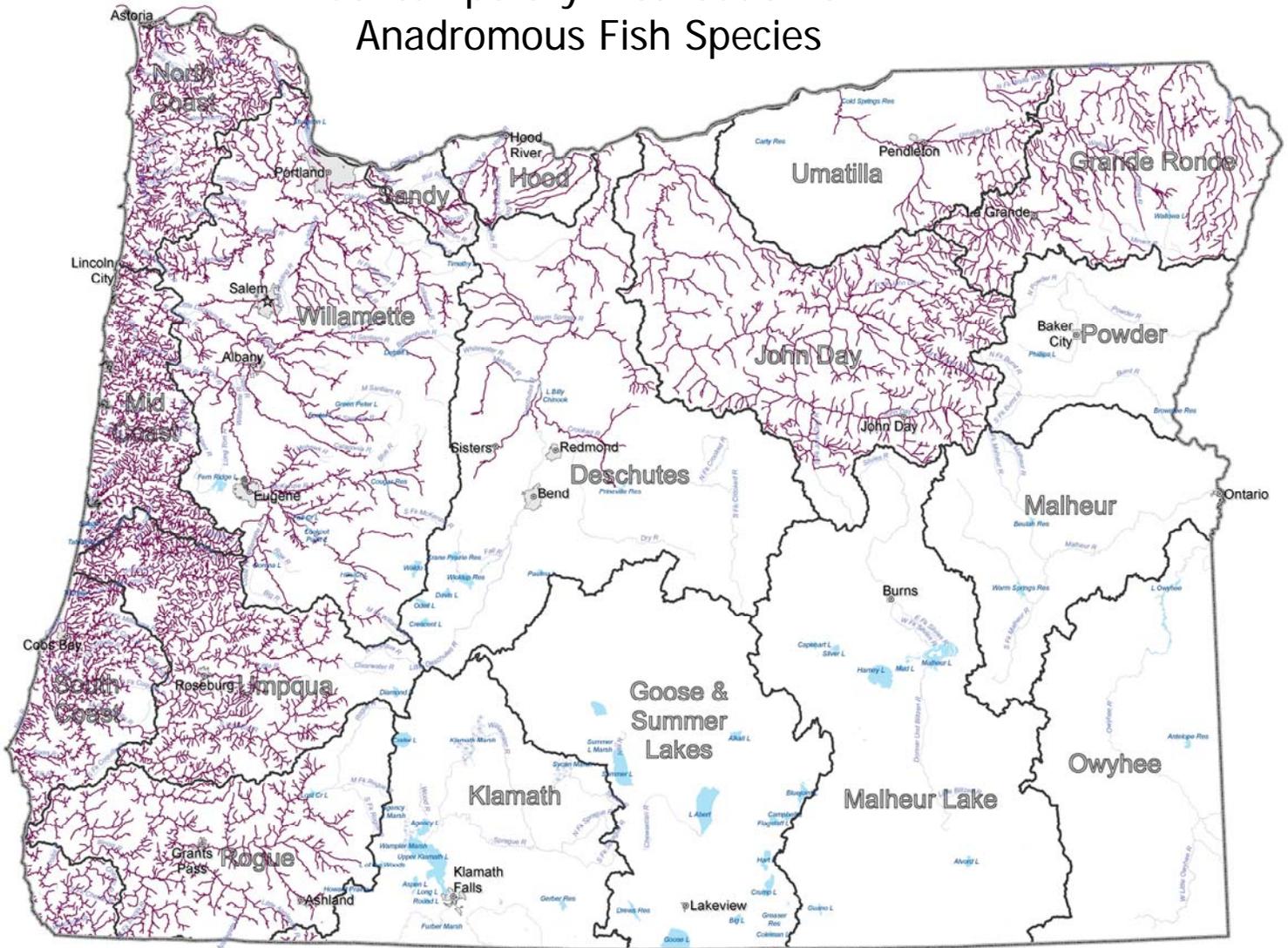
Explanation

- Highways
- County
- Industrial Private
- Family Forestland
- BLM
- National Park
- Other
- State
- Tribal
- USFS



Oregon's diverse private forests span the landscape from within urban growth boundaries to remote rural areas. An estimated 330 thousand acres of Oregon forest—about 5 percent of the state's private forestland—exist inside urban growth boundaries or other development zones. Another 1.8 million acres of private forest exist within one mile of developable areas, the forests at greatest risk of conversion and fragmentation. The remaining acres extend out from the wildland-urban interface to the more rural areas.

Contemporary Distribution of Anadromous Fish Species

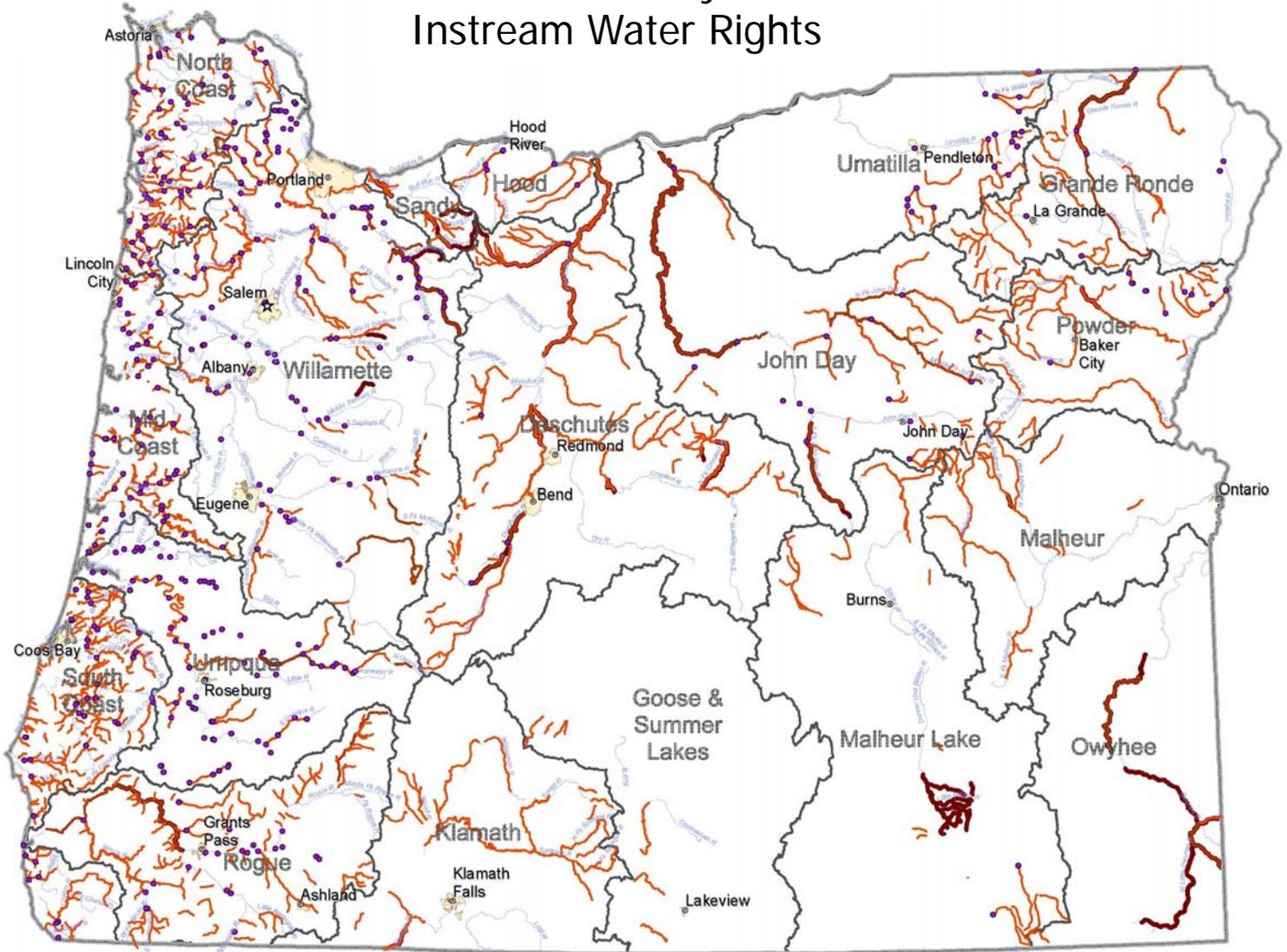


Explanation

-  ODFW anadromous species distribution
-  OWRD Administrative Basin
-  City
-  River
-  Lake
-  Marsh

Anadromous fish are born in fresh water, migrate to the ocean to grow into adults, and then return to fresh water to spawn. This map displays areas of suitable habitat believed to be used currently by wild, natural, and/or hatchery fish populations. The term “currently” is defined as within the past five reproductive cycles. This information is based on a combination of sampling, the best professional opinion of Oregon Department of Fish and Wildlife or other natural resources agency staff biologists, and modeling.

Scenic Waterways and Instream Water Rights



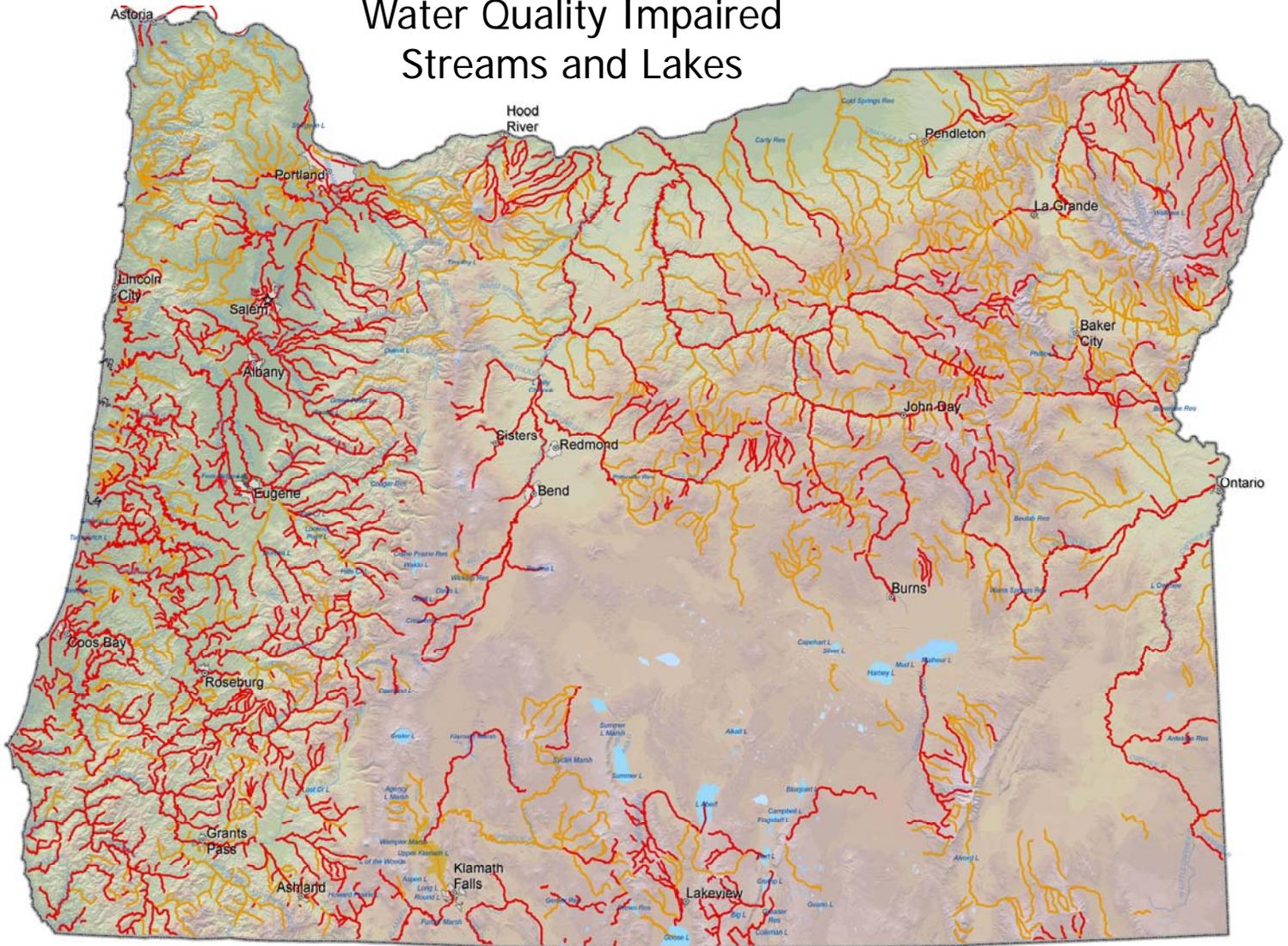
Explanation

-  Federal Wild and Scenic River
-  State Scenic Waterway
-  Instream water right reach
-  Minimum flow point
-  OWRD Administrative Basin
-  River
-  City

Since the adoption of Oregon's 1987 Instream Water Right Act, the Water Resources Department has converted to instream rights more than 500 of the state's minimum perennial stream flows and has issued more than 900 state agency-applied instream water rights.

Oregon's 1970 Scenic Waterways Act set into motion a state protection program for certain rivers in Oregon. The program promotes cooperative protection and wise use of these rivers by federal, state and local agencies, individual property owners, and recreation users, and strives to: protect the free-flowing character of designated rivers; protect and enhance scenic, aesthetic and natural values, recreation, scientific research, and fish and wildlife qualities along scenic waterways; protect private property rights; promote expansion of the scenic waterways system; and encourage other state agencies to act consistently with the goals of scenic waterways management.

Water Quality Impaired Streams and Lakes



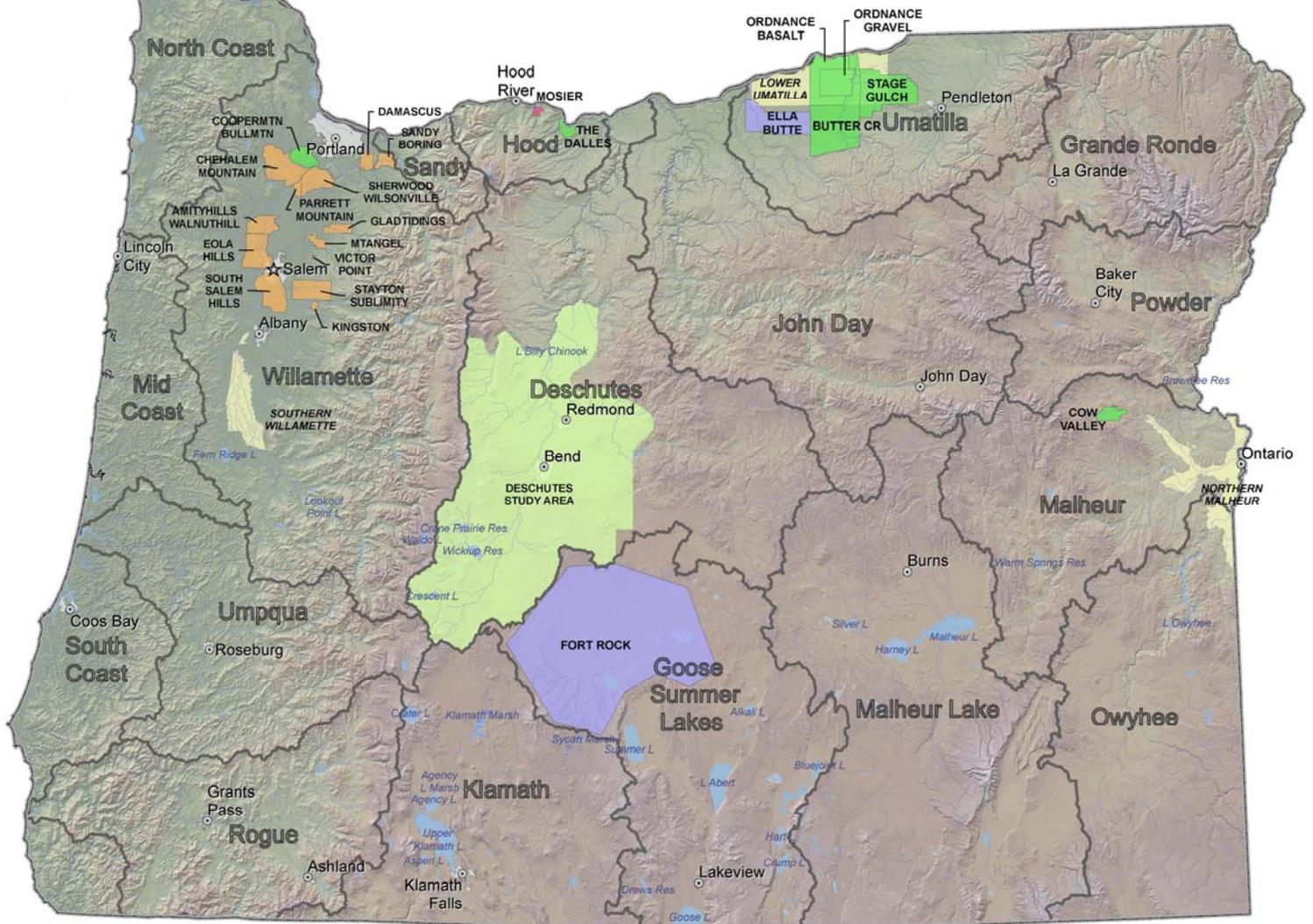
Explanation

DEQ water quality status

-  Impaired by one or more pollutants - needs TMDL
-  Impaired - does not need TMDL (TMDL approved or impaired by non pollutant)
-  City
-  River
-  Lake
-  Marsh

This map shows all waters impaired by one or more pollutants in Oregon. Waters are depicted as needing a clean water plan (also known as a Total Maximum Daily Load) until plans have been completed addressing all impairing pollutants.

Groundwater Management Areas



Explanation

OWRD GW Restricted Area

- CLASSIFIED
- CRITICAL
- LIMITED
- WITHDRAWN

Deschutes GW Study Area

-
- DEQ GW Management Area

OWRD Administrative Basin

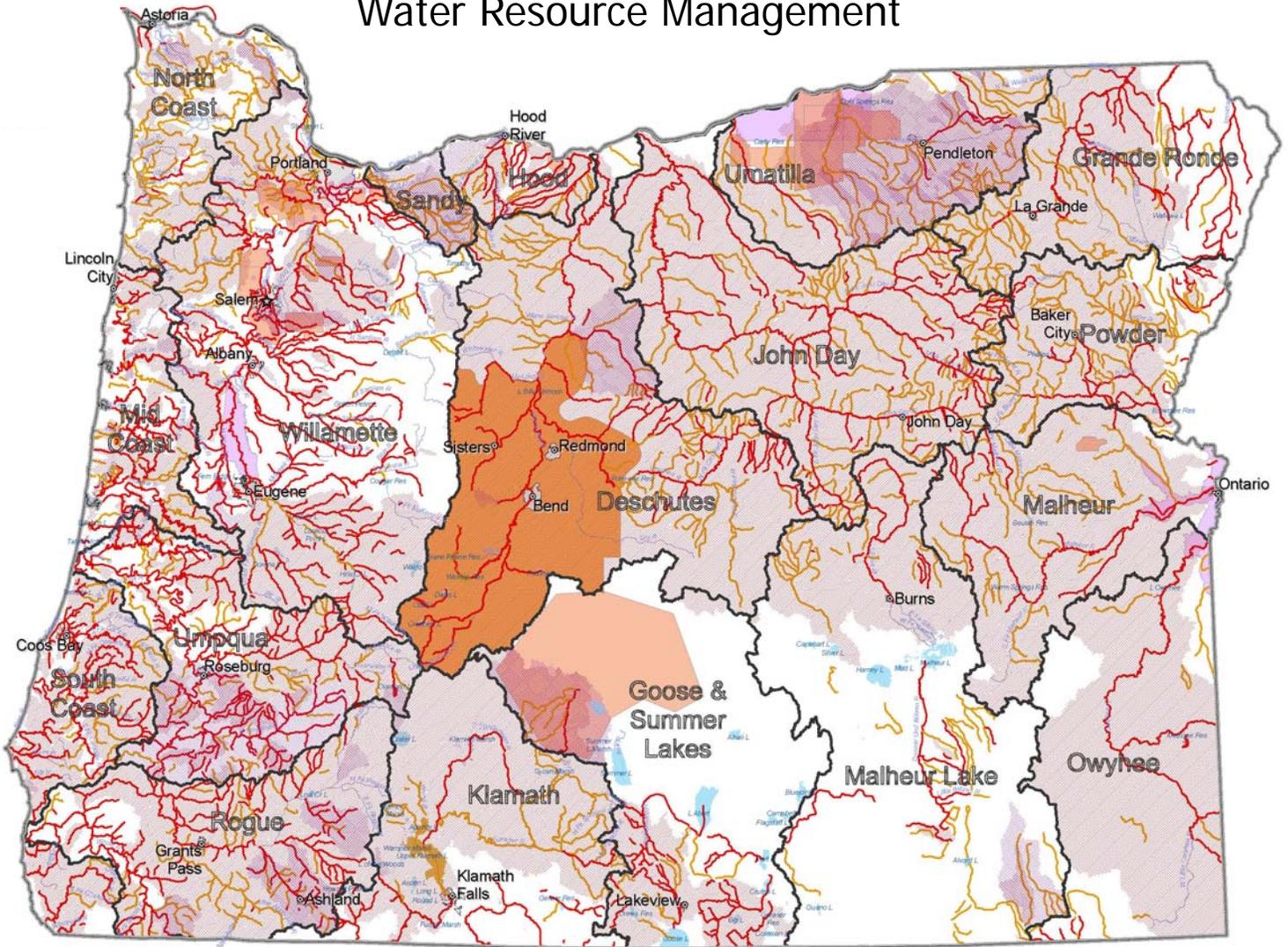
-
- City Limits

This map is a combination of information from state agencies. The Water Resources Department has designated Groundwater Administrative Areas where water levels are declining faster than they can recover. These designations — classified/limited, critical, or withdrawn— mean that certain protections apply in these areas.

Because of the interaction between groundwater and surface water, the Deschutes Study Area has special rules in place to protect scenic waterways.

The Department of Environmental Quality’s Groundwater Management Areas are designated when groundwater in an area has elevated pollution concentrations. All three Groundwater Management Areas have elevated nitrate concentrations in the groundwater.

Challenges in Integrated Water Resource Management



Explanation

DEQ water quality status

-  Impaired by one or more pollutants - needs TMDL*
-  Impaired - does not need TMDL (TMDL approved or impaired by non pollutant)
-  No water available Jun - Sep @ 80% exceedance
-  OWRD surface water withdrawn area
-  Deschutes groundwater study area
-  OWRD groundwater restricted areas
-  DEQ groundwater management area
-  OWRD Administrative Basin
-  City
-  River
-  Lake
-  Marsh

The Water Resources Department and the Department of Environmental Quality have identified a number of areas in the State that present management challenges because of declining water levels, impaired water quality, or both. This map displays many of the challenges our state faces today.

* TMDL - Total Maximum Daily Load, also known as a clean water

Federal or State Listed Sensitive, Threatened or Endangered Fish Species in Oregon



Legend

-  OWRD Administrative Basin
-  City
-  Lake
-  River
- Listed Fish Watersheds**
-  No Listed Fish Present
-  Listed Fish Present

This map displays the general locations of federal or state listed sensitive, threatened, or endangered fish species. **“Sensitive”** refers to wildlife species, subspecies, or populations that are facing one or more threats to their populations, habitat (quality or quantity), or that are subject to a decline in number of sufficient magnitude. **“Threatened”** refers to native wildlife species likely to become endangered

within the foreseeable future throughout any significant portion of its range within Oregon; or any native wildlife designated as threatened pursuant to the Federal Endangered Species Act. **“Endangered”** means any wildlife species determined to be in danger of extinction throughout any significant portion of its range within the state; or any native wildlife listed as endangered pursuant to the Federal Endangered Species Act.

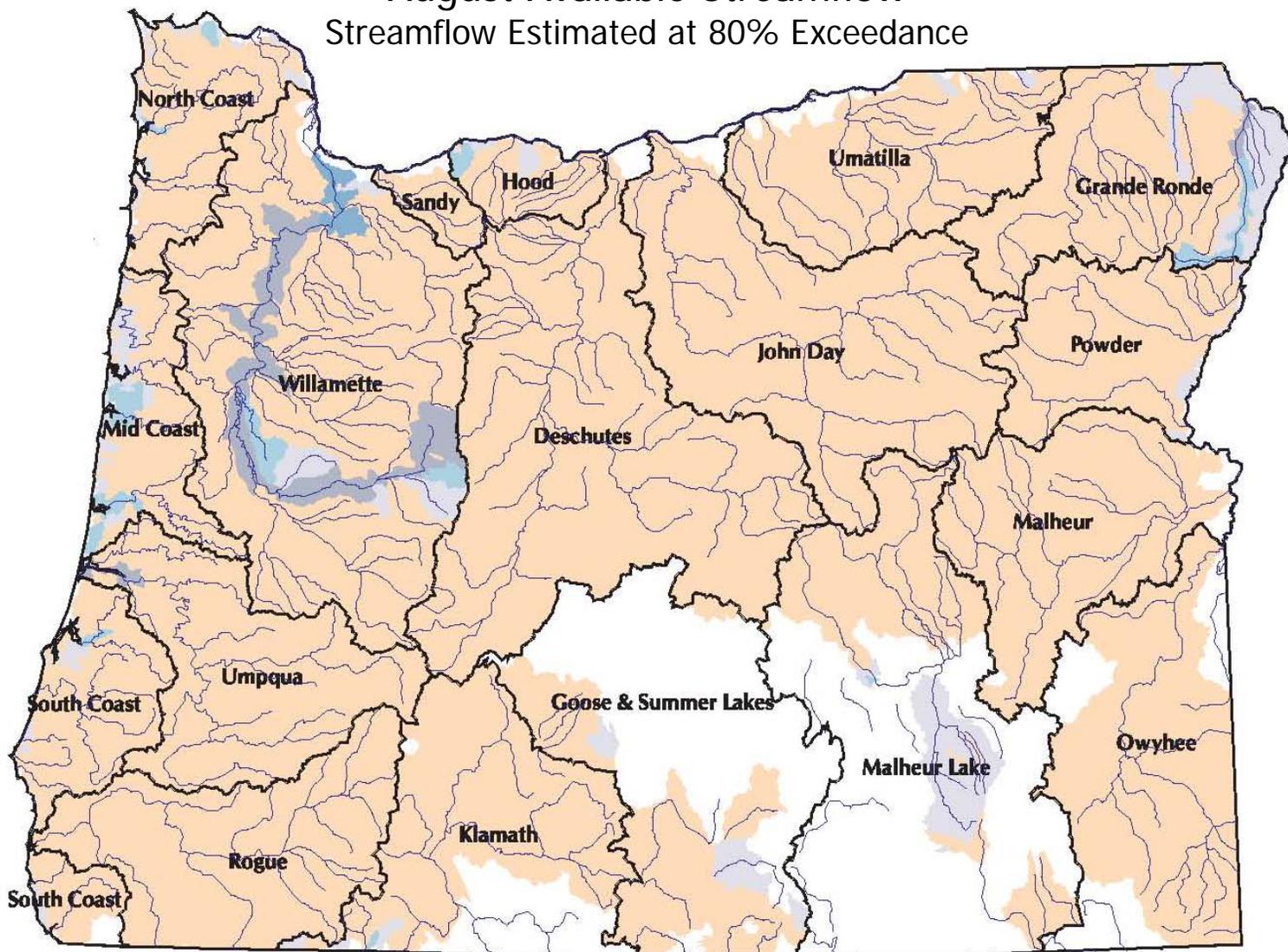
Species Presence Key*

| Symbol | Species |
|--------|---------------------------|
| a | Chinook Salmon |
| b | Coho Salmon |
| c | Steelhead |
| d | Chum Salmon |
| e | Coastal Cutthroat Trout |
| f | Westslope Cutthroat Trout |
| g | Lahontan Cutthroat Trout |
| h | Redband Trout |
| i | Bull Trout |
| j | Borax Lake Chub |
| k | Oregon Chub |
| l | Hutton Spring/Tui Chub |
| m | Umpqua Chub |
| n | Alvord Chub |
| o | Foskett Speckled Dace |
| p | Millicoma Dace |
| q | Wamer Sucker |
| r | Modoc Sucker |
| s | Lost River Sucker |
| t | Shortnose Sucker |
| u | Goose Lake Sucker |
| v | Pacific Lamprey |
| w | Western Brook Lamprey |
| x | Miller Lake Lamprey |
| y | Green Sturgeon |

* To view the species present, see online version available at www.wrd.state.or.us (click “Project Page”)

August Available Streamflow

Streamflow Estimated at 80% Exceedance



Explanation

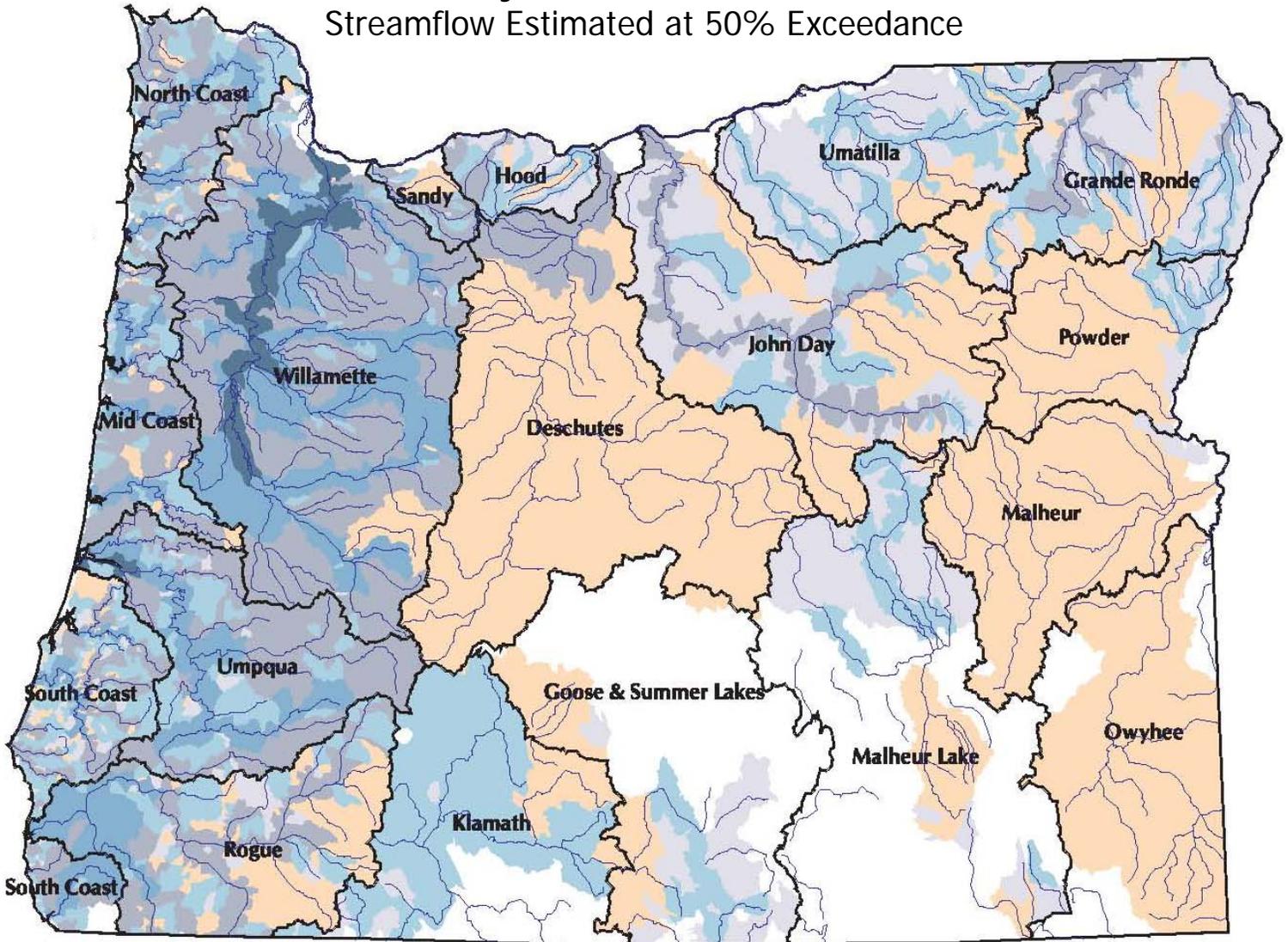
- No data
- No water available
- 1 - 10 cfs
- 11 - 100 cfs
- 101 - 1,000 cfs
- 1001 - 10,000 cfs
- 10,001 cfs or greater

This is the amount of surface water “available” if someone were to apply for a new water right for use during the summertime. This mostly brown map shows that not a lot of water would be available. Most of the water has already been allocated for agricultural, industrial, municipal, and other uses.

cfs = cubic foot per second

January Available Streamflow

Streamflow Estimated at 50% Exceedance



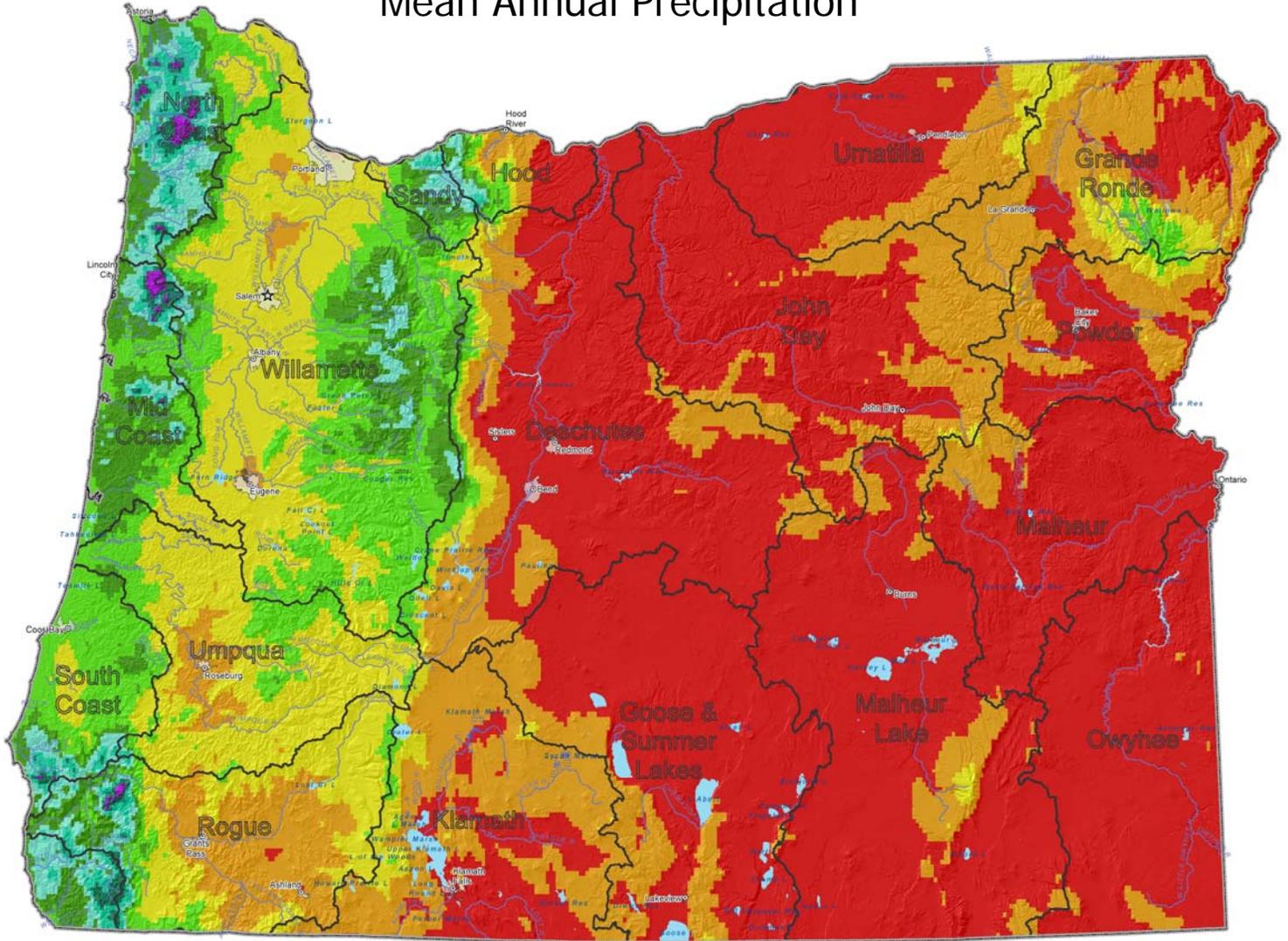
Explanation

- No data
- No water available
- 1 - 10 cfs
- 11 - 100 cfs
- 101 - 1,000 cfs
- 1001 - 10,000 cfs
- 10,001 cfs or greater

By contrast, this map shows more “available” water if someone were to apply for a new water right for use during the winter. Water captured and stored during the winter is generally used during the summer when demands are high.

cfs = cubic foot per second

Mean Annual Precipitation



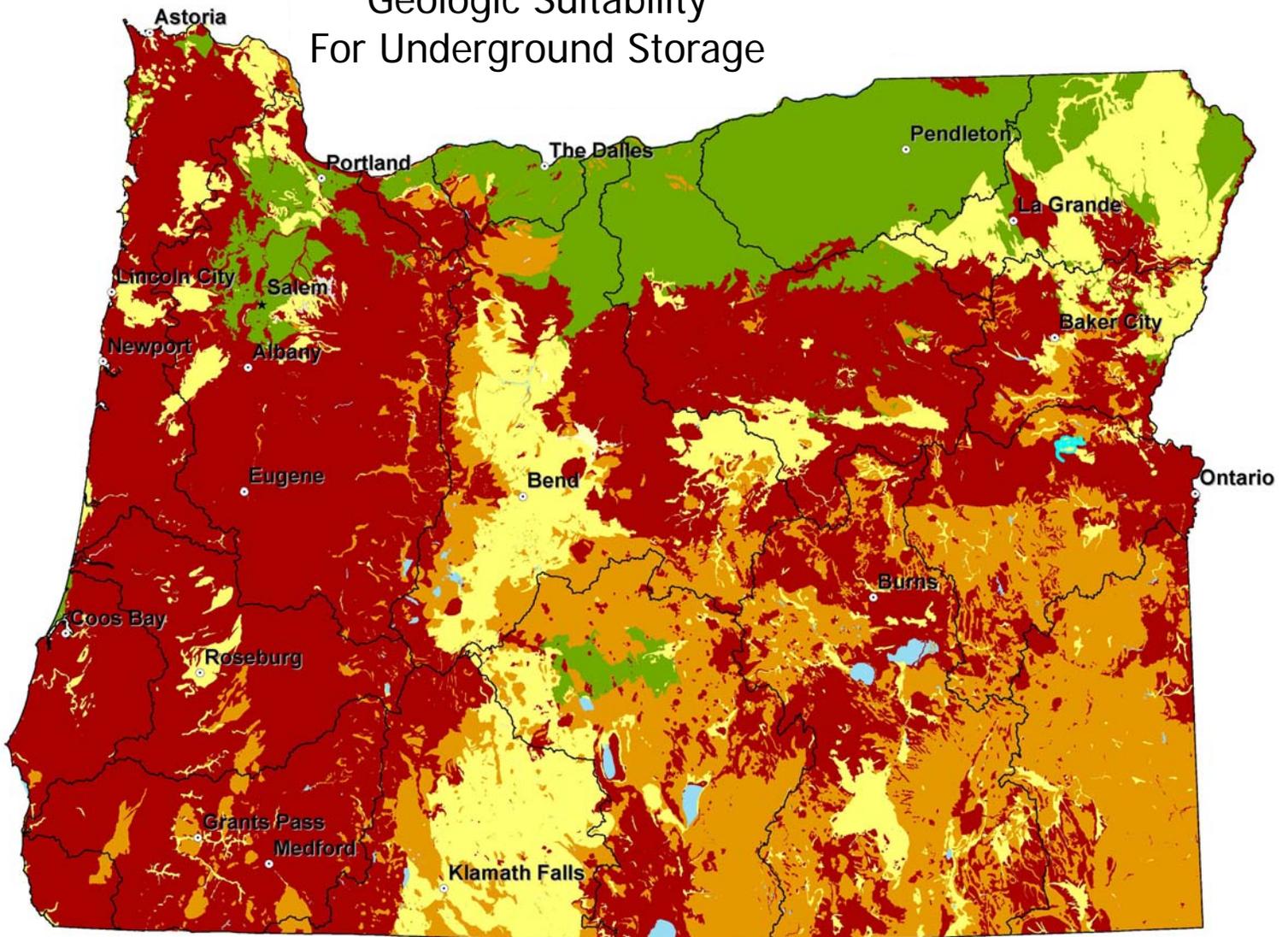
| Explanation | |
|---------------------------------------|---------------------------|
| Average Annual Precipitation (inches) | |
| | < 20 |
| | 20 - 40 |
| | 40 - 60 |
| | 60 - 80 |
| | 80 - 100 |
| | 100 - 120 |
| | 120 - 140 |
| | 140 - 160 |
| | 160 - 180 |
| | > 180 |
| | OWRD administrative basin |
| | City limits |
| | River |

Precipitation varies widely across Oregon, from as much as 200 inches at points along the Coast Range to less than 8 inches in drier Plateau Regions.

The average annual precipitation for the entire State is about 30 inches, roughly the same as Texas.

This data set contains spatially gridded average monthly and annual precipitation for the climatological period 1971-2000. Distribution of the point measurements to a spatial grid was accomplished using the PRISM model, developed and applied by Chris Daly of OSU PRISM Group.

Geologic Suitability For Underground Storage



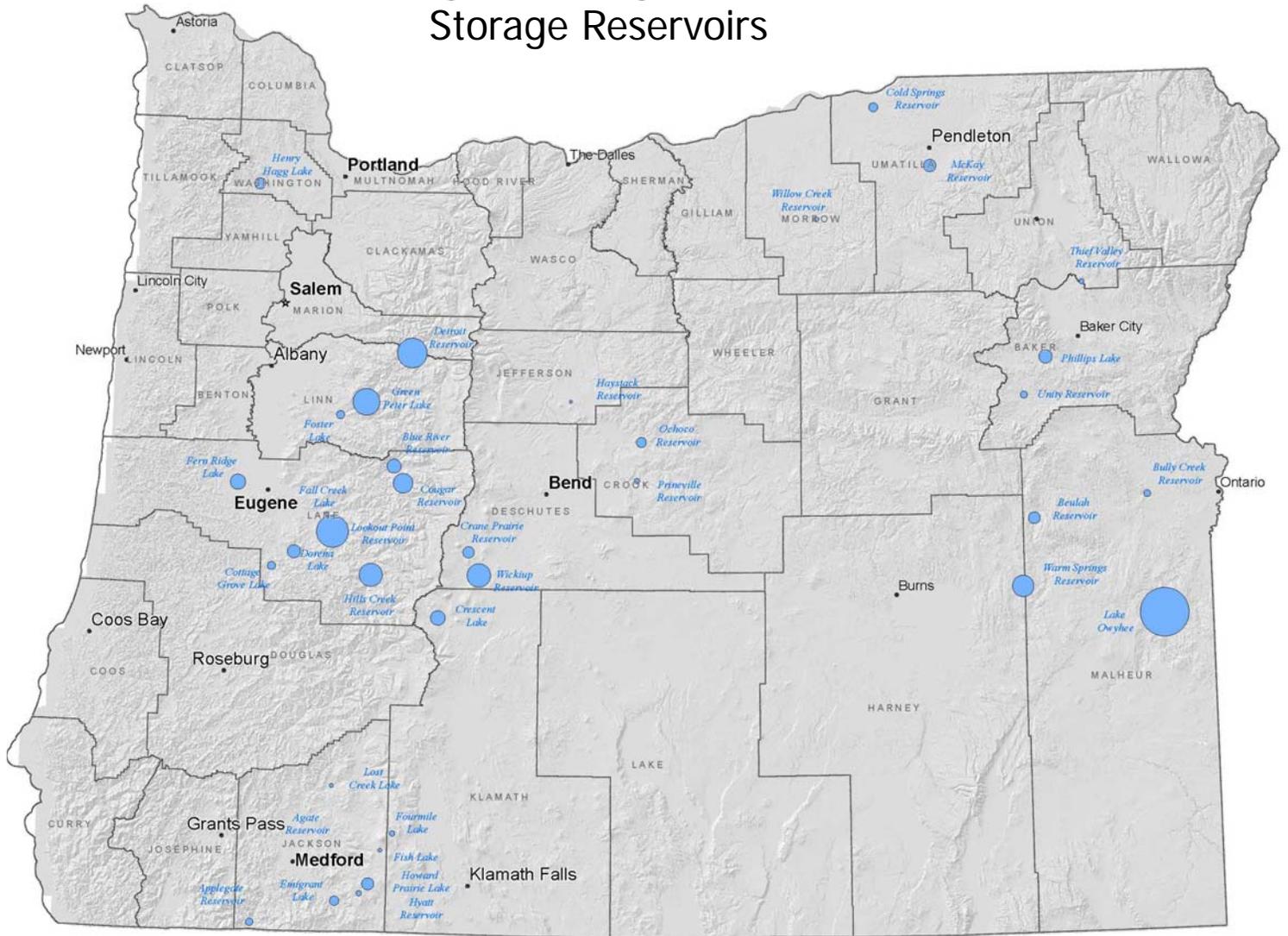
Less Storage



More Storage

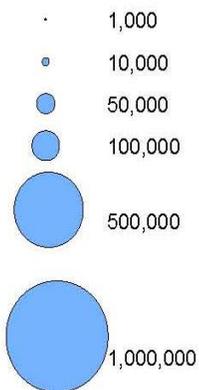
The Water Resources Department staff has evaluated 54 aquifers within Oregon, creating a rating system of “geologic suitability for underground storage.” This is original methodology that helps assess the suitability of potential locations for underground storage. The resulting summary map demonstrates that areas with Columbia River Basalt aquifers score highest for their potential to store water. Other aquifer types with storage potential include volcaniclastic (pumice deposits in the Fort Rock Basin), as well as glacial and fluvial layers (west of Pendleton and throughout southeastern Oregon). Aquifers with little storage potential include Coast Range marine sediments, Western Cascades volcanics, and Klamath Mountain metamorphics, although there may be local exceptions.

Large (Existing) Federal Storage Reservoirs



Legend

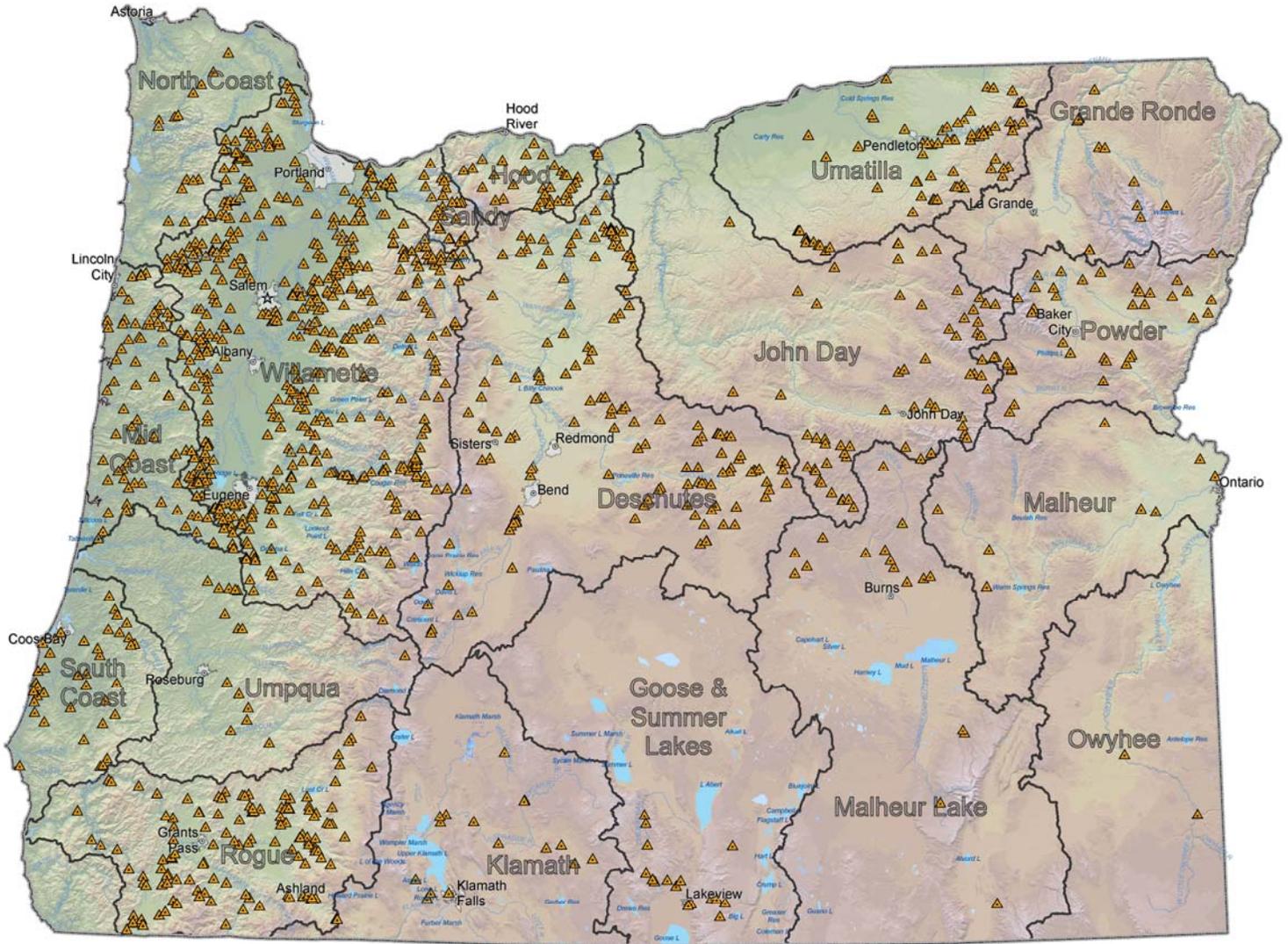
Large Federal Reservoirs Volume



The federal government owns and operates hundreds of water storage facilities throughout the state of Oregon, from small retention ponds on forest lands, to massive reservoirs used for recreation, flood control, and water supply. There are 13 large reservoirs in the Willamette Basin alone.

Under contracts with water users, the federal government releases stored water from the reservoirs allowing downstream users to divert and use the water under certain terms and conditions. Not all of the water in these reservoirs is “under contract,” providing potential opportunities to further develop our future water supplies.

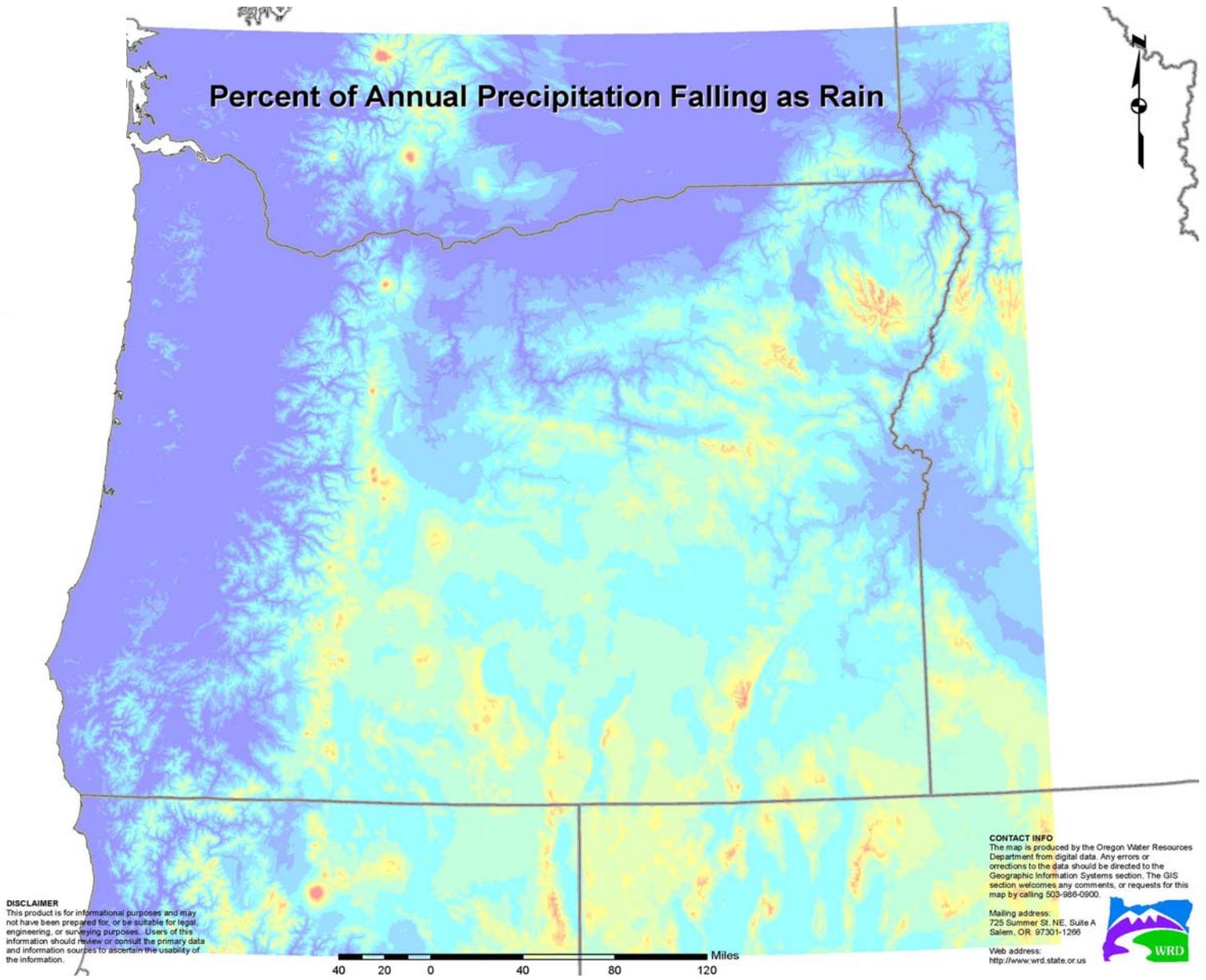
Potential Reservoir Sites



Explanation

-  Potential Site
-  OWRD Administrative Basin
-  Stream
-  Lake
-  Marsh
-  City

To date, the Water Resources Department has mapped the location of more than 1,200 potential above-ground storage sites. This information came from public and private sources. The Department has identified each site and provided internet access to all available information pertinent to the project, including reports, capacity curves, reservoir inundation areas, photographs, and site maps.



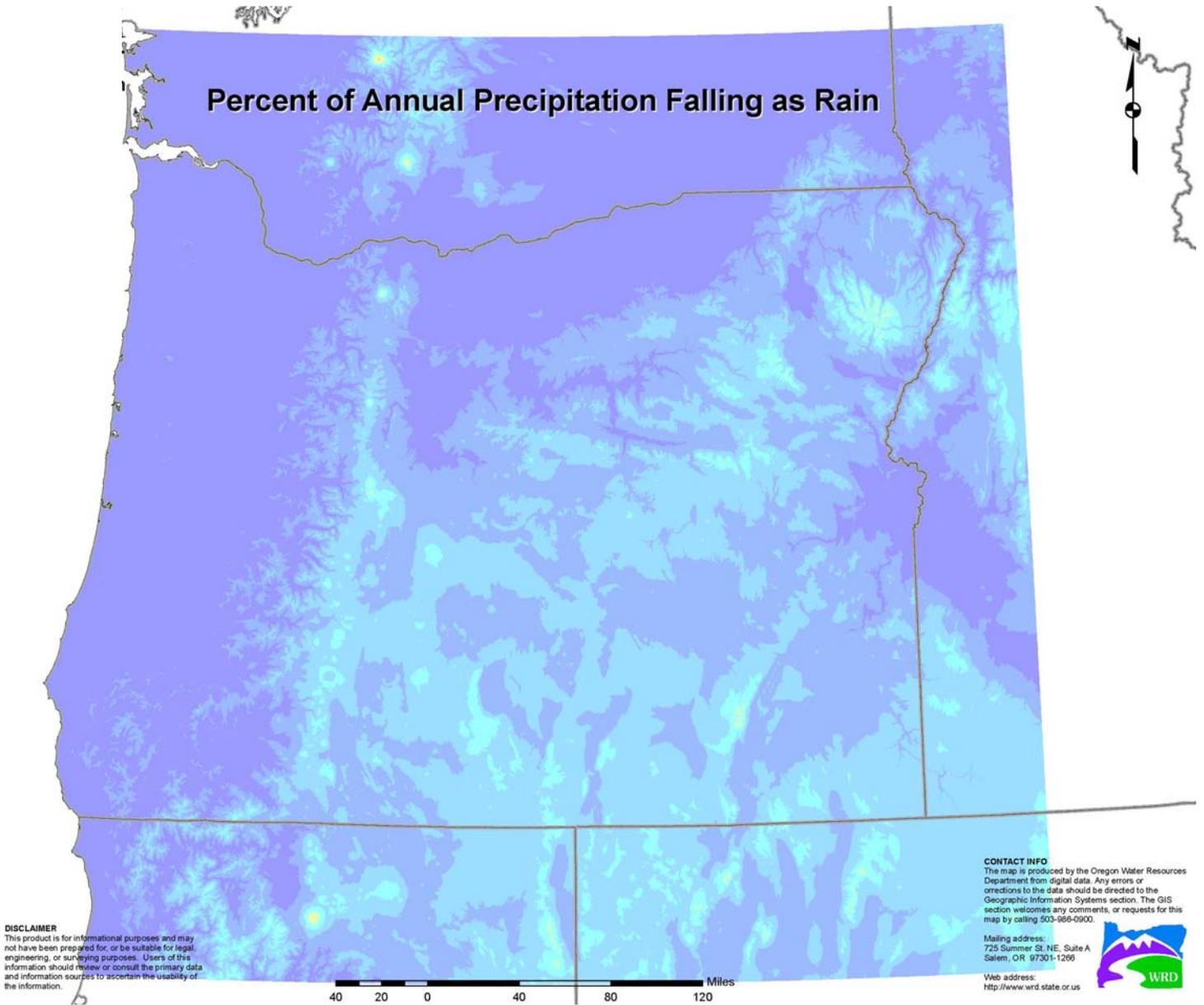
Explanation

Current climate % of precip falling as rain

- 0 - 10%
- 11% - 20%
- 21% - 30%
- 31% - 40%
- 41% - 50%
- 51% - 60%
- 61% - 70%
- 71% - 80%
- 81% - 90%
- 91% - 100%

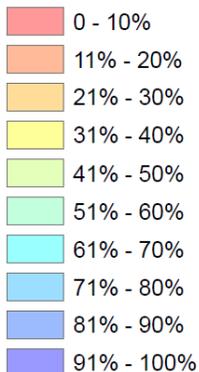
Snow Today

Snowpack, stored naturally during the winter and melting slowly during the spring, represents a significant source of water for all types of uses and functions. We rely on snowpack to recharge streams and reservoirs, to provide cold water for fish habitat and overall stream health, and to provide water supplies to agricultural, industrial, municipal, and other uses in the late spring and summer.



Explanation

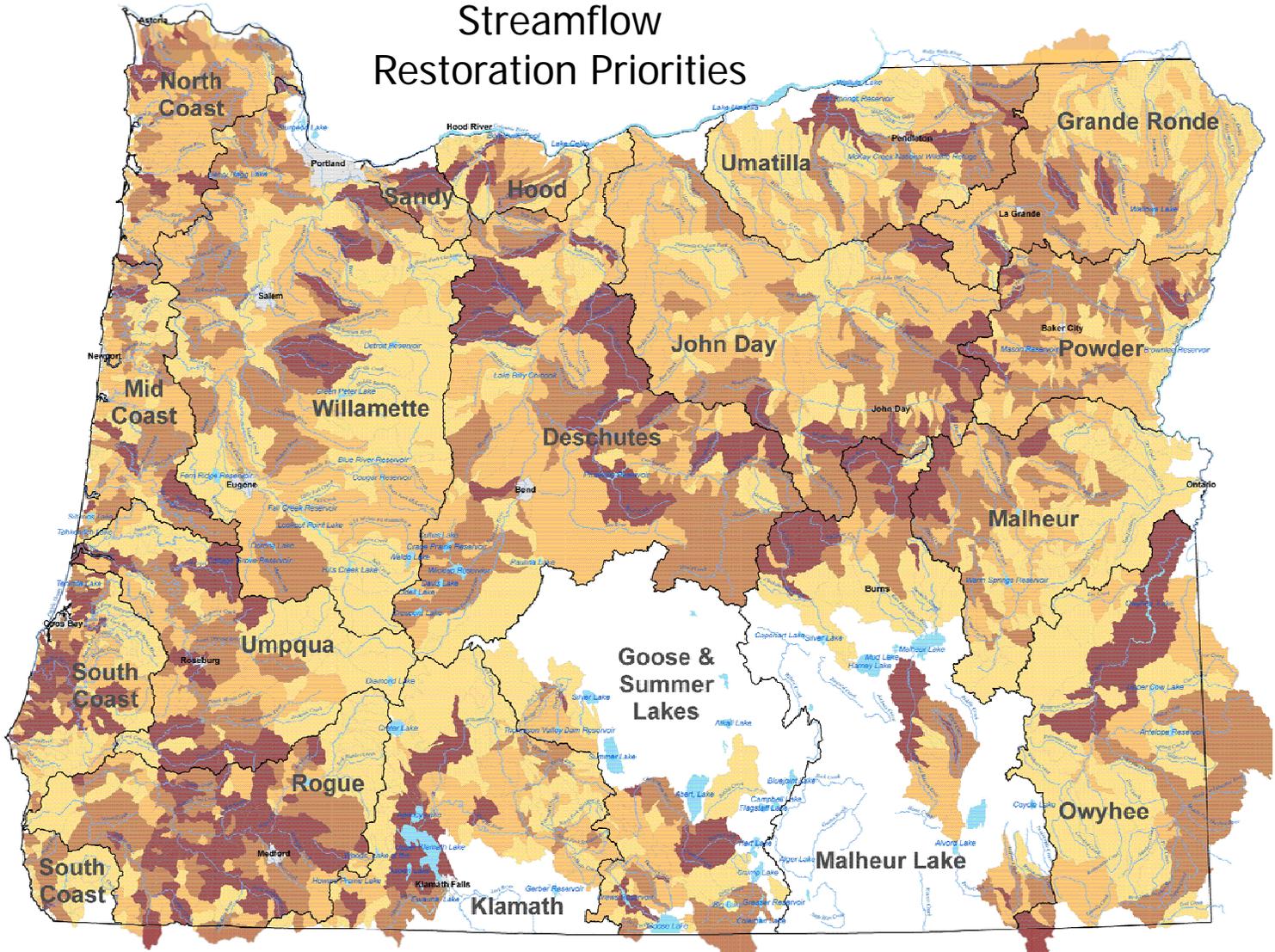
3 degrees (C) warmer % of precip falling as rain



Rain Tomorrow

Climate change models predict warmer temperatures in the coming decades, potentially changing precipitation that normally fell as snow to rain. This map shows the effect warmer temperatures might have on snowpack in Oregon. This could create problems for all users, including fish, dependent on summer streamflows.

Streamflow Restoration Priorities



Legend

- Lake
- River
- City
- OWRD Administrative Basin

Streamflow Restoration Priorities

Summer Priorities

- Not ranked
- Low
- Moderate
- High
- Highest

This map shows streamflow restoration needs and priorities. It was developed by the Oregon Department of Fish and Wildlife and the Oregon Water Resources Department as part of the Oregon Plan for Salmon and Watersheds. Although streamflow restoration priorities have been identified for all seasons, this map shows summer priorities only.

For more information

Integrated Water Resources Strategy -
<http://www.wrd.state.or.us/> (click “Project Page”)

→ Join the IWRS listserv: <http://listsmart.osl.state.or.us/mailman/listinfo/iwrs>

→ Contact the Project Team: waterstrategy@wrds.state.or.us or 503-986-0911

Oregon Climate Change Research Institute -
<http://occri.net/>

Oregon Climate Service -
<http://www.ocs.orst.edu/>

Oregon Department of Agriculture -
<http://www.oregon.gov/ODA/>

Oregon Department of Environmental Quality, Water Quality Program -
<http://www.oregon.gov/DEQ/WQ/index.shtml>

Oregon Department of Fish and Wildlife Conservation Strategy -
<http://www.dfw.state.or.us/conservationstrategy/>

Oregon Department of Forestry -
<http://egov.oregon.gov/ODF/index.shtml>

→ Forest, Farms, and People: Land Use Change on Non-Federal Land in Oregon 1974-2005 -
http://www.oregon.gov/ODF/RESOURCE_PLANNING/docs/Low_Res_Forest_farms_8_9_09.pdf

→ The Future of Oregon’s Forests: Choices, Consequences And What's At Stake For Oregon -
http://www.oregonforest.org/assets/uploads/Working_Web.pdf

→ Oregon’s Family Forestlands: Why They Matter To The State's Quality Of Life -
http://www.oregonforest.org/assets/uploads/Oregon_Family_Forestland.pdf

→ Watershed Science at Work In Oregon’s Forests: New Paired Watershed Studies Look at Effects of Contemporary Forest Management on Streams -
http://www.oregonforest.org/assets/uploads/watershed_science.pdf

“Oregon: A Geologic History Map.” This map, from the Oregon Department of Geology and Mineral Industries, was featured during the Open House, but not included within this publication. To view or purchase this map, visit:
<http://www.oregongeology.org/sub/publications/IMS/ims-028/index.htm>

Portland State University, Population Research Center -
<http://www.pdx.edu/prc/>

Oregon Water Resources Department -
<http://www.wrd.state.or.us/>

→ Water Availability -
http://apps2.wrd.state.or.us/apps/wars/wars_display_wa_tables/

→ Oregon Water Supply and Conservation Initiative (OWSCI) -
http://www.wrd.state.or.us/OWRD/LAW/owsci_info.shtml

