Rural Resource Lands

Research Report

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OREGON
Department of
Land Conservation
& Development

May 16, 2019

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This report was prepared by Hatfield Resident Fellow Stephanie Campbell. The Hatfield Resident Fellowship, a program of Portland State University, is a rigorous, project-oriented, professional and educational experience for recent graduates designed to provide each Fellow with an opportunity to acquire leadership skills with a public service agency in Oregon.

Introduction

Problem Statement

The preservation of agricultural and forest land is a primary objective of Oregon's land use planning system. However, since the inception of Oregon's statewide land use planning program in 1973, there has been concern that there are lands currently protected for exclusive farm use (EFU), forest, or mixed farm-forest under Statewide Goal 3 (Agricultural Lands) and Goal 4 (Forest Lands) which have actually been mis-zoned due to low quality soils and limited potential for agricultural or forestry use. The rural resource land issue has been approached in several iterations over the years through extensive public review, work sessions, and pilot studies by the Oregon State Legislature and the Land Conservation and Development Commission (LCDC or the commission). These lands have been difficult to define and identify due to policy, technical, and jurisdictional issues.

Historically, these lands have been termed "marginal," "secondary," "small-scale resource," "nonresource," and "rural resource" in an attempt to describe their rural nature and lower production value. Most recently "nonresource" has been replaced by "rural resource" to underscore the land's function as a resource in some capacity. Rural resource land will be used within this document to refer to this grouping of less productive resource lands. It should be noted that rural resource lands do not require a goal exception from Statewide Planning Goals 3 or 4 and thus are not considered to be "exception" lands. Exception lands are typically designated due to the existing development patterns (e.g., platted subdivisions) that preclude viable farm and forest use while rural resource lands could be hundreds or even thousands of acres with no existing settlement pattern.

As Oregon faces continued growth, how to approach land development in an intentional and proactive manner while balancing resource protection has become an increasingly critical and challenging question. There is existing concern that Oregon's agricultural and forest economies are under threat from expanding development which can cause fragmentation of large parcels, conversion of land use and land cover, and degradation of critical habitat.[1] Furthermore, there is concern that other resource values such as protecting open space to maintain soil, air, water, and fish and wildlife resources and for recreational opportunities are not given adequate consideration. Concerns about preserving private property rights and bolstering local revenue has created political pressure to continue land conversion.[2] This report seeks to create a fact-based foundation to inform future productive discussion of the issues surrounding rural resource lands. With the current collection of new and evolving issues in land use planning, now is a critical time to move forward in addressing the rural resource lands issue.

This document synthesizes the rural resource lands issue by providing a synopsis of the history of the problem, outlining the best available scientific and technical data that can inform related policy and planning efforts, and summarizing options to further address the issue. Efforts to address the rural resource lands issue should be integrated with other resource lands protection strategies by creating standards which will serve to guide counties in identifying and zoning rural

[1] MacLaren, C.; Kimball, K.; Holmes, G.; and Eisenbeis, D., 1000 Friends of Oregon. (undated). *Too Many Homes on the Range*. <http://www.friends.org/sites/friends.org/files/reports/too_many_homes.pdf>.
[2] Hansen, T. M.; Francis, C.; Esseks, J. D.; and Williams, J. A. Jr., "Multifunctional Rural Landscapes: Economic, Environmental, Policy, and Social Impacts of Land Use Changes in Nebraska," (2007). *Theses, Dissertations, and Student Research in Agronomy and Horticulture*. 45.

lands which do not meet the definition of agricultural or forest resource lands and do not warrant protection under other Statewide Planning Goals.

Impetus for Project

A strategy identified in the Oregon Department of Land Conservation and Development's (DLCD or the department) 2014-2022 Strategic Plan is development of a "nonresource/rural resource lands" policy. LCDC's 2017-2019 Policy Agenda also includes "nonresource/other resource lands" and specifies a need for additional research and possible rulemaking:

> "Consider development of a "nonresource/other resource lands" policy that is integrated with resource lands protection strategies, including consideration of carrying capacity, environmental and habitat protection, infrastructure requirements and availability, and other factors. There are currently no standards to guide counties in identifying and zoning lands which do not meet the definition of agricultural or forest resource lands. To date, several stakeholder conversations have helped further define the issue. State agencies, in particular, are identifying issues of mutual interest."

DLCD is approaching the project by first researching the issue to provide an overview of past efforts and current interests as well as what and how data can best inform rural resource designations. The department may utilize information and data gathered during the research phase to conduct additional research or to make policy recommendations during a future rulemaking phase or it may be determined that rulemaking is unnecessary. All policy decisions will be based on best available scientific and technical data and information while being balanced with the state's goals for resource land protection. This report is the result of the research phase of the project.

Sources of Information

This report synthesizes current available information regarding rural resource lands from DLCD internal documentation and reports. Additionally, GIS data and information was collected along with accompanying relevant technical and policy context. Geospatial data collection focused on coordinating with state agencies which house information and data most pertinent to addressing rural resource land designation and carrying capacity considerations. Data provided herein was obtained primarily from DLCD, Oregon Department of Agriculture (ODA), Oregon Department of Forestry (ODF), Oregon Department of Fish and Wildlife (ODFW), Oregon Department of State Lands (ODSL), Oregon Department of Environmental Quality (ODEQ), and Oregon Water Resources Department (OWRD).

Data Gaps and Limitations

The level of accurate and applicable technical and scientific data and information available is a factor in determining the scope of department and commission efforts to protect Oregon's resource lands. This document provides a foundational rather than exhaustive list of data and information which the department and commission could apply to the rural resource lands issue.

DLCD focused on gathering statewide GIS datasets which are primarily coarse scale. Attempts were made to identify data that can be used at finer, parcel-level scales, but this data was not always available or did not exist at a consistent scale across the state, with data gaps being a common occurrence. The availability of finer scale or parcel-level data often coincides with funding associated with interest and necessity for program-based goals. Due to inherent gaps

and limitations, the datasets listed herein should serve as a basis for LCDC to make informed decisions on if and how to proceed with rural resource land policy. In many cases, qualified practitioners may need to make site specific investigations to establish accurate conditions at the parcel level.

Background

History of Issue

This section outlines an abbreviated history of the rural resource lands issue to establish the historical context for this report's analysis as well as subsequent options and recommendations.

Establishment of the Oregon Land Use Planning System

1973 SB 100 is passed, establishing the statewide Oregon land use planning program through the creation of LCDC, and its administrative branch, DLCD. Additionally, SB 101 is passed, creating statewide protections for farmland through further amendments to the EFU zone (ORS Chapter 215). One of the Oregon land use planning system's primary goals has been to protect Oregon's agricultural and timber economy and accompanying farm and forest land base through a combined strategy of tax incentives and development restrictions. From the passage of this bill came 19 Statewide Planning Goals, of which Goals 3 and 4 are most pertinent to the concept of rural resource lands. Goals 3 and 4 refer to agricultural and forest lands respectively, often referred to collectively as "Resource Lands." Oregon's resource lands protection is based on statute and administrative rules as interpreted by the Land Use Board of Appeals (LUBA) and the courts.

Statewide Planning Goal 3, "Agricultural Lands," requires identification of agricultural land, use of statutory EFU zones (ORS Chapter 215), and review of farm and non-farm uses according to statute and administrative rule (OAR chapter 660, division 33) provisions. These provisions also incorporate statutory minimum lot sizes and standards for all land divisions.

Statewide Planning Goal 4, "Forest Lands," seeks to maintain Oregon's forests to allow for tree harvesting that is consistent with sound management of soil, air, water, fish, and wildlife resources.

Marginal Lands

1983 Legislature adopts the Marginal Lands Act that established trade-off between less regulation of lower quality marginal lands and improved protection for the best or primary resource lands. Only Lane and Washington counties adopt the system.

1985 Legislature does not adopt a proposed trade-off to restrict nonfarm dwellings in return for expanded lot-of-record provisions in EFU zones. Instead, the Legislature directs the Commission to "[c]onsider adoption of rules, amendments of the goals and recommendations for legislation that will provide a practical means of identifying secondary resource land and allow specified uses of those lands."

April 1985 Commission establishes Rural Lands Advisory Committee to "review whether the application of the EFU, marginal lands and lot-of-record statutes are effective in achieving the purpose of Statewide Goal 3, to 'preserve and maintain agricultural lands.'"

Secondary Lands

1987 Legislature requires Commission to "[a]dopt and submit a definition of secondary resource lands and uses permitted on secondary resource lands."

July 1988 LCDC adopts definition of "Secondary Lands" and draft proposal for the identification and the uses and densities allowed for primary and secondary resource lands.

Oct 1988 LCDC begins process to amend Statewide Goals 3 and 4 to designate "primary" and "secondary" agricultural and forest lands and establish appropriate uses and densities for such lands.

1989 Legislature directs DLCD through budget notes to fund a Pilot Program for the testing of criteria to identify "secondary lands." Part of the notes requires that the Commission will not adopt any proposed rules as part of this program until after they are presented to the "appropriate legislative review agency."

1990 Statewide Goal 4 is amended after many public meetings, workshops, and hearings that began in October 1988. Work on Goal 3 is postponed pending completion of the "Farm and Forest Research Study." The Study will be an independent analysis of Oregon's productive farm and forest lands and will determine what actions or conditions may diminish the quality and quantity of these farm and forest lands.

1991 LCDC transmits to the Legislative Assembly the "Farm and Forest Research Study" that concluded that Oregon's current system of land use planning was failing to provide adequate protection for farm and forest lands.

1992 LCDC amends Goals 3 and 4 to distinguish between small-scale resource lands, high-value and important farm land, and forest land. LCDC adopts new administrative rules for the identification of small-scale resource lands, high-value and important farm land and forest land as well as the specific uses allowed on such lands.

1993 Legislature adopts HB 3661 establishing new lot-of-record provisions for farm and forest zones and directs LCDC to repeal goal and rule provisions regarding small-scale resource lands, closing the option for designation of marginal lands by any county other than Lane and Washington.

The Big Look and Regional Problem Solving

2005 The Big Look Task Force was created as a result of Senate Bill 82 to review the state's land use planning program. Primary conclusions included the need for a more flexible system, more responsiveness to regional variations, greater regional cooperation, a move toward a more adaptive planning model, and greater simplicity.

2009 The Big Look Task Force Report was released to the 2009 Oregon Legislature. Chapter 3 of the Report focuses on issues related to appropriate zoning of non-productive farm and forest land as well as the re-designation of these lands for other rural uses. The Big Look Task Force brought attention to the need to better define and set quantifiable limits for carrying capacity. As a result of The Big Look, the 2009 Legislature passed House Bill 2229. HB 2229 provided counties with a process for corrective remapping of rural land zoning to ensure sustainable development of rezoned lands and for prompting updates of natural resource protections. The bill created the structure for a regional problem-solving process that allowed counties to remap rural lands based on the results of regional problem solving. See ORS 215.788—794.

2012 Governor Kitzhaber signed Executive Order 12-07, known as the Southern Oregon Regional Pilot Project (SORPP), establishing a Pilot Program for Regional Farm and Forest Land Conservation. Douglas, Jackson, and Josephine counties began a regional process to develop a plan that allowed for regional variation in what lands must be planned and zoned for farm and forest use. The executive order focused specifically on the parameters and measures that should be used in determining what was, and was not, "nonresource land."

2016 Final SORPP reports were submitted to LCDC. Ultimately, participating counties were unable to reach consensus on the difficult topics included in the scope of the executive order, and were not able to establish a regional planning framework to address them.

Existing Regulatory Framework

Agricultural Land

Statewide Planning Goal 3, “Agricultural Lands,” requires identification of agricultural land, use of statutory EFU zones, and review of land uses according to statute and administrative rule (OAR chapter 660, division 33) requirements.

Agricultural lands are defined in OAR 660-033-0020(1):

> (1)(a) "Agricultural Land" as defined in Goal 3 includes:
>
> (A) Lands classified by the U.S. Natural Resources Conservation Service (NRCS) as predominantly Class I-IV soils in Western Oregon and I-VI soils in Eastern Oregon;
>
> (B) Land in other soil classes that is suitable for farm use as defined in ORS 215.203(2)(a), taking into consideration soil fertility; suitability for grazing; climatic conditions; existing and future availability of water for farm irrigation purposes; existing land use patterns; technological and energy inputs required; and accepted farming practices; and
>
> (C) Land that is necessary to permit farm practices to be undertaken on adjacent or nearby agricultural lands.

(b) Land in capability classes other than I-IV/I-VI that is adjacent to or intermingled with lands in capability classes I-IV/I-VI within a farm unit, shall be inventoried as agricultural lands even though this land may not be cropped or grazed;

(c) "Agricultural Land" does not include land within acknowledged urban growth boundaries or land within acknowledged exception areas for Goal 3 or 4.

The agricultural land definition includes land based on soil capability but also requires an in-depth analysis of whether the land is suitable for farm use, which typically requires the use of discretion by local decision makers. OAR 660-033-0030 provides additional guidance on identifying agricultural land and provides an option for the use of soil assessments that are more detailed than NRCS mapping. In addition, there is substantial case law which has served to further refine how suitability for farm use should be addressed.

Forest Land

Statewide Planning Goal 4, “Forest Lands,” seeks to maintain Oregon’s forests for tree harvesting that is consistent with sound management of soil, air, water, fish, and wildlife resources.

OAR 660-006-0005(7) defines forest lands as:

(7) “Forest lands” as defined in Goal 4 are those lands acknowledged as forest lands, or, in the case of a plan amendment, forest lands shall include:

(a) Lands that are suitable for commercial forest uses, including adjacent or nearby lands which are necessary to permit forest operations or practices; and

(b) Other forested lands that maintain soil, air, water and fish and wildlife resources.

OAR 660-006-0010 provides additional requirements for identifying forest land for a comprehensive plan and zone change amendments. NRCS is the primary source for wood production capability data. If NRCS mapping is unavailable or proven to be inaccurate, alternate data sources may be considered in the following order:

1. Oregon Department of Revenue (DOR) site class maps for Western Oregon

2. USDA Forest Service plant association guides

3. Other information determined by the State Forester to be of comparable quality.

The rule does not establish a minimum threshold for wood production capability that constitutes commercial forest use. In Just v. Linn County (60 Or LUBA 74 (2009)), the Land Use Board of Appeals (LUBA) found:

“Our cases suggest that land with a productivity of less than 20 cf/ac/yr may be unsuitable for commercial forest use unless there are factors that compensate for the land’s relatively low productivity. But land in a middle range from a low of approximately 40 cf/ac/yr to a high of approximately 80 cf/ac/yr is unlikely to be unsuitable for commercial forest use unless there are additional factors that render those moderately productive soils unsuitable for commercial forest use. Rural land with a wood fiber productivity of over 80 cf/ac/yr is almost certainly suitable for commercial forest use, even if there are limiting factors.”

The portion of the forest lands definition that addresses maintaining "soil, air, water and fish and wildlife resources" has not been further defined in rule. LUBA has determined that a lack of Goal 5 resources in a county comprehensive plan is not adequate justification, if such lands are needed to maintain soil, air, fish and wildlife resources (DLCD v. Curry County, 33 Or LUBA 728 (1997)).

Rural Resource Land

Found in ORS 215.788, the current definition for rural resource lands exists in statute by the term, "nonresource land," and is defined by what it is not:

> 215.788 Legislative review of lands zoned for farm and forest use; criteria.
>
> (4) A county must plan and zone land reviewed under this section:
>
> (a) For farm use if the land meets the definition of "agricultural land" in a goal relating to agricultural lands;
>
> (b) For forest use if the land meets the definition of "forest land" used for comprehensive plan amendments in the goal relating to forestlands;
>
> (c) For mixed farm and forest use if the land meets both definitions;
>
> (d) For nonresource use, consistent with ORS 215.794, if the land does not meet either definition; or
>
> (e) For a use other than farm use or forest use as provided in a goal relating to land use planning process and policy framework and subject to an exception to the appropriate goals under ORS 197.732 (2).

Presently, counties may designate rural resource lands through two methods. The first, and to date only process utilized, is by identifying land that does not meet the definition of "Agricultural Land" or "Forest Land" and thus is not subject to Goal 3 or 4 protection. These lands are typically designated in the county comprehensive plan as "nonresource lands" and may be developed for residential or other uses not allowed in farm and forest zones. Counties permit creation of new parcels in nonresource land zones that are smaller than typically is allowed in EFU or forest zones. Rural resource lands are still subject to the other Statewide Planning Goals which, among other matters, preclude the establishment or extension of public sewer systems and urbanization. Uses allowed on rural resource lands must also be compliant with county adopted Goal 5 inventories (e.g. wildlife habitat, wetlands, riparian corridors).

Ten Oregon counties have utilized this method to rezone land from EFU and forest. The primary purpose for nonresource designations appears to be the creation of rural residential parcels. [3] Between 2008 and 2018, DLCD identified 24 zone changes associated with nonresource designations. These zone changes did not require an exception from Statewide Planning Goals 3 or 4. Two zone changes were to rural commercial zones. Twenty-two zone changes were from EFU or forest zones to zones that list single-family residential dwellings as an outright allowed use. Residential minimum parcel sizes varied between 5, 10, and 20 acres.

[3] Clatsop, Crook, Deschutes, Douglas, Jackson, Josephine, Klamath, Linn, Lane, Wasco

The second path to rural resource land designation, which has not been used by counties, requires a more comprehensive evaluation and direct DLCD participation. Found in ORS 215.788 – 794, this option was created in 2009 as a result of the "Big Look." If used, this process would provide counties with an opportunity for corrective remapping of rural lands while considering the carrying capacity of those lands for development.

To begin the Big Look process, a scope of work for the reacknowledgement must be approved by DLCD. The process would then proceed as a legislative review of county lands to determine whether lands currently zoned farm and/or forest are consistent with the definitions of "agricultural lands" or "forest lands" as stated in the respective goals. Lands which are subject to a goal exception under ORS 197.732 must also be reviewed. After making determinations regarding what farm and/or forest lands do and do not meet the definition and analyzing carrying capacity, counties must submit findings to DLCD which will then be reviewed by LCDC in coordination with ODA and ODF.

Rural resource land designations do not require a goal exception from Statewide Planning Goals 3 or 4. However, the land is still subject to compliance with the other Statewide Planning Goals unless an exception is taken. For example, Goal 11 (Public Facilities and Services) prohibits extension of sewer service to rural areas, including rural resource lands, without an exception.

Analysis and Findings

A robust rural resource lands policy will consider: capability, suitability, and carrying capacity. Capability refers to the ability of the land to produce an agricultural or forest product. This factor is primarily governed by soils and water availability. [4] Agricultural land capability class and forest productivity thresholds are useful tools for determining at what level of capability an agricultural or forest operation is deemed feasible. Suitability, another significant factor, refers to the ability to conduct viable farm or forest operations and is intimately related to the size and position of the operation's land base in relation to surrounding uses as well as accompanying infrastructure.[5] Carrying capacity refers to the level of use which can be accommodated and continued without impairment of natural resources productivity, the ecosystem and the quality of air, land, and water resources.[6] Additionally, carrying capacity, in relation to rural resource lands, should account for impacts to water supply, energy use, transportation facilities, risk and cost of wildfire, cost of public facilities and services, and the fiscal health of local government as outlined in ORS 215.791. Finally, state land use policy ensures that rural lands remain sparsely settled and are not utilized for urban levels of development and services consistent with Goals 11 (Public Facilities and Services), 12 (Transportation), and 14 (Urbanization).

The following section of the report will address the above considerations through a (1) Farm and Forest Resource Evaluation and (2) Carrying Capacity Evaluation. To begin, the Farm and Forest Resource Evaluation considers what lands might qualify as rural resource lands based upon the land's potential agricultural capability and woody biomass productivity. The Carrying

[4] Johnson, J. Oregon Department of Agriculture. (2007). *Identification and Assessment of the Long-Term Commercial Viability of Metro Region Agricultural Lands.* < https://multco.us/file/27992/download>.
[5] Ibid.
[6] Department of Land Conservation and Development, *Statewide Planning Goals: Definitions*.

Capacity Evaluation considers how available geospatial data can inform questions of if or how to proceed with development on rural resource lands.

Two basic methodological frameworks exist for using the carrying capacity analysis. One framework would use this analysis to exclude lands from rural resource redesignation so that they would remain as farm and forest lands. The other framework would use this analysis not to exclude lands from rural resource designation but instead to limit the resulting increases in non-farm and non-forest development activity that local governments could approve on such lands. It is possible that these two methodological frameworks might be used in conjunction as well—for example, using location within an urban reserve to exclude lands, while using existence of a wildlife habitat overlay to allow less development on designated rural resource lands than on similarly-designated lands not within the wildlife habitat overlay.

Regional differences were taken into consideration due to the substantial climatic differences in lands east versus west of the Cascades. For this report, Eastern Oregon includes all the counties east of the Cascades: Baker, Crook, Deschutes, Gilliam, Grant, Harney, Jefferson, Klamath, Lake, Malheur, Morrow, Sherman, Umatilla, Union, Wallowa, Wasco, and Wheeler. All other counties are considered to be in Western Oregon.

Consulting with state agencies has been and will continue to be a critical part of the process in creating a robust rural resource lands policy. Additional stakeholder conversations will be necessary to round out an informed discussion.

Farm and Forest Resource Evaluation

As rural resource lands are primarily defined by their exclusion from definitions in Statewide Planning Goals 3 and 4, analysis was first conducted to determine which lands are agricultural or forest lands.

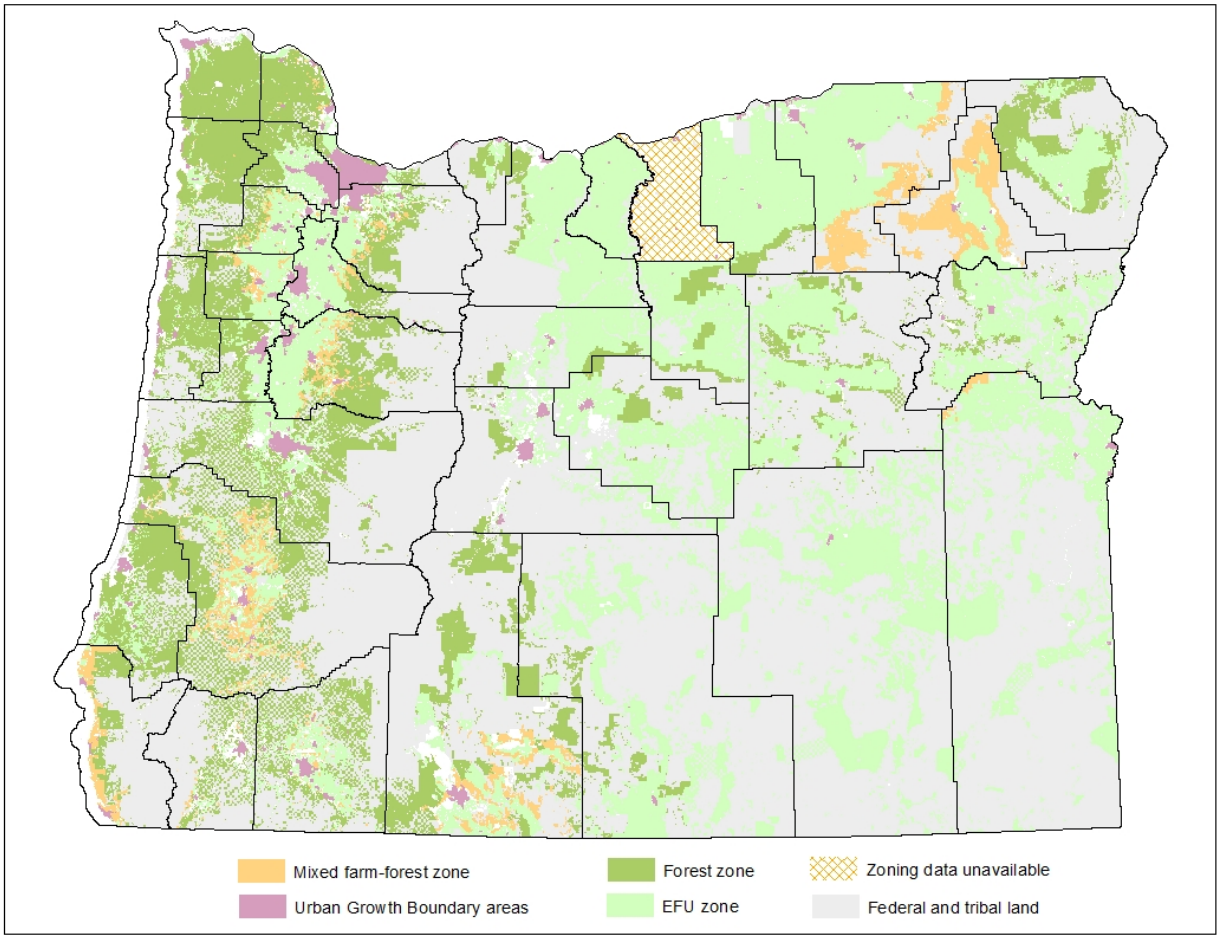
Farm and Forest Resource Evaluation goals:

1) Identify currently zoned farm and forest lands that meet capability and productivity thresholds.
2) Identify additional suitability factors that require further analysis to determine potential rural resource land designation qualifications.

Area of Analysis

Geospatial analysis began by narrowing the area of analysis to those lands which are potentially eligible for rural resource land designation. The initial area of analysis includes land currently zoned EFU, forest, and mixed farm-forest (see Figure 1).[7] Federal lands not subject to the Statewide Planning Goals were subsequently removed from the farm and forest zoning layer. Additionally, because local governments often retain farm and forest zoning as an interim measure for urbanizable lands within an urban growth boundary (UGB), such lands were also removed from the layer. The resulting narrowed layer formed the extent of the area analyzed in the following processes.

Figure 1: Exclusive Farm Use, Forest, and Mixed Farm-Forest Zoning on Non-Federal Lands



[7] Digital zoning data was unavailable for Gilliam County.

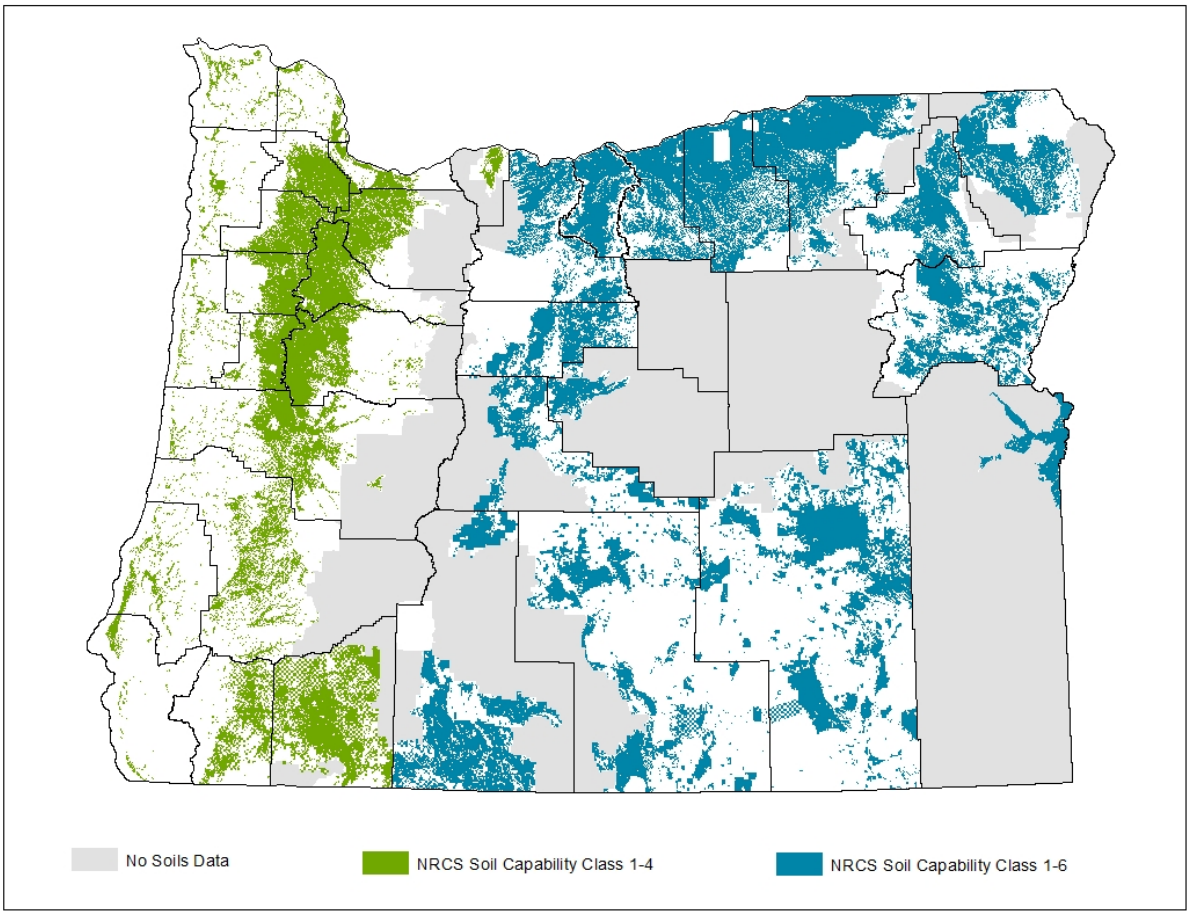
Agricultural Land

Agricultural Capability Classification

"Agricultural land" as defined by OAR 660-033-0020(1) is land composed of Class I-IV soils in Western Oregon and Class I-VI in Eastern Oregon as determined by Natural Resource Conservation Service (NRCS) soils data. Per this definition, the NRCS Gridded Soil Survey Geographic dataset for Oregon was used to determine agricultural soil capability classes for both irrigated and nonirrigated classifications. The NRCS Gridded Soil Survey Geographic is the most detailed level of soil geographic data developed by the National Cooperative Soil Survey depicting information about the types and distribution of soils across Oregon. Soil map units are linked to attributes in the National Soil Information System relational database, giving the proportionate extent of the component soils and their properties. Large areas, particularly in Eastern Oregon, have not yet been surveyed yet, although NRCS is actively working on private land in these areas which should be done in the next five years.

For the purposes of this analysis, lands were considered to be agricultural land if they had either an irrigated or nonirrigated capability class of I-IV/I-VI due to lack of consistent statewide data regarding existing, former, or potential future irrigation rights. See Figure 2 for results. The ability to irrigate soils requires a more detailed analysis when lands are proposed for rural resource designation.

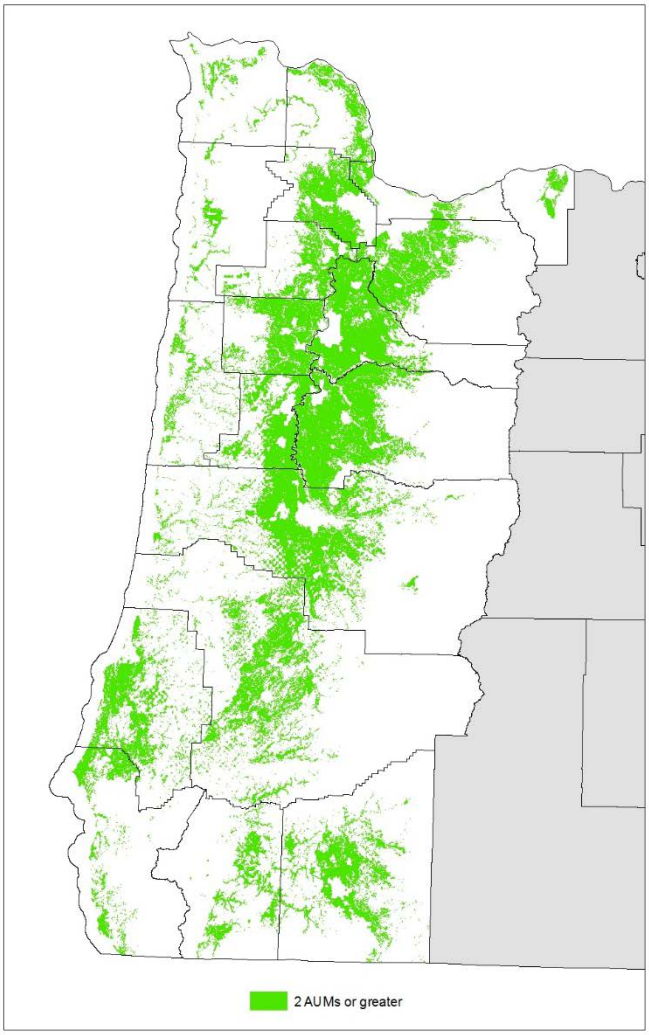
Figure 2: NRCS Agricultural Capability Classes on Non-Federal Lands



Suitability for Farm Use

In addition to NRCS soil capability classes, OAR 660-033-0020(1) further defines agricultural land as land in other soil classes that is suitable for farm use, taking into consideration soil fertility, suitability for grazing, climatic conditions, existing and future availability of water for farm irrigation purposes, existing land use patterns, technological and energy inputs required, and accepted farming practices. Land may also be suitable for farm use if it is necessary to allow farm practices to occur on nearby lands or if it is intermingled with lands in capability classes I-IV/I-VI within a farm unit. A property specific evaluation is most likely necessary to definitively ascertain whether or not a specific parcel meets the agricultural lands definition by these additional criteria, if the definition is not met by NRCS soil capability class.

Figure 3: Animal Unit Months (AUMs) for Western Oregon on Non-Federal Lands



Animal Unit Months (AUMs): Animal Unit Months are a measure of carrying capacity and land suitability for grazing and livestock production. AUMs are computed from the NRCS soils database as a way to assign pasture yields on a per acre basis for both irrigated and non-irrigated lands. Specifically, a single AUM unit denotes the amount of forage required to sustain one mature 1,000 pound cow and a calf up to 6 months of age, or equivalent (five sheep or goats, one bull or one horse), for one month. Two AUMs per acre has been considered suitable for grazing by ODA, which correlates with being capable of sustaining two cow/calf pairs, with the above stipulations, for an entire growing season. As AUMs are based on pasture yields, it is important to consider that the definition of pasture includes a high level of management which includes "periodic renovation and/or cultural treatments such as tillage, fertilization, mowing, weed control, and may be irrigated."[8] For this reason, AUMs are generally considered only applicable to Western Oregon, although there are some lands on the eastside which might have a level of management appropriate for AUM threshold application. For Eastern Oregon, pounds of forage per acre is the appropriate

[8] United States Department of Agriculture. *NRCS Range and Pasture Handbook: Glossary*. <https://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17746.wba>.

measure but there has been no definitive determination as to what is a reasonable productivity threshold for grazing operations. However, ten acres per AUM is considered excellent pasture for native rangeland in Eastern Oregon. Many commercial livestock producers depend on seasonal pasture that is less productive than ten acres per AUM. Additional criteria outside of productivity threshold metrics are necessary to maintain viable livestock operations including a minimum number of acres and a variety of land types to accommodate seasonal changes. These factors may require additional consideration by counties. See Figure 3 for analysis results.

Questions also remain regarding the development of appropriate eastside threshold parameters. It will likely be necessary to work with ODA and NRCS to identify beneficial forage and determine a suitable quantitative metric threshold for eastside range productivity. Conclusions would need to be verified through on-the-ground field analysis and stakeholder input.

Prime and unique farmland: Prime and unique farmland soils are considered to be high-value farmland soils per ORS 215.710.[9] In a limited number of circumstances, land that is classified as prime or unique farmland does not have a capability class that would automatically make it agricultural land. However, these areas may be suitable for farm use. It should also be noted that NRCS has not mapped unique soils across Oregon as has been done in other states. For the purposes of this report, farmland was considered to be prime or unique regardless of whether it needs to be irrigated or drained to receive those soil designations.

High-value farmland portions of American Viticultural Areas: Portions of Oregon's American Viticultural Areas are considered to be high-value farmland per the definition in ORS 195.300(10).[10] High-value American Viticultural Area data is derived from United States Geological Survey ten-meter digital elevation models processed to identify cells with aspect, slope, and elevation values meeting certain criteria and falling within specific viticultural areas. If land falls within high-value farmland portions of the specified American Viticultural Areas, it may be suitable for farm use.

Irrigation Districts: Irrigation is critical to consider as irrigated agriculture uses an estimated 86 percent of the water diverted from surface water or pumped from groundwater sources in the

[9] Prime farmland is defined by NRCS as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses." Unique farmland is "land other than prime farmland that is used for the production of specific high-value food and fiber crops, such as citrus, tree nuts, olives, cranberries, and other fruits and vegetables."

[10] ORS 195.300(10)(e) and (f): (10) "High-value farmland" means: (e) Land that is in an exclusive farm use zone and that is at an elevation between 200 and 1,000 feet above mean sea level, with an aspect between 67.5 and 292.5 degrees and a slope between zero and 15 percent, and that is located within: (A) The Southern Oregon viticultural area as described in 27 C.F.R. 9.179; (B) The Umpqua Valley viticultural area as described in 27 C.F.R. 9.89; or (C) The Willamette Valley viticultural area as described in 27 C.F.R. 9.90. (f) Land that is in an exclusive farm use zone and that is no more than 3,000 feet above mean sea level, with an aspect between 67.5 and 292.5 degrees and a slope between zero and 15 percent, and that is located within: (A) The portion of the Columbia Gorge viticultural area as described in 27 C.F.R. 9.178 that is within the State of Oregon; (B) The Rogue Valley viticultural area as described in 27 C.F.R. 9.132; (C) The portion of the Columbia Valley viticultural area as described in 27 C.F.R. 9.74 that is within the State of Oregon; (D) The portion of the Walla Walla Valley viticultural area as described in 27 C.F.R. 9.91 that is within the State of Oregon; or (E) The portion of the Snake River Valley viticultural area as described in 27 C.F.R. 9.208 that is within the State of Oregon.

state, with 40 percent of Oregon's farms relying on some level of irrigation.[11] The state requires irrigation districts to measure and report water use. Water rights in irrigation districts are managed by the district and are subject to frequent changes. The current irrigation districts GIS data layer available, provided by OWRD, is incomplete due to a lack of reporting. Further development of this dataset would provide decision makers with a better understanding of where governmental and physical water infrastructure may currently exist for agricultural uses. If land is inside an irrigation district, it may be inappropriate to designate it as rural resource land.

Irrigated Places of Use: The OWRD Places of Use dataset provides basic information on where the water right is being used and what it is being used for (e.g., irrigation, construction, recreation). All current and individually held water rights are included in the dataset except where held by irrigation districts, applications, temporary transfers, instream leases, and limited licenses. This data, updated on a regular basis, gives decision makers an understanding of where water is currently being reported as used for agricultural and forest uses. If land holds an irrigated water right, it may be inappropriate to designate it as rural resource land.

Forest Land

Woody Biomass Productivity Capability

OAR 660-006-0005(7) defines "forest lands" and 660-006-0010 provides a data hierarchy for evaluating biomass productivity capability. Productivity capability data was evaluated in this order, with data sources lower in the hierarchy used only when the primary data was unavailable:

1. NRCS productivity data
2. DOR Western Oregon site class data
3. USDA Forest Service plant association guides
4. Other information determined by the State Forester to be of comparable quality. In this case, U.S. Forest Service (USFS) Historic Vegetation was utilized as recommended by ODF.

NRCS productivity: Annual woody biomass production capability was determined through analysis of a layer provided by ODF, which contains NRCS Statewide Forest Productivity data. To compute annual wood production, productivity in cubic feet per acre per year was calculated as a weighted average, based on the percentage makeup, of the productivity ratings for the soil components which comprise a map unit from NRCS soils data. Where productivity calculations were available for multiple different tree species, the highest value was used. Unmapped areas are those that did not have a productivity rating available. A lack of productivity rating often, but not always, corresponds to non-forest areas. Non-forest areas may be capable of producing the minimum capability threshold even if they were not evaluated by NRCS for forest productivity.

Annual woody biomass production capability thresholds, 50 cubic feet per acre per year (cfay) or greater based on NRCS soils data using a weighted average calculation in Western Oregon and 20 cfay in Eastern Oregon, were selected based on information gathered during the SORPP process, input from ODF staff, and review of case law. The State of Oregon has

[11] Oregon Water Resources Department. (2017). *Oregon's Integrated Water Resources Strategy*. <https://www.oregon.gov/owrd/wrdpublications1/2017_IWRS_Final.pdf>.

consistently used a threshold of 20 cfay to define commercially viable forestland in Eastern Oregon and has either used a 20 or 50 cfay threshold to define commercial viability in Western Oregon. Current Forest Practices Act Reforestation Rules (OAR 629-610-0010) requires reforestation on any land capable of producing 20 cfay after a timber harvest has occurred. Land with a NRCS productivity rating of 20 cfay or greater for Eastern Oregon and 50 cfay or greater for Western Oregon is most likely "forest land" and not eligible for designation as rural resource lands.

DOR site class maps: For the purposes of property taxation, Oregon DOR assigned values to forestland in Western Oregon by classifying land into eight productivity classes. Oregon DOR's land productivity classifications, provided by ODF, indicate the average productivity class for 40-acre blocks of land in Western Oregon, as surveyed in the 1960s and 1970s. This data only exists for the west side and thus is not applicable to Eastern Oregon. DOR data has only been utilized when NRCS productivity data is unavailable. Land that falls within a DOR Forest classification capable of producing 50+ cfay in Western Oregon are most likely forest land as defined in OAR 660-006-0005(7) and subject to Goal 4 protection.

USDA Forest Service plant association guides: The use of USDA Forest Service plant association guides requires a field survey of plants within a specific parcel or area. The field observations would be cross-referenced with the guide in order to determine the "association type" of the field site. Using the guide, productivity could be inferred from the survey results. Plant association guides are not available statewide. Plant association guides may be useful when evaluating property specific zone change applications but have not been utilized as part of this analysis due to the need for field verification.

USFS Historic Vegetation: The U.S. Forest Service layer for Historic Vegetation comes from a 1930s forest resources survey which was later digitized.[12] The original vegetation types were sorted by ODF into "forest" and "non-forest" categories, where juniper was treated as "non-forest" for these purposes. Although this dataset does not quantitatively assess productivity, ODF considers the 1930s forest resources survey to be a high-quality data source which identifies lands that were historically capable of sustaining productive forest. USFS Historic Vegetation data should only be utilized when NRCS productivity data and DOR data are unavailable. Land that has a USFS Vegetation category of "forest" may be capable of forest productivity meeting the thresholds utilized in evaluating NRCS and DOR data.

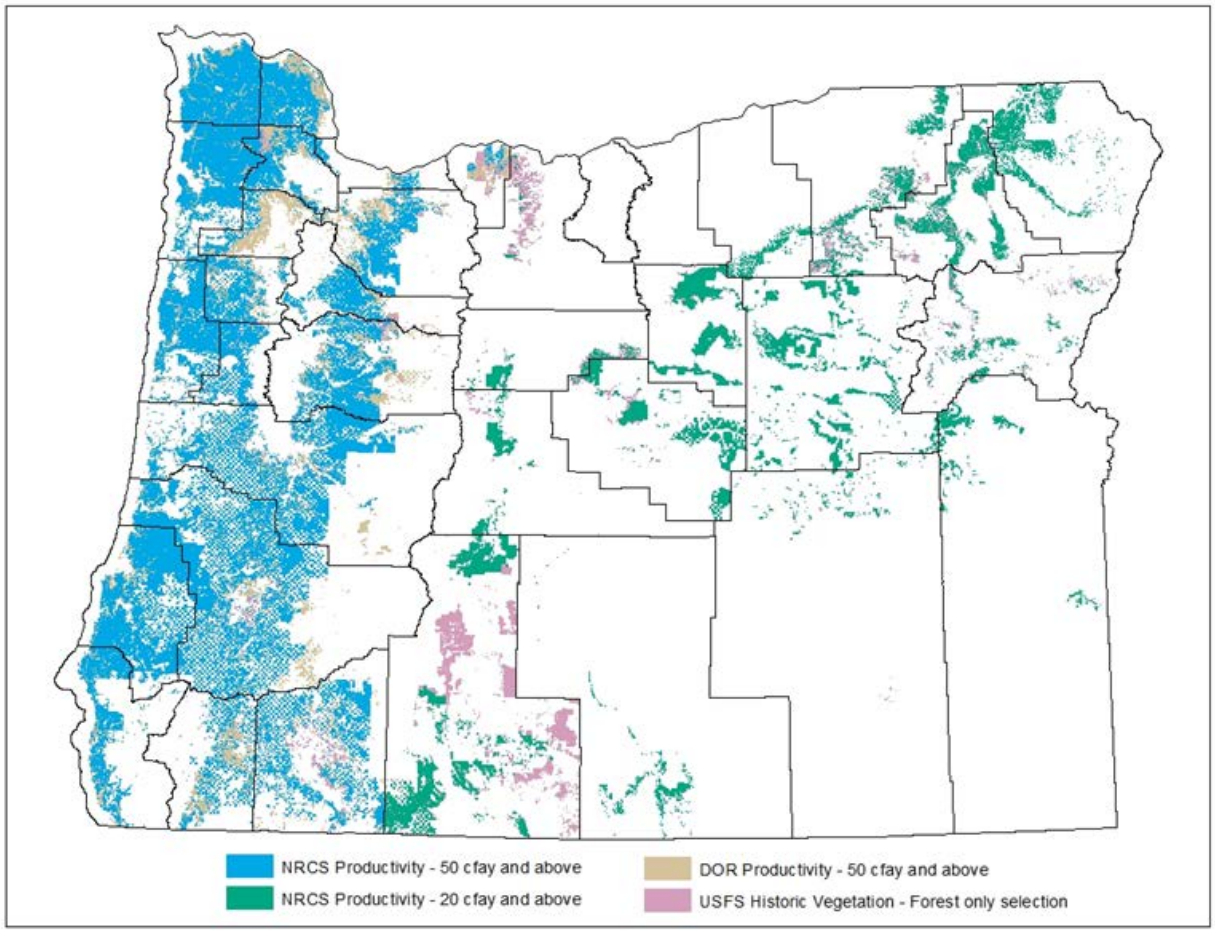
See Figure 4 for results.

Suitability for Forest Use

Suitability for forest use is tied to woody biomass productivity but also includes "adjacent or nearby lands which are necessary to permit forest operations or practices." Adequately addressing the suitability aspect of forest land reinforces the need for a detailed local analysis due to the inherent data gaps and limitations present in geospatial analysis such as was conducted for this report.

[12] United States Forest Service. "The 1930s Survey of Forest Resources in Washington and Oregon." <https://www.fs.fed.us/pnw/pubs/pnw_gtr584.pdf>.

Figure 4: Non-Federal Forest Lands Derived from NRCS, DOR, and Historic Vegetation Data



Natural Resources

The definition for “forest lands” in OAR 660-006-0005(7)(b) includes “other forested lands that maintain soil, air, water and fish and wildlife resources.” To address this portion of the definition, data presented under the following Carrying Capacity Evaluation section should be considered. Additionally, agricultural lands may provide similar natural resource benefits but this consideration is not addressed within the current definition of agricultural land.

Conclusions from the Farm and Forest Resource Evaluation

DLCD has identified several datasets that are useful in determining which lands should continue to be protected under Statewide Planning Goals 3 and 4. NRCS-derived capability and productivity data is particularly useful due to the extent and quality of the data for determining both farm and forest land, with improvements being made continuously. As stated above, the NRCS soils data will be updated within the next five years to include areas where data does not currently exist, most notably in Eastern Oregon.

Regarding grazing potential, the 2 AUMs and greater threshold denoting viable pastureland on the westside is a useful metric for analysis, although the high level of management defining

pastureland may allow for some application of this metric to lands on the eastside meeting the pasture definition. A significant data omission is eastside forage productivity threshold data. This will likely consist of working with ODA and NRCS to determine beneficial forage species and productivity levels associated with soil capabilities. Consideration should also be given to whether AUM or beneficial forage thresholds should be added to the definitions of agricultural and forest lands.

A significant opportunity exists to incorporate natural resource data into farm and forest definitions to account for the considerable benefits provided by Oregon's vital natural resources. Information in the Carrying Capacity Evaluation section may be useful in this endeavor.

Carrying Capacity Evaluation

A carrying capacity evaluation requires analysis of multiple factors to determine whether potential rural resource land should continue to be protected as resource land in order to meet other Statewide Planning Goals or whether potential rural resource lands are suitable for development and in what form and density. Unless the process in ORS 215.788-794 is utilized, counties are not required to conduct a formal carrying capacity evaluation when designating rural resource lands although they do have to demonstrate compliance with the other Statewide Planning Goals.

The rural resource lands approval option in ORS 215.788-794 does require a formal carrying capacity analysis and is the basis for evaluation of potential rural resource lands under this section. DLCD has reviewed available data that can be used to evaluate the effect of development on:

- Fish, wildlife habitat, and other ecologically significant lands;
- Water quality or the availability of water supply; and
- Natural hazards including wildfire, flooding, and landslides.

In addition, ORS 215.791 requires consideration of:

- Ensuring that development will be rural and not urban in character;
- Impacts to farm and forest uses or practices;
- Impacts to development in urban areas;
- Energy use;
- State or local transportation facilities; and
- The cost of public facilities or services and the fiscal health of a local government.

Spatial data is not readily available or easily analyzed for these factors on a statewide scale. However, possible considerations for evaluation are discussed in this section as these issues are critical to evaluating the type and form of development on rural lands.

Fish, Wildlife Habitat, and Other Ecologically Significant Lands

The protection of natural resources is considered in the definition of Forest Lands in the phrase: "other forested lands that maintain soil, air, water and fish and wildlife resources" as well as in

Statewide Planning Goal 5. Due to the wording in both the Forest Lands definition and Goal 5 there is variation in how counties apply these rules—regarding what resources should be considered, how they should be evaluated, how to determine resource significance, and how to secure protections. In addition, many comprehensive plans and the accompanying Goal 5 resource inventories across the state have not been updated since LCDC's original acknowledgement in the 1980s. As a result, the best available natural resource data is not always included in local comprehensive plans or utilized when making land use decisions. Thus rural resource designations may create conflicts between newly allowed uses and natural resources. Due to these circumstances, it may be appropriate to evaluate rural resource lands using the best available data to avoid or minimize these potential conflicts, which may include a consideration of data beyond the outdated acknowledged Goal 5 inventories. In addition, it may be appropriate to consider conservation values, including restoration of natural resources, when determining the appropriate density and location of development.

Oregon Conservation Strategy

As ODFW is the agency responsible for developing the Oregon Conservation Strategy, DLCD worked with ODFW in assessing which natural resource GIS data would be most useful to address the rural resource lands issues. Although ODFW is charged with the protection and enhancement of fish and wildlife species, the agency has very limited authority over the habitat on which fish and wildlife depend. To address these cross-boundary management issues ODFW updated the Oregon Conservation Strategy[13] in 2016 using the best available scientific information to inform fish and wildlife conservation planning efforts statewide. This statewide strategy provides a shared set of priorities with corresponding recommended voluntary actions and tools. The natural resource geospatial data referenced in this section has been selected in consultation with ODFW, using the Conservation Strategy as guidance.

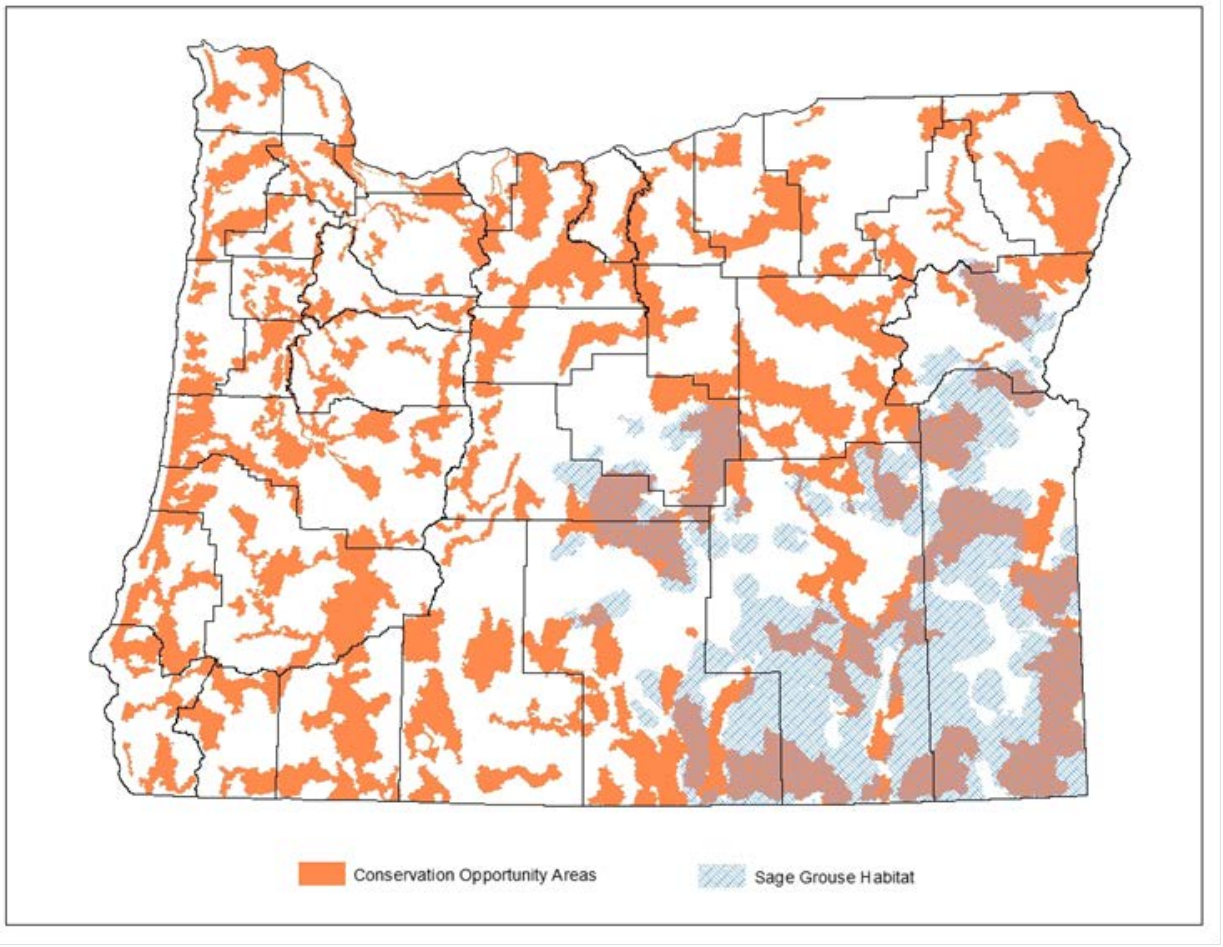
Conservation Opportunity Areas (COA): A component of the Oregon Conservation Strategy, Conservation Opportunity Areas (see Figure 5), encompass 206 priority conservation areas across the state. These areas are places where broad fish and wildlife conservation goals would best be met. COAs are generally either areas of high biodiversity, areas with unique habitat values, or areas with known restoration needs. All COAs have an associated COA profile, providing details about the area's Conservation Strategy priorities, recommended actions consistent with local priorities and ongoing conservation efforts.[14] For example, Crater Lake's COA profile details recommended conservation actions: "maintain or enhance wetland and wet meadow habitat" and "work with national and regional partners to provide Conservation Strategy outreach."

Although COAs were primarily developed to focus investments, there is precedent for using this data in making land use decisions. ORS 215.791, developed as part of "The Big Look" in 2009, requires counties designating rural resource lands to consider the 2006 version of the Oregon Conservation Strategy when evaluating whether such lands contain ecologically significant natural areas or resources. As previously mentioned, counties have not utilized "The Big Look" option when designating rural resource lands. Consideration of the current version of the Oregon Conservation Strategy when designating rural resource lands would help ensure that lands of ecological significance not identified in adopted Goal 5 inventories are zoned

[13] The Oregon Conservation Strategy site. <http://www.oregonconservationstrategy.org/>.
[14] Find COA profiles here: <http://oregonconservationstrategy.org/conservation-opportunity-areas/>.

appropriately for natural resource conservation. COAs may also be useful as a screening tool which may allow for those lands which fall inside a COA to trigger on-the ground site-specific natural resource analysis in consultation with ODFW before development may be considered. An on-site ODFW evaluation may be useful in determining the appropriate density and form of development (e.g. require large minimum lot sizes or clustering of structures to avoid sensitive habitat).

Figure 5: Conservation Opportunity Areas and Sage Grouse Habitat



Strategy Habitats: The 2016 Oregon Conservation Strategy identifies 11 Strategy Habitats[15] which focus on native habitats of conservation concern that are essential to many Strategy Species within the state. Strategy Species identifies 294 species of greatest conservation need and are defined as having small or declining populations, are at-risk, and/or are of management concern. For each Strategy Habitat and Strategy Species, information is provided in the Strategy that includes a conservation overview, data gaps, limiting factors to the species or habitat, recommended conservation actions, and available resources. To support the 10 year Oregon Conservation Strategy revision in 2016, the Institute for Natural Resources's (INR) Oregon Biodiversity Information Center (ORBIC) at Portland State University was contracted to

[15] "Oregon Conservation Strategy: Strategy Habitats." <http://oregonconservationstrategy.org/strategy-habitats/>.

use best available data and analyses to update the mapped extent and distribution of the Oregon Conservation Strategy Habitats. The objective was to comb existing data sources and use the most up-to-date and highest resolution maps available in Oregon for each Strategy Habitat, within their associated ecoregion. The results of this effort are presented in this Strategy Habitat dataset as a 30m pixel raster grid.

Strategy Habitats are useful tools to identify where potential rural resource lands may have conflicting uses with habitat that support sensitive fish and wildlife habitat (e.g., Strategy Species). Strategy Habitats may be evaluated during the consideration of eligible rural resource lands to identify those lands no longer qualifying as farm or forest land but that may have a significant conservation priority to address. This dataset can also be evaluated as part of any potential updates to existing Goal 5 resource maps and, based on the specific habitat or species, a more programmatic assessment of conflicting uses can be evaluated based on the rural resource lands proposed allowed uses. Additionally, ORBIC data, which informs much of the Conservation Strategy's geospatial data, could be useful in making more detailed spatial inquiries, although it is only available behind a $5,000 paywall, making it substantially more difficult to gain access to. Strategy Habitat data is intended to provide a broad view for these habitat types using the best available geospatial data. However, conditions may vary by site, watershed, or ecoregional level based on differences in soil, climate, and management history. Therefore, local conditions will need to be considered when determining site-appropriate conservation actions.

Oregon Fish Habitat Distribution

Oregon Fish Habitat Distribution maps provide data on the distribution of high priority fish species habitat. This data describes areas of suitable habitat believed to be used currently or historically by native or non-native fish populations. The term "currently" is defined as within the past five reproductive cycles. Historical habitat includes suitable habitat that fish no longer access and will not access in the foreseeable future without human intervention. This information is based on sampling, the best professional opinion of ODFW or other natural resources agency staff biologists or modeling. Historical habitat distribution data is not comprehensive.

While most comprehensive plans include a riparian buffer for perennial and intermittent streams, there are varying datasets and analysis used to apply appropriate protections. Assessment of current fish distribution, through the evaluation of this dataset, is a useful tool to gauge potential conflicts for streams that may have state or federally listed aquatic resources. Rural resource lands with aquatic habitats necessary for sustaining those aquatic resources for high priority fish species could apply more protective riparian protections (i.e., larger riparian buffers to avoid or minimize conflicts as a result of the new allowed uses). This dataset is useful in identifying important fish bearing streams and applying appropriate riparian buffers (i.e., Goal 5 Riparian Corridors) to avoid and minimize impacts to those aquatic resources, including many that may be listed as threatened or endangered.

Greater Sage-Grouse Habitat

Greater Sage-Grouse habitat is a distinctive wildlife resource subject to a multiplicity of threats across a wide landscape spanning several states on both public and private land. Due to the cross-boundary nature of sage-grouse management, partnership and cooperation among diverse stakeholders with accompanying voluntary conservation measures is key. In response to collaborative conservation planning for sage-grouse and the need to encourage responsible economic development, the Greater Sage-Grouse Conservation Assessment and Strategy, Oregon Sage-Grouse Action Plan, and Sage-Grouse Mitigation Program were developed. Through these planning and program efforts data were derived to map significant sage-grouse habitat and improved representation of vegetative components within sage-grouse habitat that can both be used to prioritize locations for proposed development, conservation, restoration, and mitigation actions. Specifically, the goal of these datasets is to protect essential sage-grouse habitats to meet habitat and population objectives. These data were derived based on proximity to sage-grouse leks[16] and as such may exhibit bias towards breeding and nesting areas.

To supplement this data, the Sage-Grouse Development Siting Tool[17] is an interactive application that allows prospective developers to input project data in order to get a coarse level perspective of potential project impacts to sage-grouse and their habitats. The tool utilizes best available remotely-sensed data on existing development, vegetation condition, and other land uses to provide information to help developers site projects within and adjacent to sage-grouse habitat. Prospective developers should contact the ODFW to discuss results of the Sage-Grouse Development Siting Tool and other important avoidance, minimization, and mitigation requirements contained within the Greater Sage-Grouse Conservation Strategy for Oregon (OAR 635-0140). The Oregon Sage-Grouse Data Viewer and Sage-Grouse Development Registry Viewer are also tools available through the Oregon Explorer website that are aimed at providing information about sage-grouse to help conservation and development action placement and track development actions in and around sage-grouse habitat. Additional tool(s) may be developed to provide landscape level information to help strategically place mitigation actions to increase potential benefits to sage-grouse.

Greater Sage-Grouse habitat (see Figure 5) is already considered a Goal 5 resource in the DLCD rule (OAR 660-023-0115). Maps are directly applied in county reviews unless a local jurisdiction goes through Goal 5 process, which has not yet occurred in any counties with such habitat.

Big Game Habitat

Big Game Habitat, including winter range, is already protected as a Goal 5 resource in local comprehensive plans across the state. However, many counties have not updated their big game maps since comprehensive plan acknowledgment. Additionally, comprehensive plans often do not specifically identify sensitive migration corridors. Protecting these areas is critical to maintaining habitats which sustain viable big game populations in Oregon. ODFW is working on

[16] (j) “Lek” means an area where male sage-grouse display during the breeding season to attract females (also referred to as strutting-ground). OAR 660-023-0115(3)
[17] Oregon Explorer: Sage-Grouse Development Siting Tool. <https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=sage_grouse_dev_siting>.

habitat connectivity mapping which will be available within the next three years which will further identify key conservation areas to support deer and elk in Oregon.

Big Game Habitat data is broken into Western Oregon Big Game Habitat and Eastern Oregon Big Game Habitat. Western Oregon Big Game Habitat contains two datasets: 1) Columbian White-tailed Deer (CWTD) – Occupied Habitat 2015 and 2) Western Oregon Deer and Elk Habitat. Columbian White-tailed Deer (CWTD) – Occupied Habitat 2015 covers critical, year-round habitats including brushy deciduous trees and shrubs and/or oak savanna habitats providing functions and values necessary to satisfy all CWTD life history needs. Much of these habitat areas, although impacted by anthropogenic development, are the only remaining available habitat for Columbian White-tailed Deer in Oregon. Western Oregon Deer and Elk Habitat is not inclusive of all big game species but it further categorizes habitat based on how Columbian black-tailed deer, Columbian white-tailed deer and Roosevelt elk use the habitat. Generally, deer and elk need habitat which provides a combination of food, water, and security to survive and reproduce. Abundance, distribution, and connectivity of these habitats are crucial to species survival and may vary seasonally depending on a specific species dependence on migratory or non-migratory behavior to fulfill life history requirements. Habitats supporting Black-tailed deer exhibiting a predominately migratory life history are subdivided into Summer Concentration Habitat and Winter Concentration Habitat. Habitats supporting Black-tailed deer and Elk exhibiting a predominately non-migratory life history are subdivided into Year-around Major Habitat and Year-round.

Western Oregon Deer and Elk Habitat are broken down as follows:

- Peripheral Habitat are those areas where the presence of deer and elk are considered in conflict with primary land uses and are described as Impacted Areas.
- Winter Concentration Areas are seasonal concentration areas providing essential and limited functions and values (e.g. thermal cover, security from predation and harassment, forage quantity, adequate nutritional quality, escape from disturbance, etc.) for concentrated migratory deer or elk typically from November through April.
- Summer Concentration Areas are seasonal concentration areas providing essential and limited functions and values (e.g., thermal cover, security from predation and harassment, forage quantity, adequate nutritional quality, calving and fawning areas, etc.) for concentrated migratory deer or elk typically from May through October.
- Year-round Major Habitat includes areas identified and mapped as providing essential functions and values (e.g., thermal cover, security from predation and harassment, forage quantity, adequate nutritional quality, calving and fawning areas, etc.) for non-migratory deer or elk.
- Year-round Peripheral Habitat includes areas identified and mapped as providing important but not essential functions and values (e.g. cover, forage, etc.) for deer or elk.
- Impacted Areas are identified by anthropogenic development such as areas within UGBs, city limits, otherwise determined to be less suitable habitat for deer or elk because of conflicts with proximity to humans, disease, damage, or public nuisance resulting from use by local or resident deer or elk.

Eastern Oregon Big Game Habitat is comprised of two datasets: Eastern Oregon Deer Winter Range and Eastern Oregon Elk Winter Range.[18] Eastern Oregon Deer Winter Range includes a single set of polygons which encompass the general outline of deer winter range for eastern Oregon, east of the crest of the Cascades. ODFW considers Winter Range to be that area normally occupied by deer from December through April. Data are current to 2009 except for updates made in 2012 to portions of The Dalles and Heppner Districts. Eastern Oregon Elk Winter Range includes a single set of polygons which encompass the general outline of elk winter range for eastern Oregon, east of the crest of the Cascades. The Oregon Department of Fish and Wildlife considers Winter Range to be that area normally occupied by deer from December through April. The data were assembled in 2009 with updates for The Dalles District in 2012.

Big game habitat data maps were not provided as part of this report due to the complexity and overlap of big game data layers. However, this data remains available for county use and it would be beneficial for DLCD to continue working with ODFW on appropriate application methods. While most comprehensive plans include Goal 5 considerations for big game, the acknowledged maps and implementing ordinances have typically not been updated to use the best available data and apply necessary protections to avoid conflicting uses. Utilizing the most recent big game data would help support the life history needs for big game and avoid or minimize conflicts with increased development densities.

Wetlands

Wetlands provide vital ecosystem services including flood storage and water supply, water quality improvement, food-web support, wildlife and fish habitat, as well as aesthetics, recreation, education. Oregon has lost a significant portion of its wetlands to other land uses, however these habitats remain of critical importance across the state and are identified as a Strategy Habitat in the Oregon Conservation Strategy.[19] Wetlands are already identified as significant Goal 5 resources in many local comprehensive plans across the state. However, many counties have not updated wetland inventories since original adoption in the 1980s and significant wetlands on acknowledged Goal 5 maps may not reflect current data related to water quality or wildlife habitat. [20] Improved geospatial data is available to assist in evaluating priority wetland areas and how the proposed new uses from development in rural resource zones may conflict with many of the ecosystem services they provide. Datasets which should be utilized in evaluating wetland considerations includes a combination of the National Wetland Inventory (NWI), Statewide Wetland Inventory (SWI), and Local Wetland Inventories (LWI). Using more recent data in rural resource designations would help avoid conversion of wetlands and direct development to suitable locations.

The U.S. Fish and Wildlife Service has developed a National Wetland Inventory as the principal agency tasked with national wetland management. The NWI delineates the areas of wetlands and surface waters based on an aerial data gathering methodology where wetlands were identified by their vegetation, visible hydrography and geography. The NWI dataset is

[18] ODFW Data Clearinghouse. Oregon Department of Fish and Wildlife. “ODFW Deer and Elk Winter Ranger for Eastern Oregon (2012).”
[19] Oregon Department of State Lands. “Wetland Planning and Conservation.” <https://www.oregon.gov/dsl/WW/Pages/WetlandConservation.aspx
[20] Ibid.

supplemented by the U.S. Geological Survey's National Hydrography Dataset, primarily for linear wetland and water surface features. Although they may be key, certain types of "farmed wetlands" are excluded from the dataset by policy. Due to the limitations and gaps inherent in this data gathering methodology, detailed on-the-ground site inspection is recommended. This dataset is to be integrated with the Oregon Department of State Lands' Statewide Wetland Inventory.

The Oregon Department of State Lands (DSL) is currently developing a Statewide Wetland Inventory which is an amalgamation of the NWI and DSL-approved LWI as well as the U.S. Geological Survey's National Hydrological Dataset and the U.S. Department of Agriculture National Resources Conservation Service Soil Survey data. Again, due to the limitations and gaps inherent in this data gathering methodology, detailed on-the-ground site inspection is recommended.[21]

The DSL SWI should be evaluated along with other geospatial datasets referenced above, such as Strategy Habitat or COAs, to assist in prioritizing and protecting significant wetlands, such as those providing a local watershed need or critical wildlife function. Prioritizing wetlands that are of particular importance to conservation actions should be considered and those conflicting uses be avoided or minimized to reduce potential conflicts (e.g., larger buffer around significant wetland). Consideration of this dataset with the COA overlay, for example, may also provide opportunities to develop incentives to either avoid or minimize development impacts to significant wetland areas or develop incentives to address or implement the conservation priorities.

Other Goal 5 resources

Goal 5 inventories also include natural areas, open space, scenic views and sites, federal wild and scenic rivers, Oregon scenic waterways. These areas may also be ecologically important. DLCD has not identified any new data layers that would better define these areas but they should be protected in accordance with current Goal 5 requirements in state rules and county comprehensive plans and land use ordinances.

Conclusion for fish, wildlife habitat, and other ecologically significant lands

A diversity of natural resource geospatial data exists across the state, although the extent, scalability, and applicability can vary considerably. It is likely beneficial to incorporate a subset of natural resource data into farm and forest definitions to appropriately recognize the conservation values provided by these resources. It will likely be beneficial for DLCD to institutionalize collaboration and communication with ODFW and other natural resource management agencies to determine how to best integrate their data for policy implementation. DLCD can utilize current natural resources data in consultation with the respective agencies while working with these same agencies to improve data for land use planning application.

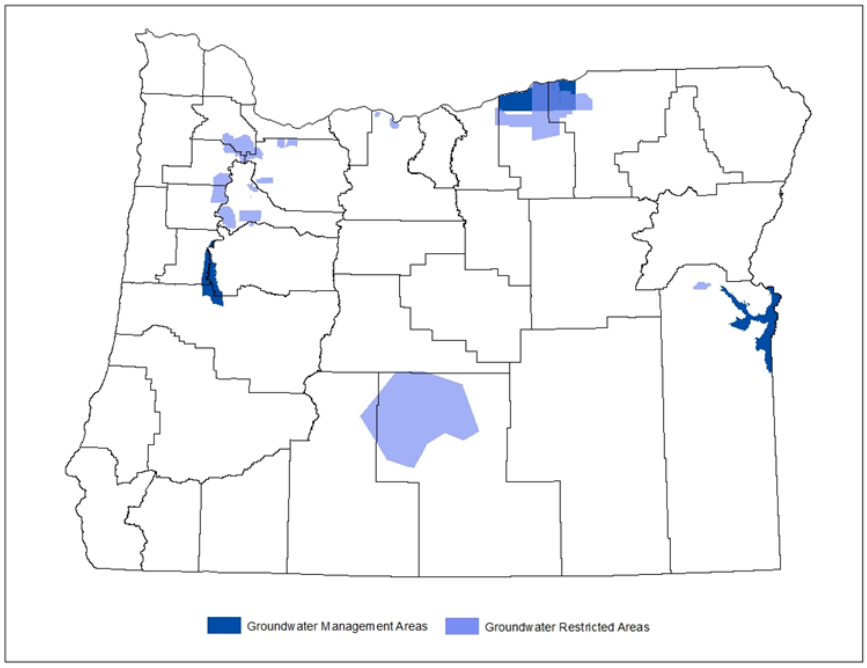
[21] Oregon Department of State Lands. "Statewide Wetlands Inventory." <https://www.oregon.gov/dsl/WW/Pages/SWI.aspx>.

Water Quality and Quantity

Healthy watersheds and working lands are intimately connected. Degraded watersheds can negatively impact the economic viability of rangeland, farms, and forests. When sustainable management practices are employed, agricultural and forest lands provide valuable services and assets related to maintaining adequate water quality and quantity by supporting critical watershed functionality. Additionally, conversion of working lands to development can adversely influence water quality and quantity.[22] Rural development primarily affects water quality by increasing nutrient and bacterial inputs via faulty septic systems and increased road traffic.

Listed in this section are GIS datasets which may be of particular use when considering rural resource land designations.[23] Additional water availability considerations can be found in the "Agricultural Lands" section above. Development on lands which falls within multiple layers may have a greater chance of negatively impacting water quality and/or quantity and will likely trigger greater scrutiny in finer scale analyses.

Figure 5: Groundwater Management Areas and Groundwater Restricted Areas



<u>Groundwater Management Areas</u>

Oregon revised statute 468B.180 requires DEQ to declare a Groundwater Management Area (GWMA) when DEQ groundwater assessments reveal area-wide groundwater contamination problems at consistently high levels. Oregon currently has three groundwater management areas (Northern Malheur County, Lower Umatilla Basin, and Southern Willamette Valley) which exhibit widespread nitrate contamination (see Figure 6). Each area has developed a voluntary action plan to reduce nitrate concentrations in groundwater. This dataset gives decision makers an understanding of where widespread groundwater contamination currently exists and should likely trigger additional analysis regarding negative impacts on water quality indicators based on land use type and water quality issues.

[22] Sierra Nevada Alliance. (2008). *Planning for Water-Wise Development in the Sierra: A Water and Land Use Policy Guide*. <https://sierranevadaalliance.org/wp-content/uploads/2014/02/PlanningforWaterWiseDevelopment.pdf>.
[23] Merenlender, A. M. and Lohse, K. A. *Planners Guide: Chapter 9: Impacts of exurban development on water quality*. <https://ucanr.edu/sites/merenlender/files/143668.pdf>.

Groundwater Restricted Areas

The Oregon Water Resources Department has classified several areas where groundwater uses are restricted in order to prevent excessive groundwater decline, restore aquifer stability, and preserve aquifers with limited storage capacity for designated high public value uses. Limitations usually apply only to the specific aquifer that has had water-level declines or other documented issues, allowing for some occasions where groundwater may still be available at a different depth from a different aquifer. It is critical to note that water availability is dynamic as new uses for water are permitted. Even if water is shown to be unavailable, there may be conditional allowance for a limited number of specific uses to be permitted. Additionally, water availability is based on estimates with variable data reliability.[24] This dataset gives decision makers an understanding of where development may further strain water availability. Figure 6 shows the locations of groundwater restricted areas.

Natural Hazards

Local mitigation planning is vital to creating a disaster resilient Oregon. The 2015 Oregon Natural Hazards Mitigation Plan identifies eleven natural hazards in the state. For this review, natural hazards were considered based upon availability of relevant datasets. Wildfire, floodplains, and landslides were determined to be the most pertinent hazards to consider in relation to rural resource land designations. Other natural hazards such as tsunamis, earthquakes, and volcanic hazards might be useful for local planners to evaluate, depending on their respective location. Data and information associated with this section should be used to inform how to most appropriately locate and cluster rural development to avoid lands subject to natural hazards while minimizing effects on farm and forest uses and reducing costs of public facilities and services.

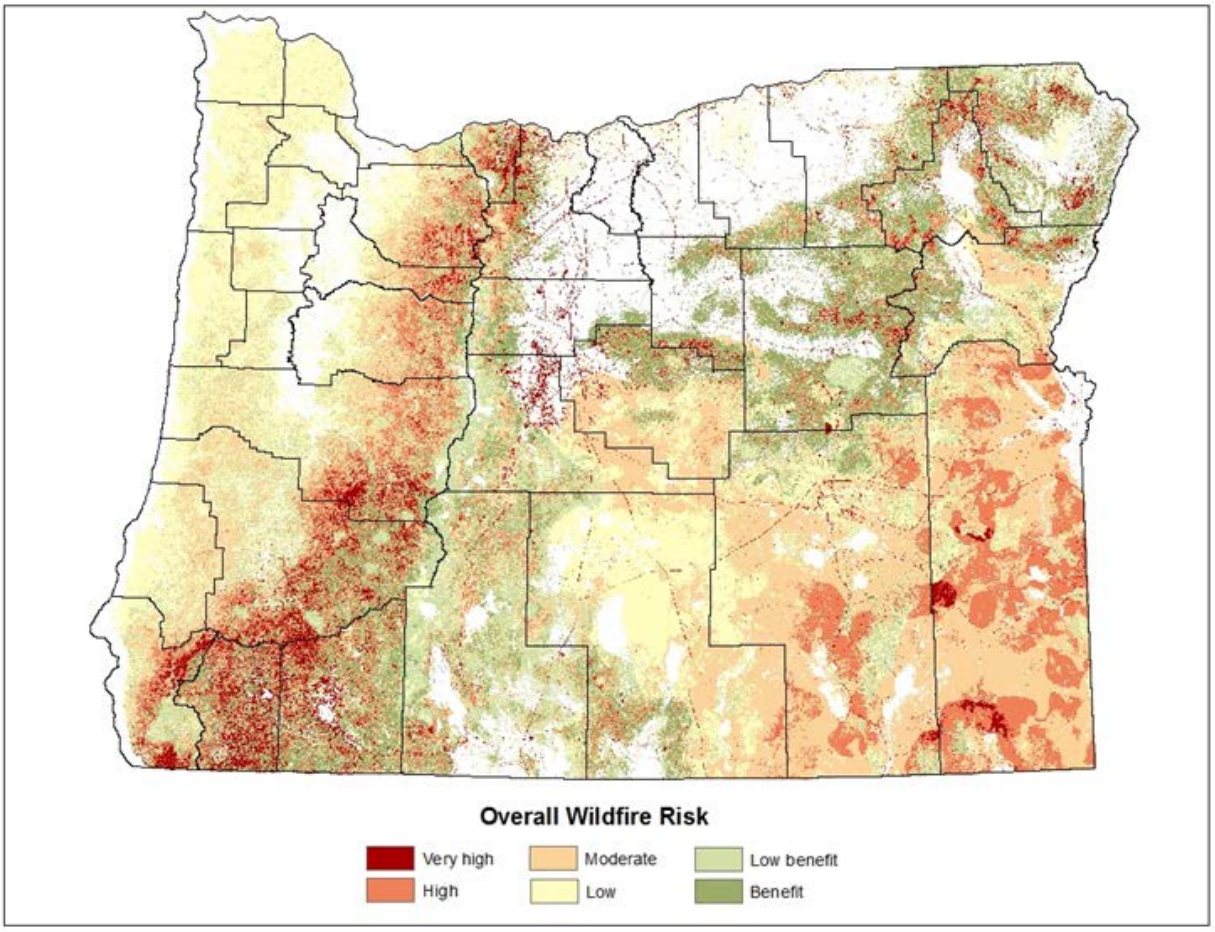
Wildfire Risk

Large, highly destructive wildfires are becoming increasingly common across the western United States including Oregon, extracting heavy economic, ecological, and social costs.[25] Additional rural development can increase vulnerability to wildfires at a time when wildfire risk is already at record heights.[26] Fire suppression is a costly endeavor with structural defense being by far the most significant of these costs.[27] The US Forest Service estimates that between 50 and 95 percent of its firefighting spending is used to defend residential structures.[28] In 2017 alone, $454 million was spent fighting wildfires across 665,000 acres statewide, with $38 million coming from state coffers.[29] Increasing development in high and very high risk areas will only serve to exacerbate rising suppression effort costs.[30] Wildfire not only causes these direct

[24] Oregon Water Resources Department. (2002). *Determining Surface Water Availability in Oregon*. <https://www.oregon.gov/OWRD/WRDPublications1/DeterminingSurfaceWaterAvailabilityInOregon.pdf>.
[25] Fox, A., 1000 Friends of Oregon. (2018). *A New Vision for Wildfire Planning: A Report on Land Use and Wildfires*. <https://www.friends.org/sites/friends.org/files/images/1kf_wildfire_paper_pdf_-_final-1.pdf>.
[26] Ibid.
[27] Fox, A., 1000 Friends of Oregon. (2018). *A New Vision for Wildfire Planning: A Report on Land Use and Wildfires*. <https://www.friends.org/sites/friends.org/files/images/1kf_wildfire_paper_pdf_-_final-1.pdf>.
[28] Ibid.
[29] Ibid.
[30] Ibid.

impacts, damaging structures and valuable resources, but can lead to secondary hazards including floods and landslides. Soil can become impermeable post-burning, increasing runoff and ultimately the risk of post-wildfire floods and landslides.[31]

Figure 6: Overall Wildfire Risk



Pyrologix, an organization contracted by the USFS to provide specialized fuel characterization and wildfire modeling services, has developed the most up-to-date, comprehensive quantitative data regarding wildfire hazard and risk to highly valued resources and assets as part of the USFS Pacific Northwest Region Quantitative Wildfire Risk Assessment. In consultation with the Oregon Department of Forestry, Pyrologix's Overall Wildfire Risk data, which can be found on Oregon Explorer, was deemed to be the most appropriate to consider in planning for rural development patterns. This dataset is the product of the likelihood and consequence of wildfire on all mapped highly valued resources and assets combined: critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, historic structures, timber, municipal watersheds, vegetation condition, and terrestrial and aquatic wildlife habitat. This dataset considers the likelihood of wildfire events encompassing more than 250 acres, the susceptibility of resources and assets to wildfire of different intensities, and the likelihood of occurrence of wildfires of each intensity. The data values reflect a range of impacts from a very high negative

[31] *Oregon Post-Wildfire Flood Playbook*. (2018). <https://silverjackets.nfrmp.us/Portals/0/doc/Oregon/PostFireFloodPlaybook_2018-09-30.pdf?ver=2018-10-04-203119-453>.

value—where wildfire is detrimental to one or more resources or assets (for example, structures, infrastructure, early seral stage and/or sensitive forests)—to positive, where wildfire will produce an overall benefit (for example, vegetation condition/forest health, wildlife habitat).[32] The Overall Wildfire Risk dataset, shown in Figure 7, can be used to determine areas where wildfire risk is high or very high. The risk of loss of life and property from wildland fire or the cost of fire suppression may be too high to justify locating additional rural development in these areas. An additional consideration in managing fire risk for rural development is Rural Fire Protection Districts (RFPDs), which delineate areas where fire and emergency medical services are provided to rural areas outside city limits. The Oregon Department of Forestry and the State Fire Marshal keep record of the state's rural and urban fire protection districts, respectively. Rural fire protection districts provide fire and emergency medical services in rural areas outside city limits. RFPDs do not always translate to adequate fire protection due to limited resources and the size of territories. These districts can also be expanded to include new developments, potentially causing further strain on existing capacity issues. Limiting rural resource land development to areas within existing RFPDs would concentrate fire protection efforts, which is critical in a time of growing wildfire threats. More information is needed to determine whether existing fire districts are currently functioning and if they have the capacity to expand.

Special Flood Hazard Areas

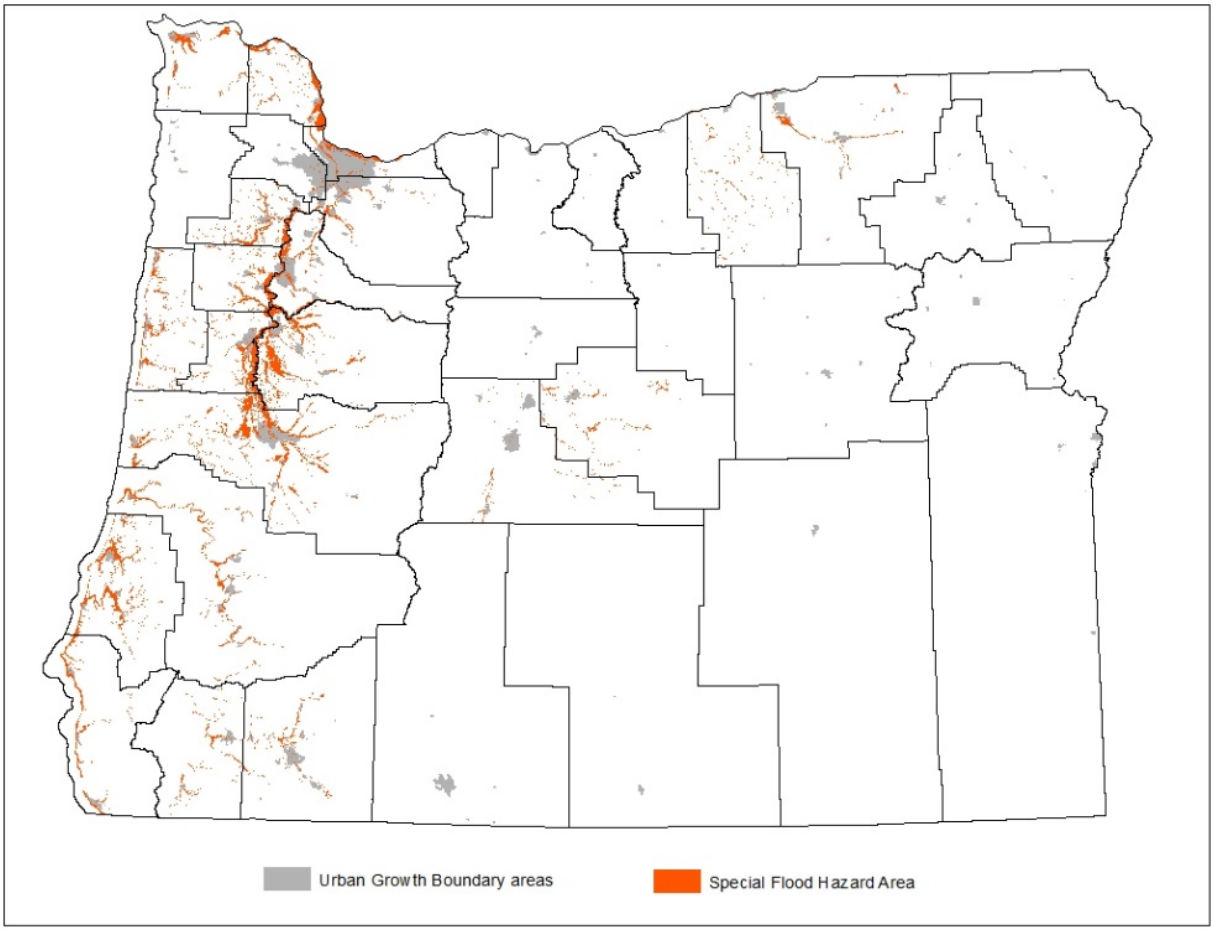
Historically, Oregon has experienced extensive flooding events, fluctuating in intensity and duration in tandem with local variability in weather, climate, and geophysical characteristics. Climate change models indicate a projected rise in extreme precipitation, resulting in an elevated flooding risk in specific basins, particularly in Western Oregon.[33] Floods alone cause property damage and loss of life but may also precipitate landslides, causing additional losses.[34]

The National Flood Hazard Layer for Oregon was developed by the Federal Emergency Management Agency's National Flood Insurance Program (NFIP). The layer contains current effective flood hazard data to support the NFIP including flood insurance zones, base flood elevations, floodways, and flood fringe areas. The majority of flood studies were conducted in the late 1970s and early 1980s and, although map updates have occurred in some locations, data gaps and limitations persist. Flooding probability is stated as a percent chance that a flood of a certain magnitude or greater will occur at a specific location in any given year. This probability is measured as the average recurrence interval of a flood in a given size and place.[35] A one percent chance of flooding at a location in any given year is commonly known as the 100-year flood and is the standard for flood regulation under the NFIP. The floodway and flood fringe together comprise the Special Flood Hazard Area (see Figure 8) which is the regulatory floodplain under the NFIP.

[32] Advanced Oregon Wildfire Risk Explorer. <https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning>.
[33] *Oregon Natural Hazards Mitigation Plan*. (2015). <https://drought.unl.edu/archive/plans/GeneralHazard/state/OR_2015.pdf>.
[34] Ibid.
[35] Ibid.

The National Flood Hazard layer for Oregon can be used to determine the areas most and least likely to flood. Flood hazard vulnerability and associated flood insurance costs can be mitigated by (a) not locating development inside the floodway; (b) avoiding building inside the Special Flood Hazard Area; or if building cannot be avoided, (c) building to NFIP minimum, or higher (more protective), standards in the Special Flood Hazard Area. Development includes building structures, filling, and grading.

Figure 7: Special Flood Hazard Area



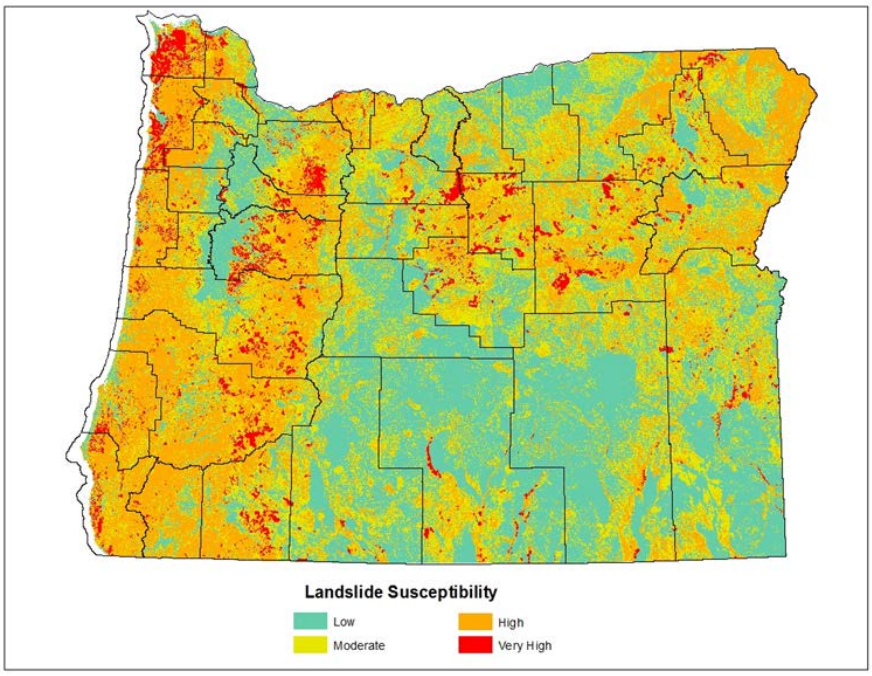
Landslide Susceptibility

Landslides are one of the most common and devastating geologic hazards in the state. Vulnerability to and costs from this hazard increase as population growth pushes development into more landslide-prone terrain. Landslides are typically triggered by ground saturation from heavy rainfall or rapid snowmelt, earthquakes, volcanoes, and human activity. Landslide susceptibility is influenced primarily by slope geometry (steepness), geologic material, and water. Due to strong correlation between precipitation and landslides, the projected increase in extreme precipitation accompanying climate change will likely result in an increase in landslide occurrence.[36]

[36] Ibid.

DOGAMI has developed a statewide landslide inventory layer (see Figure 9) at a coarse scale to inform regional planning and analysis. The intended use of this data is to help identify regions that may be more or less regionally at risk for future landslides which public agencies can then prioritize as areas for more detailed studies to be done. This coarse scale data is derived from elevation data converted into slopes which was then analyzed along with generalized geology and mapped existing landslides. Spatial statistics were then derived from the preceding analysis to create four susceptibility classes: Low, Moderate, High, and Very High.[37]

Figure 8: Landslide Susceptibility



Although the statewide landslide inventory layer is useful for regional planning and analysis, landslide risk is best evaluated using detailed landslide susceptibility data. This finer scale data is available in a few select locations. DOGAMI is continuing to develop shallow and deep landslide susceptibility maps as resources become available. Finer scale data should be used where available.[38] Shallow landslides involve movement of a relatively thin layer of slope material and have a shallow failure plane while deep landslides involve movement of a relatively deep layer of slope material. Although there is no widely accepted depth boundary between shallow and deep landslide susceptibility, DOGAMI selected 4.6m (approximately 15 feet) as the depth boundary for their shallow and deep landslide susceptibility mapping.[39] The Shallow and Deep Landslide Susceptibility maps can be used to locate new rural developments outside of areas categorized as having high and very high susceptibility to shallow or deep landslides. This data is not appropriate for site-specific evaluations but can be used to provide regional and community-scale land use planning information.[40]

[37] Burns, W. J.; Mickelson, K. A.; and Madin, I. P. Oregon Department of Geology and Mineral Industries. (2016). *Open-file Report O-16-02: Landslide Susceptibility Map of Oregon.* < https://www.oregongeology.org/pubs/ofr/p-O-16-02.htm>.
[38] Ibid.
[39] Burns, W. J.; Mickelson, K. A. *Protocol for Deep Landslide Susceptibility Mapping*. (2016). <https://www.oregongeology.org/pubs/sp/SP-48.pdf>.
[40] Burns, W. J.; Madin, I. P.; and Mickelson, K. A. *Protocol for Shallow Landslide Susceptibility Mapping*. (2012). <https://www.co.washington.or.us/lut/planningprojects/area93/upload/sp-45-protocol-for-shallow-landslide-susceptibility-mapping-web.pdf>.

Conclusions for Natural Hazards

Wildfire, floods, and landslides are likely the most useful datasets to use in addressing carrying capacity questions as they pertain to natural hazards. Depending on location, other natural hazards might be useful for local planners to consider in considering rural resource lands designation. Data and information associated with this section should be used to inform how to most appropriately locate and cluster rural development to avoid lands subject to natural hazards and associated negative cost impacts to public facilities and services. Site specific evaluation will inform what measures can be taken to appropriately mitigate natural hazards.

Rural Character of Development

LCDC's Statewide Planning Goals and rules help ensure that rural resource land remains rural. This is generally accomplished through thresholds on the type, size, and intensities of available uses, the application of parcel sizes, and limitations on the extension of sewer systems.

While not directly applicable to rural resource lands, the administrative rule regulating newly created rural residential exception areas (OAR 660-004-0040) illustrates one tool for maintaining rural lands. The rule requires a minimum parcel size of at least ten acres unless an exception is taken to Statewide Planning Goal 14 (Urbanization).The commission concluded, for the purposes of rural residential exception areas, that ten acres is the minimum parcel size to ensure fulfillment of the state's land use policy of maintaining rural land as sparsely settled with few public services. Depending on carrying capacity constraints (e.g., big game habitat), a parcel size larger than ten acres may be appropriate in some areas.

Statewide Planning Goal 11 (Public Facilities and Services) and OAR 660-011-0060 limit the establishment or extension of sewer systems on rural lands. For rural resource lands, sewage disposal requires an on-site treatment system serving a single parcel. On-site sewage disposal systems typically require larger parcel sizes which is consistent with the parcel size limitations described above.

One technique which could be implemented in order to retain rural character would be the use of open space conservation. Open space conservation is a key piece of retaining rural character. Conservation design or open space development design standards can be used in planning by structuring development around natural features. Planning begins by designating a significant percentage, at least a quarter, of otherwise buildable land to open space in a pattern conducive to a set of prioritized goals such as preserving agricultural and outdoor recreation uses as well as protecting environmental, scenic, and cultural assets.[41] Conservation design can be incentivized through offering density bonuses, reduced fees, and/or a streamlined permitting process.[42]

[41] Horst, M. et al. Portland State University. (2018). *Analysis of Expanding Rural Residential Housing in Malheur County, Oregon*.
[42] Ibid.

Impacts to Farm and Forest Uses or Practices

Development in rural areas may increase conflicts with or hinder neighboring agricultural and forestry operations. Examples of potential conflicts include complaints about spray and odor or increased traffic on public roads needed to move agricultural and forest machinery and products. For uses that may impact farm or forest uses in EFU and forest zones, property owners must demonstrate that the proposed use will not force a significant change to farm or forest practices or significantly increase their cost.[43] The rural resource designation process in ORS 215.791 similarly requires consideration of conflicts with farm and forest uses and practices.

The rural resource designation method that has been used by counties does not require these findings. Demonstrating general compliance with Goal 3 and Goal 4 may partially address impacts to neighboring farm and forest operations but it typically does not provide the level of detail that is currently required for approving conditional uses in EFU and forest zones.

Impacts to Urban Areas

Rural resource land designations may currently occur within urban reserves surrounding UGBs. Establishing new rural resource areas in close proximity to urban areas may provide some benefits when compared to isolated development (e.g. more efficient access to public services). However, such designations may interfere with the orderly and efficient development of urban areas if they are located within urban reserves. Urban reserves are intended for future UGB expansions and rural development in those areas may negatively affect the ability of cities to efficiently plan those lands for urban use following UGB expansion.

Additionally, most Oregon cities have not adopted urban reserves, and thus expand onto rural exception lands or farm and forest lands when adding to their UGBs. Allowing additional development associated with rural resource lands within close proximity to an existing UGB may hinder the ability of a city to expand its UGB in the most efficient manner possible when needed to assure a 20-year supply of urban land. Therefore, it may be appropriate to limit new development on rural resource lands within a certain distance from an existing UGB boundary.

Energy Use

Statewide Planning Goal 13 (Energy Conservation) is primarily concerned with conserving energy through proper land use planning. Goal 13 guidelines discuss promoting energy efficient development, reuse of vacant land, minimizing use of nonrenewable energy sources, and increasing density along high capacity transportation corridors.

Rural resource designations may conflict with Goal 13 when located in isolated rural areas. Isolated development may require an increase in vehicle miles traveled, inefficient extensions of energy facilities, and overall lacks the energy efficient compact design allowed in UGBs. Consideration of energy impacts is necessary when designating rural resource areas to ensure these impacts are minimized.

[43] ORS 215.296, OAR 660-033-0130(5) and OAR 660-006-0025(5)

Impacts to State or Local Transportation Facilities
Rural resource designations have potential to increase traffic on state and local roads and may even utilize private roads for access. Evaluating potential impacts to transportation systems is vitally important for public safety and is a consideration in determining the fiscal impacts of development which are associated with needed transportation facilities. Counties have adopted road standards which may dictate when a traffic impact study is required and requirements for road improvements. Counties have also adopted fire safety design standards for roads to ensure that adequate access is provided for firefighting equipment, although these standards may not apply outside of forest and mixed farm-forest zones. The application of county road and fire standards, in conjunction with consideration with the fiscal impact of rural resource land development, would help ensure that development on rural resource lands benefits counties and future landowners.

Impacts to Other Public Facilities
Rural resource designations also have the potential to increase other public facilities costs on a myriad of public services, such as fire protection, primary and secondary schools, public water service (in areas within special districts providing water service), storm runoff, and waste disposal. It is unclear how a local government would include such considerations in its analysis of carrying capacity issues.

Conclusions and Policy Options

This report provides a summary of issues pertinent to rural resource lands policy. The report documents the availability of spatial data that can be utilized at a statewide scale and highlights areas where additional data would be useful. DLCD intends to utilize the report as a basis for future research and possible rulemaking.

Regulatory application of geospatial data is challenging due to unavoidable statewide data gaps and scale limitations on the use of data. Also there are frequent updates to datasets which restrict the ability to utilize current data when relying on static date references in statute and rule. Perfect data is never an option. Policy development should consider the best available data, focus on development of new data where essential, and recognize that some issues can only be addressed upon consideration of local conditions.

Prior to 2017, DLCD began discussions with a few key stakeholders regarding rural resource policy. During the preparation of this paper, several parties expressed interest in the rural resource lands issue but, due to DLCD capacity, only a select few public agencies were able to provide input on the contents of this report. If further work on this issue is pursued, the department and commission should begin broader outreach on this issue to ensure citizen involvement. Further discussion of these issues could occur during a formal rulemaking advisory committee. However, it may be more appropriate to continue less formal discussions using this report as a reference document. Additional discussions would be most profitable if there were a set timeline for reaching conclusions and proceeding with a formal rulemaking process.

Discussion of Policy/Tool Options

Below are several policy options or tools which the department and commission could use to address rural resource lands. The department will be reviewing these policy options before presenting any recommendations for future work on this issue to the commission.

Pursue additional research

The department could conduct additional research on several aspects of the rural resource lands issue. Prioritized recommendations for further research include:

- *Citizen involvement*: Undertake stakeholder engagement process to solicit and integrate stakeholder input to bolster implementation feasibility.
- *Eastern Oregon grazing*: Develop eastside forage threshold data to delineate farm and/or forest zones from rural resource zones. However, this is complicated because grazing requires an extensive land base to sustain an economically viable operation. Animals are rotated among a variety of land types based on changing environmental conditions such as weather, forage, topography, and season. Thus, lands with less capable soils and water constraints often play a crucial role in ranchlands management.
- *Economic considerations*: ORS 215.791 requires consideration of the costs of public facilities and services and impacts to government fiscal health in designating rural resource lands.[44] A methodology for performing this analysis would help the state and counties better understand the impacts of rural resource designations.
- *Cumulative impacts*: Research cumulative impacts of development patterns on agriculture, forestry, water quality/quantity, fish and wildlife, and/or costs of public services/infrastructure.
- *Future potential resource uses:* It is critical to note that the agricultural economy is in a state of constant evolution, especially recently with expanding technologies, emerging markets and trends, and a changing climate. A significant example is seen in the Oregon's now booming viticulture industry taking hold in soils and landscapes once thought to be agriculturally insignificant and unproductive. Aside from valuable agricultural industries, these lands could be important for renewable energy resource production such as solar arrays for energy capture as well as biomass production from current invasive species (e.g., western juniper). Further research should be done to determine what burgeoning technologies and markets are on the horizon for which rural resource lands could be used.
- *Natural resource considerations:* Work with ODFW and other natural resource management agencies to determine how to best integrate their data for policy implementation. ODFW is continuing to develop geospatial data at more refined scales to support regional land use planning, which can be evaluated for updates to Goal 5

[44] ORS 215.791

acknowledged inventories. In addition, ODFW and DLCD could evaluate opportunities to enhance conservation values on lands subject to rural resource designation.

- *Climate change considerations:* Carbon sequestration is a contributor to keeping excess carbon-based greenhouse gases out of our atmosphere. Forest and agricultural lands provide a unique opportunity to withdraw atmospheric carbon through biological sequestration in soil and biomass carbon sinks.[45] Forests, particularly, play a crucial role in sequestering carbon—with U.S. forests offsetting approximately 10 to 20 percent of the nation's carbon emissions from burning fossil fuels annually.[46] Consideration of carbon storage opportunities may be beneficial in evaluating rural resource lands.
- *Ecosystem service valuation:* Ecosystem service valuation refers to the financial value of the measurable productivity of natural systems.[47] Ecosystem service valuation provides tools for decision-makers and policy-makers to evaluate management implications through rate of return on investment calculations and cost-benefit analyses of potential policies. There is an evolving understanding worldwide that the value of ecosystems increasingly can and should be taken into account in land use planning, yet efforts to do so are in their infancy.[48] Currently, ecosystem service valuation is primarily enacted through markets and payments for ecosystem services (PES) such as sulfur dioxide trading, wetlands mitigation banking, and nutrient trading. Research should be done to determine how ecosystem service valuation can be integrated into Oregon's land use planning system and how it can be applied to rural resource lands.
- *Irrigation districts:* The current OWRD irrigation district GIS data layer could be updated to provide statewide coverage.

Rulemaking

Require the process in ORS 215.788-794 to be used for all rural resource land designations.

As previously mentioned, this process currently exists and provides a thorough framework for review of rural resource lands by requiring a more comprehensive evaluation of the carrying capacity of potential rural resource lands, an assessment of impacts to the cost of public facilities or services, and includes direct DLCD involvement. This option would most likely require an amendment to rule with a potential need for an amendment to statute to update the current reference to the 2006 Oregon Conservation Strategy in ORS 215.791 to the 2016 version. It may be necessary to clarify whether the entire county needs to be evaluated or only a

[45] United States Department of Agriculture Economic Research Service. "Agriculture and Climate Change." <https://www.ers.usda.gov/topics/natural-resources-environment/climate-change/agriculture-and-climate-change/>.
[46] Oregon Forest Resources Institute. "Forests, carbon and climate change." <https://oregonforests.org/Carbon_Capture>.
[47] Davis, A. I. "Ecosystem Services and The Value of Land." *Duke Environmental Law and Policy Forum*. 20. <https://scholarship.law.duke.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1045&context=delpf>.
[48] Goldstein, J. H., Caldarone, G., Duarte, T. K., et al. (2012). "Integrating ecosystem-service tradeoffs into land-use decisions." *Proceedings of the National Academy of Sciences of the United States of America*. (2012) <https://www.pnas.org/content/109/19/7565>.

portion of the county. In addition, it may be necessary to adopt further rules to define or clarify statutory requirements.

Develop additional rule requirements for rural resource land designations that do not utilize the process in ORS 215.788-794.

Under this option, land could still be designated rural resource if it did not meet the definitions of agricultural and forest land. Rulemaking could clarify undefined terms in rule, establish new standards and criteria regarding which rural lands are eligible for redesignation, and address carrying capacity issues. Possible amendments include:

- Further defining land that is suitable for agriculture. This could include:
  - Land suitable for grazing
  - High-value farmland portions of the American Viticultural Areas identified in ORS 195.300.
  - Land in an irrigation district or place of use for agricultural water
  - Prime or unique farmland

- Further defining "Other forested lands that maintain soil, air, water and fish and wildlife resources" in OAR 660-006-0005(7).

- Further addressing areas important to fish and wildlife. This could potentially require a Goal 5 update before designating rural resource lands, or use of current ODFW data and/or consultation with ODFW for site-specific evaluations.

- Addressing carrying capacity issues discussed in this report such as natural hazards, groundwater impacts, and cost of services.

- Consideration of cumulative impacts of rural resource designations, and other surrounding development, on agriculture, forestry, and wildlife.

<u>Provide guidance to counties</u>

Rural resource lands has long been an interest of local planners. Considering current development pressures, giving additional guidance at the state level could be of assistance to counties as they develop land use planning policy. A rural lands guidance document could be provided to counties could offer clarity regarding methodology and criteria for rezoning resource lands in to a new Rural Resource Lands zone. The document could provide an outline of recommendations for how to identify and appropriately develop Rural Resource Land. This type of document could be used to supplement new rulemaking or provide guidance on the current rural resource framework. However, the positive impact of a guidance document using the current framework may be limited, especially where vague language exists in state rule.

Appendix

Appendix A: Oregon Revised Statutes related to Rural Resource Lands

215.304 Rule adoption; limitations. (1) The Land Conservation and Development Commission shall not adopt or implement any rule to identify or designate small-scale farmland or secondary land.

(2) Amendments required to conform rules to the provisions of subsection (1) of this section and ORS 215.700 to 215.780 shall be adopted by March 1, 1994.

(3) Any portion of a rule inconsistent with the provisions of ORS 197.247 (1991 Edition), 215.213, 215.214 (1991 Edition), 215.288 (1991 Edition), 215.317, 215.327 and 215.337 (1991 Edition) or 215.700 to 215.780 on March 1, 1994:

(a) Shall not be implemented or enforced; and

(b) Has no legal effect.

(4) Notwithstanding subsection (3) of this section, the uses authorized by ORS 215.283 (1)(x) or (2)(n) may be established on land in exclusive farm use zones, including high-value farmland. [1993 c.792 §28; 2001 c.672 §19; 2012 c.74 §4]

(NOTE: This section was added in 1993 following LCDC adoption of "secondary lands" rules, which were effectively repealed.)

215.316 Termination of adoption of marginal lands. (1) Unless a county applies the provisions of ORS 215.705 to 215.730 to land zoned for exclusive farm use, a county that adopted marginal lands provisions under ORS 197.247 (1991 Edition), 215.213, 215.214 (1991 Edition), 215.288 (1991 Edition), 215.317, 215.327 and 215.337 (1991 Edition) may continue to apply those provisions. After January 1, 1993, no county may adopt marginal lands provisions.

(2) If a county that had adopted marginal lands provisions before January 1, 1993, subsequently sites a dwelling under ORS 215.705 to 215.750 on land zoned for exclusive farm use, the county shall not later apply marginal lands provisions, including those set forth in ORS 215.213, to lots or parcels other than those to which the county applied the marginal lands provisions before the county sited a dwelling under ORS 215.705 to 215.750. [1993 c.792 §29]

(NOTE: Marginal lands designations are only allowed in Lane and Washington counties. Land uses allowed in Exclusive Farm Use zones for those counties are found in ORS 215.213 while the rest of the state uses 215.283.)

215.788 Legislative review of lands zoned for farm and forest use; criteria. (1) For the purposes of correcting mapping errors made in the acknowledgment process and updating the designation of farmlands and forestlands for land use planning, a county may conduct a legislative review of lands in the county to determine whether the lands planned and zoned for

farm use, forest use or mixed farm and forest use are consistent with the definitions of "agricultural lands" or "forest lands" in goals relating to agricultural lands or forestlands.

(2) A county may undertake the reacknowledgment process authorized by this section only if the Department of Land Conservation and Development approves a work plan, from the county, describing the expected scope of reacknowledgment. The department may condition approval of a work plan for reacknowledgment under this section to reflect the resources needed to complete the review required by ORS 197.659 and 215.794. The work plan of the county and the approval of the department are not final orders for purposes of review.

(3) A county that undertakes the reacknowledgment process authorized by this section shall provide an opportunity for all lands planned for farm use, forest use or mixed farm and forest use and all lands subject to an exception under ORS 197.732 to a goal relating to agricultural lands or forestlands to be included in the review.

(4) A county must plan and zone land reviewed under this section:

(a) For farm use if the land meets the definition of "agricultural land" in a goal relating to agricultural lands;

(b) For forest use if the land meets the definition of "forest land" used for comprehensive plan amendments in the goal relating to forestlands;

(c) For mixed farm and forest use if the land meets both definitions;

(d) For nonresource use, consistent with ORS 215.794, if the land does not meet either definition; or

(e) For a use other than farm use or forest use as provided in a goal relating to land use planning process and policy framework and subject to an exception to the appropriate goals under ORS 197.732 (2).

(5) A county may consider the current land use pattern on adjacent and nearby lands in determining whether land meets the appropriate definition. [2009 c.873 §5]

Note: 215.788 to 215.794 were enacted into law by the Legislative Assembly but were not added to or made a part of ORS chapter 215 or any series therein by legislative action. See Preface to Oregon Revised Statutes for further explanation.

215.791 Review of nonresource lands for ecological significance; inventory and protection of ecologically significant nonresource lands; criteria. (1) If a county amends its comprehensive plan or a land use regulation mapping zoning designations under ORS 215.788 to 215.794, the county shall review lands that are planned or rezoned as nonresource lands to determine whether the lands contain ecologically significant natural areas or resources. The county shall consider appropriate goals and the "Oregon Conservation Strategy" prepared in September of 2006 by the State Department of Fish and Wildlife.

(2) The county shall maintain an inventory in the comprehensive plan of nonresource lands that contain ecologically significant natural areas or resources and establish a program to

protect the areas or resources from the adverse effects of new uses allowed by the planning or zoning changes. The county may use nonregulatory programs to protect the resources including, but not limited to, programs for the transfer of severable development interests to other lands that do not contain ecologically significant resources.

(3) If a county amends its comprehensive plan or a land use regulation mapping zoning designations under ORS 215.788 to 215.794, the county shall review lands that are planned or rezoned as nonresource lands to determine that the uses allowed by the planning or zoning changes are consistent with the carrying capacity of the lands. The county shall ensure that:

(a) The amount, type, location and pattern of development on lands redesignated as nonresource lands:

(A) Will be rural in character and will not significantly interfere with orderly and efficient development of urban areas in the vicinity;

(B) Will not significantly conflict with existing or reasonably foreseeable farm or forest uses or with accepted farm or forest practices; and

(C) Will not lead to significant adverse effects including, but not limited to, adverse effects on:

(i) Water quality or the availability or cost of water supply;

(ii) Energy use;

(iii) State or local transportation facilities;

(iv) Fish or wildlife habitat or other ecologically significant lands;

(v) The risk of wildland fire or the cost of fire suppression;

(vi) The cost of public facilities or services; or

(vii) The fiscal health of a local government.

(b) Additional residential development on nonresource lands is, to the extent practicable, located and clustered to:

(A) Minimize the effects on farm and forest uses;

(B) Avoid lands subject to natural hazards; and

(C) Reduce the costs of public facilities and services. [2009 c.873 §6]

Note: See note under 215.788.

215.794 Review of county rezoning designations; rules. (1) A county shall submit decisions on planning and rezoning designations under ORS 215.788 to 215.794 to the Department of Land Conservation and Development for review pursuant to the procedures set forth in this section and ORS 197.659.

(2) The department shall coordinate with:

(a) The State Department of Agriculture in reviewing decisions on planning and rezoning designations for lands planned for farm use or mixed farm and forest use.

(b) The State Forestry Department in reviewing decisions on planning and rezoning designations for lands planned for forest use or mixed farm and forest use.

(3) The Land Conservation and Development Commission has exclusive jurisdiction for review of a county's decision made under ORS 215.788 to 215.794.

(4) A person who participated in the proceedings leading to the county's decisions under ORS 215.788 to 215.794 may not raise an issue on review before the commission that was not raised in the local proceedings.

(5) The commission may adopt rules implementing ORS 215.788 to 215.794. [2009 c.873 §7]

Note: See note under 215.788.

Appendix B: Oregon Administrative Rules related to Rural Resource Lands

Agricultural Lands (OAR Chapter 660, Division 33)

660-033-0020
Definitions

(1)(a) "Agricultural Land" as defined in Goal 3 includes:

(A) Lands classified by the U.S. Natural Resources Conservation Service (NRCS) as predominantly Class I-IV soils in Western Oregon and I-VI soils in Eastern Oregon;

(B) Land in other soil classes that is suitable for farm use as defined in ORS 215.203(2)(a), taking into consideration soil fertility; suitability for grazing; climatic conditions; existing and future availability of water for farm irrigation purposes; existing land use patterns; technological and energy inputs required; and accepted farming practices; and

(C) Land that is necessary to permit farm practices to be undertaken on adjacent or nearby agricultural lands.

(b) Land in capability classes other than I-IV/I-VI that is adjacent to or intermingled with lands in capability classes I-IV/I-VI within a farm unit, shall be inventoried as agricultural lands even though this land may not be cropped or grazed;

(c) "Agricultural Land" does not include land within acknowledged urban growth boundaries or land within acknowledged exception areas for Goal 3 or 4.

660-033-0030
Identifying Agricultural Land

(1) All land defined as "agricultural land" in OAR 660-033-0020(1) shall be inventoried as agricultural land.

(2) When a jurisdiction determines the predominant soil capability classification of a lot or parcel it need only look to the land within the lot or parcel being inventoried. However, whether land is "suitable for farm use" requires an inquiry into factors beyond the mere identification of scientific soil classifications. The factors are listed in the definition of agricultural land set forth at OAR 660-033-0020(1)(a)(B). This inquiry requires the consideration of conditions existing outside the lot or parcel being inventoried. Even if a lot or parcel is not predominantly Class I-IV soils or suitable for farm use, Goal 3 nonetheless defines as agricultural "Lands in other classes which are necessary to permit farm practices to be undertaken on adjacent or nearby lands." A determination that a lot or parcel is not agricultural land requires findings supported by substantial evidence that addresses each of the factors set forth in 660-033-0020(1).

(3) Goal 3 attaches no significance to the ownership of a lot or parcel when determining whether it is agricultural land. Nearby or adjacent land, regardless of ownership, shall be examined to the extent that a lot or parcel is either "suitable for farm use" or "necessary to permit farm practices to be undertaken on adjacent or nearby lands" outside the lot or parcel.

(4) When inventoried land satisfies the definition requirements of both agricultural land and forest land, an exception is not required to show why one resource designation is chosen over another. The plan need only document the factors that were used to select an agricultural, forest, agricultural/forest, or other appropriate designation.

(5)(a) More detailed data on soil capability than is contained in the USDA Natural Resources Conservation Service (NRCS) soil maps and soil surveys may be used to define agricultural land. However, the more detailed soils data shall be related to the NRCS land capability classification system.

(b) If a person concludes that more detailed soils information than that contained in the Web Soil Survey operated by the NRCS, would assist a county to make a better determination of whether land qualifies as agricultural land, the person must request that the department arrange for an assessment of the capability of the land by a professional soil classifier who is chosen by the person, using the process described in OAR 660-033-0045.

(c) This section and OAR 660-033-0045 apply to:

(A) A change to the designation of a lot or parcel planned and zoned for exclusive farm use, forest use or mixed farm-forest use to a nonresource plan designation and zone on the basis that such land is not agricultural land; and

(B) Excepting land use decisions under section (7) of this rule, any other proposed land use decision in which more detailed data is used to demonstrate that a lot or parcel planned and zoned for exclusive farm use does not meet the definition of agricultural land under OAR 660-033-0020(1)(a)(A).

(d) This section and OAR 660-033-0045 implement ORS 215.211, effective on October 1, 2011. After this date, only those soils assessments certified by the department under section (9) of this rule may be considered by local governments in land use proceedings described in subsection (c) of this section. However, a local government may consider soils assessments that have been completed and submitted prior to October 1, 2011.

(e) This section and OAR 660-033-0045 authorize a person to obtain additional information for use in the determination of whether a lot or parcel qualifies as agricultural land, but do not otherwise affect the process by which a county determines whether land qualifies as agricultural land as defined by Goal 3 and OAR 660-033-0020.

(6) Any county that adopted marginal lands provisions before January 1, 1993, may continue to designate lands as “marginal lands” according to those provisions and criteria in former ORS 197.247 (1991), as long as the county has not applied the provisions of ORS 215.705 to 215.750 to lands zoned for exclusive farm use.

(7)(a) For the purposes of approving a land use application on high-value farmland under ORS 215.705, the county may change the soil class, soil rating or other soil designation of a specific lot or parcel if the property owner:

(A) Submits a statement of agreement from the NRCS that the soil class, soil rating or other soil designation should be adjusted based on new information; or

(B) Submits a report from a soils scientist whose credentials are acceptable to the Oregon Department of Agriculture that the soil class, soil rating or other soil designation should be changed; and

(C) Submits a statement from the Oregon Department of Agriculture that the Director of Agriculture or the director’s designee has reviewed the report described in paragraph (a)(B) of this section and finds the analysis in the report to be soundly and scientifically based.

(b) Soil classes, soil ratings or other soil designations used in or made pursuant to this section are those of the NRCS Web Soil Survey for that class, rating or designation, except for changes made pursuant to subsection (a) of this section.

(8) For the purposes of approving a land use application on high-value farmland under OAR 660-033-0090, 660-033-0120, 660-033-0130 and 660-033-0135, soil classes, soil ratings or other soil designations used in or made pursuant to this definition are those of the NRCS Web Soil Survey for that class, rating or designation.

Forest Lands (OAR Chapter 660, Division 6)

660-006-0005
Definitions

(7) “Forest lands” as defined in Goal 4 are those lands acknowledged as forest lands, or, in the case of a plan amendment, forest lands shall include:

(a) Lands that are suitable for commercial forest uses, including adjacent or nearby lands which are necessary to permit forest operations or practices; and

(b) Other forested lands that maintain soil, air, water and fish and wildlife resources.

660-006-0010
Identifying Forest Land

(1) Governing bodies shall identify “forest lands” as defined by Goal 4 in the comprehensive plan. Lands inventoried as Goal 3 agricultural lands, lands for which an exception to Goal 4 is justified pursuant to ORS 197.732 and taken, and lands inside urban growth boundaries are not required to planned and zoned as forest lands.

(2) Where a plan amendment is proposed:

(a) Lands suitable for commercial forest uses shall be identified using a mapping of average annual wood production capability by cubic foot per acre (cf/ac) as reported by the USDA Natural Resources Conservation Service. Where NRCS data are not available or are shown to be inaccurate, other site productivity data may be used to identify forest land, in the following order of priority:

(A) Oregon Department of Revenue Western Oregon site class maps;

(B) USDA Forest Service plant association guides; or

(C) Other information determined by the State Forester to be of comparable quality.

(b) Where data of comparable quality under paragraphs (2)(a)(A) through (C) are not available or are shown to be inaccurate, an alternative method for determining productivity may be used as described in the Oregon Department of Forestry’s Technical Bulletin entitled “Land Use Planning Notes, Number 3 April 1998, Updated for Clarity April 2010.”

(c) Counties shall identify forest lands that maintain soil air, water and fish and wildlife resources.

Appendix C: Full-Size Maps

Figure 1: Exclusive Farm Use, Forest, and Mixed Farm-Forest Zoning on Non-Federal Lands

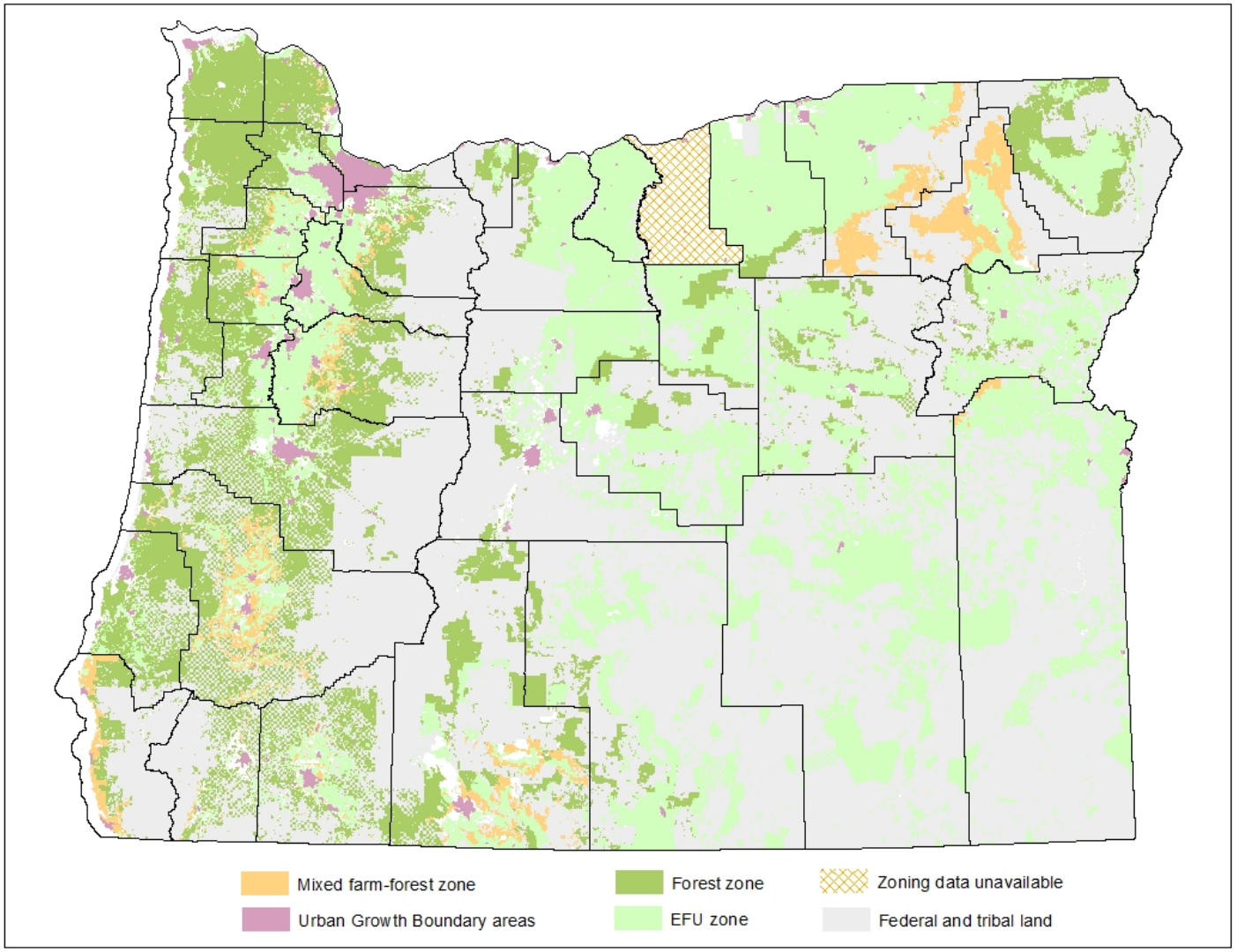


Figure 2: NRCS Agricultural Capability Classes on Non-Federal Lands

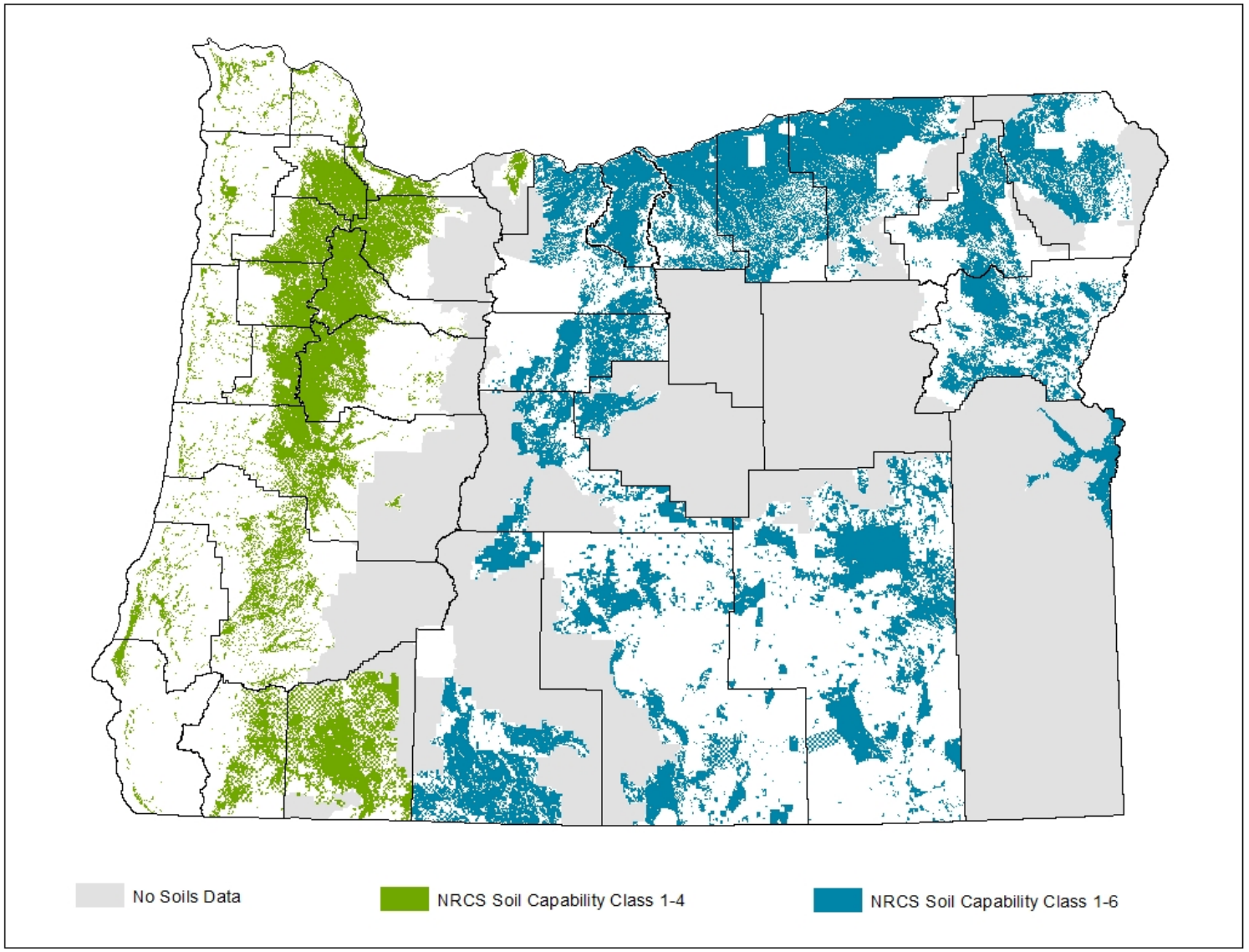


Figure 3: Animal Unit Months (AUMs) for Western Oregon on Non-Federal Lands

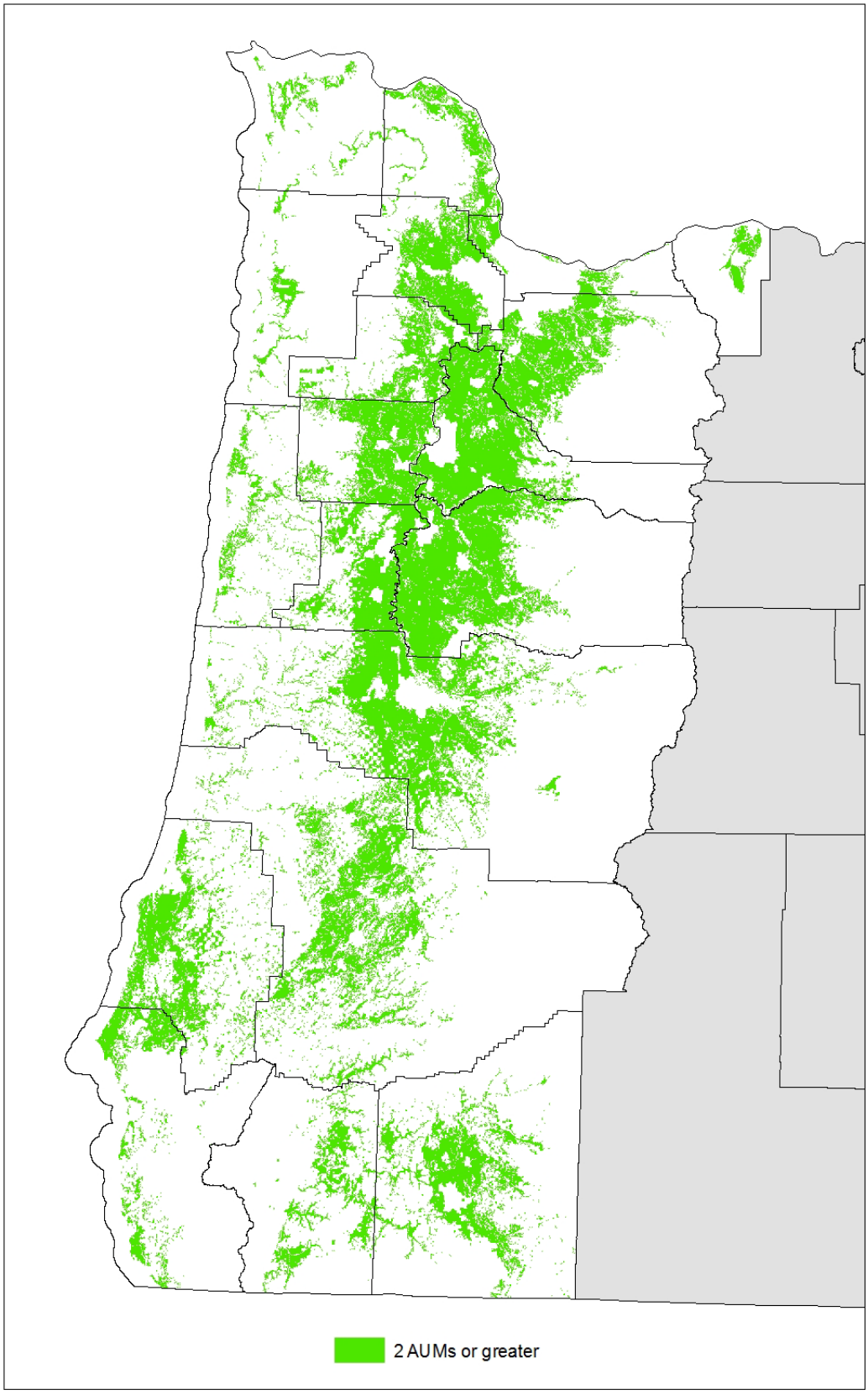


Figure 4: Non-Federal Forest Lands Derived from NRCS, DOR, and Historic Vegetation Data

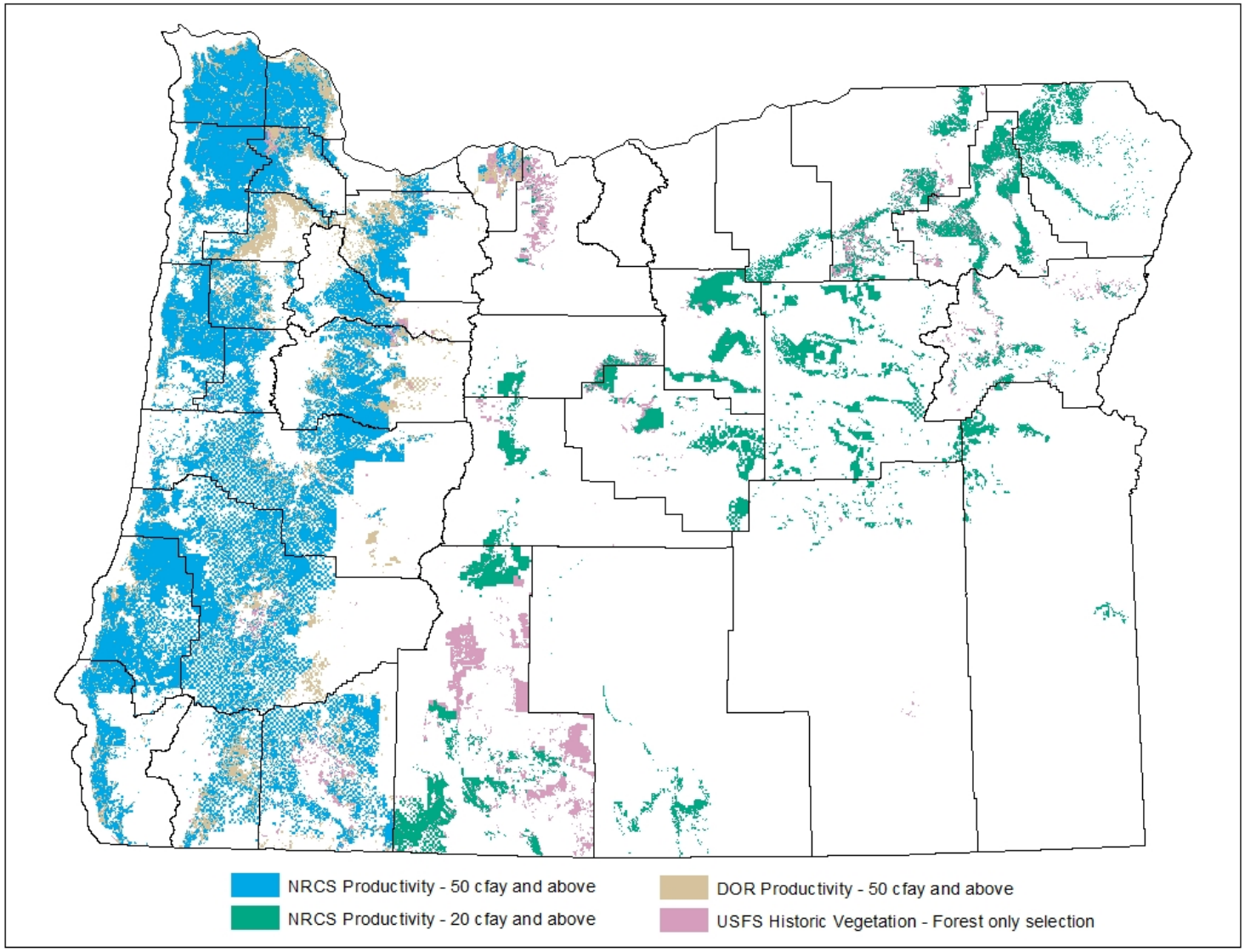


Figure 5: Conservation Opportunity Areas and Sage Grouse Habitat

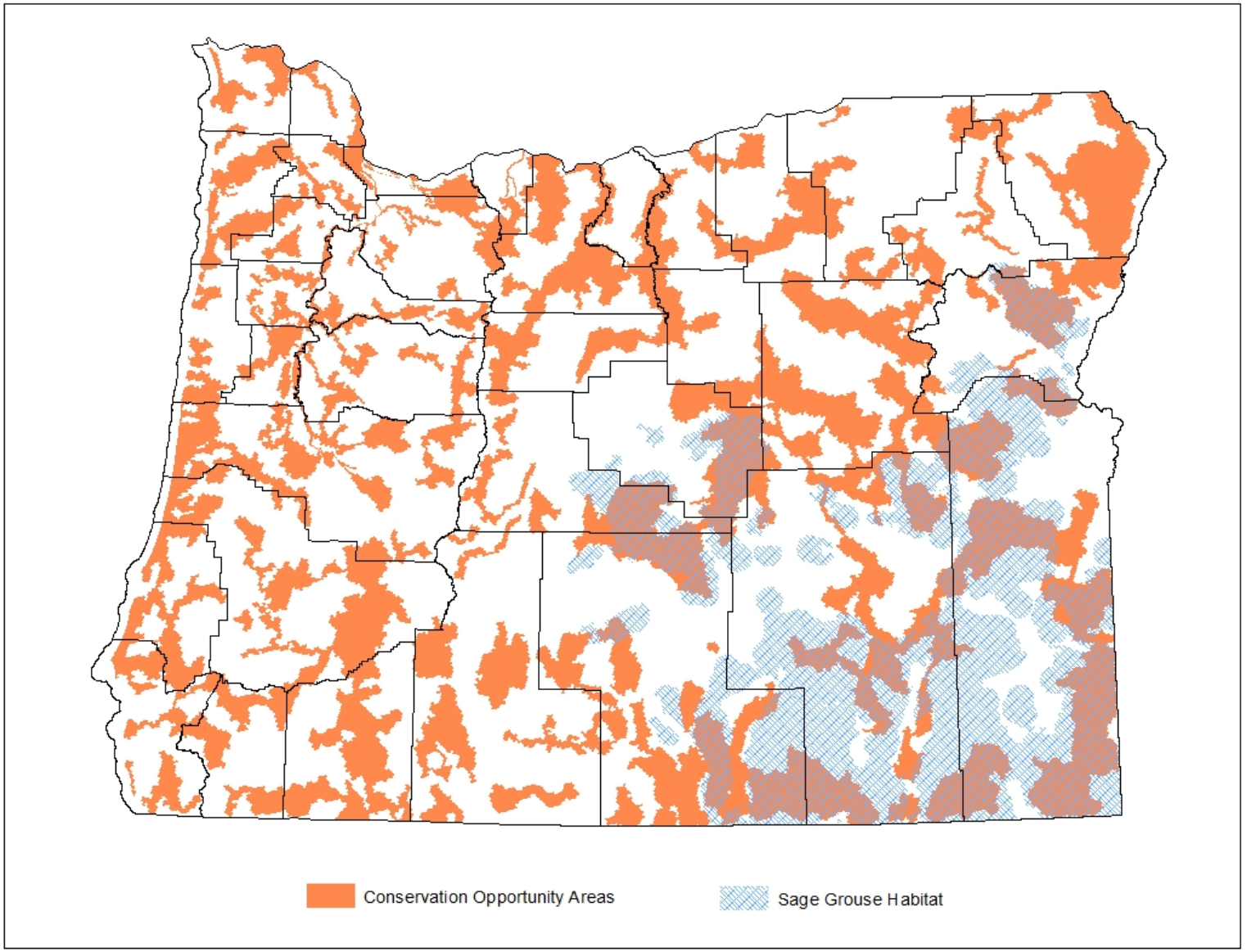


Figure 6: Groundwater Management Areas and Groundwater Restricted Areas

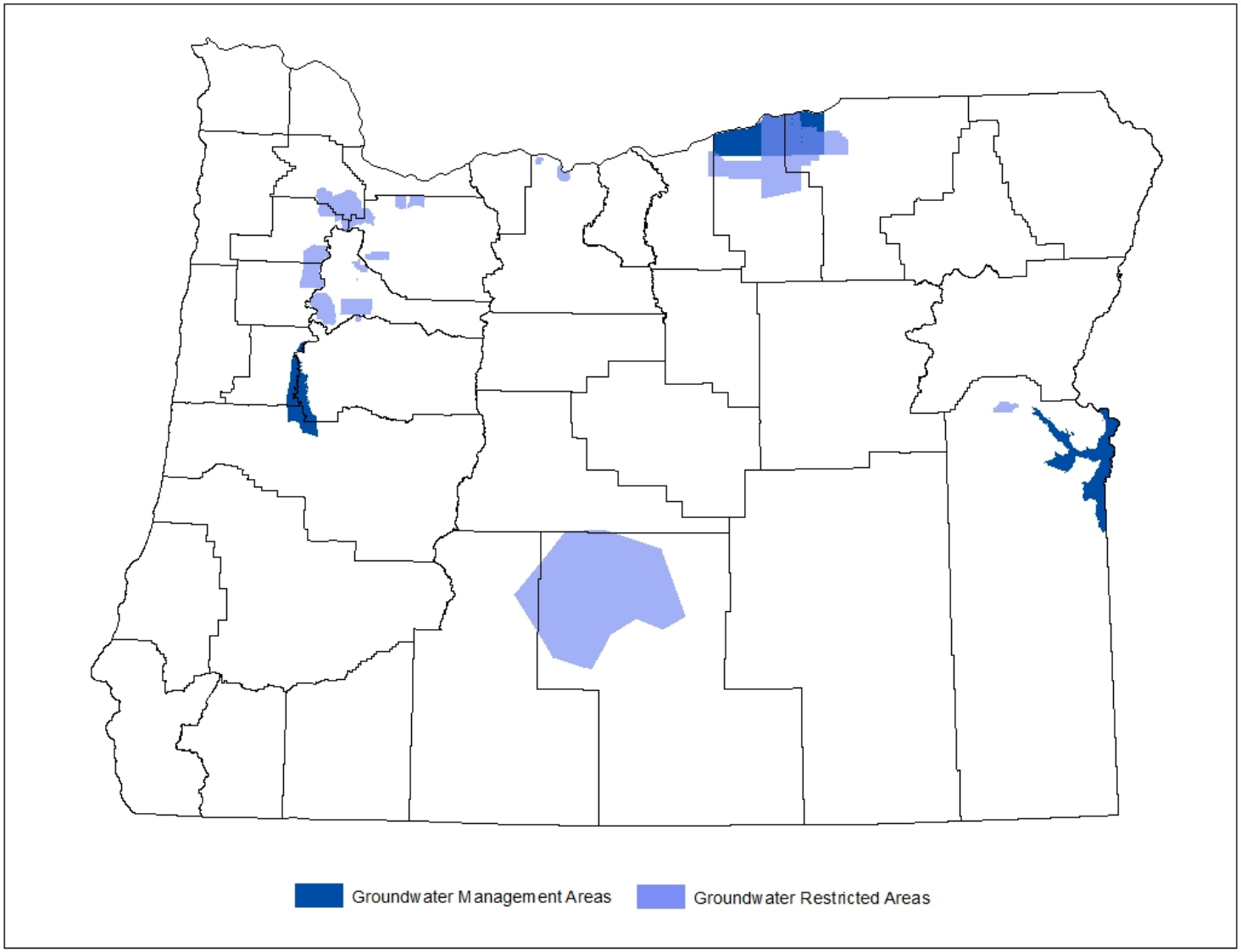


Figure 7: Overall Wildfire Risk

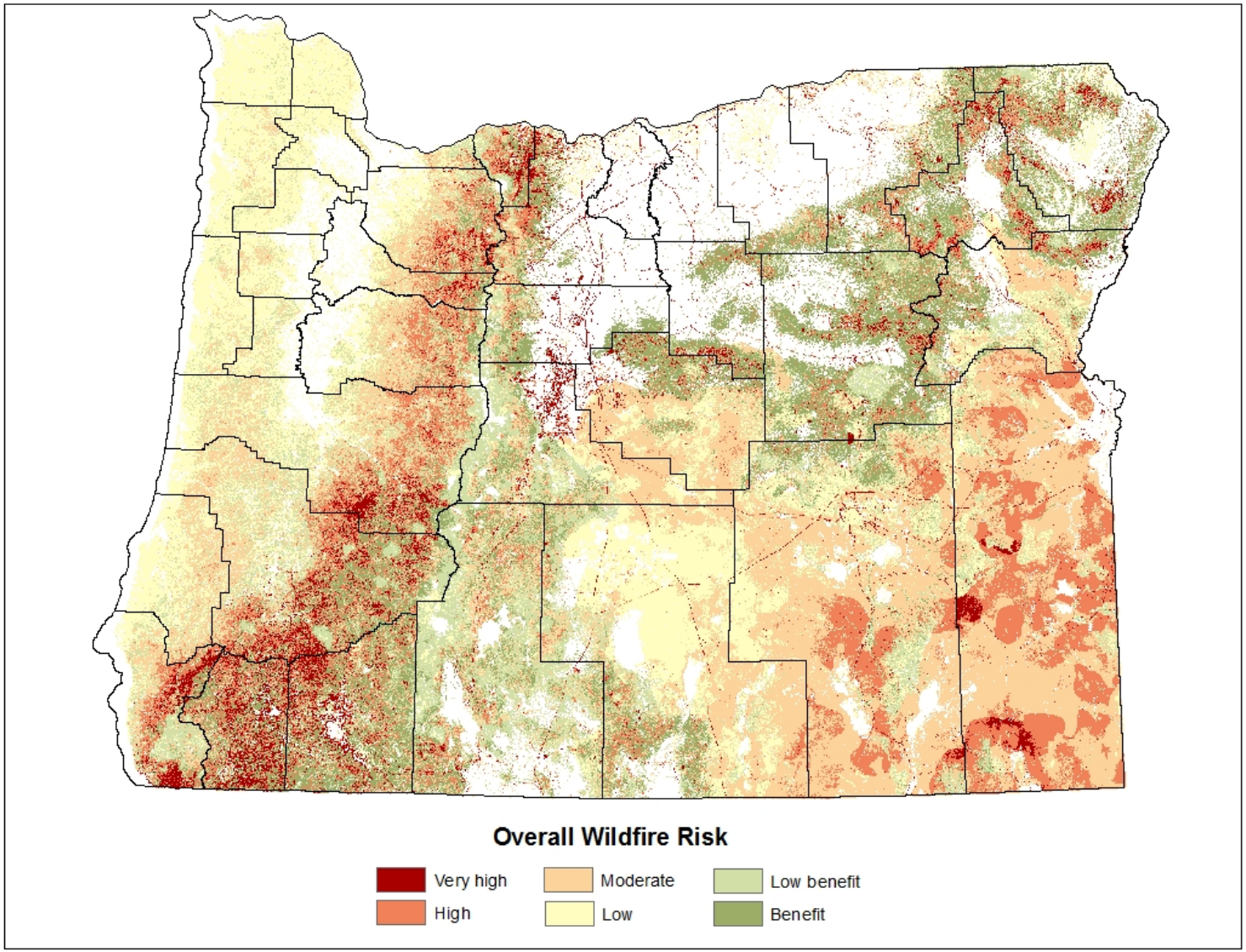


Figure 8: Special Flood Hazard Area

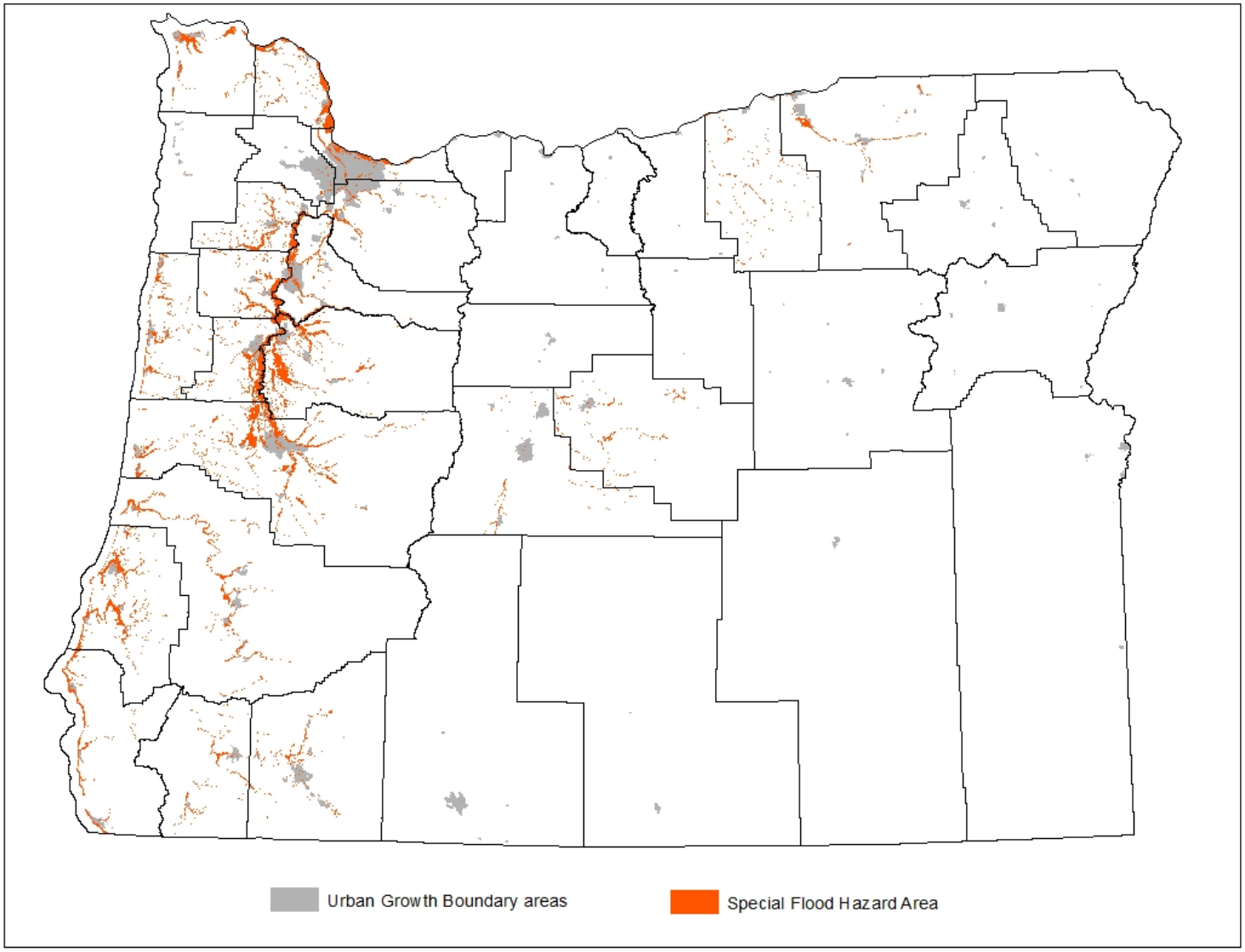


Figure 9: Landslide Susceptibility