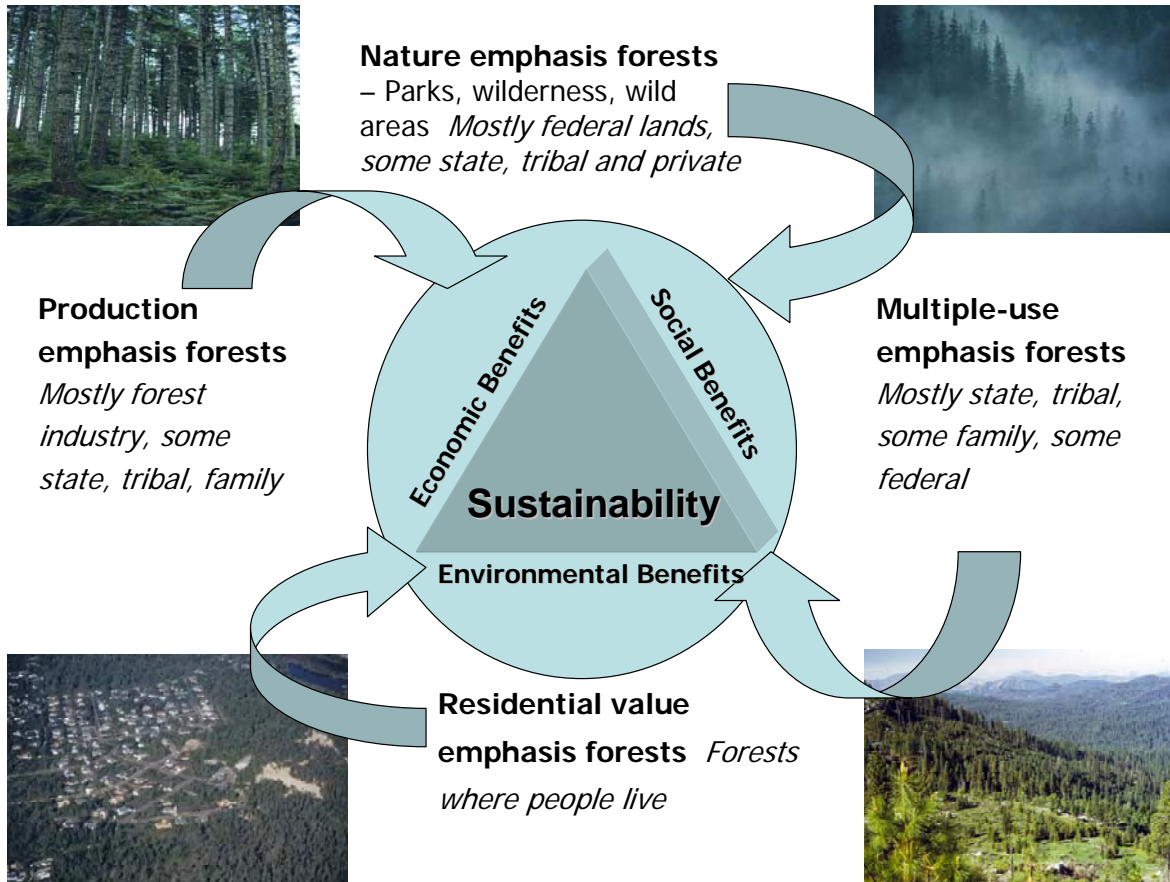


Criteria for Consideration of Forestlands within Future Rural Reserves



Prepared by the Oregon Department of Forestry
January 29, 2008

Version 1.4

Overview

Metro, the regional government serving the Portland metropolitan region, asked the Oregon Department of Forestry (ODF) to provide recommendations for criteria that would be useful in considering what forest and natural resource lands might be best included in “rural reserves.” Senate Bill 1011, enacted by the 2007 Legislature, enables Metro and local counties to designate rural reserves in order to determine where the Portland metropolitan region will — and will not — expand to accommodate population and employment growth over the next 40 to 50 years. The legislation directs the Land Conservation and Development Commission (LCDC) to adopt rules to implement the new statutes no later than Jan. 31, 2008. “Rural reserve” means land reserved to provide long-term protection for agriculture, forestry or important natural landscape features that limit urban development or help define appropriate natural boundaries of urbanization, including plant, fish and wildlife habitat, steep slopes and floodplains.

The ODF recognizes that Metro has a challenging task of balancing competing and sometimes conflicting uses as it implements its land use plan. The Oregon Board of Forestry has established as one of its seven major objectives an objective of maintaining a productive forestland base. ODF and the Board support Metro’s policies that will assist long-term viable commercial Forestry operations. However, in promoting Metro’s policies it is important to consider the regional and statewide context to avoid limits placed on growth in the Metro region being transferred as development to other parts of Oregon’s forested landscape.

The Board of Forestry’s and Department’s goals with regard to land use are to:

1. Maintain the state’s total forest land base to provide the multitude of forest benefits – social, environmental, and economic – desired by Oregonians,
2. Maintain the productivity of the forest land base with the continuous growing and harvesting of forest tree species as the leading use on private lands subject to the protection of soil, air, water, and fish and wildlife values,
3. Promote active management of Oregon’s forests by limiting conflicts to the commercial management of forestland for forest uses created by the siting of dwellings, related improvements and non-forest uses on forest land,
4. Reduce the costs and conflicts related to fire prevention and suppression caused by siting dwellings and related improvements on forest lands.
5. Encourage thoughtful planning and oversight of development activities that convert forestlands to non-forest uses.

“Metro” refers to the area under the jurisdiction of the Metro Regional government and for the purposes of this report includes the entire land area found in Clackamas, Multnomah, and Washington Counties. To maintain production of the full range of benefits that forests provide (clean water, fish and wildlife habitat, lumber and other wood products, and other ecosystem services) the Oregon Progress Board Benchmarks and Oregon Indicators of Forest Sustainability target that 97.4 percent of Oregon’s nonfederal wildland forest remains in wildland forest in the year 2010.

At current rates of development, this target will be met statewide with 98.1 percent remaining in wildland forest in 2010. The Metro counties are not meeting these targets. In 2005, 95.8 percent of 1974 nonfederal wildland forest remained in wildland forest, and development of wildland forest continues.

The forest sector is a key traded sector in Oregon. The core forest sector groupings of Primary Products, Secondary Products and Forestry Services: Employ 85,600 people as of 2000 (4 percent of Oregon's total employment). Total direct and indirect jobs produced by the sector exceed 190,000—9 percent of total state employment because the industry has a relatively high job multiplier of 2.22 – for every person employed directly in the forest sector, another 1.22 jobs are supported elsewhere.

The forest sector accounts for a total industrial output of \$12.6 billion and wage income of \$3.5 billion (over 6 percent of the total output value of the state and 5 percent of Oregon's wage income). The Primary Products sector pays an average wage \$49,800—45 percent higher than the state's average wage of \$34,400. Competitive strengths noted by stakeholders include highly productive forests, a strong forestry infrastructure (westside), proximity to markets, and a tradition of environmental leadership, including land use laws protecting forest use.

Disadvantages cited include effects of reduced harvest, high cost of production and an unpredictable political climate. These factors have led to deterioration of forestry infrastructure east of the Cascades.

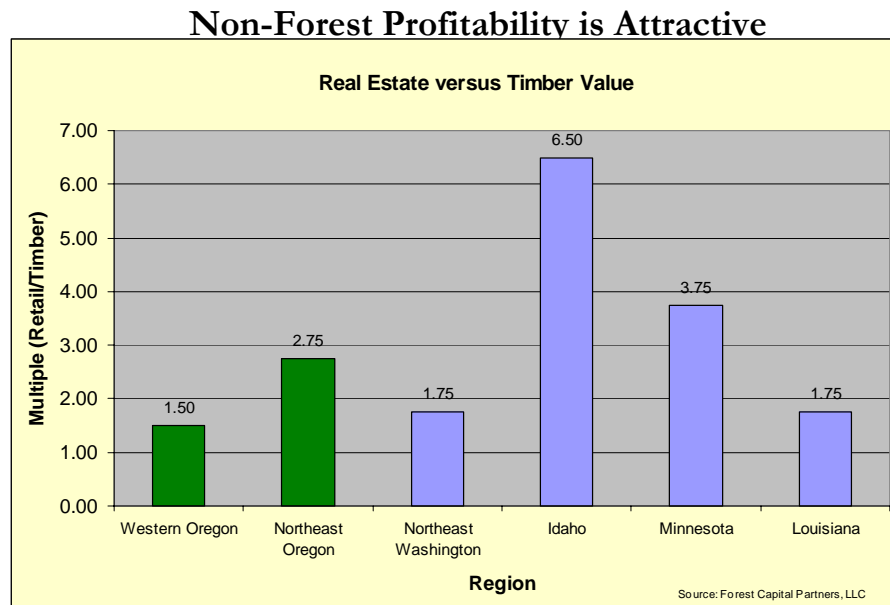
Clackamas and Washington County continue to play an important role in the state's timber harvest. Based upon 2006, Clackamas County ranked 14th and Washington County ranked 8th in the state in overall timber harvest. Clackamas and Washington Counties provided respectively 3.4 percent and 4.3 percent of the of the state's total 2006 harvest. Multnomah contributed just .3 percent of the state's timber 2006 harvest.

In addition to the economic contributions, forestlands disproportionately provide ecosystem service values, including wildlife habitat and high quality water. Forestlands also represent a range of public safety risks related to wildfire and rapidly moving landslides. These factors also pose risks to infrastructure and developed property.

In many instances, forestlands found in the Metro region operate as part of larger blocks of forestlands that include Columbia, Marion, and Yamhill counties.

I. Overarching Considerations in Considering Forestlands as Rural Reserves in the Metro Region

Across the country forestland values now often exceed timberland values. That is, the value of the land for its “highest and best use” is greater than its value as land used for the ongoing production of forest products. This is especially true for forestland in or near major urban centers and along major transportation corridors.



To protect forests, the economic values of forestland uses such as timber production must equal, or preferably surpass, the economic values of non-forest land uses such as residential use. “Working forests” is used to describe actively managed forestlands that sustain a combination of forest uses with an emphasis on timber products. Working forests are often part of the “working landscape” of farms and ranches—as well as parks and other green spaces that comprise the important components of a region’s natural mosaic.

Many states have drawn the conclusion that sustaining working forests is critically important and are implementing innovative policies to preserve working forests. Working forests provide a host of environmental and social benefits and have been described by some as critical components of a region’s “green infrastructure,” or natural life support system (Benedict and McMahon, 2002).

Population growth in Oregon is expected to remain higher than the national average. Working forests are figuring prominently in strategies to combat global climate change. Forests “play a major role in the global carbon cycle”—and in offsetting greenhouse gas

emissions (*Forests, Carbon and Climate Change, 2006*). Oregon forests per acre have among the highest potential for carbon storage in the world. Furthermore, research shows that the use of wood products also supports carbon sequestration, since these products not only store carbon but require less fossil fuel for their manufacture than other construction materials (for example, concrete). Thus, the opportunity to sequester atmospheric carbon may in fact prove to be a great motivation for preserving working forests.

This situation indicates that to successfully sustain forests, especially in urban regions, two critical elements need to be considered:

1. Social pressures that reduce the capacity of forestland to sustain timber production values will accelerate the conversion of working forests to other uses; and
2. Adding economic value for other ecosystem services provided by working forests is essential where non-forest (residential use) values exceed timberland values.

Considering these elements is especially critical since, unlike farmland, forestlands often produce income on a highly periodic and infrequent basis. Thus, risks that make future income less likely have major impacts on landowners' decisions to invest in working forest or make a conversion to other uses. This is particularly true for non-industrial lands.

What this basically means, is that in a setting like the Metro Region, simply using the land use system to designate forestlands as rural reserves will be unsuccessful. Success will require that the policies and designations in addition to limiting alternative land uses must include consideration of:

1. Increasing Working Forest Values by Improving Timber Resource Economics
2. Increasing Working Forest Values by Improving Non-Timber Resource Economics
3. Decreasing Alternative Land-Use Values by Compensate/Incentivize Landowners for Forgoing Fragmentation of conversion.

Innovative programs like Forest Legacy can be used to assist supporting forestlands. ODF is in the process of updating the Assessment of Need for the Forest Legacy Program.

II. Recommended Criteria for Evaluating Forestlands for Rural Reserves

1. Soils and operability
2. Zoning
3. Parcelization and ownership
4. Fragmentation
5. Existing land use conflicts
6. Wildfire risk

- 7. Landslide risk
- 8. Sensitive resource sites

Considerations in applying criteria:

1. Soils and operability

The physical ability of land to produce forest products is a key and dominant factor in any assessment. Quantity and quality of soils plays a significant role in the viability of forest production. Soils surveys are based on all the characteristics of soils, including climate, that influence their use and management. Interpretations are provided within soil surveys for various land uses, including forestry.

In general forest soils in northwest Oregon are highly capable of producing timber. Most soils rate above the standard for “high value forestland” established by ORS Chapter 195. **“High-value forestland”** means land that is in a forest zone or a mixed farm and forest zone that is located in western Oregon and composed predominantly of soils capable of producing more than 120 cubic feet per acre per year of wood fiber and that is capable of producing more than 5,000 cubic feet per year of commercial tree species. At 120 cubic feet per acre/year at least a 41 acre parcel would be needed to produce 5,000 cubic feet per year on an ownership.

Operability relates to road construction and harvesting conditions. Generally highly operable land includes soils with limited compaction risk and low to moderate slopes. This results in reduced logging and road construction costs.

For the Metro private forestlands, all have a productive capacity to produce 120 cubic feet per year and operability is not limiting. For the most part, the primary road systems have already been developed consistent with the likely logging method. For non-industrial ownerships operability can become a factor as parcel size decreases. Fix costs and access issues may begin to limit harvest options. Other criteria discussed below are likely to account for this limiting circumstance.

2. Zoning

Zoning is one of the primary tools government uses to protect the land values in an area because it limits conflicts between incompatible uses. Forest zones are designed to limit incompatible uses to protect the commercial value of the forest. There can be significant conflicts between commercial forest uses and residential uses. Dwellings are allowed in forest zones under limited circumstances and significant dwellings may be located adjacent to forestland zones in rural residential zones. Conflicts between residential use and forest management uses reduce forest management or increase the costs of forest management. Commercial wood fiber production, like commercial farming, often becomes incompatible with residential uses. The residents of forested areas often publicly object to common industrial forestry practices such as the aerial application of pesticides,

the burning of slash, road construction, hauling activities that create dust or harvesting and especially the use of clearcutting as a harvest method.

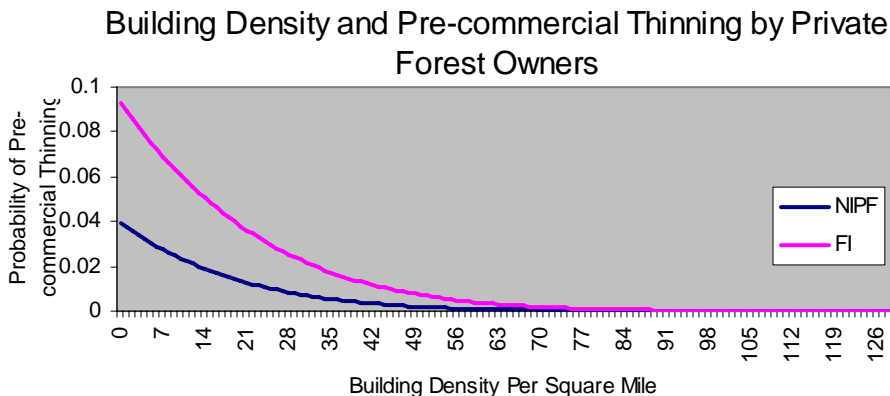
The conditions under which dwellings are authorized in Forest Zones can be found in ORS 215.720 to 215.750 and OAR 660-006-0027. Additionally, siting standards have been developed for dwellings in forest zones to increase the compatibility with forest operations, to minimize wildfire hazards and risks and to conserve values found on forest lands. The standards can be found in OAR 660-006-0029.

"Shadow conversion" occurs when land use conflicts between residential uses and forestry activities increases the difficulty and raises the cost of forest management to the point that further investments in forest management are unprofitable or the landowner perceives the riskiness of the investment is too great due to the likelihood of conflicts that will either preclude harvest or will greatly increase the costs or decrease potential revenues.

Thus, in considering zoning, caution needs to be taken to in identifying lands zoned for forest or farm/forest uses where such values as the aesthetic and recreation values generated by the "next-door" forest has already been captured and capitalized by adjacent or nearby residential tracts, resulting in owners of such tracts turning to the courts to defend "their rights" when the forest owner attempts to follow through on long planned forestry operations. This will be particularly true where rural residential zones or UGB abut forest zones. It appears Washington and Clackamas County approached forestland zoning from different perspectives. In Clackamas County, large numbers of rural residential zoning exist in a mix with the working landscape of farm and forest zones.

3. Parcelization and ownership

Dividing the forest into smaller parcels and adding dwellings can seriously reduce the values that the forest provides by displacing wildlife, increasing conflicts between residential and commercial uses, increasing the cost of fire protection, and reducing commercial timber production.



Notes: Based on relationship found by probit regression. Example is a forest stand; basal area=65; site index=70; slope=30.

All other factors being equal, smaller parcels under multiple ownerships are less favorable for long-term commercial forest use. As demonstrated by the graph above, as dwelling density increases, the probability of investment in active management declines for both industrial and non-industrial ownerships. Ownership also impacts long-term viability with size of the total ownership and ownership type being factors. The larger the total ownership, the more viable will be any piece of the ownership. In combination with size, owners that are “active” including industrial owners and involved family forest owners are more likely to manage their land in the long-term as a working forest. As discussed in the analysis and conclusions section, industrial lands provide the major timber harvests within the Metro area. However, many of the traditional ownership behaviors are changing due to the high value of lands. Nonetheless, industrial owned lands and non-industrial lands of an ownership size where behaviors are more similar to an industrial owner should be delineated and used as a factor in combination with the development zones discussed next.

ODF has mapped forestland “development zones” based upon the following categories:

Wildland Forest: Large contiguous tracts of at least one square mile of forestland with fewer than five developments per square mile generally scattered across the area. This designation may include both timberland and “other forestland”. Timberland is forestland not withdrawn from timber utilization and capable of growing industrial wood at a rate of 20 cubic feet or more per acre per year. “Other forestland”, which is of lower productivity or has been withdrawn from timber production, may also be in the wildland forest zone.

Wildland Range: Zoned only in eastern Oregon. Large contiguous tracts of non-forest/non-agricultural land of at least one square mile with fewer than five developments per square mile generally scattered across the area. Typically the land does not receive enough precipitation or lacks the soil quality for tree growth of any significant size or density. This designation may include grasslands, non-irrigated grazing or haying fields, marshes, or sagebrush land. Western juniper and other lower-productivity forest areas are sometimes classified with wildland range because grazing is often the dominant use for these forested areas.

Intensive Agriculture: Large contiguous tracts of agricultural land with fewer than nine developments per square mile generally scattered across the area. Structures associated with agriculture such as farmsteads and barns are not counted in the development limit. At least one square mile in size.

Mixed Agriculture: Intermixed agricultural, forest, and/or range land with fewer than nine developments per square mile. There are two types of mixed agricultural land: mixed forest/agriculture, where forest land consists of more than 50 percent of the non-agricultural area, and mixed range/agriculture (only in eastern Oregon), where range dominates the non-agricultural area. At least one square mile in size.

Low-Density Residential: Non-urban land with nine or more developments within an area of any size. Examples are: rural subdivisions not attached to a town or city, large numbers of structures mixed in with forests or agricultural lands, towns smaller than 40 acres.

Urban: Commercial, residential and industrial areas greater than 40 acres with a discernible street grid. Structures are evenly distributed and lot size tends to be small. City centers, industrial areas, patterned residential housing, and subdivisions attached to a city are urban areas.

Other: Naturally non-vegetated areas such as sand beaches or dunes, lava, mountain-top rock and snow; and large bodies of water including reservoirs or lakes. At least one square mile in size. This zone was not delineated in previous development zone projects.

Lands considered for rural reserves should be focused on lands currently categorized as “wildland forest” or as “mixed forest-agriculture.” Maps showing the location of wildland and mixed forest are included in the appendix.

4. Forest fragmentation

Forest fragmentation is the process of dividing large blocks of forest into smaller more isolated islands within a mosaic of other land uses, typically agricultural or urban land uses (Helms, 1998). Forest fragmentation displaces wildlife by reducing the total area of contiguous forest, introducing non-native invasive species, and isolating the remaining forest patches. The results of fragmentation can be over-browsing and removal of certain plant species, increased predation and nest parasitism, a reduction in the number of ground-nesting birds and other species, plus a general reduction in certain types of wildlife habitats (Patel-Weyand, 2002). In considering forest fragmentation, adjacent and area land use and vegetation patterns should be analyzed. Forests that are “disconnected” from other forests by non-forest vegetation are less suitable as long-term wildlife habitat. Thus, forest zones that are currently isolated from other forest cover, or are likely to become isolated over time should have lower priority for rural reserves.

5. Existing land use conflicts

Patterns of land use and expansion already exist. These need to be considered. Clackamas and Washington County have taken different approaches to zoning. Most of the “wildland forest” in Washington County is in a contiguous block in the western portion of the county. In some cases “buffers” of “mixed forest/agriculture” are adjacent to this wildland forest and may serve as an ideal buffer to further conflict. The location and amount of intermixed or adjacent low density residential needs to be a stronger consideration where “mixed forest/agriculture” lands are not located adjacent to wildland forest. Similarly, the closer the proximity to urban areas, the less likely that a working forest can be maintained and the better option would be to retain desired forestlands as park or other open space.

Clackamas County retains a number of isolated small blocks of wildland forest in the western portion and some larger “fingers” of wildland forest that are mostly surrounded by low density residential forest (and cannot necessarily be considered adjacent to the contiguous block of wildland forest making up the eastern part of the county). Conflicts are likely to be challenging to the long-term management of these lands as timberlands without some other economic returns as discussed above.

6. Wildfire risk

A Community Wildfire Protection Plan (CWPP) for Clackamas County was completed October, 2005. The plan was developed with the leadership of the County, ODF, Fire Defense Board, USFS, and BLM. The Clackamas CWPP is a consolidated reference documenting wildfire hazards, prevention and response efforts, and resource sharing information for all participating local, state and federal fire agencies. It improves upon historical fire planning efforts by providing a more localized and accurate approach for determining wildfire hazards and implementing best practices for wildfire protection in balance with sustainable ecological management and economic activities throughout Clackamas County.

A Community Wildfire Protection Plan is in process for Washington County. A review draft was presented to the public in June, 2007. The partners in development of the plan include County Emergency Management, Fire Defense Board, ODF, Sheriff’s Dept., and Northwest Mgmt. consultant.

Multnomah County has not prepared a CWPP.

Each plan includes a Wildfire Risk Assessment that analyzes the potential losses to life, property, and natural resources. Objectives of the risk assessment are to identify Communities-at-Risk and the Wildland-Urban Interface, and conduct a wildfire risk assessment that can be used in project prioritization. A map has been produced for each county showing the overall fire risk as “low,” “low-moderate,” “moderate,” “moderate-high,” and “high.”

Either moderate-high, or high categories would be appropriately considered as possible criteria for designating rural reserves.

7. Landslide risk and other natural hazards

DOGAMI has mapped portions of Oregon for landslide risk. ODF has mapped high landslide hazard locations that represent risk of shallow rapidly moving landslides. Mount Hood represents a unique set of geological risks, some related to events that combine flooding with debris torrents.

In general, locations that are subject to rapidly moving geological events and flooding, including their run-out paths or floodplains (including channel migration zone) should be

given high priority for rural reserve designation. These types of geological events are such that risk mitigation and prevention are unlikely to be successful in the long-term

8. Sensitive resource sites

a. Community Water systems

Forestland provides intrinsically higher quality water than other land uses. Forest zones that encompass a community water system should be given appropriate priority for rural reserve designation.

b. Parks and open space

Existing parks and open space can provide a framework of connectivity to limit forest habitat fragmentation. Similarly, the long-term open space plan developed by Metro can define where connectivity can be retained or restored.

c. Protected resource sites

Resource sites that deserve consideration include significant wetlands, sites used by threatened or endangered species, sensitive bird nesting and roosting sites, and “conservation opportunity areas” identified in the Oregon Conservation Strategy (ODFW 2006). Maps showing significant wetlands and sensitive sites are available from Department of Forestry field offices in Forest Grove and Molalla. Conservation opportunity areas maps are provided in the appendix.

d. Oregon scenic rivers

Portions of the Clackamas and Sandy Rivers are designated as Scenic waterways under the Oregon program. This designation influences forestland management in several ways. In addition to additional process, perceptions about how best to balance scenic resources with timber use may create additional social conflict.

III. Other Criteria:

Markets and Infrastructure

Elements such as transportation, labor availability, processing and other service needs, are factors in the long-term viability of working forests. The market infrastructure is already in place and unlikely to change. Forest sector manufacturing has located along major transportation corridors near the Columbia River, rail lines and the interstate highway system and forestland in the Metro area will have significant market options. Labor for forestry service is also locally available and skilled.

The capacity to add “value” to forest products made in the Metro area is possible through one of the “green” certification schemes, though to date wood price increases are not documented. Increasing demand for biofuels/energy development may add value to forest residuals. Conservation incentives and other programs at the federal and state levels related to renewable energy could help add additional value, especially if mixed with the urban waste stream.

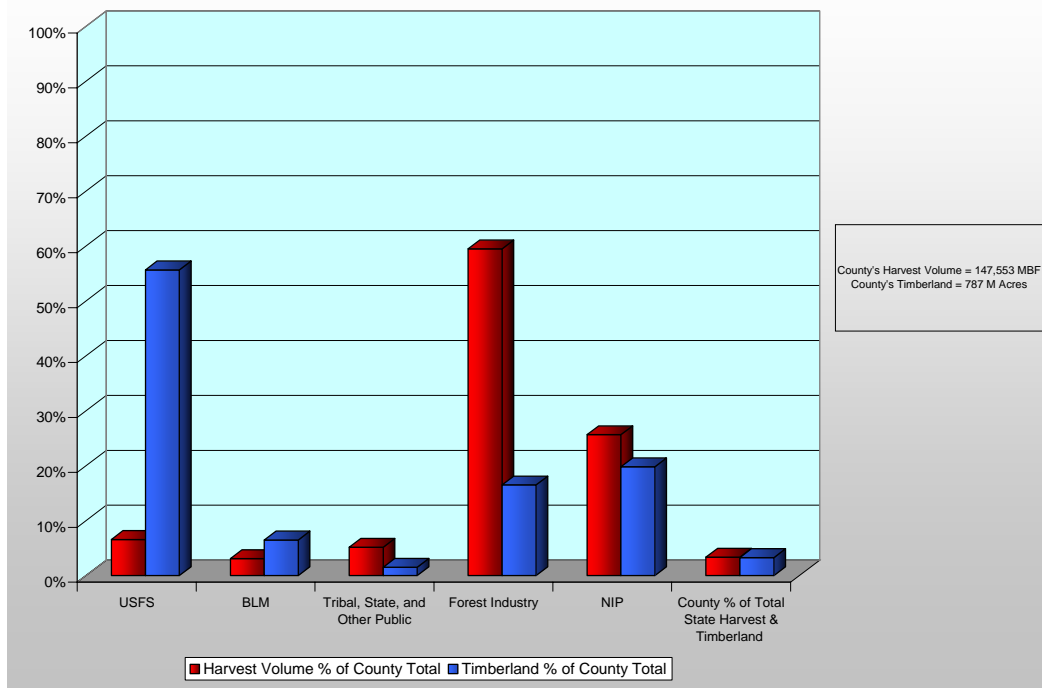
IV. Analysis and Conclusions

The three graphs below illustrate the proportion of timberland and harvest by ownership for each of the three counties. The ownership of “timberlands” within the Metro area includes federal, state, private industrial, private non-industrial and other public (county). The dominant ownership is federal in Clackamas (62 percent) and Multnomah Counties (52 percent). Washington County is dominated by private lands, with a relatively large share of state ownership (15 percent) and very little federal ownership (5 percent).

Federal lands have mostly been allocated for “nature emphasis” uses. As a result, federal lands contribute small amounts of timber harvest to the counties’ total annual harvests. The federal timberlands provide less than 10 percent of the Clackamas County annual timber harvest, less than 3 percent of Multnomah County’s harvest, and less than 1.2 percent of the Washington County’s harvest.

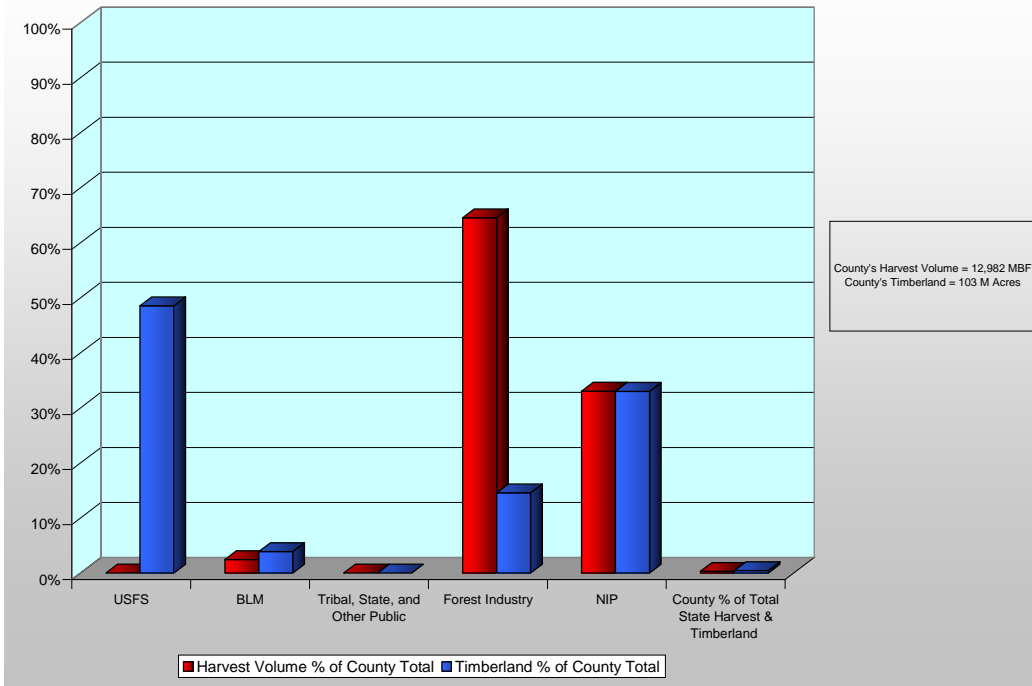
All three counties retain a substantial base of both industrial and non-industrial owners. For all three Metro Counties, non-industrial owners make up the majority of the private ownership. This is unusual as industrial lands are usually the dominant private ownership in western Oregon counties. Nonetheless, in all three Metro counties, industrial lands provide the majority of the timber harvests (Clackamas 59 percent, Washington 65 percent and Multnomah 65 percent). In Clackamas and Multnomah Counties non-industrial lands have timber harvests that are comparable to the proportion of their ownership in relation to the total timberland. However, the non-industrial owners in Washington County provide disproportionately less harvest than the proportion of that ownership (contributing 19 percent of the harvest versus contributing 42 percent of the total timberland).

Clackamas County Percent of Timberland and Harvest Volume
 (3 Year Average for Harvest Volume 2004-2006)

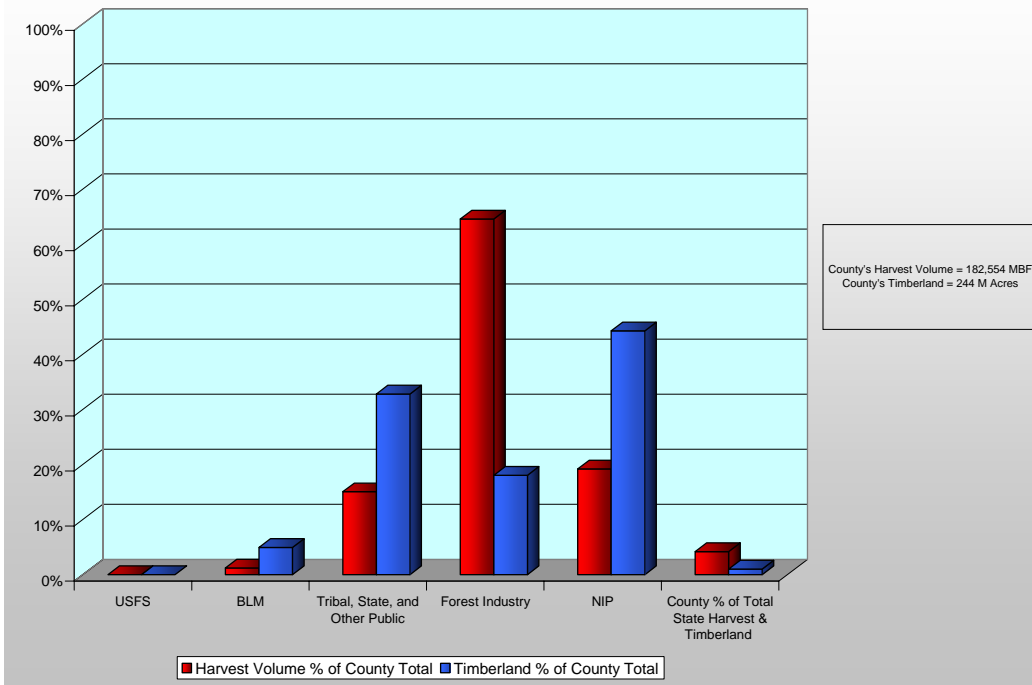


Protecting the existing wildland forests that are currently in the large contiguous blocks along with adjacent mixed forest/agricultural lands will do the most to ensure the continued contribution of these lands to maintaining a viable forest sector. An overall strategy of buffering these lands using rural reserves would appear sound. Other forestlands with high value as non-timberlands might be viable so long as other tools are used to provide landowner value. Alternatively, acquisition as parks or open space may be a better option.

Multnomah County Percent of Timberland and Harvest Volume
 (3 Year Average for Harvest Volume 2004-2006)



Washington County Percent of Timberland and Harvest Volume
 (3 Year Average for Harvest Volume 2004-2006)

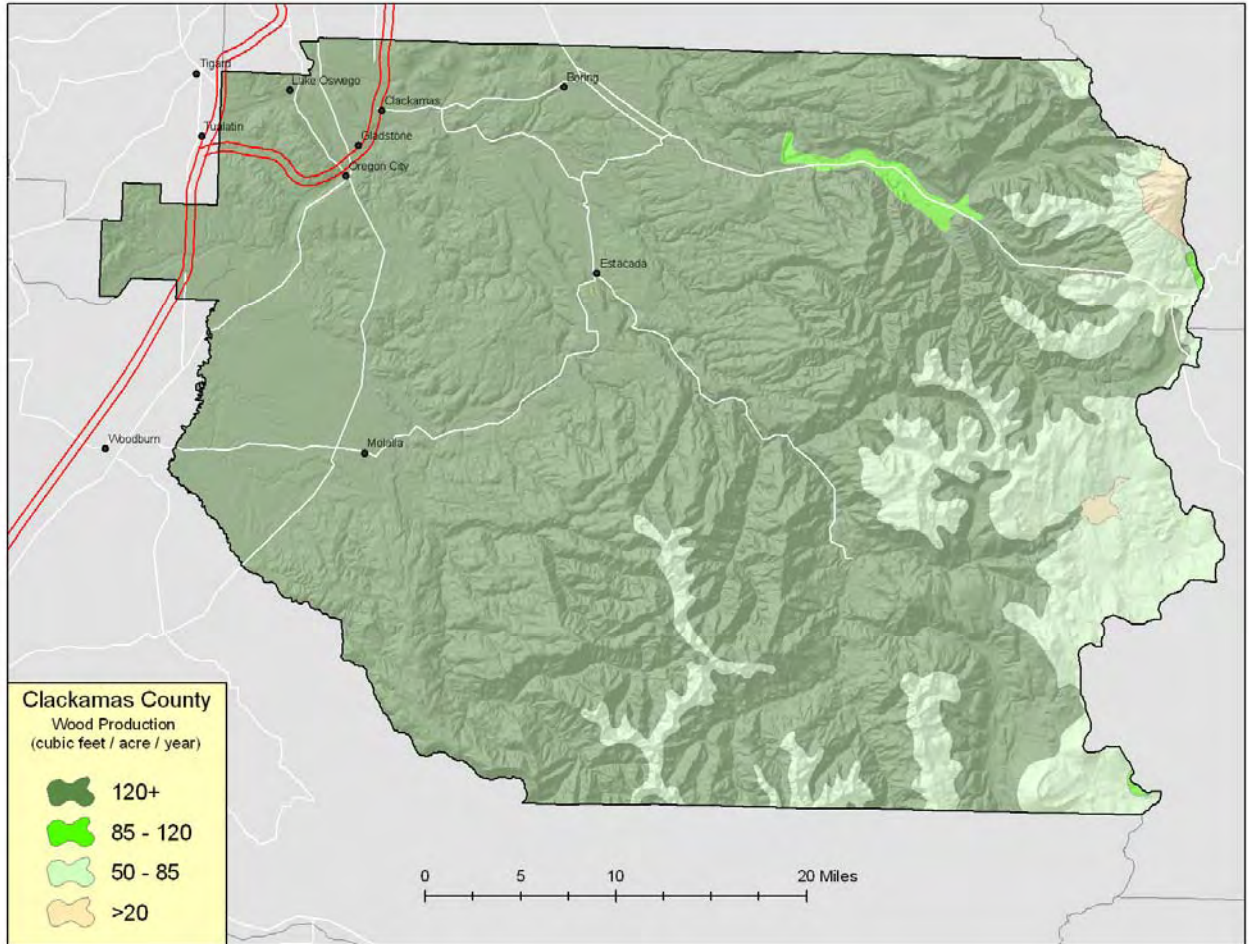


References:

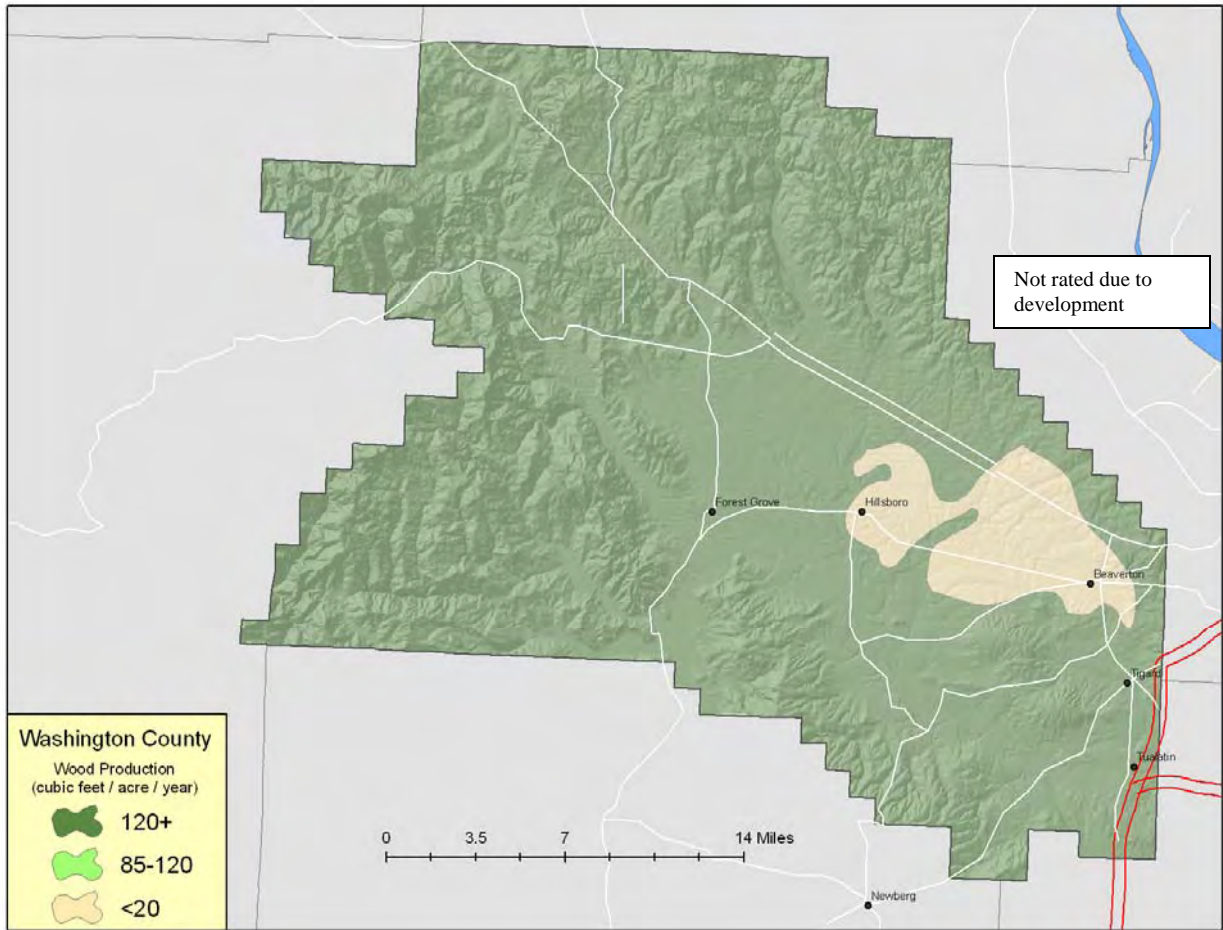
1. Benedict, M. A., & McMahon, E. T., (2002). "Green Infrastructure: Smart Conservation for the 21st Century." *Renewable Resources Journal* (20) 3: 12-17.
2. *Forests, Carbon and Climate Change: A Synthesis of Science Findings*, Oregon Forest Resources Institute, 2006
3. Helms, J.A., ed. 1998. *Dictionary of Forestry*. Society of American Foresters, Bethesda, MD. 210 pp.
4. Patel-Weynand, T. 2002. Biodiversity and sustainable forestry: State of the science review. Report for the National Commission on Science for Sustainable Forestry, Washington, DC. 54 p.

Appendix 1 – Map references (Partial compilation—additional map references available upon request)

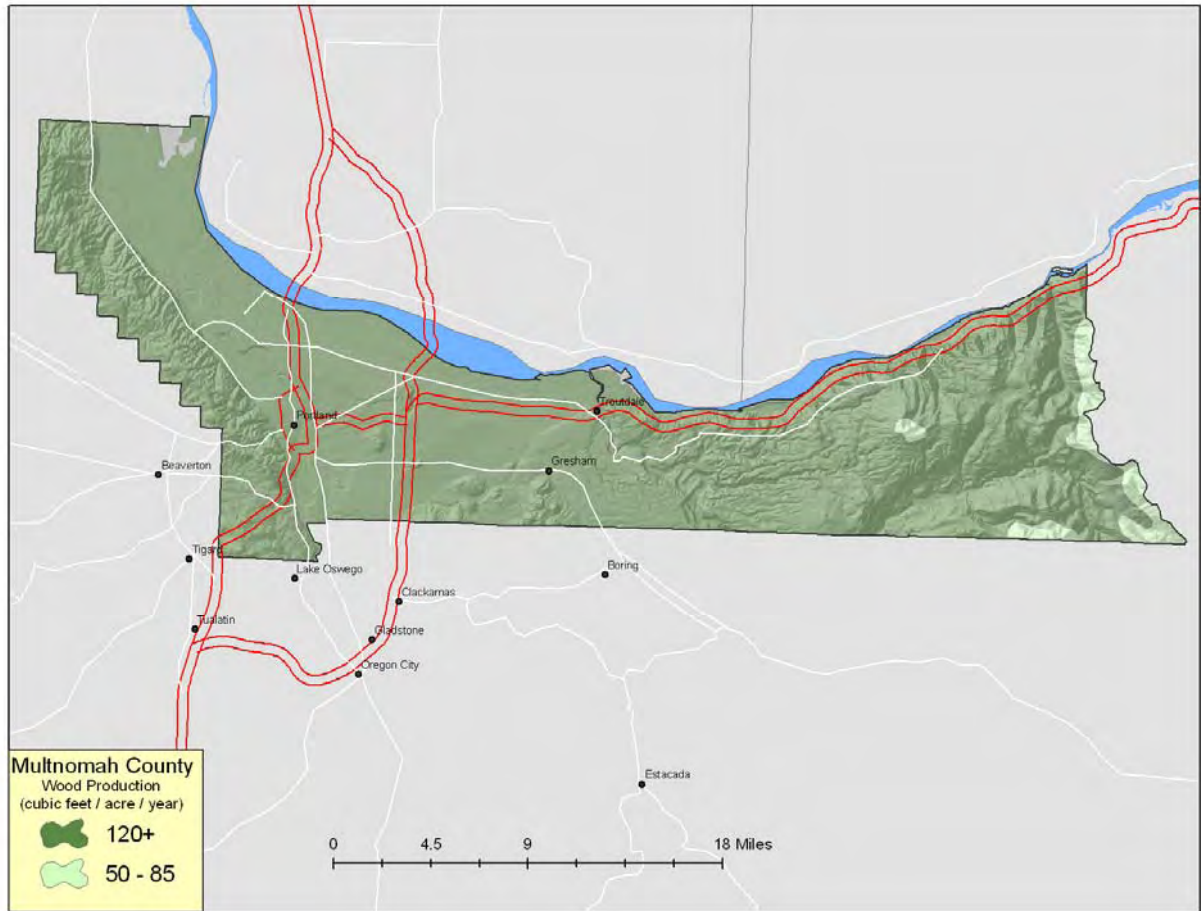
1a Cubic Foot Site Class Clackamas County



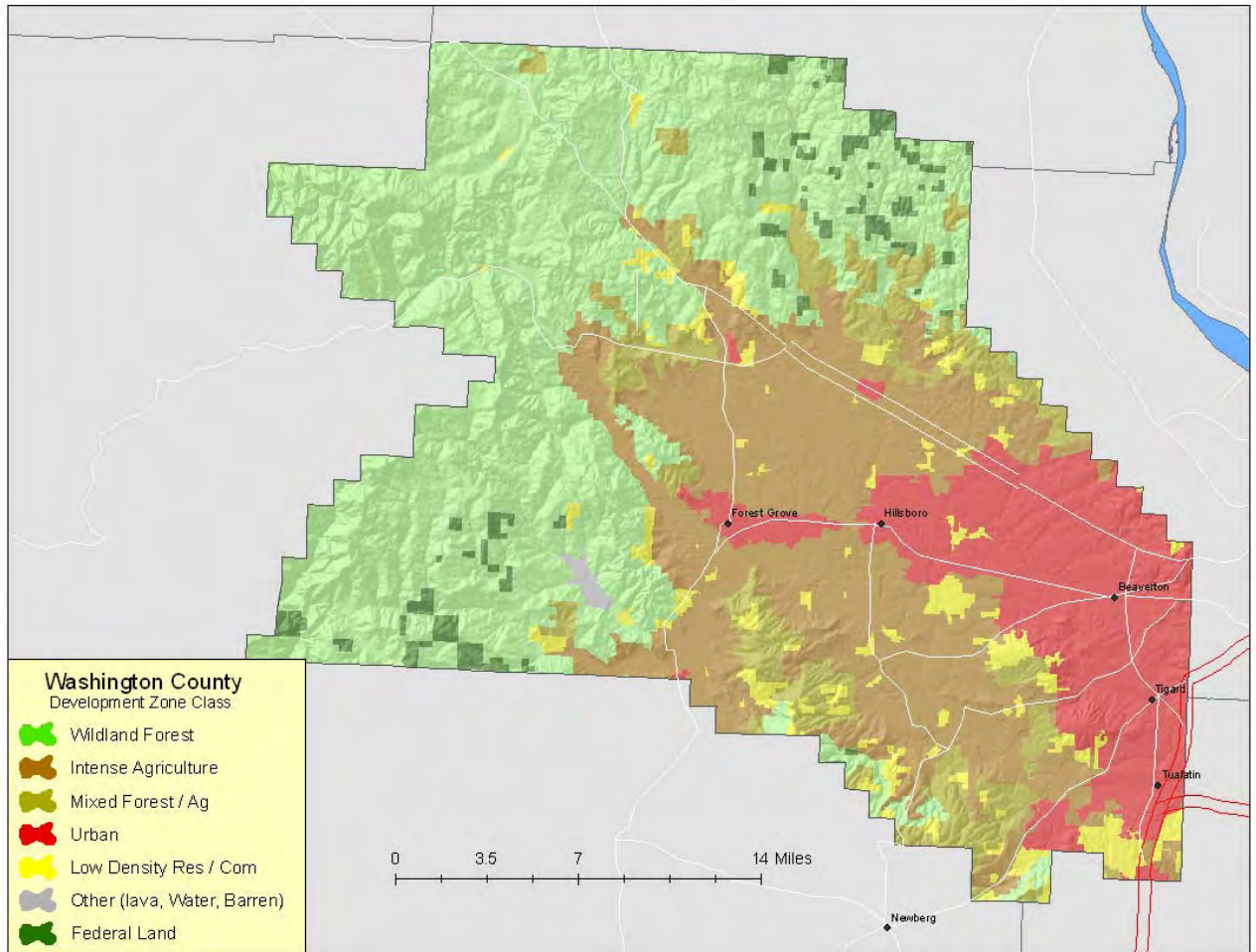
1b Cubic Foot Site Class Washington County



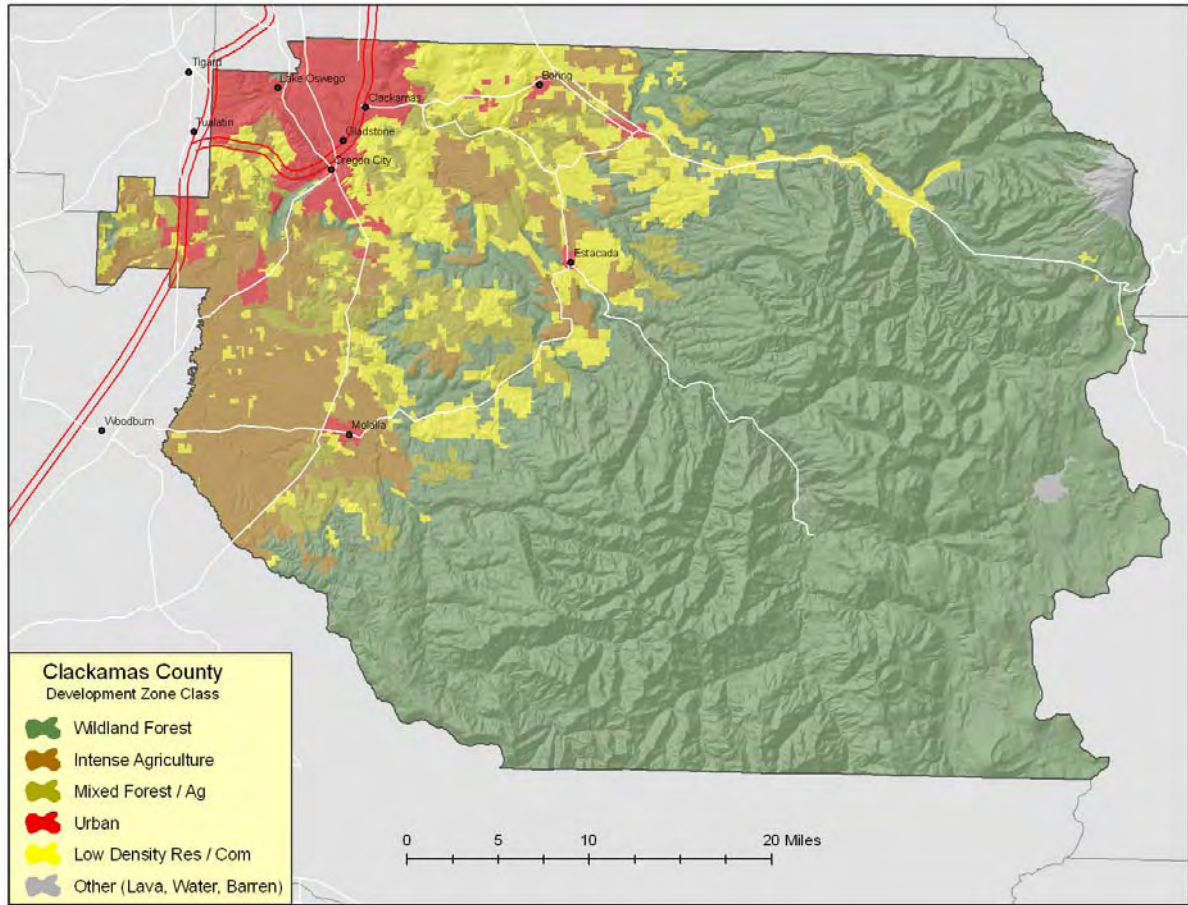
1c Cubic Foot Site Class Multnomah County



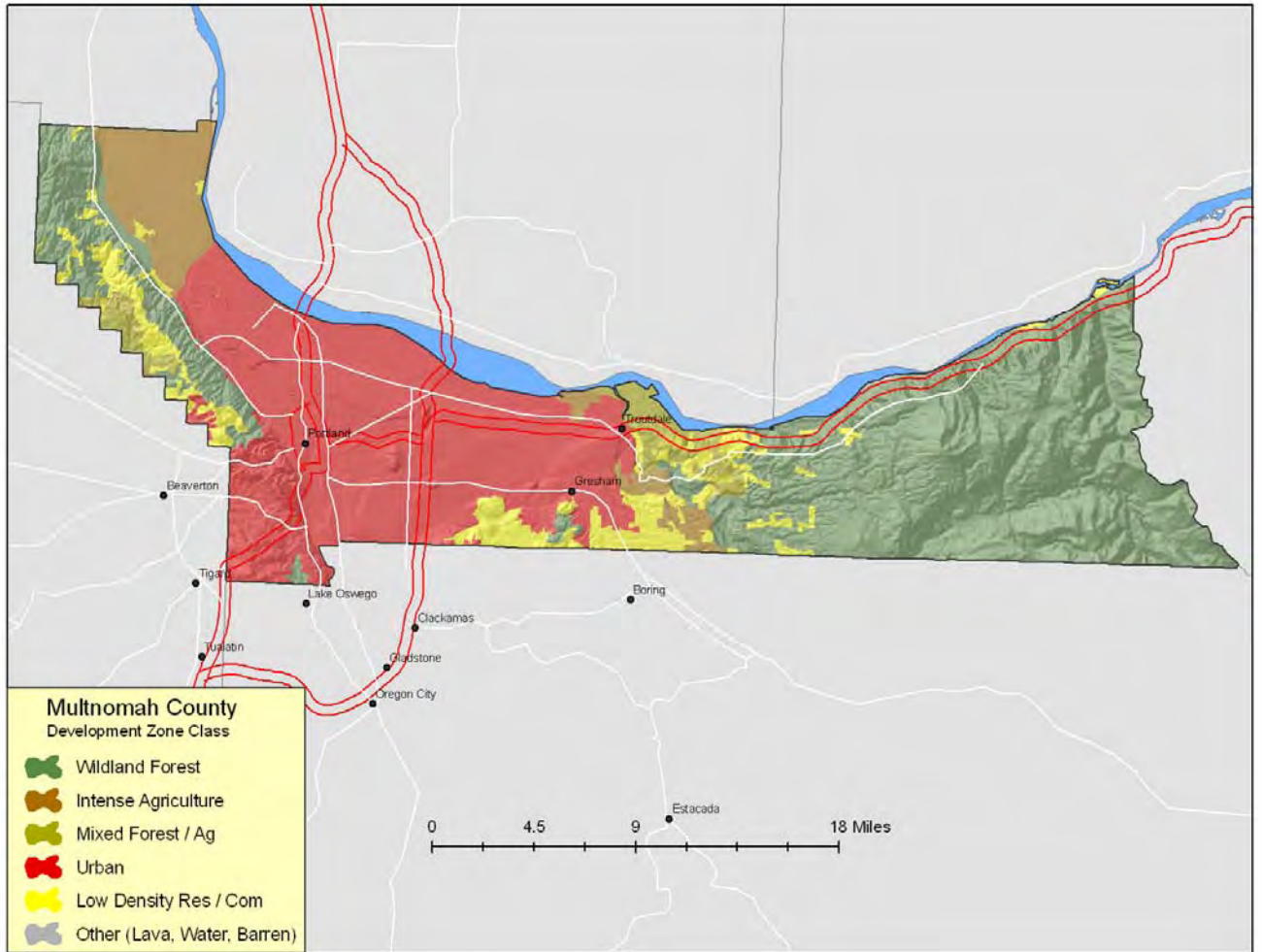
Map 2a Development Zone Class Washington County



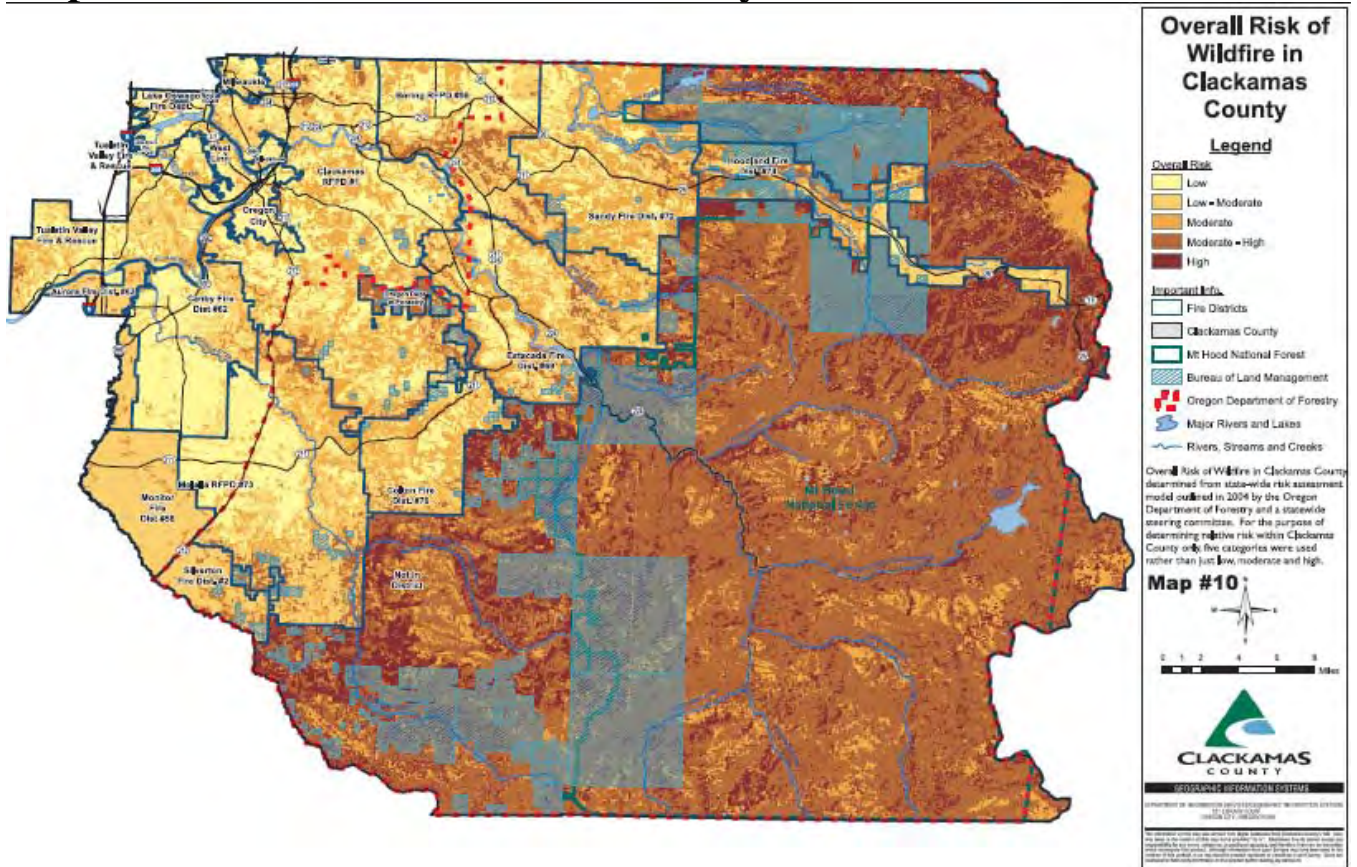
2b Development Zone Class Clackamas County



Map 2c Development Zone Class Multnomah County



Map 3a Wildfire Risk Clackamas County



Washington County CWFPF Lead Contact: Chris Asanovich, Fire Defense Board Chief, Malcolm Hiatt, ODF; mhiatt@odf.state.or.us; Scott Porter, Emergency Management

Map 4 State Conservation Plan conservation opportunity areas



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