Oregon Stream Protection Coalition

BEFORE THE BOARD OF FORESTRY

Statement of Mary Scurlock, Oregon Stream Protection Coalition
Agenda Item 7: Riparian Rule Analysis
3 June 2015

My name is Mary Scurlock, and I represent the Oregon Stream Protection Coalition's 23 fishing industry and conservation member groups[1] united in support of stronger, science-based riparian protection for streams on Oregon's over 10.6 million acres of private forestland. We share the common goal of a stronger regulatory baseline to ensure the long-term health of freshwater ecosystems and the multitude of economic benefits they support, including but not limited to saw timber and wood fiber.

I. RECOMMENDATIONS

The Board has in hand adequate information to recommend increased riparian protection on small and medium streams in Western Oregon. Based on our evaluation of the information developed by the Department, we have the following recommendations:

Buffer Size: We recommend that the Board propose at least a 100 foot no-cut riparian management area. We would also support an additional variable retention option that analysis shows performs to at least this level of compliance with the PCW.

Geographic and Stream Extent: The expanded buffer should include all small and medium fishbearing streams in all ecoregions of Western Oregon including the Siskiyoiu, with a commitment to propose appropriate commensurate protection from harvest-related stream warming for small and medium fish streams in Eastern Oregon and on nonfish streams statewide within 12 months.

II. RATIONALE

A. Alternatives that ODF's modeling does not show, or cannot be used to show, that the PCW is met with at least the target frequency should be eliminated from consideration

In order to provide a rational basis for the Board's policy choices and accountability to the public for its decisions, ***only those alternatives susceptible to quantitative evaluation of effectiveness should be considered***. As the Department notes, this leaves only the 90' and 100' no cut buffers and the state forest FMP prescriptions, for which the predictive modeling found that the PCW was likely to be met 50% or more of the time. We note that the Department's analysis shows that the PCW would be met 100% of the time with a 120

[1] Coalition members are: Audubon Society of Portland, Cascadia Wildlands , Coast Range Association, Defenders of Wildlife, Institute for Fisheries Resources, Native Fish Society, Sierra Club, Oregon Wild, Pacific Rivers Council, Wild Salmon Center, Center for Biological Diversity, Northwest Sportfishing Industry

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foot no cut, which is apparently not being considered because it is outside the "bookends" established by the Board before any quantitative analysis had begun. [The Department's 170'/275 ft^2 of basal area came in at .33 – so it seems that with a higher basal area retention the effectiveness of this type of approach could be improved].

Site-specific alternative buffer prescriptions can always be evaluated and applied by landowners under the current rule framework enabling State Forester approval of a plan for alternate practices. OAR 629-605-0100. But it should be recognized that support for such practices will still need to be have a science-based rationale outlining how these prescriptions would lead to less environmental harm – and findings like "it is possible" that "somewhat more shade than that of FPA" would be retained would still not be sufficient. (*See e.g*. page 10 of Attachment 1, Agenda Item 7 for today relative to the RFPC-B and AOL-B/OFIC-C).

B. Buffer size: public policy dictates that the Board should strive to meet the PCW more than just 50% of the time

The Board has the duty and the discretion to select alternatives that provide a high degree of certainty resource protection objectives will actually be met. *The Board's duty to select the least burdensome alternative should not be confused or compete with the Board's duty to select an alternative that meets resource objectives (e.g. the PCW and other goals) with adequate certainty.*

ODF modeling illustrates that at least a 100 foot no cut is needed to provide adequate certainty that the PCW will be met with sufficient frequency to be considered "compliant" with the criterion. A 100 foot buffer translates into an average warming of .18 degrees, which according to the box translates into meeting the PCW about 80 to 85% of the time. (Pers. Comm. J. Groom, ODF, 2 June 2015).

At least a 100 foot buffer also is needed to have a significant chance of meeting the stream warming limitations set for much of western Oregon under TMDL water quality restoration targets which are part of Oregon's water quality standards for stream temperature.

Although the modeling shows that a 90 foot buffer would likely limit warming to .29 degrees C on average, this allows too much uncertainty that warming will be prevented because the .3 limitation will only be attained slightly more than 50% of the time, meaning that about half the sites will exceed the standard. *This is not an acceptable level of risk take with public natural resources.*

The 100 foot buffer would not only provide a more reasonable, science-based level of certainty that the stream warming limitation would be met, but by the ODFs own modeling estimates it would push large wood recruitment to over 90% of natural recruitment from stream-adjacent riparian areas. *Long-term large wood recruitment is the foundation for*

salmon and trout habitat-forming processes and ensures that spawning, incubation, juvenile rearing and adult habitat is conserved and maintained.

B. A rule change for only SSBT reaches only protects too few streams and will be fraught with serious implementation problems.

We urge the Board to consider that SSBT reaches – particularly outside the Coast Range -- comprise a fraction of all fish streams, and as little as a quarter of all streams to which water quality standards apply on forestlands in western Oregon. (We defer to information generated by ODF and the federal agencies on the exact numbers).

1. Protection from stream warming and provision of other aquatic habitat attributes is biologically and legally necessary on non SSBT reaches.

The PCW by its terms requires protection of upstream reaches necessary to protect against warming in SSBT reaches, so we repeat here our position that *some non-SSBT reaches – likely both fish and nonfish reaches -- must be protected in order to meet the letter and intent of the criterion, even narrowly interpreted.* Because the PCW establishes a presumption that protection of upstream reaches is necessary to prevent warming in downstream reaches unless otherwise demonstrated, *the Board is justified in requiring default protection for a significant portions of upstream reaches – even to the extent of all fish streams.* (Default protection could be subject to a rebuttal with site-specific hydrological information demonstrating that protection is not necessary to prevent warming).

But the PCW is not the only water quality objective in play. Streams other than salmon, steelhead and bull trout reaches require protection from harvest related stream warming in order to protect other fish and headwater-dwelling aquatic species, including amphibians with aquatic life stages. *The Board is duty-bound to protect these designated uses as well and it should act to protect them now. The RipStream findings that streams are being warmed in violation of the PCW by harvest under current rules are adequate to support a degradation finding and rule change for all small and medium streams regardless of whether they are presumed to bear any particular species of fish.*

We remind the Board that the Purpose and Goals of the water protection rules at OAR 629-635-0100 (7) make it your duty "to establish and retain vegetation adequate to . . . provide aquatic habitat components and functions such as shade, large wood, and nutrients." The Board is not constrained to define "aquatic habitat components and functions" only in terms of specific water quality standards or criteria – though these clearly set a minimum floor for meeting key riparian functions.

(b) ***Tiering riparian protection to Salmon, Steelhead and Bull Trout (SSBT) reaches creates complicated implementation issues***

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The significant implications of different riparian management areas on SSBT buffer rules strongly suggest the need for detailed rules and agency guidance to ensure credible and consistent implementation. We attach for your information a memorandum from my colleague Richard Fitzgerald detailing these concerns, which include:

i. ODF will need to create, publish and maintain a new stream classification database to reflect SSBT reaches, just as it maintains a spatial database for extent of fish use now.
ii. Current rules and guidance for determining natural barriers without surveys will not accurately determine the extent of SSBT distribution.
iii. ODF's current fish survey protocol is not adequate to ensure reliable data – new rules or guidance are needed.
iv. ODFW fish distribution maps were not developed for a regulatory purpose and do not provide a consistently reliable basis for determining SSBT distribution.
v. Because current rules only allow landowners and state resource agencies to request stream classification modifications, information sources may be restricted.
vi. There are questions about whether ODF or ODFW is the appropriate custodian of the SSBT database given concerns about expertise, capacity to conduct rapid updates and funding.

C. The large corollary ecological benefits and associated economic values of riparian protection to the public mitigate far outweigh the timber value of riparian forests.

The economics of riparian conservation clearly mitigate in favor of the Board's choosing the largest practicable stream buffers.

Prevention of stream warming to protect aquatic resources and meet the specific legal mandate that has been the focus of this rulemaking, but as the Department's analysis acknowledges, retention of riparian forest also increases the availability of large wood to streams, and important stream habitat component that ODFW monitoring and other research clearly demonstrates is critically deficient in many stream reaches and watersheds but is necessary for aquatic habitat recovery.

In fact, there is a long list of valuable ecosystem services that flow from functional stream systems and intact riparian forests, and it includes among others: flood protection and stormwater regulation, drinking water production and filtration, nutrient regulation, erosion control/soil retention, biodiversity conservation, increased fish populations, recreational enhancement, carbon sequestration and others. The estimated value of these

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ecosystems services is generally very large, even when known to be underestimated.[2] Values vastly increase if the benefits to future as well as current generations are considered. The value of maintaining and restoring ecosystem health increases over time with human population.

The largest ancillary ecological value of riparian forest conservation is probably related to carbon. We attach here a memorandum from Ernie Niemi of Natural Resource Economics explaining how the carbon and climate change benefits of unlogged riparian forests could be calculated. Even accepting the lowest per acre values suggested here -- $52,00 per acre, the carbon values accruing to the public from riparian forest conservation far outweigh the timber value of these lands on a per acre basis. Upper estimates of economic benefit created by preventing conversion to forest carbon to atmospheric carbon dioxide are $100,000-$300,000 per acre.

Attachments:

(1) Memo from Richard Fitzgerald on SSBT Implementation Issues (3 pages)
(2) Memo from Ernie Niemi, Natural Resource Economics, Potential Carbon Values in Riparian Zones (3 pages)
(3) Summary comparison of Stream Protection Rules in Oregon, Washington and California (1 page)

[2] The array of ecosystem services provided by forestlands in a single Washington watershed for one year is estimated at between $1 and $5 billion dollars annually. Green/Duwamish and Central Puget Sound Salmon Habitat Plat at 6-5.

M E M O R A N D U M

To: Oregon Stream Protection Coalition

From: Richard Fitzgerald

Subject: SSBT Issues

Date: June 2, 2015

In consideration of prospective riparian retention rules to address effects of timber harvest on stream temperatures, the Oregon Board of Forestry is considering applying enhanced stream buffers to "Salmon Steelhead and Bull Trout" bearing (SSBT) reaches only. It is not yet clear how ODF would determine which portions of which streams such new buffer rules would apply to. ODF may attempt to apply its current rules and guidance for determining the extent of fish use to determining SSBT distribution. This memo briefly summarizes concerns with doing so and makes recommendations for consideration during rulemaking.

Under current rules and guidance, ODF determines the extent of fish use based on the location of natural passage barriers or field surveys. If field surveys have not been conducted for a reach, ODF designates fish use as continuing upstream from the point of known fish use to the first natural barrier to fish use. If a field survey shows that fish use ends at a natural barrier or at some other point that is not an artificial barrier to fish passage, ODF designates fish use based on the survey. If field surveys show that fish use ends at an artificial barrier, ODF will designate fish use as continuing upstream to the first natural barrier. In practice, surveys are infrequently conducted and the districts assess extent of fish use independently, some relying more heavily on field investigation and others more heavily on GIS modeling. A substantial number of stream reaches remain unclassified. The significant implications of potential no-harvest buffer rules strongly suggest the need for detailed rules and agency guidance to ensure credible and consistent implementation.

- **ODF should rely on an authoritative published spatial database for implementing SSBT rules**. Current rules require ODF to maintain a map depicting stream classifications, which includes the extent of fish use. In practice, this "map" is a spatial database reflecting classification and other reach attributes. A similar approach to SSBT rules is appropriate to ensure consistency and inform stakeholders and the public. Such a database should 1) be developed from the best available data from any credible source, 2) presume that SSBT are present from known current or historic occupied reaches upstream to a permanent complete natural barrier, 3) rely on professional experts, 4) be readily updated in response to new information, and 5) be readily available to the public. The best available data would likely be ODFW distribution data augmented by ODF natural barrier and extent of fish use data.

• The author thanks Dr. Chris Frissell and Chris Mendoza for their comments and contributions to this work.

- **Current rules and guidance for determining natural barriers without surveys will not accurately determine the extent of SSBT distribution**. While current rules define a natural barrier, this definition lacks sufficient detail to guide case-specific determinations. ODF guidance describes criteria for identification of natural barriers by physical inspection, map, or digital elevation modeling. But these criteria are unreliable for determining SSBT distribution because they fail to account for SSBT use of marginal habitats and for changes that occur over time in channel form, substrate, and the effects of large woody debris accumulation. To ensure that buffers are properly applied to SSBT streams, new rules or guidance must specify appropriate criteria for identification of permanent complete natural barriers.

- **ODF's current fish survey protocol lacks the rigor necessary to ensure reliable data**. ODF's current field survey protocol lacks adequate minimum criteria and does not account for temporal variability in fish distribution. The protocol lacks specific criteria for surveyor qualifications, sampling effort, survey timing, or the extent of sampling effort. Its descriptions of appropriate methods are extremely vague. In order to ensure that survey-based determinations of the extent of SSBT distribution are reliable, new rules or guidance must specify minimum criteria for surveyor qualifications, sampling effort, and spatial extent. Such surveys should also meet ODFW standards for distribution mapping. To account for changes in SSBT habitat conditions or other circumstances, rules or guidance should limit the extent of time that a survey may be relied on to determine that SSBT are absent from a reach. In other words, survey results should have expiration dates.

- **ODFW's fish distribution maps were not developed for this purpose**. ODFW data is based on various source materials, some of which reflects observations or opinion rather than an empirical determination of an upstream limit of species distribution. ODFW data was developed principally in response to Columbia Basin needs and has incorporated data outside of that basin opportunistically. As such ODFW data may reflect an uneven intensity of investigation. As such, ODFW distribution data alone is not a reliable basis for determining the bounds of SSBT distribution. This point is illustrated by the fact that ODF, when conducting its GIS analysis of area encumbered by potential rules, relied on its own stream classification database to determine the upstream extent of fish use.

- **Current rules hinder consideration of the best available information**. Under current rules, only persons with a property interest in lands adjoining the stream and state resource agencies may request that ODF modify a classification of that stream. This may preclude or hinder consideration of the best available information, such as information submitted by unbiased experts.

- **Determining "winter-only" habitat will be difficult and of limited value**. Such streams are likely to be extremely rare, as rearing steelhead are often found in lower "migratory" reaches and,

in wetter years, may occupy upstream reaches that typically dry up in midsummer. Even where such streams exist, an absence of shade buffers may adversely affect quality of adjacent reaches occupied beyond winter.

- **Custody of fish distribution data**. It may not be appropriate for ODF to maintain a dataset reflecting the distribution of fish species. Due to agency responsibility and expertise, it is most appropriate that ODFW maintain an SSBT database. There is precedent for state agency reliance on ODFW distribution data for regulatory purposes. ODF has expressed concern that ODFW does not currently provide rapid data updates. Rapid data updates may be important in order to allow ODF to classify an unknown stream during review of an operations notice or written plan. ODFW may also benefit from live-update capability, but funding and resources to do so are uncertain. A solution may be for ODF to fund ODFW to maintain and update the relevant fish distribution maps while ODFW retains direction over the mapping program and its personnel.
- **This memo does *not* endorse the SSBT-only approach to temperature protection rules**. The comments and recommendations made herein are offered in light of a Board decision to take an SSBT-only approach to protecting stream temperatures from the effects of timber harvest. Even if the Board were to adopt rules that fully address the issues raised above, such rules would not address the broader deficiencies of an SSBT-only approach.

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14 May 2015

TO: **Mary Scurlock, Oregon Stream Protection Coalition**
FROM: **Ernie Niemi**[1]
SUBJECT: **POTENTIAL CARBON VALUES IN RIPARIAN ZONES**

You asked me to estimate the potential economic value of carbon that could be stored in expanded riparian buffers on private forestlands in western Oregon. By allowing trees to grow, rather than be logged, expanded buffers would create an economic benefit by increasing the amount of carbon dioxide the trees remove from the atmosphere, and reducing the damage that anticipated changes in climate will impose on Oregonians and others. The assumptions and data described below suggest that this benefit likely would be about $100,000–$300,000 per acre. Incorporating different assumptions or data into the analysis would change the analytical findings somewhat, but there are significant reasons to anticipate that the actual benefit per acre will be larger.

A. Background

The Intergovernmental Panel on Climate Change (IPCC) has concluded that human-caused emissions of carbon dioxide and other greenhouses gases (GHGs), which have "increased to levels unprecedented in at least the last 800,000 years," likely underlie observed changes in average surface temperature of about 0.85^{O}C since the beginning of the 20th century.[2] This increase in temperatures has been accompanied by changes in precipitation levels and patterns, increases in extreme weather events, rising sea level, acidification of oceans, and changes in ecosystems. These changes in climate, in turn, are associated with increases in undesirable events, such as mortality and morbidity from heat waves and storms, reduced agricultural production from droughts, and property damage from floods and sea-level rise.

Carbon dioxide emissions impose real costs on real Oregonians. If emissions continue their current trends, average surface temperature is expected to increase another 4°C, potentially triggering run-away changes in climate with catastrophic effects felt in Oregon and around the world. Six years ago, I directed a team of more than 20 economists that prepared the first-ever assessment of the economic costs that climate change will impose on the families, businesses, and local governments in Oregon.[3] Using the data available at the time, it concluded that,

[1] My CV is available at http://www.nreconomics.com/cv.html.

[2] IPCC. 2013. "Summary for Policymakers." In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[3] Niemi, E., and members of the Program on Economics' Steering Committee. 2009. *An Overview of Potential Economic Costs to Oregon of a Business-As-Usual Approach to Climate Change.* Climate Leadership Initiative, Institute for a Sustainable Environment, University of Oregon. February 17.

absent meaningful actions to reduce the emissions of greenhouse gases, the average annual cost would total about $2,000 per household by 2020. Subsequent research suggests the actual costs likely will be several times larger.

When Oregon's forests remove carbon dioxide from the atmosphere and store the carbon, they reduce the risks of climate change. This reduction in climate-related risks constitutes an economic benefit to Oregonians and others exposed to these risks. Conversely, when forests are logged, much of the stored carbon is released to the atmosphere, increasing the risks, and imposing costs on individuals, families, businesses, and communities in Oregon and around the world.

B. The Potential Carbon Value of Riparian Forests

Calculation of the potential climate-related benefits from allowing forest to grow in expanded riparian buffers is a straightforward, three-part process. The first entails obtaining a credible, quantitative estimate of the additional forest carbon stored each year in the expanded riparian buffers. The second entails obtaining a credible estimate of the per-unit value of the stored carbon. The third entails multiplying the two estimates to yield an estimate of the potential economic harm per year.

Rasmussen et al. (2012) reports that private forestlands in western Oregon add about 120 cu. ft. of wood per acre per year.[4] This amount is equivalent to about 1.7 metric tons of forest carbon per acre per year.[5] This number suggests that, if an acre of riparian forest had trees about 50 years old, it would hold aboveground forest carbon equivalent to about 85 metric tons of carbon. If that acre were logged, about 70 percent of that carbon, 59 metric tons, would be released into the atmosphere before the end of the century.[6] In addition, logging, slash burning, and other forest-management activities would emit another metric ton of carbon,[7] for a total of about 60 metric tons per acre. If, instead, that acre continued growing, the forest would hold that carbon out of the atmosphere and produce economic benefits by preventing the economic damages that would occur if the carbon were emitted into the atmosphere.

An extensive review of the professional literature available through 2012 estimated the present value of the damage per ton of CO_2 emitted into the atmosphere.[8] [The present value is a single number that represents what the damage would be if the future stream of damage were to occur, instead, entirely in 2012.] The effort considered several scenarios. The core scenario indicates that each ton of forest carbon emitted into the atmosphere over the remainder of this

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[4] Rasmussen, M., R. Lord, B. Vickery, C. McKetta, D. Green, M. Gren, T. Potiowsky, D. Adams, G. Latta,R. Anderson, B. Mitchell, and D. Mark. 2012.*The 2012 Forest Report: An Economic Assessment of Oregon's Forest and Wood Products Manufacturing Sector.* Oregon Forest Resources Institute. p. 16

[5] Conversion algorithm from: BLM. 2015. "Carbon Storage in Live Trees." *Draft Resource Management Plan, Environmental Impact Statement: Western Oregon.* Appendix G – Climate Change. p. 1103

[6] Calculation using the formula reported in BLM. 2015. *Draft Resource Management Plan/Environmental Impact Statement: Western Oregon.* p. 1104.

[7] Sonne, Edie. 2006. "Greenhouse Gas Emissions from Forestry Operations: A Life Cycle Assessment." Journal of Environmental Quality. 35:1439-1450.

[8] Interagency Working Group on Social Cost of Carbon, United States Government. 2013. *Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis - Under Executive Order 12866.* May.

century would result in economic damage of about $280 (2012 dollars).[9] Another scenario recognized that the damage could be as high as $870 per ton.

Multiplying the tons of stored forest carbon times the core estimate of the value per ton indicates that the carbon-related benefit of not logging an acre of riparian forest would be about [60 tons times $280 per ton =] $17,000. Multiplying by the upper estimate of the per-ton value indicates the benefit would be $52,000 per acre.

These numbers do not tell the full story. In particular, they understate the true benefits of standing forests. The estimate of the per-ton value of stored carbon is based on the literature through 2012, which omits several major costs of climate change. One recent study filled one portion of the gap by looking beyond the initial damage from climate-related droughts, storms, etc. and quantifying the long-run impacts on global economic growth. Incorporating this finding into the numbers above increases the economic benefit from not logging a 50-year-old riparian stand by a factor of six, to about $100,000-$300,000 per acre.[10]

These numbers provide a ballpark estimate of the economic importance of carbon that could ultimately be stored in expanded riparian buffers, once trees are permitted to grow there. Further research that accounts for other types of damage omitted from the 2012 professional literature likely will push these values even higher. Other factors might push them lower. New technologies might increase the amount of carbon in long-lived wood products, for example, reducing somewhat the net benefit of not logging the trees. On balance, though, I anticipate that factors pushing the value of forest carbon higher than these numbers probably will outweigh those that might push it down.

In sum, policy actions that would prevent the logging of Oregon's riparian forests would, on average, yield an economic benefit of at least $100,000–$300,000 per acre by preventing the economic damage that would result if logging were to convert forest carbon to atmospheric carbon dioxide.

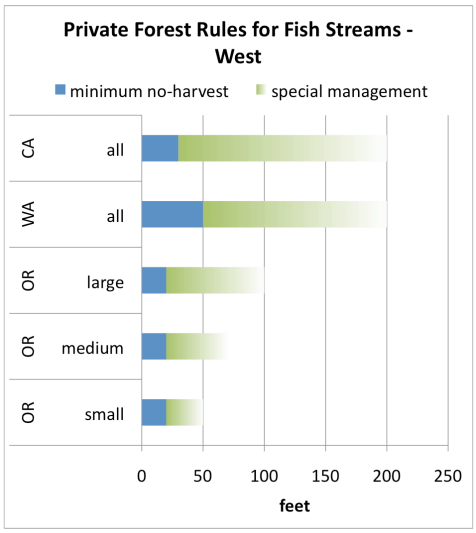
[9] BLM (2015 p. 483).

[10] Frances, C., and Delavane B. Diaz. 2015. "Temperature Impacts on Economic Growth Warrant Stringent Mitigation Policy." *Nature Climate Change*. 12 January. http://www.nature.com/nclimate/journal/v5/n2/full/nclimate2481.html. p. 2.

Private Forest Rules

Coastal / Western / Listed Salmon & Steelhead

Fish Streams



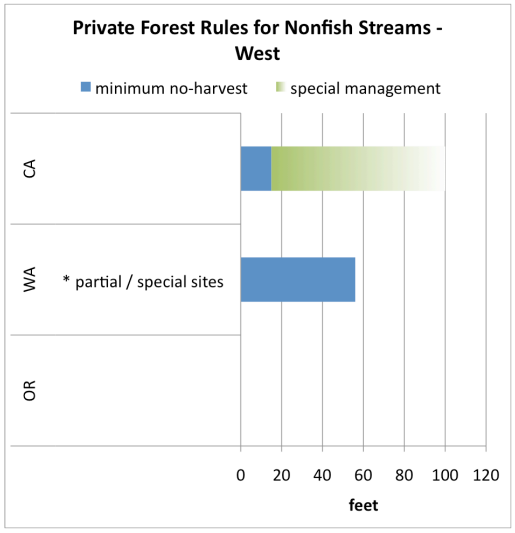
California. Buffer includes Channel Zone or Channel Migration Zone (variable, no-cut), Core Zone (min 30', no-cut), Inner Zone (min 70', 50-80% canopy & big tree retention), Outer Zone (even-aged units only, min 50', retain 50% canopy), Special Operating Zone (even-aged units only, 50', retain under- and mid-story trees).

Washington. Buffer starts at outer edge of channel or channel migration zone. Buffer includes Core Zone (50', no-cut), Inner Zone (10-100', thin from below or high retention) and big trees), Outer Zone (22-67', retain 20 trees per acre).

Oregon. Buffer starts at high water of channel. No overstory harvest within 20'. In RMA, retain trees > 6" dbh to meet BA targets.

large: 100' RMA, retain 40 conifers >11" dbh per 1000' stream.
medium: 70' RMA, retain 30 conifers > 8" dbh
small: 50' RMA, retain 40 sq. ft. basal area.

Non-fish Streams



California. Small Class II watercourses are protected by a Core Zone (15', no-cut) and an Inner Zone (35-85', retain 50% total canopy).

Washington. 50-56' no-cut buffers on 500' or 50% of nonfish stream length from confluence with fish streams, and on seeps, springs, and uppermost points of perennial flow.

Oregon. 20' RMA. Retain snags and understory vegetation.