RTI FACT SHEET **#34**
Rural forest community issues *April 2005*

A comparison of riparian regulation effectiveness in Western Washington and Oregon

By Kevin Zobrist

Western Washington (WA) and Oregon (OR) have highly productive private forestlands. Both states also have forest practice regulations that call for little or no timber harvest within riparian buffers. The intent of these restrictions is to protect habitat functions for endangered salmon and other aquatic resources. However, such harvest constraints can result in significant economic losses, especially for small forest landowners, and hence may have the unintended impact of motivating conversion from forestry to other uses. In addition there is a large body of evidence that, without thinning, previously managed riparian zones may be overstocked, forestalling the development of large trees and other mature forest characteristics desired for good quality riparian habitat. Ten case studies of small forest ownerships located west of the Cascade Mountains were used to examine the comparative costs and effectiveness of the WA and OR regulations Alternative riparian management plans are allowed under the regulations in both states and were included as part of this study to examine management options for better achieving riparian habitat objectives at a lower cost to landowners.

The current regulations in Western WA, known as the Forests and Fish Rules (FFR), require a three-zone riparian harvest buffer along either side of any fish-bearing stream. The total combined buffer width is one site potential tree height (SPTH), which is 90-200 feet depending on site quality. The zone adjacent to the stream is a 50’ no-harvest core zone. This is followed by the inner zone, in which two partial harvest options are allowed. Option 1 allows the smallest trees to be removed such that a minimum of the 57 largest trees per acre (TPA) are left. Option 2 allows the trees furthest from the stream to be removed up to a minimum distance of 80’ from the stream. The final zone is the outer zone, in which partial harvest is allowed such that 20 conifers per acre larger than 12” in diameter are retained.

In Western OR, riparian timber harvest is regulated by the 1994 Forest Practices Act (FPA), which requires riparian buffers of 50’, 70’, or 100’ in width for small, medium, and large fish-bearing streams respectively, as defined by average annual flow thresholds. No harvest is allowed within 20’ of the stream. For the remainder of the buffer, sufficient conifers must be retained such that targets for minimum total tree count and/or basal area (BA) are met. Leave tree targets are determined by stream size and geographic location. OR also has the 1997 OR Plan for Salmon and Watersheds, which encourages landowners to voluntarily minimize harvest activities in riparian areas by taking no more than 25% of the BA in excess of the minimum leave target defined by the FPA.

The Westside rules in both WA and OR have similar goals: to put the development of riparian stands on a trajectory toward a desired future condition (DFC) of mature forest structure intended to provide high quality riparian habitat. The WA rules define DFC as “the stand conditions of a mature riparian forest at 140 years of age” (WAC 222-16-010). Similarly, the OR rules define DFC as “unmanaged mature streamside stands” at 120 years of age (OAR 629-640-000). Despite these

similarities between the regulatory goals in WA and OR, the riparian prescriptions for meeting these goals are very different. The differences are particularly evident for small streams. Using an example of a small stream and site class II, the total buffer width would be 170' in WA compared to 50' in OR. Assuming Option 2 in WA, the no-harvest portion of the buffer would be 80', compared to 20' in OR. For the remainder of the buffer, WA requires 20 TPA, which would be 26 trees per 1000' of stream. For the remainder of the OR buffer, only the trees needed to achieve a total BA of 40 ft^2/1000' of stream must be retained. In many cases this target can be met or exceeded within the 20' no harvest zone.

Management simulations of the WA and OR riparian regulations were done for ten case studies of Westside small forest ownerships that ranged in size from 33 to 318 acres and included varying proportions of riparian to upland acreage with a variety of timber species and age classes. The management simulations were done using Geographical Information Systems (GIS) technology and the Landscape Management System (LMS). Five scenarios were simulated for each forest data set: minimum OR FPA requirements, OR Plan, OR Full Buffer (no harvest within the riparian zone), minimum WA FFR requirements, and WA Full Buffer.

For each scenario, the economic losses from the riparian harvest restrictions were assessed in terms of both the loss in forest value (FV) and soil expectation value (SEV). FV is the total value of a forest as an economic asset, including both land and existing timber. Losses in FV represent the total cost of riparian protection as a proportion of the total asset value of the property. SEV, also known as bare land value, is the economic value of the land by itself when used for forest management. Losses in SEV reflect a decrease in the competitiveness of forestry as a land use investment relative to other alternatives. SEV is thus an important overall indicator of long-term economic viability. The analysis of FV and SEV assumed a real target rate of return of 5%.

Figures 1 and 2 plot the FV and SEV losses respectively for the ten case studies under each of the five scenarios. The OR FPA simulations resulted in the least economic costs, with losses ranging from 3.2% to 24.2%. The higher impact case studies were those with large streams, which have wider buffers and higher retention requirements. The OR Plan resulted in a small increase in costs above OR FPA. FV losses were lower under the OR Plan compared to the OR Full Buffer as some mature timber was harvested from the riparian area under the OR Plan approach. SEV losses were the same under both scenarios, though, as not enough timber is removed under the OR Plan to utilize the land for additional rotations. The case study results for the WA FFR show economic impacts greater than OR Full Buffer. The WA Full Buffer simulations showed the most substantial impacts, with considerable value reductions in both FV and SEV for all case studies.

In both states, impacts to SEV were greater than impacts to FV. This is not unexpected, as the economic performance of new investments in forest rotations will be more sensitive to decreases in future revenue compared to existing timber for which establishment costs are sunk. SEV impacts are particularly high for the WA simulations because of the wider no-harvest areas. While WA does offer a program to partially compensate for the value of riparian leave trees, funding is only available to meet a small percentage of the potential need, and the program does not improve SEV, the important measure of long-term viability (see Fact Sheet #2). Costs of the magnitude displayed in many of the simulations for both WA and OR may increase the attractiveness of forestland conversion.

Many of the stands included in these case studies are young, dense plantations, which are typical of managed forest conditions throughout Western WA and OR. Thinning in the riparian portions of

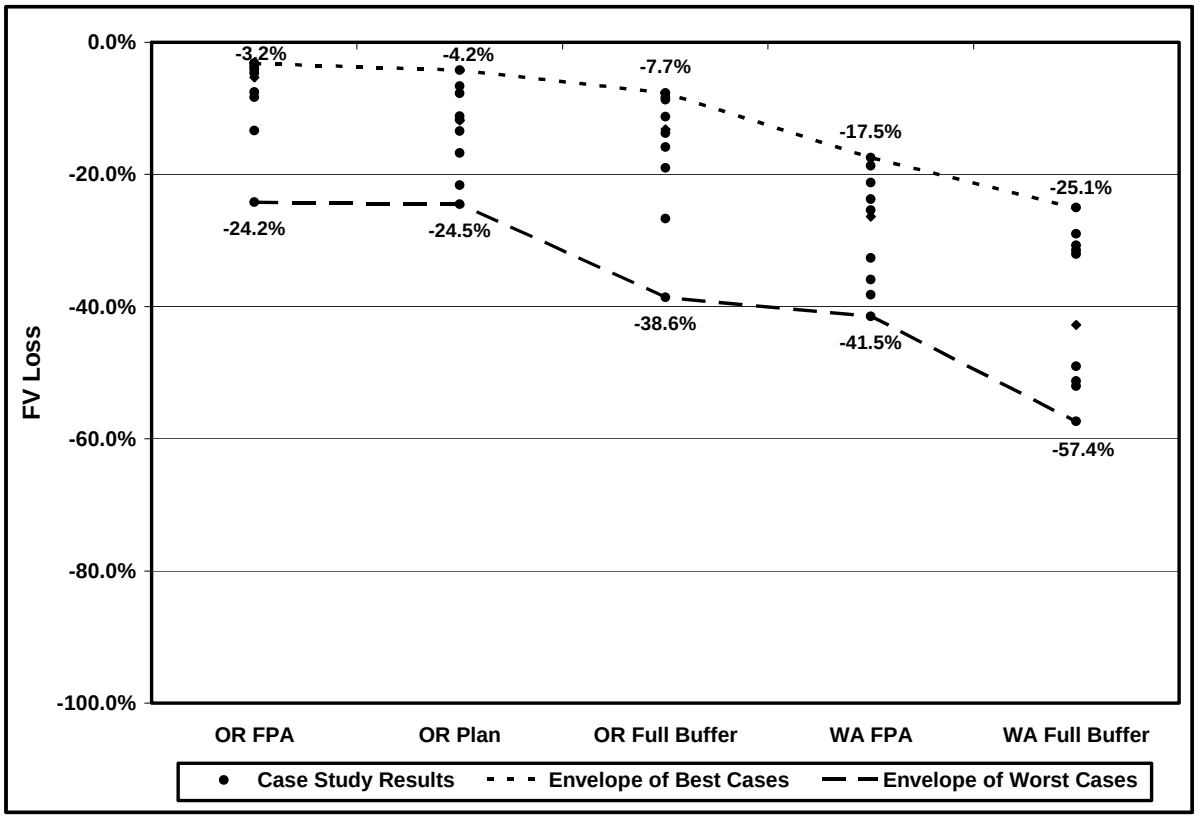

Figure 1: Losses in forest value (FV) from OR and WA riparian regulations.

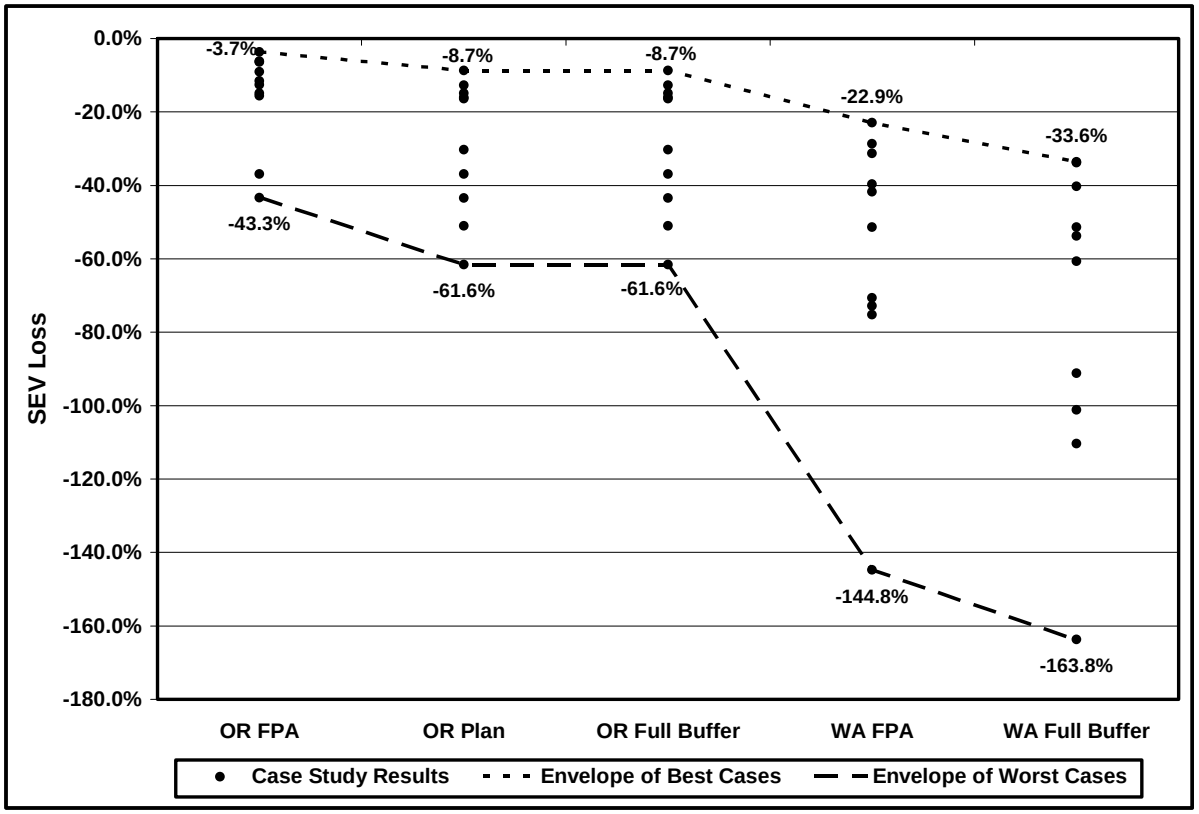

Figure 2: Losses in soil expectation value (SEV) from OR and WA riparian regulations.

these stands is either not permitted or not economically attractive under the regulations, since investments in early thinnings will not be recovered by subsequent harvests. An absence of thinning in these young, overstocked stands is known to delay or even preclude the achievement of mature forest conditions with large diameter trees (see Fact Sheet #24).

WA and OR policymakers anticipated that there could be economic and environmental problems with inflexible buffer regulations. The regulations in both states encourage landowners in these situations to pursue alternate plans (RCW 76.13.110 and OAR 629-640-000), site-specific management strategies for improving riparian habitat at a lower cost. The WA regulations further suggest "templates" of established guidelines to facilitate alternate plan implementation for common situations like overstocked stands. RTI has developed two example templates for overstocked stand on site class II (see Fact Sheet #23 for details). These templates utilize lengthened rotations with successive biodiversity thinnings to add structural complexity to the riparian zone while still maintaining economic viability.

Looking at the area within 170 feet of a small stream for an example 20-year-old plantation, Table 1 shows comparative results for the WA and OR regulatory scenarios and the two example alternate plans. The comparison measures the predicted percentage of time for each scenario simulation over the next 140 years that the resulting riparian stand structure will be statistically similar to the DFC using the RTI targeting and assessment procedure (see Fact Sheet #6). The comparison also shows the economic costs in terms of FV and SEV within this 170' zone, and the DFC/cost ratio for both FV and SEV.

Table 1: Comparison of DFC and costs between the OR and WA regulations and two alternate plan examples

Scenario	% Time in DFC	FV Cost	SEV Cost	DFC/FV Cost	DFC/SEV Cost
OR FPA	41.3%	15%	27%	2.70	1.54
WA FFR	32.1%	70%	134%	0.46	0.24
Alt A	70.1%	29%	67%	2.44	1.05
Alt B	64.9%	22%	67%	2.89	0.97

Table 1 shows that higher costs do not necessarily correlate with greater similarity to DFC. The WA regulations, with a wide application of a no-action prescription, achieve the lowest levels of DFC and also have the highest costs, resulting in very low DFC/cost ratios. The OR regulations apply the no-action prescription to a much narrower area, which lowers costs and achieves slightly higher levels of DFC, resulting from the latter years of the commercial rotations applied to the remainder of the riparian zone. Because these commercial rotations are relatively short, the overall level of DFC over 140 years is still quite limited, though the DFC/cost ratios are high because of the low costs. The two alternate plan examples provide a much higher level of DFC, suggesting that extended rotations with biodiversity thinnings can achieve DFC sooner and maintain DFC longer. The costs for these alternate plans are comparatively low, resulting in DFC/cost ratios that are comparable to the OR regulations but with greater achievement of DFC. This suggests that alternate plans are an important feature of the regulations in both states for achieving desired habitat conditions at a lower risk to the economic viability of small forest ownerships.

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