

Discussion Paper 13 (DP13): Regulatory and Policy Impacts on Timber Supply in Eastern Washington

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Changing forest policy and regulations

Since the last Eastern Washington timber supply analysis was completed in January 1995, a number of regulatory and policy changes have occurred in order to protect species listed under the Endangered Species Act (ESA). These changes have constrained private and public owner management activities differently, resulting in reduced harvest volumes and different forest structure trends for each forest landowner. The listing of the Northern Spotted Owl is perhaps the most significant listing under the ESA in terms of its

impact on timber supply and forest structure. While the listing occurred prior to the 1995 analysis, the cascading effects on timber supply, infrastructure, forest health and forest health mitigation treatments, and community stability are continuing to accumulate.

One impact of the ESA listings has been the substantial increase in planning effort that is required to harvest timber on public lands which contain habitats for at-risk species. The average amount of time required to plan and implement a timber sale on federal lands in the East Cascades is over 10 years (Townsend et al. 2004). Subsequently, rapid response to worsening forest health conditions has not been feasible. The combination of increased planning, constrained budgets, and escalating fire suppression costs that take resources from other management activities has resulted in very little timber harvested from the federal land base.

Changes in timber harvest

In the East Cascades region approximately 55% of the timber land base is effectively unavailable for timber harvest (Table DP13.1). The removal of most federal timber from the market place increased demand for logs which increased the price and made some previously costly harvest activities on private lands viable. Increases in private harvests over the past decade helped to offset some of the decline in federal harvests, but the capacity to maintain higher harvest levels on private lands has peaked and can be expected to decline (Figure 1).

Table DP13.1: Percentage of the conifer dominated timber land base by owner group and region

Region/Owner	Acres (1000's) (conifer leading)	Federal (%)	Private/Tribal (%)	State (%)
East Cascades	3,807	54.9	34.2	10.9
Blue Mountains	340	53.3	43	3.6
Northeast	2,935	33.6	56.5	7.1

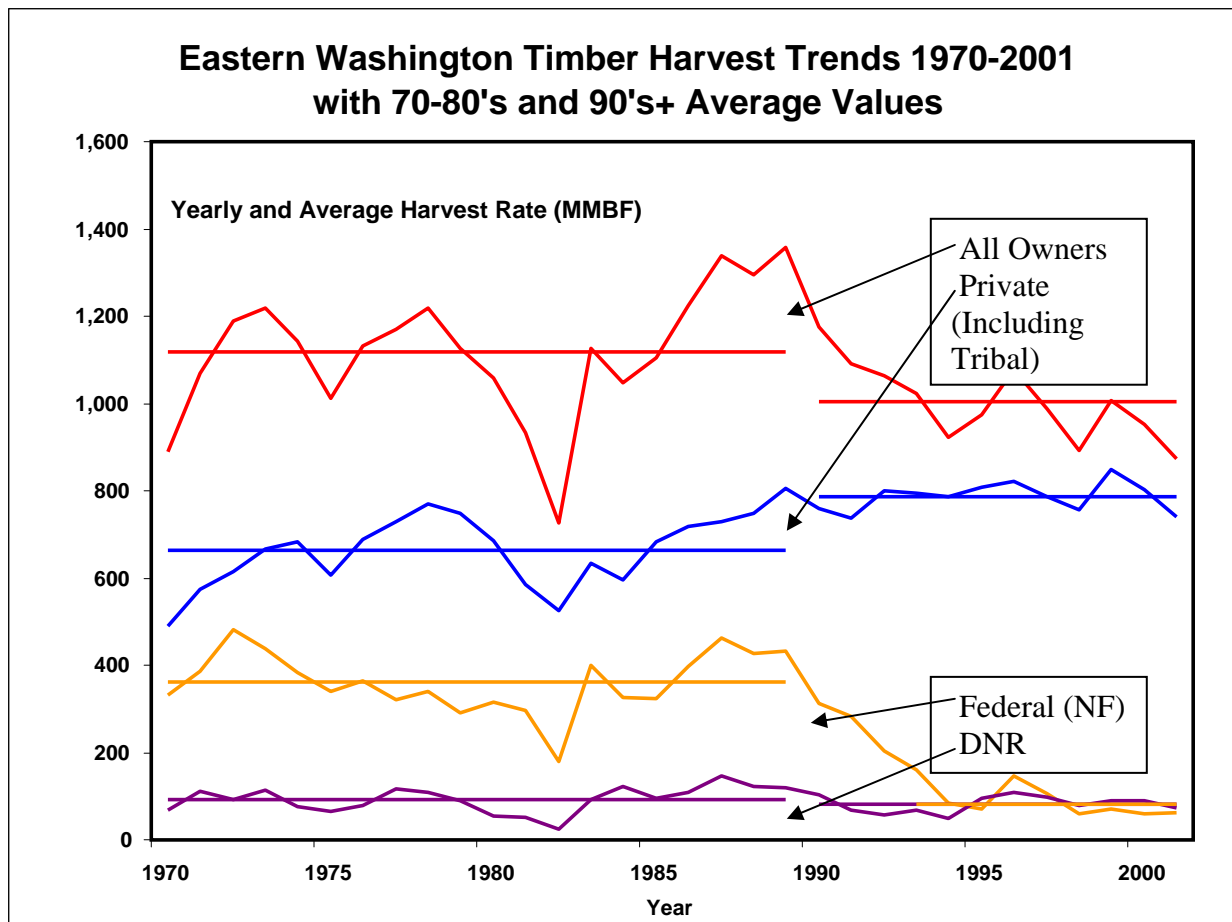


Figure DP13.1: Historical harvest volume by owner group

While reduced timber supplies resulted in higher log prices with improved economic returns for private land owners, supply-driven log prices undermined the economic viability of the milling sector. Sawmill closures in the East Cascade region, and particularly the loss of three mills in the last year in Kittitas and Chelan counties, has resulted in reduced market competition and increased haul distances for logs.

The Northeast region, however, with approximately 56% of the land base in private ownership, was less affected by declines in public harvests. Also, unlike the East Cascades region, in addition to privately available timber in Northeast, more public timber may become available from the Colville National Forest. Planning efforts by a multi-caucus stakeholder group, the Northeast Washington Forestry Coalition (NEWFC), to address forest health, at risk species, ecological values, and community stability are attempting to resolve the gridlock surrounding management activities on the Colville National Forest.

On state-owned forest lands, the yearly volume of timber made available in the past decade has not varied substantially from the 30-year average (Figure DP13.1). In response to the ESA listing of the northern spotted owl, the lynx, the grizzly, and several species of salmon the DNR developed a statewide Habitat Conservation Plan (HCP) which came into effect in November 1996. In Eastern Washington, the HCP covers three planning units along the East Cascade crest. Two of these planning units are located in the DNR Southeast Region while the Chelan unit is managed by the DNR Northeast Region (Table DP13.2).

Table DP13.2: Planning Units under the DNR HCP for eastern Washington

Planning Unit	Counties	DNR Acres
Chelan	Chelan and western Okanogan	15,000
Yakima	Kittitas and northwestern Yakima	81,000
Klickitat	Southwestern Yakima, western Klickitat and southeastern Skamania	132,000

A review of the HCP indicated that targets were not met for timber harvest and that forest health activities required more action than had been estimated (Table DP13.3). In 2004, the HCP was amended for the Klickitat planning unit to address escalating forest health issues associated with overstocked stands (DNR 2004a). The southeast region identified approximately 600 MMBF of timber that would need to be removed in order to restore a sustainable forest condition in the Southeast region, including areas covered by the HCP. To restore the forests to a sustainable condition, the harvest rate would need to increase by 50% (Shelton, 2004).

Table DP13.3: Harvest targets for eastside DNR lands under the HCP

Activity	East-side Planning units (acres) – estimate ^{1,2}	Actual acres through end FY2003 ¹	Actual as % of lower bound of target ³	Actual as % of upper bound of target ³
Harvest:	3,000-	1,682		
clearcut	6,000		93.40%	46.70%
seed tree	0	599	-	-
shelterwood	1,000-	1,934		
	5,000		322.30%	64.50%
selective	25,000-	5,982		
	35,000		39.90%	28.50%
salvage	5,000-	1,182		
	10,000		39.40%	19.70%
commercial thinning	4,000-	4,078		
	10,000		169.90%	68.00%
Overall harvest target	38,000- 66,000	15,457	67.80%	39.00%
Forest health:	3,000-			
underburning	10,000	0	0.00%	0.00%
root-rot control	1,000-	0	0.00%	0.00%
	5,000			
insect damage control	2,000-	3,618		
	15,000		301.50%	40.20%
Precommercial Thinning	3,000-	3,332		
	10,000		185.10%	55.50%

¹Values extracted from Table 2.1 DNR HCP 5-year comprehensive review

²Values are a 10 year target taken from HCP adopted November 1996

³Values are estimated as a 6 year harvest rate (1997-2003) relative to the 10 year target

Impact of the Bull Trout Overlay

The 1998 listing of bull trout (*Salvelinus confluentus*) resulted in the establishment of a bull trout overlay across most privately owned timber lands in Eastern Washington that was implemented as part of an emergency rule package. Limits to harvest within 75 feet of streams were established to maintain shade and stream temperature for the endangered bull trout. The shade rule requires that all available shade be left within 75' of streams. This rule covers the regions of Eastern Washington identified in Figure DP13.2, which include most of the timber producing forest lands in Eastern Washington.

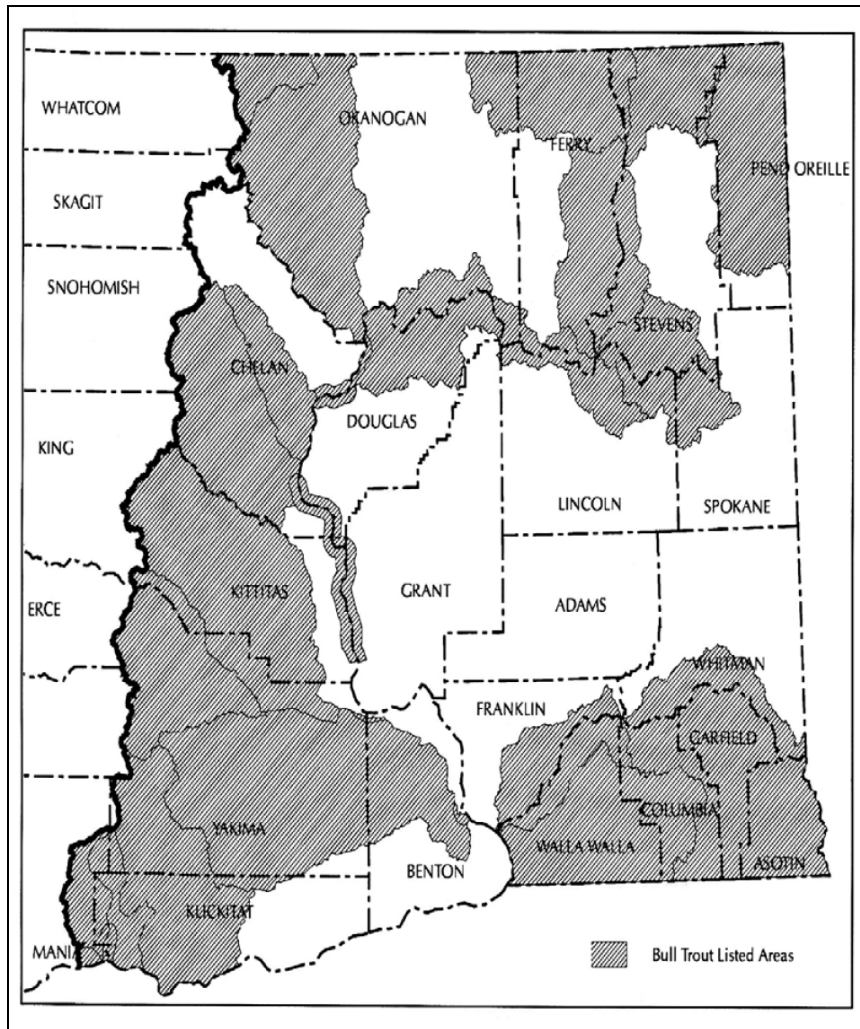


Figure DP13.2: Bull Trout Overlay for Eastern Washington*

* From WAC222-16 page 16-3

Impact of Forest and Fish Rule (FFR) change

In 2001, the Washington State Forest Practices Board also adopted changes to its regulations to meet the requirements of the Clean Water Act and the Endangered Species Act in response to the listing of several species of salmon. The new regulations, known as the Forest and Fish Rules (FFR) include additional restrictions on timber harvest in riparian areas across the state. The rules in Eastern Washington are intended to provide for restoration of riparian function while allowing activities that can ameliorate risks associated with fire, disease, and insects within riparian zones.

The FFR restrict timber harvest in a three-zone riparian buffer along any potentially fish-bearing streams. Total buffer widths vary from 75-130 feet wide by site quality and stream width, with larger streams and higher sites given wider buffers. No harvest is allowed in the “core zone” closest to the stream. Harvest is permitted in the middle or “inner zone” if the forest condition meets a dual criteria for minimum basal area and tree count of a specified diameter size. Harvest is also allowed in the “outer zone” as long as a stream-adjacent parallel road is not present. Basal area retention requirements vary along an elevation gradient with higher levels of retention required at higher elevations. Stream classification is based on the width, gradient, and flow metrics of the stream as well as basin characteristics. Presence or absence of any particular species of fish is not considered in stream classification.

The Washington DNR hydrography (hydro) GIS layer (WADNR, 2007) was used to assess broad scale regulatory impacts imposed by the Forest and Fish Rules. The hydro layer was overlain with polygon information identifying privately owned forests in eastern Washington and forest site quality information. Stream mileage (Table DP14.4) was calculated for those streams within forests where timber productivity exceeds an average growth rate of more than 20 cubic feet/acre/year. The acreage in the riparian core, inner, and outer zones by county and timbershed was estimated by combining DNR site class data with the hydro layer and ownership classification and applying the FFR rules by site class, stream type, and elevation (Table DP13.5). The estimates were grouped by water type based on the hydro layer identification of fish bearing streams (F), non-fishing bearing streams (N) and shorelines of the state (S). The total acreage in the buffers was compared against the total acres in the site classes in question (Table DP13.6) to estimate the average percentage of the land in the streamside riparian zones by county and timbershed (Table DP13.7).

Table DP13.4: Stream miles by timbershed and stream classification for private forest land in Eastern Washington

Timbershed	Water Type			Grand Total
	F	N	S	
East Cascades	1,373	4,978	340	6,690
Inland Empire	2,223	7,079	591	9,893
Grand Total	3,595	12,056	931	16,583

Table DP13.5: Acreage distribution in riparian zone buffers by county and timbershed for Eastern Washington private forests

	Water Type	F	N	S		F	S		F	S		
	Buffer Type	CORE			CORE Total	INNER		INNER Total	OUTER		OUTER Total	Grand Total
TimberShed	County											
East Cascades	Chelan	155	2,930	27	3,112	377	65	442	12	10	22	3576
	Kittitas	2,050	14,359	644	17,053	4,818	1469	6287	284	174	457	23798
	Klickitat	2,975	13,517	421	16,914	6,934	956	7890	471	24	494	25299
	Okanogan	3,573	22,919	312	26,804	8,356	768	9124	69	2	71	35999
	Yakima	923	6,608	138	7,669	2,156	336	2491	3		3	10163
East Cascades Total		9,676	60,333	1,543	71,552	22,640	3594	26235	838	209	1048	98835
Inland Empire	Asotin	645	5,482	15	6,142	1,483	48	1531	15		15	7688
	Columbia	496	4,067	53	4,615	1,125	118	1243	43	14	57	5916
	Ferry	1,436	9,545	156	11,137	3,357	371	3728	72	14	86	14951
	Garfield	329	,1847		2,175	753		753	15		15	2943
	Pend Oreille	2,606	12,486	288	15,380	6,124	716	6840	501	49	550	22770
	Spokane	2,851	15,279	339	18,468	6,585	774	7359	324	11	335	26162
	Stevens	7,210	35,295	988	43,493	16,675	2327	19002	1056	114	1170	63665
	Walla Walla	245	1805		2,050	562		562	24		24	2637
Inland Empire Total		15,817	85,804	1,839	103,461	36,664	4355	41019	2050	202	2252	146732
Grand Total		25,493	146,138	3,382	175,013	59,304	7949	67254	2889	411	3300	245567

Table DP13.6: Acreage distribution by site class, county and timbershed for Eastern Washington private forests

Timbershed	County	Site Class						Grand Total
		1	2	3	4	5	8	
East Cascades	Chelan		924	6,078	2,777	1,293	8,468	19,540
	Kittitas	618	63,850	83,397	33,581	4,280	76,508	262,234
	Klickitat	33,116	46,629	117,339	67,801	372	58,502	323,759
	Okanogan		38,375	44,494	74,802	1	302,942	460,614
	Yakima		1,094	9,542	26,500	26	71,820	108,981
East Cascades Total		33,734	150,872	260,850	205,460	5,972	518,240	1,175,128
Inland Empire	Asotin		5,086	21,164	2,890		39,358	68,498
	Columbia		7,445	36,694	1,667		18,445	64,251
	Ferry		16,862	35,675	11,939	3,983	106,397	174,857
	Garfield		4,959	9,160	1,150		16,203	31,473
	Pend Oreille		203,226	92,063	426		14,384	310,099
	Spokane		159,844	133,037	25,884		26,158	344,922
	Stevens	2,600	441,266	320,034	1,265		131,091	896,257
	Walla Walla		8,493	10,030	989		9,013	28,525
	Inland Empire Total		2,600	847,182	657,857	46,211	3,983	361,048
Grand Total		36,334	998,055	918,706	251,671	9,955	879,288	3,094,010

Though the FFR technically allow some selective harvest within the inner zone of fish bearing streams, the Cooperative Monitoring Evaluation and Research (CMER) team reports that the average basal area remaining after leaving the required 21 largest trees and 29 additional trees greater than 10 inches dbh is approximately 200 ft²/acre (Cupp 2007). This residual basal area is approximately three times the minimum required at low- and mid- elevations under the FFR. Cupp also found that the trees that could be removed in the inner zone were often not commercially valuable and that special contractual agreements had to be made to enter the stands for their removal. Given these limitations, the likelihood of private individuals removing non-merchantable trees is low. Our simulations to determine impacts therefore treat these stands as no-harvest or riparian reserve zones. The acres within the core and inner zone of F and S streams are included in the estimate of riparian reserve acreage. As Type N streams require a two-sided 50 foot buffer that is managed to retain the equivalent basal area targets as the inner zone, the N streams were also treated as riparian reserve acreage. Riparian reserve acres are excluded from treatment in simulations of available timber land. The outer zone is included in simulations for harvest treatments as there is the potential to remove merchantable volume from these parts of the riparian zone.

GIS assessment of stream miles from the DNR hydro layer (Table DP13.7) indicates that an average of 7.94% of the private forest land in eastern Washington is found along streamside riparian management zones. Of that 7.94%, approximately 7.83% is effectively reserved from harvest under the rules because of limitations imposed by the dual ceiling of tree size and basal area. As noted in the analysis of Westside riparian acres in Discussion Paper 7 (DP7-W) there is considerable uncertainty on the location of streams in the DNR hydro layer, particularly for the N streams.

LiDAR analysis of headwater streams would suggest there may be significantly more N streams than produced by this analysis. The regulatory constraints imposed by the FFR also created economically

inoperable areas resulting from the buffer protection around streams. From earlier studies on the impact of regulations (Perez-Garcia et al, 2001) we estimated that the acreage associated with these areas is an additional 0.7% of the land base. When we consider the economically inoperable areas as well as likelihood that the core and inner zones will be treated as reserves because of lack of economic incentive to enter, we are left with riparian reserves covering the percentage of productive forest land by county as given in the final column of Table DP13.7. Harvest constraints around wetlands and lakes were not estimated as the hydro layer does not provide adequate information to accurately assess what percentage of the land base that these features occupy, thus the final column in Table DP13.7 likely underestimates the percentage of land that is effectively under riparian reserve status.

Table DP13.7: Riparian buffer type by timbershed and county private timberlands in Eastern Washington

Timbershed	County	Percent of timber land in RMZ by buffer type				Economically Inoperable*	Riparian Reserve*
		Core	Inner	Outer	Total		
East Cascades	Chelan	15.93%	2.26%	0.11%	18.30%	0.70%	18.89%
	Kittitas	6.50%	2.40%	0.17%	9.08%	0.70%	9.60%
	Klickitat	5.22%	2.44%	0.15%	7.81%	0.70%	8.36%
	Okanogan	5.82%	1.98%	0.02%	7.82%	0.70%	8.50%
	Yakima	7.04%	2.29%	0.00%	9.33%	0.70%	10.02%
East Cascades Total		6.09%	2.23%	0.09%	8.41%	0.70%	9.02%
Inland Empire	Asotin	8.97%	2.23%	0.02%	11.22%	0.70%	11.90%
	Columbia	7.18%	1.94%	0.09%	9.21%	0.70%	9.82%
	Ferry	6.37%	2.13%	0.05%	8.55%	0.70%	9.20%
	Garfield	6.91%	2.39%	0.05%	9.35%	0.70%	10.00%
	Pend Oreille	4.96%	2.21%	0.18%	7.34%	0.70%	7.87%
	Spokane	5.35%	2.13%	0.10%	7.58%	0.70%	8.19%
	Stevens	4.85%	2.12%	0.13%	7.10%	0.70%	7.67%
	Walla Walla	7.19%	1.97%	0.08%	9.24%	0.70%	9.86%
Inland Empire Total		5.39%	2.14%	0.12%	7.65%	0.70%	8.23%
Grand Total		5.66%	2.17%	0.11%	7.94%	0.70%	8.53%

We applied the riparian reserve percentages calculated for private lands to the timber availability analysis of tribal and private forest land within the six timber producing regions of Eastern Washington (Table DP13.8) in order to analyze how riparian regulations might affect locally available timber supply from these lands. The timber regions were used to group the FIA inventory data into locations that were likely to be serviced by milling facilities that currently exist or have only recently ceased to operate. Differences in the acreage estimates from the FIA productive timberland inventory and the DNR private land GIS layers, and the inclusion of tribal data in Table DP13.8 account for the variance in total acreage between Tables DP13.6 and DP13.8.

Table DP13.8: Estimated percent of land reserved for riparian protection by region on private and tribal forest land

Private forested acres by region			
Region	forested acres	% riparian reserve	Commercially Available forested acres
Okanogan	401,165	7.87%	369,593
Wenatchee	305,931	9.61%	276,517
Yakima	616,585	8.15%	566,335
Timbershed 6	1,323,681	9.02%	1,204,285
Northeast	1,201,555	7.20%	1,115,092
Southeast	146,329	9.96%	131,748
Tonasket	518,782	8.57%	474,315
Timbershed 7	1,866,666	8.23%	1,713,040
All regions	3,190,347	8.53%	2,918,211

While the FFR regulatory constraints add complexity, limits on harvests in riparian areas had been in effect in Eastern Washington under the bull trout emergency rule since 1998. Evidence from the CMER study (Cupp 2007) indicates that the bull trout shade rule which preceded the FFR effectively precludes the harvest of any trees within 75 feet of streams within the bull trout overlay area. The application of the bull trout rule over much of the private land in Eastern Washington makes entry into these riparian zones unlikely. Not surprisingly, findings from Cupp and the GIS analysis are consistent with observations obtained from a review of Forest Practices Applications (Stinson, 2003) that a majority of forest landowners are choosing to forego any riparian harvest.

Disproportionate impacts on small owners

While average impacts are useful for discerning the broad scale impacts of regulatory change, they do not capture the differences that emerge when comparing the impacts on small versus large land owners. Case studies in Western Washington identified a disproportionate impact of the FFR on small landowners relative to large landowners. In order to better understand how these new rules might affect Eastern Washington small forest landowners, simulations of forest stand development and economic outcomes were modeled for nine small owner case studies located in Okanogan, Pend Oreille, Stevens, and Whitman counties (Rural Technology Initiative Fact Sheet #20 @ www.ruraltech.org/pubs/fact_sheets). The case study sites ranged from 20 to 825 acres in size and from 1700 to 3800' in elevation.

For each case study, treatment scenarios were simulated over a 90-year growth period using USDA Forest Service developed Forest Vegetation Simulator (FVS) growth models and the Landscape Management System (LMS) forestry software developed at the University of Washington's Silviculture Laboratory. Simulations of multiple harvest options and treatment regimes for both upland and riparian management units for each case study were compared to assess potential economic outcomes. Upland simulations were developed based on typical eastside management regimes that emphasize 20-30 year harvest re-entry periods. In most cases, successive harvests produced continuously lower harvestable volumes until such time as a final 'shelterwood' harvest was simulated to permit the re-establishment of shade intolerant seral species in the understory layer. While each simulation was unique to address the specific stand conditions currently present, all were predicated on the owner objective of maintaining a relatively consistent cash flow over time as well as meeting biological and regulatory objectives for site occupancy, tree growth, and harvest adjacency. Since the removal of small diameter trees did not provide a break even cash flow, the simulations did not attempt to remove the accumulation of small growth within riparian areas.

A baseline performance scenario was created that simulated management requirements for the permanent rules that were in place prior to enactment of the Forest and Fish Rules. By comparing the FFR to a 'baseline' of the permanent rules in effect immediately prior to June 2001, a measure of the incremental impact resulting from FFR was possible. Four riparian area management scenarios were evaluated under the FFR rules including a no harvest option, harvest in the outer zone only, a single harvest entry in the inner zone, and multiple harvest entries in the inner zone. Riparian area treatment simulations were timed to coincide with adjacent upland harvest simulations to minimize the cost of treating small areas. In cases 6, 7, 8 and 9, no outer zone simulations were required because soil capability classes exempted these areas from the rules. In cases 5, 7 and 8, the multiple harvest entry scenario was not possible because the stands did not produce sufficient volume and basal area to permit a viable second entry over the 90-year simulation period.

Discounted cash flows were calculated based upon estimates of harvest and reforestation costs, annual administrative costs, land taxes, and timber excise taxes. Reduced timber excise tax rates made available under FFR were included in all scenarios, except the baseline. Cash flows were discounted at a 5% expected rate of return. Costs associated with road building were not considered. One third of the cases had existing stream-adjacent parallel roads resulting in additional lost harvest revenue due to increased restrictions on timber harvest in these areas. Economic losses for case study simulations when compared to the baseline (pre-FFR) range from a 0 to 49% reduction in discounted cash flows (Figure DP13.3).

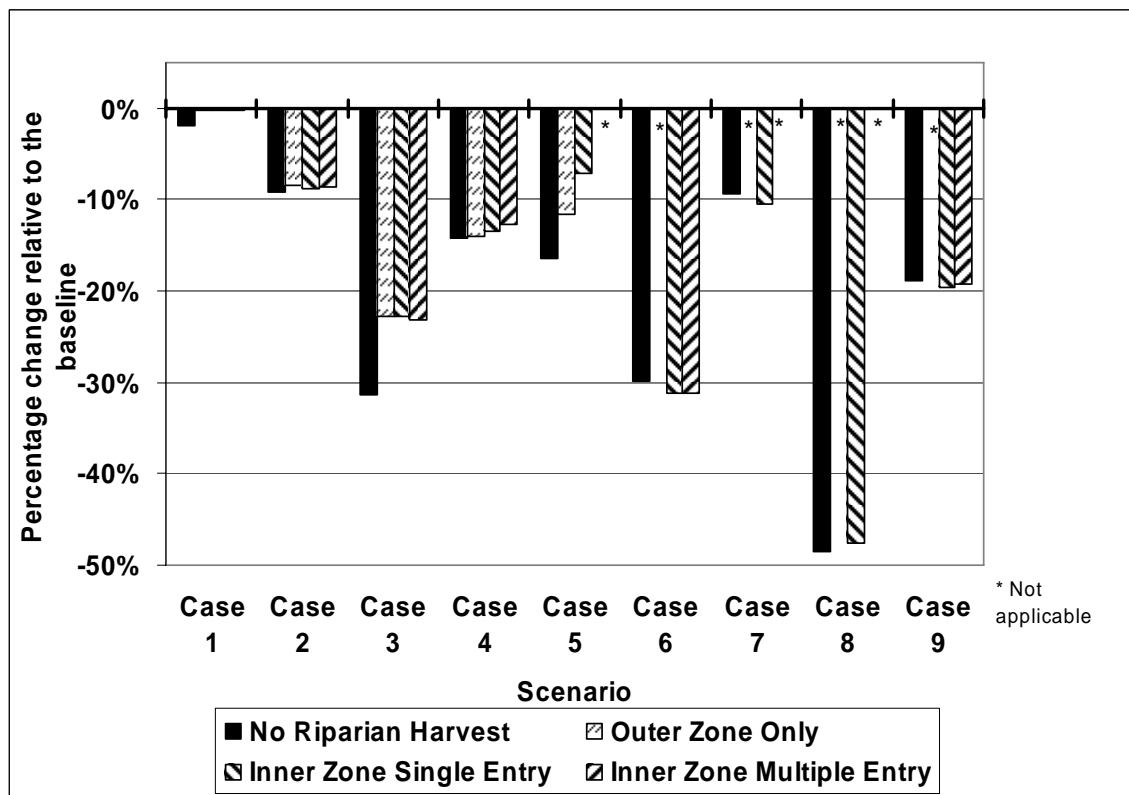


Figure DP13.3: Percent change (relative to the baseline) in the NPV of forest management cash flows over 90 years under the Forest and Fish Rules. Case 6-9 are low site classes with no requirement for an outer zone. Cases 5, 7 and 8 have no economic opportunity to re-enter the inner zone after the initial entry.

Economic losses toward the high end of the scale occurred in situations where streams were reclassified from non-fish bearing to fish bearing as in case 3 or where there are significant water resources found within the study area as in case 6. Size of landholding was not a proxy for impact as case 6 is the largest in the study at 825 acres and case 3 is the smallest at 20 acres. In case 1 an inadequate number of trees > 10" dbh restricted

harvest to approximately the same degree under the baseline and FFR rules, resulting in a 0-2% variation in economic value under either rule depending on harvest scenario.

Mitigation of impacts under the Forest Riparian Easement Program

The case by case variation of impacts is equally apparent if landowners choose to participate in a state-funded compensation program called the Forest Riparian Easement Program (FREP) as illustrated in Figure DP13.4. This variability is highlighted in case 7 where baseline harvest was prohibited because of inadequate tree count as in case 1. However, because of differences in tree sizes between the two cases, for case 7 the relative economic benefit of the FREP is substantial. In general, economic impacts attributable to the baseline rules and the incremental nature of FFR become apparent under FREP, as 6 of the 9 cases can have a net economic ‘gain’ under at least one riparian scenario.

Positive values under the ‘No Riparian Harvest’ scenario arise when harvest activities at a normal re-entry period in adjacent upland stands occur at a point that riparian stands have not met the minimum basal area or tree count required for stand entry. This outcome is particularly apparent in drier ecosystems where basal area increase takes a substantial time period or where stands have high tree densities, but few trees exceeding 10” dbh.

In many instances economic losses can become gains if the landowner qualifies for and chooses to participate in the FREP, as indicated by the positive values noted in Figure DP13.4. These gains arise because landowners would be compensated for the value of all timber they are required to leave under the FFR, whereas under baseline rules that included stream protection and shade criteria, no such compensation had been available. Under the FREP landowners are offered compensation for a percentage of the stumpage value of trees left uncut to meet FFR requirements in exchange for entering into a 50-year commitment or “easement” to leave these trees unharvested. Optimal scenarios vary depending on the landowner’s choice of participation in the FRE Program and the site and stand characteristics within riparian areas. Values in Table DP13.9 identify the best economic outcomes by case under FFR, both with and without enrolling the lands in the FREP.

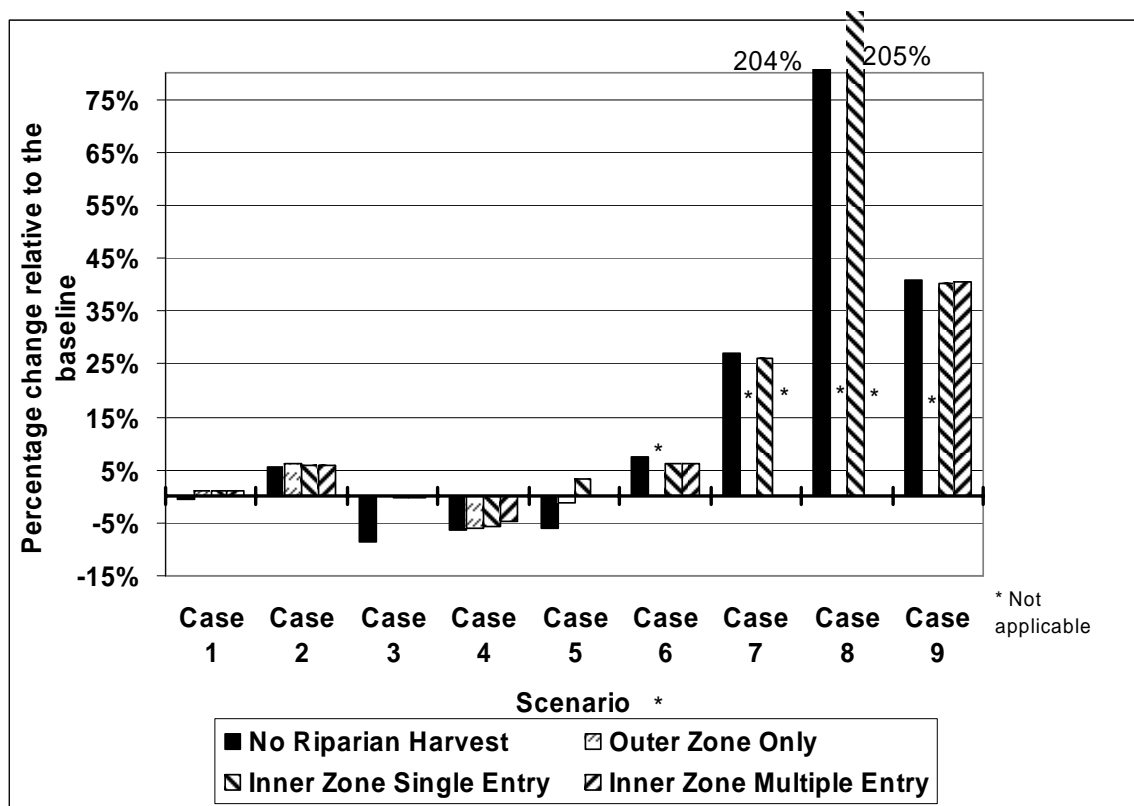


Figure DP13.4: Percent change (relative to the baseline) in the NPV of forest management cash flows over 90 years under the Forest and Fish Rules with compensation from the FREP included. The FREP includes compensation for timber that would not have been harvested under the baseline case.

Table DP13.9: A comparison of the possible changes in economic return to the landowner under FFR if a Forest Riparian Easement is taken on all riparian stands.

Case No:	1	2	3	4	5	6	7	8	9
% Change in NPV with no FREP compensation	-2%	-8%	-23%	-13%	-7%	-30%	-9%	-48%	-19%
% change in NPV with FREP compensation	1%	6%	0%	-5%	3%	7%	27%	205%	41%

Under the FREP, landowners in Eastern Washington have the potential for significant economic gain. In 7 of 9 cases, taking an easement on all riparian areas will increase the economic return to landowners over what they could have obtained under baseline rules. This finding is consistent with the results of a recent Department of Revenue (DOR) study that compares the value of riparian leave trees to the forest excise tax credit (DOR, 2002). The DOR report indicated that the value of timber left in riparian areas in eastern Washington was 65% attributable to requirements under the baseline rules and only 35% attributable to requirements under the FFR. These Eastern Washington harvester results include large and small holdings. If only small harvesters are considered, riparian timber values accounted for 49% the value of residual timber under the old rules. The small harvester figure applies to all Washington regions, not just Eastern Washington. Thus, while impacts to small landowners in Eastern Washington cannot be definitively determined from these results, the implication is that somewhere between 49% and 65% of the value of riparian timber that must be left under the FFR, was also required to be left under the baseline prior to the bull trout emergency rule. Payment for this timber, particularly in high impact over-ride situations, accounts for the positive economic results under the FREP for the majority of the case studies.

Small forest landowner decision consequences

Despite the gains that can accrue under the FREP, a review of Forest Practices Applications to the DNR indicate that a majority of small forest landowners are choosing to forego any riparian harvest while also foregoing participation in FREP. In 4 of 5 of the cases in this study, opting for complete avoidance of riparian harvest resulted in the greatest economic loss for the landowner. In effect the regulatory changes have resulted in a substantial reduction in the economic return to many but not all small owners. Foregoing any riparian harvest also has undesirable ecological consequences as Camp (1995) found that accumulations of forest fuels in riparian reserves could result in high risk to habitat qualities from fires and insect and disease vectors. Camp's research is supported by field observations that riparian forests are serving as de facto fire corridors (FHWG 2004). A Fact Sheet prepared by the Rural Technology Initiative (FS#25@ www.ruraltech.org/pubs/fact_sheets/) determined that the complex overlay of requirements in the regulations does not allow thinning along streams sufficient to reduce fire risk and insect attack unless an alternative management plan is developed and a plan specific approval process successfully completed.

Concluding Summary

The case study analysis found that multiple harvest entries within riparian zones are generally not economically practical and Cupp (2007) found that the multiple requirements for tree size and density preclude most harvest activities in the inner zone. Thus despite the intent of the rule to permit multiple harvest entries to address insect and disease conditions, regulatory constraint and practical application precludes most entries into the riparian zone. Re-entry of the riparian zone was shown to benefit the landowner economically in only two of the nine cases examined. Economic losses can occur when landowners have a substantial amount of riparian area on their land and they do not take advantage of the Forest Riparian Easement Program. In five of the nine case studies, pre-FFR regulations prohibited harvest entry into riparian stands because of minimum tree count requirements. Depending on the values left behind in these cases, the relative impact of the FFR may be minor while the benefit of the FREP can be substantial. While the FREP may provide some forest landowners with economic relief, sufficient funding for this program is not secure.

Many landowners report that in spite of FREP compensation benefits, they are unwilling to grant a 50-year state-held covenant on their forestland. In addition, the FREP does not provide incentive for stewardship activities such as removal of excessive fuel loads or restoration of early seral habitat types. To meet the biological intent of the FFR requires the adoption of alternate plans that balance economic return with stewardship values that address the risks associated with densely stocked riparian forests within a matrix of upland forests with escalating risks from insects, disease, and fire.

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