CINTRAFOR

FACT SHEET

Economic and Environmental Impact Assessment of Forest Policies to Protect Riparian Habitat

In the last decade many policy changes have resulted in large forest reserves to protect critical habitat. While much of the habitat protection was directed toward public lands, the economic impacts have been profound. New programs to provide protection for the salmon and bull trout are imminent. An assessment of the economic and environmental impacts from past and prospective forest management alternatives is essential to judge the effectiveness of future proposals.

Background: The 1990's have witnessed frequent forest management policy changes that differentially affect federal, state and private lands with the intent of protecting, first the northern spotted owl, then the marbled murrelet and, prospectively salmon and bull trout. Efforts to protect the owl and murrelet, which have been mostly dependent upon old forest structures, focused first on federal, and then state and private lands. The impacts on privately owned lands were considerably less given their limited old forest structure inventories. Harvest levels were reduced by 80% on federal forests and by roughly 40% on state lands. Private lands now account for about 85% of the harvest on 60% of the unreserved forestland.

Policymakers have attempted to protect critical habitat by approving plans that enlarge both old forest upland reserves and no-harvest zones around streams. The economic impacts from these changes have been large, resulting in losses of rural jobs and an increasing disparity between timber dependent rural and urban incomes. The expectation is that future changes driven by salmon protection may be even more severe--with most of the impact falling on private forest landowners.

Policymakers have generally opted to endorse a management strategy that largely depends on reserving certain land types and habitats from active management, following the strategy first adopted on federal lands. Active management alternatives to improve environmental and habitat conditions have recently received attention by researchers; and they may be both more effective at protecting habitat and less costly than reserve strategies. Forest stands are dynamic and ultimately change in structure through growth, natural disturbances, human interventions, and/or management.

Simulation of forest management alternatives for riparian protection: Simulations provide one method to assess the impacts of policy change, and have been prepared for a range of regulatory and management alternatives affecting western Washington for the next 200 years (table 1). Assessments of critical habitats, biodiversity, harvest levels and economic impacts demonstrate the environmental/economic tradeoffs between alternatives. For the impacts of riparian management on private lands, current practices are first simulated as a baseline (Case 1). The consequences of current regulations result in essentially 85 ft. no-management buffers along fish bearing class 1-3 streams with the buffers covering about 2-3% of the forestland. Possible alternatives to increase salmon habitat include enlarged riparian management zones (RMZs) covering both fish bearing and non-fish bearing streams, with either no-management (Case 2) or active biodiversity management within the RMZ (Case 3) to restore riparian functions that existed in pre-European settlement times. The scenarios in table 1 are for a 150 ft. RMZ on class 1-3 (larger fish bearing) streams, 100 ft. on class 4 streams and 50 ft. on class 5 (generally intermittent and non-fish bearing) streams.

The economic losses associated with the no-management RMZ are substantial. Impacts are shown for: (1) harvest losses which directly affect mill activity, (2) both short term and long-term rural jobs which are most important to community economic activity, (3) net present value (NPV), the measure of economic importance to forestland owners, (4) tax receipts of interest to government and (5) old forest (late seral) structures as an aggregate proxy for environmental affects valued by society. Harvest losses over the first 20 years from no-management within the RMZ (Case 2 compared to Case 1), measured in percent change, exceed the percentage of total acres in the RMZ, a typical effect of harvest scheduling problems when there is a reduction in mature forests of harvestable age. The first 20-year job and harvest losses in rural communities averaged 23% -- 16,500 jobs and 840 million board feet per year. The number of jobs in the longer term actually increases because more

intensive management in the early years increases the available harvest and jobs over time. Long-term job losses under Case 2 are 10% or 7,500.

Table 1. Economic and environmental impacts from riparian management alternatives on private lands in Western Washington (5,712,000 private acres, assuming no owl and murrelet protection).

(Land Base) Acres Impacted		*Case 1* Current Base 2.5%	*Case 2* No-mgt. RMZ 14%	*Case 3* Bio-mgt.RMZ 14%
			Change from the Base (Case 1)	
(Mill Impacts)				
Harvest	1-20 years average (mmbf)	3,640	-23%	-17%
	Long-term sustained	4,077	-15%	+9%
(Community Impacts)				
Rural Jobs	1-20 years	72,000	-23%	-15%
	Long-term sustained	76,500	-10%	+27%
(Landowner Impacts)				
NPV @ 5% $billions		28.8	-20%	-11%
(Government Impacts)				
State & Local Tax Receipts 1-20 years ($millions)		821	-23%	-15%
(Societal Environmental Impacts)				
Late Seral Habitat in RMZ (%)			Percent of Riparian Land Base	
	Current	1%	1%	1%
	By 5th decade	1%	6%	53%
	By 10th decade	11%	57%	67%

Harvest losses are reduced under active management using thinnings within the RMZ, (Case 3 vs. Case 1) hence the first 20-year job losses are cut to 10,800. In the long-term, jobs increase rather than decrease as a consequence of the labor intensive thinning to enhance biodiversity, which also produces larger trees with higher quality wood supporting increased value-added processing.

The NPV loss to private owners for Case 2 is $5.6 billion or 20% (slightly less than the harvest loss), but is reduced to $3.2 billion or 11% under Case 3. Tax receipts are proportional to the economic activity, with losses of $185 million per year under Case 2 and $117 million under Case 3.

The environmental improvements in Case 2 are very modest until the 10th decade, whereas more active management to replicate old forest functionality under Case 3 achieves similar levels by the 5th decade. The 5% increase in riparian acres with late seral structures by the 5th decade under Case 2 costs $1,100 million for each additional 1.0% of late seral riparian acres and under Case 3, $61 million. Using this ratio as a measure of economic efficiency, active management to increase old forest functionality within the RMZ results in an eighteen-fold improvement.

The simulation suggests near term job losses and NPV reductions in the range of 20% if active management is not allowed, but (Case 2) may only suggest a lower bound since the simulation leaves out many important affects that could substantially increase the costs. The RMZ width could be as wide as designated in the Northwest Forest Plan on federal lands or twice as wide as the illustrated RMZ, a potential doubling of the impact. Unstable slopes could also add another 5-10% of all acres to those in the RMZ, for a 50% increase in economic impact. The addition of lands to protect unstable slopes and secondary streams results in disconnected harvest units that may not be economically accessible, a substantial increase in management costs. There are also increased costs associated with road, bridge and culvert improvements. The simulation therefore provides at best only a lower bound on the cost estimate to satisfy regulatory requirements or an environmental restoration goal. Since the simulation only estimates average affects across owners, there will also be a substantial disproportionality. Some small owners will feel no impact and some will feel almost 100% loss of their economic potential if their lands fall almost entirely in the affected RMZ.

Active management within the RMZ offers the potential to grow large trees faster for stream recruitment while maintaining a more diverse understory resulting in a faster restoration of pre-European environmental conditions at a substantially lower cost than no-management zones.

For more information contact Bruce Lippke or B. Bruce Bare at the College of Forest Resources, U. Of Washington (206) 543-8684. Complete results are available in a paper that has been submitted for publication.