

Discussion Paper 6 (DP6): Changing Private Forest Management Intensities: Western Washington

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Introduction

All private timberland managers must balance maximization of annual economic returns with sustainable stewardship to ensure long-term forest productivity and enduring asset values. Management treatments must adapt strategies for site-specific growing conditions to complex and evolving forest science, markets, regulations, and other values. However, private forest owners should not be considered as a homogeneous group. Included in this broad category are the forest industry, many family forestland owners, and Indian Nations. This paper characterizes the current management treatment strategies of Western Washington private timberland owners as determined from surveys, interviews, prior analysis, and forest planning documents.

Total timber harvest volumes for Western Washington declined from 4,646 million board feet (MMBF) in 1990 to 2,667 MMBF in 2002, a two billion board feet (46%) decline (DNR 2004). The National Forest share of harvest declined from 11% in 1990 to less than 1% in 2002 as the industry share increased from 64% to 73% even though the industry harvest level fell from 2,974 MMBF in 1990 to 1,937 MMBF in 2002. The relative share for other ownerships remained stable although harvest volumes dropped for all. The combined harvest volume from all Westside private forests currently contributes 85% of the total for the region (Table DP6.1.).

Private forest owners manage timber resources based upon varied economic, environmental, and cultural values and objectives. Management strategies must be customized for existing age class and species distributions as evidenced by Figures DP6.2. and DP6.3. Site productivity, shown in Figure DP6.4., can also be an important management consideration. Summaries of management assumptions that were used in

to inform potential harvest forecasts and timber supply for the private timberlands of Western Washington are presented below.

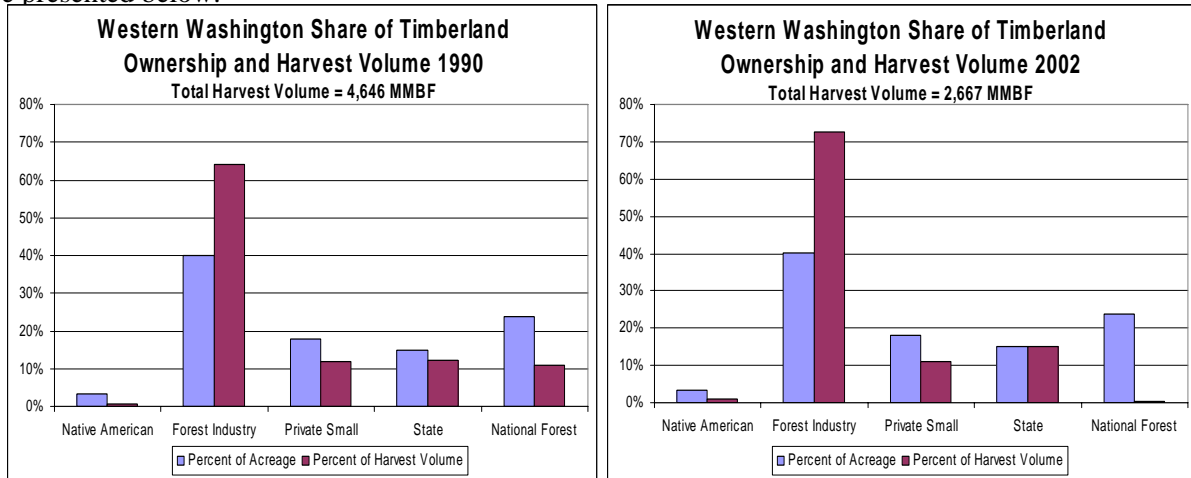


Figure DP6.1: Ownership and Harvest share change from 1990 to 2002.

Table DP6.1: Harvest Volumes for Western Washington by Ownership Type 1990 and 2002.

Year	Ownership Type – Volumes in Million Board Feet					
	Native American	Forest Industry	Private Small	State	National Forest	Total
1990	37.6	2,974.0	557.7	573.1	504.0	4,646.3
2002	26.8	1,937.0	296.8	397.8	8.3	2,666.9

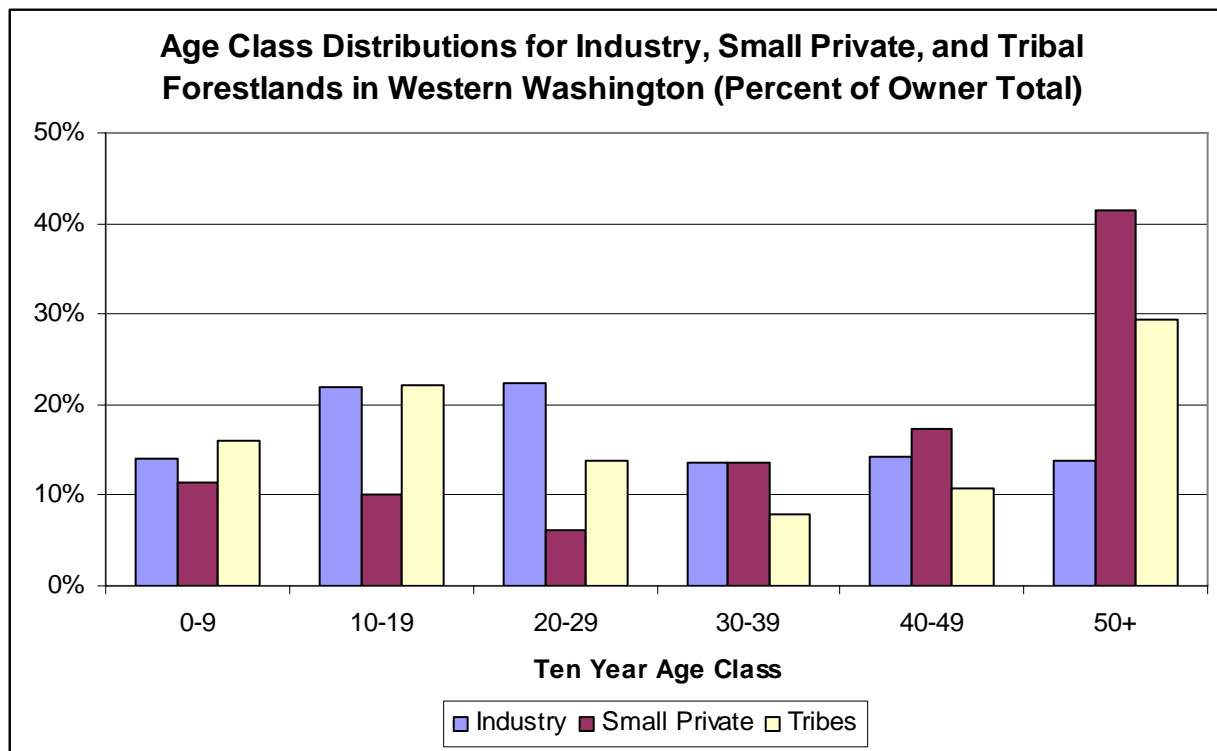


Figure DP6.2: Age class distribution by owner type.

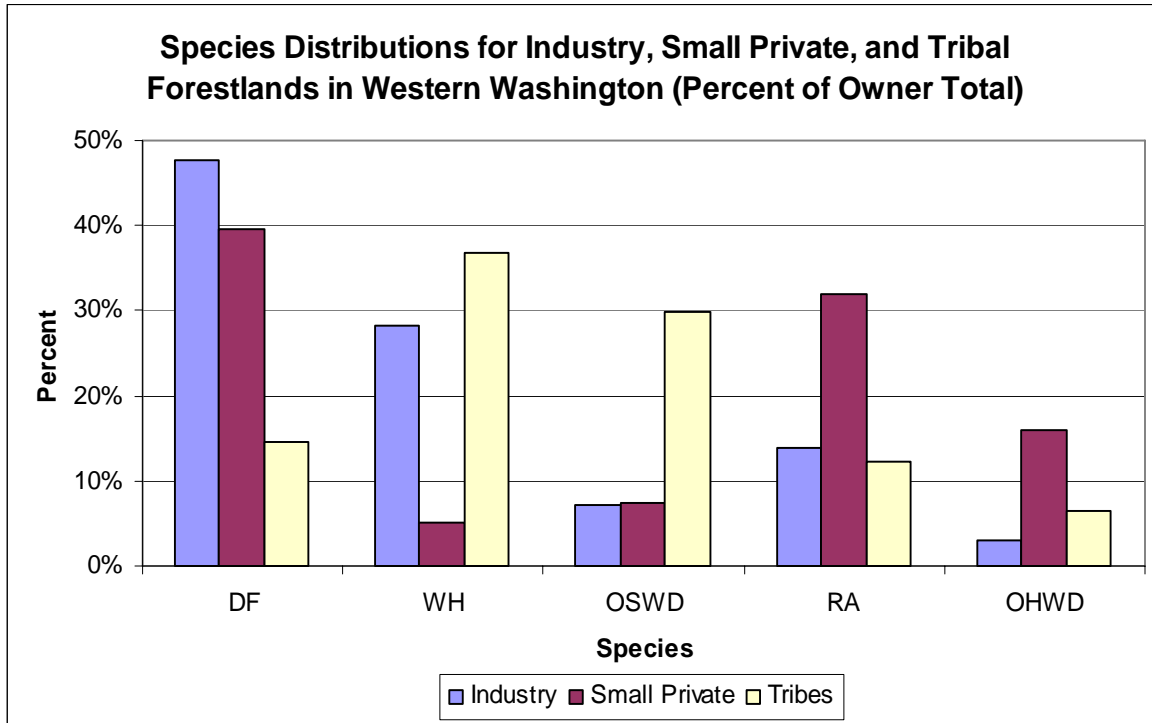


Figure DP6.3: Species distribution by owner type.

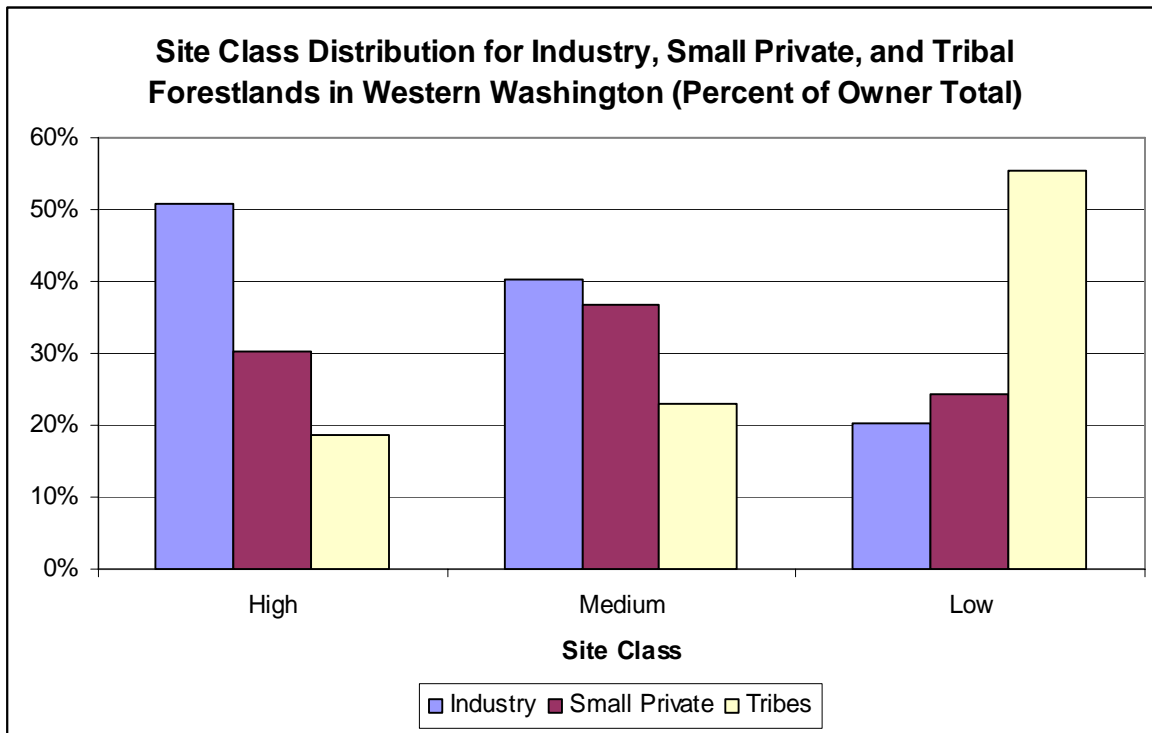


Figure DP6.4: Site class distribution by owner type.

Industrial Forestlands

Industrial forests comprise 40% of non-reserved timberlands in Western Washington (68% of all private forestlands) yet are now providing 73% of the total harvest. Industrial forests are more intensively managed to maximize harvest volumes and subsequently dominate the regional yield. Analysis of current management intensities indicates that industrial strategies have changed substantially since the 1992 timber supply analysis (Adams et al. 1992).

To better understand changes in management approaches on industrial forests, the University of Washington and the Washington Forest Protection Association surveyed timberland companies that manage commercial forestlands within the five timbersheds of Western Washington. Forest managers were asked to estimate current and future practices by dominant tree species, site class, and age class. Sixteen responses were received from companies which own more than 10,000 acres and cumulatively manage more than three million acres of forestlands in Western Washington. Results were weighted by acreage to produce average response data by timbershed.

Respondents indicated that 8.2% of all company lands are covered by roads, rock, wetlands, water, and other areas not capable of growing timber (approximately 300,000 acres). Additional land holdings unavailable for commercial timber management include voluntary reserves at 0.4% (around 14,000 acres) and regulatory reserves at 9.5% of total industrial forests (about 342,000 acres).

There are many changes in management intensions from the prior study. As much as 10 years shorter rotations to final harvest are occurring on good sites (minimum 30 years on high productivity sites and maximum 60 years on low sites). Survey respondents report that 64% of forestlands are treated with herbicides to eliminate growth competition from non-commercial vegetation. The 1990 study forecasted no use of herbicides. This change alone probably accounts for much of the shortening of rotations as research plots show that the tree growth in the first 15 years of planting is increased substantially by best practice vegetation control.

While the 1990 management survey anticipated increased planting and elimination of natural regeneration, natural regeneration appears to continue on 12% of western industrial forestlands. Also in contrast to prior practices, fertilization has all but been abandoned in recent years possibly replaced by the increases in planting of genetically improved seedlings to accelerate growth.

The greatest apparent difference between 1990 expectations and current practices is the dramatic reduction in pre-commercial and commercial thinning. The combined practice of pre-commercial followed by commercial thinning with a delayed final harvest was expected to occur on 37% of industrial forestlands but respondents now report that this management approach is employed on only 0.5% of forestlands.

A significant impact since the 1990 study has been the increase of acreage set aside for no management. In 1990, the expectation was that 4% of lands would not be managed; however, today increases in forest practice restrictions, primarily associated with riparian regulations, have resulted in 10% of industrial forests removed from harvest.

Figure DP6.5. shows the weighted averages for each treatment for all five timbersheds in Western Washington measured as a percentage of total industrial forest acres. The differences from 1990 to 2006 (blue bar on left to mahogany bar on right) show a substantial increase in herbicide use and genetically improved stock with a corresponding decrease in fertilization, pre-commercial and commercial thinning. While Figure DP6.5. displays averaged management intensities for western Washington, it is noteworthy

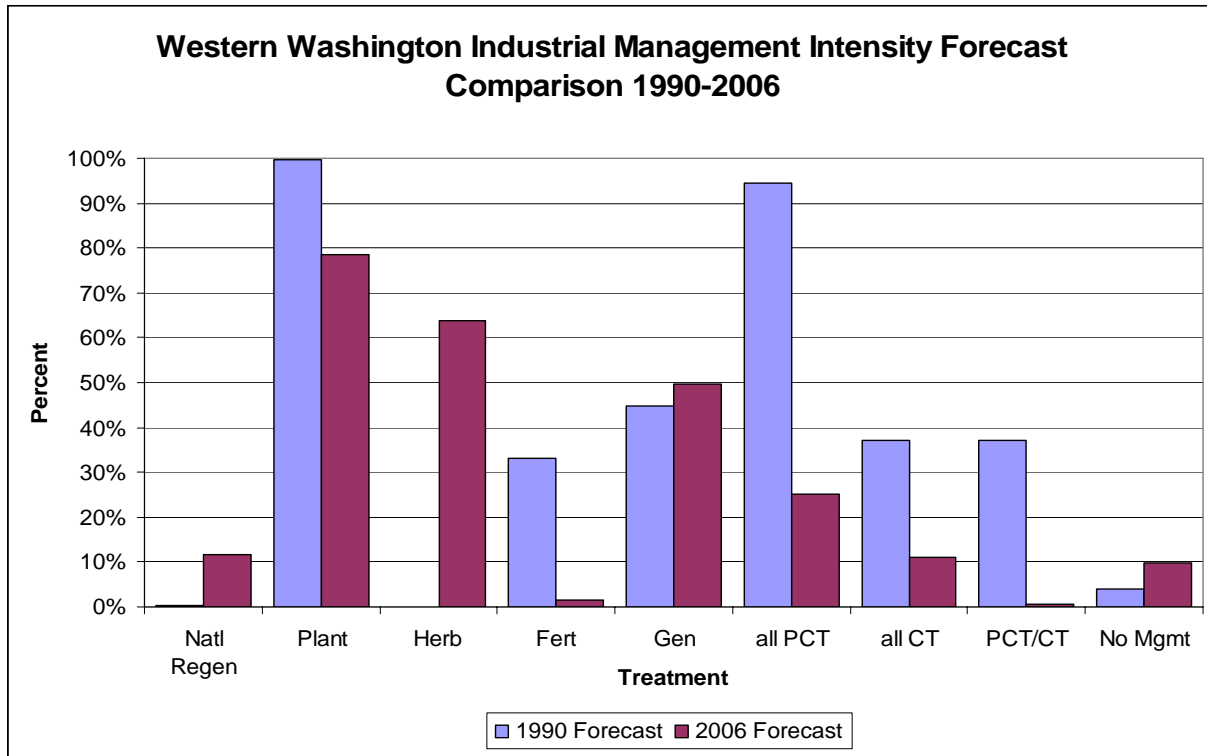


Figure DP6.5: Western Washington Industrial Management Intensity Forecast Comparison 1990-2006

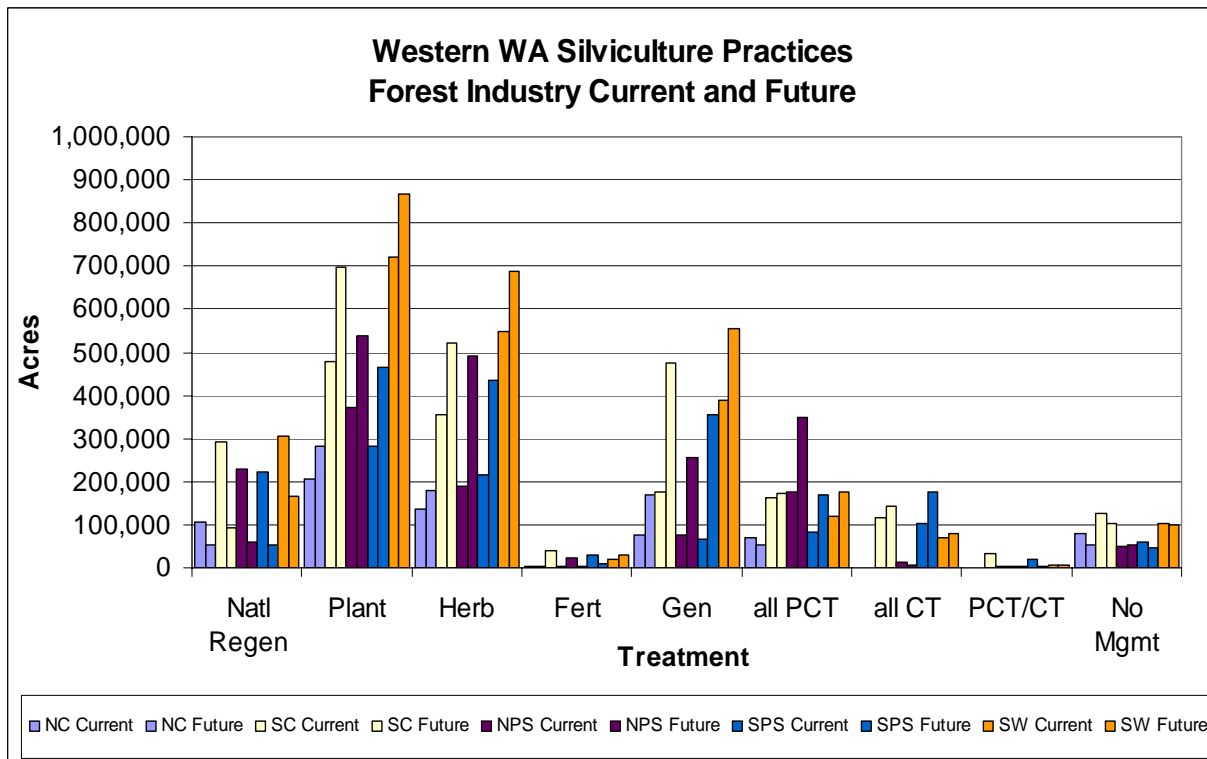


Figure DP6.6: Western Washington Silviculture Practices

¹ NC = North Coast; SC = South Coast; NPS = North Puget Sound; SPS = South Puget Sound; SW = Southwest

that practices appear to vary considerably by timbershed as shown in Figure DP6.6. which summarizes the variability in current and expected future management by individual timbershed.

These surveyed management intentions provide the critical assumptions for developing baseline harvest and forest structure projections. We are indebted to the Washington Forest Protection Association and the industrial forestland owners of Western Washington for their generous assistance in assembling this data.

Non-Industrial Forestlands

Non-industrial private forests (NIPF) in Western Washington are generally family enterprises and often serve dual purpose as working forest and home site. Family forest owners are many and are diverse. Some manage their own lands while others rely upon management guidance from professional forestry consultants. Most ownerships are small (less than 100 acres) and as a consequence are subject to infrequent harvest activities that appear to be driven more by personal circumstances than by revenue maximization as evidenced by the relatively large inventory of mature timber retained on non-industrial forestlands as compared to industrial and tribal forests (Figure DP6.2.). Subsequently, harvest flows and representative management strategies are difficult to predict. However, a survey of Washington Farm Forestry Association members that examined small landowner trends from 1988 through 1997 found that, in contrast to industry, this owner group is more likely to incorporate regular thinning treatments into forest management regimes. Harvest activities from this ten-year period were split almost evenly between regeneration harvests and commercial thinnings (Lippke et al. 2002). These results were confirmed by a 2006 survey of Washington Contract Loggers Association members, discussions with Washington University Extension, and by interviews with land owners and consultants. Management that includes commercial thinning logically extends rotation age which also explains older timber inventories. Depending upon site class and stocking conditions we assume that rotation cycles on non-industrial forests are extended by five to ten years.

Unlike industrial owners, NIPFs do not have the opportunity to average regulatory impacts such as harvest restrictions over a large number of acres. Zobrist (2003) found that depending upon the location of small forest parcels relative to environmentally sensitive areas, individual landowners may be very strongly impacted by regulatory constraints or not at all. Under such extremes the economic examples suggest some small forest landowners may become marginally economically viable raising questions in regards the future sustainability of some family forests. Other threats to family forest ownership include estate taxes that undermine generational transfer and increasing pressure from development at the urban interface. These factors may serve to increase short-term harvests of mature inventories but undermine long-term contribution from future rotations.

We are indebted to the Washington Farm Forestry Association, the Family Forest Foundation, the Washington Contract Loggers Association, Washington State University Extension, and the family forestland owners and consultants of Western Washington for their generous assistance in assembling the management information used in this study.

Tribal Forestlands

Tribal forest enterprises have become increasingly important contributors to the forest management of Western Washington. Two historic factors have influenced this transition. Declines in federal harvest volumes, as mentioned above, served to elevate the significance of tribal harvest contributions to hard-hit rural economies especially on the Olympic Peninsula. Over the last few decades tribal forestry programs have transitioned towards great autonomy with less reliance upon Bureau of Indian Affairs (BIA) assistance. Integrated management that includes development of parallel tribal enterprises such as seedling propagation has resulted in healthier forests and more jobs for tribal members. Since Indian Nations own their own forest resources and tribal enterprises are operated under the guidance of tribal councils to achieve broader socio-economic goals than profit maximization, the jobs per unit harvest volume multipliers appear to be greater for tribes than for other industry activities. Available data indicates that for tribal enterprises 1 MMBF of

timber harvest per year generates approximately 51 direct and indirect jobs (IFMAT II 2003) as opposed to a state average of 33 direct and indirect jobs. In contrast to industry divestiture of forestland assets for conversion, Western Washington Indian Nations are increasing reservation forests through purchases of allotments and non-Indian lands and by reclamation of tribal titles. Indian forests are managed to benefit tribal communities in many ways - by producing timber and revenue as well as a wide variety of non-timber products such as traditional foods and medicines, cultural values, and firewood. Spiritual use, water, and fish and wildlife habitats are also important. Protection of forests for use by tribal members on an enduring basis is a paramount management emphasis in tribal forest planning (International Forestry Consultants 2005, Makah Tribe 1999, Quinault Indian Nation and Bureau of Indian Affairs 2003).

Tribal and BIA foresters face unique challenges that include the complex management of both tribal and allotment lands. The allotment of substantial portions of forest trust lands to individuals on some reservations, as a result of the Allotment Act of 1934, greatly complicated land management and increased the difficulty of coordinating management. Management costs for individual allotments are greater than for tribal lands.

An annual allowable cut is determined by foresters for each tribe based on ten-year intervals with a current potential level of combined tribal harvest in Western Washington estimated to be about 40 million board feet per year. Forest practices are based upon prudent silvicultural regimes and, as a result, are more similar to those of industry than the highly variable family forest owners. As determined by each tribe, some forested areas are subject to special environmental and cultural protections. Riparian buffers meet or exceed state regulations. Western Washington tribal timberlands are dominated by lower site quality forests and a greater abundance of western hemlock and other softwoods than industrial and non-industrial counterparts. Subsequently, very little commercial thinning is employed and rotations are extended to 50 or 60 years. Plantation of harvested areas is followed by pre-commercial thinning to reduce overstocking. Tribal foresters report very little use of chemical herbicides or fertilizers.

We are indebted to the Makah Tribe, the Quinault Indian Nation, the Tulalip Tribes, and the Bureau of Indian Affairs for their willingness to share tribal inventory data and forest plans and their generous assistance in assembling the management information used in this study.

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