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**Sent:** Tuesday, September 29, 2009 4:38 PM

**To:** 'teanawaysubarea@co.kittitas.wa.us'

**Subject:**

Good afternoon...

Here are three items for placement on the website for folks to review.

Thanks

Wayne

DOCUMENT 2

# **An Investigation of the Prospects for Forests and the Forest Industry in Kittitas, Yakima, and Klickitat Counties**



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## **Acknowledgements**

This report represents a synthesis of information and analysis garnered from available publications and interviews with forestry professionals. Members of the research team included Larry Mason, Research Scientist at the School of Forest Resources, College of the Environment, University of Washington and Bruce Lippke, Economics Professor at the School of Forest Resources, College of the Environment, University of Washington.

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## **Introduction**

The Washington forest industry employs 45,000 people and annually generates \$2 billion in wages, \$16 billion in gross business revenues and over \$100 million in tax receipts (Eastin et al. 2007). Washington produces six billion board feet of lumber per year, one billion square feet of plywood panels (3/8" basis), and seven million tons of pulp and paper products (Eastin et al. 2007, Ince et al. 2001). Remarkably after several decades of political and economic struggles for the forest industry, Washington is the second largest lumber producer in the nation and is fourth in production of both plywood and pulp and paper products (Eastin et al. 2007, Ince et al. 2001).

Behind these impressive figures, however, there is a broader story of timber industry transition in Washington that has been the result of dramatic shifts in regional forestland ownerships and timber harvest allocations accompanied by significant structural changes to process infrastructure that promise enduring challenges to forestland managers and rural forest communities. Evolving policies, land use pressures, and declines in forest ecosystem health add further complexity to consideration of evolving future implications.

It is these developments that have been examined by this investigation with special attention to consideration of forests and forestry in the central Washington counties of Kittitas, Yakima, and Klickitat. Detailed statistics and maps are provided in Appendices.

## Historical Background

Washington became a territory of the United States in 1853 with the passage of the Organic Act (Statutes of the Territory of Washington 1854). Klickitat County was established in 1859, Yakima County in 1865, and, in 1882, Kittitas split from Yakima to become a separate county (Interstate Publishing 1904). For purposes of this report, we will refer to these three counties as central Washington. The logging industry in central Washington began in Klickitat County as settlers used ox teams to haul cordwood to the banks of the Columbia River where they sold it for fuel to the steamboats that plied the river. Settlers also harvested timber for log cabins and stove fuel. The first recorded commercial lumber production in central Washington was in 1860, from a whipsaw operation on Mill Creek in Klickitat County (Washington State Department of Archeology and Historic Preservation). The lumber industry remained small in central Washington through most of the 1800's existing mainly as independent operations that served local building needs. However, the rapid growth of the agricultural industry, which followed the institution of irrigation and apple orchards through the 1870's, created a requirement for storage and transportation containers for which abundantly available ponderosa pine proved to be uniquely suited (Howard 1973). In response to market opportunity, sawmills were constructed and began producing box shoo. This market, coupled with burgeoning regional demand for building materials, provided for the initial establishment of the forest industry in central Washington (Howard 1973).

Most of the wood production occurred in Klickitat County where, by 1892, there were ten sawmills and five shingle mills in steady operation (Interstate Publishing 1904).

The expansion of the lumber industry began an historic shift both regionally and nationally; full-time employees and increased supplies were needed. Efficient operation meant greater possibility of profit. Incremental manufacturing improvements resulted: circle saws replaced slow reciprocating saws and multi-saw edgers were added to speed the production line. In 1870, the band saw was introduced to increase production and utilization. Mills were kept running constantly and lands were logged in the most

expeditious manner (Cox et al. 1985). Skills in mill work and logging required trained workers.

With the development of the steam engine came the railroad. By 1850, the United States had nine thousand miles of railroads (Olson 1971). By 1910, American railroads operated on over 350,000 miles of track (MacCleery 1992). The railroad opened up new areas to agriculture, timber, mining, and settlement. The new settlers needed lumber to construct buildings. New industries needed wood products for industrial applications.

The railroads were huge consumers of wood products for fuel, car construction, and ties. Track required 2640 ties per mile and, because of decay; these ties had to be replaced every six to seven years (Olson 1971). Just replacing rotten railroad ties on a sustained basis required a national equivalent harvest of between 15 and 20 million acres of forest land per year in 1900 (MacCleery 1992). Railroads at one time consumed almost one fourth of the nation's annual lumber production.

In 1886, the first major sawmill in Kittitas County was built in Cle Elum solely to produce lumber for the construction of the railroad (Interstate Publishing 1904). Roslyn became a town following discovery of coal close to the rail line and the North Pacific Coal Company built its own sawmill to manufacture mining timbers and building materials. Sawn wood was also used to fabricate large pipes needed for irrigation projects and community water systems. Lumber was also required to craft patterns for foundry work (Interstate Publishing 1904).

By 1903, in Klickitat County, 23 lumber mills and seven shingle mills produced shingles, rail ties, and planed wood (Washington State Department of Archeology and Historic Preservation).

In 1903, Yakima businessmen formed the Cascade Lumber Company on the Yakima River northeast of the city. Small mills cutting lumber in communities like Wenas,



**Figure 1. 1915 - Water delivery of logs to the Cascade Lumber Company (Yakima Centennial Commission 1984).**

Cowiche, and at the mouth of the Tieton River were no longer viable as the easily accessible pine forests had all been harvested. Hauling logs by wagon to mills proved uneconomical. To feed the new mill, loggers floated logs down the Yakima and Teanaway rivers to a flume in annual drives during spring high water. In 1914, Cascade built a narrow-gauge railroad on the Teanaway, which gave rise to the community of Casland in 1917 (Yakima Centennial Commission 1984). In 1957, the

Cascade Lumber Company merged with the Boise Payette Lumber Company to form Boise Cascade.

Unprecedented American growth occurred in the nineteenth century. A foundation of this growth process, since the beginning of the nation, had been the disposition of public lands. Two ordinances, in 1785 and 1787, established the rectangular survey system, determined the procedures by which territories became states, and established a process for public land sales as well as land grants to schools (Souder and Fairfax 1996, Steen 1991). The Northwest Ordinance, passed two years later, provided the initial system for territorial governance and transition to statehood (Souder and Fairfax 1996). In 1789, Congress enacted laws to provide for the eventual transfer of all western lands, not ceded to schools or other exceptional purpose, from public to private ownership (Steen 1991). In 1812, Congress established the General Land Office, and in 1849 the Department of Interior was created. These agencies dealt with public land responsibilities, the primary of which was transfer to private ownership. Lands were offered, once surveyed, at public auction for a minimum of \$1.25 per acre. Many acres of timberland were purchased by lumbermen (Cox et al. 1985). Congress, at various times between 1842 and 1856, passed donation acts granting homesteads to encourage settlement in Florida, Oregon, Washington, and New Mexico. The government also issued script or warrants redeemable for land to satisfy its obligations,

help finance education, and reward statehood. Land and logs from such transfers were often sold to lumbermen. Large land grants, given to corporations to encourage the building of railroads, canals, and wagon roads, yielded additional log supplies for use in the mills. The Homestead Act of 1862 offered pioneers 160 acres of western lands in exchange for a filing fee and living on the land for five years. Ironically, while all these laws contributed to available timber supply, not until Congress passed the Timber and Stone Act of 1878 did it specifically address the disposal of timberlands. By allowing the dispensation of 160-acre lots that had little value for agriculture or mining, this law reflected the still prevailing bias towards small landholders and agricultural activity. Frequently frontier realities resulted in the bending or breaking of laws to solve local problems such as sufficient log supplies to mills (Steen 1969). The result was that the timber and land appetites of the nineteenth century were sufficiently served to fuel tremendous national growth. During the nineteenth century, over one billion acres, half of the entire nation, were transferred from public to private ownership. Two hundred million of those acres were deeded to railroad companies (Cox et al. 1985).

Significant forestland allocations had been established in central Washington by the beginning of the twentieth century.

Fourteen Indian tribes and bands were federally recognized as the Confederated Tribes and Bands of the Yakama Nation under the Yakama Treaty of 1855 and a reservation comprising 1,377,034 acres was created along the eastern slopes of the Cascade Mountain Range located in what became southwestern Yakima County. Today the forested portion of the reservation is managed by the Yakama Nation and, in addition to other values, provides a sustainable flow of timber to tribally owned mills in White Swan.

In 1864, President Lincoln signed into law the Northern Pacific Railroad land grant which gave public lands for a railroad right-of-way for the purpose of building and maintaining a railroad from Lake Superior to the Pacific Ocean. The land was granted in alternative square miles, which created a “checkerboard” pattern of ownership (Cox et



al. 1985). Eventually significant portions of the original railroad lands in central Washington would become commercial timberlands (Steen 1969).

In 1889, President Harrison granted Washington statehood. With statehood, Washington received sections 16 and 36 of every township, not reserved in federal ownership, for common schools grants. The original transfer of trust land grants from the federal government to Washington State amounted to 2,376,391 acres (Souder and Fairfax 1996). Today these lands, in addition to Forest Board lands that are harvested to generate revenues for county services, are managed by the Washington State Department of Natural Resources (WA DNR). State land grants further added to checker board forestland ownership distributions.

Other lands in the public domain were opened for homesteads and mining claims. Some acreages eventually became industrial and non-industrial private timberlands while others went to agricultural, residential, and commercial land-uses.

The long-held national presumption that federal land ownership was temporary towards ultimate transfer to private holdings began to erode during the latter part of the nineteenth century due to two major shifts in political understanding: eastern pressures to retain and manage apparently dwindling natural resources and a growing recognition that large areas of the west did not accommodate Jeffersonian presumptions of eventual land-use dominated by agriculture (Souder and Fairfax 1996). Establishment of federal forest reserves resulted which, in 1905, were organized within the Department of Agriculture as the U.S. Forest Service.

The Wenatchee National Forest was established in 1908 (Engstrom 2006). In 2000, the Wenatchee and the Okanogan National Forests were administratively combined to become the Okanogan-Wenatchee National Forest (OWNF) which encompasses more than four million acres and stretches north to south from the Canadian border to the Goat Rocks Wilderness - a distance of about 180 miles (Okanogan-Wenatchee National

Forest). For decades, significant timber harvests occurred on federal forests but today this is no longer the case.

## Current Circumstances

### *Timber Harvest*

As a result of harvest reductions to protect the northern spotted owl, the timber harvest on the OWNF dropped by more than 90 percent from 1988 to 1994 finally leveling off after 2000 at an average total of 30 million board feet (MMBF) per year (Wooley 2009, Dillingham et al. 2008). Of this volume, 16-20 MMBF including firewood sales is harvested in Kittitas and Yakima Counties (Wooley 2009). Over the same period (1988-1994), harvest on state forests in the three counties decreased by more than 80 percent, eventually dropping to 25 MMBF per year in 2008. Harvest on private forests, other than the Yakama Nation, dropped by two-thirds and has yet to level off.

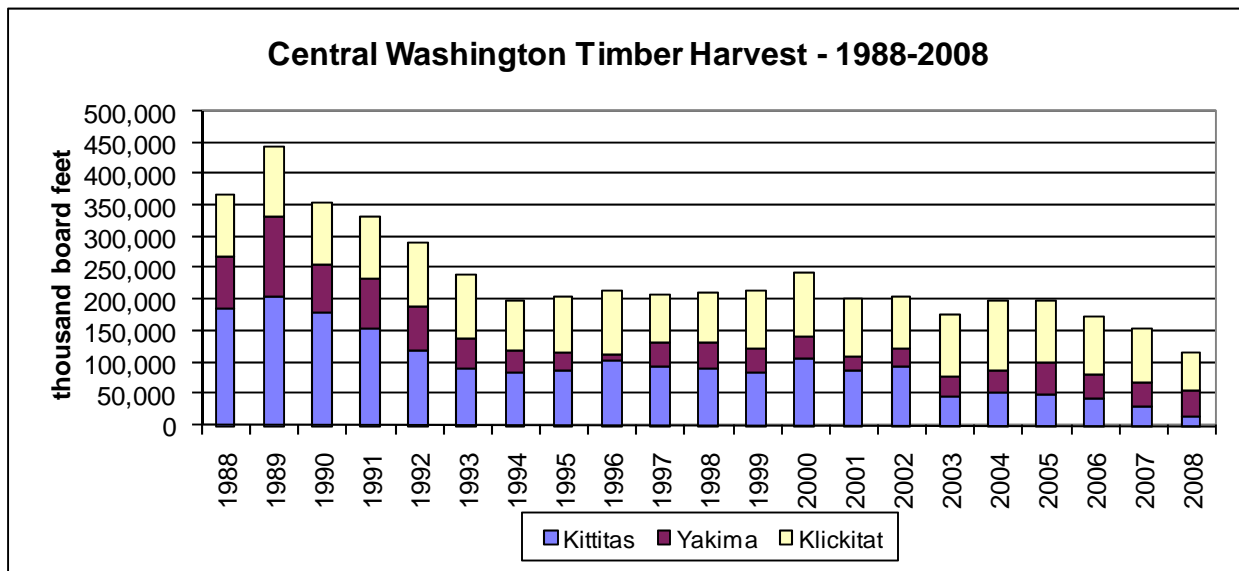


Figure 2. Central Washington timber harvest, other than from the Yakama Nation, from 1988-2008 (WA DOR & WA DNR).

Initially, following reductions in public harvest, private landowners increased harvest activities to meet demand but habitat and other regulatory constraints reduced the land base available for harvest and large harvest volumes became unsustainable.

Mills reliant upon log contributions from multiple ownerships in order to meet needed raw material volumes were closed. In 2008, the total cumulative private and public timber harvest volume in Kittitas, Yakima, and Klickitat Counties dropped to 117 MMBF with more than half of the harvest occurring in Klickitat County (WA DOR 2009). For reference, one average-sized Washington sawmill requires 60 MMBF of logs per year (Mason and Lippke 2007).

Figure 2 does not, however, include the harvest from the Yakama Indian Nation which exceeds the total 2008 multi-ownership harvest volume from the three counties (Olney 2009). Tribal harvest statistics are not tracked by Washington Department of Revenue. About half of the Yakama reservation or 650,000 acres is in forestlands of which 309,000 acres are managed for commercial timber production with an annual allowable cut (AAC) that has been set at 143 MMBF (YFP 2009, Yakama Nation 2005).

Once a quarter the Washington Department of Natural Resources prepares an economic and revenue forecast. Because of lower demand for timber, the department has experienced a high level of no bids for timber sales, averaging 40 percent of 2009 offerings through the spring quarter. The department has responded by withdrawing timber sales; 44 percent of the volume to be offered in June 2009 was withheld. Purchasers continue to delay removals of purchased timber in response to deteriorating markets. The sales price forecast for FY 2010 reflects a 34 percent reduction from the previous quarter (WA DNR 2009).

Greater detail on historical harvest statistics can be found in graphs provided in the Appendix C of this report.

### **Sawmills**

The last century has seen a rise and fall of the forest industry in many Washington communities (Mason 2005, Barney and Worth 2001). The loss of mills in central Washington, more relatively extreme than in the Pacific Northwest as a whole, began decades ago as the smaller and less-efficient mills went out of business and

consolidation of operations by larger companies occurred (Howard 1973). Since the 1990's, however, the disappearance of the remaining infrastructure has been linked primarily to government policy changes affecting timber harvest, endangered species, environmental regulations, etc. (Dillingham et al. 2008, College of Forest Resources 2007, Barney & Worth 2001). The changes for central Washington have been dramatic (Dillingham et al. 2008). Today there are very few sawmills left operating in Kittitas, Yakima, and Klickitat Counties (Table 1.). Closure of the three Boise Cascade mills at Yakima and the Layman mill at Naches in 2005-2006 marked a threshold decline for regional log markets (Jones 2009). Within the last ten years the last remaining sawmills in King and Chelan Counties have also closed.

**Table 1. The number of sawmills operating in Kittitas, Yakima, and Klickitat Counties for selected years 1925-2008 (Howard 1973, Employment Security 2002, Jones 2009).**

<b>Year</b>	<b>Kittitas</b>	<b>Yakima</b>	<b>Klickitat</b>	<b>Total</b>
1925	8	4	21	33
1947	14	8	37	59
1963	4	5	7	16
1968	3	3	6	12
1970	2	3	6	11
1990	1	5	4	10
2005	0	6	1	7
2008	0	2	1	3

Yakama Forest Products (YFP), owned and operated by the Yakama Indian Nation, has two mills in Yakima County; one for large logs and one for small logs. These mills are unique in that timber supplies are secured from reservation lands rather than from open-market purchases (Olney 2009). These mills are also unusual in that they are the only recently constructed mills in the region. The small log saw mill was built in 1998 and the large log mill in 2003 as a way to fully utilize and add value to the allowable timber cut that comes off the Nation's land (YFP 2009). Further impacting regional log availability,

the start-up of YFP mills effectively reduced log supply, available for open-market purchase, by around 100-150 MMBF per year (Backus 2009).

The last private sawmill left in central Washington to purchase logs on the open market is SDS Lumber (established 1946) which is located on the southern border of Klickitat County in the town of Bingen (SDS Lumber 2009). For reference, Bingen is 174 miles from Cle Elum, 150 miles from Ellensburg, and 114 miles from Yakima.



Figure 3. YFP mill operation in White Swan on left and SDS mill operation in Bingen on right.

As is apparent from Table 1, the number of sawmills in the three counties has declined by 95 percent since 1947. The number that purchase logs on the open-market has dwindled to one and is remote to Yakima and Kittitas Counties.

While the volume of public timber harvest fell off sharply after 1988, the number of forest products manufacturers declined, and 10,000 forest products workers lost their jobs in Washington State, the total volume of lumber production gradually increased to an average of about 4 billion board feet per year (Blatner et al. 2003, Warren 2004). While such developments may seem counterintuitive, there are several reasons why this happened. Regulatory and market changes resulted in reduced log exports; making more logs from state and private forests available to domestic processors. Mills that retooled for efficient utilization of smaller diameter logs experienced higher production and improved log-to-lumber recovery ratios through reduced saw kerf,

increased wane allowances, curve sawing innovations, and other manufacturing modernizations. An overall gain in production was achieved as surviving mills offset capacity losses through capital investments in manufacturing improvements that resulted in lower production costs and increases to overrun (Spelter 2002).

Overrun is the mill ratio of input log scale to the output lumber scale. In addition to manufacturing improvements mentioned above, overrun also results from the difference in nominal verses actual lumber sizing (for example, a 2X4 is actually 1.5 inches by 3.5 inches), the degree of taper in a long log that is segmented for lumber production, and the scale protocol differences used to measure log volume. Mason and Lippke (2007) surveyed the sawmill industry in Washington in 2006. Thirty-four mill responses, representing an annual lumber production of 4.1 billion board feet (BBFT), were obtained.

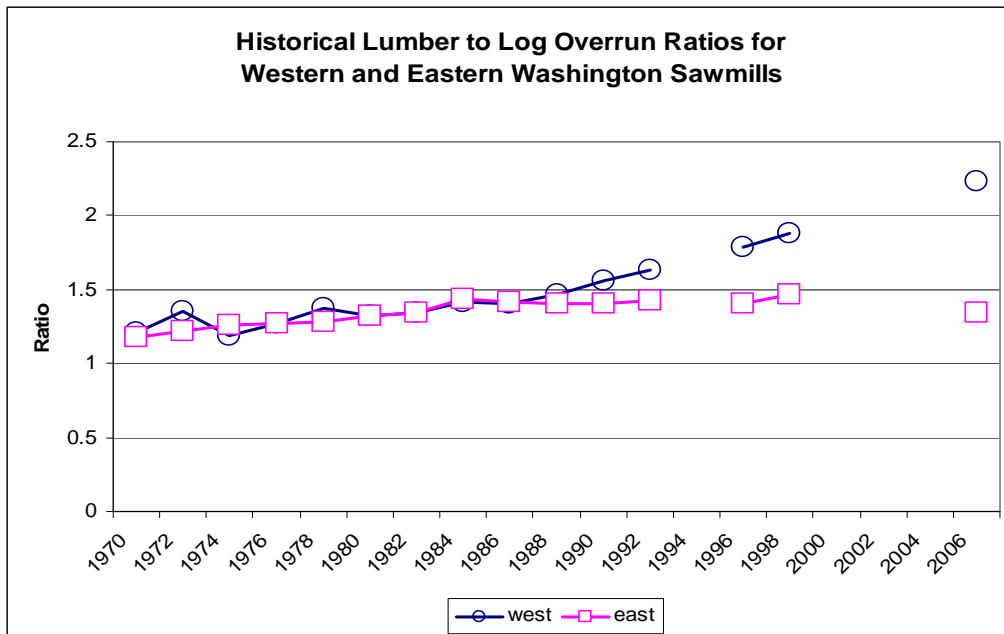


Figure 4. Lumber to log overrun for western and eastern Washington Sawmills. Data for 1970-1998 from Spelter, 2002. 2006 data from Mason and Lippke 2006.

Comparison of overrun calculated for respondent eastside mills and respondent westside mills provided interesting insight to regional sawmill competitiveness (Figure 4). Investments in modernization by westside mills have resulted in gains in overrun yields whereas this has not been the case for the eastside mills. Not coincidentally,

while losses to westside mill infrastructure have stabilized, new sawmills have been built, and production has increased; this has not been the case for eastside sawmills (excepting the unique circumstances of YFP) where closures and infrastructure decline remain chronic (Mason and Lippke 2007).

The large number of mills in Idaho just across the border further raise the question of viability for eastern Washington sawmills. Perez-Garcia et al. (2007) found that Idaho is a much lower cost lumber producer than Washington that can compete favorably for the same log supply and the same product markets. While the situation appears better for western Washington sawmills, Perez-Garcia et al. (2007), in an examination of the most significant competitors for the domestic lumber markets that Washington mills supply, found that the U.S. South log costs are 44% of Washington costs and that log costs in British Columbia are 30% of Washington costs.

The contemporary sawmill industry in Washington has become increasingly homogenous in its raw material type, lumber production, and marketing. Most Washington mills consume softwood logs that average around 11 inches in diameter (minimum 6 inches and maximum 24 inches). Nearly 85 percent of production is dimension lumber, studs, or boards with 96 percent sold to domestic markets. This means that there is little product differentiation relative to competition from other states and countries and that profitability for most mills in Washington is highly dependent upon fluctuations in U.S. housing markets (Mason and Lippke 2007). Housing starts and lumber demand have fallen to the lowest level since 1982 (WWPA 2009). Western sawmills are experiencing temporary or permanent production curtailments (Sierra Forest Legacy).

Sawmills are perishables; once closed, they are unlikely to come back. For example, the Boise Cascade sawmill in Yakima, originally established as the Cascade Lumber Company in 1903, will never again produce wood products. The city of Yakima, with assistance from the State Community Economic Revitalization Board, is planning to spend \$50 million to develop the site for a combination of commercial, medical, residential, and recreational uses (Yakima 2008).



Figure 5. Mill closures, the sign of an industry in distress (PPRC 2003).



## ***Log Markets***

In 2003, sawmills producing more than 100 MMBF per year accounted for more than 64 percent of Pacific Northwest sawmill production, whereas in 1988, mills with such large capacity accounted for only 38 percent of total production (WWPA 2004) . However, these changes occurred almost exclusively on the west side and they were not without consequences.

As the number of mills declined but average capacity increased, the haul distance from logging site to mill increased (Perez-Garcia 2005). Logs not only traveled across state lines but logs were imported from other countries. In 2002, more than 400 million board feet of logs were imported from British Columbia for process in Pacific Northwest mills (Warren 2004). Historic understanding of log-to-mill tributary areas as defined by a distance radius from the mill site would appear to be no longer applicable. As mills become more distant, however, the net returns from log sales become increasingly marginal. For some areas far-removed from mills, such as Kittitas County, real log values may no longer support forestry investment.

While Pacific Northwest sawmill production has remained stable or even increased, this has not been the case for other forest products manufacturing sectors. The plywood industry in the west lost 54 percent of capacity during the years from 1990 to 2004 and projections indicate that capacity decline will continue into the future at rates higher for the west than for the rest of the United States (Adair 2004). Reduction in public forest harvests limited the volume of large diameter timber that was available to plywood producers resulting in declining quality of panel production. As a result, end-use markets have become indifferent to product differences between western plywood and plywood produced from southern pine. Market share shifted to the southeast and the plywood industry is expected to continue to decline in the Pacific Northwest (Adair 2004). Coincident to these dynamic changes, production of oriented strand board (OSB) increased throughout North America further eroding market share of western plywood. OSB can be manufactured from small diameter low quality logs and OSB

markets have increased dramatically in recent years, claiming more than 50% of the structural panel market (Haynes 2003), yet there are currently no OSB manufacturing facilities in the western United States (Adair 2004). SDS Lumber Company operates the last remaining plywood mill in central Washington.

Large log scarcities created by federal harvest reductions helped to spur market entry of engineered wood products as replacement alternatives for wide dimension lumber and structural joists and beams. Structural engineered wood products (EWP) include glulams, wooden i-joists, and laminated veneer lumber (LVL). A subsequent reduction of market premium for larger dimension solid wood products has been the result. One manifestation of this value shift has been a permanent reduction in price premium for larger logs. EWP markets are projected for continued upward growth (Adair 2004).

Over the past twenty years, timber producers in the Pacific Northwest have witnessed significant downturns in prices for some log types. This has been particularly true for logs 30 inches and larger in diameter (Wagner et al. 2003). Today few Washington mills can handle or will take large conifer logs. For one example of the market impact, the price for ponderosa pine number one saw logs dropped by 50 percent between 1994 and 2002 (Wagner et al. 2003). Many of the large logs harvested from forests in Washington are now sold into Oregon markets. When Washington logs are sold to Oregon or other distant markets, the net return to the forestland owner must reflect a discount needed to absorb a high transportation cost; that is if the gross value of the log is great enough to warrant transport.

In the central Washington counties of Kittitas and Yakima, this appears to no longer be the case. Douglas-fir logs must be transported at least 125 miles and pine logs have to be hauled 225 miles, uneconomical distances. If prices are high enough, small logs can go to chip plants, but there the higher value lumber recovery is lost and returns to the landowner are low (WFPA 2008).



Figure 6. Boise Cascade mill site in 1984 (left) and 2009 (right) (Yakima Centennial Commission 1984, Holland 2009).

Pictured above in Figure 6 are images that offer a comparison of timber value changes in Yakima between 1984 and 2009. The changes may not be readily apparent but in two respects they are profound. In 1984, the logs in the photograph on the left were awaiting manufacture into lumber at the Boise Cascade sawmill which, at that time, processed 200 MMBF per year and employed 450 people (Yakima Centennial Commission 1984). The image on the right was taken in January 2009. The Boise Cascade sawmill is closed, the logs shown are awaiting process into chips not lumber, and these are the last logs that will be received at this yard (Muir 2009).

In Kittitas and Yakima counties, sawlog markets have become too distant for profitable log transport. Public and private forestry professionals, interviewed during the course of this investigation confirm that logs regardless of size, species, or grade are currently being sent to chip and pulp markets instead of sawmills or export log markets. Net economic returns from log sales have been marginal or negative (Dougherty, Perleberg, Pfeifle, and Wooley 2009). This does not appear to be the case in Klickitat County, however, which still has one sawmill operating and is located closer to mills in Washington and Oregon along the Columbia River.

Exports log markets, at one time, could provide a premium for the occasional load of central Washington logs that met high-quality requirements but log export demand and price premiums have declined over recent years and the transport costs from central

Washington forests to western Washington export yards have become prohibitive. Log export markets are reported as no longer available for most of central Washington (Dougherty 2009, Jones 2009, Olney 2009, Perleberg 2009, Pfeifle 2009).

There has been growing public interest in utilization of wood biomass for renewable energy. Wood biomass refers to materials not suitable for chips or lumber manufacture. Some foresters hope that renewable energy will create market value for small logs and harvest residues in central Washington (Wooley 2009). However, the present combination of low-price energy markets and high-cost woody biomass collection pose a formidable obstacle to bioenergy development (TSS Consultants 2009). A recent study of wood to energy potential in Washington concluded that, while conversion technologies are available and woody biomass is second only to hydro-electricity in its State potential for renewable energy development, progress will be dependent upon synergies with a viable forest products industry to underwrite the high costs of collection and conversion (Mason et al. 2009). In order to meet the biomass volumes needed to support an efficient energy conversion facility, sustainable multi-ownership contributions will be required (TSS Consultants 2009). While wood residue collections have begun in western Washington (Quigg 2009), markets for wood biomass do not exist in central Washington. Lack of milling infrastructure and the unreliability of multiple ownership biomass collections may preclude utilization in most locations (WFPA 2008).

### ***Workers***

With limited harvest and production activities, employment for woods workers has become sporadic and hard to find. Many have moved on to pursue better options.

Declines in timber harvest and disappearance of sawmill capacity are not the only symptoms of infrastructure decline. Harvest and hauling contractors have become scarce as well (Jones 2009, Perleberg 2009, Pfeifle 2009, Wooley 2009, Dillingham et al. 2008). While historic workforce data specific to loggers is unavailable, a review of the current membership roles of the Washington Contract Loggers Association, the Log Truckers Conference of the Washington Truckers Associations, and the Northwest Log

Truckers Cooperative indicates that there are few independent loggers and log haulers remaining in central Washington counties. Results are presented below in Table 2. Not included in Table 2 are the company loggers and truckers employed by SDS Lumber Company or the tribal logging and trucking companies that operate on the Yakama Indian Reservation.

**Table 2. Loggers and log haulers in Kittitas, Yakima, and Klickitat Counties.**

	Kittitas	Yakima	Klickitat	Total
Loggers	8	5	14	27
Truckers	17	11	8	36

In 1994, The Northwest Forest Plan (NWFP) was adopted for almost 25 million acres of forest administered by the Forest Service, the Bureau of Land Management, and other federal agencies within the range of the northern spotted owl including the OWNF. A profound shift away from timber provision by federal forests occurred. The NWFP remains highly controversial in that it created abrupt reductions in timber yields that have been blamed for large-scale job losses (Barney & Worth 2001) and it failed to prevent old forest habitat losses associated with forest health declines and consequent large-scale forest fires especially in the east Cascades (Healey et al. 2008, Agee 2007).

Dillingham et al. (2008) were charged with reviewing socioeconomic impacts resulting from changes in management for the OWNF during the first ten years following the implementation of the Northwest Forest Plan (1994-2003). The work of these researchers produced a useful chronicle of evolving circumstances for the OWNF, its neighboring communities, and a shrinking forest industry in central Washington. Findings revealed that availability of timber purchasers and local forestry contractors has declined significantly. For instance, Forest Service land managers report fewer bids on timber sales. Of the total timber volume offered for sale from 1993 to 2002, only 48 percent received bids from potential purchasers. Very few active buyers remain in all of central and northeastern Washington. Skilled support services are also increasingly difficult to find. Of the original 118 contractors that performed work, such

as road maintenance and tree planting, for the Wenatchee National Forest in 1991-1993, only 13 remained a decade later and, by 2000-2002, only 24 percent of contracts were awarded to rural contractors. The remainder went to distant urban contractors that employed imported labor.

The number of Forest Service employees on the OWNF dropped by 21 percent from 1993 to 2003. Interviews with Forest Service staff indicated, however, that the staffing data masks a pronounced shift in personnel to fire and fuels management while more profound losses occurred among most other resource staff (Dillingham et al. 2008). From 1993 to 2003, annual spending on the OWNF dropped by 49 percent.

Statewide, the loss of public resource professionals worsens. The State Department of Natural Resources reports that it has experienced a 17 percent reduction in revenues over the last two years. Nearly 200 jobs from a work force of 1,576 positions have been eliminated, including 88 layoffs and 108 jobs left vacant (Dodge 2009).

Further collapse of timber industry and forest-related work opportunities is expected and will likely affect the remaining contractors and government workers. Dillingham et al. (2008) conclude that declines in timber activities on the OWNF not only affected timber industry jobs in local communities, but also resulted in declining agency budgets and staff reductions. Communities' responses differed. Communities with greater economic diversity were able to absorb the changes in forestry-related economic activity, whereas communities more heavily dependent on timber experienced destabilizing effects.

Don Meseck, a state Employment Security economist put it succinctly, "The trend is for slow, steady decline in employment in the wood-products industry. Those jobs are gone and they're probably not coming back." (Hoang 2006).

### ***Displacement and Diversification***

Socio-economic impacts were anticipated by the framers of the NWFP and the Clinton administration. A goal of the NWFP has been to assist long-term economic

development and diversification in rural communities; diversification away from forestry. A number of relief programs were initiated to provide assistance to economically-stressed counties, communities, and displaced timber workers. Mitigation measures included creation of temporary new jobs in “ecosystem restoration”, as well as the Northwest Economic Adjustment Initiative (NEAI) to help workers retrain and move on to non-timber occupations, and the Omnibus Budget Reconciliation Act and the Secure Rural Schools Act which provided payments to counties to help compensate for the loss of revenue sharing based on timber receipts. The premise was that these funds were to decline over time as counties and workers moved on to new non-timber sources of revenue and employment. One apparent result, in many areas including central Washington, has been the facilitation of a demographic shift away from timber employment. Worker transitions to non-timber employment have occurred coincident with declines in workforce availability that are being experienced by the forest industry (Backus 2009) and the OWNF (Dillingham et al. 2008).

Mason and Lippke (2007) surveyed forest industry sectors in Washington in 2006 to gauge the characteristics of a changing workforce. Mason et al. (2008) followed with investigation of the log hauling industry. Wages for loggers, truckers, and mill workers were found to be lower than the State average and not keeping pace with inflation. When asked to characterize availability of skilled workers, 86 percent of logging company owners indicated that skilled workers are scarcer today than was the case ten years ago and 75 percent of saw mill managers acknowledged similar worker scarcity. An important finding from these two studies was that recruitment of young workers into the industry is poor and consequently the average age of forest workers is advancing. The average age of a Washington logger was found to be 52 years, the average age of a trucker was 55, the average age of a sawmill worker was 39, and the average age of a paper worker was found to be 47 years. More than 60 percent of logging company owners reported that they were over 60 years old. When asked about their company’s five-year goals, 48 percent of logging company owners reported that they expected to leave logging or retire.

## ***Recreation***

While timber harvesting has been in decline, demand for recreation has exploded. For instance, the close proximity of the OWNF to Puget Sound metropolitan areas, as well as the attractive dry climate and beautiful scenery of eastern Washington, have been attributed to dramatic increases in visitor use (Dillingham et al. 2008). Data from the National Visitor Use Survey completed in 2000 and 2001 for the OWNF shows 5.2 million recreation visitor days (RVDs) per year with the majority, 4.9 million RVDs not for wilderness use (USDA FS 2006). For comparison, a decade earlier, there were around 3.6 non-wilderness RVDs (USDA FS 1989, 1990). One recreation visitor-day is the recreation use of National Forests that aggregates 12 visitor-hours. This may entail 1 person for 12 hours, 12 persons for 1 hour, or any equivalent combination of individual or group use, either continuous or intermittent.

Increased recreational use may spur social and political pressures to constrain commercial forestry activities as evidenced by the heavily invested and very popular Mountains to Sound Greenway (see map provided in Appendix H). Newcomers to the area, attracted by natural amenities and unfamiliar with the dynamic nature of forests or harvest operations, often have strong beliefs that active management of forest resources is undesirable (Sample 2007).

An indirect effect of the NWFP has been to limit funding available to maintain roads and facilities for use by recreationists. Funding, formerly provided by the timber sale program, has been lost and not replaced (Dillingham et al. 2008). Interviews with the public and Forest Service employees in central Washington suggest agreement that many recreationists do not differentiate between state, federal, and private lands (Dillingham et al. 2008). One result, as Forest Service roads become less useable, has been increased pressure on private roads resulting in undue road wear, garbage dumping, firewood theft, and vandalism (Jones 2009). According to Forest Service employees interviewed by Dillingham et al., a declining budget for managing use and maintaining facilities limits the provision of recreational opportunities: staffing levels are



insufficient to handle the number of visitors and limited capital improvement funds compromise maintenance and development of campgrounds. Most of the interviewees from local communities characterized recreation on the OWNF as plagued by increasing regulations, closures, deteriorating quality, law enforcement, and fees. Community interviewees noted that timber management no longer generates the controversy that it once did. Recreation has taken its place. The controversy is now over appropriate types of recreation and limits on the amount of recreation and development. Escalating recreation use, primarily associated with outside users, was an important topic to almost all central Washington residents that Dillingham et al. interviewed.

### ***Timberlands***

A viable forest industry requires a suite of market opportunities from a sufficiently diverse process infrastructure to create a value spectrum for logs and wood products. Forest product sales generate revenue from which forest management investments are made based upon the expectation of future economic return. When this circular relationship experiences disruptions, policy and investment adjustments can be expected.

One manifestation, in recent decades, has been dramatic changes in ownership within the private timberland base; an historic relationship between company-owned timberlands and company-owned mills has been broken.

Significant transfers of private forestland ownership have occurred in recent years in central Washington. Vertically-integrated forest companies (with forestlands and mills), such as Boise Cascade, Champion International, and Longview Fiber, have closed their process facilities and sold their timberlands. Private timberlands have been acquired through purchase or exchange by forestland investment groups, land trusts, Indian tribes, and government agencies. Forestlands close to urban centers have been converted to non-timber land-uses such as residential, recreational, and commercial development. Some former industrial forestlands have become management-deferred public forest reserves while other areas are now owned by Timber Investment

Management Organizations (TIMOs) or Real Estate Investment Trusts (REITS), neither of which operate milling facilities.

Researchers at the University of Washington investigated causes of forestland sales in Washington. Results indicated that, in addition to improved economic returns from real estate conversion of forestlands located near an urban interface, conflicting values with urbanizing populations, uncertainty of regulatory future, changing timber market conditions, and accountability to shareholders were also cited as powerful pressures that encouraged forestland sales. Family forest owners noted that estate taxes combined with a lack of interest from younger family members also influenced the decision to sell tree farm lands (College of Forest Resources 2007).

Ever-increasing regulatory burdens undermine economic returns for private forest owners in central Washington (Jones 2009, Dillingham et al. 2008). Many of the restrictions on forest management are driven by federal laws, including the Endangered Species Act, Clean Water, and Clean Air Acts; these laws apply to forest lands managed by federal and state agencies as well as private industry and have constrained log supplies from all ownerships (Dillingham et al. 2008).

State laws such as the Forest and Fish Rules (FFR) further restrict timber harvest on private lands east of the Cascades in riparian zones along 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.

New residents to the Pacific Northwest may have attitudes, needs, and values that are often very different from those of long-term residents (Egan and Luloff 2000). New forest neighbors hold expectations that can be at variance with timber harvest (Shands 1991). A visible example of evolving values driving forestland sales can be found with the Mountains to Sound Greenway Project.

In 1990, Washington citizens created a plan for the Mountains to Sound Greenway to keep an accessible landscape of forests, wildlife habitat, and open spaces as breathing

room for people, and a place of incomparable beauty, history and outdoor recreation for their children and grandchildren. Today, the Greenway stretches along 100 miles of Interstate 90 from the waterfront in Seattle to the edge of desert grasslands in Central Washington (a map of private to public ownership transfer from the Mountains to Sound Greenway is displayed in the Appendix H). Since 1991, more than \$260 million have been invested in over 130 separate transactions by federal, state and local agencies to purchase or exchange 140,000 acres of private forestlands into public ownership. An additional 90,000 acres have been preserved by conservation easement (Mountains to Sound Greenway). One result has been a permanent reduction of the commercial forestland base and the annual regional timber harvest potential for the region.

As another example, an exchange of 21,000 acres of state trust lands, mostly outside of central Washington, for 82,000 acres of land in Yakima and Kittitas Counties owned by Western Pacific Timber, LLC, was completed in 2008. While this and other land exchanges can help to consolidate checker board ownerships, a reduction in the acreage of industrial forestlands in central Washington also results (see Appendix G). Timber companies such as Champion International, Plum Creek Timber, Longview Fiber, and Boise Cascade have all sold or exchanged extensive timberland holdings in recent years (The Daily News 2008, Little 2006, The Seattle Times 2000, The New York Times 1999).

### ***Checker Board Ownerships***

Land transfers from the federal government to rail roads and state trusts that occurred more than 100 years ago have left a legacy of checker board ownerships (see ownership maps in Appendix E). As differences in public/private forest management objectives widen, checker board public/private ownerships create access and management conflicts that challenge forest management and increase costs (Jones 2009, Dillingham et al. 2008).

### ***Risk of conversion***

The Washington State Forest Land Database (Rogers and Cooke 2009) was used to extract real estate values, acreages, improvement values and land uses for forested

areas in central Washington. Maps were produced to reflect the privately-owned areas at highest risk of conversion to residential and commercial land uses, based on a series of assumptions on forest growth, management intensity and appraised market values (see Appendix F). The base assumption is that parcels with the largest difference between the real estate value (REV) and the working forest value (WFV) are likely candidates for conversion. Working forest value is the sum of the forest value (FV) in the buffers and upland areas. The real estate value (REV) is the market value assigned to each parcel by the county assessor. The forest value (FV) is the land value plus the estimated added economic value of any standing timber (the total economic value of the forest).

Forest values for industrial and non-industrial private ownerships were estimated using site classes for central Washington forests with cost assumptions from the Future of Washington's Forests and Forest Industries Report produced for the Washington State Legislature by the University of Washington, College of Forest Resources in 2007. Modeled management scenarios within riparian buffers were based on findings from the same study and allocated by owner type since it is known that riparian areas are being managed differently by both industrial and non-industrial owners. WFV and REV were calculated and mapped for each parcel, and the output is a map of forested parcels with the differential between WFV and REV normalized to a per acre basis. Parcels with a high REV relative to WFV can be considered likely candidates for conversion whereas parcels with a high WFV relative to REV can be considered unlikely candidates for conversion.

The use of county assessor appraisal values as a proxy for the market value of forestland is feasible on forest parcels not in the Designated Forest Land (DFL) tax program. Parcels in the DFL program are not required to be appraised for fair market value and therefore a conversion risk estimate cannot be calculated using the methodology developed by Rogers and Cooke.

For the non-DFL lands the calculated conversion risk follows conventional wisdom:

smaller parcels closer to urban growth areas, major transportation corridors or high-amenity areas such as the Mountains to Sound Greenway have a much higher risk of conversion compared to larger more remote or rugged terrain properties. While conversion risk factors were not estimated for DFLs, the same proximity influences would logically extend to these ownerships as well.

Most community interviewees cited in Dillingham et al. acknowledged that the days of “big timber” in Yakima and Kittitas Counties are over and in many respects communities have already moved on. This finding suggests declining value returns for private lands retained for forestry uses. Increased regulatory burdens and worsening forest health serve to add further pressure to find new strategies for economic returns on private forestlands.

### ***Forest Health***

Mixed public/private ownerships also mean that forest health problems and heightened forest fire hazards which are especially acute on federal lands (Moore et al. 2009, Dillingham et al. 2008, Powell et al. 2001) extend a threat to adjacent landowners and communities.

Following a century of aggressive fire suppression, forests in eastern Washington, in the absence of periodic fire or timber harvest, have become overstocked with shade tolerant species resulting in overly dense conditions and drought stress. The absence of severe winter weather in recent years increases the survival rate of insect pests. These conditions stress host trees and make them susceptible to pathogens. The WA DNR conducts annual aerial surveys to detect forest pest activities and report results (Moore et al. 2009). In recent years, central Washington forests have experienced extensive outbreaks of western spruce budworm and pine bark beetles which are forecasted to continue into the future (Moore et al. 2009, Dillingham et al. 2008) (see maps in Appendix I & J).

Western spruce budworm (WSBW) defoliation has increased dramatically along the eastern slopes of the North Cascades especially in the Teanaway area of western Kittitas County, Chelan County and Okanogan County. Although relatively little activity was detected in 2008 in the Mt. Adams area and northwestern Yakima County, these forests have been affected for many past years, especially in 2005 and 2006.

The hardest hit area of insect mortality in central Washington is the Teanaway where WSBW damage has spread to over 80% of the forests (WFPA 2008) (see Appendix J).



**Figure 7. Cumulative tree mortality following repeated WSBW defoliation on OWNF (Jones).**



**Figure 8. WSBW infestation on private forestlands in the Teanaway (Jones).**



Pine bark beetle activity in central Washington is concentrated on the upper Yakama Indian Reservation and the Naches River watershed. Pine bark beetle activity also is scattered across the lower-treeline forests of Klickitat County (see map in Appendix J).

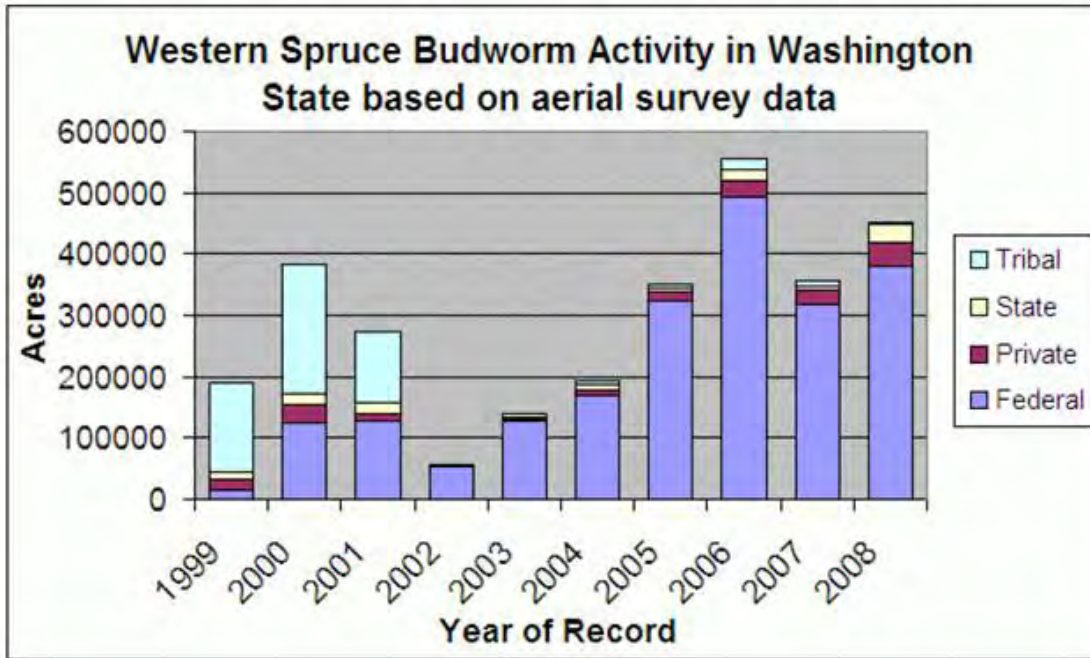


Figure 9. WSBW activity in Washington - 1999-2008 (Moore et. al. 2009).

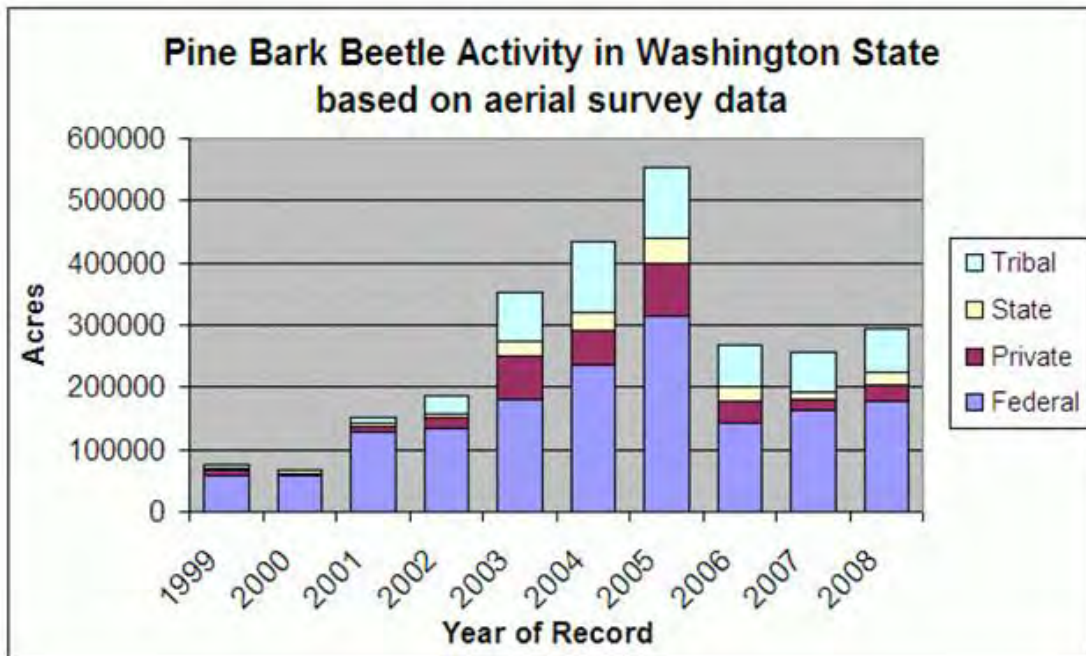


Figure 10. Pine bark beetle activity in Washington – 1999-2008 (Moore et. al. 2009).



There is broad consensus that overstocking, weather trends, insect infestations, and resultant high mortality have created a forest health crisis in eastern Washington (NW Environmental Forum 2007, WA DNR 2004). Declines in forest health combined with uncharacteristic fuel loads heighten the hazard of catastrophic crown fire (Agee 1993). Many studies and demonstrations have shown that silvicultural treatments to remove surplus fuel loads and ladder fuels to reduce forest density are successful at minimizing fire impacts (Peterson et al. 2005, Omi and Martinson 2002, Graham et al. 1999). A combination of fuels reduction treatments and commercial harvest activities have reduced catastrophic fire hazard on some state, tribal, and private forestlands. However, in absence of market opportunities for value recovery, such treatments are often reliant upon provision of public funding to underwrite fuel reduction costs (Dougherty 2009, Perleberg 2009). Forest health treatments on the OWNF are constrained by management restrictions, budget reductions, and increasing shift of funding allocations to fire suppression.



Figure 11. Burned forestland on the OWNF (Mason).

Note from Figures 9 and 10 that National Forests experience greater forest pest activity than other ownerships. Major forest fires are also not uncommon on the OWNF. Recognition that conditions on federal forests pose a hazard to adjacent forest ownerships and communities was established by the US Congress with passage of the Tribal Forest Protection Act of 2004.

Dillingham et al. (2008) found from interviews of Forest Service employees and residents in central Washington that increased risk of catastrophic forest fire due to the perceived failure of the Forest Service to manage the OWNF was the single greatest common concern. This was expressed not only in terms of imminent threat to personal

safety and property loss, but also as loss of natural resource values that attract residents, provide the economic base for recreation and wood products businesses, and otherwise support their quality of life.

Forest owner representatives interviewed during our investigation of central Washington agreed that hazardous conditions on federal lands created a threat to non-federal neighbors (Backus 2009, Jones 2009, Olney 2009, Perleberg 2009).

In addition to reduced timber values and higher costs, some policies and regulations may be endangering rather than protecting forest environments. For example, Dillingham et al. (2008) found that Forest Service employees and local residents agree that the insect mortality and fire fuels build up in the OWNF late successional reserves and wilderness areas (which amount to 65 percent of the Forest area) will result a large-scale forest fire in the near term that will effectively destroy designated habitats for the spotted owl. This hazard also exists on private and State forests where owl habitat areas are restricted from management by forest practices regulation (Jones 2009, WFPA 2008). Currently there are 19 overlapping 6,500 acre regulatory “home range” circles covering over a third of the private forest land that is experiencing high WSBW mortality in the Teanaway watershed within Kittitas County (Jones 2009, WFPA 2008).

On the forests of the Yakama Reservation through the 1990s WSBW and pine bark beetle outbreaks created widespread mortality. A combination of available internal log markets provided by YFP and a resolve amongst the Yakama people to pursue remedy resulted in an aggressive campaign of forest health treatments that reduced forest densities primarily through the removal of susceptible fir species and retention of pine (Olney 2009). The Yakama program of thinning treatments to reduce insect and fire hazard while generating economic activity and sustaining cultural values continues to guide forest management on the reservation today. In stark comparison, tribal forestry successes have been accomplished with less than one third of the funding resources on a per acre basis that are available to the National Forest (IFMAT 2003). Contemporary forestry strategies employed by Washington tribes have been identified as potential models for public forestland management (WA DNR 2004).



**Figure 12. Yakama Nation: before forest health treatment (Yakama).**



**Figure 13. Yakama Nation: after forest health treatment (Yakama).**



## Central Washington Counties: Implications for the Future

### *Klickitat*

Klickitat is the most southerly of the three counties and is the smallest with a total area of 1,880 square miles. Forty-two percent of the county is forested with 61 percent of total forested lands (508,567 acres) in private ownership (311,291 acres). Only four percent of forested lands are in federal ownership (20,018 acres). Greater detail on forest ownership distributions and other pertinent county statistics can be found in the Appendices. Klickitat County has the greatest acreage of forest in private ownership and the least in federal ownership of the three central Washington counties examined in this study.

Notable as well, Klickitat County has the last remaining private sawmill and plywood plant in central Washington. Both facilities are owned by SDS Lumber Company which has operated since 1946 and currently processes about 55 MMBF of logs per year. Frank Backus, SDS Chief Forester, estimates that 60 percent of logs purchased by his company are sourced from Klickitat County, 15 percent from Skamania County, 5 percent from Yakima County, and the remaining 20 percent from locations in Oregon. Most of the logs used in SDS mills are sourced from private forests with approximately 20 percent received from company lands. SDS reports that sufficient volumes of timber to meet production requirements are available. No logs are purchased from Kittitas County.

Further log sales opportunities are provided to Klickitat forestland owners by WKO Inc. sawmills located in nearby Carson, WA (Skamania County) and Hood River, Oregon, just south of Klickitat County across the Columbia River (Backus 2009).

Klickitat County had the highest annual public and private timber harvest volume of the three counties in 2008 (62 MMBF), the least volatility in year by year annual timber volume change over the last thirty years, and the highest percentage of private timber contribution (92 percent of total 2008 harvest volume) (see Appendix C). It was in

Klickitat County that the timber industry in central Washington began and appearances would suggest that it is in Klickitat County that the industry remains most viable today.

### ***Yakima***

Yakima is the centrally located of the three counties and is the largest with a total area of 4,296 square miles, more than twice as large as Klickitat. Forty-seven percent of the county is forested with 43 percent of total forested lands (1,298,395 acres) owned by the Yakama Indian Nation (555,959 acres). The federal government with 486,372 forested acres is the second largest forestland owner in Yakima County. Private forestlands account for only 5 percent of the total forested acreage. Greater detail on forest ownership distributions and other pertinent county statistics can be found in the Appendices.

The Yakama Nation is both a large land owner in Yakima County and a powerful economic force. Forestry is but one of the Yakama Nation's many economic enterprises. Yakama Forest Products (YFP), as described above, operates the only remaining sawmills in Yakima County and sources its logs almost exclusively from tribal forestlands. The annual allowable harvest from Yakama Nation forests (143 MMBF) is more than three times the total volume harvested in the county from other ownerships in 2008 (40 MMBF). The Yakama Indian Nation is in the planning stages for development of a wood biomass co-generation facility to be located in White Swan that is to utilize process residues from YFP sawmills in combination with wood biomass collected from logging slash and forest health treatments. While YFP has no plans to purchase open-market logs, Yakama Power may provide an outlet for woody biomass recovered from other ownerships including the National Forest (Rigdon 2009). Development of a wood biomass combined heat and power facility close to YFP provides a unique opportunity to maximize energy conversion efficiency through utilization of the heat for lumber processing while providing surplus electricity to the grid. Utilization of wood biomass from the surrounding ownerships is thought to offer opportunities to remove surplus fuel loads and improve forest health (TSS Consultants 2009). The Yakama Nation is working with federal, state, and private landowners as well as The Nature Conservancy

to develop a multi-ownership collaborative strategy for fire hazard reduction and improved forest health. This stakeholder group is known as the Tapash Sustainable Forest Collaborative.

In Yakima County, 86 percent of the non-tribal timber harvest is from public forestlands; primarily from State trust lands. Most logs are sold currently for pulp and bring little net return (Pfeifle 2009), however, in better lumber markets, logs have been shipped to mills as far away as northeastern Washington or Oregon. Incidental volumes of logs are occasionally purchased by the SDS Lumber Company as well.

In recent years the last privately owned mills (Boise Cascade and Layman Lumber) in Yakima County closed thereby effectively eliminating most open market sales opportunities for non-tribal forests. During the same period, the Yakama Nation developed its own processing capabilities to add value to tribal logs and to create employment for tribal members. In the future, we conclude that continued operation of YFP will represent the only remaining wood process infrastructure in Yakima County and, while opportunities for forest health improvements on all ownerships may result, a redevelopment of private industry mills is unlikely and consequently log markets for non-tribal forest owners will be distant and net economic returns from log sales will be low.

### ***Kittitas***

Kittitas is the northern of the three counties and with a total area of 2,297 square miles, somewhat larger than Klickitat but significantly smaller than Yakima County. Kittitas has the largest percentage of forestland acreage of the three counties with sixty-one percent of the county forested. Half of total forested lands (914,469 acres) are in federal ownership (445,197 acres) and nearly three-quarters of Kittitas forests are state or federally owned (675,914 acres). Remarkably, while Kittitas County has 1.8 times as much forestland as Klickitat County, the 2008 total timber harvest volume for Kittitas (less than 16 MMBF) was only one quarter as large as that of Klickitat. Kittitas has experienced the most dramatic declines in annual timber harvest volume of the central Washington counties. From 1985 to present, timber harvest in Kittitas County dropped

by 94 percent. Reductions in timber excise tax distributions to Kittitas County have been similarly dramatic. Kittitas County is also experiencing the worst forest health declines of the three-county area. Greater detail on forest ownership distributions, timber harvests, county timber excise tax distributions, forest health and other pertinent county statistics can be found in the Appendices.

Kittitas has no remaining sawmills and log markets are far distant as the last sawmills in surrounding counties such as King and Chelan have also closed. As discussed in the text above, there appears to be broad consensus that the timber industry is no longer functional in Kittitas County.

Kittitas, however, is experiencing uniquely rapid population growth (16.8 percent from 2000-2008); close to three times that of Yakima and Klickitat, twice that of King County, and a third again the average rate for Washington State. Close proximity to Seattle has meant increased recreational use, transient residencies, and land use conflicts; especially along the Interstate 90 corridor (Card 2003). Complicating the future of forests in Kittitas further has been the dramatic forest health decline associated with WSBW outbreaks and the inability of the OWNF to effectively respond.

We conclude that the effective end of commercial forestry in Kittitas County has arrived. Combined with rapid population growth, burgeoning recreational demand, extensive public ownership, and chronic forest health problems these circumstances will require a creative response as compared to the more stable circumstances that we find in Yakima and Klickitat Counties. Further, the urgency of strategic response is pressing given wide spread forest mortality and the consequent imminent threat of catastrophic forest fire.

## **Summary Findings and Conclusions**

If wood fiber is to be manufactured into products and energy then trees must leave the forest. Forestry workers represent a skilled workforce on which the success or failure of

commercial forestry, biomass-to-energy, and forest health programs will be dependent. A stable workforce is dependent upon confident employment future.

Management activities to maintain a viable forest industry and/or address deteriorating healthy forest conditions require long-term investment that must be supported with market returns from product sales or public funding made available to protect environmental values.

It is apparent from analysis of information provided above that both forest industries and regional forest health have experienced decline in central Washington.

In 1973, Howard determined that 84 percent of the standing timber volume in central Washington was located on publicly owned timberlands and that, without reliable supply of public timber, the future of the forest industry was in question. He also noted that increased recreational use and public land set asides could challenge future timber industry viability in the region. Howard's forecast has proven to be prophetic but with very different implications for each of the three counties examined by this study.

In Klickitat County we find a viable forest industry with functional process infrastructure and available log markets that can provide investment incentive to a dominantly private forest landscape and facilitate sustainable management of healthy forests.

In Yakima County, while the private forestry industry has diminished, the unique and persistent capabilities of the Yakama Indian Nation to manage their own forests and provide resources to assist with forest health treatments on adjacent public lands appear to hold promise for the future of the forests.

In Kittitas, however, the end of the forest industry, a forest health crisis, and rapid population growth provide less reasons for optimism. Efforts to transfer private lands to public ownership and to guide local economies away from forest industries have been largely successful. As evidenced by significant investment in the Mountains to Sound



Greenway, there is strong public interest in retaining visually attractive and ecologically functional forestlands. However, we conclude that current policy mechanisms that limit opportunities for private forestry while increasing public ownerships have largely failed to protect forests. Contemporary forest health threats to resources, habitats, and communities should suggest that an assumption that forests unmanaged are protected is overly simplistic. Investments in forest treatments are widely acknowledged as needed but appear to be declining on both private and public ownerships.

In forested areas of Washington, conservation easements and transfer of development rights have been pursued as a means to save private forests from development (Cascade Lands Conservancy). However, lacking from this strategy has been recognition that if investments in forest health are to occur then revenues from product sales or elsewhere will be needed to contribute revenue streams (Kline, Alig, and Garber-Yonts 2004). Without opportunities for profitable log sales to a viable wood products manufacturing sector, funding for forest management investment on both private and public lands has become scarce. Options have become limited. Given current circumstances in Kittitas County, planned residential and recreational development, such as has occurred with establishment of the Suncadia Resort near Roslyn (Broom 2005), may ultimately be what is needed to create forest asset values that can summon investments to save large acreages of private forest.

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# Appendix



**Appendix A: Area and Population Statistics: Kittitas, Yakima, and Klickitat Counties with King County and Washington State Provided for Comparison**

<b>Kittitas</b>	
County Area in Square Miles	2,297
County Population (2008)	38,951
Population Density/Sq Mi (2008)	17.0
% Population Growth (Apr1, 2000-July 1, 2008)	16.8%
2009 Unemployment Rate	9.5%
<b>Yakima</b>	
County Area in Square Miles	4,296
County Population (2008)	234,564
Population Density/Sq Mi (2008)	54.6
% Population Growth (Apr1, 2000-July 1, 2008)	5.4%
2009 Unemployment Rate	10.7%
<b>Klickitat</b>	
County Area in Square Miles	1,880
County Population (2008)	20,377
Population Density/Sq Mi (2008)	10.8
% Population Growth (Apr1, 2000-July 1, 2008)	6.3%
2009 Unemployment Rate	12.7%
<b>King</b>	
County Area in Square Miles	2,126
County Population (2008)	1,875,519
Population Density/Sq Mi (2008)	882.2
% Population Growth (Apr1, 2000-July 1, 2008)	8.0%
2009 Unemployment Rate	6.6%
<b>Washington</b>	
State Area in Square Miles	66,544
State Population (2008)	6,549,224
Population Density/Sq Mi (2008)	98.4
% Population Growth (Apr1, 2000-July 1, 2008)	11.1%
2009 Unemployment Rate	8.6%

Data from the US Census Bureau <http://quickfacts.census.gov/qfd/states/53000.html>  
 WA State Employment Security Dept Workforce Explorer <http://www.workforceexplorer.com/>

## Appendix B: Forestland Statistics: Kittitas, Yakima, and Klickitat Counties

### Kittitas

Total County Acreage	1,493,007		
Total Forested Acres	914,469	% of County	% of Forested
Private Forested Acres	238,555	15.98%	26.09%
State Forested Acres	139,768	9.36%	15.28%
Federal Forested Acres	445,197	29.82%	48.68%
Tribal Forested Acres	0	0.00%	0.00%
Other Public Forested Acres	90,949	6.09%	9.95%
		61.25%	100.00%

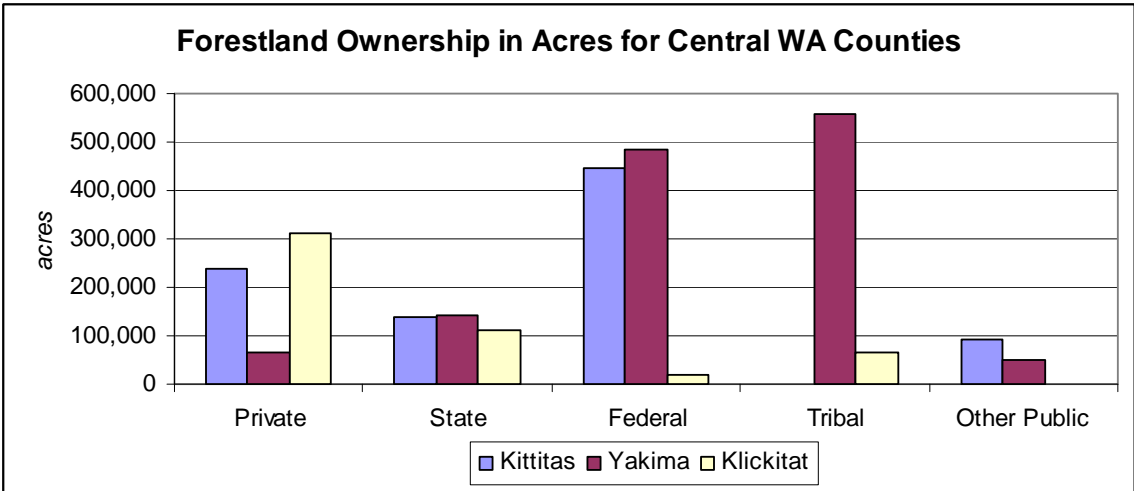
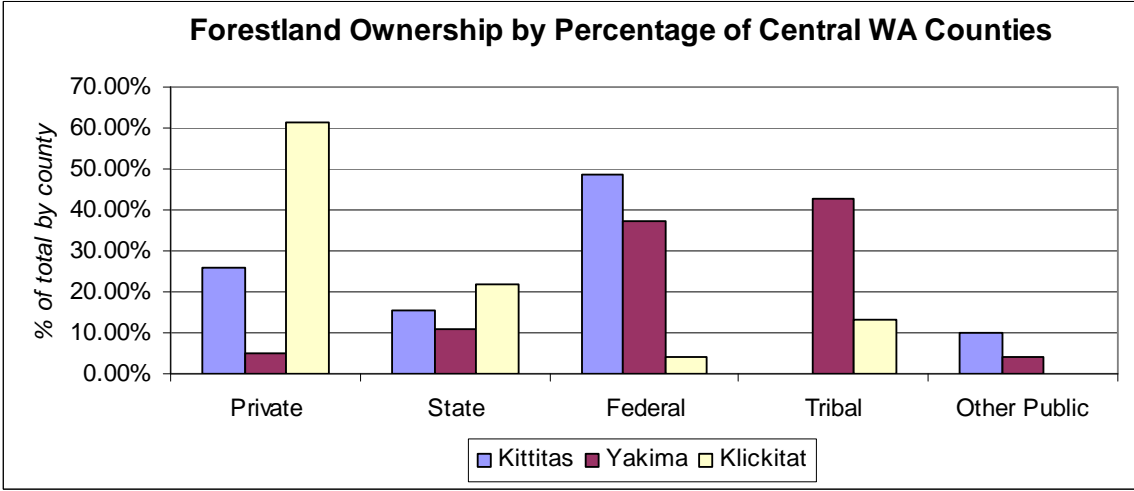
### Yakima

Total County Acreage	2,758,700		
Total Forested Acres	1,298,395	% of County	% of Forested
Private Forested Acres	65,329	2.37%	5.03%
State Forested Acres	140,548	5.09%	10.82%
Federal Forested Acres	486,372	17.63%	37.46%
Tribal Forested Acres	555,959	20.15%	42.82%
Other Public Forested Acres	50,186	1.82%	3.87%
		47.07%	100.00%

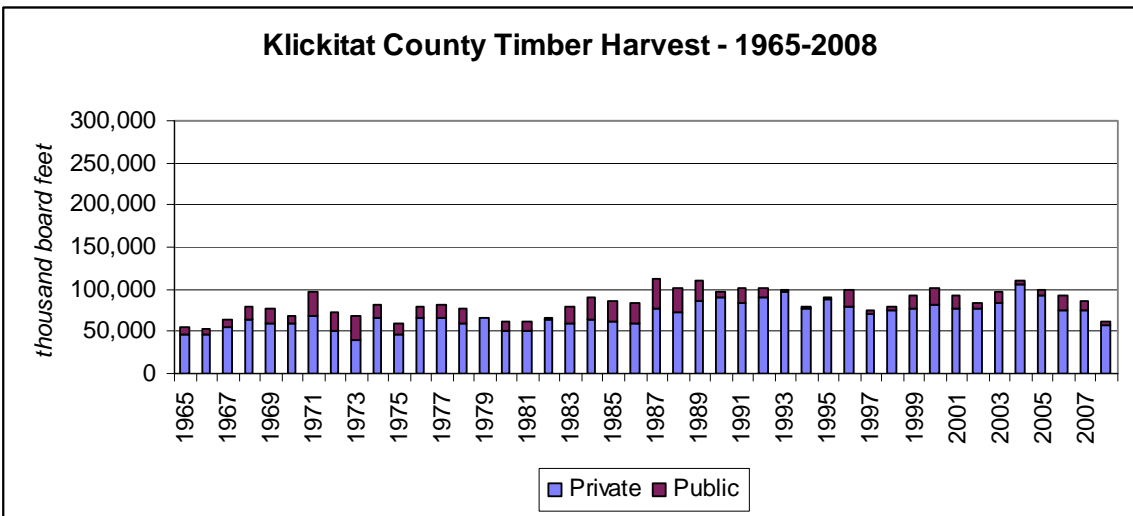
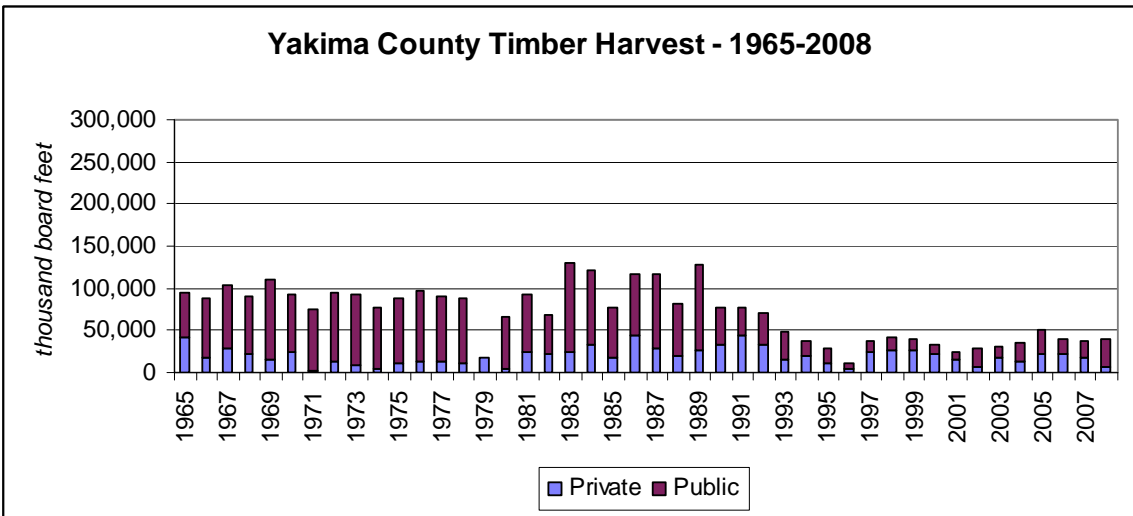
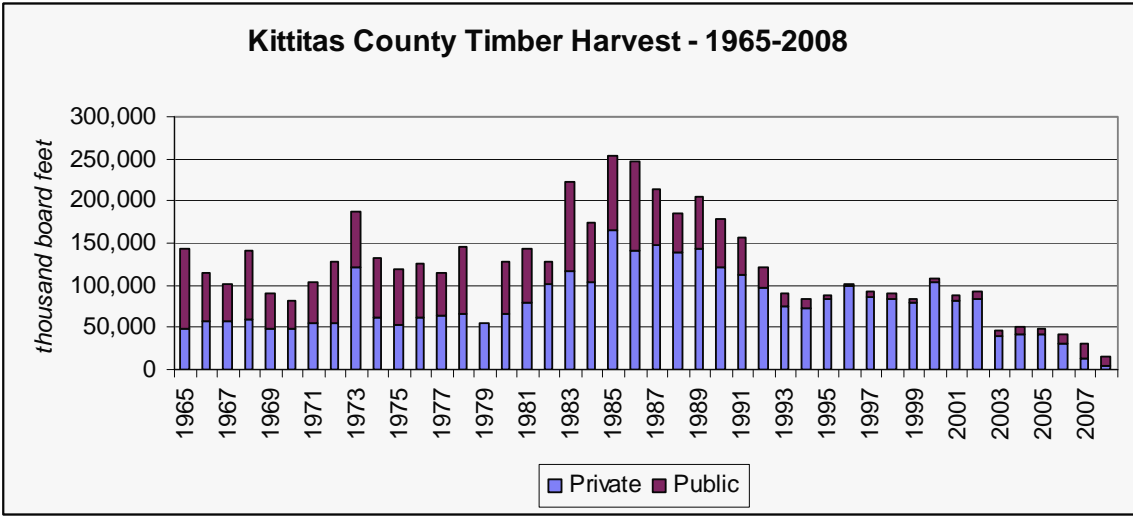
### Klickitat

Total County Acreage	1,218,799		
Total Forested Acres	508,567	% of County	% of Forested
Private Forested Acres	311,291	25.54%	61.21%
State Forested Acres	109,899	9.02%	21.61%
Federal Forested Acres	20,018	1.64%	3.94%
Tribal Forested Acres	66,283	5.44%	13.03%
Other Public Forested Acres	1,076	0.09%	0.21%
		41.73%	100.00%

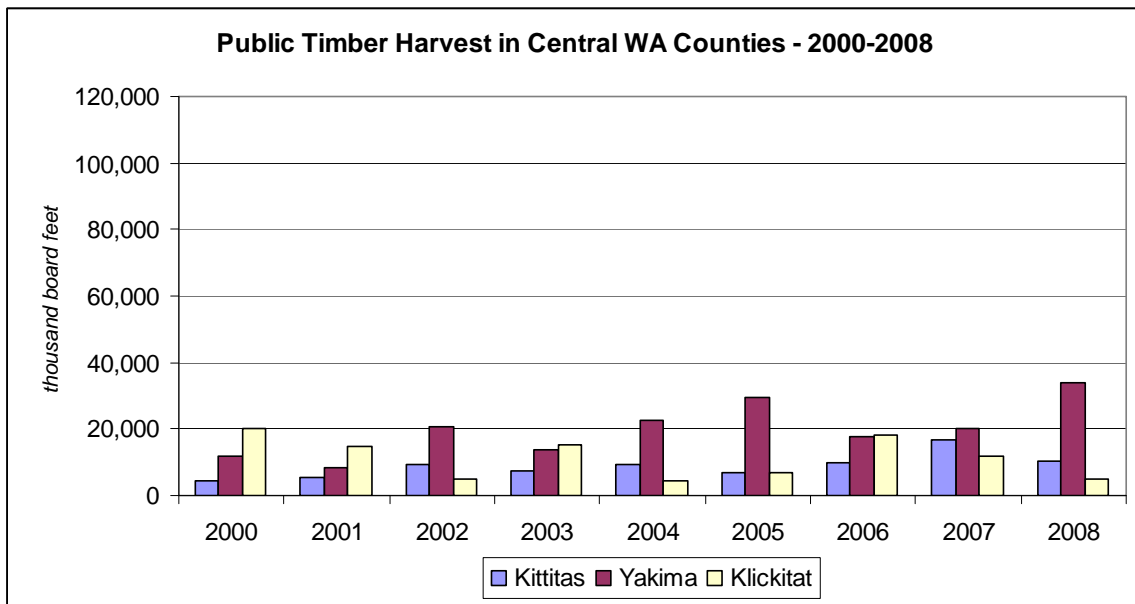
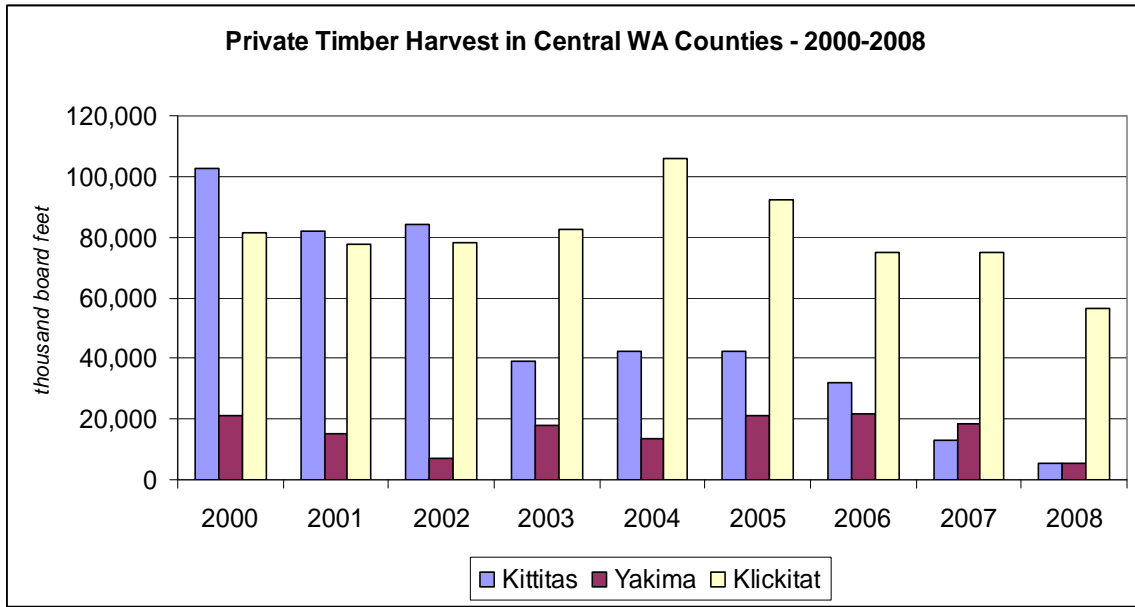
Forestland data prepared by Andrew Cooke, University of Washington, based upon information from the 2007 Washington State Forestland Database. <http://www.ruraltech.org/projects/wrl/>  
 Forested lands are considered as one acre or greater with at least ½ acre of forest cover.



## Appendix C: Timber Harvest Statistics

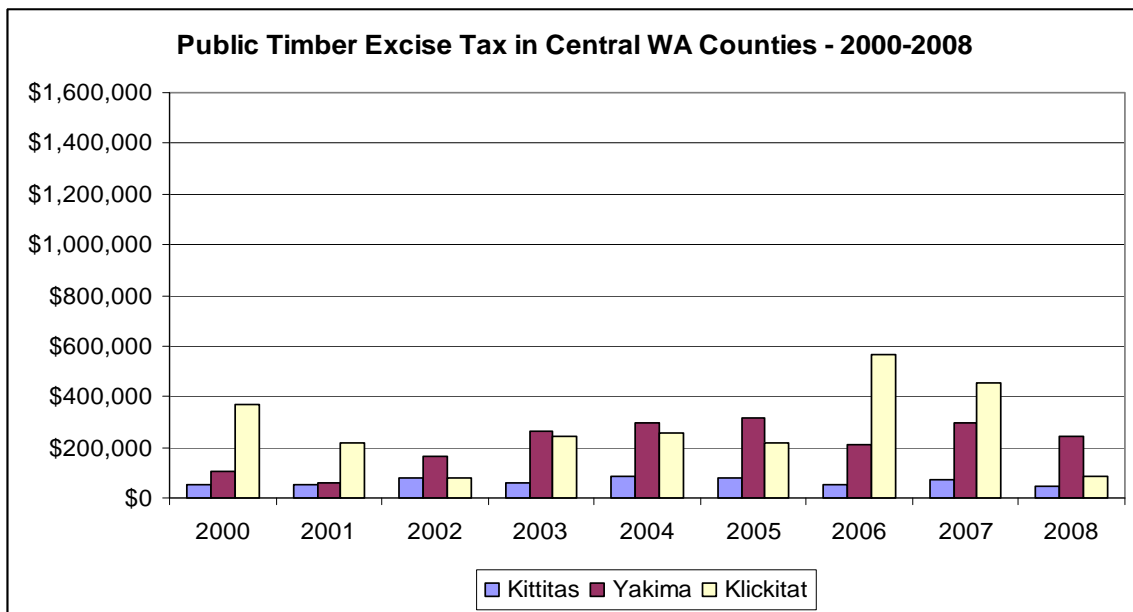
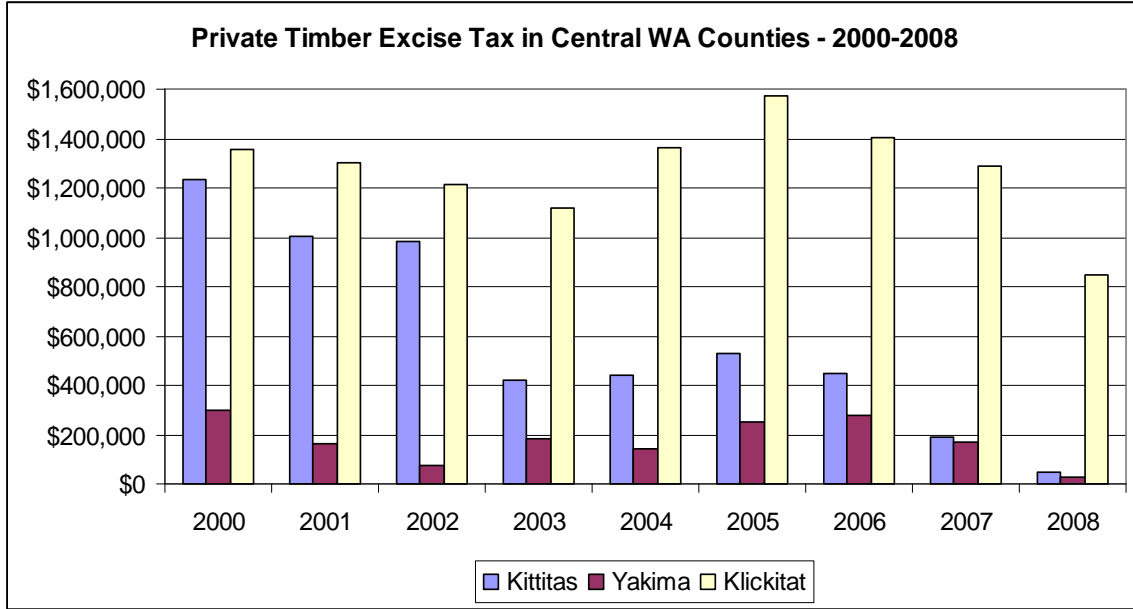


Data provide by WA Dept of Revenue and the Dept of Natural Resources.  
 Harvest data does not include timber volumes harvested on tribal forestlands.  
 Public timber harvest data was not reported by county in 1979 and is not shown for that year.



Harvest data does not include timber volumes from tribal forestlands.

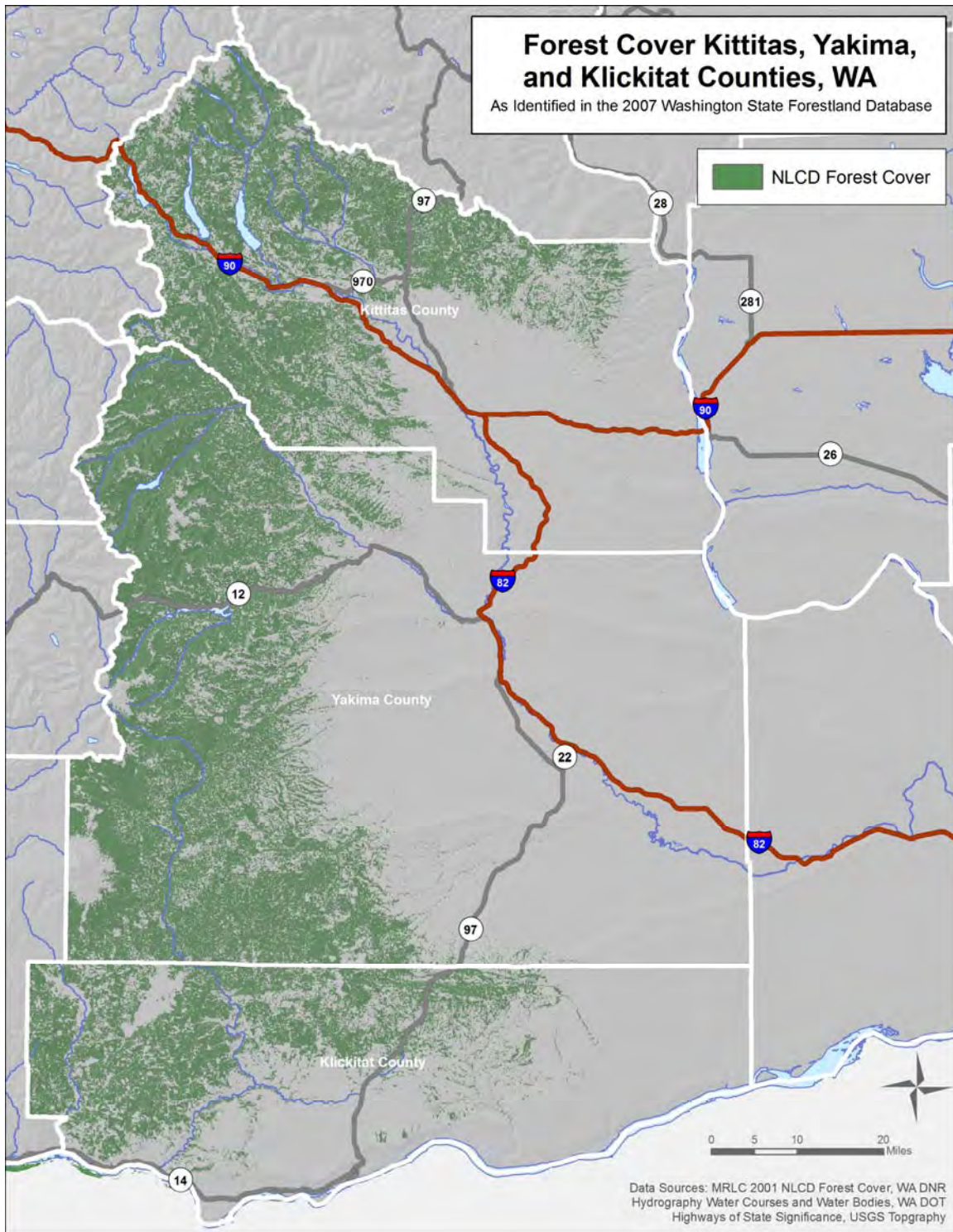
## Appendix D: Timber Excise Tax Statistics



WA DOR 2009.

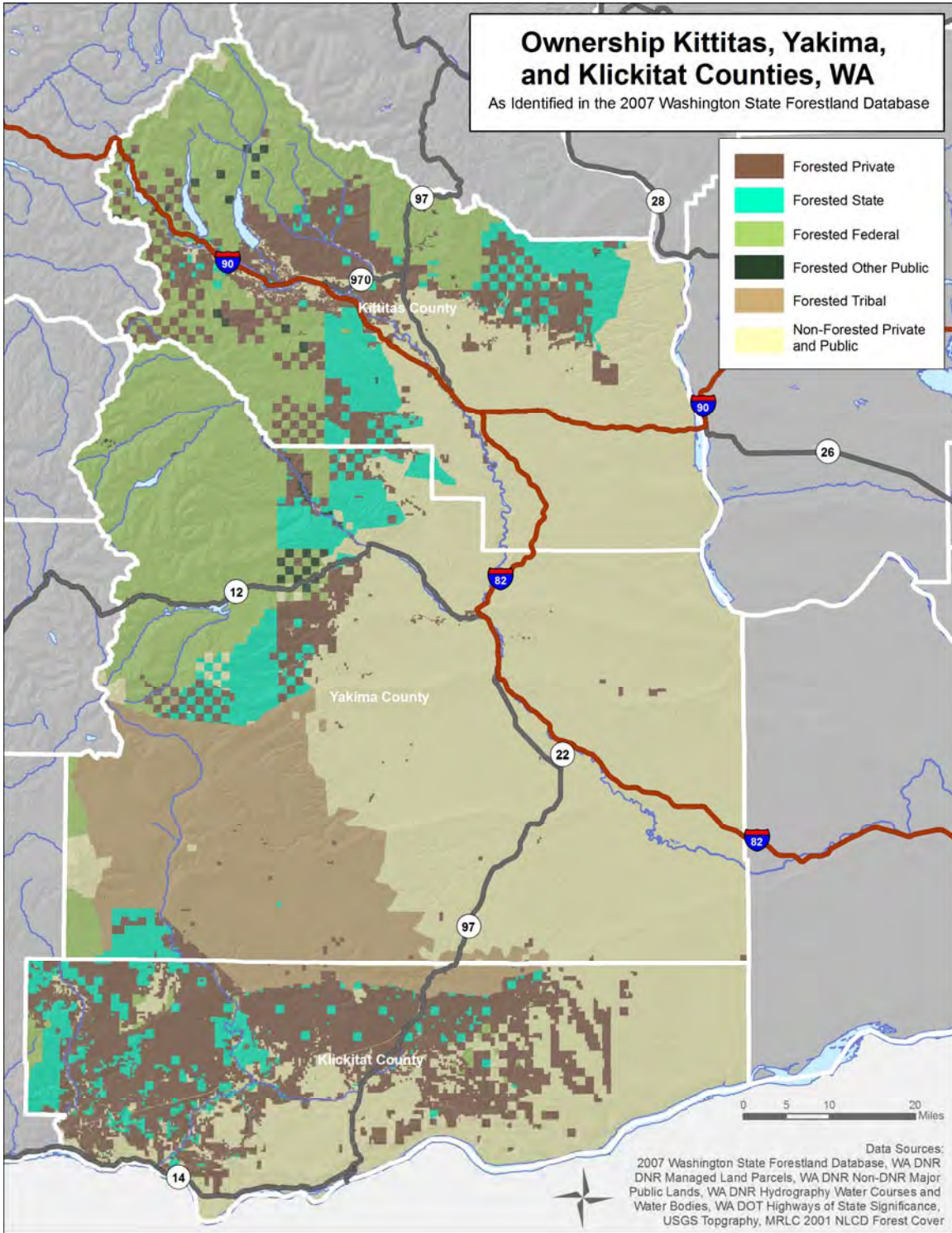
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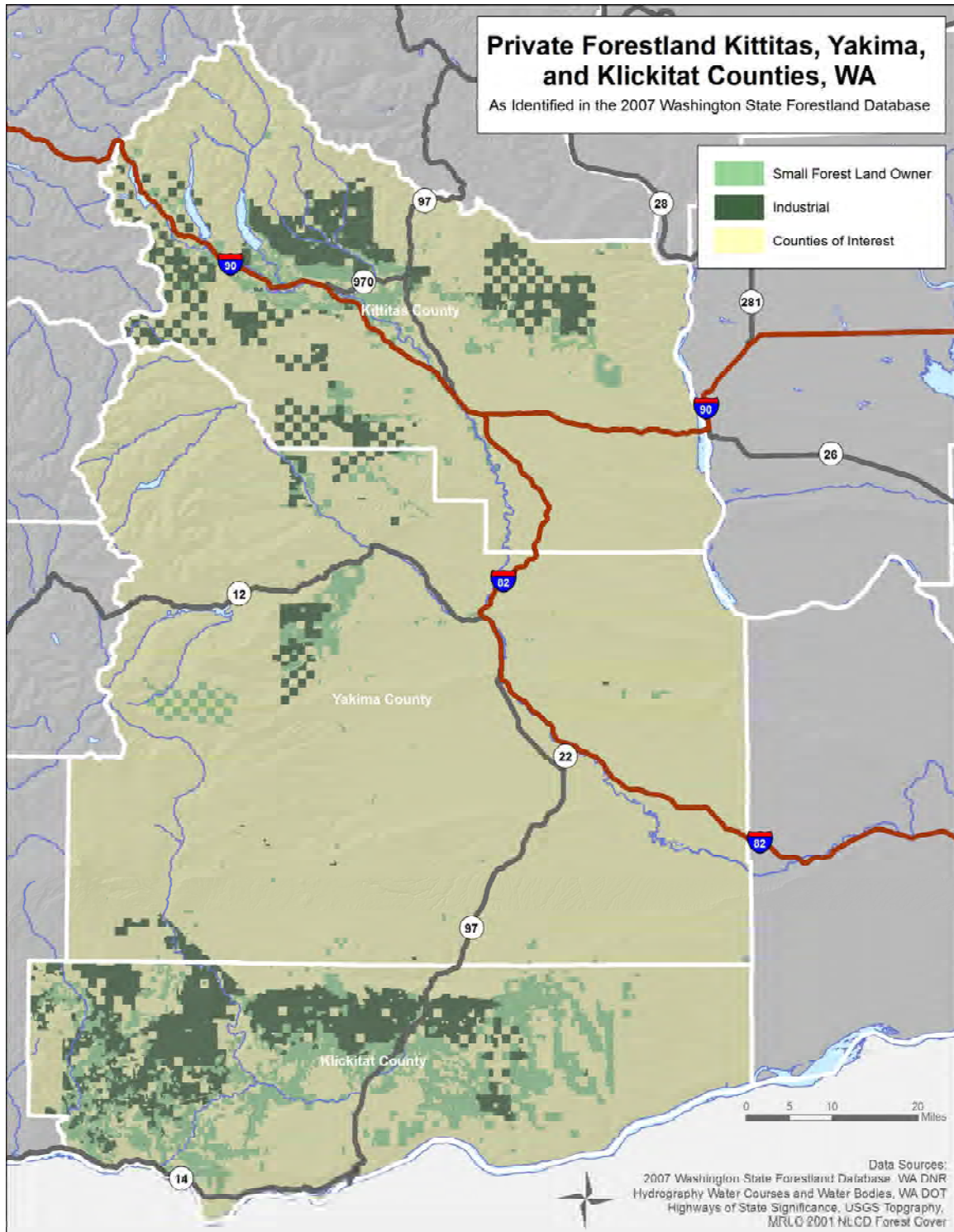
## Appendix E: Forested Ownership Maps



Maps were prepared by Andrew Cooke University of Washington. 2007 Washington State Forestland Database [http://www.ruraltech.org/projects/wrl/fldb/2009\\_report/index.asp](http://www.ruraltech.org/projects/wrl/fldb/2009_report/index.asp)  
Forested lands are considered as one acre or greater with at least ½ acre of forest cover.  
MRLC = Multi-Resolution Land Characteristics Consortium -- <http://www.mrlc.gov/>  
NLCD = National Land Cover Database.

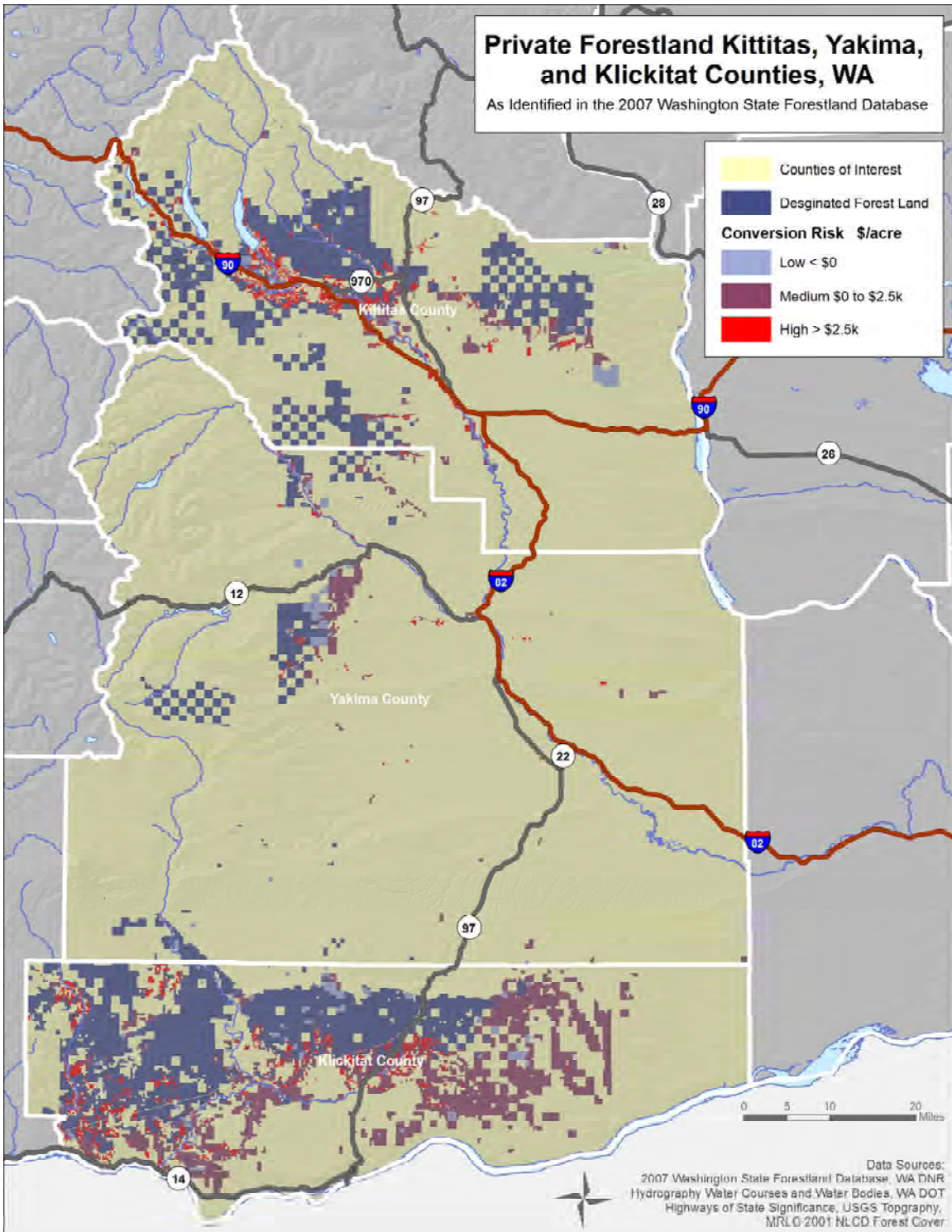








## Appendix F: Forestland Conversion Analysis



## Assessment of Private Forestland Conversion

Using the parcel-based Washington State Forest Land Database to extract real estate values, acreages, improvement values and land uses for forested areas in Washington, maps were produced of the privately-owned areas at highest risk of conversion, based on a series of assumptions on forest growth, management intensity and appraised market values. The base assumption is that parcels with the largest difference between the assessed real estate value (REV) and the working forest value (WFV) are likely candidates for conversion. Risk of conversion is characterized as low (less than \$0 difference), medium (\$0-2.5K), or high (greater than \$ 2.5K) dependent upon the difference between REV and WFV. Parcels in the Designated Forest Land (DFL) tax program are not required to be appraised for fair market value and therefore a conversion risk cannot readily be calculated. Further research will be needed to estimate conversion risk for DFLs. For more information on the Washington Forest Resource Lands Project see: <http://www.ruraltech.org/projects/wrl/>

	Acres at High Risk	Acres DFL	Acres Other Private	Total Private Acres
Kittitas	15,195	214,439	8,916	238,550
Yakima	1,120	56,558	7,651	65,329
Klickitat	12,737	264,727	33,826	311,291
<b>Total</b>	<b>29,052</b>	<b>535,725</b>	<b>50,394</b>	<b>615,171</b>

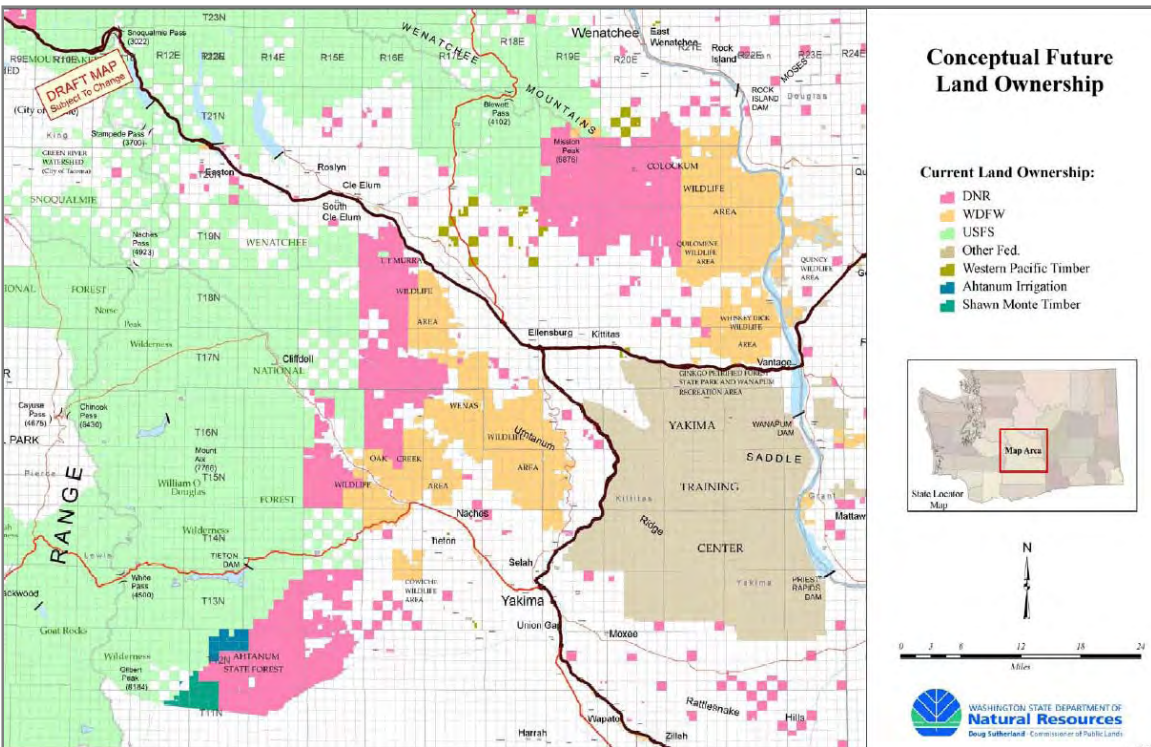
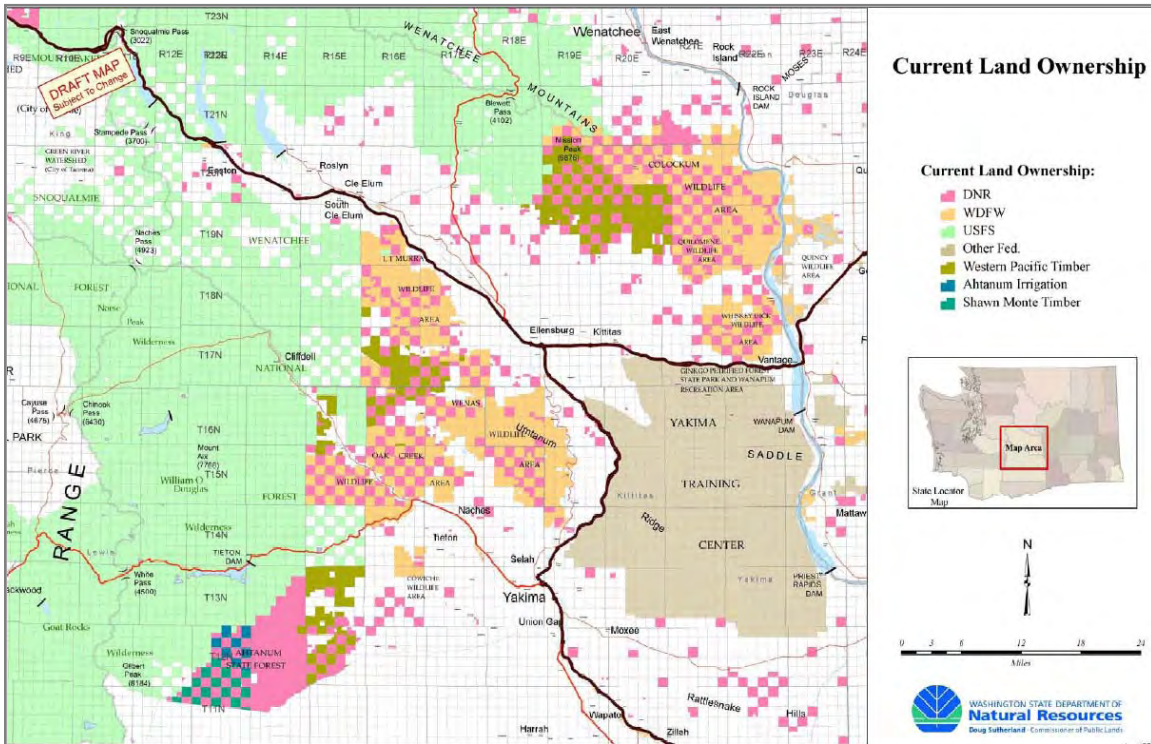
  

	% of County			% of Total Forest			% of Private Forest		
	high risk	df1	other private	high risk	df1	other private	high risk	df1	other private
Kittitas	1.02%	14.36%	0.60%	1.66%	23.45%	0.98%	6.37%	89.89%	3.74%
Yakima	0.04%	2.05%	0.28%	0.09%	4.36%	0.59%	1.71%	86.57%	11.71%
Klickitat	1.05%	21.72%	2.78%	2.50%	52.05%	6.65%	4.09%	85.04%	10.87%

<b>Acres at High Risk</b>	acres of privately owned forest on parcels with a conversion risk of \$2500 or more per acre
<b>Acres DFL</b>	acres of privately owned forest on parcels enrolled in the Designated Forestland Tax Program
<b>Acres Other Private</b>	acres of privately owned forest not in one of the two above categories

# Appendix G: Land Exchange and Acquisition



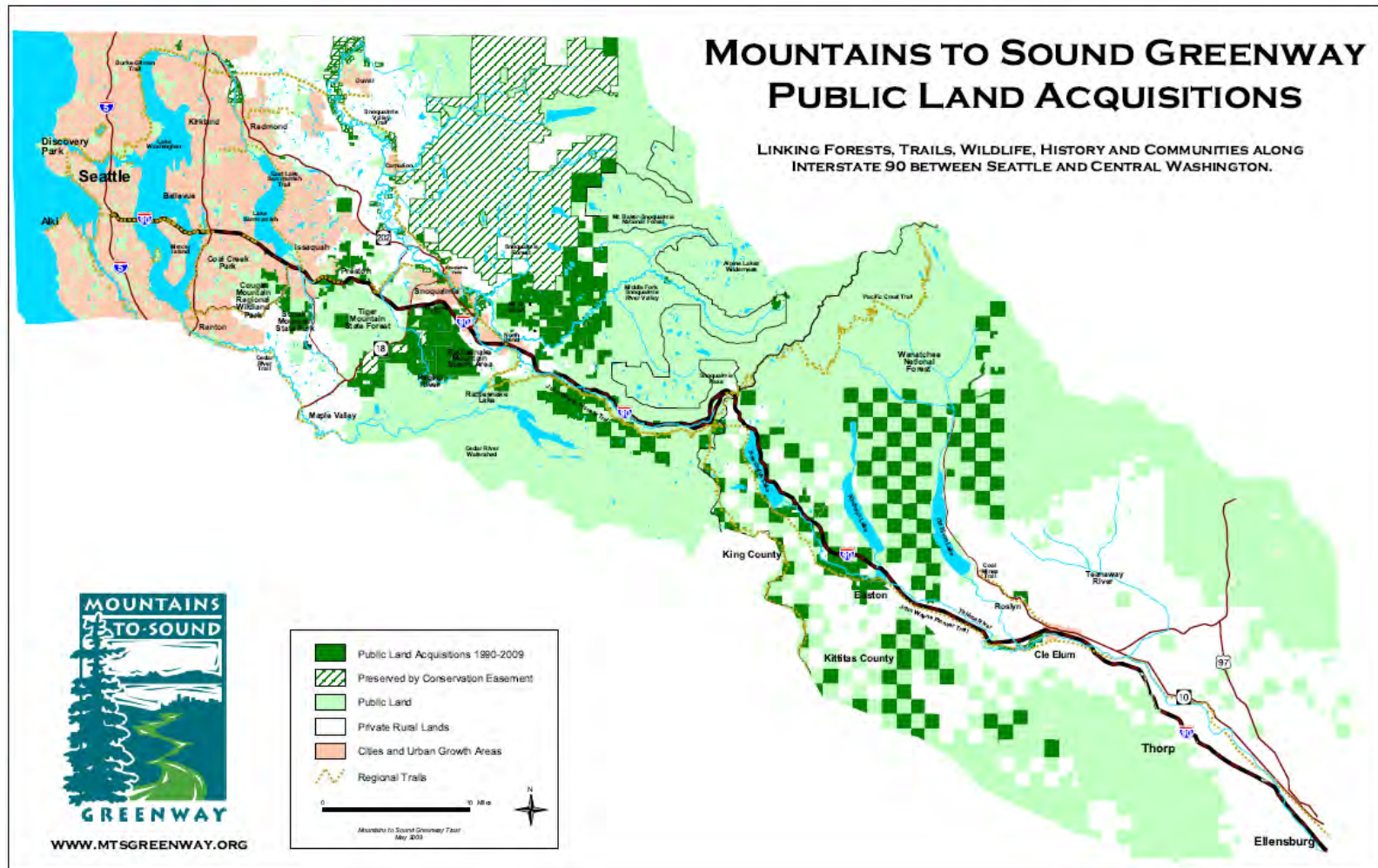
The maps above display a land exchange in Kittitas and Yakima Counties.

Source: Rocky Mountain Elk Foundation East Slope Cascades Conservation Initiative

<http://www.rmef.org/Conservation/HowWeConserve/Landscapes/Initiatives/Washington/Washington.htm>  
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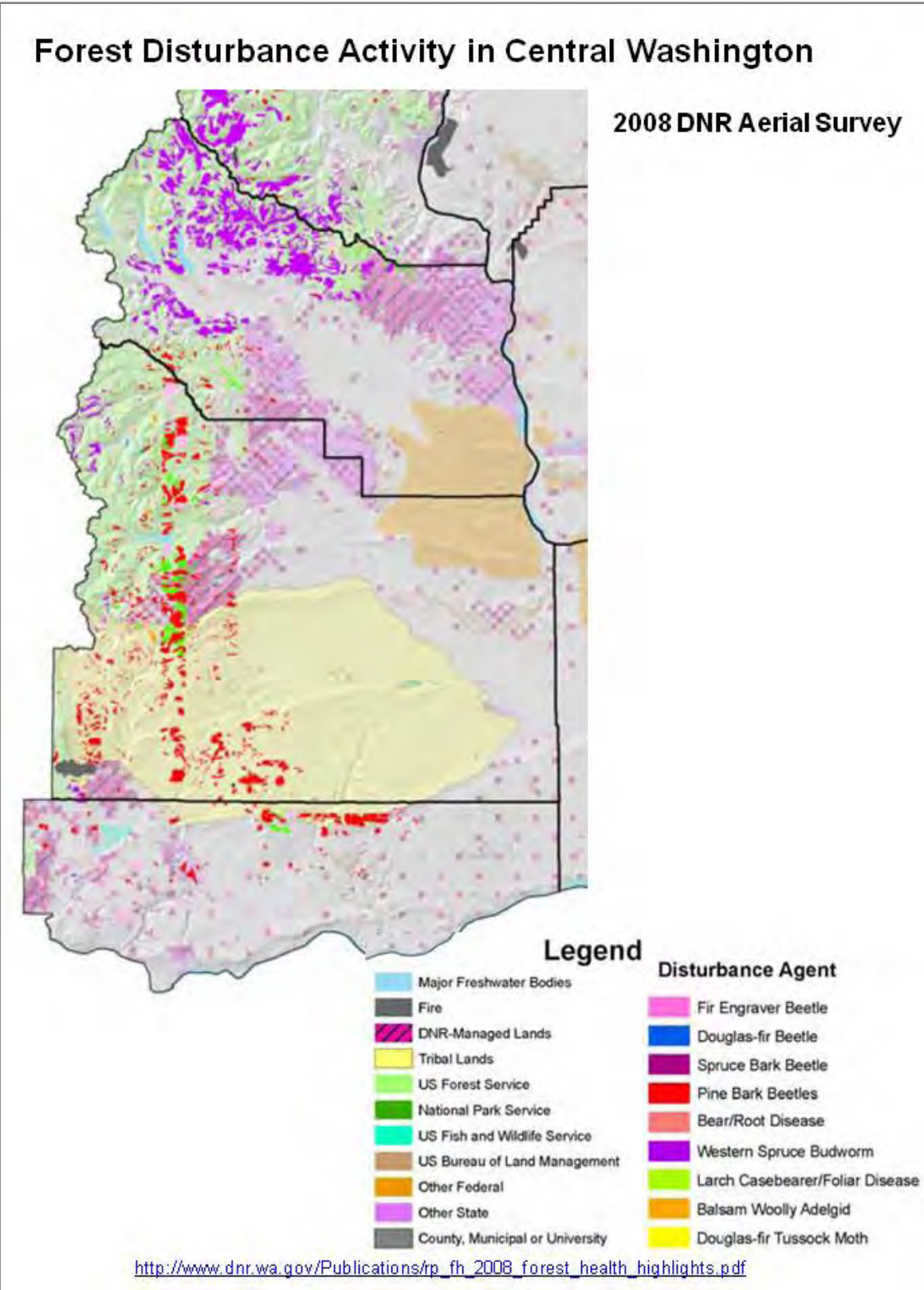


## Appendix H: Mountains to Sound Greenway



Since 1991, over \$260 million has been invested in over 130 separate transactions by federal, state and local agencies to purchase or exchange 140,000 acres of new public land to connect the scenic, recreation landscape in the Mountains to Sound Greenway. An additional 90,000 acres have been preserved by conservation easement. <http://www.mtsgreenway.org/about/land-acquisition-1/land-acquisition>

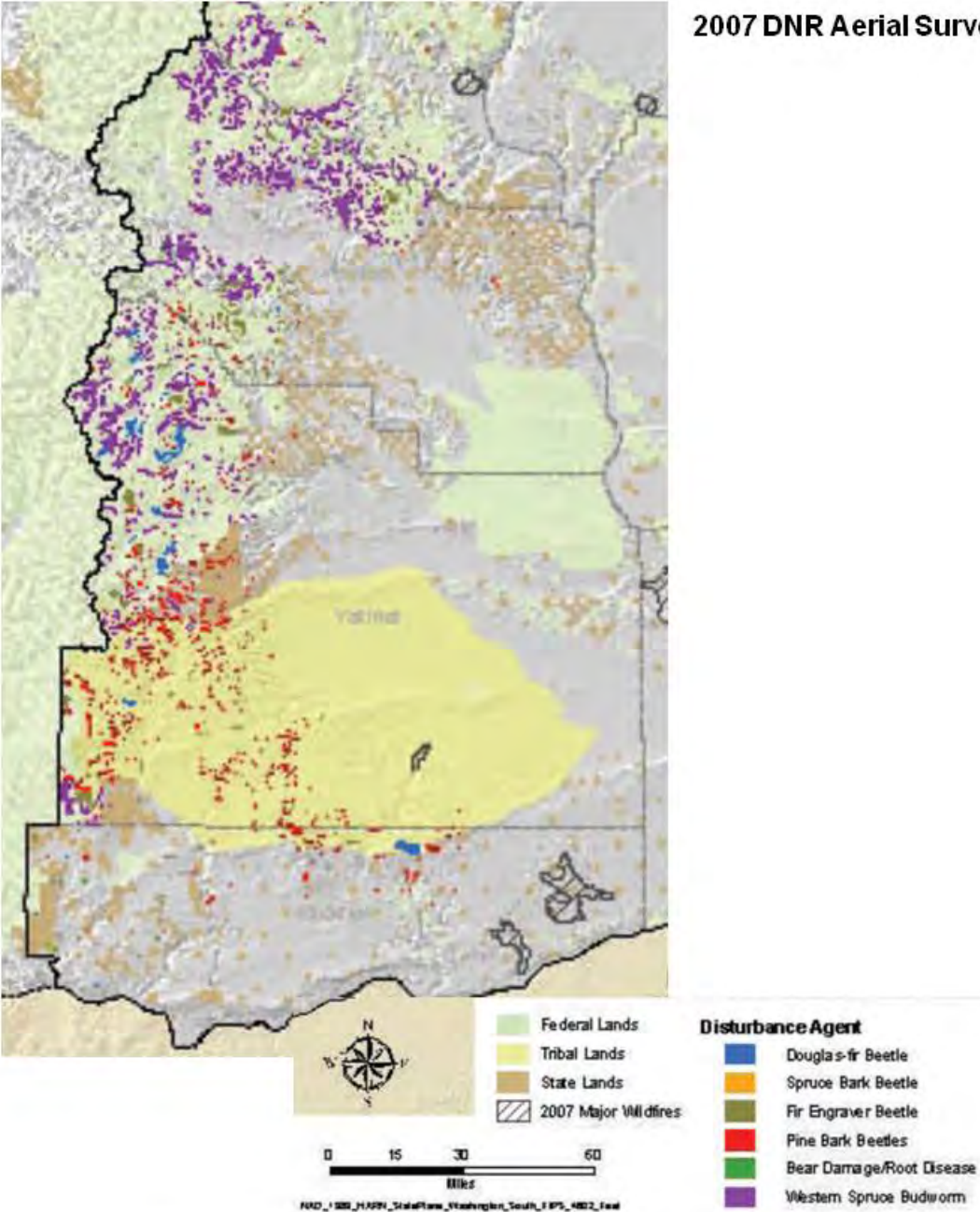
Appendix I: Forest Pests in Central Washington





# Forest Disturbance Activity in Central Washington

2007 DNR Aerial Survey

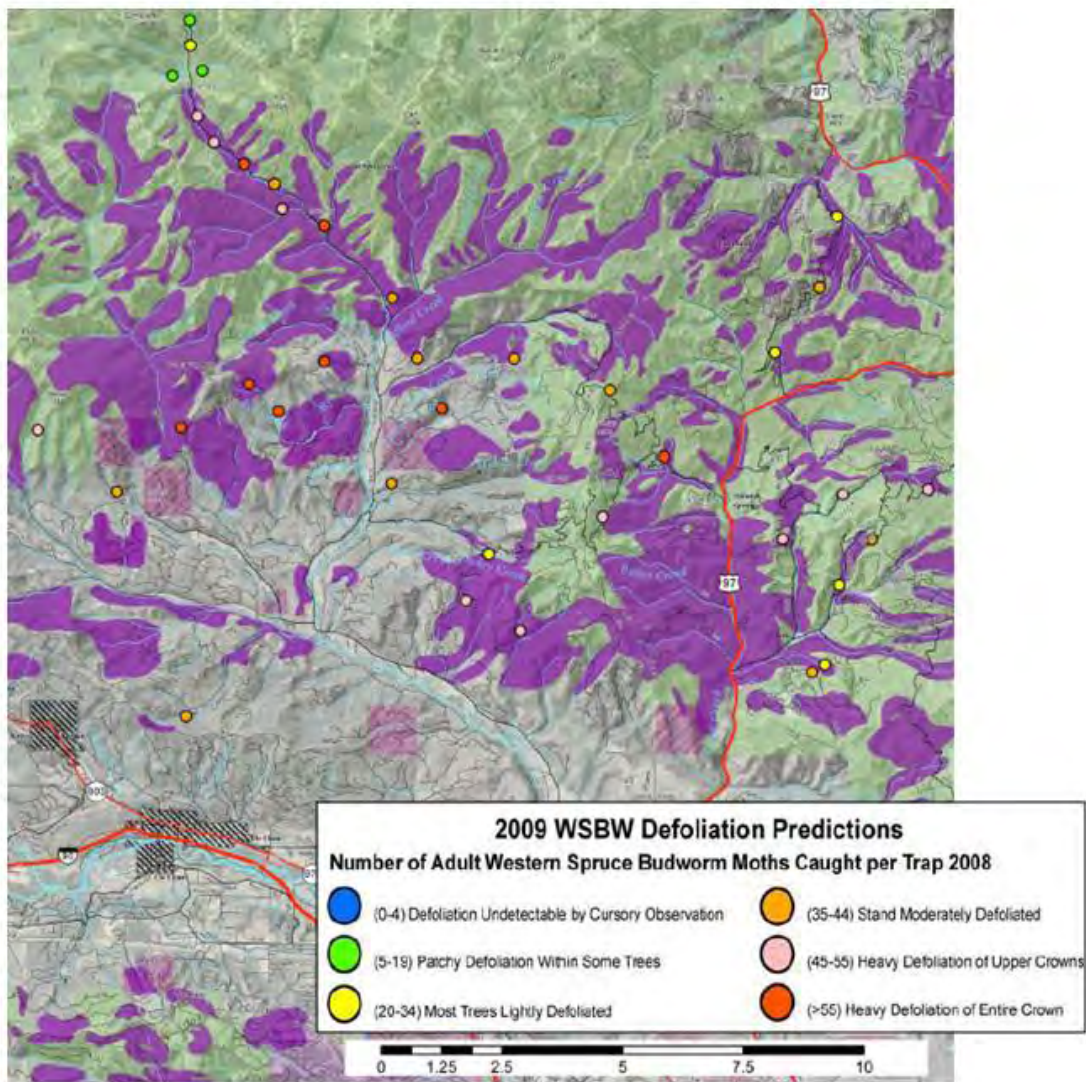


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Appendix J: Western Spruce Budworm - Teanaway

### Western Spruce Budworm Activity Teanaway River Valley 2008



WA DNR, USDA Forest Service, American Forest Land Company 2009