

EXECUTIVE SUMMARY

WESTERN JUNIPER SUPPLY AVAILABILITY ANALYSIS, MARKET ASSESSMENT AND BUSINESS DEVELOPMENT STRATEGY

**Prepared for:
The Ritter Land Management Team**



**Prepared by:
TSS Consultants**



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Final Report**

INTRODUCTION

The Ritter Land Management Team (RLMT) is considering the establishment of a Western Juniper (WJ) removal and processing enterprise. In order to effectively develop and deploy this enterprise, RLMT seeks to understand current WJ timber and fiber supply available from the greater Ritter area, the market for WJ products produces and a realistic implementation task list and timeline. In support of this effort TSS Consultants (TSS) completed a series of assessments analyses and reports. This executive summary report provides an overview of findings and recommendations gleaned from the following reports:

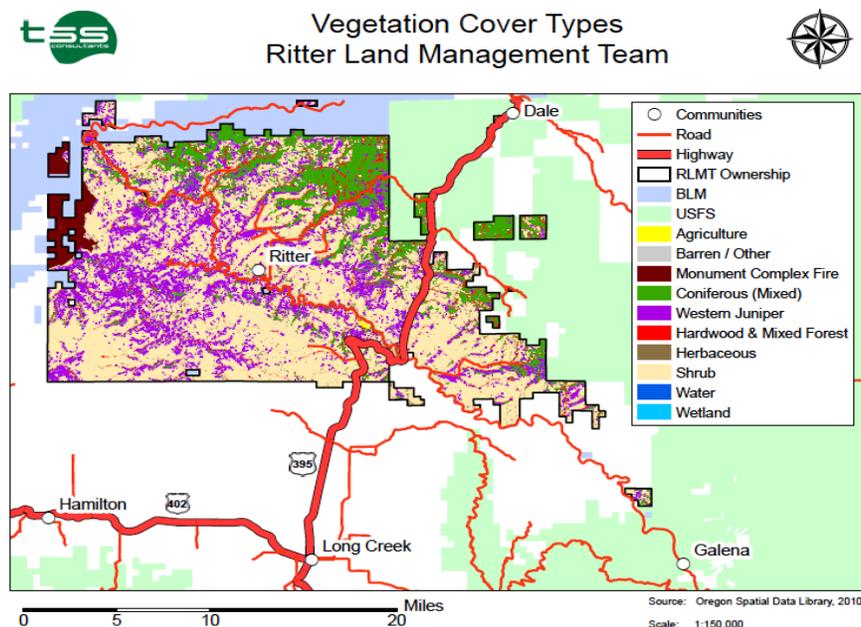
- WJ Timber and Fiber Supply Assessment
- WJ Product Market Assessment
- WJ Enterprise Deployment Feasibility Study
- WJ Enterprise Implementation Task List and Timeline

WJ TIMBER AND FIBER SUPPLY ASSESSMENT

The WJ timber and fiber assessment is an analysis of roundwood (logs) and fiber supply available over the next 10 to 15 years, generated as a byproduct of forest and rangeland restoration in the greater Ritter area. A primary objective of the RLMT is to leverage landowner stewardship goals and generate economic opportunity using market-based drivers within the area surrounding Ritter. In October 2015, the RLMT created a Strategic Action Plan (SAP) which is designed to ramp up the pace and scale of landscape level treatments which will require a coordinated, collaborative approach to pursue market-based solutions.

The Target Study Area for the WJ timber and supply assessment includes all of the RLMT landowner properties. Figure 1 provides the vegetation cover types of the TSA.

Figure 1. Vegetation Cover Types for the Target Study Area



Western Juniper density data was acquired from 2011 work that Portland State University (PSU) generated utilizing satellite imagery. In addition, slope gradient is important to characterize due to the impact of topography on WJ harvest and collection costs. Terrain with slope gradient over 35% is more challenging to operate on due to conditions (steep slope) that impede efficient and cost effective operations. In addition, safety becomes a significant consideration, with 60%+ slope conditions considered too steep for safe operation of ground-based equipment.

Combining WJ density with slope gradient analysis provides data that can be used to forecast acreage available for economic treatment and harvest. Table 1 summarizes WJ density by slope gradient class within the TSA.

Table 1. Slope Gradient Analysis Acreage by WJ Density Class

JUNIPER COVER TYPE BY DENSITY CLASS	ACREAGE WITH SLOPE <35%	ACREAGE WITH SLOPE 36-59%	ACREAGE WITH SLOPE >60%	TOTAL ACRES
05-10% Juniper Cover	7,665	2,366	503	10,534
10-15% Juniper Cover	5,196	1,665	273	7,134
15-20% Juniper Cover	5,088	1,627	234	6,949
20-25% Juniper Cover	4,899	1,640	203	6,742
25-30% Juniper Cover	3,426	1,165	149	4,740
30-35% Juniper Cover	2,694	904	104	3,702
35-40% Juniper Cover	1,908	538	49	2,495
40-45% Juniper Cover	1,043	304	29	1,376
45-50% Juniper Cover	337	112	12	461
50% + Juniper Cover	145	59	9	213
Juniper Cover Total	32,401	10,380	1,565	44,345
Other Vegetation Cover Type	48,911	10,250	2,144	61,305
TOTAL	81,311	20,630	3,709	105,650

With an understanding of vegetation cover types, WJ density, and slope gradient within the TSA, TSS conducted a WJ log and fiber supply analysis. Note that the common unit of measure is green tons (GT).¹

In order to effectively forecast WJ fiber supply, a RLMT treatment prescription was developed. This prescription was created based on consensus within the RLMT. While this serves to provide clear treatment objectives and outcomes for the WJ timber and fiber supply analysis, it in no way represents a one-size-fits-all approach. Each of the landowners making up the RLMT will define the treatment prescription to be implemented based on their own objectives and desired future condition of the landscape.

¹ One green ton represents 2,000 pounds with no adjustment for moisture content.

TSS used a 7 GT per acre average removal factor for WJ sawlog volume and 6 GT per acre average removal factor for WJ harvest residuals volume to calculate economically available supply.² Approximately 66,871 GT sawlogs and 57,318 GT harvest residuals fiber are considered economically available.³ Table 2 summarizes WJ sawlog and fiber availability.

Table 2. WJ Sawlog/Fiber Considered Potentially, Technically, Economically Available

WJ FEEDSTOCK TYPE	POTENTIALLY AVAILABLE	TECHNCIALLY AVAILABLE	ECONOMICALLY AVAILABLE
WJ Sawlogs	177,380 GT	129,604 GT	66,871 GT
WJ Fiber (Harvest Residuals)	177,380 GT	129,604 GT	57,318 GT

TSS recommends WJ harvest efforts within the TSA be focused on economical landscape level treatments with over 25% WJ density on topography no more than 35% slope gradient. Using these parameters, TSS found that approximately 9,553 acres are available for WJ harvest within the TSA. The RLMT is considering a range of WJ harvest levels, however if 450 acres are treated per year, the TSA landscape would require about 21 years to treat. One commercial truckload of WJ should accommodate 30 GT. At 450 acres treated, approximately 3,150 GT of sawlogs and 2,700 GT of fiber could be harvested annually. This amounts to the equivalent of 105 truckloads of sawlogs and 90 truckloads of fiber. It is anticipated that WJ and ponderosa pine logs from landowners outside of the TSA will likely be available as an additional sawlog resource.⁴

WJ treatment contractors have found that 12 to 24 month harvest lead-time is very helpful. By falling WJ well in advance of processing (for lumber or firewood), the WJ logs have less moisture and therefore much less weight. With less weight comes more cost effective operations allowing for more cubic feet of logs, firewood, or lumber to be economically transported on board truck. This significantly mitigates transport costs. Many of the RLMT landowners are now leaving WJ logs on the ground in anticipation of a local sawlog and/or firewood market.

WJ PRODUCT MARKET ASSESSMENT

The wood characteristics of WJ compare favorably with other North American softwoods. It is harder than ponderosa pine and has more nail strength than Douglas-fir and ponderosa pine. WJ is considered splendid for machining and bending and is

² WJ harvest residual volume will be slightly lower than sawlog volume per acre with WJ density of 25% plus. This is due to better WJ form class and relatively fewer limbs exhibited in denser stands on higher growing sites.

³ Note that the potentially, technically and economically available sawlog and fiber estimates are based on best available data.

⁴ RLMT Board of Directors reports that adjoining landowners are expressing interest in supplying WJ and ponderosa pine logs.

excellent for gluing and finishing. Examples of WJ value added products can be found on the Western Juniper Alliance website.⁵

One characteristic of WJ, which lends itself to many products, is WJ’s high natural resistance to insects and rot. A 1999 Oregon State University Forest Research Laboratory showed that WJ untreated fencepost lasted 30+ years, longer than any other untreated western tree species.⁶ This characteristic makes WJ superb for outdoor applications such as posts, siding, decking and patio furniture.

The market for WJ products appears to be very promising for the type of solid wood products that a small portable sawmill can produce (e.g., landscape timbers, dimension lumber, fence posts). Remaining focused on cutting WJ and processing the WJ material for standard markets is prudent. Diversification into many other products (e.g., custom furniture, bannisters) should be considered at a later phase. The products that Ritter should focus on are what the markets are in demand today. These products include 5”x 5”, 6”x 6”, 2”x 6”, 2”x 8” lumber and round wood fence post products. By-products produced (slabs) can be bundled (banded) and marketed as firewood. Tables 3 summarizes existing markets for WJ products.

Table 2. Existing WJ Products Listed by Ranking (High to Low)

WJ PRODUCT	COMMENTS
6”x 6” 8 foot	Main product (landscape timber)
2”x 6” 8 foot	Standard board, fall down from 6” x 6”
2”x 8” 8 foot	Standard board, fall down from 6” x 6”
Fence posts	Round wood, grouped into 3”/4”, 4”/5”, 5”/6”, and 6”/7” small end diameters
5”x 5” 8 foot	Standard post
2”x 6” 10 foot	Custom cut product
6”x 6” 10 foot	Custom cut product

WJ fiber markets have traditionally been focused on biomass fuel for power generation. The relatively low moisture content (30%) and high heat value (8,400 Btu/dry pound) of WJ fiber makes it an attractive fuel for commercial power production. However, the closures of local biomass power plants at Heppner and Prairie City have greatly impacted the local biomass fuel market. There is currently no local market for WJ biomass chips.

WJ ENTERPRISE DEPLOYMENT FEASIBILITY STUDY

The feasibility study findings and recommendations are summarized below.

⁵ <http://www.westernjuniper.org/western-juniper-in-action/>

⁶ Morrell, J.J., D.J. Miller, and P.F. Schneider. 1999. The service life of treated and untreated fence posts: 1996 post-farm report. Research contribution 26.

Investment Analysis – WJ Removal Enterprise

Findings

Given the base case assumptions⁷ for cost and revenue, the internal rate of return for the investment is 15% with an investment of \$311,250 for equipment plus an additional one time investment of \$61,000 for working capital for a total capital commitment of \$372,000.

The WJ removal operation as modeled is entirely dependent on a financially viable buyer that is converting WJ logs into valued commodities. If the processing enterprise cannot pay a reasonable market price for WJ logs, the risk to the harvesting operation is substantial. Also, the rate of production for the WJ removal enterprise is essential to the financial health of the investment. Thus, anything that promotes a consistent production rate is paramount to the operation. A rigorous equipment maintenance program, strategic management of removal operations to assure at least 140 days of annual operation, and having trained personnel will help mitigate issues that may impede or curtail production. Extending the length of harvest season will significantly improve the cash flow and internal rate of return. Conducting WJ removal on surrounding land ownerships (private and public) may provide an opportunity to diversify revenue (e.g., collect fees for range improvement). Regardless of what the marketplace does, production efficiency is one item that is under the control of the WJ removal enterprise.

Recommendations

TSS recommends proceeding with this investment, provided that the 15% hurdle rate adequately reflects the cost of capital and risk for the RLMT.

Investment Analysis – WJ Processing Enterprise

Findings

Given the base case assumptions⁸ for cost and revenue, the internal rate of return for the investment is 20% with an investment of \$260,818 for equipment and site improvements plus an additional one time investment of \$80,000 for working capital for a total capital commitment of \$340,818.

Finished product sales is a key driver (not surprising). Strategic marketing of finished products (lumber, slabwood, firewood, roundstock) both locally and regionally is paramount to financial success of the WJ processing enterprise.

Similar to the financial performance of the WJ removal enterprise, extending the working season of the WJ processing enterprise significantly improves financial performance.

⁷ Five full time employees, \$54,210/year O&M expenses, 10-year accelerated depreciation, no debt, \$65/GT cost for delivered WJ sawlogs, and 140 operating days/year.

⁸ One part time and four full time employees, \$68,976/year O&M expenses, sawmill replaced every six years, 10-year accelerated depreciation, no debt, \$65/GT cost for delivered WJ sawlogs, 3,300 board feet of lumber produced/day, 800 units of slabwood and 320 cords of firewood produced/year, 160 operating days/year.

The WJ processing operation represents a fixed asset and additional throughput (operation over and above 160 days/year) will improve revenue and internal rate of return. Procuring WJ sawlogs on the open market will diversify log supply, contribute to buildup of winter inventory and potentially allow extension of the operating season.

Recommendations

TSS recommends proceeding with this investment, provided that the 15% hurdle rate adequately reflects the cost of capital and risk for the RLMT.

Value-Added Processing Facility Siting

Findings

Two sites located within the TSA were considered as candidate sites for location of a WJ value-added processing site. The Junction property site is located adjacent to U.S. Highway 395 and the Bone Point property site is located about 12 miles from Highway 395, near Ritter. Both properties have site attributes that would support WJ processing operations. Much of the Junction property site is located within a State Wild and Scenic Waterway (Middle Fork of the John Day River).

Recommendations

TSS recommends the Bone Point property site as the preferred location for the WJ processing operation.

Opportunities to Merge WJ Product Marketing

Findings

TSS found several wholesale distributors that have experience with WJ product (lumber and firewood) procurement and distribution. Both Wilco and Sustainable Northwest Wood were responsive to TSS inquiries and indicated that there is a strong market for WJ products.

Recommendations

In order to optimize and expand WJ markets for products generated by the RLMT processing enterprise, TSS recommendations are summarized below.

Website Development

Marketing of WJ lumber products and firewood using a website that provides potential customers with visual images of products has proven to be a very effective method to reach retail customers. In addition, customers can place orders online and utilize a web based payment system (pay pal) to complete the transaction.

Local Marketing

There may be an opportunity to market lumber and firewood in local communities such as Long Creek, John Day and other markets within a 90 mile radius of Ritter. Marketing bagged firewood at the local grocery or convenience stores could provide significant

revenue during hunting season and winter months. In addition, marketing firewood locally in one half or full cord unit measure and slabwood in bundles will optimize revenue due to slightly higher pricing than wholesale pricing. Retail lumber outlets in the communities that surround Ritter may offer local marketing opportunities for WJ lumber. Considering that the WJ processing facility is likely to be located at the Bone Point site (some distance from Highway 395), it will be important to establish relationships with local retail enterprises that are located in communities that are likely to have consistent consumer traffic. In addition, RLMT should consider signage or setting a lumber trailer (loaded with a variety of WJ products) along Highway 395, directing travelers to the WJ processing site. U.S. Highway 395 is a major transportation route and represents a key marketing opportunity.

Wholesale Distribution

TSS recommends that RLMT consider working closely with wholesale distribution organizations for sales of WJ lumber and firewood products. Working with already established, commercial-scale wholesale distributors will assure that critical factors such as cash flow and product inventory management are optimized. This is especially important in the early years of the WJ processing enterprise when local markets for lumber and firewood are still in development.

WJ Removal/Processing Enterprises Optimized Business Structure

Findings

The preferred business structure for RLMT is an LLC for-profit business combining both the WJ removal and processing enterprises (as one LLC).

Recommendations

TSS recommends that the manager of the LLC (WJ removal and WJ processing enterprise) report to a three to five-member board. The Board of Directors for the WJ removal and processing LLC serve at the pleasure of the Board of Directors of the RLMT. The chair of the LLC Board of Directors is selected to report to the RLMT. TSS also recommends that the Board include expertise in accounting, legal and forest products marketing. Outside expertise on the LLC Board is also a benefit, although the cost of such knowledge may be excessive. TSS recommends obtaining outside expertise for the board that is willing to volunteer time to support the RLMT mission. Finally, operating the LLC should employ a cost accounting program that tracks the individual performance of the WJ removal and processing enterprises, separately.