# Briefing Packet
# Western Juniper Commercialization
# Status and Issues

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By
Larry Swan, U.S. Forest Service
Forest Products Economic Development Specialist

## Background

*Forest Service inventory scientists predict that within the next 50 years western juniper woodlands will be the most extensive forest cover type in Eastern Oregon.*

Acreage - There are about 2.2 million acres of western juniper woodlands in Eastern Oregon with 10% canopy cover or more.[1] This does not include the literally hundreds of thousands of acres which will convert to woodlands over the next 20 to 40 years, or 2.8 million acres with scattered juniper. About 58% of the acreage with 10% canopy cover or more is private. Other states with significant juniper acreage are California (1.3 million acres) and Idaho (275,000 acres) (see Attachment A, *Eastern Oregon Western Juniper Inventory*, and Attachment B, *Western Juniper Acreage and Volume*).

Eleven of 17 Eastern Oregon counties have at least 100,000 acres of juniper (the six which have insignificant amounts are Gilliam, Morrow, Sherman, Umatilla, Union, and Wallowa). Four counties have juniper on over 50% of their non-forested lands (Crook, Grant, Jefferson, and Wheeler).

Pacific Northwest Research Station scientists will be conducting a more detailed inventory of Eastern Oregon western juniper this summer (1999). The inventory will gather data for key questions not addressed by the late 1980s inventory which provided the data cited above, such as extent of juniper reproduction (which cannot be seen using standard remote sensing techniques) and extent of juniper old growth (pre-1880s origin).

[1]Canopy cover of 10% or more is the arbitrary minimum criteria used by inventory scientists to define "forest cover".

Volume - Western juniper is the least-utilized wood fiber resource in its range. Total woodland volume is estimated to be at least 691 million cubic feet, of which about 39% is on private lands and 61% on public lands. For comparison purposes, red alder volume is about 7,436 mm cu. ft. and California laurel is about 297 mm cu. ft. (see Attachment C, *Comparison of PNW Hardwood and Western Juniper Growing Stock Estimates*). Total woodland volume in Eastern Oregon is about 440 million cubic feet, of which 49% is private and the remainder public.

Trends - Late 1980s inventory data indicate that woodland acreage in Eastern Oregon has increased about 500% since the mid-1930s (see colored map, Attachment D, *Western Juniper in Eastern Oregon*). Scientists estimate that total woodland area could increase to 6,000,000 acres within the next 50 years, which represents 10% of Oregon's total land area. This would make juniper woodlands the most extensive forest cover type in Eastern Oregon (instead of ponderosa pine).

## Impacts

*"We feel like we're having to buy our land twice due to the costs of beating back the juniper."*

Deteriorating Watershed Conditions - The expansion and increasing densities of juniper woodlands greatly concern private landowners, government land managers, and scientists. Over one million acres already show clear evidence of watershed degradation, loss of site productivity, decrease in forage production, loss of wildlife habitat, and overall-reduction in biodiversity.

Agriculture Industry Income - Many Eastern Oregon ranchers report significant decreases in forage, which combined with low cattle prices are having a serious impact on their financial viability.

## Nature and Extent of Juniper Clearing Operations

Juniper Clearing Operations - Numerous private landowners undertake juniper thinning or clearing operations every year in Eastern Oregon and Northeastern California (estimated 5,000 to 10,000 acres per year). Due to lack of demand and markets, as well as economics, the juniper removed is often piled and burnt, or simply left to decompose after being knocked-down or cut (estimated to amount to 1.1 to 2.3 million cubic feet of juniper bole wood per year[2]). Government agencies are currently less active in clearing juniper than private landowners, due to concerns about legal challenges and lack of funding for such projects.

[2]Assuming 10,000 ac./yr. at an average of 225 cu. ft./ac = 2.25 million cubic ft. (cubic foot per acre estimate provided by Don Gedney, Pacific Northwest Research Station, Portland)

Landowner Costs - Landowner costs for simply knocking trees over with mechanical equipment, a common method used to thin juniper woodlands, average $35-$50 per acre. Manual falling, delimbing, and hand slash dispersal can run as high as $250 per acre.

Clearing Projections - Thinning and clearing operations are expected to continue whether or not a commercial industry develops for juniper, and despite a decrease in government subsidies. According to Tom Birch, a Forest Service scientist who summarized data from a national study of forested land owners and their harvest plans, there are probably at least 3,000 ranchers in Oregon and California who plan to thin their juniper woodlands within the next 10 years.

## Woodland Management

Results - Research completed by Oregon State University shows that proper juniper management can significantly increase forage, improve wildlife habitat, and increase overall biodiversity. Timing is important though. Costs to treat juniper at the seedling/ sapling stage can be as low as $4 to $8/acre if prescribed fire is used. Treatment for mature woodlands, where juniper has out-competed native grasses and shrubs, ranges between $30 to $100/acre, depending upon the amount of restoration work needed (such as seeding and scattering slash).

Surface Water Response - Preliminary research results and years of anecdotal evidence suggest juniper management can increase capture, storage, and beneficial release of precipitation in watershed drainage subbasins with high juniper densities. For example, in areas with 20% juniper canopy cover or more, it is theoretically possible to increase precipitation going into the water cycle by two inches or more simply by reducing the amount of snow and rain intercepted by and evaporated from the woodland canopy. This is equal to about a 15% increase, given that average annual precipitation for many woodland areas is only 12 to 14 inches.

## Historic Use

Although the majority of western juniper harvested over the years has been used for fence posts and firewood, there are reports going back at least 50 years of mills which tried to commercially process the species. The earliest wood products research known to involve western juniper began in 1949, as part of an Oregon State University study of the service life of treated and untreated posts (Miller 1986).[3] The research literature also indicates temporary interest in the 1950s for use in composites and extractive oil, and some interest in the late 1970s due to the perception of an energy crisis.

[3]According to Miller (1986), western juniper is the most durable heartwood species in the Pacific Northwest. Average service life in western Oregon exceeds 30 years. Other species included in the study were Pacific yew, redwood, various cedar species, and Oregon white oak.

The most successful commercial western juniper operation of any size was a mill owned and operated by Gary Gumpert in Prineville in the mid to late 1970s (five to 10 employees). Primary product emphasis was interior paneling, but other products were made in the course of refining the panel product (such as furniture and mantel pieces). At the time the mill was sold, about one-third of the production was juniper and the remainder incense cedar.

Probably the greatest use of juniper over the last 10 years has been as a source of fuel for power generation. In the early to mid-1990s, at least a thousand acres of juniper woodlands in Northeastern California were harvested for power generation biomass. Power generation markets for juniper have virtually disappeared though, due to changes in laws governing alternative power purchases.

## How Did the Western Juniper Commercialization Project Get Started?

Focus Group - The Western Juniper Commercialization Project was begun in 1992 as a result of feedback from a Forest Products Industry focus group run by the Forest Service in Klamath Falls. In just 18 months, over 1,200 manufacturing jobs were lost out of a total regional manufacturing employment base of less than 4,000. Reasons for the large loss in jobs included a reduction in Federal timber supply and lack of privately-owned timber in the region (over 65% of the land in Klamath County is managed by either the Forest Service or Bureau of Land Management). The Forest Products Industry saw juniper as a potential new source of fiber and wanted to find cost-effective methods to utilize juniper cut down by ranchers to improve grazing lands.

## How Are Activities Coordinated and Funded?

Ad Hoc Steering Committee - Commercialization project activities are coordinated by an ad hoc Steering Committee made up of industry, landowners, university extension, government agencies, and non-profit economic development organizations. Logistical support and facilitation of the Steering Committee and its projects are a combined effort of the Forest Service, Oregon Economic Development Department, a private business consultant hired by the Steering Committee, a local non-profit economic development organization, Oregon State University Extension, and the Northwest Wood Products Association.

The ad hoc Steering Committee was recognized with the Governor's Award for "Partnership Excellence in Economic Development" in 1997. At last count, over 150 different public and private entities had been involved in project activities.

Funding - Funding for projects and industry development is obtained from a variety of state, Federal, foundation, and private industry sources. About $3.45 million has been committed since 1994 (approximately 50% state and Federal economic development funding, and 50% from private industry and foundations).

## What's Been Accomplished?

Commercialization Projects - Commercialization entails a complex network of interrelated subject areas, each with its own set of interest groups and stakeholders, and information needs (see Attachment E, *Strategy Matrix: Marketing and Developing Under-Utilized and Low-Value Forest Products*). It is estimated well over 100 western juniper commercialization projects have been completed since 1993-94, ranging from lumber recovery to management demonstration areas (see Attachment F, *Examples of Academic and Research Assistance Projects*). Much of the work undertaken is considered "ground-breaking". Very little was known about western juniper physical, mechanical, and fiber properties, and oil chemistry prior to beginning the commercialization process.

Companies Processing Juniper - In 1991, the juniper industry consisted of a few artisans, and seasonal firewood and post cutters. There are now at least 35 companies selling juniper products into at least 11 main markets or distribution channels, ranging from animal bedding shavings to doors and flooring. None of the companies have gross sales of juniper exceeding $250,000 (for more information about markets, products, and processing, see Attachment G, *Processing and Finishing Western Juniper*).

Job Creation -Over 35 full-time equivalent (FTE) jobs have been created in more than 14 Eastern Oregon communities. Due to increased awareness and publicity, it is estimated at least another 35 FTE jobs were created as an indirect result of commercialization projects. Private industry indicates that the number of jobs related to juniper processing are expected to double within the next two years. The ad hoc Steering Committee believes that the juniper industry will eventually generate gross sales of over $20 million per year, which translates to more than 250 direct and indirect jobs in rural Eastern Oregon communities.

## Key Technical Commercialization Issues

Harvest Costs - It is estimated juniper harvest costs average two to three times that of other common Eastern Oregon commercial species. Special techniques and equipment design are needed to significantly reduce costs, improve slash dispersion for watershed restoration purposes, and improve safety. The Forest Service has committed about $200,000 to fund development and testing of harvest equipment specifically designed for juniper. Added costs due to regulation and taxation are also a concern. Government watershed restoration project subsidies are expected to play a key part in defraying harvest costs until better and more economic methods are developed.

Economies of Scale - The western juniper industry needs higher volume logging and manufacturing operations to obtain economies of scale, and assure consistent supply quantity and quality. Economies of scale are also needed to spread the cost of maintaining sufficient inventory to attract and maintain larger sales accounts.

Marketing - Before higher volume operations can be developed, markets must be identified and entered which will absorb current and expected volume, at a price which yields a profit to the private manufacturer.

Falldown and Residuals - Markets have to be developed for falldown and residuals. On-going work with Oregon State University and the first, whole-log shavings mill west of the Rockies show promise, but it will take time to develop the infrastructure that the wood products industry takes for granted for other species.

## Potential Oregon Board of Forestry Issues

The stimulus for the April 23rd presentation to the Oregon Board of Forestry was legislation introduced by the Senate Committee on Agriculture and Natural Resources (SB 1151). The legislation addressed one of the ad hoc Western Juniper Commercialization Steering Committee's "priority management and commercialization issues": Clarification of forest practice act rules related to western juniper (see Attachment H, *Highlights of Written Testimony Regarding SB 1151*).[4] Other legislation introduced by the Committee relate to funding for juniper shavings toxicity studies, and juniper biological research synthesis and on-the-ground management publications (SB 413).

SB 1151 stimulated discussions between Juniper Steering Committee members, Department of Forestry Forest Practices staff, and representatives of the Oregon Cattleman's Association, Farm Bureau, and Small Woodlands Association. Examples of issues raised related to Department of Forestry programs, from the perspective of operators and the Agriculture industry, follow. It should be clearly understood that a number of issues, such as reforestation and unit size, were cleared-up after Salem staff explained how and when certain administrative rules would apply:

- Do Forest Practice Administrative Rules apply to commercial western juniper harvest operations?

[4]Other items on the *Priority Issues List* include: 1) Reducing taxes on commercial juniper harvest (Eastern Oregon Privilege Tax and Forest Products Harvest Tax); 2) Raising consumer awareness about wood borers in green juniper lumber; 3) Instituting state affirmative procurement program to encourage use of raw material produced by watershed restoration activities; 4) Broadening scope of state watershed enhancement program guidelines to include more upland watershed projects; and 5) Mapping and identifying woodland development trends in high priority watersheds.

- Should watershed restoration activities involving commercial western juniper harvest be administered by the Department of Forestry or other state agency, such as Department of Agriculture?

- Do "best available" juniper science research and site restoration management guidelines conflict with Forest Practice rules?

  Specific Example No. 1: Will Forest Practice rules require reforestation?
  Specific Example No. 2: Will the Department of Forestry fire hazard risk rating system conflict with slash retention guidelines?
  Specific Example No. 3: Will Forest Practice rules prevent juniper removal and slash dispersal in and around dry or seasonal drainages, seeps, and springs?

- Will juniper harvest unit size be constrained by Forest Practice rules?

- How do Forest Practice rules address noxious weed infestations and management guidelines (such as groundcover seeding and restocking levels)?

- How do Forest Practice rules affect number, type, and distribution of juniper "leave trees"?

- How will the lessons and practices applicable to other Eastern Oregon western juniper commercial operations be communicated to operators and Forest Practice foresters?

It became clearly evident after further discussions with Forest Practices staff and representatives of the ad hoc Western Juniper Commercialization Steering Committee, Cattlemen's Association, Farm Bureau, and Small Woodlands Association, that the scope of review of Department of Forestry's programs related to western juniper needed to be broadened. As of April 21st, language of a proposed amendment to SB 1151 is:

> Section 1: *Not later than one year after the effective date of this 1999 Act, the State Forestry Department, in coordination with Oregon Department of Agriculture, Oregon Department of Environmental Quality, and Oregon Department of Fish and Wildlife, shall complete a review of its programs, and those programs administered by the Department for other state agencies, to determine programmatic and regulatory issues related to commercial western juniper harvest, and how the Department can respond to help resolve these issues in a manner which will benefit landowners, and improve watershed and rangeland health. Upon completion of its review, the State Forestry Department shall recommend any necessary programmatic or regulatory changes to the State Board of Forestry.*

Examples of questions which are expected to be addressed because of this amendment language include:

- What is the nature and extent of the Department of Forestry's role and involvement with rangeland improvement and watershed restoration projects involving western juniper?

- Do Department programs duplicate responsibilities and oversight of other state agencies and programs?
- How might Department programs be better coordinated and more efficiently managed to encourage restoration and rangeland health, benefit landowners, and improve juniper utilization?

- What are the nature and extent of other state agency programs administered by the Department of Forestry, which affect western juniper woodland management activities?

- How might the programs administered by the Department for other state agencies be better coordinated and more efficiently managed to encourage restoration and rangeland health, benefit landowners, and improve juniper utilization?

- What should be the Department's role and contribution to activities designed to improve watershed health, benefit landowners, and encourage utilization of western juniper?

- How do Department activities support local watershed councils? What else can be done to support local watershed councils and proposals?

A clause to exempt juniper from Eastern Oregon Privilege Tax and Forest Products Harvest Tax was also suggested for SB 1151:

> *Section 2 - In order to encourage the growth of a western juniper industry and reduce costs of improving watershed health on degraded rangeland, this Act exempts western juniper from the Eastern Oregon Privilege Tax and Forest Products Harvest Tax..*

## Summary

Commercialization of a new tree species is complex. Compounding the complexity for western juniper is that management and processing require linking two normally unrelated fields: Rangeland science and forest operations.

The Board of Forestry's support of SB 1151, as amended (proposed) is solicited by members of the Juniper Steering Committee. Steering Committee members believe it is important in the early developmental stages of an industry to review programmatic and regulatory issues, and do what makes sense from a long-term perspective rather than patch together programs and regulations which were never intended to apply to woodlands and rangeland. The Governor's

Eastside Forest Advisory Panel will soon be asked to expand its scope of work and include juniper woodlands in its review of Eastern Oregon watershed health concerns.

Members of the Juniper Steering Committee realize the issue of harvest taxation may be more complex and, at the Board's convenience, are willing to discuss why this is important to the industry. A background paper about western juniper taxation, prepared at the request of the Senate Committee on Agriculture and Natural Resources and members of the Juniper Steering Committee, is attached (see Attachment I, *Background Research: Harvest Tax Issues*). Preliminary discussions with the Department of Revenue indicate that the Department will not oppose exempting juniper from Eastern Oregon Privilege Tax and Forest Products Harvest Tax.

A partial list of formal participation or involvement of Oregon Department of Forestry personnel in various aspects of the western juniper commercialization process over the last eight years are noted in Attachment J (*Partial List - Previous Involvement of ODF Personnel*).