



Ponderosa Pine Utilization Summit

OUTCOMES
& ACTIONS



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Executive Summary

The Council of Western State Foresters' (CWSF) Forest Products Committee (FPC), in collaboration with the Forest Stewards Guild and Hardigg Consulting, convened the Ponderosa Pine Utilization Summit (Summit) from November 18 to 20, 2025, in Flagstaff, AZ. The Summit brought together key stakeholders to identify priority challenges, explore solutions, and develop strategies to support sustainable ponderosa pine management and utilization.

Ponderosa pine forests are a cornerstone of resilient western landscapes, historically maintained by frequent, low-intensity fires that created open, drought-tolerant stands. A century of fire suppression and changes in land use have increased forest density, fuel loads, and the risk of high-severity wildfire. At the same time, utilization of ponderosa pine for timber and other forest products has declined, leaving limited markets for small-diameter and low-value material.

The CWSF FPC prioritized increasing ponderosa pine utilization because the stakes for forest resilience and industry viability are high. There is growing concern that the combination of a loss of milling infrastructure and the lack of viable markets will slow active forest management, increasing the risk of high-severity wildfire and other forest health issues to both communities and landscapes. This urgency aligns with national direction, such as the USDA's executive order to accelerate forest management, the USDA Forest Service's new National Active Management Strategy, and the related regional implementation plans.

Key challenges identified at the Summit included inconsistent timber supply due to regulatory complexity and litigation, limited markets and secondary infrastructure for low-value material, high transportation costs, and workforce recruitment and retention barriers. Participants noted that increasing demand for ponderosa pine is foundational to addressing many of these challenges, particularly given the difficulty of sustaining profitable mills with small-diameter wood. Promising solutions include long-term planning in National Environmental Policy Act (NEPA) -ready landscapes, stacking funding across sources, distributed and co-located wood processing facilities, conversion of residuals into value-added products, tax and investment incentives for infrastructure, collaborative workforce development strategies, and marketing efforts to expand markets for ponderosa pine.

This event would not have been possible without the enthusiasm of the CWSF FPC and the support of the Summit sponsors: WoodSyn, LLC; National Wild Turkey Federation; Bureau of Business and Economic Research - University of Montana; Ecological Restoration Institute at Northern Arizona University; Southwest Fire Science Consortium; and Village Camp.



Summit Overview

The Summit was designed as a working meeting and was attended by more than 120 participants from almost all Western states. Participants represented a broad cross-section of interests, including state and federal agencies, tribal governments, industry and mill operators, market entrepreneurs, non-governmental organizations, and academic partners. The agenda combined panels, breakout discussions, and facilitated working sessions, to allow participants to collaboratively identify challenges and generate solutions. The Summit brought participants to the heart of ponderosa pine country and offered a direct connection to research at Northern Arizona University, the Ecological Restoration Institute, and the USDA Forest Service's Rocky Mountain Research Station. A field tour of Restoration Forest Products in Bellemont provided real-world context and illustrated successful practices for ponderosa pine utilization.

The primary goals of the Summit were to: 1) understand barriers to ponderosa pine utilization and restoration efforts, 2) explore innovative and practical solutions to overcome those barriers, and 3) identify actionable next steps that can be implemented at regional and local scales.

As with any event, the Summit provided lessons for future gatherings. More than half of the attendees were from Arizona, making it difficult to structure geographically specific small group conversations that allowed for new ideas to emerge. While representatives from just about every sector participated, it was also uneven, which limited opportunities for cross-sector problem-solving. Despite these limitations, participant feedback was overwhelmingly positive and indicated strong enthusiasm for addressing the utilization challenge.



Key Challenges

The Summit agenda was organized by four core themes. The primary challenges participants identified for each theme are summarized below.

SUPPLY

The total supply of ponderosa pine is generally sufficient to meet utilization needs. In fact, in many places, fire suppression has resulted in more ponderosa pine trees than the landscape can support. The challenges for utilization are the consistency, access, and quality of supply. Weather and environmental conditions have long influenced timber availability through factors such as seasonal operability, snowpack, and storm events. In recent decades, however, new constraints have emerged, such as forest closures because of extreme wildfire risk or seasonal restrictions to protect wildlife. More frequent, large, high-severity wildfires reduce the availability and quality of timber resources.

Timber supply from federal lands is often inconsistent because of long environmental analysis and review processes. In some cases, limited staff or contractor capacity for wildlife or archeological surveys can slow analysis. Even when environmental reviews are completed, litigation can further delay projects. Road maintenance and the complexities of working across jurisdictions add to the hurdles of long-term planning. Working across jurisdictions also obfuscates the available supply; timely supply data can be difficult to aggregate. Summit participants noted that a mix of projects varying in size, location and purpose, along with standardized requirements and timely communication would help improve consistency.

Key Challenges

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INFRASTRUCTURE & MILLS

Few mills operate in the Intermountain West, where ponderosa pine is common. Declines in demand for ponderosa pine products, major increases in international competition, and aging mill infrastructure have combined to reduce the market value of ponderosa pine. The shift from large to small-diameter ponderosa pine compounds market declines, as small-diameter trees often have lower wood quality and higher handling costs.

Competition and low margins require full utilization of ponderosa pine, which in turn requires markets for low-value wood or residuals. Biomass, energy cogeneration, and other uses for low-value wood or residuals are also scarce across the range of ponderosa pine. The high cost of removing material, particularly small-diameter or non-merchantable timber, often makes biomass and other secondary processing options unprofitable, and in some cases, removal becomes a liability. Furthermore, permitting and regulatory requirements can take years to complete, and past project failures have created reluctance to invest again.

Additionally, coordinating material flows between lumber mills and other utilization opportunities adds operational complexity and uncertainty for producers. The absence of a cohesive strategy for the wood products industry further discourages investment. Participants suggested that monetizing the intrinsic value of forest restoration could address some of these challenges, as well as improving market development and creating compelling storytelling that highlights both the ecological and economic benefits.

MARKETS & INNOVATION

Markets for ponderosa pine face significant challenges, particularly for small-diameter and low-value material. Wood from small-diameter trees is difficult to transport and has a low value-to-weight ratio. In addition, the long distances between the forests, mills, and markets, often over poor roads, only makes the transportation challenge more difficult. Existing programs, such as hazardous fuel transportation grants are temporary and not sustainable.

Regulatory and financial barriers can also limit market growth and product innovation. For example, ponderosa pine lacks standardized building codes or product testing approvals, which limits its use in mass timber and other emerging applications. Certification, Occupational Safety and Health Administration (OSHA) requirements, and long permitting timelines often add additional costs and delays. The challenges of milling and marketing ponderosa pine dissuades investors from funding new projects, particularly when other investment opportunities offer greater returns. Innovative, new products from ponderosa pine show potential, but require investment, marketing, and wide adoption to be influential at scale.



Key Challenges

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WORKFORCE

Loggers, truck drivers, and mill workers are crucial to successful ponderosa pine utilization. However, many potential workers perceive jobs in the woods or lumber mills as difficult and dangerous, even if that view is outdated. Recruiting, training, and retaining skilled workers remains a major challenge, and pathways for workforce development are often incomplete. Retaining workers requires not just keeping people in jobs, but providing clear opportunities for career advancement. While there are a number of excellent forest sector workforce development programs, participants identified the lack of predictable, diversified funding for these types of programs as an impediment to program uptake and participation. Furthermore, participants noted that workforce development is often treated as an add-on rather than a core component of collaborative restoration and utilization efforts. In addition, there is limited emphasis on youth-focused education and engagement, which reduces the long-term pipeline of skilled natural resource professionals.

CROSS-CUTTING OBSERVATIONS

Several cross-cutting themes emerged from the challenge mapping discussions. First, scale and local context matter. Strategies that were successful in one region may not translate neatly to another, given different leadership, forest conditions, markets, community and agency capacity, or similar factors. Second, longstanding collaboration and the accrual of trust are essential. In places where partners have been working together across jurisdictions, sharing information and aligning priorities, progress has accelerated. Finally, the low value of material generated from forest management requires creative market development, new product innovation, and storytelling that clearly articulates the ecological and economic value of the work.



Promising Solutions

SUPPLY

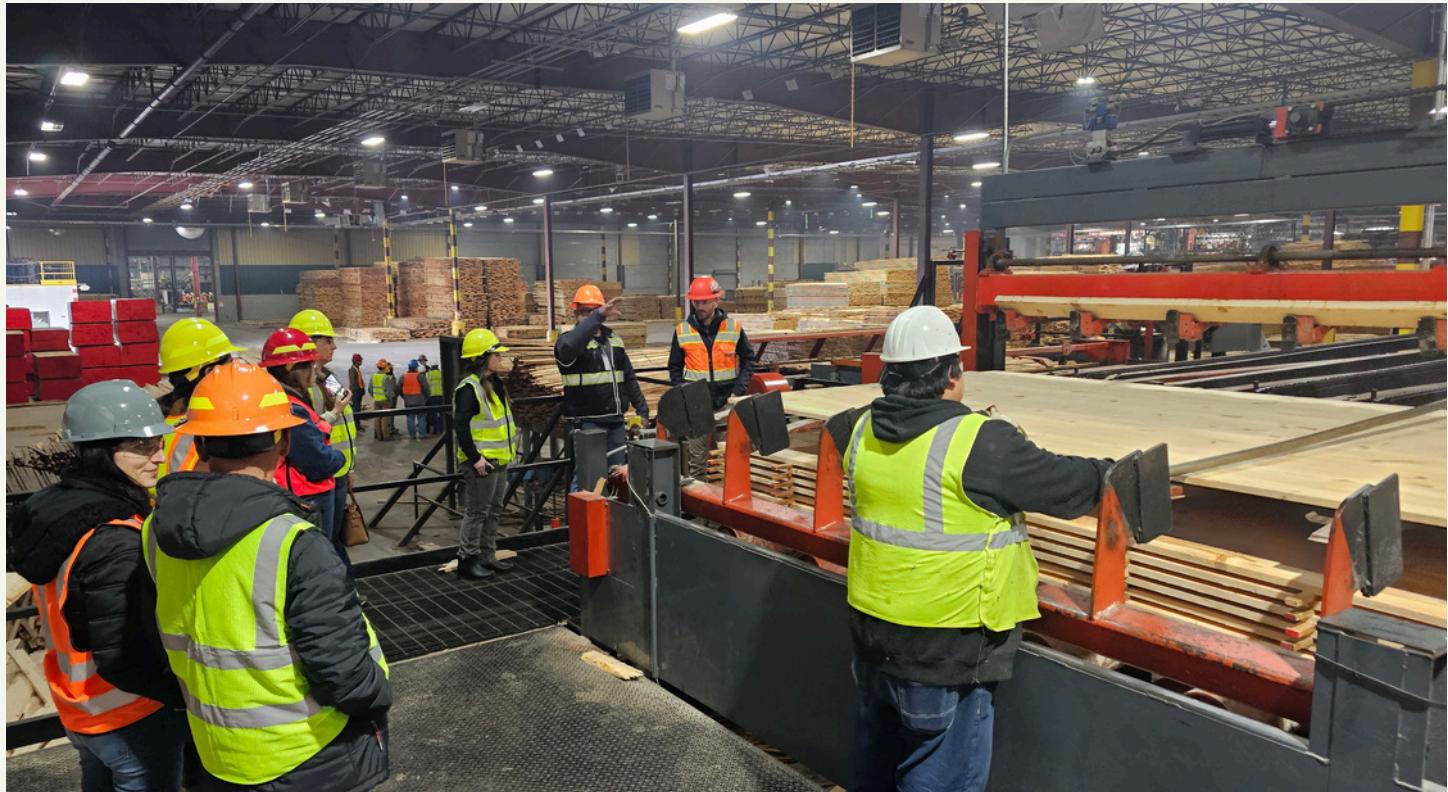
Summit participants shared examples from across the range of ponderosa pine where collaboration between land managers and businesses within a region or woodshed helped make wood supply more consistent. Bringing in partners who might have been overlooked in the past helps build consistent supply. For example, Tribes, utilities, state lands, and non-industrial private landowners can provide wood as a complement to large land managers like the National Forests. Utility right of way clearance may not provide large volumes of wood, but linking in right of way work with adjacent projects can increase efficiency. Similarly, private landowners often manage small acreages, but adding their supply to a broad plan can help avoid constraints that may affect other supply, such as government shutdowns.

For lands managed by the federal government, an array of mechanisms exist to ensure long-term supply. Stewardship agreements, Good Neighbor Authority (GNA), Tribal Forest Protection Act, long-term contracts, and shared stewardship more broadly can all establish greater certainty of supply.

Summit participants identified that building a supply plan or assessment across all interested jurisdictions for three to five years was essential to consistent supply. The area within a supply assessment should vary based on the geography and markets, but be big enough to support existing industry or attract investment. Engaging as many landowners as possible helps to provide more wood but more importantly, it creates diversity to hedge against disruptions. Not all landowners need to engage at every stage of the supply planning. For example, it may be appropriate to bring in utilities or small private landowners for a few targeted conversations to avoid collaboration fatigue. Ideally, the supply plan should be investment-ready and include details such as accessibility, constraints, and timber size classes. Participants noted that a supply assessment can dovetail well with financial planning. A diversity of partners translates to a diversity of funding sources from wildfire threat reduction grants to private business investments.

Promising Solutions

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INFRASTRUCTURE & MILLS

High transportation costs and dispersed mills often makes ponderosa pine utilization economically challenging. Participants discussed the benefit of co-locating processing facilities into a “wood campus” that could reduce transportation costs and create efficiencies by operators sharing infrastructure. An initial step would be to quantify available supply (as described above in the Supply solution section) and to review infrastructure capacity. A key consideration is to verify the operational independence and that operations are strong enough to stand alone before expanding. Participants also cautioned that co-located facilities may only work in certain scenarios.

Beyond co-location, participants emphasized the importance of strengthening both primary and secondary infrastructure. In the absence of markets, mills struggle to fully utilize residuals and low-value material, reducing financial viability. A recurring theme was that secondary processing capacity is foundational to the success of mills and should be treated as a primary investment priority.

One creative example of how a community addressed funding was a municipal bond approved by Flagstaff voters, enabling a partnership between the city, the Coconino National Forest, and the State of Arizona, to reduce the risk of high-severity wildfire and post-fire flooding. The bond generated funding without increasing property taxes and is an example of how a community aligned partners around shared resilience goals.

Promising Solutions

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MARKETS & INNOVATION

To overcome the persistent challenge of limited markets for low-value and small-diameter wood, targeted incentives such as tax credits, accelerated depreciation, or siting/permit support, could encourage investment in biomass and other secondary processing facilities. One approach Summit participants suggested was developing model legislation or policy language that can be adapted by states to encourage private investment in biomass infrastructure.

Manufacturing and use of mass timber and cross-laminated timber are expanding across the country, creating additional opportunities to increase demand for these materials. Participants noted the opportunities to expand the use of ponderosa pine in structural applications, particularly as a means of supporting affordable housing development. Linking housing for natural resource and forest products workers with ponderosa pine is an attractive, if complicated dream. The Summit highlighted innovative new products with potential for wide adoption, which could increase demand for ponderosa pine. At the same time, participants noted a continued need for research and development for new wood products and utilization opportunities.

Additional marketing is needed to increase both awareness of and demand for ponderosa pine products. Some participants focused on a sector-wide marketing effort to emphasize the sustainability and other benefits of using wood, particularly from local sources. Other participants suggested a more region or state centered approach to emphasize the benefits of ponderosa pine utilization specifically. These two approaches are complementary and could be implemented in tandem.

WORKFORCE

The need for a dependable workforce was a recurring theme throughout the Summit. Discussions highlighted gaps in forestry, logging, trucking, and mill work. Participants shared successful approaches to recruiting and retaining workers, and recommended collecting and sharing these best practices. A successful strategy for strengthening the forest-sector workforce is collaboration across agencies and industries. As with timber supply, diverse partnerships among community colleges, state agencies, nonprofits, and private companies can support more reliable and comprehensive workforce development by offering full career pathways.

A broad partnership is needed for workforce development because many challenges extend beyond the workplace. Housing, healthcare, and family services can be just as important as the job itself. Wraparound services, which address workers' needs holistically, are a way to improve recruitment and retention. Similarly, making connections across counties or regions can open opportunities for training and recruitment. This is particularly true in natural resources where work often moves across regions with the seasons.





Opportunities for Action

The discussions at the Summit identified many promising solutions and examples of successful approaches for ponderosa pine management and utilization. However, the applicability of these strategies will necessarily vary based on local context, such as political leadership, economic considerations, existing markets, community capacity, and infrastructure. Effective solutions must be tailored by region, as each landscape faces unique conditions, constraints, and opportunities, including factors like social license or existing industry. Actions will also depend on the roles and capacities of different organizations, and are intended for multiple purposes and audiences. A flexible ‘menu of options’ can allow people to identify approaches best suited for their local landscape or context.

A consistent theme of the Summit was the importance of multi-partner collaboration, which creates space for aligning priorities as well as sharing knowledge and resources. Collaboration enables alignment of supply planning, long-term funding strategies, and workforce development. By looking across multiple ownerships and funding sources, rather than individual landowners and managers working in isolation, resources can be pooled and leveraged to support different types of work.

Another way of conceptualizing collaboration is project stacking. Layering different organizations’ projects in a focal area creates synergies, where the sum is greater than the parts. For instance, the combination of workforce development, fuel reduction, conservation finance, lumber production, and residual biomass utilization all in one geography can generate momentum unreachable by a single entity or program. Finally, opportunities for pilot projects and demonstration areas provide proof of concept for innovative ideas while building local capacity.

Solutions for the increased utilization of ponderosa pine will work at different scales, actors, and regions. The Summit focused on knowledge sharing and idea generation rather than trying to define a perfect solution that could work anywhere.

Opportunities for Action

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HOST PEER-TO-PEER LEARNING EXCHANGES

A clear value of the Summit was the opportunity for participants to learn directly from peers, hearing about what has worked in Arizona, Colorado, Montana, or California. While innovative approaches to market development and utilization exist, they are scattered across regions. Building on the success of the Summit, the CWSF FPC, USDA Forest Service, or individual state forestry agencies could sponsor regional peer learning exchanges that allow a small set of people to visit solutions that are already working, understand the enabling conditions, and take and adapt ideas back to their own context. Essentially, a peer-to-peer learning exchange would be a more focused, in-depth version of the Summit, where partners from the same area, facing the same challenges, could dig into the details of solutions like those showcased during the Summit field tour.



CONVENE STATE OR LOCAL WORKSHOPS

The Summit successfully identified and categorized current challenges and opportunities surrounding ponderosa pine utilization across the West, and created valuable space for people to share ideas and lessons learned. Building on this foundation, state agencies, the CWSF FPC, or other organizations, could use the ideas generated to convene more focused workshops at a smaller geographic scale and workshop more specific solutions with a targeted audience.

DEVELOP A MARKETING STRATEGY

Marketing of wood, particularly ponderosa pine, was identified by participants as a key need. Participants suggested compelling storytelling that highlights both the ecological and economic benefits of wood could expand utilization of ponderosa pine. While state or local efforts may be useful, a national campaign that has a specific leader and is spearheaded by one entity instead of smaller, varied marketing campaigns could be more effective.

Opportunities for Action

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BUILD A SUPPLY AND INVESTMENT PLAN

Developing an investment-ready supply plan that identifies wood quantities, qualities, constraints, and costs for a given area should be considered a high priority for improving utilization. A three or five year supply plan can attract industry and workers because it provides greater certainty. Planning can be done iteratively, with new data or refinements added as the need arises or the resources are available. Planning should be collaborative and recognize each partner's limitations such as proprietary data. While state or federal agencies may be natural leads for planning, any respected partner can spearhead the effort. Universities and research entities are excellent partners when they can be included.

Just as landowners and managers often plan work in silos, funding to implement projects is also typically sought and managed in isolation. Participants suggested taking a longer-term, more coordinated approach to align projects with potential funding. Mapping out available sources (e.g., state funds for fuel reduction, rural development loans for infrastructure, or philanthropic funding for collaboration) can identify where they complement each other and create greater certainty that priority work is completed.

A supply and investment plan may require partners to reorient around small-diameter trees and residuals. While lumber may still be a keystone for utilization, Summit participants identified that an effective market for small-diameter material and residuals is often the most difficult hurdle to overcome. More generally, diversification leads to a stronger utilization ecosystem.

A solid workforce development and retention strategy should be considered alongside supply and investment planning. Depending on the local workforce constraints, it may warrant consideration as a first priority.

MONITOR AND TRACK OUTCOMES

Measuring progress and identifying deficits is crucial to progress. Establishing metrics and a monitoring framework need not be a burden; existing tracking by state and federal organizations may be sufficient. Reporting on measured progress to investors and implementers is essential for continued funding and participation. State agencies or lead implementers are likely best suited to select appropriate metrics and publicize progress. University and research entities should also be engaged as potential partners.



Conclusion

The Ponderosa Pine Utilization Summit underscored both the urgency and opportunity facing communities and land managers in the West.

Participants collectively recognized the importance of restoring ponderosa pine ecosystems to reduce wildfire risk while supporting community economic development. While challenges remain, participants brought strong expertise and identified creative ideas for coordinated action and investment. With continued leadership and coordinated action, the West can stabilize existing infrastructure by supporting new market development. Participants expressed hope that the Summit will encourage continued collaboration and exploration of opportunities to advance the recommendations presented in this report.



ADDENDUM:

Solution Ideas from the Summit

Below are some of the solutions that emerged from the Summit with wide support. They provide an example of the diversity and range of solutions different groups in different regions may find useful.

SUPPLY PLANNING

- Create a planning framework that includes NEPA, simplified contracting, and cooperatives of operators to efficiently complete project work.
- Implement long-term agreements such as GNA with states, stewardship agreements, and sustained yield units.
- Create a working group between USFS/state/private landholders, mills and forest product facilities, and purchasers/contractors to strategically design (large & small) and time (location/time of year) offerings of sale for consistent supply over five years.
- Design a menu of restoration projects to meet strengths and needs of multiple operators of different sizes and capacities to support a resilient network of operators and innovations.
- Mentor power and water utilities to increase their investments in watershed projects to help diversify funding.
- Engage with Tribes to provide additional, consistent supply.
- Create ‘wood banks’ modeled off the idea of a ‘grass bank’ for livestock grazers, i.e., set aside parcels in case there is a fire or other issue for a specific timber sale.
- Consolidate investment grade information in one place with info from USFS/states/partners to promote investment.

REGULATORY POLICY

- Regulatory reform such as NEPA or Equal Acts of Justice.
- Give priority to natural resource facility permitting. Reduce regulatory burden for building new wood processing plants.
- Develop model legislation or policy language that can be adapted by states to encourage private investment in biomass infrastructure.

ADDENDUM:

Solution Ideas from the Summit

INFRASTRUCTURE

- Foster co-development with multiple companies to each handle one or more steps in the tree to product cycle.
- Make operational efficiencies the priority. Higher yield and value sawmill efficiency is a must.
- Form public-private partnerships through municipal or county bonds.
- Use mass timber or cross laminated timber to build affordable housing that is allocated for forest industry workers.

MARKETS & INNOVATION

- Incentivize biomass facility investment through tax breaks.
- Convert slash and wood waste to other products i.e., sustainable fuel, ethanol through established new technologies
- Invest in research and development to produce more uses; invest state and federal funds in forest products labs and wood innovations.
- Build wood campuses where multiple forest products are produced from a central supply of ponderosa pine.
- Mobilize many smaller scale biomass facilities in new markets like carbon removal or mine restoration.
- Get ponderosa pine certified for commercial mass timber projects.
- Connect with electricity producers who are being asked to supply electricity to consider biomass.
- Capitalize on data centers being built for AI.

ADDENDUM:

Solution Ideas from the Summit

TRANSPORTATION

- Exploring different mechanisms to overcome the transportation bottlenecks.
- Mobile biomass or biochar - how do we bring production to the woods?
- Develop a distributed wood product economy by activating existing capacity and equipment through portable sawmills, and developing a marketing and sales collective anchored on in-state utilization buyer initiatives aligned with climate-smart wood values.
- Design a platform like Uber or Lyft ridesharing to organize people who have trucks to bring pine from forest to mill.

MARKETING

- Increase public awareness and acceptance of wood as a renewable natural resource.
 - “Cutting and utilizing trees is good for the environment!”
- Promote wood utilization nationally.

WORKFORCE

- Identify best practices for workforce retention via employer and employee perspectives.
- Encourage employers to create additional budgetary line items that take into account local housing, fuel, and other wraparound services.
- Outline promising career paths in forest operations and products industry.
- Integrate workforce needs into collaborative partnerships.



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<https://foreststewardsguild.org/>

<https://www.westernforesters.org/about/committees/forest-products-committee>