Hazardous Fuels Woody Biomass Utilization and Marketing Planning Summit Report

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Problem Statement
The ability to manage the Nation’s federal, state, and private forests is limited by lack of markets for low-value trees. Poor market prices and limited utilization options hamper cost effective forest and land management. Serious consequences for the Nation’s forests has arisen as many of the ecologically needed land management activities have been deferred due to lack of low-value timber markets. There has been an increase in overstocked forests with excessive buildup of low- to no-value trees and limited options for managing them. Overstocking of low-value timber creates excessive forest fuels buildup, lowered forest vigor, increased susceptibility to insect and disease attack, declining biodiversity, and poorer timber quality.

Economical uses of low-value timber including, woody biomass, hazardous fuels material, small-diameter and underutilized material need to be found and encouraged to help defray land management costs. Finding economically viable uses for these products will help offset forest management, land and watershed restoration, and forest fuels reduction costs. Currently, a deficit in forest products technical assistance capacity limits the ability to provide professional assistance to solve this National problem.

Objectives
Enhance marketable products and tangible benefits from the improved and expanded utilization of our nation’s forest products including hazardous fuels and related woody biomass by addressing:

1. Technical and marketing assistance to forest products producers, processors and forest/land managers.
2. Identifying utilization and markets opportunities for traditional forest products and hazardous fuels from forest and mill residues through collaborative work with state, Extension, federal agencies, and industry.
3. Creating new opportunities for the wise use of hazardous fuels and biomass utilization as an alternative to waste disposal.

This focus will enhance the Forest Products Marketing Unit’s outreach to hazardous fuels and woody biomass resources managers, will provide an outlet for Forest Products Laboratory knowledge, and will address the issue of a lack of markets for forest and mill biomass residues.

Activities
This project entailed conducting an independent planning summit under contract with the USDA Forest Service to discuss issues, potential projects across all landscapes in the United States, and potential partners.

Planning Summit
A Hazardous Fuels Woody Biomass Utilization and Marketing Planning Summit was held with utilization and marketing partners to discuss issues, potential projects, and new directions for the Forest Products Laboratory (FPL) - Forest Products Marketing Unit. The Summit was held at the Kemp Research Station in Lake Tomahawk, Wisconsin from October 29 – 31, 2013. A summit planning team of the Sustainable Resources Institute and the Forest Products Marketing Unit determined essential participant sectors and individuals, generated potential
discussion topics, and created an agenda. Summit attendance was by invitation only. Twenty-six participants were sought from: The USFS Forest Products Marketing Unit, Forest Products Laboratory, State & Private Forestry, and Wood Education Resource Center/Regional Biomass Coordinators. Sixteen of the invitees attended the summit, with most sectors being represented. The complete invitee and participant list are found in Appendix A. The Summit agenda is found in Appendix B. Individual topics were assigned to participants who were asked to lead discussion of that topic. A complete list of discussion topics is found in Appendix C.

**Forest Products Marketing Unit**

**Introduction**

The Forest Products Marketing Unit (FPMU), formerly the Technology Marketing Unit (TMU) located at the FPL in Madison, Wisconsin is a part of the Research and Development arm of the US Forest Service. The FPMU provides a broad scope of expertise in wood products utilization, marketing, technology transfer, and technical assistance to wide variety of users.

**Mission**

The mission of the FPMU is to improve the use of wood by transferring technologies developed primarily by the FPL and other Forest Service research stations, but also those technologies developed by state agencies, universities and their Extensions. Additionally, the FPMU seeks to identify economic opportunities to reduce catastrophic wildfire and improve the nation’s forest health. The FPMU serves as an intermediary by partnering with the USFS Research and Development and State and Private Forestry staffs, University Extension Specialists, state forestry staffs, Resource Conservation & Development Councils, forest products enterprises, urban and rural communities, and non-governmental organizations. The FPMU’s scope includes forest products conservation, processing, manufacturing efficiency, marketing, and recycling.

**Administrative History**

The FPMU was a detached Washington Office Cooperative Forestry operation until 1993 when it was transferred to the FPL to reduce full time employee numbers in the Washington office. A detailed Intra-Agency agreement (FP-92-1716) was written to outline the roles and responsibilities of the FPL and State & Private Forestry (S&PF) and this agreement continues to guide the operations of the FPMU.

**Funding**

The FPMU serves as a national point of coordination for and has the authority to receive support of up to $5 million per year. In prior years the Economic Action Program (EAP) funding, which was from program Authority dollars, supported the overall functions of the FPMU. Programs included the Small Diameter Grant Program, National Fire Program, National Fire Plan, Woody Biomass Utilization Grants, Jump Start Grants, and Forest Restoration Grants, among others.

With the loss of dedicated EAP dollars, the FPMU has functioned with overhead costs from various initiatives for the Agency. The Authority, first established in the 2005 Healthy Forest Restoration, provided specific direction for the FPMU and replaced earlier authority for Forest Product Conservation and Recycling and Rural
Development through Forestry Authorities, both of which were part of the Economic Action Programs budget line item.

At present time, the FPMU operates out of the Woody Biomass Utilization Grant program which is funded out of the FS Wildland Fire - Hazardous Fuels appropriation through the following administrative provision:

“Funds appropriated to the Forest Service shall be available for interactions with and providing technical assistance to rural communities and natural resource-based businesses for sustainable rural development purposes.”

Field units (Regional Woody Biomass Coordinators) are encouraged to make use of this Authority to work with communities to improve the utilization of woody biomass from vegetation management projects on National Forest Service lands, thereby providing enhanced economic opportunities for communities by making raw material available for use. Field units are also encouraged to consider this Authority as one option to retain biomass utilization skills previously funded through the Economic Action Programs. Applying woody biomass utilization and marketing expertise to planning and implementing hazardous fuels reduction and vegetation management projects can help reduce the cost of treatments funded from hazardous fuel reduction, vegetation and watershed management, wildlife habitat management, forest products, and forest health protection programs.

**New Directions**

The U.S. has lost half of its forest products manufacturing capacity since 2005. This loss of wood products industrial capacity is negatively impacting the ability to manage the Nation’s forests. Finding economical uses and associated forest products industrial infrastructure for low-value, small-diameter, and underutilized trees as well as reinvigorating markets for traditional forest products is a pressing need in the United States. Expanded markets for both low-value and traditional forest products would improve the capacity to manage the Nation’s forests. Technical assistance, at the Federal and State levels, is essential to the development of improved efficiency of processing, manufacturing and marketing of wood and fiber products. Improving processing efficiency and forest products markets are especially critical for the economical use of woody biomass, hazardous fuels material, low-value trees, small-diameter and underutilized tree species.

**FPMU Program Elements and Clientele**

The FPMU provides services to a broad and diverse clientele base. Delivery partners and clientele include: NFS, FPL and FS R&D, S&PF, Regional Biomass Coordinators, State Foresters and staff, Wood Products Extension Specialists; industry; tribal enterprises; and the general public. Table 1 summarizes FPMU program elements and clientele.
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<th>Who</th>
<th>What (“When &amp; Where” as appropriate)</th>
<th>How (who/example)</th>
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<td>FPMU Core Program</td>
<td>Networking and Partnership Building</td>
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<td>Networking and Partnership Building</td>
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<td>Technical information dissemination, Handle technical inquiries, Electronic information, Conferences (SmallWood) &amp; workshops</td>
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<td>Facilitate technology transfer</td>
<td>FPL Incubator, Technology demonstration</td>
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<td>Technical expertise/advise/review</td>
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<td>Special projects and demonstrations</td>
<td>Western Mobile HewSaw Operation for Utilizing Hazardous Fuels (Apache-Stigreaves NF, Jim Zornes, Forest Supervisor)</td>
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<td>Forest products marketing R&amp;D</td>
<td>Housing Market Report, Hardwood Market Report with NRS Staff</td>
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<td>NFS</td>
<td>U&amp;M—Stewardship Contract/Agreements</td>
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<td>Forest products utilization R&amp;D</td>
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<td>FPL Incubator</td>
<td>Entrepreneurial &amp; Mfg. expertise</td>
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<td>Inquiries, special projects &amp; assistance</td>
<td>Phone; e-mail; publications dist.</td>
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<td>State &amp; Private Forestry (Washington Office)</td>
<td>Congressional/USDA inquiries</td>
<td>Technical information dissemination</td>
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<td>Technical publications dissemination</td>
<td>Facilitate grants management</td>
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<td>Regional Cooperative Forestry Directors</td>
<td>Technical information dissemination</td>
<td>Partnership and coordination with FS Regions (NFS and Regional Wood Biomass Coordinators)</td>
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<td>Networking</td>
<td>Technical assistance, Technical demonstration</td>
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<td>State Foresters and Utilization Staff; Wood Products Extension</td>
<td>Networking</td>
<td>NAASF Utilization Committee Meeting</td>
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<td>Technical Publications</td>
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<td>Train-the-Trainer (workshops/training)</td>
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<td>Technical demonstration projects</td>
<td>Wisconsin Mobile HewSaw project, Dr. Bob Govett, UW-Stevens Point</td>
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<td>Industry</td>
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<td>Conferences (Small Log Conference)</td>
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<td>Technical/financial feasibility spreadsheets</td>
<td>Dr. Bob Govett, UW-Stevens Point</td>
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<td>Tribal Enterprises</td>
<td>Technical information dissemination</td>
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<td>U&amp;M technical expertise &amp; assistance</td>
<td>per Butch Blazer, Deputy Undersecretary</td>
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<td>FIA =&gt; Resource Analysis</td>
<td>w/ BIA Forest Resource Planning staff</td>
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<td>General Public &amp; Misc.</td>
<td>Technical inquiries/request for information</td>
<td>In coordination with FPL Public Affairs</td>
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Table – 1. FPMU Program Elements and Clientele Summary Table (9-28-2013)
Recommendations from the Planning Summit

A cadre of forest products experts providing help to address natural resource issues and the loss of livable wage jobs in forest-dependent communities is needed. Revitalizing and retaining critical forest products infrastructure necessary for meeting the USDA Forest Service resource management objectives is essential.

Collaboration with the State Foresters and their Forest Products Utilization and Marketing staffs, Wood Products Extension program specialists, and other key partners is imperative in providing effective forest products technical assistance from the Forest Products Marketing Unit and other USFS staff. Forest products technical assistance can be provided in various forms to assist in solving problems and taking advantage of opportunities for improved utilization and marketing. Efforts would focus on assistance to rebuild and retool processing capacity to economically use woody biomass, small-diameter and other underutilized trees in addition to more traditional improved processing efficiency and industrial development.

Urgency to Act Now before Technical Expertise is Lost

Further loss of technical expertise threatens the ability of the Forest Service to advance and continue to develop the knowledge necessary to increase the efficiency of forestry practices and operations to conserve and extend the nation’s natural resource amenities and the benefits that flow from the nation’s forests (Appendix D). Agreement among the Deputy Chief’s will combine the knowledge, expertise and agency resources to focus on sustainable forestry through the conservation and wise use of wood and fiber, biomass energy, and other forest products. Additionally, communities and economies are sustainably enhanced.

Through a collaborative agreement and working with public and private partners the Forest Service will continue its role as a conservation leader in facilitating science-based natural resource management and technology transfer in support of and to encourage sustainable forestry improved forest restoration among state, tribal governments, industry, natural resource based organizations, land managers and landowners.

USDA Forest Service S&PF and R&D have collaborative working arrangements throughout the United States. This acknowledgment of past collaborative efforts provides national direction and coordination of existing staff and resources to achieve national and regional objectives guided through State Resource Assessment as outlined in Appendix E and NFS Forest Plans.

Ongoing collaborative efforts have been well received and provide a model for coordination across Deputy Chief’s program areas. Due to the continued demands in advancing new areas that provide an economic use of forest based material the knowledge in woody biomass utilization and harvesting, advanced housing and composites, emerging use of Nanotechnology, and efficient clean wood energy requires a focused cooperative effort directed by S&PF, R&D, and NFS leadership. It is timely to formalize an arrangement that supports funding, positions, and resource initiatives that are jointly shared. The action will result in leveraging each Deputy Chief’s area resources for targeting future program resources to important developing technologies.
Forest Products Marketing Unit

Recommended Purpose
Establish a Forest Products Marketing Program to strengthen technology development and application while extending technical assistance across the three Deputy Chief’s programs of the USDA Forest Service. This agreement will provide for national coordination of agency authorities and appropriated resources within R&D, S&PF, and NFS Deputy Chief’s areas. This collaboration effort will provide new and expanded opportunities for utilization of the by-products from forest health and restoration activities in addition to traditional timber sales programs.

The purpose is to improve the effectiveness and efficiency of the Forest Service and other agencies in landscape-scale forest conservation and restoration actions so forests are productive and more resistant to threats by:

- Developing and expanding forest products markets;
- Improving economic conditions;
- Creating new jobs in a wide-range of forest product and associated enterprises.

Recommended Responsibilities
Responsible for technical and financial assistance that supports the unique national and international mission of the Forest Service in land conservation and community stability along a complex urban to rural land gradient through improved utilization of wood and associated wood-using markets.

Recommended Scope
Technical scope of the FPMU includes harvesting, processing, manufacturing, marketing, conserving, and recycling of forest-based products through programs that include, but not limited to, wood-based nanotechnology, green building construction, and biomass for energy.

Recommended Support
This collaborative effort should be supported jointly by R&D, S&PF and NFS with broad agency Authority and appropriated funds.

Recommended Objectives
1. Establish and facilitate cooperative and collaborative working relationships and partnerships;
2. Strengthen forest products marketing, technology development and application;
3. Extend technical assistance expertise across the three Deputy Chiefs’ program areas;
4. Provide national coordination or very broad agency authorities and appropriated resources;
5. Expand forest products marketing and utilization opportunities for products and residues from forestry operations across all landscapes including Federal, State and local public, private and tribal enterprises, private lands, and forest dependent communities including but not limited to:
   - Stewardship agreements and contracting,
   - Timber harvesting,
   - Timber stand improvement,
   - Forest fuels reduction activities,
• Forest health activities,
• Land restoration activities,
• Natural disaster recovery, and
• Urban forest utilization.

Recommended FPMU 5 Year Focus Areas and Outcomes

1. Hazardous Fuels Woody Biomass Utilization
   • Woody Biomass Utilization Grants Program National Coordination
   • Eagar, Arizona HewSaw Project with Vaagen Bros. and Apache–Stigreaves NF
   • NFS Stewardship Contracting and Stewardship Agreements U&M technical assistance
   • Close coordination with NFS–Forest Supervisors (Raaf, Scardina, Strong, Zornes)

2. Forest Products Traditional Markets & Forest Products Industry Competitiveness
   • Work closely with state forestry utilization & marketing staffs for program delivery
   • Provide ‘Train–the–Trainer’ opportunities for state forestry U&M staffs
   • Guided by State Forestry Assessments – addressing utilization & marketing needs
     with State Forestry and NASF Markets Committee coordination

3. Urban Wood Utilization
   • Baltimore County, Maryland urban wood utilization project
   • WisDNR Division of Forestry urban wood utilization projects
   • Clearinghouse of urban wood utilization technical information

4. Tribal Relations & Marketing Assistance (Refer to Appendix F)
   • Add Washington Office, Office of Tribal Affairs detailer to FPMU (potentially Estelle Bowman)
   • Menominee Tribal Enterprise Cabinet and Millworks Division marketing project
   • White Mountain Apache tribal mill restart (in progress with Patrick Rappold)
   • Mescalero Forest Products tribal mill restart (Carmen Austin, NM Forestry)
   • Yakama Forest Products technical assistance (TBD)

5. Wood Energy & Biofuels
   • Provide Washington Office–Cooperative Forestry technical information and
     assistance for wood energy projects and the State Wide Energy Teams
   • Super-Efficient Ultra-Low Polluting Wood Stove project (Mark Knaebe)
   • Technical assistance and expert advice on wood energy projects (Mark Knaebe)

6. Green Building
   • Assist the FPL and FS Engineers in innovative uses of wood in USFS construction
   • Provide technical assistance to Washington Office–Cooperative Forestry

7. Nanotechnology
   • Forest Products Laboratory – research and development for Nanotechnology commercialization
   • US Endowment for Forestry and Communities nanotechnology demonstration
   • Grants management of S&PF $1 million grant to the US Endowment
Recommended FPMU Roles and Responsibilities

- Partnership building and coordination
- Networking - SmallWood Conference
- Technical Assistance
- Extension – education, training, technical publications and resources
- Technology Transfer
- National focus for consistency of program delivery

Recommended FPMU/Program Staffing – including extended positions in WO and FS Regions

- FPMU Current Staff
  - Rusty Dramm – Interim Program Manager (GS 14)
  - Mark Knaebe – Natural Resource Specialist (GS 13)
  - (vice Dramm) – Forest Products Technologist (GS 13)
  - Doug Tucker – Program Assistant (GS 07)
- Supported Partners (cooperative agreements)
  - Dusty Moller – Utilization Manager, University of Nevada – Reno, SBDC – $50K/year
  - Patrick Rappold – State Utilization and Marketing Specialist, Arizona State Forestry – $25K/year
- FPL Volunteers
  - Sue LeVan (FPL, retired)
- FPMU Additional Staffing Needs
  - Partnership Coordinator (GS 09/11) – most critical need!
  - Tribal Affairs Liaison/Marketing Assistance Specialist (initially a Washington Office Detailer; GS 11/12)
  - Technical Writer/Editor (GS 09/11)
- Regional Forest Products U&M Specialists (work in coordination w/ Regional Biomass Coordinators)
  - Western Multi-Regional U&M Specialist (GS 13)
  - Northeastern Area U&M Regional Specialist (GS 12/13)
  - Southern Regional U&M Specialist (GS 12/13)
- Washington Office – S&PF Cooperative Forestry Staffing Needs
  - Forest Products Marketing/Utilization Assistant Director (GS 15)
  - National Woody Biomass Coordinator(GS 14)

Recommended FPMU Partners and Cooperators

- USFS
  - Deputy Chiefs (R&D, S&PF, NFS)
  - Washington Office Legislative Affairs – Doug Crandall
  - S&PF Cooperative Forestry
    - Washington Office-Cooperative Forestry – Dave Atkins
    - Regional Cooperative Forestry Directors
    - Regional Woody Biomass Coordinators
- R-1 – Angela Farr
- R-2 – Mike Eckhoff
- R-3 – Dennis Dwyer
- R-4 – Scott Bell
- R-5 – Larry Swan
- R-6 – Ron Saranich
- R-8 – Dan Len
- R-9/NA – Lew McCreery
- R-10 – Dan Parent

- Wood Education Resource Center (WERC) – Ed Cesa

- Forest Products Laboratory
  - Research Work Units (RWUs)
  - Grants and Agreements Office
  - Public Affairs Office

- USFS Research Stations
  - Northern – Delton Alderman, Iris Montague, Melody Jones, Ed Thomas, etc.
  - PNW – Eini Lowell, Portland, OR
  - Southern – Forestry Operations RWU, Auburn, AL
  - Rocky Mountain – Fire Research

- USFS Technology and Development Centers
  - Missoula
  - San Dimas

- National Forest System
  - Forest Supervisors
    - Jim Zornes, Apache-Stigreaves NF
    - Teresa Raaf, Malheur NF
    - Paul Strong, Chequamegon-Nicolet NF
    - Others as relationships with NFS further develops
  - WO Staff
  - Stewardship Contracts and Agreements Programs

- State Forestry – (State Assessments Note: U&M issues rank #1 or #2 in 85% of states)
  - National Association of State Foresters (Jay Farrell NASF Executive Director)
    - Forest Markets Committee (Carla Harper, Contractor)
  - Northeastern Area Association of State Foresters (Ian MacFarlane, NAASF Executive Director)
    - NAASF Utilization Committee (Gordon Boyce, Chair Utilization Committee)
  - Southern Group of State Foresters (Wib Owen, SGSF Executive Director)
    - Environmental Services, Utilization & Marketing (SUM) Task Force – (Charlie Becker)
  - Council of Western State Foresters (Caitlyn Pollihan, CWSF Executive Director)
    - Marketing (Diane Denenberg, Marketing and Communications Director)
Individual State Foresters and Staffs
  - Utilization and Marketing Staffs
  - Urban Forestry Staffs

- Wood Products Extension and Universities – *including Wood Innovation Centers*
  - University of Nevada-Reno (*Dusty Moller*)
  - Natural Resource Research Institute, UM–Duluth (*Brian Brashaw*)
  - UW-Madison, Wood Products Extension (*Scott Bowe*)
  - UW-Stevens Point, Wood Products Extension (*Bob Govett*)
  - Virginia Polly technic Institute (*Bob Smith*)
  - Oregon State Univ. Extension (*Scott Leavengood*)
  - Mississippi State University (*Phil Steele*)

- Tribal Partners and Collaborators – *request per USDA Deputy Undersecretary Butch Blazer*
  - Forest Service WO Tribal Relations (*Estelle Bowman*)
  - College of the Menominee Nation (*CMN – Chris Caldwell*)
    - Menominee Tribal Enterprise (*MTE*)
    - Mescalero Forest Products (*MFP*)
    - Fort Apache Timber Company (*FATCO*)
    - San Carlos Apache mill
    - Yakama Forest Products (*YFP*)
    - Warm Springs Forest Products
  - Bureau of Indian Affairs – forest inventory analysis (*Dave Wilson, BIA BOFARP*)

- Non-Governmental Organizational Partners
  - US Endowment for Forestry and Communities – *Carlton Owen*
  - Sustainable Resources Institute, Inc. – *Don Peterson*
  - Forest Business Network – *Craig Rawlings (SmallWood and Small Log conferences)*
  - Resource Conservation and Development Councils (*RC&Ds*)

- Private Cooperators (examples of potential collaborators)
  - Consultants
    - Renewable Resource Solutions, LLC – *Don Peterson*
    - LD Jellison Engineering – *Larry Jellison*
    - The Beck Group – *Bryan Beck, Roy Anderson, Bill Carlson*
  - Forest Products Industry
    - Vaagen Bros, Colville, WA (Duane Vaagen, Russ Vaagen)
    - Future Forests, LLC (Dwayne Walker, Rob Davis)
    - HewSaw North America
  - Associations (marketing/technology focused – TAPPI, SFPA, WWPA, Wood Works, etc.)
Process Implementation

A forest products technical assistance approach for improving the efficiency of processing, manufacturing and marketing of wood and fiber products and business performance is needed. This no-nonsense approach to results-driven improvement begins with identifying specific problem(s) in one or more of critical factors, then taking appropriate decisive corrective action. Based on the Harvard Business School research on effective improvement programs, this business proven approach bypasses lengthy preparations and activity focused processes. Instead, the approach focuses on producing results by focused problem solving and generating results quickly.

Forest products projects are constrained by technical, economic, and market limitations. Success or failure of a new, existing or expanding forest products project is dependent on several Critical Factors for Success:

1. Raw Material Resource Assessment—availability, material characterization, specifications, pricing, quality, location;
2. Products—what products can you make from the available resource;
3. Marketing—marketing feasibility, marketing plan, distribution (transportation);
4. Forest Products Processing and Manufacturing Technology—mill/plant design requirements, technical feasibility, equipment selection and manufacturing methods;
5. Management Team "Know How"—does the management team have what it takes to be successful?
6. Financial—management, feasibility, financing and financial management;
7. Environmental, Health and Safety—regulations, licensing, concerns; and
8. Social License—do you have the social support to be successful?

Deficiency in one or more of the critical factors can have profound negative influence on the success of a forest products project, especially in light of the current national economy and volatile wood product markets. Focusing in and addressing deficiencies and resolving issues with the Critical Factors for Success, results in successful projects, business retention and expansion, retaining and expanding employment in forest products industry; and improving forest management.

Efficiency and productivity improvement efforts by Federal, State, and Wood Products Extension Utilization and Marketing (U&M) Specialists have a solid proven track record in curbing losses to our Nation's natural resources and improved the productivity and competitiveness of the forest products industry. Assessment of past efforts indicates substantial return on investment of federal dollars in technical assistance and technology transfer (refer to Mobile HewSaw.)

A small core of forest products technical experts still exists within the USFS and among traditional S&PF Cooperative Forestry's partners, primarily State Forestry; and Wood Products Extension staffs. Other assistance providers include private consultants and contractors; Resource Conservation and Development Councils (RC&Ds); and Small Business Development Centers (SBDCs). This core of individuals have an intimate working knowledge of and formal education in the utilization and marketing of forest products with several years' experience providing technical assistance to the forest products industry. These experts have the practical forest
products industry experience necessary to providing the high level of expertise needed for an effective technical assistance effort. An example of how this has worked in the past follows.

**Mobile HewSaw**

The Wisconsin Mobile HewSaw Mill Demonstration was a cooperative project involving the Forest Service – Forest Products Marketing Unit; Wisconsin Department of Natural Resources (WisDNR) – Division of Forestry; and several forest products firms. This is an excellent example of how partnerships and a "no-nonsense" approach to technology transfer/technical assistance efforts can result in significant economic development while enhancing the ability to manage our forests and sustain the nation's forest resources through wise use.

(Images courtesy of HewSaw Veisto Group, Veisto Oy, Mäntyharju, Finland, and Vaagen Bros., Colville, WA)

**Background Issues**

Wisconsin has lost 40,000 jobs since 2006 in the forest products sector, mostly in the pulp and paper industry. By 2008, the deepening U.S. economic recession resulted in further loss of pulp mill capacity and softening of the demand and prices of softwood pulpwood. The Wisconsin DNR-Division of Forestry was concerned with this loss of capacity and the associated impacts that are limiting the ability to manage Wisconsin's forests. WisDNR was
seeking alternative uses for the State's red pine resources for producing softwood dimension lumber and studs was one of these identified alternatives.

*State Forester Requests Assistance*

In 2007, State Forester Paul DeLong requested technical assistance from the Forest Products Laboratory (FPL), Madison, to address these issues. Technical assistance was provided in cooperation between the USDA Forest Service – Forest Products Marketing Unit and the Wisconsin Division of Forestry to demonstrate the suitability of small diameter red pine for lumber production as a potential replacement for lost pulp mill capacity. Rusty Dramm, FPMU Forest Products Utilization Specialist and Terry Mace, Wisconsin DNR Utilization and Marketing Specialist conducted sawmill lumber recovery studies on the mobile HewSaw mill and provided critical technical assessment of mobile sawmilling technology capabilities.

*Key Industry Partners*

Vaagen Brothers Lumber Co., Colville, WA, owner of the mobile HewSaw mill; Plum Creek Timber Co., who supplied 6,500 tons of red pine pulpwood logs from plantation thinnings; and Ralph Hamel Forest Products, Vesper, Wisconsin, who supplied the sawmill crew, processed the red pine into 1.5 million board feet of lumber and marketed the products.

*Project Objectives*

Objectives of this pilot demonstration test were to (1) assess potential of the mobile mill for processing Lakes States pulpwood-size material and (2) provide an initial assessment of potential for using small-diameter material from tree-thinning operations and forest fuels reduction projects in the Western United States in this mobile mill.

*Mobile HewSaw Mill Demonstration*

An Industry Field Day at Hamel Forest Products was organized for Lake States Lumber Association (LSLA) members. Several interested sawmill managers from surrounding states and the local area visited the mill. Participants in the Forest Products Society’s “SmallWood Conference” held in Madison in June 2008 also visited the demonstration site for a tour.

*Economic Impact*

The economic multiplier effects are substantial for a mobile, semipermanent or permanent mill operation. Minnesota IMPLAN economic impact modeling system software projected that operating this type of mobile sawmill would add 75–100 indirect jobs in addition to the 12–15 direct jobs. Acres treated could range from 5,000 to 15,000 acres annually, depending on the type of forestry operations or harvest prescription.

The IMPLAN economic impact projections were confirmed by a sawmill that installed a new $7,500,000 HewSaw line in their operation in Spencer, WI. After participating in the LSLA Industry Field Day, the mill owner contacted and worked with HewSaw to design a system to handle softwoods and hardwoods for lumber and railroad tie production. The mill employs 15 workers. An additional 75 loggers/log truck driver jobs were stimulated in supplying roughly 100,000 cunits annually of small diameter timber mostly from private woodlands in Wisconsin.
and Minnesota. Annually, 70,000 cunits could be processed from small-diameter trees in the West with similar economic impacts.

This project demonstrated the: (1) potential of high-speed mobile sawmilling for utilizing small-diameter trees from forestry operations (fuels reduction projects, landscape restoration, and timber stand improvement) to treat upwards of 15,000 acres annually; (2) potential of high-speed sawmill technology as a replacement for lost pulp mill capacity in the Lake States, New England and the South; (3) potential to reestablish lost sawmill capacity in the Western U.S. that is more appropriately scaled to lower timber sale volumes; and (4) potential for a lower capital investment cost alternative to capital intensive investments needed for traditional high-speed small-log sawmill operations; (5) production of higher value product (lumber) for small diameter material, while also producing pulp chips, sawdust for pellet plants, and bard for direct biomass fuel from the residues.

The Wisconsin Mobile HewSaw demonstration and recovery studies showed very favorable results, worthy of further investigation by Vaagen Brothers into using small logs from fire salvage operations from fuel reduction projects in the Western United States. In 2012, the mobile HewSaw mill, used in the original demonstration, was transported from Wisconsin to Eagar, AZ, for additional trials and establishment of a small log sawmilling operation. As of summer 2013, the HewSaw mill is fully operational, with 30 jobs stimulated in the Eagar area. The HewSaw mill processes 500 green tons (20 truckloads) per day of small diameter logs from fuel reduction work that is sawn into lumber and marketable mill residues.

**Conclusion**

Technical assistance provides a vital link between our nation’s forests resources and the professionals who manage them, and the industry that processes them into products that are used nationally and internationally. Reinvigorating the process and expertise for providing this assistance through the USDA Forest Service and its state partners is essential for the maintenance and growth of this nation’s forest products industry. Although grant/loan programs can provide vital support for numerous entities, many times technical assistance can provide the direction needed to optimize the use of these funds or in some cases, this technical assistance may be all that is needed to make a project or business successful. With the proper support, the Forest Products Marketing Unit at the FPL can provide the leadership in providing this assistance.
# Appendix A – Planning Summit Invitees & Attendees

Names in **BOLD** are Attendees

<table>
<thead>
<tr>
<th>USDA Forest Service</th>
<th>Attendees E-mail Addresses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest Products Marketing Unit, FPL</td>
<td></td>
</tr>
<tr>
<td>• Rusty Dramm, Interim Program Manager</td>
<td><a href="mailto:jdramm@fs.fed.us">jdramm@fs.fed.us</a></td>
</tr>
<tr>
<td>• Doug Tucker, Program Assistant</td>
<td><a href="mailto:dltucker@fs.fed.us">dltucker@fs.fed.us</a></td>
</tr>
<tr>
<td>• Mark Knaebe, Natural Resource Specialist</td>
<td><a href="mailto:mknaebe@fs.fed.us">mknaebe@fs.fed.us</a></td>
</tr>
<tr>
<td>• Terry Mace, FPL Volunteer</td>
<td><a href="mailto:mace.terryr@gmail.com">mace.terryr@gmail.com</a></td>
</tr>
</tbody>
</table>

| Forest Products Laboratory (FPL) | | |
| • Mike Ritter, FPL Assistant Director | | |

| S&PF Cooperative Forestry, Washington Office | | |
| • Steve Marshall, Cooperative Forestry Assistant Director | | |
| • Dave Atkins, Cooperative Forestry Program Manager | | |

| WERC/Regional Biomass Coordinators | | |
| • Lew McCreery, NA Biomass Coordinator, WERC | | |
| • Ed Cesa, Assistant Director, WERC | | |
| • Dan Parrent, Regional Biomass Coordinator, R-10 | djparrent@fs.fed.us |
| • Larry Swan, Regional Biomass Coordinator, R-5 | | |

| State Forestry | Paul Delong@wisconsin.gov |
| • Paul DeLong, NASF/State Forester, WI | | |
| • Steve Hubbard, U&M Specialist, WI | | |
| • Patrick Rappold, CWSF/U&M Spec., AZ | PatrickRappold@azsf.gov |
| • Charlie Becker, SGSF/U&M Spec., VA | charlie.becker@dof.virginia.gov |
| • Anthony Weatherspoon, MI-DNR (retired) | salaam45@wwdb.org |
| • Dan Vongroven, U&M Spec., MN | steve.vongroven@state.mn.us |
| • Dan Rider, NAASF/U&M Specialist, MD | | |
| • Paul Frederick, U&M Specialist, VT | | |

| Extension/University | | |
| • Dusty Moller, U&M Director, Univ. of Nevada – Reno | dmoller@unr.edu |
| • Scott Bowe, Wood Prod Ext. Specialist, UW-Madison | sbowe@wisc.edu |
| • Collin Buntrock, Master’s Degree Candidate, UW-Madison | buntrock.collin@gmail.com |
| • Bob Govett, Wood Prod Specialist, UW-Stevens Point | rgovett@uwsp.edu |
| • Brian Brashaw, Dir. Wood Materials & Mfg. NRRI | bbrashaw@nrri.umn.edu |

| Contractors/Critical Partners | | |
| • Craig Rawlings, Pres., Forest Business Network | craig@forestbusinessnetwork.com |
| • Don Peterson, Exec. Dir., Sustainable Resources Institute, Inc. | sri.dpetersen@sbcglobal.net |
Appendix B – Planning Summit Agenda

Monday, October 28
1:00 pm Camp set up and pre-summit arrival for long distance travelers
6:00 pm Dinner (Mess Hall)

Tuesday, October 29
11:00 am Arrival, check-in and lunch (Mess Hall)
1:30 pm Introductions and agenda (meet in the Boat House classroom)
1:45 pm Summit Goals and Objectives – expectations and takeaways
2:00 pm Forest Products Marketing Unit (FPMU) introduction and unit review
3:00 pm Break
3:30 pm Forest Service (R&D, S&PF, NFS) Expectations, Focus and Guidance
4:30 pm Group discussion and summarizing the day’s work
5:00 pm Adjourn to small group discussions
6:00 pm Dinner (Mess Hall)

Wednesday, October 30
6:00 am Breakfast
8:00 am Day’s agenda and announcements (Boat House classroom)
8:15 am FS Research and Development examples of targeted priorities
9:15 am Cooperative Forestry Woody Biomass Utilization Grant Program
9:45 pm Break
10:15 am National Forest System (NFS) examples of priority needs and issues
11:00 am FS International Forestry example projects
11:30 am Lunch (Mess Hall)
1:00 pm SmallWood 2014 – SE Minnesota with joint NAASF Utilization Committee meeting
1:45 pm Tribal Nations and Tribal Enterprise example projects
2:30 pm Break
3:00 pm State Forestry and State Resource Assessments (panel discussion)
4:00 pm Wood Products Extension and Universities efforts
5:00 pm Adjourn to small group discussions
6:00 pm Dinner (steaks on the grill)

Thursday, October 31 (Halloween)
6:00 am Breakfast
8:00 am Day’s agenda and announcements
8:15 am What is it that we really want to do?
9:30 am Break
10:00 am Where do we go from here?
11:00 am Summit wrap up
11:45 am Lunch (Mess Hall) and go home
Appendix C - Planning Summit Discussion Topics

Forest Products Marketing Unit (FPMU) – former Technology Marketing Unit
Internal USFS review of FPMU, July 2013
  WO Review of FPMU (June 2012)
  Charter and name change – what is the FPMU authorized and charged to do?
  Working across all three USFS Deputy Chief’s areas – expansive USFS authorities
  Organizational chart and structure
  What FPMU is charged to do
  How we conduct business and get the work done
  Expanding the FPMU and partnership opportunities

Forest Products Laboratory, USDA Forest Service
  Hazardous Fuels Reduction through Utilization & Marketing for Healthy Forests
    Infrastructure Protection – Union Pacific Railroad cooperative research agreement
    Woody Biomass Utilization Grants – Technical Assistance to grant awardees
    FPMU is closing out and handing off to the USFS Regional Biomass Coordinators
    Grant program outcomes and impact – IMPLAN Analysis
  Responding to Natural and Man Made Disasters – fire, weather events, insect & disease
    Protocols and Challenges of Interagency Coordination (FEMA, Corp of Engineers)
    Ice Storm Response in Wisconsin
    Hurricane Sandy Recovery
    Invasive Species Management and Salvage Tree Utilization
    Beetle-Killed Forests – FPL strategy and salvage tree utilization
  Urban Tree, Woody Debris and MSW Utilization
    Las Vegas, NV Urban Wood Recycling
    Emerald Ash Borer Utilization in Michigan
    Oak Creek, WI Mechanized Urban Tree Removal
    Baltimore Urban Forest Utilization – Cooperative Partnership Agreement
  Woody Biomass Energy
    Emissions from Wood Energy – the ultimate wood stove (Knaebe project)
  Advanced Housing – “Green Building”
    Cross Laminated Timber (CLT), Columbia Falls, MT
    CLT Demonstration Project
  Nano-Materials from Woody Biomass – Cooperative Agreement – US Endowment for Forestry
  SmallWood 2014 Planning – Rochester, Minnesota with joint NAASF Utilization meeting

USFS International Forestry – Israel, South America (Knaebe)
PNW Research Station, USDA Forest Service – working with the Sitka Lab
Cooperative Forestry, USFS
  Cooperative Forestry – state energy teams, infrastructure protection
  Northeastern Area, S&PF
  Wood Education Resource Center
Regional Coordinators
Woody Biomass Utilization Grants Program – FPMU is closing out and handing off
   Grants Administration – FS Regional Coordinators
   Grant program outcomes and impact – IMPLAN Analysis

National Forest System (NFS), USFS
Hazardous Fuels Reduction through Utilization and Marketing for Safety
   White Mountain Stewardship Contract – Future Forests, LLC
   Wallow Fire, 2011 – Alpine, Eagar and Nutrioso, AZ
   Arizona HewSaw Operation, Eagar, AZ, 2013

Stewardship Contracts and Agreements
   Stewardship Contracts – technical assistance, Malheur Nat’l Forest
      Assessing forest products processing capacity & markets (Malheur NF)
      Provide technical assistance to stewardship contractors

Stewardship Agreements
   Asbestos contaminated forest – Kootenai NF and Libby, MT
   Invasive species (Emerald Ash Borer, salt cedar, etc.)
   Beetle-Killed Forests – FPL strategy and salvage tree utilization
      Summary of Invasive Utilization Options (Publication by Brashaw and Ross)
      Summary of Beetle-Killed Utilization Options (future publication)

Pinyon Juniper (PJ) Utilization

State Forestry – State Assessments – U&M issues rank #1 or #2 in 85% of states
   National Association of State Foresters (NASF)
      National Perspectives on State Forestry Needs
      Forest Markets Committee (FMC) – Carla Harper
   Northeastern Area Association of State Foresters (NAASF)
      NA Perspectives
      NAASF Utilization Committee
   Southern Group of State Foresters (SGSF)
      Southern Perspectives – Southern states are under-served
      Services, Utilization and Marketing (SUM) – SUM Meeting update
   Council of Western State Foresters (CWSF)
      Western Perspectives (Rappold, Moller)
      Western State Foresters needs
      Western Forestry Leadership Coalition (WFLC)

Wood Products Extension and Universities
   UW-Madison, Wood Products Extension – international marketing
   UW-Stevens Point – business feasibility spreadsheets & assistance
   University of Nevada Reno – technical assistance; USDA-Rural Development
   Virginia Polly technic Institute (VPI) – Bob Smith
   Natural Resource Research Institute, UM–Duluth – working with FPL
Tribal Nations and Tribal Enterprise – per USDA Deputy Undersecretary Butch Blazer

- Menominee Tribal Enterprise (MTE) – cabinet & millworks marketing project
- Mescalero Forest Products – retooling/startup assistance request
- Fort Apache Timber Company – retooling and startup update
- Working with Bureau of Indian Affairs – inventory analysis – project with Dave Wilson, BIA
- Forest Service WO Tribal Relations and Liaison
- Navajo sawmill (AZ and NM)

SmallWood 2014 – SE Minnesota

- NASF Utilization Committee Annual Meeting
- SmallWood tours
- SmallWood technical program

Forest Products Marketing Unit – Responding to the Charter

- How do we want conduct business, get the work done and rebuild U&M assistance capacity?
- Working with FPL, FS Research, NFS and State & Private Forestry
- External program review of FPL – the old CORE industry meeting at FPL
- Expanding the FPMU and partnership opportunities, staffing, and funding
Appendix D – Notes on Rebuilding U&M Technical Assistance

Forest Products Technical Assistance for Improving Forestry

Discussions at the 2002 SmallWood Conference in Albuquerque, NM stimulated ideas on understanding how forest products utilization and marketing assistance enables efficient and cost effective forest management. To the field forester, this connection is obvious, but not so much to the growing number of forest planners and specialists in the Forest Service.

Ecosystem Management was all the rage at the time of the conference, with focus on the complex interactions within ecosystems. Not so evident at the time was discussion on treatments for Ecosystem Management. Ultimately, it boils down to vegetative management. There was a significant change in focus in Federal land management. Rather than focusing on what products are harvested from the land, new focus was on the condition the forest was left in after treatment. While not generally recognized at the time, this accelerated the need for markets for small-diameter material and woody biomass.

Managing our Nation’s forests (i.e., federal, state, and private forestlands) is limited by the lack of outlets (i.e., markets) for low-value (e.g., underutilized, small-diameter) trees. Poor market prices and limited utilization options hampers cost effective forest and land management. This presents serious consequences for the Nation’s forests as much needed land management is deferred.

Rusty Dramm and Dean Huber, USFS and Terry Mace, Wisconsin DNR developed a think piece addressing “Improving Forest Management Capabilities through Forest Products Technical Assistance.” The paper proposed a National Forest Products Technical Assistance Program to help defray the cost of increasingly expensive forestland management. The need for improved and expanded forest products utilization and marketing technical assistance centers on improving the efficiency of processing and marketing of wood and fiber products to enable economical used of low-value trees.

Technical assistance would focus on improving the situation to make land management opportunities more attractive. Consequently, all areas of natural resource conservation would be improved, including watersheds and landscapes, aesthetics, soil, air quality, wildlife, recreation, and forest protection from insect disease and fire, as well as timber production.

National Utilization & Marketing Meeting

In anticipation of Federal legislative support and funding for the National Association of State Foresters (NASF) “Sustainable Forests – Sustainable Communities” initiative, a National Utilization and Marketing Meeting was held in conjunction with the Northeast Utilization and Marketing Council annual meeting in Connersville, Indiana in August 2004. This national meeting focused on strengthening forest products utilization and marketing (U&M) technical assistance capacity in the United States to meet ever growing needs outlined in the NASF initiative. Specifically, the NASF initiative identified several needs including: manufacturing jobs, strengthening U.S. industry competitiveness, and sustaining forest dependent communities. At the same time, such important U&M work further enhances forest management opportunities for the conservation and wise use of forest resources, healthy forests and watersheds, and protection from forest fires, insects and disease.

The National U&M Meeting objectives were to (1) better define needs and opportunities for U&M technical assistance, (2) develop strategies for expanding National, State, and Extension U&M programs to meet these increasing needs and opportunities, and (3) formulate a plan and action items to strengthen U&M technical assistance capacity in the U.S. The focus of the national meeting was on enhancing and growing the cadre of
professionals and programs that deliver technical assistance, technology transfer, and extension outreach in the broad field of forest products utilization and marketing. Specifically, the meeting focused on revitalizing state, federal and extension utilization and marketing (U&M) assistance. In addition, the meeting provided opportunities to network with forest products research capabilities and other U&M support functions of the USDA Forest Service, Extension, university and other organizations and agencies.

Improved forest products utilization and marketing remains, as one of the fields where the need for expanded technical assistance effort is greatest. There are substantial areas where the level of utilization of the nation’s forest resources can be improved to manage our forests for the greatest good for the greatest number of people—today and into the future. At the same time, businesses strengthen their competitive position, family-wage earning jobs are retained and expanded, and forest-dependent communities survive and quality of life is improved.

Current efforts in the United States include USDA Forest Service and State U&M programs with specialists possessing broad technical background in forest products utilization & marketing. Such efforts provide forest products utilization and marketing solutions for dealing with issues like retaining and creating sustainable family-supporting wage jobs, forest products and manufacturing economic development, forest fuels reduction, and watershed protection. These efforts are highly recognized and have a long history of success for over 30 plus years.

At the national level, a program previously existed within the USDA Forest Service, State & Private Forestry—Cooperative Forestry. At the Federal level, previous programs included the: (1) Forest Products Conservation & Recycling (FPC&R), and (2) Wood In Transportation (WIT). Both programs were at the time part of the Economic Action Program (EAP) under S&PF Cooperative Forestry. Two centers of excellence were noted specifically: (1) the Technology Marketing Unit at the Forest Products Laboratory, and (2) the Wood Education and Research Center in the Northeastern Area.
Appendix E–State Forestry Assessments Priority Issue: Forest Products Utilization and Marketing

Key Talking Points from the State Foresters

- Industry plays a critical role in forest management by providing the markets for forest products and biomass removals from forestry operations allowing management to occur;
- Utilization plays a vital role in forest management by providing an economic engine for forest dependent communities (jobs) and economical outlets (markets) for wood and biomass fiber removals from forestry operations;
- Utilization and marketing efforts help resolve forest health issues such as
  - Manage forest stand stocking levels to reduce stress and risk of insect and disease outbreaks (Mountain Pine Beetle),
  - Clean water through watershed restoration and protection,
  - Reduce the negative economic impact of invasive species (EAB),
  - Improve the overall health of forests across all ownerships;
- Forest management is greatly restricted by current poor forest products markets and outlets for all materials in some states (sawtimber, pulpwood, low-value woody biomass);
- Forest products utilization and marketing technical assistance helps improve the ability to enhance forest management in a cost efficient manner;
- Sustainability is the balance and harmony of the environment, community and economic sectors working together;
- Funding sources (Knuteson Vandenberg funds, mill tax) are inadequate to manage our forests to meet our management objectives without the sale of forest products.
**Appendix F - Summary of FPMU Tribal Assistance**

The Forest Products Marketing Unit (FPMU) at the Forest Products Laboratory, Madison, Wisconsin provides technical and financial assistance to tribal nations and tribal enterprises upon request to enhance the cultural, economic and environmental sustainability of tribal resources. Refer to the attached Summary Table of Tribal and Minority Assistance.

<table>
<thead>
<tr>
<th>Tribal Nation/Entity</th>
<th>Year</th>
<th>Project Title</th>
<th>Description/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menominee Tribal Enterprises (MTE) Menominee Nation (Neopit, WI)</td>
<td>2012</td>
<td>MTE Millworks Cooperative Agreement</td>
<td>MTE startup division producing high-end kitchen cabinets and millworks. Cooperative Agreement for marketing plan, product design and employee training. Partner with College of the Menominee Nation &amp; MTE. (near completion)</td>
</tr>
<tr>
<td>Navajo and Jicarilla Apache Nations (NM)</td>
<td>2012</td>
<td>New Greenfield Sawmill Technical Assistance</td>
<td>Carmen Austin, NM State Forestry &amp; Rusty Dramm w/ Dusty Moller (in progress)</td>
</tr>
<tr>
<td>Yakama Forest Products (White Swan, WA)</td>
<td>2011</td>
<td>Yakama Forest Products sawmill retooling for pine saw logs</td>
<td>Sawmill assistance and financial feasibility of sawmill expansion project for high grade pine lumber. Follow-up to The Beck Group Mill Study (on hold)</td>
</tr>
<tr>
<td>BIA Branch of Forest Resources Planning (BOFRP)</td>
<td>2011</td>
<td>Log Supply Distribution for Tribal Sawmill Enterprises in support of YFP project</td>
<td>Dave Wilson, (BOFRP) &amp; Rusty Dramm – adapting FIA data to develop log supply distributions for sawmill feasibility studies using FS Veg Mgt. Program. (on hold).</td>
</tr>
<tr>
<td>Confederated Tribes and Bands of the Yakama Nation (Toppenish, WA)</td>
<td>2010</td>
<td>Yakama Nation Timber Appraisal System Review</td>
<td>Assisted BIA in review of the Yakama Appraisal System - analyzing methods for valuation of timber. Presentation to Tribal Council and site visit (Bernie Ryan, BIA – done)</td>
</tr>
<tr>
<td>San Carlos Apache (AZ)</td>
<td>2010</td>
<td>Woody Biomass Grant</td>
<td>$250K for scragg sawmill and associated equipment (done)</td>
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<tr>
<td>Bois Forte Band of Chippewa (Nett Lake, MN)</td>
<td>2009</td>
<td>Woody Biomass Grant</td>
<td>$250K for Morbark chipper and trailer. Supplying woody biomass for Laurentian biomass power plant (done)</td>
</tr>
<tr>
<td>Mescalero Forest Products (MFP) Mescalero Apache Tribe (Mescalero, NM)</td>
<td>2008 &amp; 2011</td>
<td>Sawmill Retooling for Small Diameter Logs and Woody Biomass Grant</td>
<td>Sawmill study &amp; recommendations for retooling the mill for the small diameter. (Dusty Moller, Kim Kostelnik; John Waconda and Bernie Ryan, BIA) Also, reviewed MFP’s new business plan. $250K for sawmill retooling.</td>
</tr>
<tr>
<td>Flathead Stickers &amp; Lath, Inc. (Confederated Salish Kootenai Tribes (Ronan, MT)</td>
<td>2008</td>
<td>Flathead Stickers and Lath Technical Assistance Visit</td>
<td>Technical Assistance Visit – provided recommendations on log yard layout, products, markets, operational efficiency and safety (w/Scott Bell, S&amp;PF, R-3 – done)</td>
</tr>
<tr>
<td>Coquille Indian Tribe (Coquille, OR)</td>
<td>2008</td>
<td>Woody Biomass Grant</td>
<td>Roll-Off containers for transporting woody biomass to Roseburg Forest Products mill in Dillard, OR. (done)</td>
</tr>
<tr>
<td>Fort Apache Timber Company (White Mountain Apache – Whiteriver, AZ)</td>
<td>2007 &amp; 2011</td>
<td>Log Sort Yard and Sawmill Technical Assistance Visits</td>
<td>Log sort yard &amp; small log conversion recommendation to counter impacts of Rodeo-Chediski fire; Technical consultation on reopening the FATCO sawmill (on hold)</td>
</tr>
<tr>
<td>Zuni Pueblo (Zuni, NM)</td>
<td>2007</td>
<td>Business Planning for Tribal Sawmill and Yard Layout</td>
<td>Financial feasibility, market planning, plant layout, safety, dry kilns recommendations (w/Moller – done)</td>
</tr>
<tr>
<td>Blackfeet Nation (MT) &amp; Turtle Mountain Band of the Chippewa (ND)</td>
<td>2005 &amp; 2010</td>
<td>Business Financial Feasibility; Aspen Log Marketing Assistance</td>
<td>Bob Govett, UWSP and Rusty Dramm - workshop; Also provided assistance for Turtle Mt. on markets for mature aspen stumpage (Don Peterson, contractor – done)</td>
</tr>
<tr>
<td>Zuni Pueblo (Zuni, NM)</td>
<td>2004</td>
<td>Furniture Plant BioMax</td>
<td>Assisted DOE on Zuni BioMax heating system (done)</td>
</tr>
<tr>
<td>Navajo (Cameron, NM)</td>
<td>2003</td>
<td>Hogan Traditional Housing</td>
<td>Provided engineering design work for Hogan project (done)</td>
</tr>
</tbody>
</table>