BIG VALLEY FOREST PRODUCTION AND STEWARDSHIP STUDY

Forest Resource Availability Study

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Table of Contents

Tables

Exhibits

INTRODUCTION

TSS Consultants (TSS) was retained by the Superior California Economic Development District (SCEDD) to complete two tasks as part of the Big Valley Production and Stewardship Study:

1. Facilitate discussions with community members in the Big Valley region of Northern California. Primary objective of these discussions is the development of a stewardship project in the greater Big Valley area.
2. Conduct a forest resource availability study for the Big Valley area.

In June, 2005 a report on the results of task #1, "Report on Community Participation in the Formulation of a Stewardship Project," was presented to SCEDD (refer to Appendix A for full report). This report provides the results of task #2.

BACKGROUND

Throughout much of the inland West, concentrations of hazardous forest fuels are placing rural communities, sensitive habitat and entire watersheds at significant risk to catastrophic wildfire. During the 2000 fire season over 8.4 million acres of wild lands in the West were impacted by fire. Total fire suppression costs during this record-setting fire season exceeded 2 billion dollars.

A primary factor influencing the intensity of these wildfire events is the unnaturally high concentrations of vegetation. This is noted in the April 1999 General Accounting Office report (GAO/RCED-99-65), Western Forests: A Cohesive Strategy is Needed to Address Catastrophic Wildfire Threats.

"The most extensive and serious problem related to the health of national forests in the interior West is the over-accumulation of vegetation."

Clearly, over a century of successful fire suppression efforts have facilitated a very serious buildup of vegetation - mostly small, traditionally sub-merchantable trees. In order to restore the health of western forests and reduce the risk of wildfire, these over-stocked stands require treatment. Typically, treatment requires the removal of small trees – both commercial, as sawlogs, and non-commercial, many times in the form of woody biomass fiber suitable for use as feedstock for power generation.

The National Fire Plan (NFP), as implemented by the USDA Forest Service and the Bureau of Land Management, seeks to treat millions of acres of overstocked forests in the West. Complementary to this effort, there exists a significant opportunity for utilization of these small trees in the form of sawlogs for conversion to forest products (lumber/veneer/panel products) and woody biomass for use as fuel in the generation of heat and power.

Congress has recently authorized the use of stewardship contracts to conduct landscape scale fuels reduction, watershed improvement and forest restoration activities on federally-managed lands. These relatively new contracts, first piloted on the Kaibab National Forest in the late 1980's, are fast becoming an important contracting tool for federal natural resource managers. While striving to meet landscape health improvement objectives, these contracts may provide resource availability assurance that may facilitate potential development of new sawmills/biomass power plants or the reactivation of the biomass cogeneration facilities and/or sawmills such as the facility at Bieber, California (formerly Big Valley Lumber Company).

In addition to reducing the costs and losses from wildfires, there are a number of public and private benefits from reducing forest fuels and diverting the biomass for use as fuel in the generation of renewable electrical power. These additional benefits include new jobs and businesses in rural communities, new property income and sales tax revenues for local and state agencies to provide more public services, and potential air quality improvements from significantly reducing air pollutants from wildfires or the open burning of woody biomass. Recent studies indicate that approximately 4.9 new jobs[1] are generated for every newly-developed megawatt of biomass power.

The Big Valley Forest Resource Availability Study addresses the sustained availability (economically and environmentally) of sawlogs and woody biomass fiber tributary to a potential sawmill and biomass power plant located at Bieber, California. This resource availability study assesses long-term sawlog and woody biomass fuel availability generated from management activities on both private and public lands located within the Big Valley market area.

Funding for this study was provided by Lassen County and the USDA Forest Service – State & Private Forestry

STUDY OBJECTIVES

The primary objective of this study was to determine the quantities of sawlogs and woody biomass fuel that are economically and environmentally available from public and private lands within the Big Valley market area (BVMA). This resource study considered sawlog resource availability from timber harvest activities and woody biomass fuel availability from the following activities:

- Commercial timber harvests.
- Fuels treatment activities.
- Grassland and range improvement activities – western juniper management.

For both sawlog and woody biomass fiber the following parameters are characterized:

[1]Morris, Gregory. 1999. *The Value of the Benefits of U.S. Biomass Power*, NREL/SR-570-27541. National Renewable Energy Laboratory, Golden, CO.

- **Resource availability** expressed in thousand board feet (MBF)[2] for sawlogs and bone dry tons (BDT)[3] of woody biomass fuel, of the potential resources that are economically and environmentally available. Projected amounts available are based upon best estimates as provided by resource managers responsible for state, federal, and private lands. Long-term resource availability estimates are provided.
- **Current competition** or demand for the potential resource generated within the market study area.
- **Time of year availability** for delivery of the potentially available resource.
- **Cost estimates** to harvest, collect, process and transport sawlogs and woody biomass fuel to a target study site (Bieber) within the Big Valley market study area.

FINDINGS

Resource Availability

TSS Consultants assessed the availability of sawlogs and woody biomass fuel resources within the BVMA and found:

- Between 590,700 and 706,600 BDT of woody biomass fuel is currently generated on an annual basis within the BVMA. Current demand for biomass fuel generated within the BVMA is significant at approximately 465,000 BDT per year, which results in a potential net availability of between 126,700 and 241,600 BDT per year. This volume of biomass fuel is sufficient to support a 7 megawatt (MW)[4] power plant that has an estimated fuel consumption of 55,000 BDT per year. At this level of fuel consumption, there exists a 2.3 to 4.4 fuel supply coverage ratio of biomass fuel available for a 7 MW biomass power facility located at Bieber, California. Table 1 reports current biomass fuel availability within the BVMA.

[2]One thousand board feet (MBF) is a common unit of measure related to sawlog volume. A board foot is the amount of wood contained in an unfinished board 1 inch thick, 12 inches long, and 12 inches wide (abbreviated "BF"). Common units as related to sawlog volume measurement include 1,000 BF or MBF and 1,000,000 BF or MMBF.

[3]One bone dry ton (BDT) is 2,000 pounds of biomass (usually in chip form) at zero percent moisture.

[4]One megawatt (MW) is a measure of electrical output and equals one thousand kilowatts. This is enough electricity to support approximately 1,000 households.

Table 1. Summary of Woody Biomass Fuel Currently Available on an Annual Basis Within the Big Valley Market Area (Expressed as Bone Dry Tons)

Fuel Type and Source	Low Estimate	High Estimate
Forest residues – timber harvests, all ownerships	162,000	198,000
Fuels treatment – public lands	139,000	170,000
Fuels treatment – private lands	143,400	175,200
Western juniper removal/range imp. – public lands	7,700	9,400
Western juniper removal/range imp. – private lands	138,600	154,000
Totals	**590,700**	**706,600**

- It is anticipated that biomass fuel available commencing in 2009 will increase due to the implementation of western juniper treatment projects consistent with the Sagebrush Steppe Restoration Initiative on public lands in Northeastern California. Table 2 reports on projected biomass fuel availability commencing in 2009.

Table 2. Summary of Woody Biomass Fuel Potentially Available Commencing 2009 on an Annual Basis Within the Big Valley Market Area (Expressed as Bone Dry Tons)

Fuel Type and Source	Low Estimate	High Estimate
Forest residues – timber harvests, all ownerships	162,000	198,000
Fuels treatment – public lands	139,000	170,000
Fuels treatment – private lands	143,400	175,200
Western juniper removal/range imp. – public lands	252,000	308,000
Western juniper removal/range imp. – private lands	138,600	154,000
Totals	**835,000**	**1,005,200**

- Approximately 180,000 to 220,000 MBF of sawlogs are currently generated on an annual basis within the BVMA. Current demand for sawlogs generated within the BVMA is significant at approximately 168,000 MBF which results in a net availability of 12,000 to 52,000 MBF per year. Table 3 reports current sawlog availability within the BVMA.

Table 3. Summary of Sawlogs Potentially Available on an Annual Basis Within the Big Valley Market Area (Expressed as Thousand Board feet)

Sawlog Source	Low Estimate	High Estimate
Public lands	21,600	26,400
Private lands	158,400	193,600
Totals	**180,000**	**220,000**

Current Competition

Summarized in Tables 4 and 5 is a review of current biomass power plants, sawmills/veneer plants competing for biomass fuel and sawlog resources generated within the BVMA.

Table 4. Competition For Biomass Fuel Within the Big Valley Market Area

Biomass Power Plant	Location	Rated Capacity (MW)	Total Fuel Requirements (BDT/Yr)	Total Fuel Requirements With Curtailments (BDT/Yr)	Transport Distance from Bieber	Competition within BVMA (BDT/Yr)
Burney Mtn Power	Burney, CA	10	100,000	80,000	37	60,000
Burney Forest Power	Burney, CA	32	240,000	240,000	39	100,000
Collins Pine	Chester, CA	12	110,000	110,000	109	25,000
HL Power	Wendel, CA	32	240,000	150,000	99	100,000
Mt Lassen Power	Westwood, CA	10	100,000	100,000	97	40,000
Roseburg FP (on line in late 2007)	Weed, CA	12	110,000	110,000	85	10,000
Sierra Pacific Industries	Burney, CA	20	160,000	160,000	38	60,000
Sierra Pacific Industries	Quincy, CA	14	112,000	112,000	141	30,000
Wheelabrator Shasta Energy	Anderson, CA	50	400,000	400,000	101	40,000
Totals			**1,572,000**	**1,462,000**		**465,000**

Table 5. Competition For Sawlogs Within the Big Valley Market Area

Sawmill or Veneer Plant	Location	Sawlog Usage (MBF/Yr)	Transport Distance from Bieber	Competition within BVMA (MBF/Yr)
Collins Pine	Chester, CA	80,000	109	13,000
Columbia Plywood	Klamath Falls, OR	80,000	95	18,000
Fremont Sawmills	Lakeview, OR	25,000	106	10,000
Roseburg Forest Products	Weed, CA	70,000	85	18,000
Shasta Green	Burney, CA	40,000	39	24,000
Sierra Pacific Industries	Burney, CA	80,000	38	36,000
Sierra Pacific Industries	Central Valley, CA	53,000	95	3,000
Sierra Pacific Industries	Quincy, CA	150,000	141	16,000
Thomas Lumber	Klamath Falls, OR	50,000	96	16,000
Timber Products	Yreka, CA	70,000	10	14,000
Totals		**698,000**		**168,000**

Time of Year Availability

Interviews conducted with biomass fuel processing contractors, timber harvesting contractors and resource managers operating within the BVMA indicate that harvesting operations are conducted on a seasonal basis depending primarily upon weather. Biomass fuel and sawlogs sourced from forest fuels treatment activities, timber harvesting and western juniper removals are typically available May through October. Of primary concern is potential damage to soil resources from mechanical equipment operating in damp weather conditions when soils are most vulnerable to compaction and other disturbance. Occasionally winter operations are conducted if a "hard freeze" occurs that renders the soil in a hardened condition which allows mechanical harvest, collection, processing and transport while minimizing impacts to soils or roads.

Cost Estimates

Summarized in Tables 6 and 7 are cost estimates related to the costs of harvesting, collection, processing and transport of biomass fuel and sawlogs within the BVMA. For the purposes of this study, it was assumed that transport distance averages 30 miles one way (60 miles round trip). These cost estimates are a result of interviews conducted with

biomass fuel processing contractors, timber harvesting contractors and resource managers operating within the BVMA.

Table 6. Collection, Processing and Transport Costs For Biomass Fuel Sourced from Forest and Western Juniper Operations in the Big Valley Market Area (Expressed as $/BDT)

Operation	Low Estimate	High Estimate
Forest residues - logging	$30	$33
Fuels treatment/forest restoration	$44	$51
Western juniper removal	$44	$63

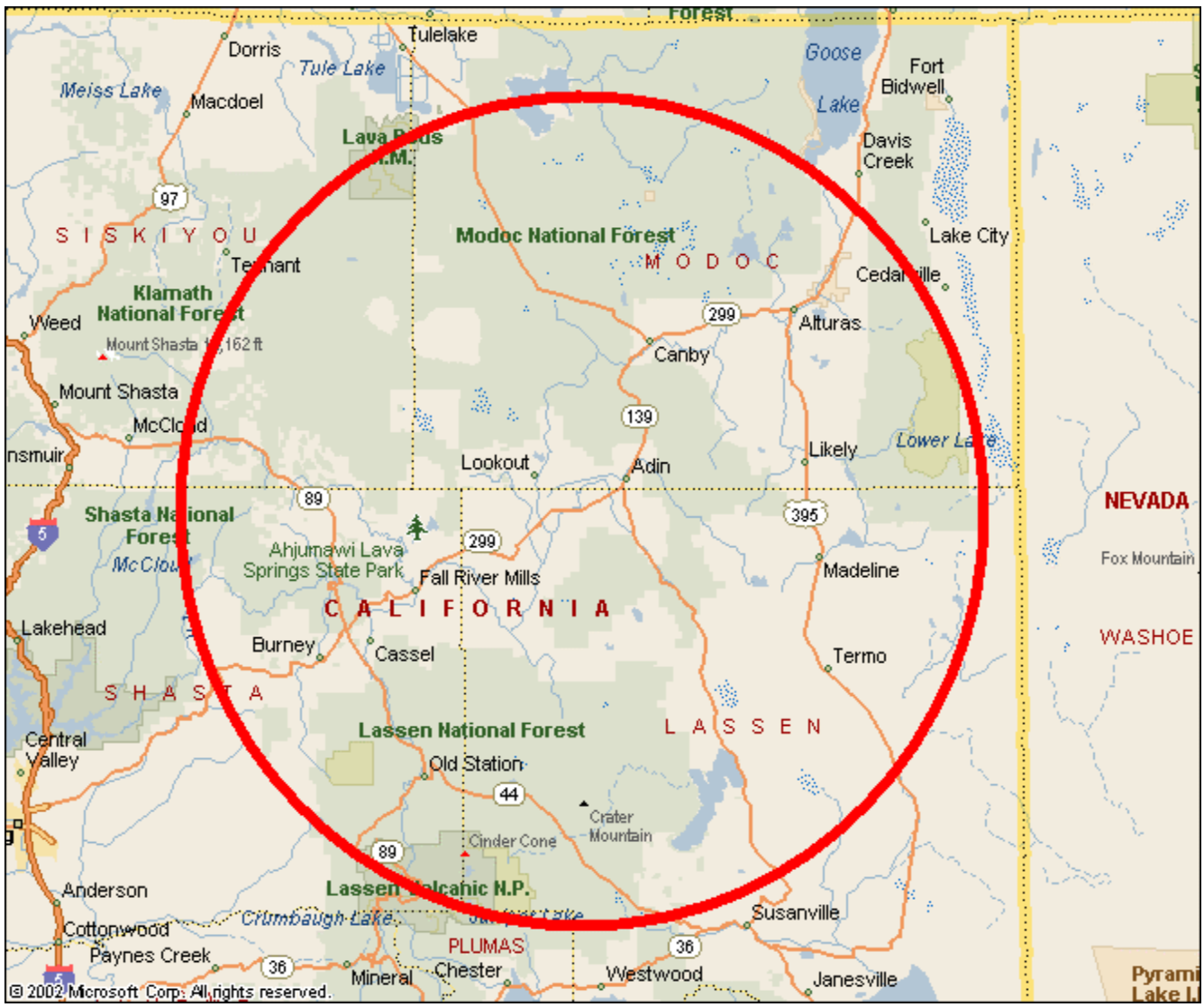
Table 7. Collection, Processing and Transport Costs For Ground-Based Sawlog Removal Operations Within the Big Valley Market Area (Expressed as $/GT and $/MBF)

Operation	Low Estimate	High Estimate
Timber harvest	$28/GT	$45/GT
Timber harvest	$196/MBF	$315/MBF

BIG VALLEY MARKET STUDY AREA

For the purpose of this study, the Big Valley market study area is considered to be that geographic region included within a 50-mile radius of Bieber, California. Exhibit 1A below defines the target study area.

Exhibit 1A. Big Valley Market Study Area



Vegetation Cover Types – Big Valley Market Area

To better understand the biomass and sawlog resource availability for a given area, it is helpful to understand the vegetation types within that area. Biomass fuel and sawlog volumes available on a sustained basis over time are directly dependent upon vegetation type. Vegetative cover data for this study was made available with the assistance of the Fire and Resource Assessment Program (FRAP) of the California Department of Forestry and Fire Protection staff. FRAP staff[5] were able to gather and synthesize vegetation layer data to provide coverage for the BVMA. Vegetation cover classes utilized in this analysis were consistent with the California Wildlife Habitat Relationship database.

Exhibit 1B is a vegetation cover map that highlights vegetation cover in the BVMA. Table 8 provides the key findings of the vegetation cover analysis by ownership class in tabular form.

[5]Many thanks to FRAP and in particular to James Spero, GIS Analyst, FRAP.

Exhibit 1B. Vegetation Cover Summary for the Big Valley Market Area

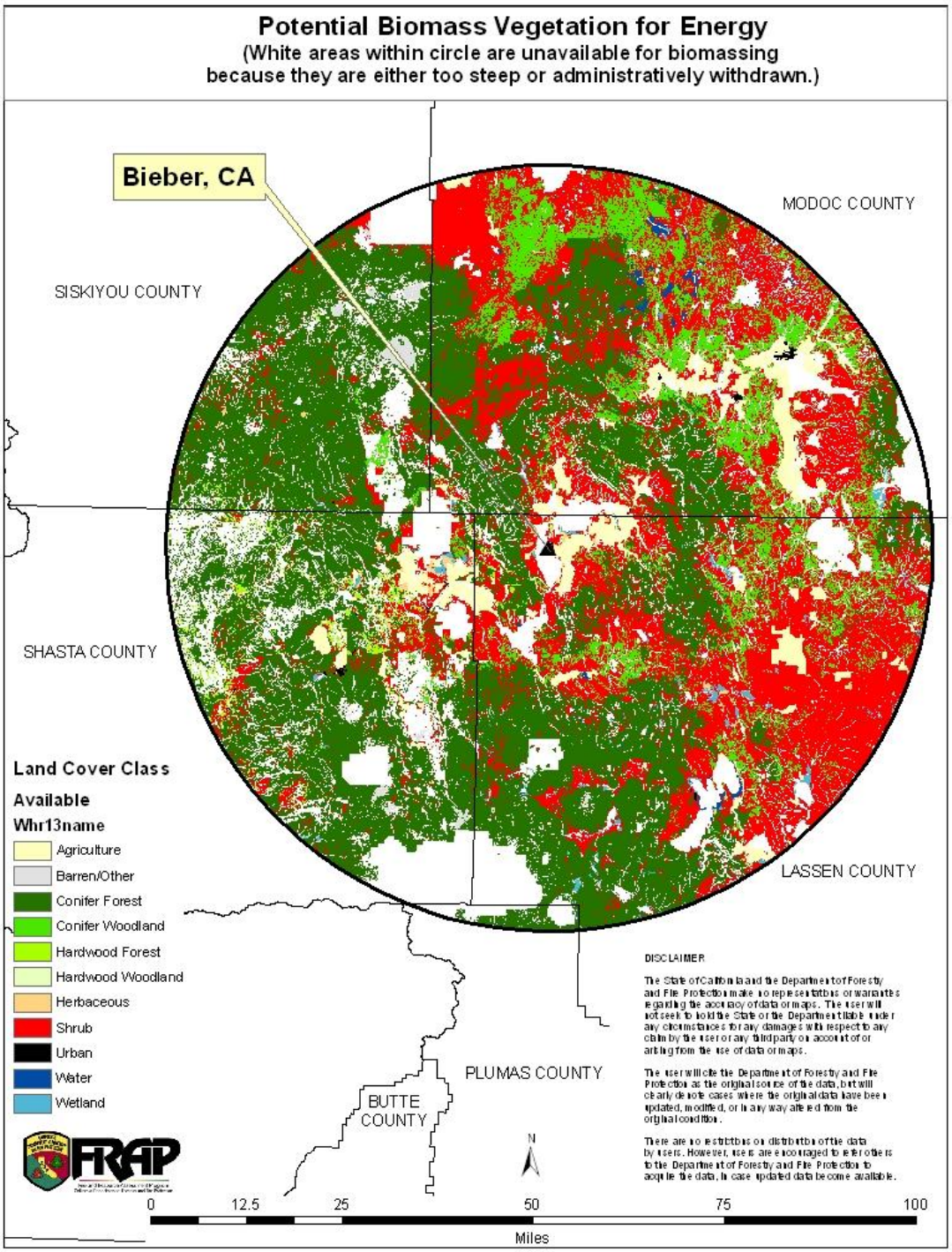


Table 8. Vegetation Cover Summary – Big Valley Market Area

Acres[6] Technically Available For Restoration Activities or Fuels Treatment by Land Cover Class and Owner

WHR13NAME	Total Of Acres	Private	State	USFW	NPS	BLM	USFS	NGO/Other
Agriculture	163,213	155,570	368	3,825	-	1,955	722	773
Barren/Other	38,897	2,483	54	12	82	823	35,440	2
Conifer Forest	1,952,622	758,631	6,499	-	319	38,719	1,148,264	190
Conifer Woodland (Juniper)	407,763	93,334	1,628	400	-	105,882	201,863	4,655
Hardwood Forest	45,418	29,556	516	-	-	3,099	12,128	119
Hardwood Woodland	1,191	558	5	-	-	5	623	-
Herbaceous	29,312	23,428	178	37	-	2,896	2,740	32
Shrub	1,322,382	464,894	7,077	3,702	141	345,555	498,335	2,679
ALL	3,960,798	1,528,455	16,333	7,977	541	498,861	1,900,113	8,451

[6]Acres technically considered available for restoration or fuels treatment activities that might produce biomass fuel as a byproduct include those acres:

- Not considered an urban area, a body of water or wetlands.
- Located on 35% slope or less.
- On federal lands – not in Special Management Areas such as Wilderness, Wild & Scenic River Areas, Research Natural Areas, Special Interest Areas.
- On private lands – not in Stream Management Zone, or reserved status.

Note that the FRAP vegetation cover analysis set topographic and land management exclusion parameters consistent with current biomass fuel harvesting operations within the study area. Acres technically considered available for timber harvest, restoration or fuels treatment activities that might produce sawlogs or biomass fuel include those acres:

- Not considered an urban area, a body of water or wetlands.
- Located on 35% slope or less.
- On federal lands – not in Special Management Areas such as Wilderness, Wild & Scenic River Areas, Research Natural Areas, Special Interest Areas.
- On private lands – not in Stream Management Zone, or reserved status.

Acres meeting these parameters were considered as "potentially available" for vegetation management activities. Clearly, management activities will only be conducted on those lands that fall within the conifer forest and conifer woodland (western juniper) vegetation types.

Table 9 summarizes vegetation cover data for the BVMA. It is worth noting here that the predominant vegetation type within the BVMA is coniferous forest at 48% of total acres considered "potentially available."

Table 9. Vegetation Cover Types Within the Big Valley Market Area (Expressed in Acres and % of Total Vegetation Cover Type)

Vegetation Type	Conifer Forest	Shrub	Conifer Woodland (western juniper)	Other	Total
Acres	1,952,622	1,322,382	407,763	436,541	3,960,798
% of Total Acres	48%	33%	10%	9%	

Table 10 provides vegetation cover data by ownership class within the BVMA.

Table 10. Conifer Forest and Conifer Woodland Vegetation Cover Types by Ownership Within the Big Valley Market Area (Expressed in Acres and % of Total Vegetation Cover Type)

Ownership Class	Private	USFS	BLM	State	Other
Conifer Forest - Acres	758,631	1,148,264	38,719	6,499	509
Conifer Forest – Acres % of Veg. Type	39%	59%	2%	Min.	Min.
Conifer Woodland (western juniper) - Acres	93,334	201,863	105,882	1,628	4,655
Conifer Woodland (western juniper) % of Veg. Type	23%	50%	26%	Min.	Min.

Some important observations can be made from data provided in Table 10 regarding vegetation cover and land ownership allocations with the BVMA including:

- Over 60% of the conifer forest vegetation type is managed by federal land management agencies – USFS and BLM.

- Over 76% of the conifer woodland (western juniper) vegetation type is managed by federal land management agencies – USFS and BLM.

BIOMASS FUEL RESOURCE AVAILABILITY

In December 2005 TSS conducted a woody biomass fuel availability study of the BVMA. The primary objective of the study was to determine the volume of woody biomass fuel resources that are reasonably available (economically and environmentally sustainable) as biomass fuel for a power generation facility located at Bieber, California. As noted earlier in this report (Exhibit 1A), the BVMA is considered to be that geographic region included within a 50-mile radius of Bieber, California.

Public and Private Lands – Forest Residue Availability

Woody biomass fuel and sawlog availability studies traditionally rely on information regarding historic timber harvest levels. This information can provide insight to determine trends and historical benchmarks to show actual forest harvest activities over time.

Outlined below in Table 11 is information summarizing forest harvest activities from 1995 to 2004 in the four counties that are included in the BVMA: Shasta, Lassen, Modoc, and Siskiyou. Annual timber harvests[7] during this ten-year study period ranged from a high of 500 million board feet (MMBF) in 2004 to a low of 361 MMBF in 2001.

Table 11. Historic Timber Harvest Levels, Private and Public Lands, in Shasta, Lassen, Modoc, and Siskiyou Counties (Expressed as MBF)

Year	Shasta Private	Shasta Public	Lassen Private	Lassen Public	Modoc Private	Modoc Public	Siskiyou Private	Siskiyou Public	Total
1995	142.7	7.0	37.2	48.8	24.3	32.4	157.6	29.8	**479.8**
1996	155.8	12.1	40.7	24.6	13.9	16.4	135.6	43.1	**442.2**
1997	135.9	15.1	32.0	20.2	23.4	18.5	186.8	64.0	**495.9**
1998	142.2	6.7	40.0	16.2	9.9	8.8	142.8	46.4	**413.0**
1999	151.2	4.5	48.1	15.7	21.7	1.5	155.5	43.3	**441.5**
2000	136.2	8.4	52.4	8.2	38.6	3.0	157.6	35.8	**440.2**
2001	140.0	4.5	50.7	4.0	23.6	3.6	123.6	11.2	**361.2**
2002	151.2	0.9	74.1	11.0	29.0	0.1	166.6	20.6	**453.5**
2003	114.6	7.7	51.0	12.1	14.5	4.9	192.1	38.8	**435.7**
2004	129.6	6.1	84.7	7.0	33.5	0.6	214.9	24.4	**500.8**
Average	**139.9**	**7.3**	**51.1**	**16.8**	**23.2**	**9.0**	**163.3**	**35.7**	**446.4**

[7] This data is presented courtesy of the California State Board of Equalization (BOE).

The notable decrease in the 2001 timber harvest level can be directly attributed to two factors, one of which is market driven while the other is guided by changes in public land management policy:

- Relatively depressed North American markets for lumber.
- Decreased harvesting activity on publicly-managed lands.

The decrease in harvesting activities on public lands is related to a drop in harvest activities on forest lands managed by the USDA Forest Service. This decrease in harvest level activity is a direct result of public land management agencies shifting land management focus away from commodity production (sawlog outputs) to concentrate more on amenity values (watersheds, wildlife habitat, fisheries habitat and recreation to name a few).

Harvest levels on private lands have been fairly consistent over time. As table 11 indicates, harvest levels have shifted more and more to private lands within the BVMA. Table 12 shows harvest levels as a percentage over time by land ownership.

Table 12. Historic Timber Harvest Levels, Public and Private Lands, as a Percentage of Total Timber Harvests in Shasta, Lassen, Modoc and Siskiyou Counties
(Expressed as Percent of Total)

Year	Percent of Harvest Public Lands	Percent of Harvest Private Lands
1995	25%	75%
1996	22%	78%
1997	24%	76%
1998	19%	81%
1999	15%	85%
2000	13%	87%
2001	5%	95%
2002	7%	93%
2003	15%	85%
2004	8%	92%

Table 12 demonstrates a trend that will likely continue, i.e., private forestlands in the BVMA will generate the majority of timber harvested for the foreseeable future. TSS conducted interviews with private and public forestland managers and found that foresters managing private lands were of the opinion that current harvest levels are sustainable but will rise and fall depending primarily upon:

- The relative value of forest products and associated demand for sawlogs.
- Economic cost of harvesting and transporting sawlogs to market.

Foresters managing public lands acknowledged that while they are not driven by the same return on investment and sawlog market conditions that foresters managing private lands face, they are constrained in their timber harvest activities due to:

- Fluctuating federal dollars allocated to timber management (timber sale preparation, staff salaries, equipment, etc.).
- Policy trend towards managing public lands for amenity values.
- Litigation and appeals by conservation/preservation organizations.

Based upon TSS's experience working with logging and chipping contractors in this region, the recovery factor for biomass fuel processed from timber harvests is approximately 0.9 BDT of woody biomass (tops and limbs) and could be generated from each MBF of timber harvested.

In order to estimate the forest residues available as a byproduct of timber harvest operations, the following assumptions can be made:

- The annual timber harvest level in the near term is 90% of the average annual harvest for 1995-2004 (446 MMBF * 0.90) = 401 MMBF in the four county region.
- The timber harvest activities within the BVMA (as shown in Exhibit 1A) make up 50% of the harvest activities in the four counties (401 MMBF * 0.50) = 200 MMBF.

Then:

- At the 0.9 BDT per MBF forest residue recovery ratio, approximately 180,000 BDT (.9 BDT * 200,000MBF) are reasonably available as biomass fuel annually as a byproduct of timber harvest operations within the BVMA.

Forest Fuels Treatment – Public Lands

As discussed in the Introduction section of this report, the National Fire Plan was launched after the devastating fire season of 2000 when more than 8.4 million acres were impacted by wildfire. The nation began to realize the problem posed by years of fuel accumulating to unnaturally high levels primarily in the inland West region. The National Fire Plan is the foundation for a long-term program to reduce fire risks and restore healthy, fire-adapted ecosystems, primarily on public lands.

Since 2000, other efforts and initiatives have supplemented the general direction of the National Fire Plan. Examples include:

- The Ten-Year Comprehensive Strategy and Implementation Plan, a collaborative product of the Western Governors' Association, federal agencies, Tribes, interest groups, and local officials, calls for more active forest and rangeland

management. The Plan outlines ways to protect communities and improve the environment through restoration projects.

- The Healthy Forests Restoration Act (HFRA) of 2003 provides BLM and USFS land managers with legislative tools to expedite forest and rangeland restoration projects. HFRA aims to expedite the preparation and implementation of hazardous fuels reduction projects on federal land and assist rural communities, states, and private landowners in restoring healthy forest conditions on state and private lands.

Timber and fire staff managing public lands typically accomplish fuels treatment using a variety of treatment options/tools including:

- Treat and leave on site.
- Treat and remove.
- Prescribed fire to combust unwanted vegetation on site (pile and burn or broadcast burn).

In recent years pubic lands managers have begun to re-think the use of prescribed fire as the primary fuels management tool of choice. Public stakeholders have voiced concerns regarding the predominant use of prescribed fire due to the following issues:

- Air quality impacts (haze, human health issues associated with air quality).
- Potential for escape (concerns for a repeat of the Cerro Grande fire in New Mexico or Lewiston Fire in California).
- Visual impacts of burned and blackened forests.
- Biomass utilization – for value-added products and rural employment.

With the National Fire Plan in place, fuels treatment goals set and public stakeholders input, the public lands timber and fire staff have begun utilizing the treat and remove fuels treatment method, especially in regions (such as the BVMA) where markets exist for biomass fuel generated as a byproduct of these treatments. In addition, and as a result of the Healthy Forest Restoration Act, public forest managers have new contracting tools such as stewardship contracts that can facilitate the treatment of thousands of acres over a maximum contractual term of 10 years.

Timber and fire staff managing public lands monitor forest fuels treatments as acres treated and additionally as volume removed. Volume removed is reported by the USFS in the form of a quarterly and annual "cut and sold" report. This is how they report their progress in treating and restoring forested acres over time. For the purposes of this resource availability study, information was gathered utilizing cut and sold reports and interviews with public land managers. The four national forests (managed by the USFS) located within the BVMA generate significant volumes of woody biomass material from forest fuels treatment activities. The BLM, Alturas District, manages few forested acres within the BVMA and generates very little (negligible) biomass material suitable for use as biomass fuel.

Table 13 provides information on historic and projected forest restoration/fuels treatments that have or will include treat and remove activities for the national forests that are located within the BVMA:

Table 13. Biomass Removals From Fuels Treatment Activities on Public Lands, Historic (2001 to 2005) and Planned (2006 to 2010) Within the Big Valley Market Area (Expressed in Acres Treated and BDT removed)

National Forest	Average BDT Removed/Year 2001 - 2005	Planned BDT Removals/Year 2006 - 2010	Percent Within BVMA	Planned BDT Removals/Year Removed Within BVMA
Klamath NF Goosenest RD	22,000	30,000	40%	12,000
Shasta/Trinity NF Shasta/McCloud MU South Fork MU Trinity River MU	50,000	70,000	50%	35,000
Lassen NF Almanor RD Hat Creek RD Eagle Lake RD	140,000	200,000	65%	130,000
Modoc NF Devils Garden RD Doublehead RD Big Valley RD Warner Mtn RD	19,000	35,000	85%	29,000
TOTALS	**231,000**	**335,000**		**206,000**

The volume of biomass fuel generated as a result of fuels treatment activities can vary significantly depending on the existing forest conditions and the management objectives of the landowner/agency. Interviews with local chipping contractors, private forest managers and national forest staff indicate that biomass fuel removed from fuels treatment activities on national forests can range from 3 to 20 BDT per acre.

The fuels treatment projects planned on the four national forests listed in Table 13 are scattered at locations throughout each ranger district. Column four of Table 13 estimates the percentage of total acres scheduled to be treated by national forests that are located within the BVMA. Note that information provided in Table 13 is based on estimates from interviews with forest staff and cut and sold reports as generated by the USFS.

Discussions with national forest staff also yielded information on two primary risks associated with project development and implementation on public forests:

- Funding from Congress for fuels treatment is allocated on an annual basis. Variations in funding levels can severely impact the number of acres treated in any given year.
    - Much of the funding allocated to forest fuels treatment projects is used in the compilation of environmental assessments and studies as required by the National Environmental Policy Act (NEPA).
    - Staffing levels for timber and fuels management personnel are dependent upon funding availability. If staff is reduced as a result of decreased funding, then the number of fuels treatment projects planned and implemented will likely be reduced.
- Litigation and/or appeals from conservation organizations. Some forests are clearly more targeted than others. The Lassen National Forest and Klamath National Forest have been the target of several appeals in recent years.

In order to estimate the biomass fuel available from proposed forest fuels treatment activities on national forests within the BVMA, the following assumptions can be made:

- Approximately 75% of the woody biomass fuel projected to be removed during planned fuels treatment projects on national forests located within the BVMA are actually removed (206,000 * 0.75) and total 154,500 BDT per year.

Big Valley Sustained Yield Unit

In January of 1950, the Big Valley Federal Sustained Yield Unit (BVFSYU) was established. Located in Lassen and Modoc counties, the BVFSYU covers an area of over 223,000 acres and is managed as part of the Big Valley Ranger District, Modoc National Forest. Approximately 91,000 acres of the BVFSYU are considered suitable for timber production.[8]

The enabling legislation for the BVFSYU was the Sustained-Yield Forest Management Act of 1944 which set three primary objectives for the establishment of Sustained Yield Units:

- Promote the stability of forest industries.
- Provide for a continuous and ample supply of forest products.
- Secure the benefits to society that forests provide (water supply, wildlife, etc.).

[8]Per the Big Valley Federal Sustained Yield Unit, Integrated Resource Analysis, Modoc National Forest, June, 2003.

The amended policy statement (dated August, 1979 and issued by the Modoc National Forest) for the BVFSYU noted that the primary purpose for the establishment of the Unit was to "provide the maximum feasible permanent support to the Big Valley community from the lumber industry." Policy provisions of the BVFSYU include the requirement that not less than 80% of the sawtimber sold within the Unit must be processed (primary manufacture) within the Big Valley community (towns of Adin, Bieber, Lookout and Nubieber). Sawtimber is defined as "material suitable for the manufacture of lumber." In addition to primary manufacture, the receiving facility must be equipped to dry the lumber and surface approximately 50% of total lumber production.

When the BVSYU was first established, five sawmills were operational within the Big Valley Community. Today there are no sawmills currently operating within the BVFSYU.

An annual cutting budget (Allowable Sale Quantity) for the BVFSYU was first set in 1950 at 8 MMBF/year and has been as high as 13 MMBF, but today it is set at 9 MMBF. The cutting budget is revised based on land management policy review which is conducted from time to time, with the last review in 1991[9] setting the cutting budget at 9 MMBF. If a reduction in the cutting budget of over 20% is to be considered, the USFS is directed to conduct an advisory hearing for interested parties to provide input.

In recent years the timber sale program on the BVFSYU has resulted in almost no timber harvest from the Unit. However, with renewed interest in the startup of a new sawlog manufacturing facility at Bieber, the USFS is planning to offer between 3 to 5 MMBF[10] of sawtimber per year from timber management activities within the BVFSYU.

Forest Fuels Treatments – Private Lands

There are no known records available that summarize the number of acres treated or biomass material removed from privately managed forests within the BVMA. However, when interviewing private lands forest managers, it is clear that there exists a strong interest in continuing to conduct forest restoration and fuels treatment activities. Since the 1984 startup of the first biomass power generation plant in Burney (Ultrapower I, now known as Burney Mountain Power), public and private forest managers have been able to recover part, if not all, of the costs associated with the treatment and removal of forest fuels. For this reason, private forest managers have treated numerous acres over time, providing biomass power plants with a steady and dependable supply of woody biomass fuel.

Several private forest managers did note that due to increased costs (diesel prices, lack of chipping contractors) to treat and remove forest fuels, they had reduced the number of acres treated per year. Several of these forest managers are managing forest tracts

[9]Interview with Laurence Crabtree, District Ranger, Big Valley Ranger District.
[10]Ibid.

located some distance (50 – 60 miles) from Bieber and noted that increased transport costs could not be recovered with the current prices for biomass fuel offered by the closest biomass power plants.

Like public forest managers, private forest managers must prepare environmental documents prior to startup of harvesting or fuels treatment operations. Documents known as timber harvest plans must be prepared consistent with regulatory guidelines outlined in the California Forest Practices Act and the California Environmental Quality Act (CEQA). In recent years California's legislature and the State Board of Forestry have relaxed documentation and regulatory requirements associated with forest fuels treatment activities. These changes were made in an effort to reduce regulatory expense for private forest landowners attempting to conduct fuels reduction projects. However, private forest managers are facing some challenges in the implementation of fuels treatment projects, including:

- Lack of chipping contractors available to conduct fuels treatment projects. Several of the local contractors have gone out of business or downsized. Some contractors have trended away from conducting work on private lands, opting to concentrate efforts on the implementation of fuels treatment service contracts as offered by the USFS and the BLM.
- Lack of hauling contractors available to transport biomass fuel to market.
- Increased diesel fuel costs that have not been recouped by the value of biomass fuel delivered to the biomass plants.
- Uncertainty regarding future biomass fuel values. Most of the private forest managers were acutely aware that several biomass power plants will be negotiating new power sales rates in the summer/fall of 2006.

Table 14 summarizes the current and projected biomass fuel generated from private forests within the BVMA.

Table 14. Current and Projected Biomass Fuel Available From Forest Fuels Treatments on Private Lands Within the Big Valley Market Area (Expressed in BDT/year)

Year	2005	2006	2007	2008	2009	2010
BDT	162,500	155,750	171,500	171,500	153,500	144,500

Note that the increase in woody biomass fuel projected in years 2007 and 2008 is attributed to the fuel that will be removed from tree plantations which are planned for treatment starting in 2007. Available biomass fuel starts to decrease in 2009 as private forest managers were more uncertain what acres could be treated economically. Several forest managers noted that by 2009 most of the forests located close to major transportation corridors will have been treated and more distant tracts will be considered for treatment. They also noted that as they return to acres already treated in the 1980's,

the yield of woody biomass volume (BDT/acre) will be less as the primary fuels treatment was completed during the initial fuels treatment operation.

Table 14 provides a five-year (2006 – 2010) projection of woody biomass fuel expected to be available from fuels treatment projects on private forestlands within the BVMA. The average volume of woody biomass fuel available is projected to be 159,300 BDT per year from private forestlands for the 2006 – 2010 period within the BVMA.

Western Juniper Removal/Range – Watershed Improvement

Interviews with USFS, BLM personnel and private landowners indicate there is strong sentiment that large numbers of western juniper trees should be removed in support of range and watershed improvement/restoration. Due to a variety of factors, including the impacts of grazing and successful fire suppression efforts, hundreds of thousands of acres of the inland West have been converted from shrub steppe and aspen vegetation communities to western juniper woodlands. Traditionally, western juniper was primarily confined to rocky ridges with sparse vegetation. However, during the last 120 years, western juniper has begun to seriously encroach and occupy more productive sites with well-drained soils.

As western juniper has become more prevalent in the range ecosystems of the inland West, there has been a related decline in range health. Western juniper is highly competitive in rangeland ecosystems for both water and nutrients and in many cases out-competes native grasses and shrubs. As the more desirable grasses have declined, less desirable herbs and grasses such as cheat grass have proliferated.

The change in grazing vegetation and water availability brought on by western juniper encroachment has negatively impacted grazing lands and habitat available for livestock and wildlife. Both public and private land managers are beginning to actively seek solutions to improve the range conditions which include the removal of western juniper vegetation.

As noted below, western juniper vegetation is the dominant vegetation cover type on over 407,000 acres within the BVMA. Table 15 summarizes the three dominant vegetation cover types with western juniper as the third most prevalent, making up 10% of the vegetation cover within the BVMA.

Table 15. Vegetation Cover Types[11] Within the Warm Springs Market Area (Expressed in Acres and % of Total)

Veg Type	Conifer Forest	Shrub	Western Juniper	Other
Total Acres	1,952,622	1,322,382	407,763	436,541
% of Total	48%	33%	10%	9%

[11]Source: Fire and Resource Assessment Program – California Department of Forestry and Fire Protection.

Western Juniper Removal – Public Lands

Currently between 1,200 and 1,400 acres per year of western juniper vegetation type are treated on publicly managed lands (Klamath National Forest, Modoc National Forest and BLM – Alturas District) within the BVMA. Most of the treatments include removal of western juniper material. However, if western juniper treatment projects are located some distance from a road system or are located on steep (over 35% slope) topography, then the juniper is typically felled and left on site and/or treated using prescribed fire.

Many of the western juniper treatments on public lands that include western juniper removal are conducted using service contracts that range in cost from $130 to $300 per acre. Some of these treatments include the use of prescribed fire. Range conservationists tend to favor alternatives to the prescribed fire option for the following reasons:

- Fire is typically effective in the management of western juniper trees that are less than 6 feet in height. Much of the western juniper vegetation is over 6 feet in height.
- Fire tends to favor less desirable forage, such as cheat grass and rabbit brush.
- Negative impacts of smoke on surrounding communities.
- Liabilities of prescribed fire (potential for escape).

Discussions with contractors and fuels procurement managers operating within the BVMA indicate that the removal rate for western juniper treatment operations typically ranges from 4 BDT to 14 BDT per acre.

In order to estimate the volume of biomass currently available from western juniper removal activities on publicly managed lands within the BVMA, the following assumptions can be made:

- Average removal rate of 10 BDT per acre for biomass available from western juniper removal activities.
- Annual western juniper treatment in the near term is 90% of the average current treatment programs on public lands (1,200 acres * 0.90) = 1,080 acres.
- Treatments conducted on public lands within the BVMA are 80% of the acres treated annually (1,080 acres * 0.80) = 860 acres.

Then:

- At the 10 BDT per acre recovery, 8,600 BDT (10 BDT * 860 acres) are reasonably available as biomass fuel annually as a byproduct of western juniper removal activities on public lands within the BVMA.

Sagebrush Steppe Restoration Project

In recent years public land managers note that interest in the treatment of western juniper vegetation has increased as a result of concerns about the encroachment of this invasive vegetation and the negative impacts this encroachment has had on the Sagebrush Steppe ecosystem in the West. Modoc County, Modoc County Resource Advisory Committee, Modoc National Forest and the Bureau of Land Management/Northeastern California field office are working as a team to implement a management strategy to treat stands of western juniper. One of the primary objectives of this implementation strategy is to restore the sagebrush steppe ecosystems by thinning or removing western juniper vegetation.

The first action in the implementation of this strategy is the completion of the Sagebrush Steppe Restoration Environmental Impact Statement (see Appendix B for detailed overview). The study area for the Sagebrush Steppe EIS includes all of Modoc County and portions of Lassen, Shasta, and Siskiyou counties in California and Washoe County in Nevada. All told, this EIS addresses approximately 6.5 million acres in northeastern California and northwestern Nevada. This EIS is now being conducted with completion of the final EIS expected in March, 2007.[12]

The Sagebrush Steppe EIS will be utilized by public land managers to update and amend land and resource management plans to incorporate land allocations, management direction, desired future conditions, treatment areas, methodological priorities, conservation measures and an implementation schedule. Interviews with public land managers indicate an expectation that a restoration program will be implemented as a result of the EIS which will treat 30,000 to 50,000 acres per year. Implementation of the Sagebrush Steppe restoration strategy is expected to begin in 2008 with project layout and the start of project level National Environmental Policy Act (NEPA) assessments. Starting in 2009, project level treatments should begin in earnest with 30,000 to 50,000 acres/year of western juniper treatment. This program should generate a significant volume of western juniper material available for use as biomass fuel.

In order to estimate the volume of biomass potentially available starting in 2009 from western juniper removal activities on publicly-managed lands within the BVMA, the following assumptions can be made:

- Removal rate of 10 BDT per acre for biomass available from western juniper removal activities.
- Annual western juniper treatments beginning in 2009 are 40,000 acres on the Modoc National Forest and the BLM-Alturas Area District.
- Treatments conducted within the BVMA are 70% of the acres treated annually (40,000 acres * 0.70) = 28,000 acres.

Then:

[12] Per Rob Jeffers, Modoc National Forest.

- Assuming a 10 BDT per acre recovery, 280,000 BDT (10 BDT * 28,000 acres) are potentially available starting in 2009 as biomass fuel annually as a byproduct of western juniper removal activities on public lands within in the BVMA.

Western Juniper Removal – Private Lands

Private land managers, primarily range managers and foresters, are very interested in conducting western juniper removals to facilitate range and watershed improvement and restoration. Currently western juniper treatment activities on private lands within the BVMA are sporadic due to the relatively high cost to treat and remove this type of vegetation. In some cases federal subsidies have been available to offset a portion of the treatment costs. However, federal subsidies to support this work are inconsistent from year to year (depending upon federal appropriations). For the purpose of this study it was assumed that no federal fiscal support was available to treat western juniper on private lands within the BVMA.

Private land managers who were contacted expressed a definite interest in the implementation of western juniper removal and utilization projects as long as there was a local market for the biomass fuel that supported the full costs (harvest, collection, processing and transport) required to remove and transport the biomass to market. Interest in long-term (multiple year) commitments to deliver biomass fuel from western juniper removal operations was quite high.

Western juniper treatment and removal is currently being conducted on private lands within the BVMA. Because western juniper is not considered a commercial tree species by the California Board of Forestry, there are no regulatory requirements for private landowners or land managers to address when conducting western juniper treatment and removal activities. There is very little documentation available regarding acres of western juniper stands treated on an annual basis. However, discussions with chipping contractors and biomass fuel procurement managers operating within the BVMA indicate that approximately 140,000 BDT per year are currently being removed as biomass fuel.

Sawmill Residuals – Big Valley Power

The owners of Big Valley Power are planning to install recently purchased sawlog processing equipment (now stored on site adjacent to the BVP facility) to produce lumber products. Interviews with a BVP representative[13] indicate that the sawmill should be fully operational in 2007. On a one-shift basis, the sawmill is expected to produce approximately 20,000 BDT per year of sawmill residuals suitable for use as biomass fuel. Sawmill residuals were not considered in this resource study, so this volume of material – projected to be available commencing in 2007- was not included in the findings of this study.

[13]Brad Seaberg, Forester and Fuel Manager, Big Valley Power.

Current Competition – Biomass Fuel

Currently there are nine biomass power plants (not including BVP) competing for biomass fuel generated within the BVMA. There has been some interest from project development advocates regarding the potential for development of biomass power plants at Canby, California, Alturas, California and Lakeview, Oregon. Because these projects are only in the "discussion" phase, they are not specifically addressed in the competition review for this report.

Exhibit 1C provides a BVMA map showing market areas for biomass power plants that may access biomass fuel generated within the BVMA. Note that the BVMA boundary is highlighted in red.

Exhibit 1C. Biomass Fuel Resource Competition Within the Big Valley Market Area

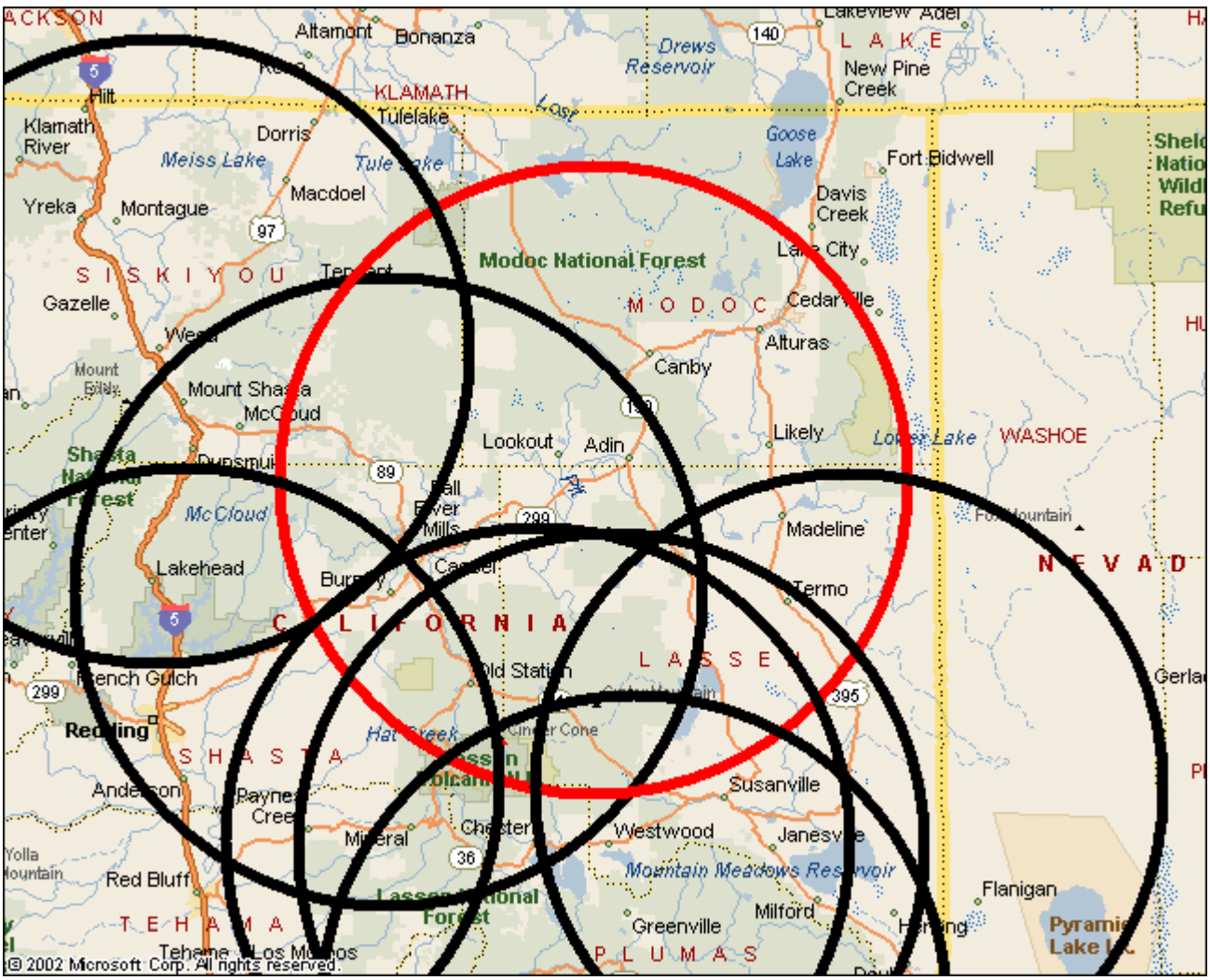


Table 16 provides a review of plant location, power capacity rating, fuel requirements, expected usage (after curtailment), transport distance from Bieber and an estimate of the biomass fuel that each facility is currently accessing from sources within the BVMA. The Roseburg Forest Products biomass plant is currently being retrofitted and is expected to generate 12 MW of power starting in late 2007. It was included in this current competition review. Utilizing geographic information provided in Exhibit 1C and market data from interviews with resource managers, foresters and sawmill managers, the volume of biomass fuel that all nine plants are accessing within the BVMA is approximately 465,000 BDT/year (see column seven of Table 16 below). Note that this total volume figure was adjusted to reflect the fact that some biomass power plants have "captive" supply sources (typically sawmills co-located on site) that are consistently available over time and reduce the amount of open market fuel purchases required.

Table 16. Competition For Biomass Fuel Within the Big Valley Market Area

Biomass Power Plant	Location	Rated Capacity (MW)	Total Fuel Requirements (BDT/Yr)	Total Fuel Requirements With Curtailments (BDT/Yr)	Transport Distance from Bieber	Competition within BVMA (BDT/Yr)
Burney Mtn Power	Burney, CA	10	100,000	80,000	37	60,000
Burney Forest Power	Burney, CA	32	240,000	240,000	39	100,000
Collins Pine	Chester, CA	12	110,000	110,000	109	25,000
HL Power	Wendel, CA	32	240,000	150,000	99	100,000
Mt Lassen Power	Westwood, CA	10	100,000	100,000	97	40,000
Roseburg FP (on line in late 2007)	Weed, CA	12	110,000	110,000	85	10,000
Sierra Pacific Industries	Burney, CA	20	160,000	160,000	38	60,000
Sierra Pacific Industries	Quincy, CA	14	112,000	112,000	141	30,000
Wheelabrator	Anderson, CA	50	400,000	400,000	101	40,000
Totals			**1,572,000**	**1,462,000**		**465,000**

Time of Year Availability – Biomass Fuel

Interviews conducted with biomass fuel processing contractors and resource managers operating within the BVMA indicate that harvesting operations are conducted on a

seasonal basis, depending upon weather conditions. Biomass sourced from forest fuels treatment activities, timber harvesting and western juniper removals is typically available May through October. Of primary concern is potential damage to the soil resource from mechanical equipment operating in damp weather conditions when soils are most vulnerable to compaction and other disturbance. Occasionally winter operations are conducted if a "hard freeze" occurs that renders the soil in a hardened condition which allows mechanical harvest, collection, processing and transport.

When operating within sensitive wildlife habitat, a "limited operating period" may be enforced (primarily on public lands) that, as the term implies, limits the time of year when fuels treatment or timber harvesting might occur.

During extended periods of warm weather, operations may be limited due to concerns regarding the potential to ignite fires with mechanical harvesting equipment. Exceptionally dry conditions may require that operations be limited to times of the day when humidity and temperature mitigate the potential for ignition, such as early morning to early afternoon. However, if dry conditions persist, operations may be suspended for days.

Cost Estimates – Harvest and Transport – Biomass Fuel

To better understand the potential cost of biomass fuel delivered to a biomass power plant, the full costs of harvest, collection, processing and transport must be assessed. Interviews were conducted with biomass fuel processing contractors and foresters regarding the costs of harvest, collection, processing and transport. The findings are presented in a low and high range due to the number of variables that can impact costs of operation including:

- Haul distance to facility.
- Vegetation type and density.
- Cost of diesel.
- Cost of labor.
- Road improvement and maintenance.
- Time of year delivery.

Outlined below is the range of costs:

Table 17. Collection, Processing and Transport Costs For Biomass Sourced from Forest and Western Juniper Operations in the Big Valley Market Area (Expressed as $/BDT)

Operation	Low Estimate	High Estimate
Forest residues - logging	$30	$33
Fuels treatment/forest restoration	$44	$51
Western juniper removal	$44	$63

Note that the transport costs used to generate the low and high estimates in Table 17 assumed an average one-way haul distance of 30 miles (60 miles round trip).

SAWLOG RESOURCE AVAILABILITY

In December, 2005, TSS conducted a sawlog resource availability study of the BVMA. The primary objective of the study was to determine the volume of sawlogs that are reasonably available (economically and environmentally sustainable) for a sawmill located at Bieber, California.

As noted earlier in this report, the dominant vegetation cover type within the BVMA is coniferous forest. Table 18 summarizes conifer forest vegetation cover type and ownership within the BVMA.

Table 18. Conifer Forest Vegetation Cover Types by Ownership Within the Big Valley Market Area (Expressed in Acres and % of Total Vegetation Cover Type)

Ownership Class	Private	USFS	BLM	State	Other
Conifer Forest – Acres	758,631	1,148,264	38,719	6,499	509
Conifer Forest – Acres % of Veg. Type	39%	59%	2%	Min.	Min.

Historically, timber harvests within the BVMA (and Northern California) have fluctuated significantly over time. As presented earlier in this report, the California Board of Equalization maintains records for timber harvested on both private and public lands. Based upon this information (see Table 11) and from interviews with public and private land managers, sawlog availability was estimated to be approximately 200 MMBF per year from harvesting operations within the BVMA. From the interviews and historical data (see Table 12) it is anticipated that in the near term, public lands will produce approximately 12% of the sawlogs available with private lands providing the balance at 88% of total.

Table 19 summarizes projected annual sawlog outputs within the BVMA.

Table 19. Projected Annual Sawlog Outputs by Ownership Within the Big Valley Market Area
(Expressed in MBF and % of Total Sawlog Harvest)

Ownership Class	Private	Public	Total
Sawlogs Harvested - MBF	176,000	24,000	200,000
Sawlogs Harvested - % of Total	88%	12%	

Current Competition – Sawlogs

Currently there are a total of ten commercial scale sawmills and veneer plants competing for sawlogs generated within the BVMA.

Exhibit 1D provides a BVMA map showing market areas for sawmill and veneer plants that may access sawlogs generated within the BVMA. Note that the BVMA boundary is highlighted in red.

Exhibit 1D. Sawlog Resource Competition Within the Big Valley Market Area

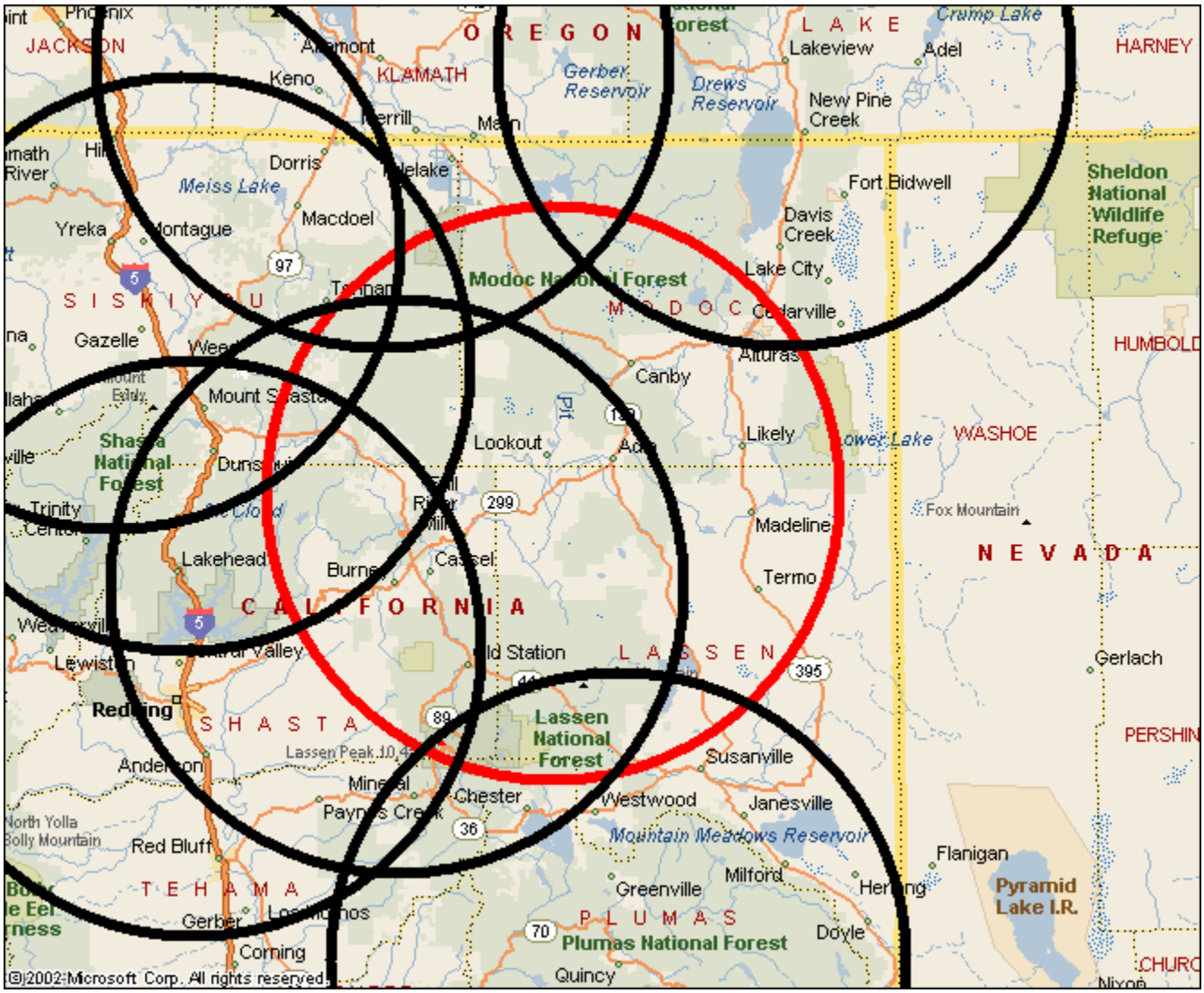


Table 20 provides a review of sawmill and veneer plant location, approximate sawlog requirements,[14] transport distance from Bieber and an estimate of the sawlog resource that each facility is currently accessing from sources within the BVMA.

Table 20. Competition For Sawlogs Within the Big Valley Market Area

Sawmill or Veneer Plant	Location	Sawlog Usage (MBF/Yr)	Transport Distance from Bieber	Competition within BVMA (MBF/Yr)
Collins Pine	Chester, CA	80,000	109	13,000
Columbia Plywood	Klamath Falls, OR	80,000	95	18,000
Fremont Sawmills	Lakeview, OR	25,000	106	10,000
Roseburg Forest Products	Weed, CA	70,000	85	18,000
Shasta Green	Burney, CA	40,000	39	24,000
Sierra Pacific Industries	Burney, CA	80,000	38	36,000
Sierra Pacific Industries	Central Valley, CA	53,000	95	3,000
Sierra Pacific Industries	Quincy, CA	150,000	141	16,000
Thomas Lumber	Klamath Falls, OR	50,000	96	16,000
Timber Products	Yreka, CA	70,000	10	14,000
Totals		**698,000**		**168,000**

Time of Year Availability – Sawlogs

The time of year availability for sawlogs is similar to that of biomass fuel within the BVMA. Harvesting operations are conducted on a seasonal basis primarily dependent upon weather conditions. Sawlogs sourced from timber harvesting are typically available May through October. Of primary concern is potential damage to the soil resource from mechanical equipment operating in damp weather conditions when soils are most vulnerable to compaction and other disturbance. Occasionally winter operations are conducted if a "hard freeze" occurs that renders the soil in a hardened condition which allows sawlog harvest, collection, processing and transport.

When operating within sensitive wildlife habitat, a "limited operating period" may be enforced (primarily on public lands) that, as the term implies, limits the time of year when timber harvesting might occur.

[14]Based on interviews with resource managers and log buyers.

Time of year availability for sawlogs from harvesting operations has constraints similar to those of biomass removal, i.e., during extended periods of warm weather, operations may be limited due to concerns regarding the potential to ignite fires with mechanical harvesting equipment. Exceptionally dry conditions may require that operations be limited to times of the day when humidity and temperature mitigate the potential for ignition, such as early morning to early afternoon. However, if dry conditions persist, operations may be suspended for days.

Cost Estimates – Harvest and Transport – Sawlogs

To better understand the potential cost of sawlogs delivered to a sawmill, the full costs of harvest, collection, processing and transport must be assessed. Interviews were conducted with timber harvesting contractors and foresters regarding the costs of harvest, collection, and processing using a conventional mix of mechanical, ground-based equipment (tractor logging) for the harvesting of sawlogs. The findings are presented in a low and high range due to the number of variables (similar to those noted earlier in this report regarding the costs for the removal of biomass fuel) that can impact costs of operation including:

- Haul distance to facility.
- Vegetation type and density.
- Cost of diesel.
- Cost of labor.
- Road improvement and maintenance.
- Time of year delivery.

Outlined below is the range of costs:

Table 21. Collection, Processing and Transport Costs For Ground-Based Sawlog Removal Operations Within the Big Valley Market Area (Expressed as $/GT and $/MBF)

Operation	Low Estimate	High Estimate
Timber harvest	$28/GT	$45/GT
Timber harvest	$196/MBF	$315/MBF

Note that the transport costs used to generate the low and high estimates in Table 21 assume an average one-way haul distance of 30 miles (60 miles round trip), that one load of sawlogs averages 3.5 MBF, and that 1 MBF weighs in at 7 green tons (GT).

Appendix A. Report on Community Participation in the Formulation of a Stewardship Project

BIG VALLEY FOREST PRODUCTION AND STEWARDSHIP STUDY

Report on Community Participation in the Formulation of a Stewardship project

June 1, 2005

Prepared for:

Superior California Economic Development District
Attention: Robert Nash, CEO
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BIG VALLEY FOREST PRODUCTION AND STEWARDSHIP STUDY

Executive Summary

TSS Consultants (TSS) was retained by the Superior California Economic Development District (SCEDD) to complete two tasks as part of the Big Valley Production and Stewardship Study:

1. Facilitate discussions with community members in the Big Valley region of northern California. Primary objective of these discussions is the development of a stewardship project in the greater Big Valley area.

2. Conduct a forest resource availability study for the Big Valley area.

This report provides the results of task #1.

Consistent with the stewardship project development objectives of this study, two public meetings were conducted in Bieber, California and were coordinated by TSS:

- January 10, 2005 – Introduction of stewardship concept/opportunities. Formation of the Big Valley Stewardship Group.

- January 31, 2005 – Review specifics of a stewardship project application and secure volunteers from the Big Valley Stewardship Group to form a contract subcommittee.

At the request of the Big Valley Stewardship Group and contract subcommittee, TSS generated the initial draft of a stewardship contracting proposal application which is attached as Exhibit F. The draft application was reviewed and approved for submittal to the Regional Forester, Region 5, USDA Forest Service. The Rush I Vegetation Treatment stewardship application was accepted by the Regional Forester in late March, 2005.

Community Meetings

As noted above, TSS organized and participated in two meetings with the Big Valley community and local resource management agencies. The first meeting was held the evening of January 10, 2005. TSS Consultants coordinated with Jim Kilcrease, Big Valley Chamber of Commerce representative and Laurence Crabtree, Ranger, Big Valley Ranger District to set the agenda as well as provide suggestions on a participant invitation list. Arrangements were made to hold the meeting at Veterans Memorial Hall in Bieber. TSS contacted local newspapers (Modoc County Record, Intermountain News, Mountain Echo) to publish community service announcements targeting communities in the greater Big Valley region.

Jim Kilcrease and Laurence Crabtree also made contact with community stakeholders to provide notification regarding the January 10 meeting.

At the initial community meeting, Tad Mason (TSS) and Bill Wickman (subcontractor to TSS) provided the meeting participants with an overview of the enabling legislation, Section 323 of Public Law 108-7, setting policies that federal land management agencies now use to facilitate stewardship projects. It is important to note that PL 108-7 requires stewardship projects be designed utilizing input from local communities. The January 10 meeting at Bieber was the beginning of community discussion on stewardship projects that might be considered for the Big Valley Federal Sustained Yield Unit on the Modoc National Forest. The agenda for this meeting is attached as Exhibit A. There were approximately 40 participants in attendance (see Exhibit B for the meeting sign-in sheet).

At the close of the January 10 meeting, participants asked that TSS support the stewardship project efforts by facilitating more discussions and meetings within the Big Valley community. As a result of this request a subsequent meeting was set and organized for January 31, 2005. TSS again contacted local newspapers to announce the second meeting of the Big Valley Stewardship Group. Jim Kilcrease, on behalf of the Big Valley Chamber of Commerce, issued invitations to meeting participants within the community.

During the January 31 meeting, Tad Mason and Bill Wickman reviewed stewardship project examples and opportunities for the Big Valley Stewardship Group. They facilitated the group's selection of leaders and a committee to proceed with collaborative discussions regarding stewardship projects in the Big Valley region. The meeting agenda is attached as Exhibit C. In addition, a review of the USDA Forest Service Region 5 stewardship contract proposal application was conducted using an existing project as an example. The group agreed to proceed with the Rush 1 project for submittal as an application to the Regional Forester. A contract subcommittee was formed and the group requested that TSS provide them with the initial draft of the stewardship project application. The contract subcommittee members are listed in Exhibit E.

On February 4, TSS Consultants provided the Big Valley Stewardship Group and contract subcommittee with the draft stewardship application for review and edification. On February 7, the subcommittee met and reviewed the application. Utilizing the subcommittee's comments and suggested edits, TSS generated a final draft for submittal to Laurence Crabtree and Jack Blackwell, Regional Forester. The Rush 1 stewardship contract proposal application was subsequently approved by Mr. Blackwell in late March. The stewardship contract proposal application is attached as Exhibit F.

Suggested Plan of Work

TSS proposes that during the next few months, the Big Valley Stewardship Group consider the following tasks as part of a plan of work to facilitate a focused collaborative group and a positive working relation with the Forest Service on the Rush 1 stewardship project as well as future stewardship projects.

1. The Big Valley Stewardship Group should continue working with the Forest Service to develop a stewardship contract for the Rush 1 project.
2. The group should continue to meet to collaboratively work on locations and types of resource management projects they feel should be prioritized for implementation using retained receipts from the Rush 1 project.
3. The group should consider reviewing with the Forest Service recent assessments conducted on the Modoc National Forest (for example, Fireshed Assessment) that are used as planning tools by the agency to actively manage resources on a landscape scale.
4. As part of the next planned community meeting, group exercises should be utilized to help facilitate common goals.

   Exercise One: Have the group discuss strategies for avoiding pitfalls that might stifle progress, as follows:

   Ways to avoid common pitfalls that hinder collaboration (2 minutes).
   Review one-on-one within the group (3 minutes).
   Report to the full group (5 minutes).

   Examples to avoid pitfalls:

   - Assure a feedback loop.
   - Make frequent check-ins.
   - Assess individual levels of comfort.
   - Provide updates at beginning of meetings.
   - Consider hiring a professional facilitator.
   - Develop projects in a visual way so that all can grasp complex issues.
   - Identify community leaders.
   - Keep open minds and have active listening.
   - Know organizational goals and limits.
   - Share organization plans.
   - Provide some meeting structure.

   Exercise Two: To address "vision of stewardship," each person should provide a statement to the following topic headings:

   - Expectations and scope/size
   - Potential activities
   - Timeframes
   - Level of community/agency involvement
   - Vision of success (describe success)

After each person has reported, develop common themes from visioning.

Following the exercises, it is suggested that the group leaders set a meeting schedule to ensure that stewardship projects are kept on track. Common areas of collaboration when developing stewardship projects are:

- Project goals and project selection.
- Contract goals and objectives.
- Use of retained receipts.
- Traditional ecological knowledge.
- Improving resource utilization.
- Multi-party monitoring.
- Communications and outreach to the community.
- Others – as specified by the group.

Observations

Through these initial efforts, the Big Valley community has developed a broad-based interest group as well as a solid leadership core. Working as a team, providing input to the Forest Service, they are very focused on the objectives they intend to accomplish.

Conclusions

It is important that the Big Valley Stewardship Group maintain the momentum they have developed by organizing a regular meeting schedule with the Forest Service. It is recommended that the Forest Service provide information to the group periodically on the Big Valley Ranger District Program of Work. The Forest Service is the lead organization relative to the development and implementation of stewardship projects. The Big Valley Stewardship Group would provide input into project selection, timing and design in support of sustainable forest/range health improvement/fuels treatment projects that meet the Big Valley community's goals and objectives.

Summary of Exhibits

- Exhibit A: January 10, 2005 Meeting Agenda
- Exhibit B: January 10, 2005 Meeting Sign-In Sheet
- Exhibit C: January 31, 2005 Meeting Agenda
- Exhibit D: January 31, 2005 Meeting Sign-In Sheet
- Exhibit E: Big Valley Stewardship Group Contract Sub-Committee
- Exhibit F: Rush I Vegetation Treatment Stewardship Contracting Proposal Application

EXHIBIT A

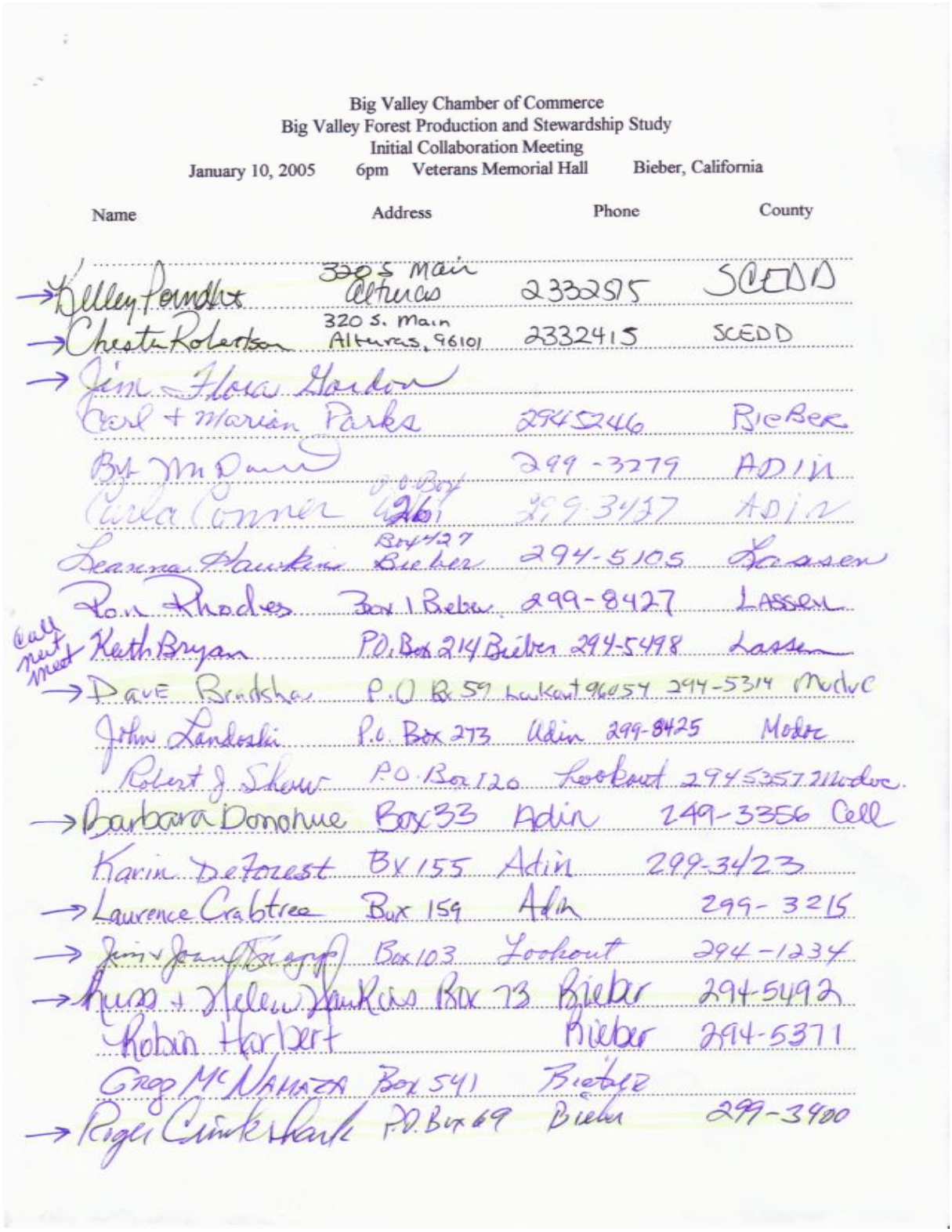
Big Valley Forest Production and Stewardship Study
Initial Collaboration Meeting, 6 PM, January 10, 2005
Veterans Memorial Hall, Bieber, CA
Hosted by the Big Valley Chamber of Commerce

Time	Topic	Presenter(s)
10 Min	Welcome and Introductions	Jim Kilcrease, Big Valley Chamber of Commerce
5 Min	Overview of BV Forest Production and Stewardship Study	Bob Nash, Ex Dir, Superior California Economic Development District Tad Mason, Forester, TSS Consultants
10 Min	Big Valley Power LLC – Project Update	Glenn Zane, Brad Seaberg, Big Valley Power LLC
15 Min	Review USDA Forest Service Plan of Work on the Big Valley Sustained Yield Unit	Laurence Crabtree, Ranger, Big Valley Ranger District
30 Min	Introduction to Stewardship Legislation and Stewardship Projects	Bill Wickman, Stewardship Specialist
20 Min	Discuss Group Collaboration	Bill Wickman
10 Min	BREAK	Refreshments provided by Big Valley Chamber of Commerce
15 Min	Discuss Project Timelines	Bill Wickman
30 Min	Group Discussion of Potential Projects	Bill Wickman, Tad Mason
15 Min	Form Stewardship Work Group*	Jim Kilcrease and Group
10 Min	Work Group - Future Meeting	Group

* The goal of this stewardship group is to work as a liaison between USFS and small contractors for projects in the Big Valley Sustained Yield Unit.

EXHIBIT B

January 10, Meeting Sign-In Sheet



Big Valley Chamber of Commerce
Big Valley Forest Production and Stewardship Study
Initial Collaboration Meeting
January 10, 2005 6pm Veterans Memorial Hall Bieber, California

Name	Address	Phone	County
Kelley Pendlx	320 S. Main Alturas	2332915	SCEDD
Chester Roberson	320 S. Main Alturas, 96101	2332415	SCEDD
Jim + Flora Gordon			
Earl + Marian Parks		2945246	Bieber
Bob McDaniel		299-3279	Adin
Linda Conner	PO Box 261	299-3437	Adin
Deanna Hawkins	Box 427 Bieber	294-5105	Lassen
Ron Rhodes	Box 1 Bieber	299-8427	Lassen
Keith Bryan (call next meet)	P.O. Box 214 Bieber	294-5498	Lassen
Dave Bradshaw	P.O Box 59 Lookout 96054	294-5314	Modoc
John Landeskin	P.O. Box 273 Adin	299-8425	Modoc
Robert J. Skeen	P.O. Box 120 Lookout	2945357	Modoc
Barbara Donohue	Box 33 Adin	249-3356	Cell
Karin DeForest	Box 155 Adin	299-3423	
Laurence Crabtree	Box 159 Adin	299-3215	
Jim + Jan [illegible]	Box 103 Lookout	294-1234	
Russ + Helen Hawkins	Box 73 Bieber	294-5492	
Robin Herbert		Bieber	294-5371
Greg McNamara	Box 541	Bieber	
Roger Cinkham	P.O. Box 69	Bieber	299-3400

EXHIBIT C

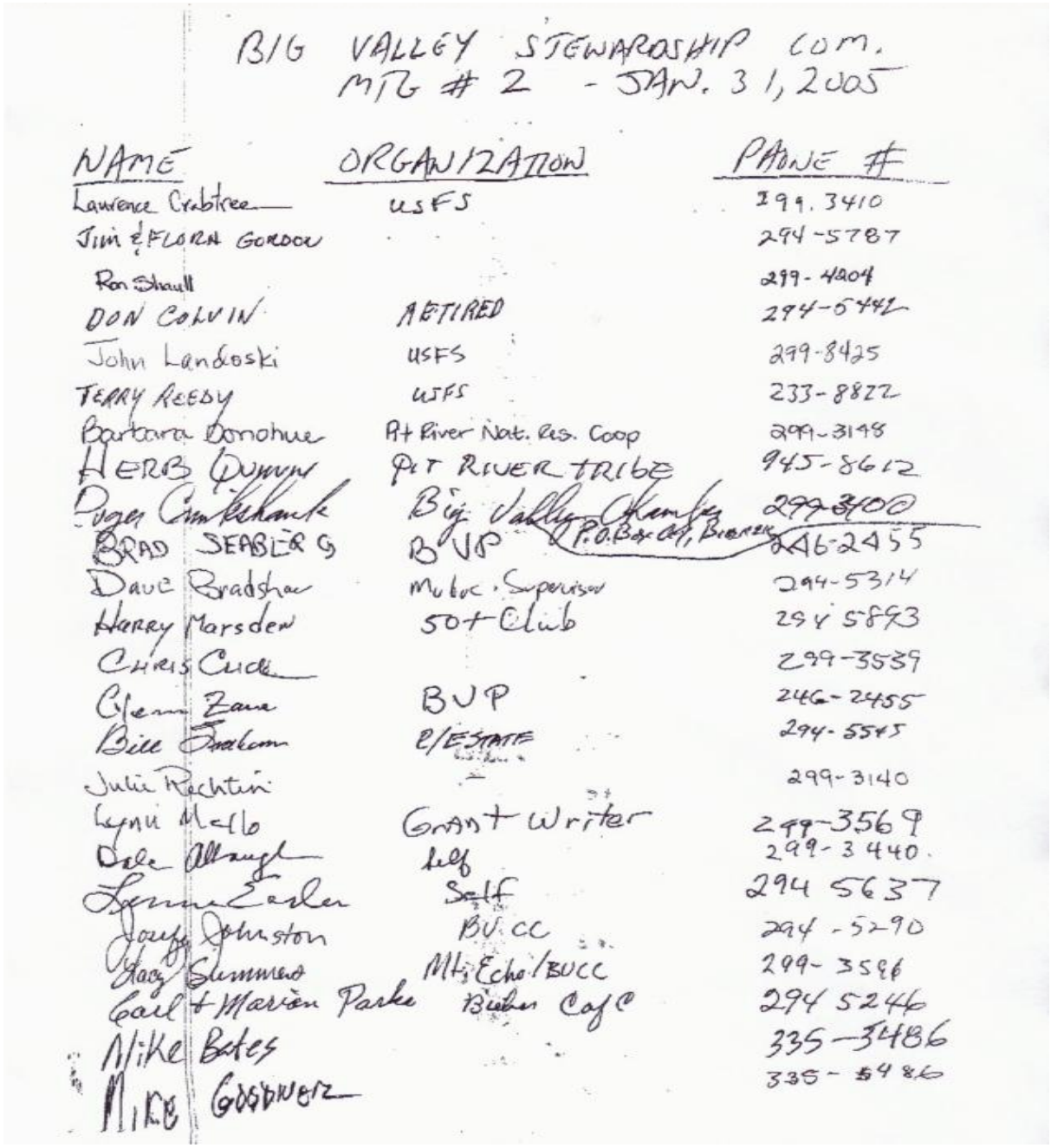
Big Valley Forest Production and Stewardship Study - Collaboration Meeting,
6 PM, January 31, 2005
Veterans Memorial Hall, Bieber, CA

Hosted by the Big Valley Chamber of Commerce

Time	Topic	Presenter(s)
10 Min.	Welcome and Introductions, Review Agenda	Jim Kilcrease and Tad Mason, Forester, TSS Consultants
20 Min	Review of BV Stewardship Opportunities; **A.** Basic overview. **B.** False expectations – what a stewardship project is not. **C.** Differences between stewardship projects and efforts underway by the Modoc Fire Safe Council.	Bill Wickman, Stewardship Specialist Tad Mason
30 Min	Review and discuss Rush 1 as a stewardship project	Laurence Crabtree, Ranger, Big Valley Ranger District
20 Min	Discuss R5 Stewardship Application and process going forward	Bill Wickman
10 Min	BREAK	
30 Min	Group Discussion of Other Potential Projects A. What other projects might be considered as potential stewardship projects? B. How do we go forward.	Laurence Crabtree, assisted by Bill Wickman, Tad Mason, Jim Kilcrease
10 Min	Consider Stewardship Committee – Select Chair, Future Meetings, Agenda's and False Expectations	Group

EXHIBIT D

January 31, Meeting Sign-In Sheet



BIG VALLEY STEWARDSHIP COM.
MTG # 2 - JAN. 31, 2005

NAME	ORGANIZATION	PHONE #
Lawrence Crabtree	USFS	299.3410
Jim & FLORA GORDON		294-5787
Ron Shaull		299-4204
DON COLVIN	RETIRED	294-5442
John Landoski	USFS	299-8425
TERRY REEDY	USFS	233-8822
Barbara Donohue	Pit River Nat. Res. Coop	299-3148
HERB QUINN	PIT RIVER TRIBE	945-8612
Roger Crutchfield	Big Valley Grange P.O.Box 69, Bieber	299-3400
BRAD SEABERG	BVP	246-2455
Dave Bradshaw	Mu Doc. Supervisor	294-5314
Harry Marsden	50+ Club	294 5893
Chris Cuda		299-3539
Glenn Zane	BVP	246-2455
Bill Thalacker	R/ESTATE	294-5545
Julie Rechtin		299-3140
Lynn Mello	Grant Writer	299-3569
Dale Allaugh	Self	299-3440
Lynne Eesler	Self	294 5637
Jerry Johnston	BV CC	294-5290
Tracy Stummer	Mt. Echo/BVCC	299-3596
Earl & Marion Parker	Bieber Cafe	294 5246
Mike Bates		335-3486
MIKE GOODWIN		335-5486

EXHIBIT E

BIG VALLEY STEWARDSHIP GROUP
Contract Committee

Name and Address	Phone, Cell, Fax and E-mail
Jim Kilcrease P.O.Box 351 Bieber, Ca. 96009	Home 530-294-5613 Cell 530-949-9458 Bev49@frontiernet.net
Buck Parks P.O.Box 210 Adin, Ca. 96006	Home 530-299-3178
Chris Click	Home 530-299-3178
Mike Goodwen	Home 530-335-5486 crc@citlink.net
Jim Gordon P.O.Box 275 Bieber, Ca. 96009	Home 530-294-5787 Fax 530-294-5859 fireline@hdo.net
Roger Cruikshank P.O.Box 69 Bieber, Ca. 96009	Home 530-299-3400
Brad Seaberg 1615 Continental Str., Ste.100 Redding, Ca. 96001-1134	Home 530-246-2455 Cell 530-515-7007 Fax 530-246-7008 bseaberg@crsinet.com
Brian Dahle P.O.Box 100 Bieber, Ca. 96009	Home 530-299-3223 Cell 530-251-3888
David Bradshaw P.O.Box 59 Lookout, Ca. 96954	Home 530-294-5314
Russ Hawkins P.O.Box 73 Bieber, Ca. 96009	Home 530-294-5492 Cell 530-298-1204 delcorp@hdo.net

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EXHIBIT F

USDA Forest Service
Stewardship Contracting Proposal

Project Name:	**Rush 1 Vegetation Treatment**
Region:	**05**
Forest:	**Modoc**
Ranger District:	Big Valley

Primary Forest Service Contact

Name:	**Laurence Crabtree**
Title:	District Ranger
Address:	P.O. Box 159, Adin, California, 96006
Phone:	(530) 299-3215
Email:	lcrabtree@fs.fed.us

A.1 Project Summary/Objectives:

The National Fire Plan (2002) and Healthy Forest Restoration Act (2004) provide direction to reduce fuel loadings in fire-prone forests to protect people and sustain resources. Concurrent with these initiatives, the Pacific Southwest Region of the Forest Service has launched the "Forests with a Future" campaign (2004) to emphasize the protection of communities, old growth trees, and wildlife in the Sierra Nevada from the risk of catastrophic wildfires. The wildland-urban interface (WUI), areas where threats to high value assets (homes and communities) are the greatest are considered high priority areas for treatment. The Rush Creek community was included in a national list of urban-interface communities that are at high-risk from wildfire.

The topography, access, and weather patterns in the Rush Creek area dictate that primary fire suppression efforts, in the event of a large wildfire, would be along the major ridges and roads. These are the areas where it is critical to thin stands and reduce unnatural concentrations of forest fuel. While fuel treatments do not "fire proof" an area, strategically placed treatments can manipulate stand structure and reduce surface fuels, the two factors that contribute most to high-intensity, destructive fires.

The Rush 1 Vegetation Treatment Project is located on the Big Valley Ranger District and is within the Big Valley Federal Sustained Yield Unit. This project is consistent with the goals and objectives of the Big Valley Federal Sustained Yield Unit. The Rush 1 project has also been designed to coordinate with treatments planned on privately owned lands. Some fuels treatments have already been accomplished on both private and public lands. The Rush1 Vegetation Treatment expands these treatments by treating along public/private boundaries.

Within the Rush 1 Vegetation Treatment planning area there are approximately 353 acres of wildlife habitat managed for the Northern Goshawk and old growth timber. Treatment of fuels within and adjacent to these critical wildlife habitats is important to reduce the potential of catastrophic wildfires impacting these areas.

The Rush 1 Vegetation Treatment planning area covers portions of 17 sub-watersheds. Vegetative cover is critical for maintaining the hydrological function of any watershed. A large, high intensity wildfire within the planning area would have severe impacts on water quality. Hill slope stability would likely be reduced, and short-term increases in turbidity from fine, suspended sediment would occur. Aquatic systems and habitat could be degraded temporarily. Water temperatures could increase in stream reaches where riparian vegetation mortality is high and tree canopy is consumed by fire.

There are approximately 3,500 acres to be treated on National Forest System (NFS) land with this project. About 2,540 acres would involve under-story thinning of small commercial size conifers, along with biomass removal and various other treatments identified in Section A.5. (below). Commercial timber removal from this project is anticipated to generate approximately 8 million board feet (8 MMBF) of sawlogs, with an estimated stumpage value of $960,000.

The stewardship contract would provide for fuels treatments as well as the under-story commercial thinning. Timber sale receipts resulting from the harvesting would be applied to fuels reduction treatments and other conservation activities (see paragraph A.5 below) within the Rush 1 Vegetation Treatment Project area. Biomass removal, hand/machine piling accumulated fuels, removing western

juniper, and other treatment activities would be accomplished through contractor "credits" accumulated from the timber sale harvesting.

The use of a stewardship contract would significantly improve the operational and administrative efficiency while accomplishing the purpose and need of the project since the prime contractor would cut and remove the biomass material concurrent with the sawlog harvesting operation. Biomass removal has sometimes been a separate treatment activity. Experience has shown that the operational efficiencies and administrative effectiveness from using one prime contractor to perform the stewardship project work is significant. A single entry, utilizing an integrated approach where commercial timber is removed and all related fuels treatment activities accomplished using the same contractor is known to minimize impacts to the forest resources while maximizing efficiencies.

A.2 Project Location:

The project area is located approximately 6 miles northeast of Adin, along the east and west side of State Highway 299, on NFS land. It is situated mainly in the Rush and Johnson Creek watersheds. These watersheds are intermixed with NFS lands, and private ownership.

The Rush 1 Vegetation Treatment Project units are strategically located in the WUI defense and threat zones. The fuels reduction treatment units cover one defense zone (about 115 acres) and two threat zones (for about 1,000 acres).

The legal description for the Rush 1 Vegetation Treatment Project is:

T.40N., R.10E., Sections 18, 19, and 30; and
T.41N., R.9E., Section 34.
T.40N., R.9E., Sections 1-4, 9-16, 21-28, 34, and 35; M.D.B. & M.

See the attached maps (2 pages) for more detailed information on the Rush 1 Vegetation Treatment Project.

A.3 Meeting Local and Rural Community Needs:

The Rush 1 Vegetation Treatment addresses management on NFS lands, however, it has been designed to coordinate with treatments planned on privately owned lands. As noted above - some treatments have already been accomplished on both private and public lands. The Rush 1 Vegetation Treatment Project expands these treatments by treating along public/private property boundaries. Protecting homes and private property meets the high priority needs of the local rural communities.

Through a stewardship contract, the Rush 1 Vegetation Treatment Project would create jobs for local timber workers. These workers live and recreate in the local communities. Not only would the commercial harvesting sustain and/or create new jobs but the integrated fuels treatment activities could provide additional local employment.

The existing 7 mega-watt power plant (Big Valley Power LLC) has been refurbished and is currently purchasing biomass fuel. The Rush 1 Vegetation Treatment Project could provide an additional source of biomass fuel. In addition, a small scale sawmill is planned within the boundary of the Sustained Yield Unit to start production and manufacturing of sawlogs from the area. This stewardship project as well as future projects will help assure that the biomass fuel and sawlog markets are again available locally.

A.4 Size of Project Area:

The Rush1 Vegetation Treatment addresses thinning, masticating, tractor piling, pile burning, and underburning of approximately 3,500 acres within the WUI area surrounding the Rush Creek community.

A.5 Proposed Activities or Conservation Work:

The following list represents the planned treatments for the project. Multiple treatments may occur on the same acre, thus acres of treatments exceeds the total project acres. Not all treatments would be included in the stewardship contract. Forest Service personnel would implement all prescribed fire projects including pile burning within their fuels program of work.

Treatments (approximate units of measure):

- Approximately 2,540 acres of under story thinning and biomass removal;
- 1,036 acres of post harvest machine piling;
- 580 acres of a combination of hand piling and machine piling;
- 480 acres of hand piling only:
- 199 acres of a combination of hand piling and mastication;
- 499 acres of a combination of machine piling and mastication:
- 399 acres of mastication;
- Approximately 1 mile of road construction
- 327 acres of cutting/removal junipers and various post harvest treatments

In addition to the treatments listed above, the scope of work for this stewardship project would include:

- A biological impact monitoring plan to assure that the project objectives have been met consistent with contract specifications.
- Noxious weed survey and mitigation plan.
- Communications plan that includes a significant public outreach component.

A.6 Authorities Being Used:

Authority	Mark if being Used
Goods for Services	**X**
Designation by Description or Prescription	**X**
Retention of Receipts	**X**
Best Value Contracting (required)	**X**
Multi-year Contracting	
Less than free and open competition *	
Non- USDA administration of timber sales	

*Will require special Regional Forester approval. Applicants will need to summarize why they need this authority.

A.7 Current Status:

The Rush 1 Vegetation Treatment Decision Memo was signed by Laurence Crabtree, District Ranger on September 30, 2004. Currently the District is working with the Big Valley communities to determine what work to include in the Stewardship contract. The Request for Proposals for this Stewardship Project is planned to be distributed sometime in late summer, 2005. Award of the contract to the successful contractor is expected to take place in early fall, 2005.

Details of the collaboration for this project are described below, in B.2.

B.1 Project Funding

Forest Service Appropriations (available for the contract)	0
Cooperator Contributions	
In-cash	0
Donated Services	0
Other (*specify*)	0
What is the estimated value of the goods being exchanged:	$960,000
What is the estimated cost of the conservation activities:	$785,000

All net receipts generated from this project will be retained for future stewardship projects on the Big Valley Federal Sustained Yield Unit.

B.2 Collaboration

A proposal for the Rush 1 Vegetation Treatment planning effort has been listed in the Schedule of Proposed Actions. The agency held a public meeting on January 28, 2004, and invited residents of the Rush Creek community, and local and state fire protection agencies, to cooperatively develop the proposed action. The attendees suggested activities that they felt could accomplish goals outlined in the Healthy Forest Restoration Act and National Fire Plan. Those in attendance were supportive of activities that were suggested.

On March 15, 2004, the Rush 1 Vegetation Treatment planning effort was presented to the Pit River Tribal Council at the quarterly consultation meeting. The Council identified issues that were later reviewed and discussed at a separate meeting held on March 26, 2004, at the Big Valley Ranger District.

The proposal was also provided to the public and other agencies for comment during a scoping period that lasted from June 1 through June 30, 2004. Four comments were received noting general

agreement with the proposed action: two of the four stated the thinning activities could allow them to work closer to home; one remarked that the visual impacts of prescribed underburning could reduce private property values; and another noted environmental concerns. A review of the comments indicated that no significant issues were identified.

A separate scoping letter was sent to the Pit River Tribe during the same time period. The Atwamsini Band Head noted their support for the fuel reduction objectives of the planning area and planned project activities. They emphasized the tribes' interest in employment opportunities that could result from treating the area.

Finally, a conference call with members of the Sierra Nevada Forest Protection Campaign occurred on July 26, 2004. The representatives discussed issues, requested information and generally agreed with the type of proposed activities.

On January 10, 2005, the Big Valley Chamber of Commerce hosted a public meeting to inform the Big Valley community groups about stewardship contracting as well as review with the Forest Service the potential current and future projects within the Big Valley Federal Sustained Yield Unit. TSS Consultants, under contract to the Superior California Economic Development District assisted with the stewardship project implementation overview and helped to facilitate discussions with the meeting participants. There were approximately 50 participants ¢ all local to the Big Valley area. SCEDD has a grant with the Forest Service as well as Lassen County to assist the communities and agency in working together in a collaborative manner to move forward with projects to re-establish jobs and markets within the sustained yield unit. Due to the community interest in support of a stewardship project in the Big Valley area a second community meeting was held on January 31, 2005, with approximately 40 community members (many new from the January 10th meeting) and the agency. Again, hosted by the Big Valley Chamber of Commerce, with assistance from TSS Consultants, the meeting participants expressed widespread support for designation of the Rush 1 Vegetation Treatment Project as a stewardship project.

B.3 Type of Contract*: Please select the contract type (i.e., Integrated Resource Contract (service contract) or Integrated Resource Contract (timber sale).*

☐ Integrated Resource Contract—Service Contract (currently limited to 1000 CCF of sawlog volume)

☒ Integrated Resource Contract—Timber Sale

Contract Length 3 years Years (*maximum permissible is 10 years*)

SIGNATURE AND CONCURRENCE:

Prepared By:

Big Valley Stewardship Collaboration Committee	Spokesperson	
Signature	Title	Date

District Ranger Concurrence

Signature	Date

Forest Supervisor Concurrence
Stan Silva

Signature	Date

Regional Stewardship Coordinator Concurrence

Signature	Date

Director of Forest Management Concurrence

Signature	Date

Director of Acquisition Mgmt Concurrence

Signature	Date

Regional Forester Approval:

Signature	Date

Appendix B. Sagebrush Steppe EIS - Overview[15]

RESTORATION OF THE SAGEBRUSH STEPPE AND ASSOCIATED ECOSYSTEMS IN NORTHEAST CALIFORNIA AND NORTHWEST NEVADA THROUGH IMPROVED WESTERN JUNIPER AND OTHER RESOURCE MANAGEMENT

Background

Sagebrush steppe ecosystems are high in biodiversity and extremely productive. These vegetation communities support a number of key wildlife species including sage-grouse, mule deer, pygmy rabbits, pronghorn, and burrowing owls. They are also an important component of Native American and Western culture.

Today, these ecosystems in northeast California and northwest Nevada are threatened by rapidly expanding western juniper. Restoration will benefit the habitats of sage obligate species, stabilize and improve hydrologic conditions, enhance the forage base for wildlife and domestic animals, and tap into a source of renewable energy.

The Bureau of Land Management's Northeastern California field offices and the Modoc National Forest are working together to develop and implement a management strategy to thin or remove heavy stands of juniper and to slow continuing encroachment in order to restore the sage steppe ecosystem on public and National Forest lands. Modoc County and the Modoc County Resource Advisory Committee head up an association of approximately 40 local, regional and statewide groups and agencies involved with the initiative.

Project Location

The project encompasses approximately 6.5 million acres in northeastern California and northwestern Nevada. This analysis area embraces the county of Modoc and includes portions of Lassen, Shasta, and Siskiyou counties in California and Washoe County, Nevada (see Figure 1).

Purpose and Need for the Project

Over the past 100 to 150 years, western juniper has increased approximately 15 fold in the 6.5 million acre analysis area. This expansion of western juniper is largely attributed to the removal of fire from the ecosystem. Computer modeling based on soil types and validated by state mapping of juniper coverage in 1887 indicated the presence of approximately 196,000 acres of juniper in the analysis area while digital mapping,

[15]Provided courtesy of the USFS – Modoc National Forest.

completed in 2002, depicted juniper occurrence on approximately 3 million acres (see Figures 1 and 2).

This conversion of the sagebrush ecosystem to a predominantly juniper woodland type has resulted in a dramatic loss of biodiversity on the landscape, severely diminished habitat values (particularly for sage obligate species), and substantially degraded the hydrologic conditions on many watersheds.

This pervasive loss of the sagebrush ecosystem and its attendant vegetative, habitat, and hydrologic values, represents a compelling need for management action.

The purpose of this project is to develop and institutionalize a juniper management strategy for public lands and National Forest System Lands encompassed by the 6.5 million acre analysis area in order to restore the sagebrush ecosystem and associated vegetative communities to desired habitat conditions existing historically.

More specifically the strategy seeks, through improved juniper management, to restore sagebrush ecosystem vegetation composition, structure, function and distribution to historic configurations, such that historic fire return intervals can be sustained.

Additional objectives include improving watershed function and condition, managing fuels to conform with the National Fire Plan requirements, and implementing, where appropriate, national renewable energy direction.

Proposed Action

Federal managers of the Forest Service and the Bureau of Land Management propose to amend their respective land management plans to incorporate the land allocations, management direction, desired future conditions, treatment areas, methodological priorities, conservation measures and implementation schedule derived from the Sagebrush-Steppe Restoration Strategy.

For the Forest Service, this means amending the Modoc National Forest Land and Resource Management Plan. It is also anticipated that the Lassen, Shasta Trinity and Klamath National Forests will choose to amend their Land and Resource Management Plans based on this analysis, as appropriate. The Alturas Field Office of the Bureau of Land Management will amend its Resource Management Plan to reflect the restoration strategy. It is anticipated that the Eagle Lake and Surprise Field Offices will also amend their plans.

The objective this strategy is to implement an integrated management approach to reduce the current level of western juniper encroachment across a 6.5 million acre planning area in an environmentally sensitive manner. Primary methods to be employed for western juniper reduction include fire treatment, mechanical treatment and hand treatment. Using this integrated approach, managers hope to treat 30,000 to 50,000 acres per year across all jurisdictions within the planning area.

Once the western juniper canopy cover has been reduced on various range sites, maintenance of desired future conditions is the goal of the proposed action. Key representative range sites to be treated and desired future conditions include:

> **Loamy 14-16"** 50% grasses such as Idaho fescue, bluebunch wheatgrass, and Nevada bluegrass; 10% forbs such as mulesear, buckwheat and lupine; and 40% shrubs such as mountain big sagebrush, bitterbrush and mountain mahogany.
>
> **Shallow Loam 14"+** 30% grasses such as needlegrass, bluegrass and bluebunch wheatgrass, 20% forbs such as hawksbeard, lupine and yarrow and 50% shrubs such as low sagebrush, bitterbrush and rabbitbrush.

It is intended that western juniper will also be assessed for treatment in associated upland range sites as well as ponderosa pine, Jeffrey pine, white fir forest associations, aspen stands and riparian sites.

For the purpose of developing the proposed action, certain landscape level planning assumptions were made regarding the viability of various treatment options (see below). These assumptions would not necessarily apply to all site specific treatments.

> •Where western juniper canopy cover exceeds 20%, there is probably inadequate understory or ladder fuel to carry a prescribed fire.
> •By definition, wildland-urban interface (WUI) areas are in close proximity to residential, industrial or agricultural structures thereby increasing the complexity of fire treatments.
> •20% western juniper canopy cover is the approximate point at which it may become viable to remove juniper as a biomass product.
> •Mechanical harvesting equipment operates most efficiently on less than 30% slopes.
> •Using various techniques, it is possible to mechanically harvest juniper for biomass up to a one mile distance from roads capable of supporting tractor-trailer traffic.
> •Areas with less than 14" of average annual precipitation are particularly susceptible to cheatgrass and noxious weed encroachment following disturbance and may require special attention relative to seeding, revegetation and grazing management.
> •On certain areas, juniper reduction efforts should be limited to hand treatment. These areas include heavy juniper canopy cover on slopes greater than 30%, juniper in riparian areas and steep drainages, juniper encroachment in sensitive wildlife habitat and juniper encroachment on archaeological sites.

Conservation measures relative to naturally occurring juniper, noxious weed prevention, cultural resource protection, wildlife habitat conservation, vegetation seeding and revegetation, and livestock grazing will be developed as an integral part of strategy development.

Proposed treatment strategies and approximate acreages potentially affected are described below.

Protection Areas of naturally occurring juniper would be protected from disturbance.	196,000 acres Figure 2
Priority Mechanical Treatment >20% juniper canopy cover, <30% slope, <1 mile from serviceable access road**,** >**14"** precipitation.	334,000 acres Figure 7
Priority Mechanical Treatment (2) >20% juniper canopy cover, <30% slope, <1 mile from serviceable access road, **<14"** precipitation. During treatment, these areas would generally receive special attention in terms of revegetation, potential noxious weed issues, and grazing issues.	28,000 acres Figure 7
Isolated Mechanical Treatment >20% juniper canopy cover, <30% slope, >1 mile from serviceable access road, **>14"** precipitation. These areas would generally require new road construction to remove juniper.	54,000 acres Figure 8
Isolated Mechanical Treatment (2) >20% juniper canopy cover, <30% slope, >1 mile from serviceable access road, **<14"** precipitation. These areas would generally require new road construction to remove juniper and during treatment these areas would generally receive special attention in terms of revegetation and potential noxious weed issues.	1,400 acres Figure 8
Forest Management Treatment <20% juniper canopy cover associated with stands of pine and fir. Juniper would be addressed during stand treatment operations.	751,000 acres Figure 6
Wildland Fire Treatment <20% juniper canopy cover, **>14"** precipitation, outside WUI.	847,000 acres Figure 5
Wildland Fire Treatment (2) <20% juniper canopy cover, **<14"** precipitation, outside WUI. These areas would generally receive special attention in terms of revegetation and potential noxious weed issues.	261,000 acres Figure 5

WUI Fire Treatment <20% juniper canopy cover, **>14"** precipitation, inside WUI. These fires would generally be of higher complexity due to their proximity to structures and people.	378,000 acres Figure 4
WUI Fire Treatment (2) <20% juniper canopy cover, **<14"** precipitation, inside WUI. These fires would generally be of higher complexity due to their proximity to structures and people. These areas would generally receive special attention in terms of revegetation and potential noxious weed issues.	105,000 acres Figure 4
Sensitive Hand Treatment >20% juniper canopy cover, >30% slope or juniper stands of various canopy covers associated with sensitive resources such as within 100' of perennial or seasonal drainages.	96,000 acres Figure 3

Summary

Of the approximate 3,000,000 acres of western juniper occurrence within the 6.5 million acre planning area, approximately:

196,000 acres would be **protected** as naturally occurring juniper.
1,600,000 acres would be **assessed** for potential fire treatment.
750,000 acres would be **assessed** for treatment in association with forest management.
400,000 acres would be **assessed** for potential mechanical treatment.
96,000 acres would be **assessed** for potential hand treatment.

As part of the strategy development process, an implementation schedule for priority treatment areas would be developed.