

Lily Gap Forest and Watershed Health Project, Phase 2

Category One Grant Proposal: Site Improvement

Project Title: Lily Gap Forest and Watershed Health Project, Phase 2
County: Calaveras
Sierra Nevada Conservancy (SNC) Subregion: South Central
SNC Area Representative: Brandon Sanders
Area Manager: Julie Bear

ORGANIZATION INFORMATION

Organization: United States Department of the Interior, Bureau of Land Management (BLM), Mother Lode Field Office, 5152 Hillside Circle, El Dorado Hills, CA 95762

Organization Type: Government

Organization Website: <http://www.blm.gov/ca/st/en/fo/folsom.html>

Has the organization successfully completed similar project(s)?: Yes

If yes, please describe the project(s): Lily Gap Forest Health Project, Phase 1. Adjacent to Phase 2 site, 157 acres, \$182,000 budget, application of United States Forest Service's General Technical Report 220 forest health approach, biomass sold to Buena Vista biomass plant near Ione, California.

PROJECT CONTACT INFORMATION

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Day-to-Day Grant Project Manager (Person/Title): Brian Mulhollen

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DETAILED PROJECT DESCRIPTION NARRATIVE

Project Description

BLM's 420-acre Lily Gap Forest and Watershed Health Project is located on BLM-administered public lands in Calaveras County, California. The project is located near the town of West Point in Calaveras County, California at Township 7 North, Range 13 East, Section 25, at latitude 38 degrees, 26 minutes north; longitude 120 degrees, 29 minutes west.

Lily Gap is situated on forested slopes within the Mokelumne River watershed on the south rim of the North Fork Mokelumne River Canyon. Within the project area the consequence of decades of suppression has been the buildup of dead brush, slash, and litter debris in the understory and dense thickets of conifers (especially incense-cedar and ponderosa pine). These conditions are considered unhealthy with many potential downsides, such as loss of ecological diversity, and greater susceptibility to disease/insect infestation.

Critically, these conditions are more likely to support a high severity, high intensity fire—such as a crown fire—that could be devastating to the watershed, not to mention property and lives. The area has not experienced fire in decades, leading to dead brush, slash and litter in the understory surrounding dense thickets of conifers. The parcel is entirely within the wildland urban interface (WUI), near several small towns and dozens of private residences.

BLM proposes to recreate pre-suppression forest conditions, increase resiliency to future wildfires to reduce the risk of a large damaging fire, and reduce erosion and thereby protect and restore the Mokelumne River watershed. All treatments will conform to the recommendations of the United States Forest Service's General Technical Report 220, *An Ecosystem Management Strategy for Sierran Mixed-Conifer Forests* (GTR-220). Consistent with the recommendations in this report, BLM will implement the following silviculture strategy on the Lily Gap parcel. BLM will create landscape heterogeneity by mimicking the forest conditions that would be created by the fire behavior and return interval associated with differences in slope position, aspect, and slope steepness. Stem density and canopy cover will be highest in drainages and riparian areas, and then decrease over the midslope. Stem density and canopy cover would be higher on northeast aspects compared to southwest. In general pine will be left and white fir, Douglas-fir, and incense-cedar thinned, which will help restore historical species composition. Gaps may be located in areas with thinner soils or lower productivity to foster lower canopy cover since the Lily Gap area historically supported lower tree densities and fuel loads. The relative proportion of these conditions (i.e., low density, dispersed large trees, and large and small gaps and tree groups) and their composition would be varied depending on existing forest conditions and topographic position.

A higher density of tree stems and canopy cover would be retained in the cooler moister microsites, such as along the prominent drainage (outside of the riparian buffer) near the center of the parcel. Defect trees, snags, and downed logs would be retained for wildlife to the extent feasible. In particular, snags greater than 24 inches DBH provide hiding, denning, nesting, and food storage sites for a variety of wildlife. These large snags would be retained unless to do so would create an unusually unsafe concentration of fuels.

The majority of the work would be done by a hand crew under the supervision of BLM's fuel/fire management specialists. Treatment methods will include use of a brush chipper with pile burning and mechanical mastication. No new landings would be built. In some cases, it would be necessary to create tracks into the project area. The tracks are needed to drive heavy equipment to harvest sites and to, then, transport the harvested vegetation to the designated staging areas. Wherever possible, a hand crew with chainsaws and a rubber-tracked chipping and hauling equipment would be used

Figure 1 depicts the stand as it is today. Figure 2 represents what the stand would generally look like after treatment is fully implemented. All the trees less than 8 inches DBH have been removed and some of the larger diameter trees have been removed to increase spacing and reduce overall density. Snags and areas of brush would be retained to provide habitat for certain wildlife.

Stand=1001 Year=2011 Inventory conditions

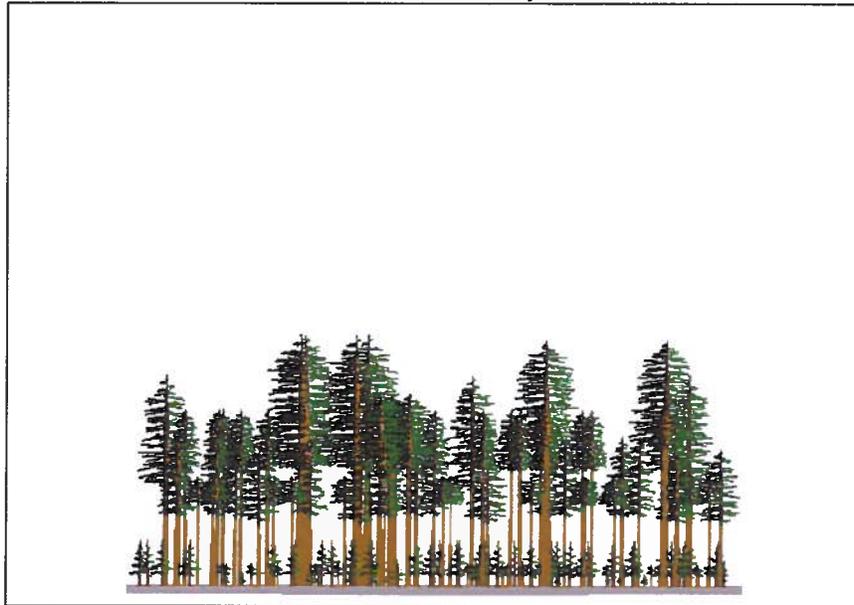


Figure 1. Before Treatment

Stand=1001 Year=2012 Post cutting



Figure 2. After Treatment

A small seasonal stream flows through the project site and, within a mile, reach the North Fork of the Mokelumne River. The Lily Gap Phase 2 project will decrease the risk of fire in these watersheds and, in so doing, reduce long-term soil erosion and sediment flow into the Mokelumne River. This is important because of the project's location immediately above the Tiger Creek Reservoir, a critical component of the hydroelectric power generation infrastructure that has been constructed throughout the North Fork canyon. Enhanced fire protection will also contribute to the maintenance of the late seral forest stands characteristic of the north-facing slopes of the river canyon. In addition, BLM's Sierra Resource Management Plan (2008) found the North Fork Mokelumne to be suitable for wild and scenic river designation because it possesses outstandingly remarkable wild, scenic and recreational values (ORVs). Lily Gap Phase 2's beneficial impacts on watershed health would be consistent with this finding and the protection and enhancement of river ORVs.

Forest health improvements will be particularly helpful in the late seral stage stands that are found in

the south central portion of the Lily Gap parcel, adjacent to the small seasonal creek. This would contribute to future enhancement of these stands for wildlife. On-site riparian habitat within the parcel will be protected due to such project design features as streamside buffer zones. This, together with the retention of downed wood, coarse woody debris and snags will benefit a variety of wildlife species, including cavity-nesting birds. Finally, the treatments would enhance a small wet meadow that is located in the riparian drainage. BLM's botanist describes the meadow, with its horsetail, leopard lily, digitalis, columbine, mugwort, sedges and rushes as an interesting and unusual community for this area.

Harvest of material for woody biomass utilization such as electric power generation and shaved animal bedding will occur throughout the project area where it is most economically feasible. It will also provide a demonstration of a dozer and brush rake to pile vegetation, all in a manner that minimizes new ground disturbance and erosion, prevents the spread of weeds and retains coarse woody debris for wildlife habitat.

Phase I of the Lily Gap project, a 157 acre treatment, was completed in July 2013. This request for SNC funding will allow BLM to address a further 200 acres immediately to the north of the Phase 1 site. The total project cost will be \$200,450. BLM is requesting \$185,000 from SNC through this grant process. The remaining \$15,450 will be provided by Congressionally-appropriated forestry funds.

Workplan and Schedule Narrative

Due to its relatively low elevation (approximately 3,500 feet), the project will be implemented after the end of the fire season, that is, between mid fall and late spring. The anticipated start date is late 2014. Selection of a private timber contractor(s) will be completed by March 2015. Work will begin shortly after the contractor is selected, and will continue over a two year period, with completion by Spring 2017. Pile burning will be conducted in the spring of both 2016 and 2017. Final site cleanup and restoration will occur by April 2017. A detailed project schedule follows:

Project Schedule

DETAILED PROJECT DELIVERABLES	TIMELINE
Contracting Prepare government estimate, prepare and post statement of work, conduct bidder site visit, review timely bids, select and award contract.	October 2014 – March 2015
Forest Treatments 2015 - 2016 Thin white fir, Douglas fir, incense cedar. Remove brush. Generally leave pine. Leave higher densities of tree stems and cover in cooler moister microsites. Transport biomass for energy production, and transport logs to mills. Treat approximately 107 acres.	October 2015 – April 2016
Pile Burning Spring 2016 Burn piles of residual forest waste and slash prior to start of fire season.	April 2016
Forest Treatments 2016 - 2017 Thin white fir, Douglas fir, incense cedar. Remove brush. Generally leave pine. Leave higher densities of tree stems and cover in cooler moister microsites. Transport biomass for energy production, and transport logs to mills. Treat approximately 50 acres.	October 2016 – December 2016
Pile Burning 2017 Burn piles of residual forest waste and slash prior to start of fire season.	January 2017 – March 2017
Final Site Cleanup and Restoration Complete final removal of biomass and project cleanup by start of fire season.	April 2017
Progress Reports Prepare reports describing accomplishments to date	May 2015, May 2016, May 2017

Land Tenure

BLM holds fee title to all project lands. No other agencies or jurisdictions hold any real property interest in these parcels. The property is not a part of any BLM grazing lease. There are no other agreements with any entity that affect project lands or their future operation and maintenance.

Restrictions, Technical/Environmental Documents and Agreements Narrative

National Environmental Policy Act documents have already been prepared and public review completed. A Finding of No Significant Impacts and a Decision Record were signed in May 2011. The Decision Record is the federal approval document; no additional BLM approvals are required and no permissions or permits from other entities are necessary. There are no known encumbrances on the property that could adversely impact project completion. All project work would occur on public lands under the jurisdiction of the BLM. Access to this property is currently available: these are not land locked parcels. Thus, the project is "shovel ready."

Organizational Capacity Narrative

BLM has the staff, training and expertise to complete the project as proposed. All necessary environmental documents have been prepared. BLM will retain ownership and, as a natural resources and land management agency, has the capability and Congressional policy direction to provide long term management for this parcel.

Cooperation and Community Support Narrative

Lily Gap has been endorsed by the Amador Calaveras Consensus Group (ACCG), an award-winning forest collaborative that has implemented numerous healthy forest projects with the participation of federal and state agencies, local jurisdictions, non governmental organizations and private businesses. BLM has been an active participant in the ACCG since its inception in 2008 and the Lily Gap project is BLM's most ambitious contribution to the ACCG's regional watershed protection and restoration strategy. Thus Lily Gap is consistent with the ACCG's All Lands - Triple Bottom Line approach, as well as the Amador Calaveras Cooperative Association for Biomass Utilization's community economic development work.

The project is also a key component of the watershed health strategy currently being developed by the interagency Mokelumne Avoided Cost Analysis (MACA) team. MACA's purpose is to determine how upper Mokelumne River watershed conditions affect forest health, fire risk, erosion potential and other factors directly impacting water users, including major utilities. The MACA team has identified a number of agency projects that could improve the health of surrounding forests, reduce erosion and fire risk and thereby improve water quality and protect related infrastructure. The Lily Gap project is one of the projects being considered by the MACA team. It is located in a MACA planning unit that is being recommended as an area in need of immediate forest treatments to provide for the protection and restoration of the Mokelumne River drainage, lakes and reservoirs along the river, and other natural resources within the watershed.

Though not required for the proposed completion of the site treatment described above this project will also be conducted in such a way as to inform work being done by the Sierra Cascades All-Lands Enhancement (SCALE) Demonstration. In this demonstration project Burney-Hat Creek Community Forest and Watershed Group and the ACCG are working together to advance triple-bottom line (environment, economy, and community) outcomes and connect learning and adaptive work through monitoring. This project will coordinate with projects of the Burney-Hat Creek Community Forest and Watershed Group to share experience and data that informs SCALE efforts. Collectively the SCALE projects intend to advance forest and watershed restoration and fuels thinning on private and

public lands (BLM and Forest Service). The two groups will draw on existing SNC indicators and explore development of new indicators as needed—including identifying indicators and metrics that more effectively address triple-bottom line outcomes. The two groups are jointly exploring and describing ways to advance multi-party monitoring and adaptive learning and management through these projects.

There is no known opposition to this project.

Long-Term Management and Sustainability Narrative

Long term management would be guided by the BLM's Sierra Resource Management Plan (RMP), adopted in 2008, which provides management direction for public lands in the Sierra Nevada Foothills and which is to remain in place through the year 2038. The Sierra RMP requires that BLM's forested lands be managed for late succession/old growth conditions, and that they be thinned for forest health, fuels reduction and special status species habitat. This requirement applies to the Lily Gap parcel, and will dictate its future management. BLM anticipates that the Lily Gap parcel will be monitored by field staff on a regular basis and, when necessary, maintained to ensure that the parcel is moving towards late succession conditions. This would involve selective site retreatment by hand crews every five to seven years.

BLM's permanent staff includes fire and fuel reduction crews who will be available to maintain and retreat this site. Thus the agency has the capacity to sustain a long-term commitment to manage this parcel.

SUPPLEMENTAL DOCUMENTS

The following documents are attached.

- Project Maps, including
 - Project Location Map
 - Parcel Map with County Assessor's Parcel Numbers
 - Topographic Map and Site Plan
 - Air Photo
- Photos of the Project Site

FINANCIAL FORMS

Detailed Budget Form

A **detailed budget form** is attached that identifies all project costs for which SNC funds are being requested. The form identifies matching funds that will be provided by BLM.

Cost Allocation Plan

Fifteen percent (15%) of grant funds will be applied to cover the BLM's costs to administer the Lily Gap Forest and Watershed Health project. Administrative costs will include only those direct and indirect expenses that are specifically charged to the Lily Gap project. These will include compensation for personal services (salaries, wages and benefits), office expenses and supplies, equipment including fleet (mileage), contracting oversight and other miscellaneous support costs. Costs will not include insurance, facilities, telephones and communications. No printing or training expenses are anticipated.

Supplemental Documents

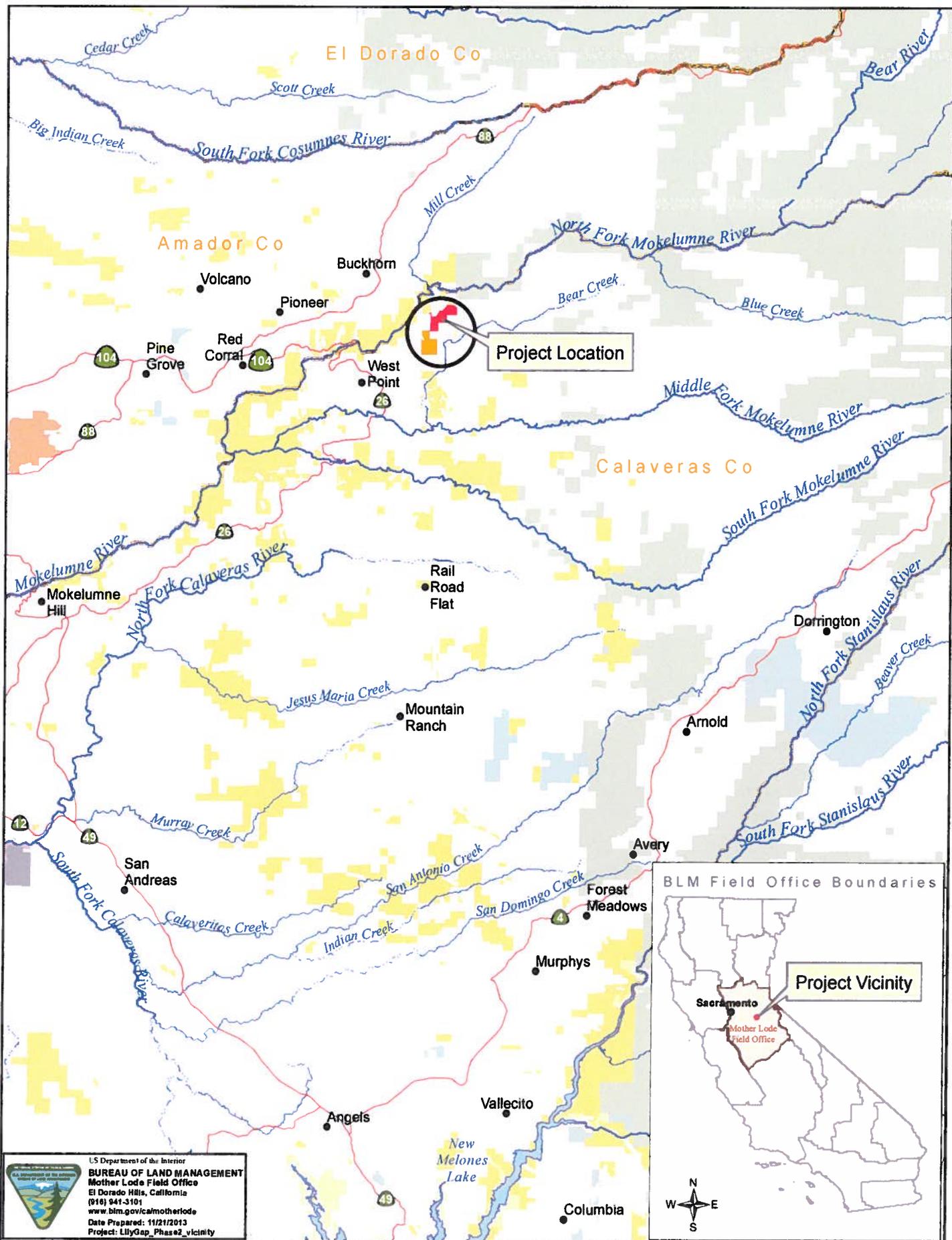
Project Maps

- Project Location Map
- Parcel Map
- Topographic Map and Site Plan
- Aerial Photo

Photos

Project Location Map

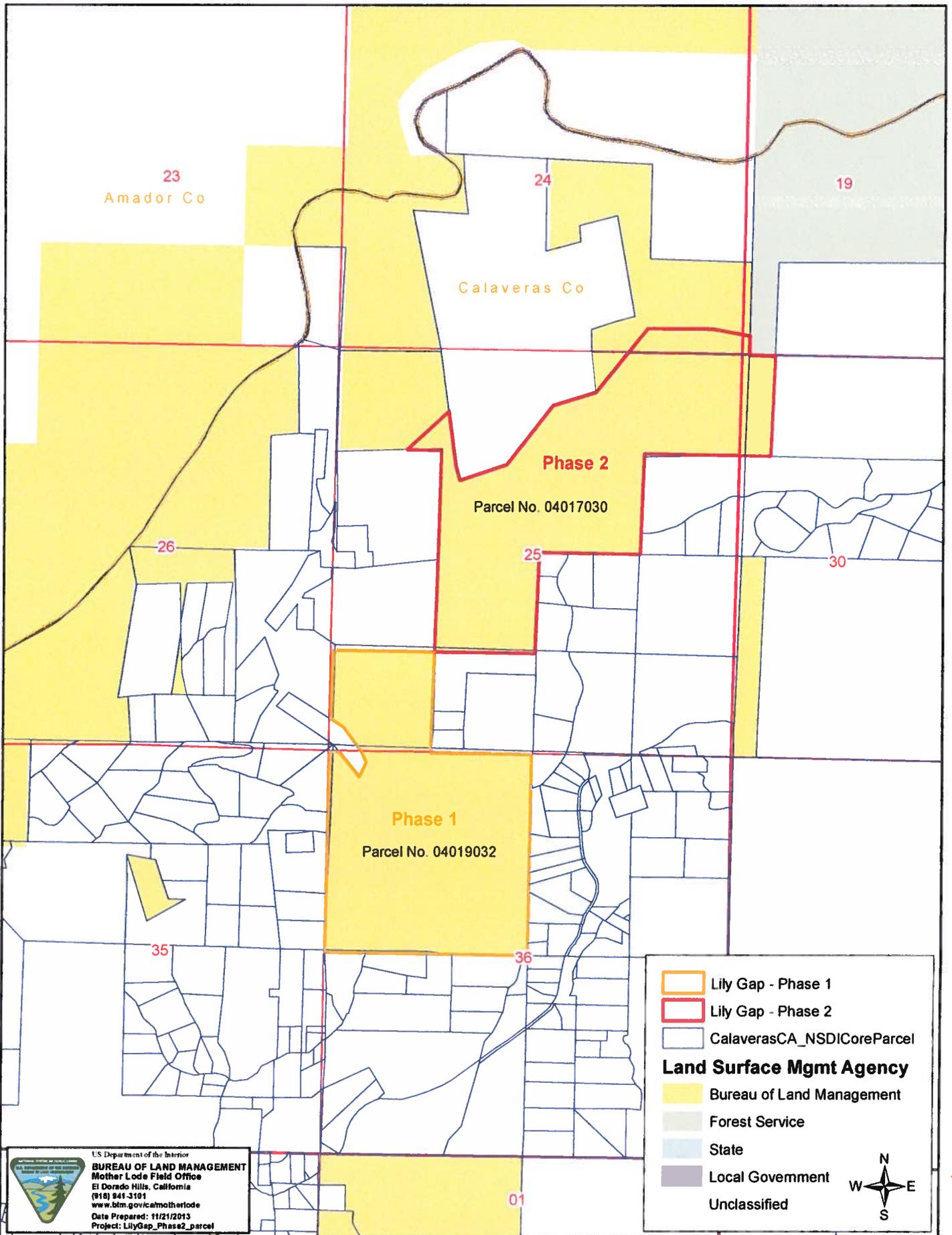
Lily Gap Forest and Watershed Health Project, Phase 2



US Department of the Interior
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El Dorado Hills, California
(916) 941-3101
www.blm.gov/motherlode
Date Prepared: 11/21/2013
Project: LilyGap_Phase2_vicinity

Parcel Map

Lily Gap Forest and Watershed Health Project, Phase 2



23
Amador Co

24
Calaveras Co

19

Phase 2

Parcel No. 04017030

T7N

T7N

Phase 1

Parcel No. 04019032

T6N

T6N



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Project: LilyGap_Phase2_parcel

- Lily Gap - Phase 1
- Lily Gap - Phase 2
- CalaverasCA_NSDICoreParcel
- Land Surface Mgmt Agency**
- Bureau of Land Management
- Forest Service
- State
- Local Government
- Unclassified



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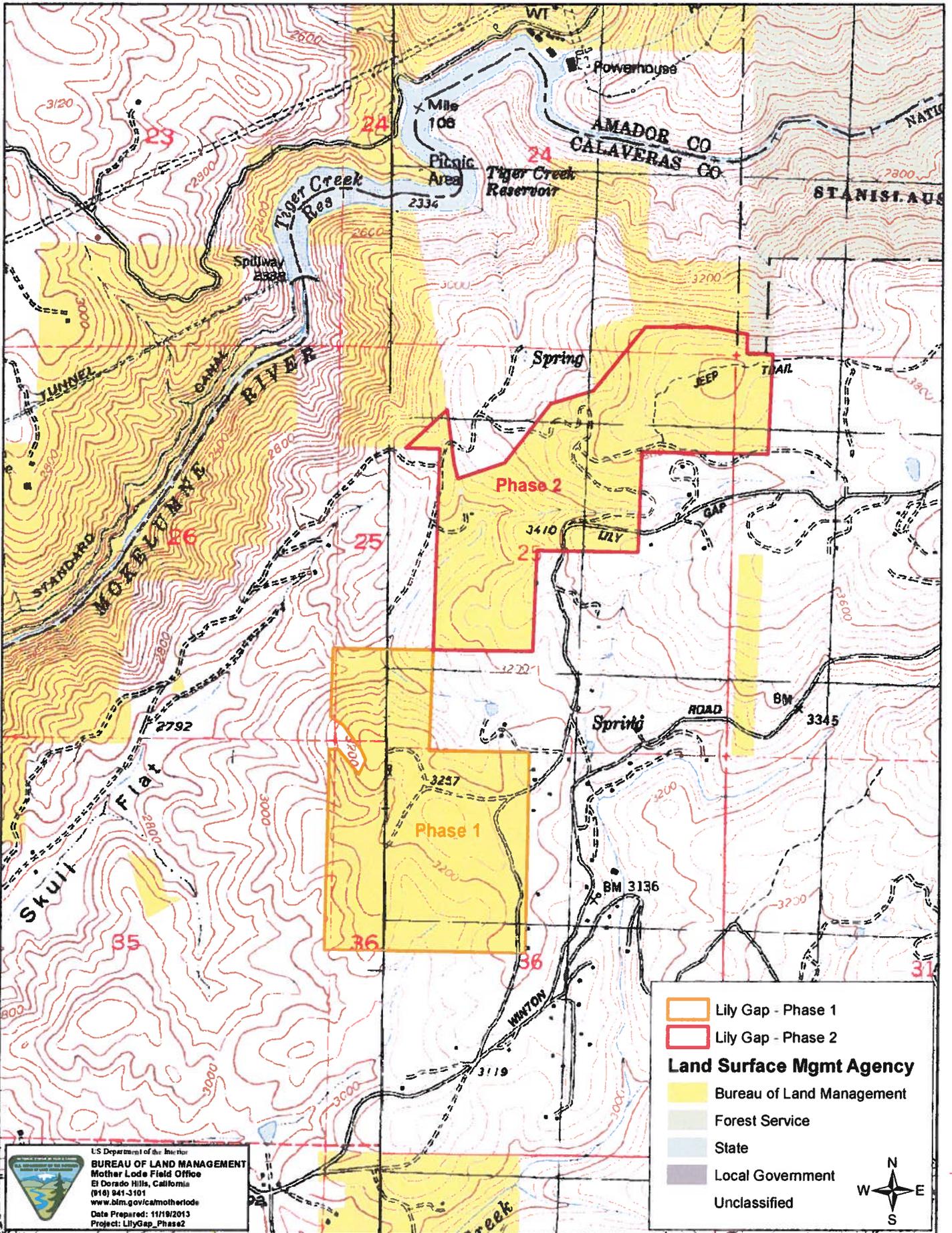
R13E

1,500 750 0 1,500 Feet

R14E

Topographic Map and Site Plan

Lily Gap Forest and Watershed Health Project, Phase 2

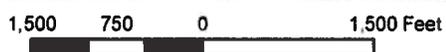


	Lily Gap - Phase 1
	Lily Gap - Phase 2
Land Surface Mgmt Agency	
	Bureau of Land Management
	Forest Service
	State
	Local Government
	Unclassified


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 Date Prepared: 11/19/2013
 Project: LilyGap_Phase2

1:20,000

R13E



R14E



T6N

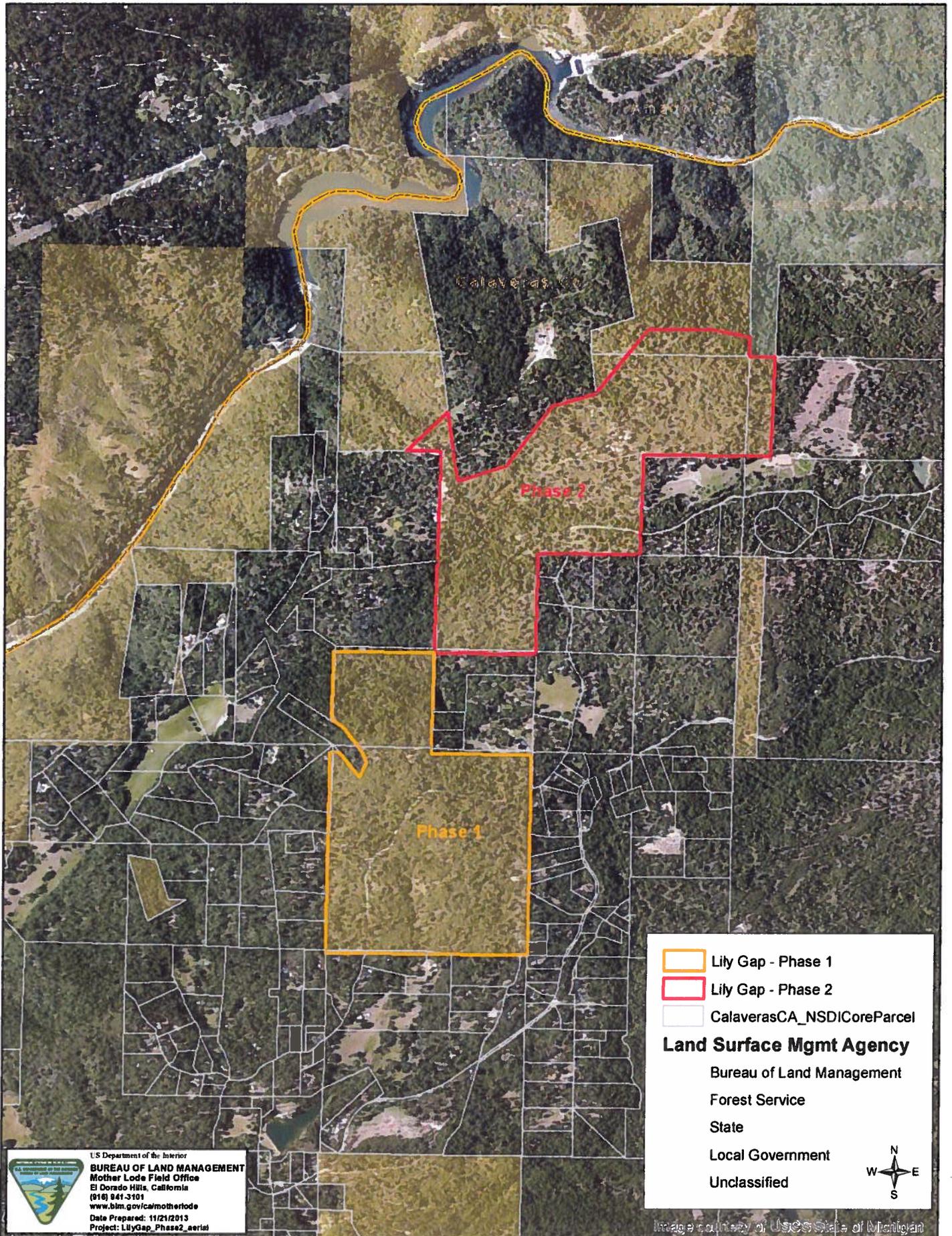
T7N

T7N

T6N

Aerial Photo

Lily Gap Forest and Watershed Health Project, Phase 2



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Date Prepared: 11/21/2013
Project: LilyGap_Phase2_aerial

1:20,000

R13E

1,500 750 0 1,500 Feet

R14E

T6N

T7N

T7N

T6N



Lily Gap Phase 2: Unthinned Young Tree Stand

Lily Gap Phase 2: Dense Manzanita Thicket





Above and Below: Lily Gap Phase 2 Unthinned General Forest





Lily Gap Phase 1, Post Treatment. Note clustering of trees at bottom of slope.



Above and Below: Lily Gap Phase 1, Post Treatment.



Detailed Budget Form

**SIERRA NEVADA CONSERVANCY
PROPOSITION 84 - DETAILED BUDGET FORM**

**Project Name: Lily Gap Forest and Watershed Restoration Project, Phase 2
Applicant: Bureau of Land Management**

SECTION ONE	Units	Unit Cost	Total Cost	Project Cost Breakdown				Total
				Year One (2014)	Year Two (2015)	Year Three (2016)	Year Four (2017)	
DIRECT COSTS								
<i>Project Management and Forestry/Fuels Staff Costs</i>	740 Hours	\$35/hour	26,000.00	\$4,000.00	\$14,000.00	\$8,000.00		\$26,000.00
<i>Project Timber Contractor</i>	157 Acres	\$766/acre	120,250.00		\$60,125.00	\$60,125.00		\$120,250.00
<i>Pile Burning</i>	2 weeks	\$4,000/week	8,000.00		\$2,500.00	\$5,500.00		\$8,000.00
			0.00					\$0.00
			0.00					\$0.00
			0.00					\$0.00
DIRECT COSTS SUBTOTAL:	0	\$0.00	\$154,250.00	\$4,000.00	\$76,625.00	\$73,625.00	\$0.00	\$154,250.00

SECTION TWO	Units	Unit Cost	Total Cost	Project Cost Breakdown				Total
				Year One	Year Two	Year Three	Year Four	
INDIRECT COSTS								
<i>Monitoring</i>	86 Hours	\$35/hour	3,000.00		\$1,000.00	\$2,000.00		\$3,000.00
<i>Project materials & supplies purchased</i>			0.00					\$0.00
<i>Publications, Printing, Public Relations</i>			0.00					\$0.00
			0.00					\$0.00
INDIRECT COSTS SUBTOTAL:	0	\$0.00	\$3,000.00	\$0.00	\$1,000.00	\$2,000.00	\$0.00	\$3,000.00
PROJECT TOTAL:	0	\$0.00	\$157,250.00	\$4,000.00	\$77,625.00	\$75,625.00	\$0.00	\$157,250.00

SECTION THREE	Units	Unit Cost	Total Cost	Project Cost Breakdown				Total
				Year One	Year Two	Year Three	Year Four	
Administrative Costs (Costs may not to exceed 15% of total Project Cost) :								
<i>Contracting, clerical and natural resource staff salaries and benefits</i>	650 Hours	\$35/hour	22,750.00	\$7,000.00	\$8,000.00	\$7,750.00		\$22,750.00
<i>Equipment including fleet</i>			5,000.00	\$1,000.00	\$2,000.00	\$2,000.00		\$5,000.00
			0.00					\$0.00
			0.00					\$0.00
ADMINISTRATIVE TOTAL:	0	\$0.00	\$27,750.00	\$8,000.00	\$10,000.00	\$9,750.00	\$0.00	\$27,750.00
SNC TOTAL GRANT REQUEST:	0	\$0.00	\$185,000.00	\$12,000.00	\$87,625.00	\$85,375.00	\$0.00	\$185,000.00

SECTION FOUR	Units	Unit Cost	Total Cost	Years Fund Received				Total
				Year One	Year Two	Year Three	Year Four	
OTHER PROJECT CONTRIBUTIONS								
<i>BLM Congressionally Appropriated Funding</i>			15,450.00	\$4,000.00	\$7,000.00	\$4,450.00		\$15,450.00
			0.00					\$0.00
			0.00					\$0.00
			0.00					\$0.00
			0.00					\$0.00
Total Other Contributions:	0	\$0.00	\$15,450.00	\$4,000.00	\$7,000.00	\$4,450.00	\$0.00	\$15,450.00

NOTE: The categories listed on this form are examples and may or may not be an expense related to the project. Rows may be added or deleted on the form as needed. Applicants should contact the SNC if questions arise.

* Operating Costs should be allocated to the percentage that is applicable to the grant based on your cost allocation methodology and cannot exceed 15% of your total project costs.

Environmental Documentation

Environmental Assessment,
Finding of No Significant Impact,
and
Decision Record



United States Department of the Interior



BUREAU OF LAND MANAGEMENT

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Lily Gap biomass demonstration project (CA-180-10-25) Decision Record April 2011

1.0 Introduction and Background

The Bureau of Land Management's Mother Lode Field Office (BLM) manages thousands of acres of public lands in the central western Sierra Nevada, particularly within the transition between the lower montane forest and chaparral "belt." These public lands include densely forested tracts in the Lily Gap area north of West Point on the divide between the north and middle forks of the Mokelumne River. Due to decades of fire suppression and other factors, brushy chaparral species, young overstocked stands of conifers (ponderosa pine and incense cedar), and other volatile fuels have increased markedly on these lands, resulting in a corresponding increase in the probability of a high-severity wildfire, with potentially devastating effects on the environment and adjacent private properties. The primary goal of the proposed action is to create healthier, more fire-resilient conditions on 450 acres of forested public land off of Lily Gap Road. Our definition of forest health draws heavily from the ideas and silvicultural strategies of long-term Forest Service research in the central western Sierra Nevada (North et al. 2009). The most important underlying principle of this research is that western Sierran forests are adapted to, and perhaps even dependent on, regular low intensity low severity wildfires. Forest managers should attempt to return forests to pre-suppression-era conditions—prior to circa 1910 when low intensity low severity wildfires likely occurred naturally on a regular interval as a result of lightning strikes and perhaps Native American- (and early settler-) caused ignitions. This fire regime is likely to improve forest health and, critically, lower the potential for the forest to support a catastrophic wildfire; thus protecting the environment and private properties. BLM would demonstrate various fuel reduction methods (chipping, pile burning, mastication, feller buncher, etc.) to determine which treatment is the most cost effective way to create healthy conditions. BLM would explore opportunities to provide vegetative material to the proposed biomass utilization plant near Lone, CA as a way of reducing fuels and thus mimicking the effects of a low intensity low severity fire within the project area. Prescribed fire is the most obvious way to move the project area forest toward healthier pre-suppression conditions. However, prescribed fire was not analyzed in the EA because BLM does not foresee having the budget, personnel, and other resources necessary to conduct a prescribed fire within the project area in a safe manner. Based on information in the EA, the project record, and recommendations from my staff, the following constitutes my decision.

2.0 Decision

2.1 Alternatives Considered but not Selected

The no action alternative was considered but not selected. Under this alternative, fuels would not be treated within the project area. None of the negative impacts discussed in the EA would occur: negligible soil disturbance caused by the use of a mechanized equipment and temporary dust due to mastication of vegetation and temporary smoke due to burning piled vegetation. However, BLM would miss an opportunity to determine which treatment method would most cost effectively help BLM to apply the current silvicultural strategies of North et al. (2009). These silvicultural strategies make a lot

of sense from a current management standpoint. These strategies are designed to move west-slope Sierran forests such as the forest found within the project area toward pre-suppression-era conditions—these conditions would potentially create a healthier and more fire-resilient forest. These conditions would help lower the potential for the forest to support a highly destructive wildfire—such as a crown fire—within the Lily Gap area. Local residents are concerned with protecting their homes from wildfire. Therefore, the strategies help BLM to address the fire management goals, objectives, and strategies laid out in the Sierra Resource Management Plan and the office's Fire Management Plan.

2.2 Decision and Rationale

Based on information in the EA, the project record, and recommendations from my staff, I have decided to implement the proposed action as described in the EA. The proposed action is needed to try to create healthy forest conditions within the project area and, thus, reduce the threat of a high-severity wildfire. BLM would also demonstrate different treatments to determine which method (or methods) is the most cost effective way of reaching the goal of creating healthy forest conditions. The proposed action will help reduce threats to the environment and private property adjacent to public land caused by catastrophic wildfire. There is no time restriction on when the project can be implemented, though all of the project design features must be followed, particularly with respect to preventing unnecessary erosion of sediments into drainages, preventing the introduction of noxious weeds, avoiding identified cultural resources, and ensuring that mining claimants' activities allowed under BLM's mining regulations are not unnecessarily disturbed.

3.0 Consultation and Coordination

No special status animal or plant species (or their habitats) will be affected by the project; therefore, consultation with US Fish and Wildlife Service was unnecessary.

4.0 Public Involvement

An earlier version of this EA was posted on the BLM Mother Lode Field Office internet website for a formal 30-day public comment period in October and November 2010. On November 2, 2010, BLM received a letter from the Foothill Conservancy commenting on this EA. In their letter the Foothill Conservancy raised several issues regarding the proposed action. The Foothill Conservancy questioned why BLM had not considered prescribed burning as a treatment option. They pointed out that chipping and mastication without actually removing fuels may not help BLM reach the stated goal of preventing the possibility of a high severity fire—that, in fact, it may not change fire behavior at all. They also pointed out that the EA lacked detail. On November 17, 2010, BLM met to discuss the EA with members of the Foothill Conservancy as well as members of another interested group, Sierra Forest Legacy, at the office of Foothill Conservancy in Pine Grove, CA. We went over specific issues raised in the Foothill Conservancy letter. Another issue that the Foothill Conservancy raised at the meeting is that the EA lacked specifics regarding the current environmental conditions (affected environment) within the project area and the EA also lacked specifics regarding what the project area might look like after the proposed action was fully implemented (the desired future condition). There was also concern that the needs of the proposed biomass plant near Lone might drive BLM forest management in the future. In subsequent email communication, members of Sierra Forest Legacy directed BLM to the long-term forest management research of the US Forest Service (summarized in North et al. 2009) which they believe might be a worthwhile approach to consider in the EA. BLM took the public's comments into consideration and produced another version of the EA which adopts many of the management ideas of North et al. (2009). BLM met at the project area with the Foothill Conservancy and other interested members of the public on March 7, 2011 to discuss the proposed action and the revised EA. The EA was released for another 30 day public review period on the BLM Mother Lode Field Office internet website during March and April 2011. On April 18, 2011, BLM received an email from the Foothill Conservancy commenting on this EA. In the email the Foothill Conservancy pointed

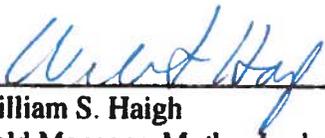
out that the proposal to remove all conifers under 8 inches DBH was not consistent with the approach of North et al. (2009) which calls on forest managers to leave a full range of conifer size and age classes. BLM updated the EA proposed action to ensure that a full range of conifer size and age classes would be maintained as part of the treatment.

5.0 Plan Consistency

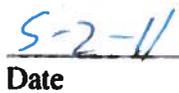
Based on information in the EA, the project record, and recommendations from my staff, I conclude that this decision is consistent with the management goals, objectives, and strategies laid out in the Sierra Resource Management Plan and the Fire Management Plan. Specifically, the Sierra Resource Management Plan's Record of Decision (pages 15-16) gives BLM the goal of establishing a cost-efficient fire management program commensurate with threats to life, property, public safety, and environmental resources. My decision is also in compliance with the Endangered Species Act; Section 106 of the National Historic Preservation Act; and other applicable laws, regulations, and BLM policies.

6.0 Administrative Remedies

Administrative remedies may be available to those who believe they will be adversely affected by this decision. Appeals may be made to the Office of Hearings and Appeals, Office of the Secretary, U.S. Department of Interior, Board of Land Appeals (Board) in strict compliance with the regulations in 43 CFR Part 4. Notices of appeal must be filed in this office within 30 days after publication of this decision. If a notice of appeal does not include a statement of reasons, such statement must be filed with this office and the Board within 30 days after the notice of appeal is filed. The notice of appeal and any statement of reasons, written arguments, or briefs must also be served upon the Regional Solicitor, Pacific Southwest Region, U.S. Department of Interior, 2800 Cottage Way, E-1712, Sacramento, CA 95825. The effective date of this decision is the date this decision is signed.



William S. Haigh
Field Manager, Mother Lode Field Office



Date



United States Department of the Interior



BUREAU OF LAND MANAGEMENT

Mother Lode Field Office
5152 Hillsdale Circle
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Lily Gap biomass demonstration project (CA-180-10-25) Finding of No Significant Impact April 2011

It is my determination that this decision will not result in significant impacts to the quality of the human environment. Anticipated impacts are within the range of impacts addressed in the Sierra Resource Management Plan (RMP)/Final Environmental Impact Statement. The proposed action does not constitute a major federal action having a significant effect on the human environment; therefore, an environmental impact statement is not necessary and will not be prepared. This conclusion is based on my consideration of CEQ's following criteria for significance (40 CFR §1508.27), regarding the context and intensity of the impacts described in the EA, and based on my understanding of the proposed action:

- 1) *Impacts can be both beneficial and adverse and a significant effect may exist regardless of the perceived balance of effects.* Potential impacts include negligible soil disturbance caused by use of a rubber-tracked chipper, masticator, and other mechanized equipment, and temporary dust due to mastication of vegetation and temporary smoke due to pile burning or burning in the biomass plant near Lone, CA. However, with the project design features, none of these impacts would be significant at the local or regional scale (cumulatively) because of the small scale of the proposed action.
- 2) *The degree of the impact on public health or safety.* No aspects of the proposed action have been identified as having the potential to significantly and adversely impact public health or safety. In fact, the project is designed to help firefighters fight wildfire and to protect nearby private residences from wildfire; therefore protecting public health and safety, especially for local residents.
- 3) *Unique characteristics of the geographic area.* The area affected by the proposed action does not have any unique characteristics. Soils, vegetation, wildlife, and cultural resources are all typical for the elevation and terrain in the west central Sierra Nevada.
- 4) *The degree to which the effects on the quality of the human environment are likely to be highly controversial effects.* No anticipated effects have been identified that are scientifically controversial. As a factor for determining within the meaning of 40 C.F.R. § 1508.27(b)(4) whether or not to prepare a detailed environmental impact statement, "controversy" is not equated with "the existence of opposition to a use." *Northwest Environmental Defense Center v. Bonneville Power Administration*, 117 F.3d 1520, 1536 (9th Cir. 1997). "The term 'highly controversial' refers to instances in which 'a substantial dispute exists as to the size, nature, or effect of the major federal action rather than the mere existence of opposition to a use.'" *Hells Canyon Preservation Council v. Jacoby*, 9 F.Supp.2d 1216, 1242 (D. Or. 1998).
- 5) *The degree to which the possible effects on the human environment are likely to be highly uncertain or involve unique or unknown risks.* The analysis does not show that the proposed action would involve any unique or unknown risks.

6) *The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.* Fuels reduction using hand crews and mechanized equipment (i.e., rubber-tracked chipper, masticator, etc.) is not precedent setting. BLM undertakes these types of projects on a regular basis. Biomass utilization is somewhat new to the Mother Lode Field Office, but the environmental impacts are similar to fuels projects with a pile-burning component, which are nothing new to the field office and are not precedent setting.

7) *Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.* No significant cumulative impacts have been identified. The proposed action is relatively small in scale and is consistent with the actions and impacts anticipated in the Sierra RMP. BLM has not recently proposed any projects of this scope within the Mokelumne River watershed. Nothing like this is planned in the foreseeable future.

8) *The degree to which the action may adversely affect National Historic Register listed or eligible to be listed sites or may cause loss or destruction of significant scientific, cultural or historical resources.* The proposed action would not affect cultural resources listed on or eligible for the National Register of Historic Places.

9) *The degree to which the action may adversely affect ESA listed species or critical habitat.* No ESA listed species (or their habitat) would be affected by the proposed action.

10) *Whether the action threatens a violation of environmental protection law or requirements.* There is no indication that this decision would result in actions that would threaten such a violation.



William S. Haigh
Field Manager, Mother Lode Field Office



Date



United States Department of the Interior



BUREAU OF LAND MANAGEMENT

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EA Number: CA-180-10-25

Project Name: Lily Gap biomass demonstration project

Location: MDM T 7 N, R 13 E, Sections 24, 25, 26, and 36,
T 7 N, R 14 E, Section 30
Lily Gap area near West Point, Calaveras County, CA
(See attached project area maps in Appendix B)

1.0 Purpose of and Need for Action

1.1 Need for Action

The Bureau of Land Management's Mother Lode Field Office (BLM) manages scattered public lands off of Winton Road, north of West Point—what is referred to as the Lily Gap area. Much of this area has not experienced wildfire in decades. Shrub stands have aged and now contain a larger proportion of dead fuels, and in some forest stands understory fuels have increased, creating unhealthy forest conditions and making the probability that the area will experience a devastating wildfire more likely. At the same time, the local communities have grown. There are now numerous private residences in the area, many of them adjacent to BLM-administered parcels containing dense fuels. Local residents are concerned about wildfire and are anxious to see public land managers like BLM take action to reduce fuels on public lands. The Lily Gap area is considered to be within the wild land-urban interface (WUI) and the local communities are considered "at risk."

With this need in mind, the primary purpose of the proposed action is to create healthy forest conditions on approximately 450 acres of forested public land managed by BLM in the Lily Gap area. Our definition of forest health within the project area draws from the findings of long-term US Forest Service research in the montane/mixed conifer forests of the western central Sierra Nevada (North et al. 2009). A key finding of this (and related) research is that mixed coniferous forests of the west central slopes of the Sierra Nevada (including forests types within the project area) are well adapted to, and perhaps dependent upon, regular low severity, low intensity wildfire—something that the Lily Gap area has not experienced for decades. In other words, wildfire was likely an integral part of the lifecycle of western Sierran forests. Within the project area the consequences of decades of suppression have been, most obviously, the buildup of dead brush, slash, and litter debris in the understory and dense thickets of conifers (especially incense-cedar and ponderosa pine). These conditions are considered unhealthy with many potential downsides, such as loss of ecological diversity, and greater susceptibility to disease/insect infestation. Critically, these conditions are more likely to support a high severity, high intensity fire—such as a crown fire—that could be devastating to the environment, not to mention property and lives. A key consideration, then, is how to restore the healthier pre-suppression conditions to the project area. This outcome would have the important effect of increasing the resilience of the forest to future wildfires and reducing the possibility of a high severity, high intensity fire in the Lily Gap area. This is good for the environment as well as for local residents.

The title of this EA is “Lily Gap biomass demonstration project.” If BLM decides to implement the proposed action, what would we be demonstrating? An important aspect of the proposed action is to determine which treatment method would help us achieve our goal of creating healthy forest conditions within the project area in the most cost effective manner. The treatment methods are laid out in Section 2.1.

The most basic question is what would this forest look like if fire had been left to play its natural role? There would be far less brush and shrubs, fewer small diameter trees (including thickets of ponderosa pine and incense cedar), and widely spaced large diameter dominant trees of diverse species (sugar pine, Douglas fir, ponderosa pine, incense cedar, black oak, canyon live oak, madrone, etc.). The majority of trees would be ponderosa pine. There would also be more diversity in the herbaceous layer. This is the desired future condition we are working toward in the proposed action.

If a fire were to occur in this stand during the time of year fires normally start in California, it would likely move into the upper story burning virtually all the trees and vegetation within the project area. By doing proposed treatment, we can move this stand to a healthier, more resilient condition so if a fire were to occur after treatment, it would just kill the small evergreens trees and remove much of the shrub and forb understory—which is what likely occurred historically.

Of note, broadcast prescribed fire seems to be the most obvious and effective way to restore forest health. If healthy forest conditions are seemingly dependent on regular low intensity fire, why not reintroduce fire under controlled conditions? Due to the project area’s close proximity to several homes/communities, air quality issues, the massive accumulation of fuels, budget constraints, and other factors, it is extremely unlikely that BLM would be able to do broadcast prescribed burning within the project area at this time. This treatment is not considered in this EA. Therefore, the treatment options considered would involve cutting vegetation either by hand or by mechanical means (i.e., chipper, masticator, etc.) or both.

Cutting does not, by itself, reduce vegetation/fuels; it rearranges them. Since it is possible that a biomass electric generation plant may be in operation near Lone, Amador County by the time this project is implemented, one goal of the proposed action is to determine which method of treatment could generate biomass for this plant in the most feasible and cost effective manner. This could help to remove unwanted cut vegetation. If hauling cut vegetation to the biomass plant is not feasible, BLM would consider pile burning as an alternative. Regardless of the treatment method demonstrated, the desired future condition of a healthy forest will remain the primary goal.

1.2 Conformance with Applicable Land Use Plans

The proposed action—to improve the health of forests on public land in the Lily Gap area and to make this forest more fire resistant to help protect adjacent private property—is consistent with the Sierra Resource Management Plan, approved in February 2008. The Sierra Resource Management Plan’s Record of Decision (pages 15-16) gives BLM the goal of establishing a cost-efficient fire management program commensurate with threats to life, property, public safety, and environmental resources. BLM’s objectives for meeting these goals are to 1). reduce the risk of wildfire in WUI communities; 2). reduce the risk of catastrophic wildfire through fuels management; 3). use prescribed fire, mechanical, and biological treatments to reduce fuels and promote ecosystem diversity and resilience, control invasive species, reduce fuel hazard, improve wildlife habitat, increase water yield, and enhance watersheds. The Folsom/Mother Lode Field Office Fire Management Plan, approved in March 2008 gives BLM various fire and fuels treatment objectives and strategies for specific lands under BLM’s administration. Specific objectives and strategies for the fire management unit, in which the project area is located, are laid out in the plan. The proposed action is consistent with these objectives and strategies.

1.3 Silvicultural Prescriptions for Sierran Mixed-Conifer/Lower Montane Forest

Our definition of healthy forest conditions within the project area draws heavily from the research of North et al. (2009) in the western Sierra Nevada. Their recent report titled *An ecosystem management strategy for Sierran mixed-conifer forests* (North et al. 2009) contains key concepts and silvicultural principles that we have incorporated into the proposed action to achieve the goal of creating a healthy forest conditions within the project area. Appendix A presents a summary of this research.

2.0 Proposed Action and Alternatives

2.1 Proposed Action

BLM proposes to treat Lily Gap as a “demonstration project,” that is, as a venue for applying a variety of different treatment methods to determine which are the most ecologically effective and economically feasible. Regardless of the treatment method demonstrated, the goal would be to create healthy forest conditions within the project area by applying the management ideas of North et al. (2009) (see Appendix A).

Silvicultural Strategy: The silvicultural strategy laid out in Appendix A (especially section A.3) would be applied to all portions of the project area that have the characteristics of a Sierran mixed-conifer/lower montane forest type. This would include nearly the entire the project area with the exception of a dry meadow area and a small wet meadow.

Dead and decadent stands of manzanita and other brush would be removed. All oaks would be retained regardless of canopy position unless they constitute a potential ladder fuel. Other tree species such as madrone and dogwood would be left to create diversity.

Most conifers less than 8 inches diameter at breast height (DBH) would be removed. This includes the dense thickets of incense-cedar and pine. Some conifers less than 8 inches DBH would be retained to ensure that a full range of size and age classes would be represented. Large pines and groups of large pines would be retained, with strategic clearing of potential ladder fuels around them to give them additional protection and to create some open gaps in the canopy. This means that some trees greater than 8 inches DBH would be removed if they are potential ladder fuels and to decrease overall stand density. Any conifers greater than 8 inches DBH that are to be removed to protect the larger “leave” trees and tree clusters would be marked by a BLM forester or fuels specialist. The cut trees would be sold at their highest and best use. Trees larger than 12 inches DBH generally would be sold as sawtimber.

A higher density of tree stems and canopy cover would be retained in the cooler moister microsites, such as along the prominent drainage (outside of the riparian buffer) near the center of Section 25. Defect trees, snags, and downed logs would be retained for wildlife to the extent feasible. In particular, snags greater than 24 inches DBH provide hiding, denning, nesting, and food storage sites for a variety of wildlife. These large snags would be retained unless to do so would create an unusually unsafe concentration of fuels.

Treatment Methods: The different treatment methods to be demonstrated are outlined below. The majority of the work would be done by a hand crew (i.e., BLM fuels crew, inmates, Hotshots, contractors, etc.) under the supervision of BLM’s fuel/fire management specialists.

- 1. Brush Chipper with Pile Burning.** The crew would feed cut vegetation into a rubber-tracked brush chipper staged on existing roads. The crew would pile and prep vegetation in 6 x 6 ft

piles for burning at a later date in accordance with a BLM-approved burn plan and other BLM policy. Approximately 60 piles per acre would be constructed.

2. **Mechanical Masticator.** The crew would use a mechanical masticator to grind, chip, and chew vegetation. The masticated vegetation would be broadcasted across the project area, leaving an altered fuel type, which does not reduce the quantity of fuels, but rearranges them so they are more manageable in the event of wildfire suppression. Equipment selected to carry out this task would be designed to minimize ground disturbance. Multiple cutting attachments would be used to adapt to the terrain and fuels.
3. **Biomass.** If the proposed biomass plant is built near Lone, BLM may attempt to harvest biomass size material. The likely method for harvesting biomass within the project areas is as follows. Fallers would use chainsaws to cut brush and trees less than 8 inches diameter at breast height (unless the trees are a potential ladder fuels that threatens the larger “leave” pines). Cut vegetation would be bucked into manageable lengths for the crew to feed into a rubber-tracked chipper. The chips would be fed directly into a trailer towed by a small rubber-tracked vehicle. The vehicle would tow the chips to designated staging areas (existing roads, pullouts, and landings). Here, the chips would be loaded into a semi-truck trailer and transported to the biomass plant.
4. **Biomass Using Feller Buncher.** Another method for harvesting biomass that may be used involves a feller buncher—a tractor with an attachment that can rapidly cut and gather several trees. The feller buncher would cut and position trees and other vegetation into piles at the harvest site. A rubber-tracked skidder would then move the vegetation from the harvest sites to designated staging areas (existing roads, pullouts, and landings). Here, a large-scale tub grinder would chip the vegetation directly into the trailer of a semi-truck for transport to the biomass plant near Lone. Trees of larger diameter which could be utilized as sawtimber would be loaded on log trucks to be hauled to the closest mill. It would be necessary to create tracks into the project area to access harvest sites and to, then, transport vegetation from the harvest sites to the designated staging areas for further processing and loading. Ground disturbance would be kept to a minimum and would occur only where necessary. No new roads would be built. The number of new tracks into the project area would be minimized. The tracks would be put to bed after work at the harvest site is completed. Only existing roads, pullouts, and landings would be used as designated staging areas.
5. **Dozer and Brush Rake.** BLM would demonstrate for the public the use of a dozer and brush rake to pile vegetation for chipping and biomass utilization in a 5-acre area in the project area. BLM would study the environmental effects of this kind of treatment on the 5-acre area.

The project area may see fuels work at any time over the following 10 years. At the end of this 10-year period, fuels work of any kind within the project area would need to be reauthorized, if necessary with a “fresh” NEPA document. The present EA will be reviewed by staff to determine whether it is adequate to use to reauthorize the proposed action and/or other kinds of fuels work.

Any fuels treatment work (i.e., broadcast prescribed burn, etc.) that BLM may propose in the future outside of the scope of the above described proposed action and/or affecting land outside of the project area analyzed in this EA would be subject to BLM’s full environmental review/decision-making process. In other words, a new NEPA document may be needed, including new cultural and biological recommendations.

2.2 Project Design Features

All treatment work would be conducted subject to the following stipulations.

1. **Minimize New Ground Disturbance.** Cut vegetation would be forwarded to designated staging areas: existing roads, road pullouts, and landings on BLM-administered land for further processing and loading into trucks. No new landings would be built. In some cases, it would be necessary to create tracks into the project area. The tracks are needed to drive heavy equipment to harvest sites and to, then, transport the harvested vegetation to the designated staging areas. Wherever possible, a hand crew with chainsaws and a rubber-tracked chipping and hauling equipment would be used (rather than a feller buncher) to harvest biomass and sawtimber. Biomass material would not be harvested unless the biomass plant is built at Lone, as proposed. Berms, large boulders, and other kinds of barriers may be placed at strategic locations after harvest to prevent dirt bikes and other off-highway vehicles from driving in the treated area and causing erosion.
2. **Erosion and Sedimentation Control.** Erosion and sedimentation are potential issues affecting the drainages near where the center line (running east-west) of the section 25, crosses the drainage that appears on the USGS 1:24,000 topographic map. This stream drainage has been degraded by previous land use. Mining and timber harvest have left an areas of un-vegetated slope and has caused some sedimentation in the channel. To prevent any further potential degradation, streamside buffers (100 ft minimum from the centerline of the stream) would be established for the perennial streams that flow through the project area. No equipment operation would be allowed on slopes greater than 35 percent; hand work would be allowed.
3. **Weed Control.** To minimize the potential for introduction or spread of invasive weeds, equipment used for the proposed action would be cleaned prior to entering area and, where possible, would avoid operating within weed-infested areas, such as stands of scotch broom, or oblong spurge. Occurrences of these weed species were found only at the edge of the public land and avoidance should be feasible.
4. **Cultural Resources.** Flagging-tape buffers would be established around identified cultural resources. These cultural resources would be protected during project implementation.
5. **Wildlife.** Attempt to implement the project outside the breeding season, generally spring (March-June) so as not to disrupt nests, dens, and young animals.
6. **Wildlife.** Avoid wood rat nests and large woody debris when creating burn piles. If a potential nest cannot be avoided, check the pile for signs of wildlife before lighting. If nests or dens are found, leave the pile alone. If it must be burned, restack it nearby or give the animal a path to escape from the fire.
7. **Wildlife.** Leave an uncut patch (minimum of 0.25 acres) for every 10 acres harvested, with patches totaling 5 percent of the area. Use leave trees or large snags as the center for uncut patches. Riparian and other buffers can help to satisfy this goal.
8. **Wildlife.** Retain live trees with existing cavities.
9. **Wildlife.** Avoid damaging existing downed woody debris, especially large (18+ inches) hollow or rotten logs and rotten stumps during all harvesting operations. Leave all existing coarse woody material (more than 6 inches in diameter at the large end) and snags as possible.

10. **Wildlife.** Retention of coarse woody debris in managed stands should more closely model coarse woody debris found in natural stands. Retain and scatter tops and limbs from 20 percent of the trees harvested.
11. **Mining Activity.** There are several active mining claims in the project area. BLM is regulating the use of these claims under the federal mining regulations at 43 CFR 3809 and 3715. Mining claimant Louis Saltzer has been authorized by BLM under these regulations to live on one of his mining claims, now within the project area analyzed in this EA. BLM would work with Louis Saltzer to ensure that his mining activity and related occupancy, as allowed under the regulations, is not negatively affected by the proposed action.

2.3 No Action

Under the no action alternative, BLM would not treat fuels in the project area. Fuels would not be harvested for biomass.

2.4 Alternatives Considered but Eliminated from Detailed Analysis

Due to the project area's close proximity to several homes/communities, air quality issues, budget constraints, and other factors, it is extremely unlikely that BLM would be able to do broadcast prescribed burning within the project area. This alternative is eliminated from detailed analysis.

3.0 Affected Environment

The project area is approximately 420 acres of public land located off of Lily Gap Road/Winton Road, two air miles north east of the town of West Point, in the central Sierra Nevada foothills. Specifically, the project area is located just northwest of Skull Flat, on the divide between the north and south forks of the Mokelumne River. Elevations within the project area range from 3760 to 2840 ft above sea level. There are several unnamed seasonal streams in the project area that drain to the North Fork of the Mokelumne River. One of the drainages (known historically as Skull Flat Gulch or Skull Flat Creek) runs east-west through the project area in Section 25. This drainage is, in some sections, deeply incised and flows perennially. Please refer to the project area maps in Appendix B.

Vegetation in the project area varies depending on elevation, aspect, soils, etc. While westside Ponderosa pine forest tends to be the dominate overstory species over much of the area, the occurrence of Douglas fir, incense-cedar, sugar pine and oak, lends portions of the project area to being classified as mixed conifer type. Whiteleaf manzanita and mountain misery dominate the understory layers. On more north facing slopes the amount of Douglas fir, incense-cedar, and sugar pine as well as canyon live oak increases. Along Skull Flat Creek, big leaf maple, mock orange, white alder, and mountain dogwood become prominent. Other associated woody species include black oak, madrone, deer brush, buckbrush, pinemat ceanothus, toyon, Sierra gooseberry, golden fleece, and poison oak. Due to the lack of disturbance, the area has become thick with brush and suppressed conifers of many species. There are numerous places where the whiteleaf manzanita is so thick, it is impossible to walk through.

The drainages do not support riparian vegetation for the most part. The prominent east-west drainage in Section 25, known as Skull Flat Creek, does support some riparian vegetation (as indicated in the paragraph above), but it is not well developed probably because of the steepness of the grade. Of note, near where the center line (running east-west) of Section 25 crosses Skull Flat Creek, there is a wet meadow dominated by horsetail, with leopard lily, digitalis, columbine, mugwort, sedges, and rushes. There is a dry meadow in the southern portion of the parcel in Section 36.

The vegetation within the project area provides habitat for a variety of wildlife typical for the central Sierra foothills, including black bear, coyote, bobcat, grey fox, California quail, Steller's jay, raven, hawks, and eagles.

The project area is generally within the Mother Lode (east belt), a region of California that experienced substantial gold mining beginning shortly after the discovery of gold in the region in 1848 and lasting to approximately the time that the USA entered World War II (and, in some cases, after World War II). In fact, gold mining (and later logging) was historically the backbone of the region's economy. Many of the current towns in the vicinity of the project area (such as West Point and Railroad Flat) were founded during the Gold Rush (1848 to ca. 1858). Logging intensified after World War II. Evidence of mining and logging activity within the project area is a legacy of the region's historic mining and logging economies—economies that helped to support these and other towns. For more information about the cultural resources found within the project area, refer to the attached cultural resources inventory report by the BLM archaeologist.

The project area is near the boundary of the Stanislaus National Forest. There are numerous residences on private land in the general area, including along the boundaries of BLM-administered land within the project area. The level of recreational use in the project area is quite low. The project area may see some use by hunters. There has been off-highway vehicle use within the project area, as well. Under the 2008 Sierra RMP this use is not allowed off of roads designated for motorized use.

BLM manages this area in accordance with class III visual resource management (VRM) standards. BLM's objective for class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat basic elements found in the predominant natural features of the characteristic landscape.

There are several active mining claims within the project area. BLM is regulating the use of these claims under the federal mining regulations at 43 CFR 3809 and 3715. Mining claimant Louis Saltzer has been authorized by BLM under these regulations to live on one of his mining claims, now within the project area analyzed in this EA.

4.0 Environmental Effects

The following critical elements have been considered in this environmental assessment and have been determined to be unaffected by the proposal: areas of critical environmental concern, prime/unique farmlands, floodplains, wetlands and riparian zones, wilderness, and environmental justice.

4.1 Impacts of the Proposed Action and Alternatives

Forestry. Using data from the Forest Inventory and Analysis gathered by the Forest Service and field observations by the BLM forester, we were able to visually depict what the forest looks like now and what it would look like after we have fully implemented the proposed action. This was accomplished by processing the data through the Forest Vegetation Simulator (FVS). This computer program takes stand data and allows you to set parameters for different types of treatments, and then project the stand into the future to see what would happen after the treatments have been implemented. It is important to remember that this is a "representation" of this stand using real data, and not an exact duplication.

Figure 1 depicts the stand as it is today. Figure 2 represents what the stand would generally look like after treatment is fully implemented. All the trees less than 8 inches DBH have been removed and some of the larger diameter trees have been removed to increase spacing and reduce overall density. Keep in mind that snags and areas of brush would be retained to provide habitat for certain wildlife.

Stand=1001 Year=2011 Inventory conditions

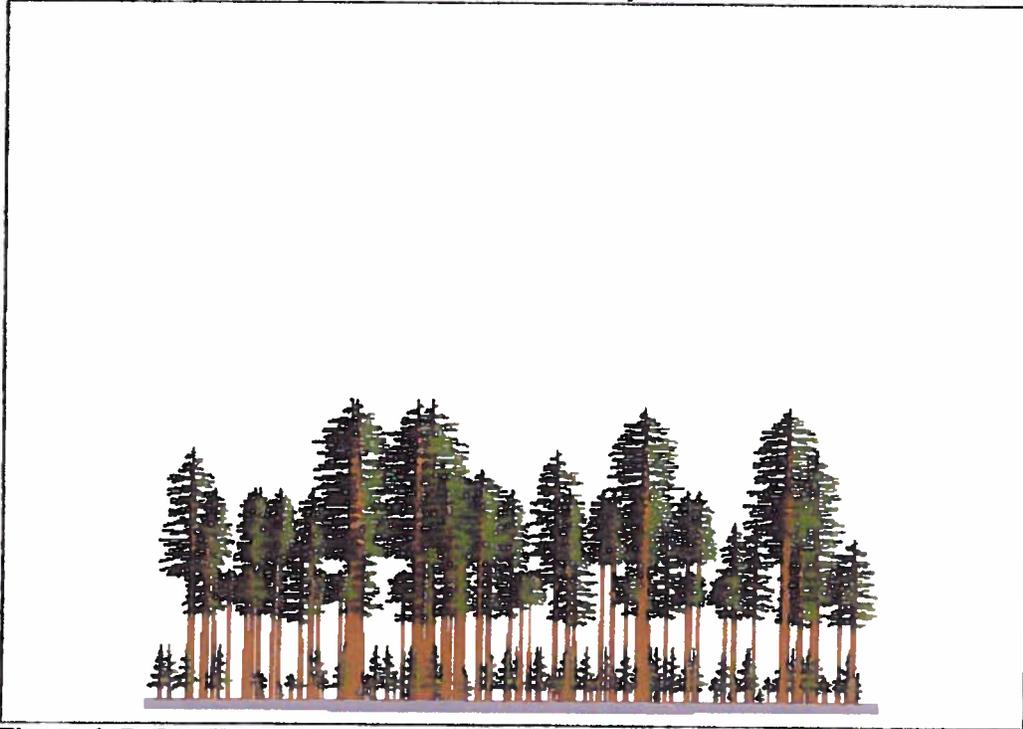


Figure 1. Before Treatment

Stand=1001 Year=2012 Post cutting



Figure 2. After Treatment

Soil – Air – Water. The proposed action would have negligible short-term negative impacts on atmospheric, water, and soil resources in the project area, especially if heavy equipment is not used to harvest vegetation for biomass. There are small seasonal streams in the area that feed into the North Fork of the Mokelumne River, a mile or so to the west. The proposed action could cause erosion and some additional sediment to flow into these streams and into the river. BLM has recommended that the river, from Tiger Creek Reservoir to Highway 49 be incorporated into the national wild and scenic river system. Water quality is one of the outstandingly remarkable values that, in BLM's view, makes this stretch of river potentially eligible for wild and scenic designation. The area that would be treated is relatively small in size and ground disturbance would be minimized using the project design features in Section 2.2 of this EA. In particular, heavy equipment would not operate on slopes greater than 30 percent and/or within 100 ft of perennial streams. Equipment used for the project is small in terms of size and power and would be equipped with rubber-tracked tires to minimize ground disturbance. The proposed action would not have more than a negligible impact on soils and water quality. Cutting and chipping of vegetation, as proposed, would create some dust, but again dust created by the proposed action is small and not enough to seriously affect air quality. The same can be said for potentially burning vegetation harvested in the project area in a biomass plant. The proposed action is too small to seriously affect air quality on a local or regional scale.

Botany. BLM botanists analyzed the impacts of the proposed action on botanical/vegetation resources, especially special status plants. The analysis is designed to help BLM meet its obligations under the Endangered Species Act and meet other authorities and BLM policies. The botanist recommended that the proposed actions would not affect threatened and endangered plants or other BLM special status plants. White leaf manzanita chaparral and ponderosa pine/black oak forest are project area plant communities adapted to periodic wildfire. It is likely that the project area has experienced natural wildfire events in the past and has recovered after the wholesale removal of shrubs and other understory vegetation. Likewise, the common woody species (e.g., white leaf manzanita) that would be cut in the course of the proposed action would reestablish themselves within the project area over time. However the relative abundance of species can be altered by the treatment method used to reduce fuels. For instance, cutting shrubs with a chainsaw or masticator favors sprouting species like chamise or toyon that are not killed by cutting. These species can reestablish themselves quickly. Obligate seeding species like white leaf manzanita may become less abundant in the stand after this kind of treatment.

Wildlife. The BLM wildlife biologist analyzed the impacts of the proposed action on wildlife, especially on special status wildlife. Her analysis was designed to help BLM meet its obligations under the Endangered Species Act and other authorities and BLM policies. The biologist recommended that the proposed action would not affect threatened and endangered wildlife or other BLM special status wildlife.

While mechanical fuels treatments can decrease the risk of catastrophic fire, they do not provide the ecosystem benefits of low intensity low severity fire, and they alter habitat needed by wildlife. In general, fire-dependent species, species preferring open habitats, and species that are associated with early successional vegetation or that consume seeds and fruit appear to benefit from mechanical fuel reduction activities. Increasing understory light for shrub patch development can increase habitat for some small mammals and birds. In contrast, species that prefer closed-canopy forests or dense understory, and species closely associated with those habitat elements that may be removed or consumed by fuel reductions, would likely be negatively affected by fuel reductions. Some habitat loss may persist for only a few months or a few years, such as the loss of shrubby understory vegetation which can recover quickly. The loss of large-diameter snags and down wood, which are important habitat elements for many wildlife and invertebrate species, may take decades to recover and thus represent some of the most important habitat elements to conserve during fuel reduction treatments.

Retention of snags is addressed in the proposed action. Downed wood retention is addressed in project design features 10 and 11. These measures would reduce this impact.

Overall, direct mortality of wildlife owing to crushing from heavy equipment during fuel reduction is considered to be low, but this is mostly based on anecdotal information. It is believed that most species are able to find refuge microsites (e.g., inside burrows or under surface objects) or move away from approaching equipment. However, spring-season thinning during the breeding season may result in mortality of ground- and shrub-nesting bird nestlings and species living within litter such as small mammals, reptiles, amphibians, and invertebrates. Project design feature 6 that attempts to avoid the breeding/nesting period would reduce this impact.

Black bear. By volume, about 25 percent of black bear diet can consist of insects (mainly ants and yellowjackets) obtained primarily from down logs. A decrease in down wood would result in fewer ants and yellowjacket nests available to black bears. Project design features 10 and 11 address the retention of coarse woody material. Fuels reduction would likely increase the amount of grasses and berries used by black bears for foraging.

Deer. The proposed fuels reduction strategy would increase forage quantity and quality for deer. However, escape cover for mule deer, and other animals that need high shrub cover to avoid predators would be reduced. Project design feature 8 which calls for the retention of uncut patches of vegetation would reduce the impacts of less escape cover.

Small Mammals. Shrubs, down wood, and snags provide important cover from predators thus the loss of these habitat elements may have negative consequences for some small mammal species. The silvicultural strategy to be implemented, along with project design features 10 and 11, address snag and down wood retention and would reduce this impact. Small mammal species that need high shrub cover to avoid predators may be negatively affected by shrub removal for the first few years post-treatment, but then exceed pretreatment population levels when shrubs recover and food sources are high from increased light, herbaceous growth, and seed production. Project design feature 8 that retains patches of uncut vegetation would reduce the impacts of shrub removal. However, other species prefer open habitat conditions and may benefit from the food resources provided by plentiful grasses and forbs that may establish after fuel reduction. Some species of small mammals prefer high canopy closure, such as northern flying squirrel, and thus may be adversely affected by thinning treatments. Thinned stands would likely be poor bushy tailed woodrat habitat due to their association with abundant large snags, mistletoe brooms and soft log cover. Project design feature 10 that addresses retention of pre-harvest coarse woody material and the proposed action which addresses retention of snags will reduce these impacts.

Bats. Several species of bats roost under the bark of tall, large-diameter trees or in cavities of large snags. If large-diameter snags and trees are protected during fuel reduction as proposed, it is likely that fuels reduction may have minimal or even positive effects on bat populations. Retention of large trees and snags is addressed in the proposed action and project design features.

Birds. Fuels reduction conducted during the nesting season is more likely to result in high mortality of nestlings, especially for species nesting on the ground and in shrubs and small trees. Project design feature 3 that attempts to avoid the breeding/nesting period would reduce this impact. Fuels reduction prior to the nesting season is likely to reduce nesting habitat for ground- and shrub-nesting species. At the population level, the proposed project would not have a measurable negative effect on migratory bird populations. This is in part because the project is relatively small compared to the amount of mixed conifer forest within the field office boundary. The impact is further reduced by project design feature 8 which leaves patches of uncut vegetation.

Bird responses to fuels reduction are dependent on the species and other factors. Some bird species prefer early successional and open habitats, and these species are likely to increase in abundance after fuel reduction. In contrast, some bird species may be less abundant after fuel reduction. Hurteau et. al (2008) found that mountain chickadee and yellow-rumped warbler were particularly sensitive to thinning treatment in his study at the Southwestern Plateau. Removal of large trees or snags would likely affect species nesting in tree canopies and cavities of snags or live tree boles. Recruitment of large snags for cavity nesters may take decades or longer, depending on existing stand conditions. The proposed action which addresses the retention of large trees and snags would reduce these impacts. Further, project design feature 9 that addresses retention of live trees with cavities would reduce these impacts.

Cavity-nesting birds. If fuel treatments involve removing or eliminating snags, then a net loss of nesting habitat for primary and secondary cavity-nesting birds might be expected for many years. The majority of research studies report that fuel treatments result in a decrease in populations of cavity nesters owing to loss of dead trees used for nesting and roosting. The proposed action which addresses the retention of large trees and snags would reduce these impacts. Further, project design feature 9 that addresses retention of live trees with cavities would reduce these impacts.

Raptors. The more open understory created by fuel reduction may be advantageous to some species of hawks, owls, and eagles that prey on small mammals and birds in open forests and small clearings. Prey species that have less cover are more easily captured, and some prey species prefer open forests (for example, deer mice). However, some raptor species and some small mammals and avian prey prefer closed canopy forests and thus may avoid stands that have been treated to reduce fuels. Raptor species that prefer closed canopy forest, such as California spotted owl and northern goshawk, were not detected in the project area so these raptors will not be impacted by the project. The removal of trees with dwarf mistletoe brooms during thinning treatments would likely be detrimental to wildlife species that nest in mistletoe brooms, including great horned owl, northern goshawk, Cooper's hawk, California spotted owl, and red-tailed hawk. Retention of defect trees which is addressed in the proposed action would reduce this impact.

Thinning from below, while still retaining large trees, snags, large downed wood, and high canopy closure should allow continued habitat suitability for northern goshawk and California spotted owl. Although vegetation manipulation to reduce wildfire hazard may create less than optimum habitat for northern goshawk and California spotted owl, this should be weighed against the hazard for stand replacement fires and complete loss of habitat over large areas. Retaining large trees, snags, large downed wood, and patches of high canopy closure is addressed in the proposed action and the project design features. In addition, northern goshawk and California spotted owl were not detected in the project area, and therefore would not be impacted by the proposed action.

Amphibians. A few amphibians are strictly aquatic, but most use upland habitats at various times during the year, and a few species are strictly terrestrial. Upland habitat use by forest amphibians largely depends on the availability of moist duff and litter and rotting down wood. Amphibian response to reducing canopy cover would likely be unfavorable because of the warmer and drier conditions created in the understory vegetation, down wood, litter, and soil. Most terrestrial salamanders require moist soils or decomposing wood to maintain water balance, and dry conditions usually result in suppressed populations. Project design features 10 and 11 that address retention of downed wood would reduce this impact. Anurans (frogs and toads) may be less affected by changes in environmental conditions associated with the proposed fuel reduction project because of their tendency to travel at night and during rain events, their greater vagility than salamanders, and their close association with wetlands. Still, species that frequently occupy terrestrial habitats such as many salamanders, boreal toads, and tree frogs may be killed during fuel treatments or find post-treatment conditions unsuitable.

These negative effects would be expected to be short-term. The direct mortality of amphibians during fuels reduction treatment is not anticipated to be high. Fuels reduction treatments may contribute fine sediment to streams because of increased surface runoff. Sedimentation causes reduced survivorship of eggs and tadpoles of some stream-breeding amphibians that lay their eggs and rear tadpoles under rocks or within interstitial spaces in the substratum. Project design feature 2 that establishes stream buffer zones would reduce sedimentation into the stream, thus reducing this impact.

Reptiles. James and M'Closkey (2003) found that the removal of dead trees (standing and prone) during fuels treatment on the Colorado Plateau may limit the local distribution, abundance, and diversity of lizards, which include dead trees in their microhabitat for shelter, perching, foraging, courting, and defending territories. Removal of dead trees could seriously affect the local abundance and diversity of lizard species, which spend substantial time in this microhabitat. Project design features 10 and 11 address the retention of coarse woody debris, and the proposed action addresses retention of snags. The retention of snags and coarse woody debris would reduce these impacts.

Coarse Woody Debris. One of the key differences between biomass removal and a traditional timber harvest is the reduction of dead wood on the forest floor. Besides providing wildlife habitat, dead wood serves as a seedbed for regeneration, releases nutrients back into the soil and forest, decreases runoff and erosion, facilitates nitrogen fixation, and stores forest carbon.

Butts and McComb (2000) found in their study site in western Oregon that coarse woody debris reductions associated with thinning of stands may negatively impact salamanders and shrews. The abundance of ensatina and clouded salamanders increased with the volume of coarse woody debris. In addition, the probability of encountering either ensatina or Trowbridge's shrew increased with cover of coarse woody debris on the forest floor. The study suggests that current management guidelines for coarse woody debris retention may not provide adequate habitat for forest-floor vertebrates that depend on this component of the habitat. The authors suggest that the retention of coarse woody debris in managed stands should more closely model coarse woody debris found in natural stands, and thus recommend coarse woody debris retention in the range of 100-300 m³/hectare. This is more likely to provide coarse woody debris for terrestrial salamanders.

In three regions (West, North and East) of south and central Sweden, Gunnarson et. al. (2004) studied short-term effects of slash removal on species richness and abundance of beetles in coniferous and mixed forests. The study concluded that extensive slash removal leads to impoverished species richness of beetles at a local scale. Slash heaps left on site may provide important refuges for ground-active beetles. Moreover, the results support the general theory that microhabitat structure affects arthropod abundance and diversity. Project design features 10 and 11 that address the retention of coarse woody debris would reduce these impacts.

Cultural Resources. The BLM archaeologist has conducted a cultural resource study of the proposed action to determine whether significant cultural resources could be affected by the proposed action. The study includes a background records search and field inventory. The study is designed to help BLM meet its obligations under Section 106 of the Historic Preservation Act. The background record search and field inventory indicate very low sensitivity for prehistoric resources, especially village sites. The terrain is mostly steep and heavily forested. The project area has a much higher sensitivity for historic-era gold-mining- and logging-related resources. Logging during the last 30 to 50 years has also left a mark on the project area in the form of skid roads, stumps, and eroded areas. All cultural resources found within the project that could be affected by the proposed action would be flagged for avoidance. In other words, no cultural resources would be affected by the proposed action. It is anticipated that the proposed actions would not affect significant cultural resources. Consultation with Native Americans is occurring as this EA is put out for public review. All Native American input will

be carefully considered. We do not anticipate that any places of traditional religious and cultural significance to Native Americans would be affected. If we do identify such places we will work with the affected Native Americans to modify the proposed action to avoid negative effects.

Recreation. The proposed action could have negligible short-term negative impacts on recreational use. Hunters and motorists on designated routes might be inconvenienced temporarily during project implementation due to the noise and the dust caused by cutting and chipping fuels, and the use of the roads in the area by project-related vehicles including a semi-truck/trailer. Recreationists would continue to use the project area after the proposed action is implemented with no additional inconvenience. As noted in the affected environment section, there has been off-highway vehicle use within the project area. Under the 2008 Sierra RMP this use is not allowed off of designated roads. The proposed action would be done in a way that does not increase unauthorized use of off-highway vehicles within the project area.

Visual Resources. The project area is not known for its visual resources. The proposed project could have a negligible negative impact on visual resources. Vegetation would be removed. Some might consider this an improvement to the scenery. Most importantly, the proposed action would be consistent with BLM's VRM class III management objective under the 2008 Sierra RMP, which is to partially retain the existing character of the landscape.

4.2 Impacts of the No Action Alternative

There would be no direct impacts to environmental resources, such as atmospheric, soil, water, biological, and cultural resources. Though highly variable and difficult to predict with certainty, not implementing the proposed action could lead to detrimental impacts to forest health, firefighting efforts, and adjacent private properties. If a fire were to occur within the project area during the usual California fire season, it would likely move into the upper story—a crown fire—burning virtually all the trees and vegetation within the project area. By doing proposed treatment, we can move this stand to a healthier, more resilient condition so if a fire were to occur after treatment, it would just kill the small evergreens trees and remove much of the shrub and forb understory—which is what likely occurred historically. The BLM may also miss an opportunity to provide vegetation to a biomass plant near Ione. We would miss an opportunity to help produce energy and increase economic growth. Quantifying this impact is impossible.

4.3 Cumulative Impacts

Negative cumulative impacts on the larger watershed scale are not anticipated. The proposed action would have negligible negative impacts on commonplace plants and wildlife. The current condition of the vegetation has been influenced by decades of wildfire suppression. Other than prescribed fire (or an uncontrolled wildfire), which has been removed from further consideration in this EA for a variety of reasons (refer to Section 2.4), there is not at present a better way to reduce dense understory vegetation that would have been reduced by wildfire in the past, before fire suppression was practiced. Prescribed burning is severely limited by safety and air quality concerns, especially in the wildland urban interface. The number of homes in close proximity to the project area would make burning here problematic. The proposed action is expected to have beneficial cumulative impact on wildfire suppression in the area, as long as BLM maintains the treatment area.

With respect to atmospheric, soil, and water resources, negative cumulative impacts on the watershed scale are not anticipated. The project design features would greatly limit the amount of potential erosion of sediments into the drainages/tributaries of the North Fork of the Mokelumne River. BLM has not recently proposed any projects of this scope within the Mokelumne River watershed. Nothing like this is planned in the foreseeable future.

5.0 Agencies and Persons Consulted

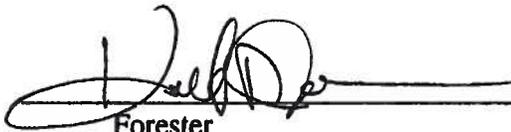
5.1 Authors

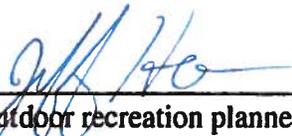
James Barnes, BLM NEPA coordinator/archaeologist
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Brian Mulhollen, BLM fuels specialist

5.2 BLM Interdisciplinary Team/Reviewers:

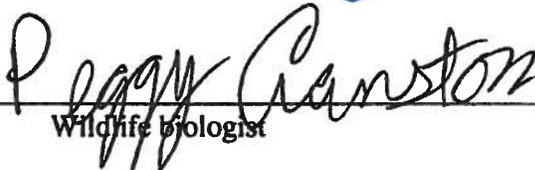

NEPA coordinator/Archaeologist 3/1/11
Date


Fuels specialist 3/1/11
Date


Forester 3/1/11
Date


Outdoor recreation planner/VRM specialist 2/25/11
Date


Botanist 2/24/2011
Date


Wildlife biologist 2/25/2011
Date

5.3 Availability of Document and Comment Procedures

This EA will be posted on Mother Lode Field Office's website (www.blm.gov/ca/motherlode) under NEPA and will be available for a 30-day public review period. The EA is also available by mail upon request during this 30-day public review period. Comments should be sent to James Barnes at Bureau of Land Management, Mother Lode Field Office, 5152 Hillsdale Circle, El Dorado Hills, California 95762 or emailed to jjbarnes@blm.gov.

5.4 References Cited and Sources of Information

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Pilliod, D.S., E.L. Bull, J.L. Hayes, and B.C. Wales

2006 *Wildlife and invertebrate response to fuel reduction treatments in dry coniferous forests of the western United States: a synthesis*. Gen. Tech. Rep. RMRS-GTR-173. U.S. Forest Service, Rocky Mountain Research Station, Fort Collins, CO. 34 pp. (Much of the wildlife impact section came from this publication.)

Appendix A

Silvicultural Prescription for Sierran Mixed-Conifer/Lower Montane Forest

A.1 Background and the Importance of Fire

Our definition of healthy forest conditions within the project area draws heavily from the research of North et al. (2009) in the western Sierra Nevada. Their recent report titled *An ecosystem management strategy for Sierran mixed-conifer forests* (North et al. 2009) contains key concepts and silvicultural principles that we feel can be incorporated into the proposed action to achieve the goal of creating a healthy forest conditions within the project area.

Chief among these concepts is the importance of wildfire. North et al (2009) explains that:

Fire plays a pivotal role in reshaping and maintaining mixed-conifer ecosystems. Fire was once very common in most of the western Sierra and has been a primary force shaping the structure, composition, and function of mixed-conifer forests. ... [Most of the fires were of low intensity and returned at frequent intervals.] The main effect of low-intensity fire is its reduction of natural and human-created (i.e., resulting from management activities) fuels, litter, shrub cover, and small trees. These reductions open growing space, provide a flush of soil nutrients, and increase the diversity of plants and invertebrates. By reducing canopy cover, fire also increases habitat and microclimate heterogeneity at site, stand, and landscape levels [North et al. 2009:5-6].

Forest fuels are usually assessed in three general categories: surface, ladder, and canopy bulk density. Fuel treatments often focus on ladder fuels (generally defined to be variably sized understory trees that provide vertical continuity of fuels from the forest floor to the crowns of overstory trees.) Some studies and models, however, suggest a crown fire entering a stand is rarely sustained (i.e., sustained only under extreme weather conditions) if understory fuels are too sparse to generate sufficient radiant and convective heat. [North et al. 2009:3].

By itself, prescribed fire is difficult to apply in some forests owing to fuel accumulations, changes in stand structure, and operational limitations on its use. Mechanical treatments can be effective tools to modify stand structure and influence subsequent fire severity and extent and are often a required first treatment in forests containing excessive fuel loads. [North et al. 2009:6-7]

Prescribed fire is generally implemented very carefully, killing only the smaller size class trees. In some cases, it is ineffective for restoring resilience, at least in the first pass. For example, prescribed fire may not kill many of the larger ladder-fuel or co-dominant true fir trees that have grown in with fire suppression. In many stands, mechanical thinning followed by prescribed fire may be necessary to achieve forest resilience much faster than with prescribed fire alone. [North et al. 2009:7]

Some forests cannot be prescription burned, at least as an initial treatment, because of air quality regulations, increasing wildland home construction, and limited budgets. Yet restoration of these forests still depends on modifying fuels because it reduces wildfire intensity when a fire does occur and can produce stand conditions that simulate some of fire's ecological effects. [North et al. 2009:7]

One measure of resilience is that fire disturbance produces mortality patterns consistent with the dynamics under which the forest evolved. Mixed-conifer resilience might be best ensured by (1) reducing fuels such that if the forest burned, the fire would most likely be a low severity surface and (2) producing a forest structure that keeps insect and pathogen mortality at low, chronic levels. Where intermediate-size trees are abundant, they may present a fire and fuels risk, especially when live crowns are continuous to the forest floor (North et al. 2009:v).

Intermediate-size trees can contribute to overly dense stands that are moisture stressed and at risk of bark beetle attacks:

In addition to ladder and surface fuels, managers have been concerned with reducing canopy bulk density in DFPZs and the defense zone of wildland urban interfaces (WUI). Overstory trees are commonly removed, and residual trees are evenly spaced to increase crown separation. The efficacy of canopy bulk density reduction in modifying fire behavior is largely a function of weather conditions. Research has suggested there is often limited reduction in crown fire potential through overstory thinning alone, without also treating surface fuels. [North et al. 2009:4]

A concern with the widespread use of canopy bulk density thinning in defensible fuel profile and defense zones is the ecological effects of the regular tree spacing. In the Sierra Nevada, historical data, narratives, and reconstruction studies indicate mixed conifer forests were highly clustered with groups of trees separated by sparsely treed or open gap conditions. This clustering can be important for regenerating shade-intolerant pine, increasing plant diversity and shrub cover moderating surface and canopy microclimate conditions within the tree cluster and providing a variety of microhabitat conditions for birds and small mammals. [North et al. 2009:4]

A.2 Importance of Stand Heterogeneity and Density

Recent studies have shown that spatial heterogeneity was a key feature in forest resiliency and characteristic of frequent fire's effect on mixed-conifer forests. Fuel treatments that produce uniform tree spacing reduce this ecologically important spatial heterogeneity. North et al. (2009) explains that:

Horizontal heterogeneity, however, used to be relatively common in Sierran mixed-conifer forests [due to logging/reforestation practices]. All of the Sierran reconstruction studies suggest mixed-conifer forests, under an active fire regime, had a naturally clumped distribution containing a variety of size and age classes. [North et al. 2009:15]

At the stand level, vertical heterogeneity can still be provided by separating groups of trees by their canopy strata. For example, a group of intermediate-size trees that could serve as ladder fuels might be thinned or removed if they are growing under large overstory trees. The same size trees in a discrete group, however, might be lightly thinned to accelerate residual tree growth or left alone if the group does not present a ladder fuel hazard for large, overstory trees. [North et al. 2009:15-16]

To increase horizontal heterogeneity, we suggest using microtopography as a template. Wetter areas, such as seeps, concave pockets, and cold air drainages, may have burned less frequently or at lower intensity. Limiting thinning to ladder fuels in these areas is suggested because with their potentially higher productivity and cooler microclimate, they can support greater stem densities, higher canopy cover, and reduced fire effects. A concern with current uniform fuel reduction is that these microsite habitats associated with sensitive species would be eliminated. Surface fuel loads at these microsites should still be reduced to lower their vulnerability to high-intensity fire.

In contrast, upslope areas, where soils may be shallower and drier and where fire can burn with greater intensity, historically had lower stem densities and canopy cover. On these sites, thinning might reduce the density of small or, where appropriate, intermediate trees and ladder and surface fuels toward a more open condition. In some circumstances this thinning may reduce water stress, accelerating the development of large residual trees. Within a stand, varying stem density according to potential fire intensity effects on stand structure would create horizontal heterogeneity. [North et al. 2009:16-18]

Historical forests can provide a better understanding of the ecological processes that have shaped mixed-conifer forest and the habitat conditions to which wildlife have adapted. All reconstruction studies, old forest survey data sets, and 19th-century photographs suggest that frequently burned forests had very low tree densities. ... Studies reconstructing pre-European conditions all indicate that forests had a greater percentage of pine, a clustered pattern with highly variable canopy cover, and a high percentage of the growing stock in more fire resistant, large-diameter classes. ... What these reconstructions do provide is inference about the cumulative process effects of fire, insects, pathogens, wind, and forest dynamics on stand structure and composition, producing forests resilient to most disturbances, including wildfire. ... [Modeling] found a low-density forest dominated by large pines was most resilient to wildfire, sequestered the most carbon, and had the lowest carbon dioxide (CO₂) emissions and thus contributed less to global warming. An analysis of carbon emissions and storage from different fuel treatments, found

understory thinning followed by prescribed fire produced the greatest reduction in potential wildfire severity without severely reducing carbon stocks. [North et al. 2009:9].

In fire-suppressed forests, shrubs are often shaded out, reducing their size, abundance, and fruit and seed production in low-light forest understories. Anecdotal narratives, a forest reconstruction, and a few early plot maps suggest shrub cover in active-fire conditions might have been much higher than in current forests, mostly owing to large shrub patches that occupied some of the gaps between tree clusters. [North et al. 2009:12]

Studies in the Sierra Nevada and Klamath Mountains found that mixed-conifer structure and composition varied by fire patterns that were controlled by landscape physiographic features. Fire intensity, and consequently a more open forest condition, increased with higher slope positions and more southwesterly aspects. ... Cumulatively these studies suggest that forest landscapes varied depending on what structural conditions would be produced by topography's influence on fire frequency and intensity. [North et al. 2009:19]

A.3 Silvicultural Strategy

North et al. (2009) asserts that a new silviculture for Sierran mixed-conifer forest that

balances ecological restoration and wildlife habitat with fuel reduction can meet multiple forest objectives. By necessity, recent Sierran silviculture has first been focused on reducing fire severity through fuel reduction. For many reasons, including maintaining or restoring resilient forests, public safety, and property loss, fuel reduction remains a priority. We suggest that, with some modification, wildlife and ecological objectives can also be met. [North et al. 2009:22]

Diameter-limit prescriptions applied equally to all species will not remedy the significant deficit of hardwoods and pines in current forests. Prescriptions that differ by species can retain hardwoods, which are important for wildlife, and favor pines that can increase the forest's fire resilience. Given their current scarcity in many locations, there are few instances that warrant cutting either hardwoods or pines in mixed-conifer forests. [Id.]

In general, leaving pine and thinning white fir, Douglas-fir, and incense-cedar will help restore historical species composition and increase the forest's fire resilience. There are times, however, where removing pine can reduce fuels, decrease the risk of drought or insect induced mortality, and accelerate the growth of the residual pine trees.

We suggest creating landscape heterogeneity in the Sierra Nevada by mimicking the forest conditions that would be created by the fire behavior and return interval associated with differences in slope position, aspect, and slope steepness. In general, stem density and canopy cover would be highest in drainages and riparian areas, and then decrease over the midslope and become lowest near and on ridgetops. Stem density and canopy cover in all three areas would be higher on northeast aspects compared to southwest. Stand density would also vary with slope becoming more open as slopes steeper. [North et al. 2009:20]

Locating gaps in areas with thinner soils or lower productivity may be logical to foster lower canopy cover since these areas historically supported lower tree densities and fuel loads. In the forest matrix between tree groups and gaps, frequent-fire forests generally consisted of widely spaced, large trees, most of which were pines. The relative proportion of these conditions (i.e., low density, dispersed large trees, and large and small gaps and tree groups) and their composition could be varied depending on existing forest conditions and topographic position.

The proposed silvicultural approach is a multiaged-stand strategy driven by the need for wildlife habitat, fire-resistant stand structures, and restoration of stand and landscape patterns similar to active-fire conditions in mixed-conifer forests. Although we use the term multiage, we are most interested in size and structure, and their associated ecological attributes. Multiaged stands are a flexible means of including variable stand structures with two or more age classes and integrating existing stand structures into silvicultural prescriptions. [North et al. 2009:22]

Clusters of intermediate to large trees (i.e., >20 inches diameter at breast height [DBH]) are sometimes marked for thinning with the belief that they are overstocked and thinning would reduce moisture stress. Some evidence, however, suggests these groups of large trees may not be moisture stressed by within-group competition.... Reconstructions of Sierran forests with active fire regimes have consistently found large trees in groups. These groups, however, can be at risk if intermediate and small trees grow within the large tree groups. Thinning these small and intermediate trees will reduce fire laddering. [North et al. 2009:23-24]

What is considered a ladder fuel differs from stand to stand, but typically these are trees in the 10- to 16-inch DBH classes. Trees larger than this may be thinned, for additional fuel reduction by reducing canopy bulk density in strategic locations. Removal of some of the intermediate sized trees would also have the economic benefit of providing revenue to help offset the costs of the fuels reduction and could fund additional projects (North et al. 2009:24).

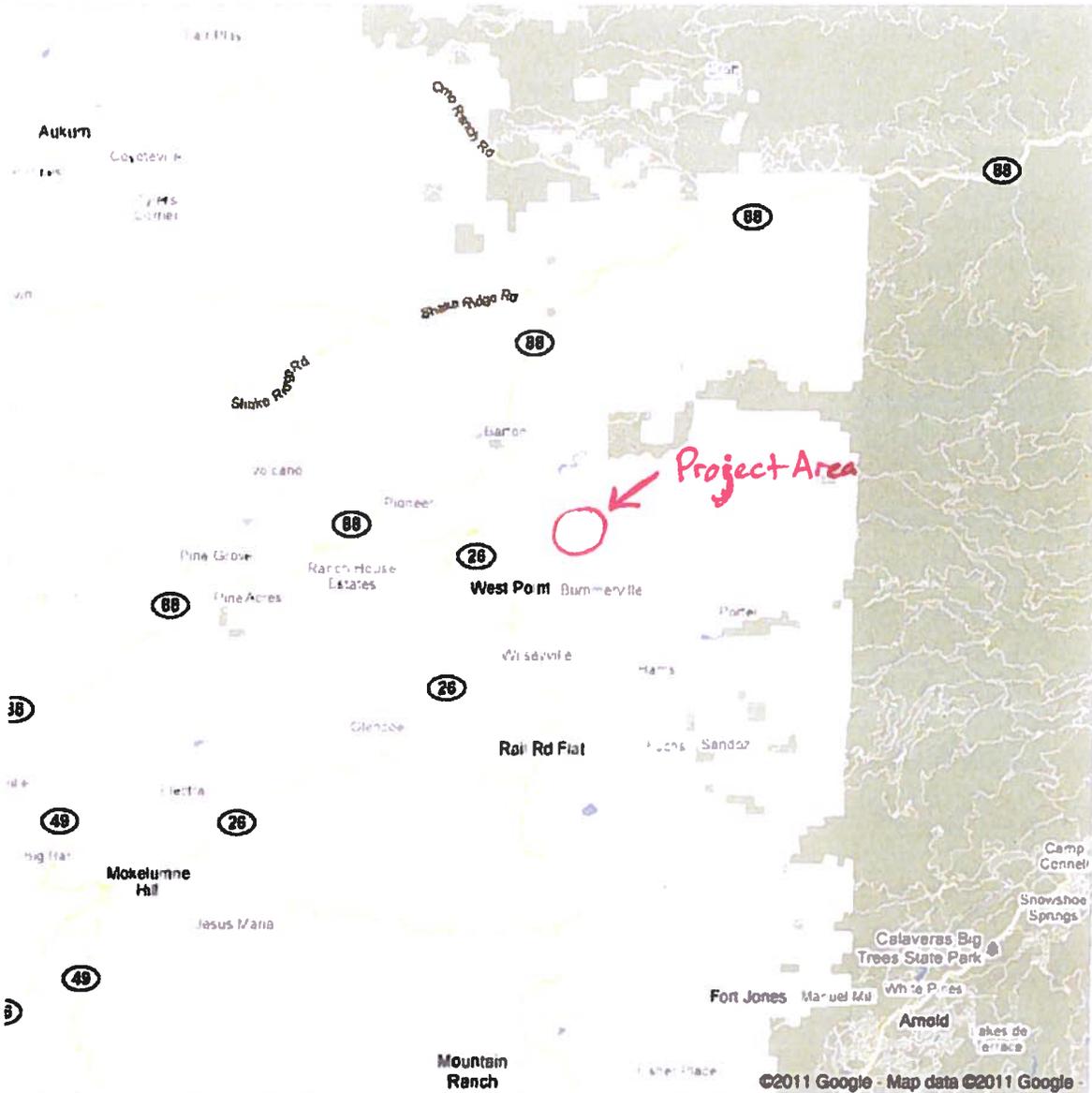
Thinned intermediate-size trees should only be fire-sensitive, shade-tolerant species such as white fir, Douglas-fir, and incense-cedar. In mixed-conifer forest, attempt to keep intermediate-size pines and hardwoods because of their relative scarcity and importance to wildlife and fire resilience. . . Some intermediate-size trees can still function as ladder fuel, particularly those that were initially grown in more open conditions. These trees can have live and dead limbs that extend down close to the forest floor providing a continuous fuel ladder. . . [In] middle to upper slope topographic position ... some thinning of intermediate-size trees may help accelerate the development of large "leave" trees. We suggest, however, that these criteria not be applied to riparian areas, moist microsites often associated with deeper soils, concave topography, or drainage bottoms because these areas may have supported higher tree densities and probably greater numbers of intermediate size trees. [North et al. 2009:24-25]

Appendix B
Project area maps

Appendix B
Project area maps



Notes Project location map for the Lily Gap biomass demonstration project

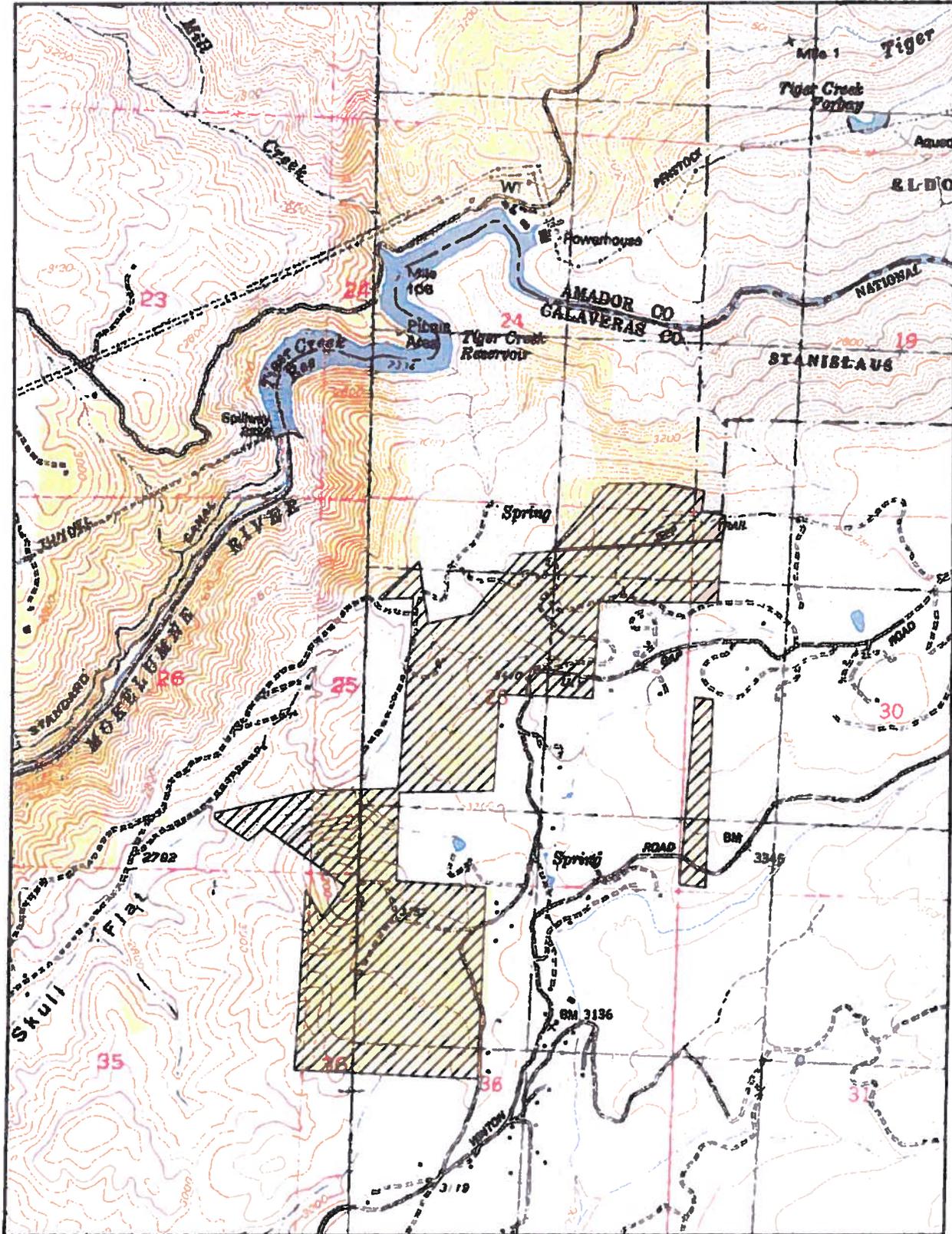


R13E

R14E

T7N

T7N



Lilly Gap Biomass Demonstration Project



Harvest Area, 450 acres



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT
 Mother Lode Field Office
 El Dorado Hills, California
 (916) 841-3101
www.ca.blm.gov/motherlode
 Date Prepared: 3/18/2011
 Project: LillyGapBiomassEA 8x10.mxd

Performance Measures

Sierra Nevada Conservancy Performance Measures Description

August 5, 2008

Acres of Land Improved or Restored

Purpose

The purpose of this Performance Measure (PM) is to track efforts to improve natural resource conditions, such as site productivity and wildlife habitat, through site improvement or restoration activities and reduce the risk of natural disasters, such as catastrophic wildfire, flood, avalanche, etc. Wherever possible, acres should be categorized by importance or priority rating, such as acres of critical habitat, or acres in moderate, high and very high fire hazard areas as delineated by CAL FIRE's Fire Hazard Severity Zoning Map.

Likely Project Categories

This PM would likely be applicable for projects in the following category:

- Site improvement/restoration projects.

Variations

This PM is further classified by the following two variations:

- Site Importance or Priority Rating
- Restoration/Improvement Project Purpose
 - ✓ Natural Disaster Risk Reduction – Fire
 - ✓ Natural Disaster Risk Reduction – Other
 - ✓ Natural Resource Protection, e.g., invasive species removal, erosion control, vegetation planting, trail/bridge replacement, forest health, etc.
 - ✓ Water Quality
 - ✓ Habitat, both aquatic or terrestrial
 - ✓ Resource Management, e.g. increasing site productivity, vegetation management, forest management, etc.
 - ✓ Recreation

Guidance on Applying this PM to Your Project

This is a recommended approach to collecting data and reporting on this PM. Grantees are asked to further evaluate how these steps may best be applied to their specific projects and to discuss with SNC any steps or considerations that may be unique.

➤ Data collection:

- a. Document total acres treated.
- b. Identify land restoration or improvement purpose(s) for the acres treated, using the following list (check all that apply and provide number of acres for each purpose or topic area):
 - i. Natural Disaster Risk Reduction – Fire
 - ii. Natural Disaster Risk Reduction – Other
 - iii. Natural Resource Protection, e.g., invasive species removal, erosion control, vegetation planting, trail/bridge replacement, forest health, etc.
 - iv. Water Quality
 - v. Habitat, both aquatic or terrestrial
 - vi. Resource Management, e.g. increasing site productivity, vegetation management, forest management, etc.
 - vii. Recreation
- c. Where appropriate, identify the federal, state, or local government site importance or priority rating for the treated acres and the source of the rating
 - i. For fuel treatments, document the acres treated by risk category (moderate, high, very high) based on Cal Fire severity rating (<http://frap.cdf.ca.gov/data/frapgismaps/download.asp>).
 - ii. For habitat restoration, identify, if applicable, acres that contain rare natural communities (i.e., those communities that are of highly limited distribution); priority acres based on the California Wildlife Habitat Relationships System (<http://www.dfg.ca.gov/biogeodata/cwhr/morecwhr.asp>); or habitat for threatened or endangered species as listed by the California Department of Fish and Game or U.S. Fish and Wildlife Service).
 - iii. Consider other applicable importance or priority ratings as determined by federal, state, or local government resource management or planning agencies.

Sierra Nevada Conservancy
Performance Measures Descriptions

- **Reporting:** Report total number of acres improved or restored by importance/priority rating and treatment purpose. Note: one acre may be counted more than once if improvement/restoration of that acre meets more than one purpose. Suggested reporting format as follows:

Acres treated	Site importance or priority rating	Source of prioritization or importance rating	Purpose (from list provided above)

Other

The level of effort required to measure, analyze, and report acres of land improved or restored should be minimal, less than 40 hours. Accurate measurement and reporting requires careful record-keeping, but no special skills or knowledge are required.