

Burney Gardens Aspen & Meadow Restoration

Sierra Nevada Conservancy—Watershed Improvement Program

Full Grant Application



Prepared by the Fall River Resource Conservation District

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Burney Gardens Timber Harvest Plan

Burney Gardens Grazing Management Plan: PG&E

Burney Gardens Grazing Management Plan DRAFT: Shasta Forests Timberlands

Burney Gardens Meadow Restoration Project Forest Management Plan

Completed Application Checklist

Appendix B - Full Application Checklist

SNC Reference#: _____

Project Name: Burney Gardens Aspen & Meadow Restoration

Applicant: Fall River Resource Conservation District

Please mark each box: check if item is included in the application; mark "N/A" if not applicable to the project. "N/A" identifications must be explained in the application. Please consult with SNC staff prior to submission if you have any questions about the applicability to your project of any items on the checklist. All applications must include a CD including an electronic file of each checklist item, if applicable. The naming convention for each electronic file is listed after each item on the checklist. (Electronic File Name = EFN: "naming convention". file extension choices)

Submission requirements for all Category One and Category Two Grant Applications

1. Completed Application Checklist (EFN: Checklist.doc, .docx, .or .pdf)
2. Table of Contents (EFN: TOC.doc, .docx, or .pdf)
3. Full Application Project Information Form (EFN: SIform.doc, .docx, or .pdf)
4. CCC/Local Conservation Corps Document (EFN: CCC.pdf)
5. Authorization to Apply or Resolution (EFN: authorization.doc, .docx, or .pdf)
6. Narrative Descriptions (EFN: Narrative.doc or .docx)
 - a. Detailed Project Description (5,000 character maximum for section 5a only)
 - Project Description including Goals/Results, Scope of Work, Location, Purpose, etc.
 - b. Workplan and Schedule
 - c. Restrictions, Technical/Environmental Documents and Agreements
 - Restrictions / Agreements (EFN: RestAgree.pdf)
 - Regulatory Requirements / Permits (EFN: RegPermit.pdf)
 - d. Organizational Capacity
 - e. Cooperation and Community Support
 - Letters of Support (EFN: LOS.pdf)
 - f. Tribal Support Narrative (EFN: tribal.doc, docx)
 - g. Long Term Management and Sustainability
 - Long-Term Management Plan (EFN: LTMP.pdf)
 - h. Performance Measures
7. Budget documents
 - a. Detailed Budget Form (EFN: Budget.xls, .xlsx)
8. Supplementary Documents
 - a. Environmental Documentation
 - California Environmental Quality Act (CEQA) documentation (EFN: CEQA.pdf)
 - National Environmental Policy Act (NEPA) documentation (EFN: NEPA.pdf)
 - b. Maps and Photos
 - Project Location Map (EFN: LocMap.pdf)
 - Parcel Map showing County Assessor's Parcel Number(s) (EFN: ParcelMap.pdf)

- Topographic Map (EFN: *Topo.pdf*)
- Photos of the Project Site (10 maximum) (EFN: *Photo.jpg, .gif*)
- c. Additional submission requirements for Fee Title Acquisition applications only
 - Acquisition Schedule (EFN: *acqSched.doc, .docx or .pdf*)
 - Willing Seller Letter (EFN: *WillSell.pdf*)
 - Real Estate Appraisal (EFN: *Appraisal.pdf*)
- d. Additional submission requirements for Site Improvement / Restoration Project applications only
 - Land Tenure Documents (EFN: *Tenure.pdf*) See Letters of Support (Item 6e).
 - Site Plan (EFN: *SitePlan.pdf*) Site Plan is included in the THP (see Item 8a: CEQA documents)
 - Leases or Agreements (EFN: *LeaseAgmnt.pdf*)

I certify that the information contained in the Application, including required attachments, is accurate, and that I have been authorized to apply for this grant.


 Signed (Authorized Representative)

8/21/15
 Date

Jeffrey J. Oldson Director, Fall River RCD
 Name and Title (print or type)

Full Project Information Form

SIERRA NEVADA CONSERVANCY		
PROPOSITION 1 – Watershed Improvement Program Project Information Form		
SNC REFERENCE #		
PROJECT NAME Burney Gardens Aspen & Meadow Restoration		
APPLICANT NAME <i>(Legal name, address, and zip code)</i> Fall River RCD PO Box 83 McArthur, CA 96056		
AMOUNT OF GRANT REQUEST \$500,000		
TOTAL PROJECT COST \$1,174,150		
PROJECT LOCATION <i>(County with approx. lat/long, center of project area)</i> Shasta County, 40°43'31"N, 121°42'33"W		
SENATE DISTRICT NUMBER 1	ASSEMBLY DISTRICT NUMBER 1	
PERSON WITH MANAGEMENT RESPONSIBILITY FOR GRANT CONTRACT		
<i>Name and title</i>	<i>Phone</i>	<i>Email Address</i>
<input checked="" type="checkbox"/> Mr. Mike Millington, President	530-336-5618	fallriverrcd@citlink.net
<input type="checkbox"/> Ms.		
TRIBAL CONTACT(S) INFORMATION		
<i>Name:</i> Isidro Gali	<i>Phone Number:</i>	
<i>Email address:</i> galiisidro@yahoo.com		
COUNTY ADMINISTRATOR OR PLANNING DIRECTOR CONTACT INFORMATION		
<i>Name:</i> Rick Simon	<i>Phone Number:</i> 530-225-5532	
<i>Email address:</i> rsimon@shastacounty.org		
NEAREST PUBLIC WATER AGENCY CONTACT INFORMATION		
<i>Name:</i> Jacqueline Matthews	<i>Phone Number:</i> 530-224-3249	
<i>Email address:</i> jacqueline.matthews@waterboards.ca.gov		

Please identify the appropriate project category below and provide the associated details (*Choose One*)

Category One Site Improvement

Category Two Pre-Project Activities

Category One Acquisition

Site Improvement/ Acquisition Project Area

Project Area: 1,021

Total Acres: 1,021

SNC Portion (if different):

Acquisition Projects Only For Acquisitions Only

Appraisal Included

Select one primary Pre-Project deliverable

Permit

CEQA/NEPA Compliance

Appraisal

Condition Assessment

Biological Survey

Environmental Site Assessment

Plan

California Conservation Corps/Local Conservation Corps Consultation

Jeff Oldson

From: Prop 1@CCC <Prop1@CCC.CA.GOV>
Sent: Thursday, August 13, 2015 9:25 AM
To: Jeff Oldson; Prop 1@CCC; inquiry@prop1communitycorps.org
Cc: Scott Carnegie; Hsieh, Wei@CCC; Johnson, Nicholas@CCC; Wolsey, Scott@CCC
Subject: RE: CCC Consult- SNC Watershed Improvement Program

Hi Jeff,

Thank you for contacting the CCC. Unfortunately, we are unable to participate in this project. Please include this email and the Consultation Review Document below with your application as proof that you reached out to the CCC.

Thank you,

Wei Hsieh, Manager
Programs & Operations Division
California Conservation Corps
1719 24th Street
Sacramento, CA 95816
(916) 341-3154
Wei.Hsieh@ccc.ca.gov

California Conservation Corps Proposition 1 - Water Bond Consultation Review Document

Applicant has submitted the required information by email to the California Conservation Corps (CCC):

✓ Yes (applicant has submitted all necessary information to CCC)

After consulting with the project applicant, the CCC has determined the following:

✓ It is NOT feasible for CCC to be used on the project (deemed compliant)

APPLICANT WILL INCLUDE THIS DOCUMENT AS PART OF THE PROJECT APPLICATION.

From: Jeff Oldson [mailto:JeffO@wmbeaty.com]
Sent: Wednesday, August 12, 2015 1:35 PM
To: Prop 1@CCC; inquiry@prop1communitycorps.org
Cc: Scott Carnegie
Subject: CCC Consult- SNC Watershed Improvement Program

Good afternoon,

I am contacting you for a consultation regarding Corps participation in a proposed project which we are looking to fund using a SNC Watershed Improvement Program Grant.

Project Title: Burney Gardens Aspen & Meadow Restoration

Project Description: This project will fund implementation of aspen and meadow restoration on approximately 1,300 acres of degraded meadow and aspen stands. The project is part of the Burney Creek- Hat Creek Community Forestry Project, coordinated by the Fall River Resource Conservation District and the Burney - Hat Creek Community Forest and Watershed Group, which seeks to restore approximately 2,530 total acres of aspen, meadow, and adjacent overstocked forestland in the area. This is a collaborative effort between four separate landowners (Shasta Forest Timberlands c/o W.M. Beaty & Associates, PG&E, SPI, and Fruit Growers Supply), and has received supported from both the Sierra Institute and the Sierra Nevada Conservancy for planning and implementation of this and other elements of the project.

The goal of this project is to restore both aspen stands and a mountain meadow to pre-European conditions. Aspen stands have been severely encroached by conifers (primarily lodgepole pine), which are limiting the aspens ability to thrive and regenerate. The meadow system proposed for restoration is also severely encroached by lodgepole pine. Restoration of the aspen stands shall be accomplished by harvesting and chipping of all conifers within 100 feet of aspen trees (fire resistant ponderosa pine, and trees >30" dbh may be retained). The meadow restoration will occur by harvesting and chipping all lodgepole pine (exclusive of wildlife trees) within identified meadow areas. Drier meadow edges will have all lodgepole pine removed, and other small diameter conifers will be thinned based on the guidelines in the approved Timber Harvest Plan (THP). Chips generated from the project will be removed from the site, and utilized at a local biomass power generation facility to generate electricity. It is not anticipated that any saw logs will be harvested from the project (some sawlog-size logepoles are present, but they will likely be chipped). Any revenue generated from the chips will be an in-kind contribution to reduce the cost of the restoration work.

Implementation of this project will result in both the restoration of natural conditions in the meadow and aspen stands, and will also result in a return to the natural hydrological form and function of the meadow, watercourses, and floodplain in the project area, which will reduce sediment flow into Burney Creek and the Pit River. Removal of encroaching conifers will also raise the water table, and reduce transpiration, resulting in increased water flows. The associated channel restoration (which is also part of the greater Burney Gardens Project, but not covered under this grant application) is currently being implemented, and will further these goals. Restoration of the meadow and aspen stands will also greatly reduce the risk of catastrophic wildfire to the area (and the associated water quality risks post-fire), reduce the risk of large scale insect outbreak in the forest, and will utilize harvested biomass material to offset the use of fossil fuels for generating electricity. This project will also create jobs for Burney, which is identified as a disadvantaged community.

Project Map: (see attached)

Project Implementation (estimated start and end dates): Implementation timeline is highly dependent on funding, as well as ground conditions (i.e. work cannot be conducted in a "wet" year). Implementation is planned to start in the Summer of 2016, to be completed by Summer 2021.

Please contact me with any additional questions.

Sincerely,
Jeff Oldson

Jeffrey J. Oldson | Reforestation Forester (RPF #2957) | W. M. Beaty & Associates, Inc.

PO Box 249, McArthur, CA 96056-0249

Cell: 530.921.3219 | Fax: 530.336.5947

McArthur Office: 530.336.6986 | Redding Office: 530.243.2783

Jeff Oldson

From: Prop1 Community Corps <inquiry@prop1communitycorps.org>
Sent: Thursday, August 13, 2015 9:05 AM
To: Jeff Oldson
Cc: Prop1@ccc.ca.gov; Scott Carnegie
Subject: Re: CCC Consult- SNC Watershed Improvement Program

Hello Jeff,

Thank you for contacting the Local Conservation Corps. Unfortunately, we are unable to participate in this project. Please include this email with your application as proof that you reached out to the Local Conservation Corps.

Thank you,
Dominique

On Wed, Aug 12, 2015 at 1:35 PM, Jeff Oldson <JeffO@wmbeaty.com> wrote:

> Good afternoon,

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> in a proposed project which we are looking to fund using a SNC

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> and aspen stands. The project is part of the Burney Creek- Hat Creek

> Community Forestry Project, coordinated by the Fall River Resource

> Conservation District and the Burney - Hat Creek Community Forest and

> Watershed Group, which seeks to restore approximately 2,530 total

> acres of aspen, meadow, and adjacent overstocked forestland in the

> area. This is a collaborative effort between four separate landowners

> (Shasta Forest Timberlands c/o W.M. Beaty & Associates, PG&E, SPI, and

> Fruit Growers Supply), and has received supported from both the Sierra

> Institute and the Sierra Nevada Conservancy for planning and implementation of this and other elements of the project.

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> mountain meadow to pre-European conditions. Aspen stands have been
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> Jeffrey J. Oldson | Reforestation Forester (RPF #2957) | W. M. Beaty &

> Associates, Inc.

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> PO Box 249, McArthur, CA 96056-0249

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> Cell: 530.921.3219 | Fax: 530.336.5947

>

> McArthur Office: 530.336.6986 | Redding Office: 530.243.2783

>

>

Jeff Oldson

From: Prop1 Community Corps <inquiry@prop1communitycorps.org>
Sent: Thursday, August 20, 2015 4:04 PM
To: Jeff Oldson
Subject: Re: CCC Consult- SNC Watershed Improvement Program

California Association of Local Conservation Corps

Proposition 1 - Water Bond

Consultation Review Document

Applicant has submitted the required information by email to the Local Conservation Corps (CALCC):

✓ Yes (applicant has submitted all necessary information to CALCC)

After consulting with the project applicant, the CALCC has determined the following:

✓ It is NOT feasible for CALCC to be used on the project (deemed compliant)

APPLICANT WILL INCLUDE THIS DOCUMENT AS PART OF THE PROJECT APPLICATION.

On Wed, Aug 12, 2015 at 1:35 PM, Jeff Oldson <JeffO@wmbeaty.com> wrote:

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Please contact me with any additional questions.

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Jeff Oldson

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Resolution to Apply

Fall River Resource Conservation District

Post Office Box 83
McArthur, CA 96066

Telephone/Fax: (530) 336-6591/336-5618
e-mail fallriverrod@citlink.net

**BEFORE THE BOARD OF DIRECTORS OF THE
FALL RIVER RESOURCE CONSERVATION DISTRICT
COUNTY OF SHASTA, STATE OF CALIFORNIA**

IN THE MATTER OF: Grant application to Sierra Nevada Conservancy for Burney Garden Aspen and meadow restoration.

RESOLUTION NO: 81915-1

BE IT RESOLVED by the Board of Directors of the Fall River Resource Conservation District that said Board does hereby approve submitting a grant application in the amount of \$500,000 to the Sierra Nevada Conservancy for the purpose of Burney Garden Aspen and meadow restoration.

BE IT FURTHER RESOVLED that the Board President of said Board be and hereby is authorized to sign and execute said agreement on behalf of the Fall River Resource Conservation District.

The foregoing resolution was duly passed and adopted by the Board of Directors of the Fall River Resource Conservation District at a regular meeting thereof, held on the 19th day of August in the year 2015, by the following vote.

AYES: 4

NOES: 0

ABSENT: 3



Signature, Board of Directors Member

MICHAEL J. MILLINGTON, PRESIDENT

Print Name and Title

Narrative Description

Detailed Project Description

This project will fund implementation of aspen and meadow restoration on approximately 1,021 acres of degraded meadow and aspen stands. The project is part of the Burney- Hat Creek Community Forest Project, coordinated by the Fall River Resource Conservation District and the Burney - Hat Creek Community Forest and Watershed Group, which seeks to restore approximately 2,530 total acres of aspen, meadow, and adjacent overstocked forestland in the area. The Burney Gardens Project is a collaborative effort between four separate landowners (Shasta Forest Timberlands c/o W.M. Beaty & Associates, PG&E, SPI, and Fruit Growers Supply), which has received supported from the Sierra Nevada Conservancy, the US Fish and Wildlife Service, the Shasta County Resource Advisory Committee, California Department of Conservation, the National Fish and Wildlife Foundation, and the Rocky Mountain Elk Foundation for planning and implementation of this and other elements of the project. This grant proposal seeks funding for restoration of the aspen and meadow areas on two of the non-industrial project participants (PG&E and Shasta Forest Timberlands); the two other landowners (SPI and Fruit Growers Supply) will accomplish their portions of the restoration independently.

The goal of this project is to restore both scattered aspen stands and a mountain meadow to pre-European conditions. Aspen have been severely encroached by conifers (primarily lodgepole pine), which are limiting the aspens ability to thrive and regenerate. The meadow system proposed for restoration is also severely encroached by lodgepole pine. Restoration of the aspen areas shall be accomplished by harvesting and chipping of all conifers within 100 feet of aspen trees (fire resistant ponderosa pine, and trees >30" dbh may be retained). The meadow restoration will occur by harvesting and chipping all lodgepole pine (exclusive of wildlife trees) within identified meadow areas. Drier meadow edges will have all lodgepole pine removed, and other small diameter conifers will be thinned based on the guidelines in the approved Timber Harvest Plan (THP). Chips generated from the project will be removed from the site, and utilized at a local biomass power facility to generate electricity. It is not anticipated that any saw logs will be harvested from the project (some sawlog-size lodgepole are present, but they will likely be chipped). Any revenue generated from the chips will be an in-kind contribution to reduce the cost of the restoration work.

Implementation of this project will result in both the restoration of natural conditions in the meadow and aspen areas, and will also result in a return to the natural hydrological form and function of the meadow, watercourses, and floodplain in the project area, which will reduce sediment flow into Burney Creek and the Pit River. Removal of encroaching conifers will also raise the water table, and reduce transpiration, resulting in increased water flows. The associated channel restoration (which is also part of the greater Burney Gardens Project, but not covered under this grant application) is currently being implemented, and will further these goals. Restoration of the meadow and aspen stands will also greatly reduce the risk of catastrophic wildfire to the area (and the associated water quality risks post-fire), reduce the risk of large scale insect outbreak in the forest, and will utilize harvested biomass material to offset the use of fossil fuels for generating electricity. This project will also create jobs for Burney, which is identified as a disadvantaged community.

W.M. Beaty & Associates, Inc. was contracted by the Fall River RCD to complete the original THP, and will likely be contracted again for overall administration/management of the project, based on their intimate knowledge of the project. It should be noted that WBA will be compensated for overall project management; however, they have agreed to provide RPF services for their portion of the project area as an in-kind contribution. The RCD will be responsible for compiling a final project report (with some information provided by WBA), invoice billing, and independent monitoring of the project.

Work Plan and Schedule Narrative

The schedule for project completion is highly dependent on actual ground conditions. If ground conditions are favorable (i.e. a “dry year”) then all work may be completed in a single summer. However, a “wet year” could force operations to be delayed for an entire year, or could result in a short timeframe for operations in that year. With this in mind, a timeline for the project is provided below. Progress reports will be submitted to the SNC every six months, in addition to the final report upon project completion.

Detailed Project Deliverables	Timeline
Spring 2016	RCD contracts with W.M. Beaty & Associates or another forest management company for project management services.
Spring 2016	Contract with a Licensed Timber Operator (LTO) experienced in biomass work to complete the project.
Spring 2016	LTO generates a purchase order(s) with local power plants.
Summer 2016	Establish photo monitoring points within meadows and aspen stands.
Summer 2016	Each individual landowner completes watercourse and boundary flagging on their properties (in-kind contribution).
Summer 2016 or Summer 2017.	Mechanical restoration treatment will begin based on ground conditions.
Fall 2016	6-month progress report to SNC.
January 20 th , 2017	THP extension requested from CalFire.
Spring 2017	6-month progress report to SNC.
Fall 2017	6-month progress report to SNC.
Spring 2018	6-month progress report to SNC.
Fall 2018	6-month progress report to SNC.
Fall 2018	All mechanical restoration work completed.
Fall 2018	Photo monitoring points rerecorded.
Winter 2018	Final report submitted to SNC and other stakeholders.

Restrictions, Technical/Environmental Documents and Agreements Narrative

Restrictions/Agreements

The greatest restriction to the successful completion of the project (and indeed the need for grant funding in the first place) is the highly variable and wholly unpredictable nature of the biomass energy market in northern California. Should the demand for chips decrease significantly, the number of acres which can be completed under the project may be reduced. Actual implementation costs for the entire 1,021 acres are estimated at \$684,325 (see Budget Narrative for details). This estimate is based off a quote from Tubit Enterprises (local Burney area logger with extensive biomass and chipping experience) for cutting, skidding, chipping, and hauling the material to the nearest power plant (Burney Forest Power). Should chip demand rise considerably before the project is implemented, costs could drop significantly. Based on the above estimate, only 690 of the 1,021 acres will be treated under this grant; areas to be treated will be prioritized based on ground conditions (i.e. moisture and accessibility). Additional grants are currently being pursued to help ensure the entire restoration is completed.

The next encumbrance to project completion is ground conditions. Since the area in question is moist throughout most of the year, operations will likely need to take place in a “dry year” during late summer and early fall.

The final encumbrance to project completion is the possible transfer of title for some or all of the PG&E property to Humboldt State University. This is addressed in the long-term management plan, and is not a significant concern, as both Humboldt State University and PG&E have given their support to the project.

Regulatory Requirements/Permits

Permit	Agency	Status	Notes
Timber Harvest Plan	CalFire	On file.	#2-12-001-SHA. Expires January 30 th , 2017. 2 year extension will be requested if needed.
404 permit	Army Corps of Engineers	On file.	
Section 401 Water Quality Certification	CVRWQCB	On file.	
Waiver of Waste Discharge	CVRWQCB	On file.	
Streambed Alteration Agreement	CDFW	On file.	#1600-2012-0013-R1. Expires 6/30/20.

Organization Capacity Narrative

Fall River RCD has successfully secured, managed, and implemented numerous natural resource planning and implementation projects in the last ten years. Several of these projects included

agreements with SNC. All this work has been accomplished with a small core team consisting of an Administrative Assistant, two part-time employees, and a Watershed Coordinator. In addition to this staff, the RCD Board of Directors are actively involved with projects and spend many hours in planning meetings to ensure projects goals and objectives are met. This project intends to use the Administrative help of President Mike Millington, and coordination from Todd Sloat, Watershed Coordinator. Mike Millington has served as a director and President for ten years, and Todd Sloat has served as the RCD's Watershed Coordinator for 12 years. W.M. Beaty & Associates or a similar forest management company will be contracted to complete on the ground management of the project. W.M. Beaty & Associates manages 300,000 acres of timberland in northern California, and has been involved in a number of similar restoration projects. WBA has a staff of 15 professional foresters, in addition to GIS and wildlife specialists who are more than capable of project management. PG&E also maintains a large staff of foresters and resource professionals. PG&E and WBA are each responsible for their own individual project flagging and LTO supervision. Every project awarded to the RCD's has been successfully completed on time and under budget. This is particularly impressive given that a few of these projects received unexpected opposition once they were awarded, but the staff, consultants, and community members and stakeholders were able to resolve those conflicts and find agreeable solutions.

As noted, W.M. Beaty & Associates was contracted by the Fall River RCD to write the Burney Gardens THP (with Scott Carnegie as the RPF). Jeffrey Oldson is employed full-time by W.M. Beaty & Associates as a professional forester (Jeffrey does not own any stock in the company), and is also on the board of directors for the Fall River RCD. Jeffrey has completed the majority of this grant application, and is the submitter on behalf of the Fall River RCD. Should the Fall River RCD receive funding for this grant, it is likely that W.M. Beaty & Associates will be hired as the project manager; however, the RCD could choose to utilize the services of another forestland management company with the capability to manage this project. Jeffrey agrees to abstain from all Fall River RCD votes regarding contracting of project management for this grant, to ensure fairness and transparency are maintained. W.M. Beaty & Associates does not stand to gain financially from the restoration; the project is anticipated to improve the value of the area for forage, but to reduce or eliminate the value of the area for timber production. W.M. Beaty & Associates has already provided significant in-kind contributions of staff hours towards getting this project off the ground (despite only managing 20% of the potential grant project area), and would like to see the restoration implemented to "do the right thing."

Cooperation and Community Support Narrative

This project has outstanding community support, in addition to collaboration involving a number of landowners and other entities. As described above, the Fall River RCD will submit and administer the grant. The project itself was conceived by the Burney-Hat Creek Community Forest Watershed Collaborative Group, which represents the interests of a broad range of stakeholders. To date, planning and implementation funds and support have been provided by the Shasta RAC, the US Fish and Wildlife Service, California Department of Conservation, National Fish and Wildlife Foundation, Rocky Mountain Elk Foundation, and the Sierra Nevada Conservancy. Consultation with the following entities occurred during THP preparation: CalFire, California Department of Fish and Wildlife, Central Valley Regional Water Quality Control Board, US Fish and Wildlife Service, US Forest Service, California Geological

Survey, PG&E, Sierra Pacific Industries, Fruit Growers Supply Co., W.M. Beaty & Associates, and the Sierra Institute. Letters of support from the following entities are also included with the grant application: California Trout, Rocky Mountain Elk Foundation, Sierra Institute, Burney Basin Fire Safe Council, PG&E, Humboldt State University, W.M. Beaty & Associates, Inc., Hat Creek Valley Fire Safe Council, and the CalFire Shasta-Trinity Unit Vegetation Management Program.

This aspen and meadow restoration proposed for implementation under this grant is just part of the overall Burney Gardens project, which seeks to restore 2,530 total acres in the area. In addition to the Burney Gardens project, the Burney-Hat Creek Community Forest Project seeks to improve forest and watershed conditions and socioeconomic community outcomes in two watersheds across 364,000 acres.

No known opposition or concerns to the project have been voiced to date.

Letters of Support



August 14, 2015

Mr. Mike Millington

President
Fall River Resource Conservation District
P.O. Box 83
McArthur, CA 96056

RE: Burney Gardens Project

Dear Mr. Millington:

California Trout gives its full support to the Burney Gardens Project. This project will restore a highly degraded yet critically important mountain meadow ecosystem and result in improved water quality, improved water flows, reduced fire risk, improved forest health, and enhanced wildlife habitat. The public also benefits by the creation of jobs (in a struggling rural area), reduced fire risk and associated air quality concerns, and by the use of biomass energy to offset fossil fuel use. It is our sincere hope that this collaborative project will be implemented, and will serve as the model for future large-scale cross-boundary restoration projects.

Sincerely,



Andrew Braugh
California Trout
Shasta-Klamath Regional Director



August 17, 2011

Fall River Conservation District
ATTN: Todd Sloat
PO Box 83
McArthur, CA 96056

Dear Todd:

We are pleased to inform you that the Rocky Mountain Elk Foundation (RMEF) has approved your project titled "Burney Gardens Meadow and Aspen Restoration" (RMEF Project #CA110454) for funding at the \$12,000 level. The California Project Advisory Committee recommended funding at this lower level due to a desire to support the project, tempered by a limited budget.

All correspondence should be mailed to the address listed below, to the attention of the Lands and Conservation Department.

Please coordinate with your Billing Office to establish funding/billing arrangements. The RMEF does not track projects by collection agreement or other agency project numbers, so to ensure proper and timely payments, the RMEF project number and title is required on all invoices, money proffers, collection agreements, and other correspondence. If entering into an agreement or contract is required by your agency, please provide a copy of this letter to your Grants and Agreements Specialist to advise them of this grant and RMEF procedures and to ensure coordination within your agency.

The Elk Foundation has adopted a policy, approving project-funding availability for a two-year period. **This grant is effective through August 17, 2013.** All field work must be completed and billing must be received by RMEF by this date. We are no longer able to approve project deadline extensions for any reason.

RMEF funding policy and procedures are as follows:

- Strictly prohibits the use of donated funds for administration, overhead, or other indirect costs.
- Encourages billings to be completed within the same fiscal year as agency/organization expenditures.
- Requires 30 days to process invoices.
- Encourages lump sum billings and discourages monthly billings.
- Requires at least a 1:1 matching fund ratio for projects.
- Expects project cost savings to be distributed among the project-contributing partners.
- Requires projects to be funded on a cost-reimbursable or a vendor direct basis, unless other arrangements are made.
 - For cost reimbursable billings, please pay vendors directly and then submit invoices to the RMEF for reimbursement. Be certain to include the RMEF project number and title on all invoices.
 - For vendor direct payments, the procedure is as follows:
 - Have vendors send invoices directly to you for review and approval.

5705 Grant Creek Rd. | Missoula, MT 59808-8249 | (800) CALL ELK | WWW.RMEF.ORG

- Sign the invoices, showing your authorization of the expenses, and write the RMEF project number and title on the invoices.
 - Send invoices to the RMEF for payment, attn: Lands and Conservation.
 - The RMEF does not pay invoices received directly from the vendor. We require your signature authorization to confirm expenses are accurate and goods and/or services were received.
- RMEF requires a current W-9 form on file for each vendor we pay through our PAC program. Please include a W-9 form with the first invoice you submit for **each vendor**. If you are unsure whether or not RMEF has a W-9 on file for a particular vendor, please contact RMEF. Invoices payable to the US Forest Service, US Fish and Wildlife Service or state wildlife agencies are exempt from this requirement.

RMEF reporting policy is as follows:

- Requires a full accounting of the expenditures of the grant upon final billing.
- Encourages and appreciates annual progress reports, in-house publications, follow-up and monitoring reports.
- Requires recognition of the Elk Foundation's contribution by appropriate means.
- Reserves the opportunity to review final drafts for interpretive signs, brochures and publications.
- Requires photo documentation of project activities. (See attached photo guidelines.)
- Requires a Project Completion Report (PCR) detailing project activities within 60 days of project completion. A separate PCR must be submitted for each approved grant. (See attached PCR.)

Should you have any questions or information needs, please contact:

Kelli McCain
Billing, Forms & Signatures
(406) 523-0264
kmccain@rmef.org

Christine Hastings
Project Updates, Photos,
Reporting & Recognition
(406) 523-4541
christine@rmef.org

Tom Toman
Policy, Agreements &
Contracts
(406) 523-3443
tom@rmef.org

The Elk Foundation values accuracy and quality in project reporting. Thorough reporting helps us feature great partnerships like yours in the pages of *BUGLE* and newsletters as well as better serve our project partners, supporters and wildlife resources. We recognize that sometimes the accounting and on-the-ground project activities may not coincide and we may not be able to closeout all aspects of the project simultaneously. In the event RMEF funds are expended during the first part of the project and a PCR is submitted, we would appreciate an additional, final comprehensive report detailing all the project elements as planned or outlined in the project proposal.

The Elk Foundation appreciates the efforts of the Fall River Conservation District to address habitat enhancement needs. Thank you for helping us to pass on a wildlife legacy. We look forward to hearing from you.

Sincerely,



Tom Toman
Director of Conservation

Enclosures



23 January 2012

Dear Todd Sloat:

It is with great pleasure and enthusiasm that I write this letter of support for the Burney and Hat Creek Community Forest and Watershed Group proposal advanced through the Fall River Resource Conservation District to the Sierra Nevada Conservancy. My participating in the group has been an absolute pleasure largely because of the on-the-ground accomplishments and active engagement of a diverse group of stakeholders in the collaborative.

This project addresses the Sierra Nevada Conservancy's land and water benefits directly. I have been surprised by the active commitment of the private timberland owners to advance a project that will not only protect but improve watershed functioning, forest health, and wildlife habitat, while returning little to no money to their company for their efforts. This commitment has resulted in what is now one of the largest watershed restoration projects in the state. It certainly is the largest on private timber company managed land. And there remains strong agreement among the participants to expand the work further.

While this is a planning project, it is important to note that other portions of the work with partners involve implementation, reflecting a genuine commitment as well as a readiness to move from planning to implementation. The recent submission of the Timber harvest Plan spanning all four ownerships and agreement by land managers to expand work based on this planning is testimony to the readiness of planning that will lead to quick on-the-ground restoration and improvement. The support for this work by other members of the Burney and Hat Creek Collaborative group, including environmental interests, along with permitting agencies such as Fish & Game and State Water Quality Control Board among others, underscores the environmental benefits that will result from this project.

This project is novel in scale and scope, and directly connects a stream with meadow and forested uplands. Involving four landowners working together and then connecting this project with the larger Burney-Hat Creek landscape allows an integrated approach that extends healthy forest and watershed work and benefits across a 370,000 acre landscape. These benefits extend to national forest land and because they are deliberately linked to high-risk fire corridors this project provides benefits for nearby communities. For example, work in Burney Gardens is linked to reducing catastrophic fire risk in the larger project area and corridors that will carry fire to the Johnson Park community.

Finally, part of the pleasure in writing a support letter of this sort is knowledge that the work has the active support of the entire Burney-Hat Creek Community Forest and Watershed Group. This work is what led to the award received in 2011 from Region 5. The group's commitment to advancing triple-bottom line work, and their success in implementing projects in two short years bodes well for effective use of SNC planning dollars for this project.

I thank you and the group for allowing me to be a part of this exciting work.

Sincerely,

Jonathan Kusel
Executive Director

August 21, 2015

Mr. Mike Millington

President
Fall River Resource Conservation District
P.O. Box 83
McArthur, CA 96056

RE: Burney Gardens Project

Dear Mr. Millington:

Our organization gives its full support to the Burney Gardens Project. After discussions with project planners and participants, it is clear that this project will restore a highly degraded yet critically important mountain meadow ecosystem. This restoration will result in great environmental benefits including improved water quality, improved water flows, reduced fire risk, improved forest health, and enhanced wildlife habitat. The public also benefits by the creation of jobs (in a struggling rural area), reduced fire risk and associated air quality concerns, and by the use of biomass energy to offset fossil fuel use. It is our sincere hope that this collaborative project will be implemented, and will serve as the model for future large-scale cross-boundary restoration projects.

Sincerely,

A handwritten signature in black ink, appearing to read "Jon Neugebauer". The signature is fluid and cursive, with a large initial "J" and a long, sweeping tail.

Jon Neugebauer

Burney Basin Fire Safe Council

Project Coordinator



**Pacific Gas and
Electric Company™**

Dan McCall
RPF #2705
3600 Meadow View Dr.
Redding, CA. 96002
Natural Resource Management

Phone: 530-246-6447
Fax: 530-246-6445
E Mail DCMV@pge.com

August 12, 2015|

Mr. Mike Millington
President
Fall River Resource Conservation District
P.O. Box 83
McArthur, CA 96056

RE: Burney Gardens Restoration Project

Dear Mr. Millington:

Pacific Gas & Electric (PG&E) gives its full support to the Burney Gardens Project. After discussions with project planners and participants, it is clear that this project will restore a highly degraded yet critically important mountain meadow ecosystem. This restoration work will result in numerous environmental benefits including improved water quality, improved water flows, reduced fire risk, improved forest health, and enhanced wildlife habitat. The public also benefits by the creation of jobs (in a struggling rural area), reduced fire risk and associated air quality concerns, and by the use of biomass energy to offset fossil fuel use. It is PG&E's sincere hope that this collaborative project will be implemented, and will serve as the model for future large-scale cross-boundary restoration projects.

As a project participant, PG&E will provide a registered professional forester to review and oversee project preparation work and to administer operations on PG&E property.

Sincerely,

Dan McCall
Pacific Gas & Electric Company



HUMBOLDT STATE UNIVERSITY

Office of the Dean, College of Natural Resources & Sciences

August 24, 2015

To Whom It May Concern:

This letter signals the College of Natural Resources and Sciences approval for the Burney Gardens meadow restoration (lodgepole pine removal) project as proposed by W.M. Beatty & Associates and their partners. Though we do not own the Burney Gardens property, we have been approved for acquisition by the PGE Stewardship Council board, and we understand that restoration efforts on the property may depend on our approval. Our objectives for the property are complementary to the objectives of the proposed treatments, and we wish to see ongoing restoration efforts continue. We appreciate the efforts of the landowners and agencies who have worked on the Burney Gardens property thus far and we hope to partner with them in the future.

Sincerely,

A handwritten signature in black ink, appearing to read "S. Smith".

Steven A. Smith, Ph.D.
Dean

FORESTLAND
MANAGEMENT

August 24, 2015



W. M. BEATY &
ASSOCIATES, INC.

845 BUTTE ST. / P.O. BOX 990898
REDDING, CALIFORNIA 96099-0898
530-243-2783 / FAX 530-243-2900
www.wmbeaty.com

Mr. Mike Millington
President
FALL RIVER RESOURCE CONSERVATION DISTRICT
P.O. Box 83
McArthur, CA 96056

Re: Burney Gardens Project

Dear Mr. Millington:

W. M. Beaty & Associates gives its full support to the Burney Gardens Project. It is clear that this project will restore a highly degraded yet critically important mountain meadow ecosystem. This restoration will result in great environmental benefits including improved water quality, improved water flow and storage, reduced fire hazard, improved forest health, and enhanced wildlife habitat. The public will also benefit due to the creation of jobs (in a struggling rural area), reduced fire hazard and associated air quality concerns, and by the use of renewable biomass energy to offset fossil fuel use. It is our sincere hope that this collaborative project will be implemented, and will serve as the model for future large-scale cross-boundary collaborative restoration projects.

As a project participant, W. M. Beaty & Associates, Inc. will provide a registered professional forester to complete project preparation work and to administer operations on lands managed by W. M. Beaty & Associates, Inc. We also grant permission for the Fall River Resource Conservation District to monitor the project site for 25 years.

Sincerely,

W. M. BEATY & ASSOCIATES, INC.

Scott P. Carnegie
Project Forester, RPF No. 2540
(530) 524-9071
scottc@wmbeaty.com

SPC:spc

W. M. Beaty & Associates, Inc., established in 1969, provides forestland management, timber inventories, and wildlife assessments to facilitate the maintenance of healthy, well-managed forests.

Hat Creek Valley Fire Safe Council
PO Box 87
Old Station, CA 96071

August 24, 2015

Mr. Mike Millington

President
Fall River Resource Conservation District
P.O. Box 83
McArthur, CA 96056

RE: Burney Gardens Project

Dear Mr. Millington:

Our organization has given its support to the Burney Gardens Project in the past through our participation in the Burney Hat Creek Collaborative Forest Group. After discussions with project planners and participants, it is clear that this project will restore a highly degraded yet critically important mountain meadow ecosystem. This restoration will result in great environmental benefits including improved water quality, improved water flows, reduced fire risk, improved forest health, and enhanced wildlife habitat. The reduced fire risk result of the Project alone makes it highly worthwhile in the eyes of the Hat Creek Valley Fire Safe Council. It is our sincere hope that this collaborative project will be implemented, and will serve as the model for future large-scale cross-boundary restoration projects.

Sincerely,

Donald F. Curtis

Chairman

Jeff Oldson

From: Larsen, Shane@CALFIRE <Shane.Larsen@fire.ca.gov>
Sent: Thursday, August 27, 2015 4:14 PM
To: Jeff Oldson
Subject: : Burney Gardens

Forester Oldson,
Please forward this email to the Fall River RCD.

CAL FIRE Shasta-Trinity Unit Vegetation Management Program supports the Burney Gardens project, and applauds your efforts in ecological restoration and fuels reduction. The project is to be included in the Burney Community Wild Fire Protection Plan and we look forward to future cooperation.

Regards,
Shane Larsen RPF#2976

Shane Larsen

SRA / VMP Forester I

CAL FIRE Shasta-Trinity Unit

875 Cypress Ave, Redding, CA 96001

Cell: 530 448-2486

SaveOurWater.com Drought.CA.gov

Tribal Support Narrative

The Pit River Tribe is a member of the Burney-Hat Creek Community Forest Watershed Collaborative Group, and has participated in project planning. The Pit River Tribe has shown both support and opposition to the project (depending on the project coordinator present at the group meetings). Marissa Fierro (Environmental Coordinator) and Isidro Gali (Tribal Chairperson) were contacted via email to discuss the proposed project. Ms. Fierro initially indicated that she would like to have a telephone conference to discuss the project, but she did not respond to follow-up emails seeking to set up the conference. No response was received from Mr. Gali.

As part of the THP process, all local tribal entities were contacted for any information on cultural sites within the project area, and no replies were received.

Long-Term Management and Sustainability Narrative

Burney Gardens Aspen & Meadow Restoration Long-Term Management Plan

Long-term management of the Burney Gardens project is a critical issue with regards to such a large scale and multi-ownership undertaking. Long-term management related to range and livestock is addressed in the complete grazing management plan. Long-term management of the aspen and meadow restoration portion of the project will be achieved through continued collaboration on the part of all involved parties. The ultimate goal of the project is to restore the project area to pre-settlement conditions, which includes the natural role of fire in the ecosystem.

This use of fire (on an estimated 10-15 year cycle) would maintain the aspen and meadow stands, while destroying any lodgepole which begin to re-encroach the area. The use of fire is a controversial and difficult subject to address. On large tracts of privately owned land such as this, it is infeasible to implement a large scale prescribed fire without assistance from CalFire and/or the USFS. CalFire assistance will be sought through the Vegetation Management Program, or through State Responsibility Area funds. While it is somewhat unusual to receive assistance from the USFS on a project on private property, it is authorized by the Wyden Amendment, and cooperative assistance will be pursued. Close collaboration with both the USFS and CalFire through the Burney-Hat Creek Community Forest Watershed Collaborative Group will be the key to ensure this fire “maintenance” occurs.

Should prescribed fire be deemed totally infeasible due to future environmental, legislative, or other concerns, then maintenance will still be necessary using surrogates for fire. Meadow restoration maintenance has been successfully accomplished in the past using hand crews to cut and pull any new lodgepole seedlings. Such an activity would be funded by future grants from agencies and participants already involved in this project. Maintenance work may occur as early as 2021, so efforts to secure grant funding and cooperative assistance for maintenance work will begin in 2019.

On the forested areas adjacent to the meadow and aspen restoration, individual landowners have a wide range of long-term management strategies to ensure continued sustained yield of forest products. These management strategies are identified in the THP (Section II, Item 14a). This project also includes photo monitoring of the project area, and the Fall River RCD will continue this monitoring for at least the

next 10 years. All landowners grant the SNC permission to visit the project area for monitoring purposes for the next 25 years (landowners request notification of such visits). The Burney Gardens Meadow Restoration Project Forest Management Plan also addresses long-term management and related issues, and is attached to the end of this grant application.

Most or all of the PG&E lands included for treatment in the project are involved in the PG&E bankruptcy settlement agreement which seeks to conserve those properties in perpetuity for the public benefit. As part of this conservation, the parcels involved in this project have been recommended for transfer to Humboldt State University. Humboldt State University has been consulted, and is equally committed to this project as the other participants should they be granted title to the lands while the project is being implemented. A letter of support to this effect is included with this application.

Performance Measures

Number and Type of Jobs Created

We estimate that the project will generate approximately 25,000 BDTs of chips. Harvesting these chips will require approximately 2,500 feller-buncher hours (assuming production of 10BDT/hour). Skidding is estimated to take approximately 2,500 hours as well (10BDT/hour). A loader will be needed to feed the chipping machine, also for 2,500 hours. A logging crew foreman/mechanic will also be needed, for 2,500 hours. Chip trucks will be required for approximately 2,000 loads of chips (assuming 12.5BDT/load); at 3 hours per round trip, 6,000 trucking hours will be needed. That means 16,000 hours of work will be created just for logging of the project (7.7 full-time equivalent jobs). Additionally, jobs will be sustained at the local biomass power plant. Other jobs supported by the project include the registered professional foresters employed by the companies providing their in-kind services. The staff of the RCD is also supported by this project, including an Administrative Assistant, a Watershed Coordinator, and two part time employees. Total hours worked in accomplishing this restoration project will be reported to the SNC.

Number and Value of New, Improved, or Preserved Economic Activities

a. New, Improved, or Preserved Services

Local biomass power plants will be supported. Local logging capacity will be supported. Grazing capacity and wildlife habitat will be improved. Water quality and quantity will be improved. Recreation will also be improved (primarily hunting).

b. Amount of Product or Services Created/Improved/Preserved

This project will support one or more of three local biomass power facilities, which have a combined capacity of 101MW of power generation (UC ANR website, 2015). The final report will detail how many BDTs were sent to each facility.

Local logging capacity will be supported; the project will likely require one medium sized logging company for a 6 month commitment (and associated jobs described above). The final report will detail the number of employees and different companies involved in implementation of this project.

The post-restoration meadow will have improved grazing capacity, estimated at 150lbs forage/acre currently, increasing to 750lbs forage/acre post treatment (Burney Gardens Grazing Management Plan SFT DRAFT). The final report will document the number of acres restored.

Improved wildlife habitat is non-quantifiable, but restoration of the natural meadow ecosystem and aspen stands is invaluable. Acres restored will be the reported metric for this category.

Recreational hunting opportunities will also be improved through the improved wildlife habitat. Acres restored will be the reported metric for this category.

Number of People Reached

The number of people already involved in this collaborative project is high. This is described in the collaboration section of the application. Since this is an implementation project, it is unlikely that many new people will be reached, but additional outreach/collaboration efforts will be documented in project progress reports.

Resources Leveraged for the Sierra Nevada

This project leverages previous grant planning funds, and channel restoration planning and implementation funds as described below. These funds will not be used towards implementation of the current project (but were used to plan it). Volunteer hours are not anticipated, but could be realized if Humboldt State University becomes more deeply involved in the project during its implementation and follow-up monitoring. If funded, this project would also leverage in-kind contributions of RPF services and chip value from the two project landowner participants (also described below). Final valuation of these in-kind services will be provided in the project progress reports and final report.

Matching Funds Source	Description	Amount
Shasta RAC	Burney-Hat Creek Community Forest Project (includes additional projects beyond Burney Gardens)	\$127,450 (approximately \$40,000 was specifically for Burney Gardens)
Shasta RAC	Burney Gardens Channel Restoration	\$10,000
USFWS	Burney Gardens Channel Restoration	\$25,000
SNC	Assessment, design, and management plans for Burney Gardens.	\$75,000 awarded (\$53,000 used)
Rocky Mountain Elk Foundation	Burney Gardens	\$12,000
California Department of Conservation	Burney Gardens- Meadow Restoration	\$3,000 (part of a larger grant)
National Fish and Wildlife Foundation	Burney Gardens- Meadow Restoration	\$3,000 (part of a larger grant)

In-kind Funding	Description	Amount (estimated)
SFT RPF Services (\$25/acre)	RPF services provided by landowner.	\$5,200.00
PG&E RPF Services (\$25/acre)	RPF services provided by landowner.	\$20,325.00
SFT Chip Value (@ \$45/BDT value)	Value of chips contributed by landowner to offset restoration costs.	\$234,000.00
PG&E Chip Value (@ \$45/BDT value)	Value of chips contributed by landowner to offset restoration costs.	\$914,625.00
Total		\$1,174,150

Acres of Land Improved or Restored

The project is anticipated to restore and improve natural resource conditions in a number of categories across all treated acres. The risk of fire will be decreased across all acres. Habitat (both aquatic and terrestrial), and natural ecosystem function will be improved/restored across all areas. Water quality will be improved across all acres. Forage will be improved across all areas (for both wildlife, and prescribed grazing as described in the grazing management plans). Recreation (in the form of hunting) will be improved across all acres by vastly improving habitat for native game species. Total acres restored/improved will be the metric for this category, and progress will be reported to the SNC.

SIERRA NEVADA CONSERVANCY
Budget Documents SNC Watershed Improvement Program - DETAILED BUDGET FORM

Project Name: Burney Gardens Aspen & Meadow Restoration
Applicant: Fall River Resource Conservation District

SECTION ONE DIRECT COSTS	Year One	Year Two	Year Three	Year Four	Year Five	Total
<i>Project Management Costs</i>	\$4,500.00	\$7,000.00	\$4,500.00			\$16,000.00
<i>Site Restoration Work Costs</i>	\$100,000.00	\$260,000.00	\$100,000.00			\$460,000.00
<i>Project Equipment, Building, Land purchase</i>	\$0.00	\$0.00	\$0.00			\$0.00
<i>Project Materials & Supplies Purchase</i>	\$0.00	\$0.00	\$0.00			\$0.00
						\$0.00
						\$0.00
						\$0.00
DIRECT COSTS SUBTOTAL:	\$104,500.00	\$267,000.00	\$104,500.00	\$0.00	\$0.00	\$476,000.00
SECTION TWO PARTIAL INDIRECT COSTS	Year One	Year Two	Year Three	Year Four	Year Five	Total
<i>Monitoring</i>	\$1,000.00	\$1,000.00	\$1,500.00			\$3,500.00
<i>Publications, Printing, Public Relations</i>						\$0.00
<i>Reporting, Perf Measures, Invoice Billing</i>	\$1,000.00	\$1,000.00	\$2,000.00			\$4,000.00
						\$0.00
INDIRECT COSTS SUBTOTAL:	\$1,000.00	\$1,000.00	\$1,500.00	\$0.00	\$0.00	\$7,500.00
PROJECT TOTAL:	\$105,500.00	\$268,000.00	\$106,000.00	\$0.00	\$0.00	\$483,500.00
SECTION THREE Administrative Costs (Costs may not exceed 15% of the above listed Project costs) :						Total
<i>*Organization operating/overhead costs</i>	\$5,500.00	\$5,500.00	\$5,500.00			\$16,500.00
						\$0.00
						\$0.00
						\$0.00
						\$0.00
ADMINISTRATIVE TOTAL:	\$5,500.00	\$5,500.00	\$5,500.00	\$0.00	\$0.00	\$16,500.00
SNC TOTAL GRANT REQUEST:	\$111,000.00	\$273,500.00	\$111,500.00	\$0.00	\$0.00	\$500,000.00
SECTION FOUR OTHER PROJECT CONTRIBUTIONS	Year One	Year Two	Year Three	Year Four	Year Five	Total
<i>List other funding or in-kind contributors to project (i.e. Sierra Business Council, Department of Water Resources, etc.)</i>						
SFT RPF Services (\$25/acre)	\$5,200.00					\$5,200.00
PG&E RPF Services (\$25/acre)	\$20,325.00					\$20,325.00
SFT Chip Value (@ \$45/BDT value)	\$234,000.00					\$234,000.00
PG&E Chip Value (@ \$45/BDT value)	\$914,625.00					\$914,625.00
						\$0.00
Total Other Contributions:	\$1,174,150.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,174,150.00

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.

Budget Narrative

Direct Costs: This section includes project management costs for three years (to be contracted with W.M. Beaty & Associates, Inc. or a similar management company). Site restoration costs are included in this section; since the value of the chips generated from the project are being applied towards restoration costs, this field represents the amount of funds needed in addition to the chip value to make the project financially feasible. Actual implementation costs are estimated at \$684,325; this estimate is based off 25 BDT of chips per acre, across 1,021 acres, with a \$45/BDT value delivered to the power plant, but with a restoration cost of \$71.81 per BDT, for a net subsidy of \$26.81 per BDT needed. This estimate is based off a quote from Tubit Enterprises (a local Burney area logger with extensive biomass and chipping experience) for cutting, skidding, chipping, and hauling the material to the nearest power plant (Burney Forest Power). If chip prices don't improve by the time the project is implemented, then all the money allocated to project implementation will be used to complete as many acres of restoration as possible.

Partial Indirect Costs: The monitoring cost is for two yearly field visits by the Fall River RCD to independently monitor and assess project progress (including photo monitoring) and meeting of the terms of the grant. Reporting, performance measures, and invoice billing includes the cost of creating and distributing progress reports to the SNC, and project billing.

Administrative Costs: This section includes operating and overhead costs for the Fall River RCD. Monthly operating costs at the RCD (including insurance, accounting, utilities, and building costs) are \$1,530 a month. This project is estimated to account for 30% of the RCD's operating costs for three years, at a cost of \$5,500 a year (\$16,500 total).

Other Project Contributions: This includes the Registered Professional Forester services which both landowners have agreed to provide. This also includes the value of the chips harvested under the project, all of which will be an in-kind contribution by the landowners to defer the cost of the restoration. Previous grant funds used for project planning are not included in this section, but are listed in the "Resources Leveraged for the Sierra Nevada" section of the application.

Supplementary Documents

Environmental Documents

CEQA compliance has been completed via the approved Timber Harvest Plan (THP) #2-12-001-SHA(4) which is attached. A THP is the functional equivalent to an EIR. The CEQA appendix is also included below.

Appendix F - CEQA/NEPA Compliance Form

(California Environmental Quality Act & National Environmental Policy Act)

Instructions: All applicants must complete the CEQA compliance section. Check the box that describes the CEQA status of the proposed project. You must also complete the documentation component and submit any surveys, and/or reports that support the checked CEQA status.

If NEPA is applicable to your project, you must complete the NEPA section in addition to the CEQA section. Check the box that describes the NEPA status of the proposed project. Submit any surveys, and/or reports that support the NEPA status. For both CEQA and NEPA, submittal of permits is only necessary if they contain conditions providing information regarding potential environmental impacts.

NOTE: Effective July 1, 2015, AB52 compliance is required.

CEQA STATUS

(All applicants must complete this section)

Check the box that corresponds with the CEQA compliance for your project. The proposed action is either Categorical Exempt from CEQA, requires a Negative Declaration, Mitigated Negative Declaration, or an Environmental Impact Report per CEQA.

Categorical Exemption or Statutory Exemption

If a project is exempt from CEQA, all applicants, including public agencies that provide a filed Notice of Exemption, are required to provide a clear and comprehensive description of the physical attributes of the project site, including potential and known special-status species and habitat, in order for the SNC to make a determination that the project is exempt. A particular project that ordinarily would fall under a specific category of exemption may require further CEQA review due to individual circumstances, i.e., it is within a sensitive location, has a cumulative impact, has a significant effect on the environment, is within a scenic highway, impacts an historical resource, or is on a hazardous waste site. Potential cultural/archaeological resources must be noted, but do not need to be specifically listed or mapped at the time of application submittal. Backup data informing the exemption decision, such as biological surveys, Cultural Information Center requests, research papers, etc. should accompany the full application. Applicants anticipating the SNC to file an exemption should conduct the appropriate surveys and submit an information request to an office of the California Historical Resources Information System (CHRIS).

1. Describe how your project complies with the requirements for claiming a Categorical or Statutory Exemption per CEQA:
[Click here to enter text.](#)
2. If your organization is a state or local governmental agency, submit a signed, approved Notice of Exemption (NOE) documenting the use of the Categorical Exemption or Statutory Exemption, along with any permits, surveys, and/or reports that have been completed to support this CEQA status. The Notice of Exemption must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.
3. If your organization is a nonprofit, there is no other California public agency having discretionary authority over your project, and you would like the SNC to prepare a NOE

for your project, let us know that and list any permits, surveys, and/or reports that have been completed to support the CEQA status. All supplementary documentation must be provided to the SNC before the NOE can be prepared.

[Click here to enter text.](#)

- Negative Declaration OR**
- Mitigated Negative Declaration**

If a project requires a Negative Declaration or Mitigated Negative Declaration, then applicants must work with a qualified public agency, i.e., one that has discretionary authority over project approval or permitting, to complete the CEQA process.

1. Describe how your project complies with the requirements for the use of a Negative Declaration or a Mitigated Negative Declaration per CEQA:
[Click here to enter text.](#)
 2. Submit the approved Initial Study and Negative Declaration/Mitigated Negative Declaration along with any Mitigation Monitoring or Reporting Plans, permits, surveys, and/or reports that have been completed to support this CEQA status. The IS/ND/MND must be accompanied by a signed, approved Notice of Determination, which must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.
-

Environmental Impact Report

If a project requires an Environmental Impact Report, then applicants must work with a qualified public agency, i.e., one that has discretionary authority over project approval or permitting, to complete the CEQA process.

1. Describe how your project complies with the requirements for the use of an Environmental Impact Report per CEQA:
[Click here to enter text.](#) An approved THP (#2-12-001-SHA) is approved by CalFire. A THP is the functional equivalent to an EIR.
 2. Submit the Draft and Final Environmental Impact Report along with any Mitigation Monitoring or Reporting Plans, permits, surveys, and/or reports that have been completed to support this CEQA status. The EIR documentation must be accompanied by a signed, approved Notice of Determination, which must bear a date stamp to show that it has been filed with the State Clearinghouse and/or County Clerk, as required by CEQA.
[Click here to enter text.](#) The approved THP is attached to the application.
-

Maps and Photos

Project Location Map: A project map for the SNC project area is included below, in addition to a THP vicinity map, and THP wide silviculture maps; additional maps can be found in the attached THP.

Parcel Map with County Assessor's Parcel Numbers: Included below.

Topographic Map: Topographic lines are included on the project map. No modern buildings exist within the project area. Historic and prehistoric sites are located within the project area, and are protection of these sites is described in the Confidential Archaeological Survey Report within the THP. As suggested, satellite/aerial photographs have also been attached below.

Burney Gardens SNC Project

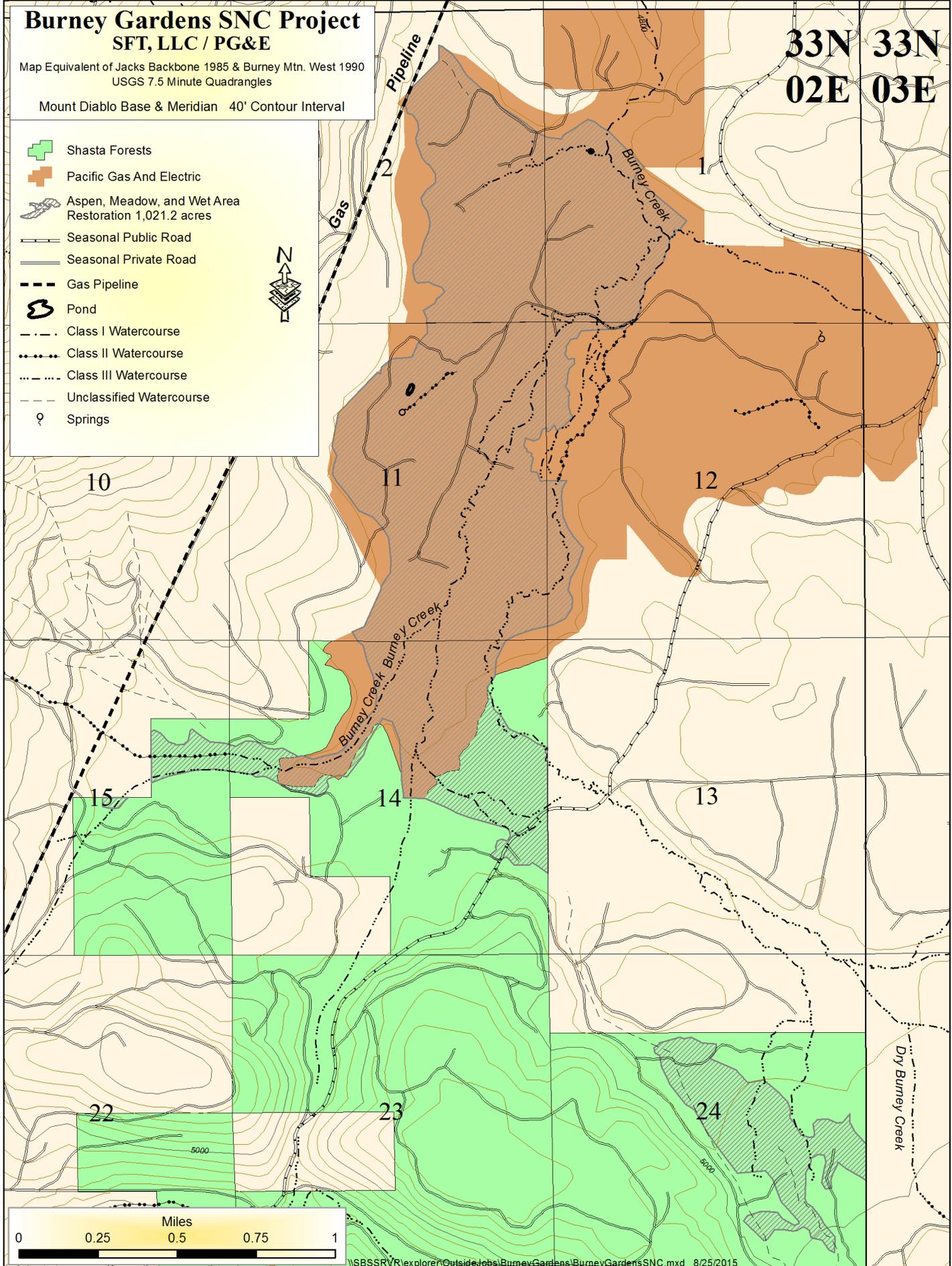
SFT, LLC / PG&E

Map Equivalent of Jacks Backbone 1985 & Burney Mtn. West 1990
USGS 7.5 Minute Quadrangles

Mount Diablo Base & Meridian 40' Contour Interval

33N 33N
02E 03E

-  Shasta Forests
-  Pacific Gas And Electric
-  Aspen, Meadow, and Wet Area Restoration 1,021.2 acres
-  Seasonal Public Road
-  Seasonal Private Road
-  Gas Pipeline
-  Pond
-  Class I Watercourse
-  Class II Watercourse
-  Class III Watercourse
-  Unclassified Watercourse
-  Springs



MSBSSRV\Explore\OutsideJobs\BurneyGardens\BurneyGardensSNC.mxd 8/25/2015

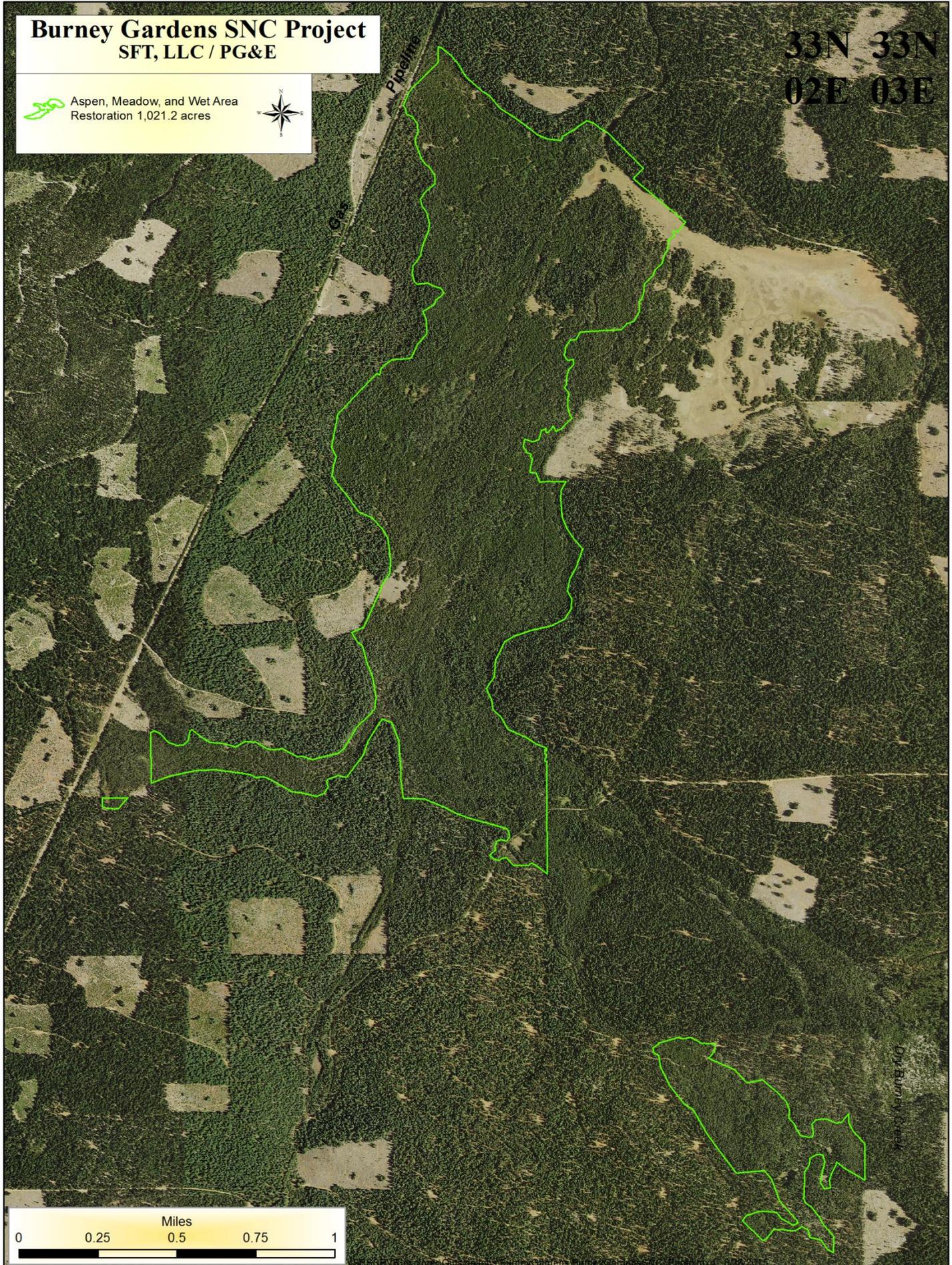
Burney Gardens SNC Project

SFT, LLC / PG&E

33N 33N
02E 03E



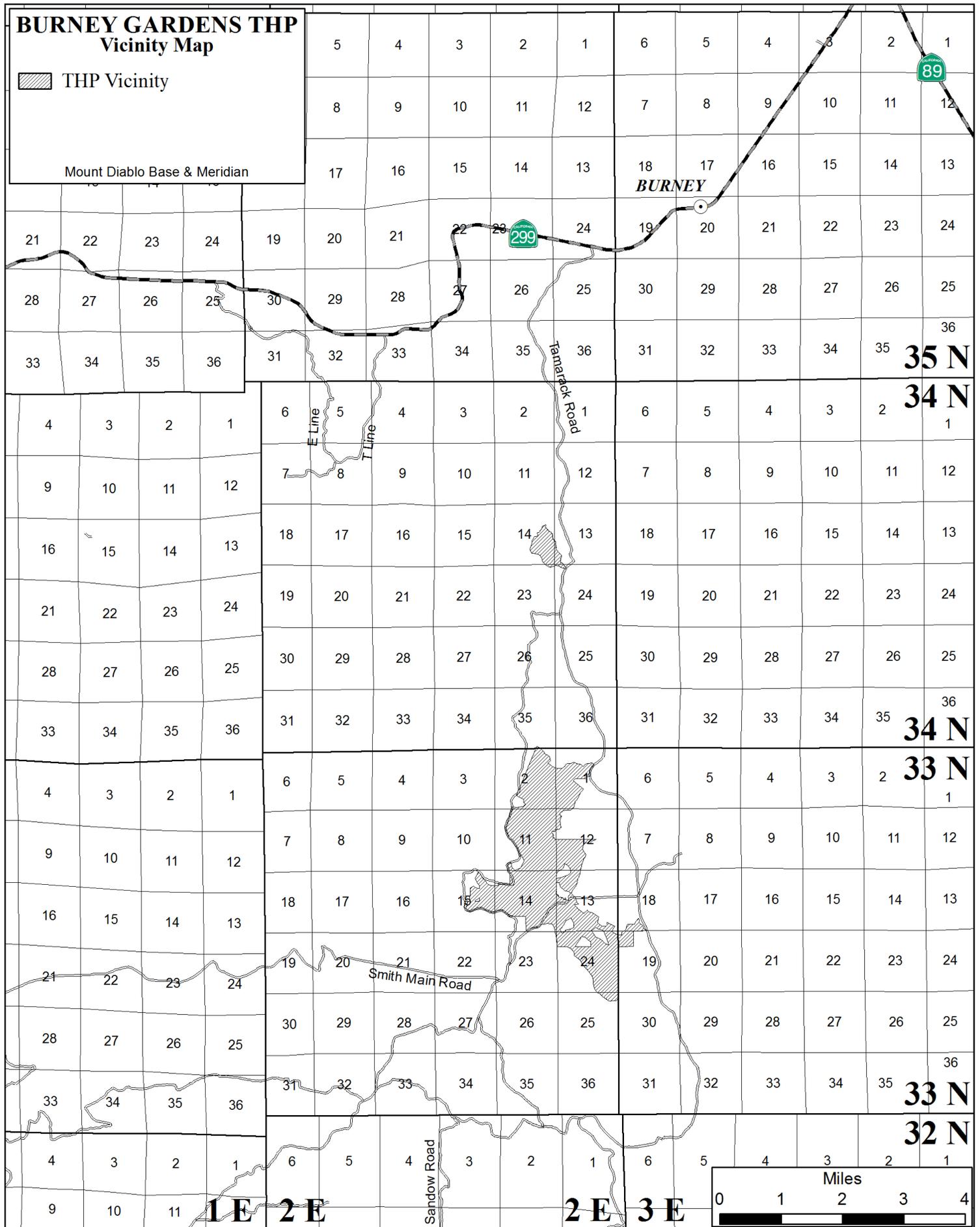
Aspen, Meadow, and Wet Area
Restoration 1,021.2 acres



BURNEY GARDENS THP Vicinity Map

 THP Vicinity

Mount Diablo Base & Meridian



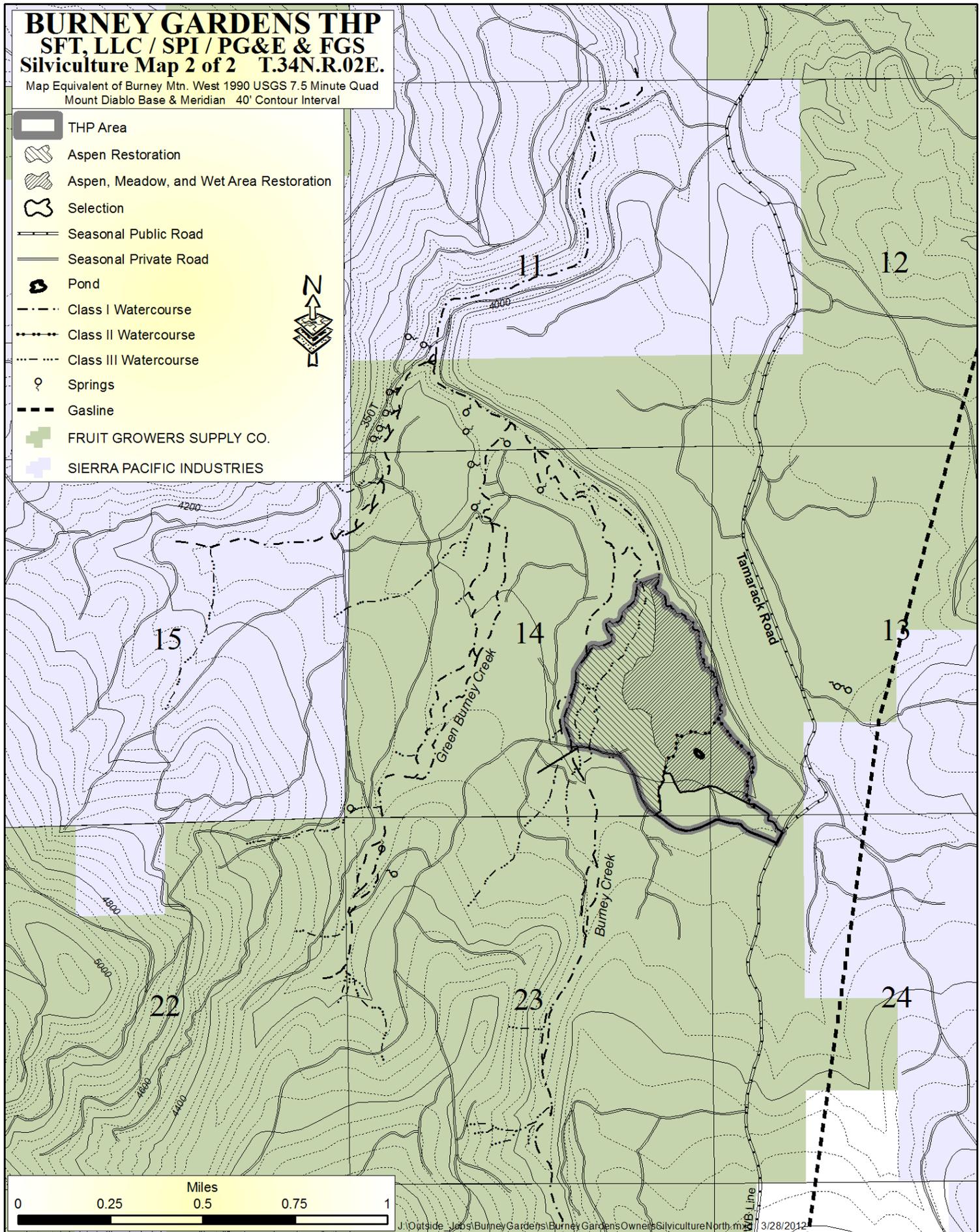
BURNEY GARDENS THP

SFT, LLC / SPI / PG&E & FGS

Silviculture Map 2 of 2 T.34N.R.02E.

Map Equivalent of Burney Mtn. West 1990 USGS 7.5 Minute Quad
 Mount Diablo Base & Meridian 40' Contour Interval

-  THP Area
-  Aspen Restoration
-  Aspen, Meadow, and Wet Area Restoration
-  Selection
-  Seasonal Public Road
-  Seasonal Private Road
-  Pond
-  Class I Watercourse
-  Class II Watercourse
-  Class III Watercourse
-  Springs
-  Gasline
-  FRUIT GROWERS SUPPLY CO.
-  SIERRA PACIFIC INDUSTRIES



J:\Outside_Jobs\Burney Gardens\Burney Gardens Owners\Silviculture\North.mxd 3/28/2012

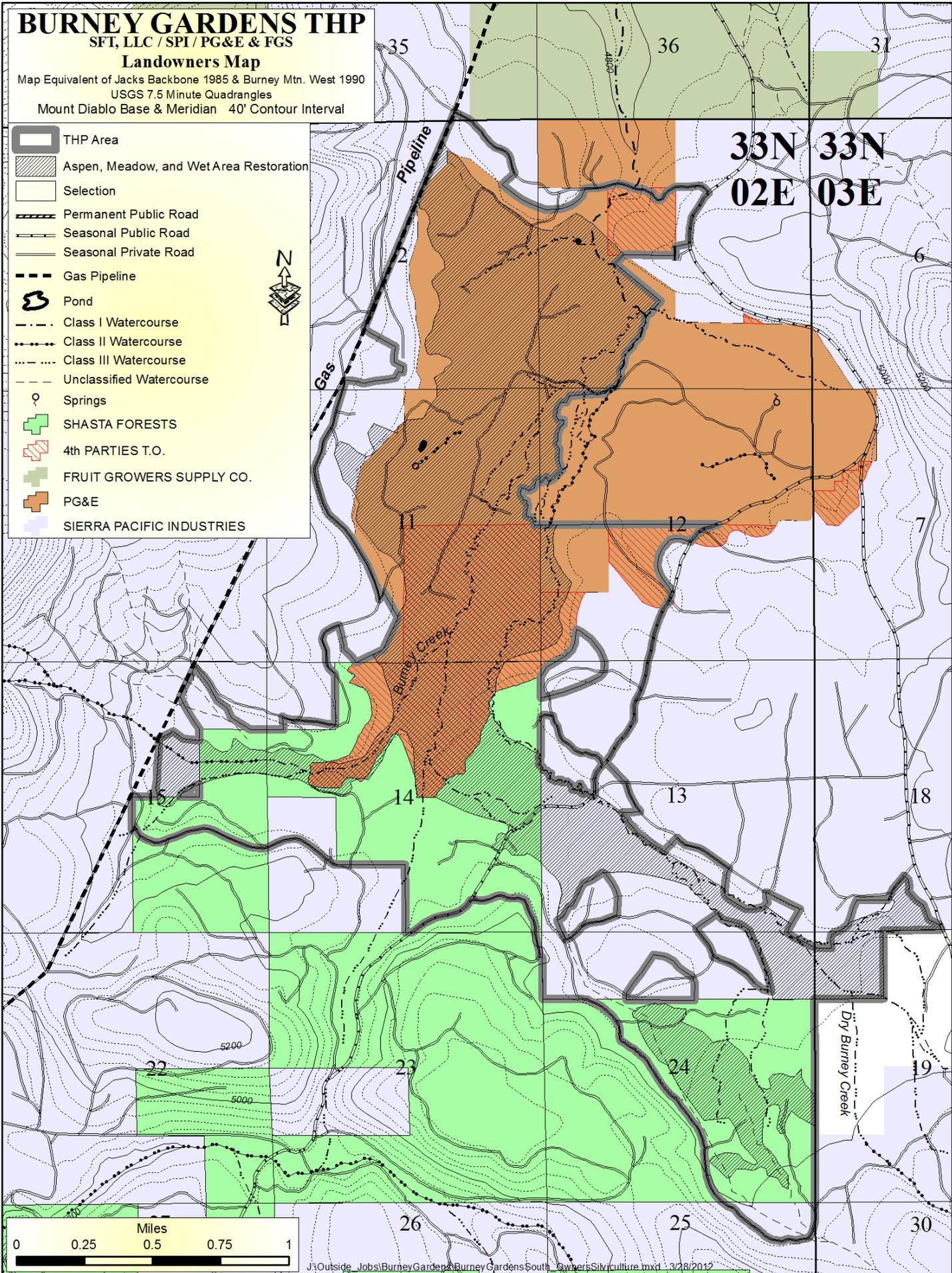
BURNEY GARDENS THP

SFT, LLC / SPI / PG&E & FGS

Landowners Map

Map Equivalent of Jacks Backbone 1985 & Burney Mtn. West 1990
 USGS 7.5 Minute Quadrangles
 Mount Diablo Base & Meridian 40' Contour Interval

-  THP Area
-  Aspen, Meadow, and Wet Area Restoration
-  Selection
-  Permanent Public Road
-  Seasonal Public Road
-  Seasonal Private Road
-  Gas Pipeline
-  Pond
-  Class I Watercourse
-  Class II Watercourse
-  Class III Watercourse
-  Unclassified Watercourse
-  Springs
-  SHASTA FORESTS
-  4th PARTIES T.O.
-  FRUIT GROWERS SUPPLY CO.
-  PG&E
-  SIERRA PACIFIC INDUSTRIES



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Photos of the Project Site



Figure 1: Watercourse with Lodgepole Encroachment



Figure 2: Wet area with lodgepole encroachment.



Figure 3: Meadow with lodgepole encroachment on edge.

Additional Submission Requirements for Site Improvement/Restoration Project Applications

Land Tenure Documents: All landowners agreed to project participation during the THP preparation process. Both W.M. Beaty & Associates, and PG&E have also provided letters of support reiterating their support of the project. Should the THP document and the letters of support not prove sufficient to prove land tenure; additional documents will be provided to the SNC upon request.

Site Plan: The site plan is contained within the THP document. Please note that this grant only covers the Aspen, Meadow, and Wet Area Restoration portion of the THP, and only on Shasta Forests Timberlands property (managed by W.M. Beaty & Associates) and PG&E property.

Additional Attachments

Burney Gardens Timber Harvest Plan

Burney Gardens Grazing Management Plan: PG&E

Burney Gardens Grazing Management Plan DRAFT: Shasta Forests Timberlands

Burney Gardens Meadow Restoration Project Forest Management Plan

ADMIN. USE ONLY
Comments-date & S or M

J
21
105
-NF
PW-SHA
CGS
7. RT
8. Schultz
9.
10.
11.
12.

TIMBER HARVESTING PLAN
STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY
AND FIRE PROTECTION
RM-63 (01-00)

THP Name:

BURNEY GARDENS

(In the CDF FPS, this is "THP Description")

If this is a Modified THP, check box:

FOR ADMIN. USE ONLY
2-12-001-SHA (4)
THP No. _____
Dates Rec'd JAN 05 2012
Date Filed JAN 13 2012
Date Approved JAN 31 2012
Date Expires JAN 30 2015
Extensions 1) 2)

This Timber Harvesting Plan (THP) form, when properly completed, is designed to comply with the Forest Practice Act (FPA) and Board of Forestry and Fire Protection rules. See separate instructions for information on completing this form. NOTE: The form must be printed legibly in ink or typewritten. The THP is divided into six sections. If more space is necessary to answer a question, continue the answer at end of the appropriate section of your THP. If writing an electronic version, insert additional space for your answer. Please distinguish answers from questions by font change, bold, or underline.

SECTION I: GENERAL INFORMATION

This THP conforms to my/our plan and upon approval, I/we agree to conduct harvesting in accordance therewith. Consent is hereby given to the Director of Forestry and Fire Protection, and his or her agents and employees, to enter the premises to inspect timber operations for compliance with the Forest Practice Act and Forest Practice Rules.

1. TIMBER OWNER(S) OF RECORD: (see Landowners Map at end of Section II)

Name Fruit Growers Supply Company
Address 37530 Highway 299 East
City Burney State CA Zip 96013-9999 Phone (530) 335-2882
Signature (notified via certified mail - see Section V) Date 11/21/11

Name Fourth Parties
Address c/o W.M. Beaty & Associates, Inc., PO Box 990898
City Redding State CA Zip 96099-0898 Phone (530) 243-2783
Signature [Signature] Date 1/4/12

Name Pacific Gas & Electric Company
Address 3600 Meadow View Drive
City Redding State CA Zip 96002 Phone (530) 246-6447
Signature (notified via certified mail - see Section V) Date 11/21/11

Name Shasta Forests Timberlands, LLC
Address c/o W.M. Beaty & Associates, Inc., PO Box 990898
City Redding State CA Zip 96099-0898 Phone (530) 243-2783
Signature [Signature] Date 1/4/12

Name Sierra Pacific Industries
Address PO Box 496014
City Redding State CA Zip 96049 Phone (530) 378-8111
Signature (notified via certified mail - see Section V) Date 11/21/11

RECEIVED

JAN 05 2012

REDDING
FOREST PRACTICE

NOTE: The timber owner is responsible for payment of a yield tax. Timber Yield Tax information may be obtained at the Timber Tax Section, MIC: 60, State Board of Equalization, P.O. Box 942879, Sacramento, California 94279-0060; phone 1-800-400-7115; BOE Web Page at http:// www.boe.ca.gov.

TIMBERLAND OWNER(S) OF RECORD: (see Landowners Map at end of Section II)

Name Fruit Growers Supply Company
Address 37530 Highway 299 East
City Burney State CA Zip 96013-9999 Phone (530) 335-2882
Signature (notified via certified mail - see Section V) Date 11/21/11

Name Pacific Gas & Electric Company
Address 3600 Meadow View Drive
City Redding State CA Zip 96002 Phone (530) 246-6447
Signature (notified via certified mail - see Section V) Date 11/21/11

Name Shasta Forests Timberlands, LLC
Address c/o W.M. Beaty & Associates, Inc., PO Box 990898
City Redding State CA Zip 96099-0898 Phone (530) 243-2783
Signature  Date 1/4/12

Name Sierra Pacific Industries
Address PO Box 496014
City Redding State CA Zip 96049 Phone (530) 378-8111
Signature (notified via certified mail - see Section V) Date 11/21/11

3. LICENSED TIMBER OPERATOR(S):

Name Unknown Lic. No. _____
(If unknown, so state. You must notify CDF of LTO prior to start of operations)
Address _____
City _____ State _____ Zip _____ Phone _____
Signature _____ Date _____

4. PLAN SUBMITTER(S):

Name W.M. Beaty & Associates, Inc.
Address PO Box 990898
City Redding State CA Zip 96099-0898 Phone (530) 243-2783
(Submitter must be from 1, 2, or 3 above. He/she must sign below. Ref. Title 14 CCR § 1032.7(a))
Signature  Date 1/4/12

a. List person to contact on-site who is responsible for the conduct of the operation. If unknown, so state and name must be provided for inclusion in the THP prior to start of timber operations.

Name Unknown
 Address _____
 City _____ State _____ Zip _____ Phone _____

b. Yes No Will the timber operator be employed for the construction and maintenance of roads and landings during conduct of timber operations? If no, who is responsible?

c. Who is responsible for erosion control maintenance after timber operations have ceased and until certification of the Work Completion Report? If not the LTO, then a written agreement must be provided per 14 CCR § 1050 (c).

The Licensed Timber Operator (LTO) shall be responsible for the erosion control maintenance after timber operations have ceased and until certification of the Work Completion Report.

6. a. Expected date of commencement of timber operations:

date of THP conformance, or _____ (date)

b. Expected date of completion of timber operations:

3 years from date of THP conformance, or _____ (date)

7. The timber operation will occur within the:

- COAST FOREST DISTRICT
- Southern Subdistrict of the Coast F. D.
- SOUTHERN FOREST DISTRICT
- High use subdistrict of the Southern F. D.
- NORTHERN FOREST DISTRICT
- The Tahoe Regional Planning Authority Jurisdiction
- A County with Special Regulations, identify: _____
- Coastal Zone, no Special Treatment Area
- Special Treatment Area(s), type and identify: _____
- Other _____

8. Location of the timber operation by legal description:

Base and Meridian: Mount Diablo Humboldt San Bernardino

LOCATION OF TIMBER OPERATION				
Sections	Township	Range	Acreage	County
13, 14, 23, 24, 35	34N	2E	130	Shasta
1, 2, 11, 12, 13, 14, 15, 23, 24, 25	33N	2E	2,340	Shasta
18, 19	33N	3E	60	Shasta
Total			2,530	(Logging Area Only)

Sierra Pacific Industries Assessor's Parcel Numbers:

- 034-060-013
- 034-140-029, 034-140-031, 034-140-034, 034-140-058
- 034-160-002, 034-160-011, 034-160-017, 034-160-023
- 034-210-001, 034-210-009

USGS 7.5' Quad: Jacks Backbone 1985 and Burney Mountain West 1990

Planning Watershed: (CALWATER Version, Identification Number, and Name):

CalWater version 2.2.1, 5526.330101, Whittington Butte and 5526.310102, Dry Burney Creek

9. Yes No Has a Timberland Conversion been submitted? If yes, list expected approval date or permit number and expiration date if already approved.

10. Yes No Is there an approved Sustained Yield Plan for this property?
Number 00-002-R (12/10/10) Approved 9/6/11

The Shasta Forests SYP includes the Shasta Forests Timberlands portion of the THP area (see Landowners Map at end of Section II).

Yes No Has a Sustained Yield Plan been submitted but not approved? Number Date sub.

11. Yes No Is there a THP or NTMP on file with CDF for any portion of the plan area for which a Report of Satisfactory Stocking has not been issued by CDF? If yes, identify the THP or NTMP number(s):

Yes No Is there a contiguous even aged unit with regeneration less than five years old or less than five feet tall? If yes, explain. Ref. Title 14 CCR § 913.1 (933.1, 953.1) (a)(4).

12. Yes No Is a Notice of Intent necessary for this THP?

Yes No If yes, was the Notice of Intent posted as required by 14 CCR § 1032.7(g)?

13. RPF preparing the THP: Name Scott P Carnegie RPF Number 2540

Address c/o W.M. Beaty & Associates, Inc. PO Box 990898

City Redding State CA Zip 96099-0898 Phone (530) 336-6986

a. Yes No I have notified the plan submitter(s), in writing, of their responsibilities pursuant to 14 CCR § 1035 of the Forest Practice Rules.

Yes No I have notified the timber owner and the timberland owner of their responsibilities for compliance with the Forest Practice Act and rules, specifically the stocking requirements of the rules and the maintenance of erosion control structures of the rules.

As the employer of the Registered Professional Forester (RPF) who prepared the plan, W.M. Beaty & Associates, Inc. is fully aware of all timber harvesting plan (THP) responsibilities identified in Title 14 of the California Code of Regulations (14 CCR) § 1035 concerning this plan. W.M. Beaty & Associates, Inc. has been retained by the Fall River Resource Conservation District for preparation of this THP and compliance with all pertinent regulations. W.M. Beaty & Associates, Inc., as agent for Fourth Parties and Shasta Forests Timberlands, LLC, accepts the responsibilities identified in 14 CCR § 1035. Fourth Parties is the timber owner for a portion of the area owned by Pacific Gas & Electric Company (see Landowners Map at end of Section II). Certified letters were sent to Fruit Growers Supply Company, Pacific Gas & Electric Company, and Sierra Pacific Industries notifying them of their responsibilities for compliance with the Forest Practice Act and rules (see Section V, Attachments).

b. Yes No I will provide the timber operator with a copy of the portions of the approved THP as listed in 14 CCR § 1035 (e). If "no", who will provide the LTO a copy of the approved THP?

W.M. Beaty & Associates, Inc., Plan Submitter.

c. I have the following authority and responsibilities for preparation and administration of the THP and timber operation. (Include both work completed and work remaining to be done):

Preparation of the plan, accuracy and completeness of the plan contents, sample marking and flagging for the pre-harvest inspection, preharvest inspection attendance (if requested by the

Director), observation of the timber operation on the timber and timberland owner's behalf, and submittal of amendments and extensions. There are no known current or potential conflicts of interest with regard to the timber or land that is subject to operations under this plan. I am not the real party of interest for whom I am providing professional forestry services. Disclosure of newly discovered conflicts of interest I have with regard to the plan submitter, timberland owner, timber owner, the LTO, and timber purchaser, pertaining to the timber or timberland that is subject to operations under this plan as long as I have responsibilities relative to this plan. The disclosure shall include identification of the real party of interest for whom I am providing professional forestry services.

Fourth Parties & Shasta Forests Timberlands

I have been retained by the plan submitter to complete required timber marking, flagging, and wildlife surveys prior to operations and provide professional advice to the LTO, timber owner, and timberland owner upon request throughout the active timber operations regarding the plan, the Forest Practice Rules, and other associated regulations pertaining to timber operations. Be present, or ensure that my designee is present, on the logging area at a sufficient frequency to know the progress of operations and advise the LTO, timber owner, and timberland owner, but not less than once during the life of the plan. Inform the LTO during operations of any mitigation measures incorporated into the plan that are intended to address operations that have a high likelihood of resulting in immediate, significant and long-term harm to the natural resources of the State if such mitigation measures are not strictly applied to minimize such impacts. Without delay, notify in writing the LTO, the plan submitter, and the Department of a decision to withdraw professional services from the plan.

- d. Additional required work requiring an RPF, which I do not have the authority or responsibility to perform:

Fruit Growers Supply Company, Pacific Gas & Electric Company, and Sierra Pacific Industries

Complete required timber marking, flagging, and wildlife surveys prior to operations and provide professional advice to the LTO and timberland owner upon request throughout the active timber operations regarding the plan, the Forest Practice Rules, and other associated regulations pertaining to timber operations. Be present, or ensure that my designee is present, on the logging area at a sufficient frequency to know the progress of operations and advise the LTO and timberland owner, but not less than once during the life of the plan. Inform the LTO during operations of any mitigation measures incorporated into the plan that are intended to address operations that have a high likelihood of resulting in immediate, significant and long-term harm to the natural resources of the State if such mitigation measures are not strictly applied to minimize such impacts.

- e. After considering the rules of the Board of Forestry and Fire Protection and the mitigation measures incorporated in this THP, I have determined that the timber operation:

will have a significant adverse impact on the environment. (Statement of reasons for overriding considerations contained in Section III).

will not have a significant adverse impact on the environment.

Registered Professional Forester: I certify that I, or my supervised designee, personally inspected the THP area, and this plan complies with the Forest Practice Act, the Forest Practice Rules and the Professional Foresters Law. If this is a Modified THP, I also, certify that: 1) the conditions or facts stated in 14 CCR § 1051 (a) (1) - (16) exist on the THP area at the time of submission, preparation, mitigation, and analysis of the THP and no identified potential significant effects remain undisclosed; and 2) I, or my supervised designee, will meet with the LTO at the THP site, before timber operations commence, to review and discuss the contents and implementation of the Modified THP.

Signature 

Date 1/16/12

SECTION II: PLAN OF TIMBER OPERATIONS

NOTE: If a provision of this THP is proposed that is different than the standard rule, the explanation and justification should normally be included in Section III unless it is clearer and better understood as part of Section II.

SILVICULTURE

14. a. Check the Silvicultural methods or treatments allowed by the rules that are to be applied under this THP. Specify the option chosen to demonstrate Maximum Sustained Production (MSP) according to 14 CCR § 913 (933, 953) .11. If more than one method or treatment will be used show boundaries on map and list approximate acreage for each.

- Clearcutting, Shelterwood Prep. Step, Shelterwood Seed Step, Shelterwood Removal Step, Seed Tree Seed Step, Seed Tree Removal Step, Selection, Group Selection, Transition, Commercial Thinning, Road Right of Way, Sanitation Salvage, Special Treatment Area, Rehab. of Understocked Area, Fuelbreak, Variable Retention, Aspen, Meadow, and Wet Area Restoration, Alternative, Conversion, Non-Timberland

Total acreage 2,530 ac.: Explain if total is different from that in 8.

MSP option chosen: (a) (b) (c)

Option A: Fruit Growers Supply Company: Tiered off of THP No. 2-02-181-LAS(2). Sierra Pacific Industries: Tiered off of THP No. 2-97-359 SHA(4).

Option B: Shasta Forest Timberlands: See Shasta Forests SYP No. 00-002-R (12/10/10).

Option C: Pacific Gas & Electric Company.

Refer to Section III, Item 14, for compliance with the requirements of 14 CCR § 1034(m)(1).

Aspen, Meadow, and Wet Area Restoration

As per 14 CCR § 933.4(e)(8)(C), MSP requirements are met by implementing actions that contribute to attaining the measures of success approved by the Department for this prescription.

b. If Selection, Group Selection, Commercial Thinning, Sanitation Salvage, or Alternative methods are selected the postharvest stocking levels (differentiated by site if applicable) must be stated. Note mapping requirements of 1034(x)(12).

Refer to the Silviculture Map at end of Section II for the location where each prescription will be applied. The THP area is Dunning site class II and III.

Selection

On Site II and III lands at least 75 sq. ft. per acre of basal area shall retained. For the Pacific Gas & Electric Company ownership (see Landowners Map at end of Section II), the residual stand shall contain sufficient trees to meet at least the basal area, size, and phenotypic quality of the tree requirement specified under the seed tree method.

c. Yes No Will evenage regeneration step units be larger than those specified in the rules (20 acres tractor, 30 acres cable)? If yes, provide substantial evidence that the THP contains measures to accomplish any of subsections (A) - (E) of 14 CCR § 913 (933, 953) .1 (a) (2)

in Section III of the THP. List below any instructions to the LTO necessary to meet (A) - (E) not found elsewhere in the THP. These units must be designated on map and listed by size.

- d. Trees to be harvested or retained must be marked by or marked under the supervision of the RPF. Specify how the trees will be marked and whether harvested or retained.

Yes No Is a waiver of marking by the RPF requirement requested? If yes, how will LTO determine which trees will be harvested or retained? If yes and more than one silvicultural method, or Group Selection is to be used, how will LTO determine boundaries of different methods or groups?

Refer to the Silviculture Map at end of Section II for the location of each silvicultural prescription.

The boundary between the Aspen Restoration area and the Aspen, Meadow, and Wet Area Restoration will be self-evident on the ground and identified by the presence of lodgepole pine stands, no flagging is necessary.

The boundary between the Aspen Restoration area and Selection area occurs at a Class II watercourse that will be used as the boundary, no flagging is necessary.

The boundary between the Selection area and the Aspen, Meadow, and Wet Area Restoration will be self-evident on the ground and identified by the presence of lodgepole pine stands, no flagging is necessary.

Aspen Restoration

All aspen trees shall be retained to the extent feasible. All conifers within 100 feet of aspen trees may be harvested. Conifers on the north side of and within 100 feet of aspen trees, fire resistant ponderosa pine trees, and trees >30" diameter at breast height (dbh) may be retained. All size classes of conifers between the aspen openings may be thinned using the spacing guidelines under the selection prescription below.

Aspen, Meadow, and Wet Area Restoration

All aspen shall be retained to the extent feasible. All lodgepole pine may be harvested exclusive of those to be retained for wildlife habitat (see Item 35). On upland areas within and adjacent to the meadow areas, conifers (exclusive of lodgepole) shall be retained where feasible but may be thinned using the spacing guidelines under the selection prescription below.

Within 100 feet of aspen, all conifers may be harvested (exclusive of those to be retained for wildlife habitat, see Item 35). The remaining conifers may be thinned using the spacing guidelines under the selection prescription below. Conifers on the north side of aspen, fire resistant ponderosa pine trees, and trees >30" dbh may be retained.

Selection

Merchantable trees (≥ 8 inches diameter inside bark (dib) at 32 feet or ≥ 12 inches dbh) to be harvested shall be marked by the RPF or supervised designee prior operations with a blue painted band around the circumference of the tree and a base mark below the cutline.

A waiver of marking by the RPF requirement is requested for biomass thinning of submerchantable trees (<8 inches dib at 32 feet or <12 inches dbh). Areas may be biomass thinned using operator selection, however, biomass thinning shall not occur within any watercourse and lake protection zone (WLPZ), equipment exclusion zone (EEZ), or equipment limitation zone (ELZ). Biomass thinning shall adhere to the following guidelines:

1. Spacing: Trees shall be spaced using a "diameter plus six rule" as shown in the table below. Trees >18 inches dbh shall be ignored in the spacing pattern when selecting which sub-sawlog trees to leave (i.e., if an 8-inch dbh tree is 4 feet away from a 24-inch dbh tree and it is the most desirable leave tree in the vicinity, it should be retained along with the 24-inch dbh tree).

LEAVE TREE SPACING GUIDELINES	
Average DBH (inches)	Average Spacing (feet)
<6	12
8	14
10	16
12	18
>14	20

2. Crown Class: Crown class refers to a trees relative position within the stand canopy. Leave trees shall be selected in the following rank: (1) dominant, (2) co-dominant, and (3) intermediate.
 3. Live-Crown Ratio: Leave trees should have >40% live-crown ratio (length of the bole of the tree clothed with living branches relative to the total height of the tree).
 4. Growth: Leave trees will be selected which exhibit signs of vigorous growth such as constant or increasing leader growth.
 5. Undesirable Characteristics: When selecting leave trees, those with characteristics and deformities such as crook, sweep, spiral grain, forks, multiple tops, broken tops, unsound cat faces, basal scars, or signs of insect and disease attack shall not be retained unless desired for wildlife habitat. The RPF or supervised designee may issue special instructions regarding dwarf mistletoe infestations or any other undesirable characteristic.
 6. Species: Provided the above criteria have been satisfied, leave trees should be favored for selection in the following order: (1) ponderosa pine, (2) sugar pine, (3) Douglas-fir, (4) white fir, and (5) incense-cedar.
 7. Wildlife Habitat Considerations: Biomass thinning shall not occur within any WLPZ, EEZ, or ELZ to retain existing wildlife habitat. Snags >22-inch DBH which do not contain sound sawlog volume shall be retained exclusive of those which must be felled as directed under Item 33. All large down woody debris >22-inch diameter, (either naturally occurring, or from prior harvest activities) which does not contain sound sawlog or biomass volume, shall be retained. These logs may be moved to allow for the passage of heavy equipment but shall not be destroyed.
- e. Forest products to be harvested:
Sawlogs, veneer logs, cull logs, hog fuel chips, and fuel wood.
- f. Yes No Are group B species proposed for management?
 Yes No Are group B or non-indigenous A species to be used to meet stocking standards?
 Yes No Will group B species need to be reduced to maintain relative site occupancy of A species?
- If any answer is yes, list the species, describe treatment, and provide the LTO with necessary felling and slash treatment guidance. Explain who is responsible and what additional follow-up measures of manual treatment or herbicide treatment are to be expected to maintain relative site occupancy of A species. Explain when a licensed Pest Control Advisor shall be involved in this process.
- g. Other instructions to LTO concerning felling operations.
- Trees bearing metal "Designated Wildlife Tree" signs or large painted "W"s shall be left standing and undamaged to the extent feasible.
 - Use existing skid trails and landings where practical.
 - Construct any necessary new skid trails and landings in open areas where practical.
 - Use directional tree falling to avoid retained trees and snags.
- h. Yes No Will artificial regeneration be required to meet stocking standards?

- i. Yes No Will site preparation be used to meet stocking standards? If yes, provide the information required for a site preparation addendum, as per 14 CCR § 915.4 (935.4, 955.4).
- j. If the rehabilitation method is chosen, provide a regeneration plan as required by 14 CCR § 913 (933, 953) 4 (b).
N/A

PESTS

- 15. a. Yes No Is this THP within an area that the Board of Forestry and Fire Protection has declared a Zone of Infestation or Infection, pursuant to PRC 4712 - 4718? If yes, identify feasible measures being taken to mitigate adverse infestation or infection impacts from the timber operation. See 14 CCR § 917 (937, 957) .9 (a).
- b. Yes No If outside a declared zone, are there any insect, disease or pest problems of significance in the THP area? If yes, describe the proposed measures to improve the health, vigor, and productivity of the stand(s).

HARVESTING PRACTICES

16. Indicate type of yarding system and equipment to be used:

GROUND BASED*

- a. Tractor, including end/long lining
- b. Rubber tired skidder, Forwarder
- c. Feller buncher

CABLE

- d. Cable, ground lead
- e. Cable, high lead
- f. Cable, Skyline

SPECIAL

- g. Animal
- h. Helicopter
- i. Other

All tractor operations restrictions apply to ground based equipment.

17. Erosion Hazard Rating: Indicate Erosion Hazard Ratings present on THP. (Must match EHR worksheets).

- Low Moderate High Extreme

If more than one rating is checked, areas must be delineated on map down to 20 acres in size (10 acres for high and Extreme EHRs in the Coast District).

18. Soil Stabilization: In addition to the standard waterbreak requirements describe soil stabilization measures or additional erosion control measures to be implemented and the location of their application. See requirements of 14 CCR § 916.7 (936.7, 956.7), and 923.2 (943.2, 963.2) (m), and 923.5 (943.5, 963.5) (f).

Soil Stabilization in WLPZs

Within the WLPZ adjacent to Class I and II waters, areas where mineral soil exceeding 800 continuous square feet in size is exposed by timber operations, (exclusive of the traveled surface of roads), shall be treated for reduction of soil loss with a minimum 90% coverage of slash or straw mulch to a minimum 1-inch applied depth. Treatment shall be done prior to October 15th except that such bare areas created after October 15th but before May 1st shall be so treated within 10 days, or as agreed to by the Director.

Waterbreak Timing

Waterbreaks shall be constructed immediately upon conclusion of use of skid trails, roads, and landings, which do not have permanent and adequate drainage facilities, or drainage structures (exclusive of the area designated for Aspen, Meadow, and Wet Area Restoration). Except as otherwise provided for in the rules: waterbreaks shall be installed no later than the beginning of the winter period of the current year of timber operations. Installation of drainage facilities and structures is required from October 15th to May 1st on all constructed skid trails and tractor roads prior to sunset if the National Weather Service forecast is a "chance" (30% or more) of rain within the next 24 hours and prior to weekend or other shutdown periods. Waterbreaks do not need to be constructed on roads in use after October 15th provided that all such waterbreaks are installed prior to the start of rain that generates overland flow.

Waterbreak Location

Drainage facilities shall be constructed on all roads (exclusive of the area designated for Aspen, Meadow, and Wet Area Restoration). Waterbreaks shall be cut diagonally a minimum of 6 inches into the firm roadbed or skid trail surface and shall have a continuous firm embankment of at least 6 inches in height immediately adjacent to the lower edge of the waterbreak cut. Waterbreaks shall be located to allow water to be discharged into some form of vegetative cover, duff, slash, rocks, or less erodible material wherever possible, and shall be constructed to provide for unrestricted discharge at the lower end of the waterbreak so that water will be discharged and spread in such a manner that erosion shall be minimized. Where waterbreaks cannot effectively disperse surface runoff, including where waterbreaks on roads and skid trails cause surface runoff to be concentrated on downslopes, roads, or skid trails, other erosion controls shall be installed as needed. The maximum distance between waterbreaks shall be based on the erosion hazard rating (EHR) and road or skid trail gradient and shall not exceed the following standards except where natural drainage will occur, i.e., low spots, draws, and depressions. In these areas, any berm on the downhill side of the road or skid trail shall be removed to allow drainage and a drainage facility shall not be constructed.

MAXIMUM DISTANCE BETWEEN WATERBREAKS				
EHR	U. S. Equivalent Measure Road or Skid Trail Gradient (feet)			
	0 – 10%	11 – 25%	26 – 50%	>50%
Low	300	200	150	100

- Waterbreaks shall be constructed to avoid concentrating discharge into watercourses.
- Permanent drainage facilities (short dimension rolling dips) shall be constructed, reconstructed, or maintained if existing on select seasonal and appurtenant seasonal roads used for this operation as directed by the RPF, or his designee. Permanent drainage facilities shall be reconstructed prior to the completion of hauling where feasible, as determined by the RPF or supervised designee so that these facilities will be stable and compact upon completion of hauling. Where construction of permanent drainage facilities is not feasible as determined by the RPF or supervised designee drivable waterbars shall be constructed. The RPF or supervised designee may assist the LTO in identifying locations where drainage facilities shall be constructed on seasonal roads.

Other Stabilization

- Excess material from road construction, reconstruction, and abandonment shall be deposited and stabilized in a manner or in areas where downstream beneficial uses of water will not be adversely affected.
- Sidecast or fill material extending more than 20 feet in slope distance from the outside edge of the roadbed which has access to a watercourse or lake which is protected by a WLPZ shall be stabilized with a minimum 90% coverage of slash or straw mulch to a minimum 1-inch applied depth to reduce soil erosion. Sidecast of road surface material toward watercourses shall be minimized by sidecasting material to the inside of the road to the extent feasible during road surface grading.
- Berms along roads created from grading or truck traffic during operations shall be pulled back onto the road surface prior to completion of hauling and final road grading. Berms shall be removed or breeched before the winter operating period as per 14 CCR § 943.4(e).

Aspen, Meadow, and Wet Area Restoration

Most of the roads and landings in the area designated for Aspen, Meadow, and Wet Area Restoration are seasonally flooded with up to approximately 18 inches of water. These roads, landings, and associated skid trails may be reused, however, they shall only be used when there is a stable operating surface and when saturated soils do not exist. Roads shall only be bladed when necessary for hauling as determined by the RPF, or his designee. Isolated wet spots shall be treated with fabric and rock as needed to facilitate passage. All skid trails shall be identified by the RPF or supervised designee with orange flagging prior to use. Due to the dense growth of herbaceous vegetation throughout the

adjacent historical meadow, it is predicted that the disturbed sites will be heavily vegetated within two years.

19. Yes No Are tractor or skidder constructed layouts to be used? If yes, specify the location and extent of use:
20. Yes No Will ground based equipment be used within the area(s) designated for cable yarding? If yes, specify the location and for what purpose the equipment will be used. See 14 CCR § 914.3 (934.3, 954.3) (e).
21. Within the THP area will ground based equipment be used on:
- a. Yes No Unstable soils or slide areas? Only allowed if unavoidable.
- b. Yes No Slopes over 65%?
- c. Yes No Slopes over 50% with high or extreme EHR?
- d. Yes No Slopes between 50% and 65% with moderate EHR where heavy equipment use will not be restricted to the limits described in 14 CCR § 914 (934, 954) .2 (f) (2) (i) or (ii)?
- e. Yes No Slopes over 50% which lead without flattening to sufficiently dissipate water flow and trap sediment before it reaches a watercourse or lake?

If a. is yes, provide site specific measures to minimize effect of operations on slope stability below. Provide explanation and justification in section III as required per 14 CCR § 914 (934, 954) .2 (d). CDF requests the RPF consider flagging tractor road locations if "a." is yes. If b., c., d. or e. is yes, 1) the location of tractor roads must be flagged on the ground prior to the PHI or start of operations if a PHI is not required, and 2) you must clearly explain the proposed exception and justify why the standard rule is not feasible or would not comply with 14 CCR § 914 (934, 954). The location of heavy equipment operation on unstable areas or any use beyond the limitations of the standard rules must be shown on the map. List specific instructions to the LTO below.

22. Yes No Are any alternative practices to the standard harvesting or erosion control rules proposed for this plan? If yes, provide all the information as required by 14 CCR § 914 (934, 954) .9 in Section III. List specific instructions to the LTO below.

Waterbreaks are not required to be constructed on roads and skid trails within the Aspen, Meadow, and Wet Area Restoration. See Section III, Item 22.

WINTER OPERATIONS

23. a. Yes No Will timber operations occur during the winter period? If yes, complete "b, c, or d." State in space provided if exempt because yarding method will be cable, helicopter, or balloon.
- b. Yes No Will mechanical site preparation be conducted during the winter period? If yes, complete "d".
- c. I choose the in-lieu option as allowed in 14 CCR § 914 (934, 954) .7 I. Specify below the procedures listed in subsections (1) and (2), and list the site specific measures for operations in the WLPZ and unstable areas as required by subsection (3), if there will be no winter operations in these areas, so state.
- d. I choose to prepare a winter operating plan per 14 CCR § 914 (934, 954) .7 (b).

NOTE: "Winter period" means the period between November 15 and April 1, except as noted under special County Rules at Title 14 CCR § 925.1, 926.18, 927.1, and 965.5... (a) except as otherwise provided in the rules: (1) All waterbreaks shall be installed no later than the beginning of the winter period of the current year of timber operations. (2) Installation of drainage facilities and structures is required from October 15 to November 15 and April 1 to May 1 on all constructed skid trails and tractor roads prior to sunset if the National Weather Service forecast is a "chance" (30% or more) of rain within the next 24 hours.

The intent of this winter operating plan is to allow operations in the Selection area to continue into the winter period if generally dry conditions persist or hard frozen conditions occur, and to begin operations before end of the winter period if there is a dry spring and conditions allow for operations. No winter operations are permitted within the Aspen, Meadow, and Wet Area Restoration.

1. Erosion Hazard Rating

The area where winter operations are permitted is has a low EHR.

2. Mechanical Site Prep Method

No site preparation is associated with this THP.

3. Yarding System

Ground based yarding will be used on the entire THP area.

4. Operating Period

November 15th through April 1st.

5. Erosion Control Facilities Timing

Installation of drainage facilities and structures is required from October 15th to May 1st on all constructed skid trails and tractor roads prior to sunset if the National Weather Service forecast is a "chance" (30% or more) of rain within the next 24 hours and prior to weekend or other shutdown periods. Waterbreaks shall be constructed immediately upon conclusion of use of skid trails, roads, and landings, which do not have permanent and adequate drainage facilities, or drainage structures. Waterbreaks do not need to be constructed on roads in use after October 15th provided that all such waterbreaks are installed prior to the start of rain that generates overland flow.

6. Consideration of Form of Precipitation – Rain or Snow

During the winter period, the majority of precipitation comes in the form of snow. Rain does occur and is the principle form of precipitation in November and March. Precipitation, in either form, which results in saturated soil conditions (see definition below) shall result in a shutdown of operations.

7. Ground Conditions

The use of logging roads, tractor roads, or landings shall not take place at any location where saturated soil conditions exist, where a stable logging road or landing surface does not exist, or when visibly turbid water from the road, landing, or skid trail surface or inside ditch may reach a watercourse or lake. Grading to obtain a drier running surface more than one time before re-incorporation of any resulting berms back into the road surface is prohibited. Persistent isolated wet spots on haul roads and landings shall be stabilized with rock to maintain a stable road surface and to permit passage. Operations shall not continue following a precipitation event unless saturated soil conditions do not exist, stable operating surfaces exist, and the RPF or supervised designee has approved commencement of operations.

Saturated soil conditions means that soil and/or surface material pore spaces are filled with water to such an extent that runoff is likely to occur. Indicators of saturated soil conditions may include, but are not limited to: (1) areas of ponded water, (2) pumping of fines from the soil or road surfacing material during timber operations, (3) loss of bearing strength resulting in the deflection of soil or road surfaces under a load, such as the creation of wheel ruts, (4) spinning or churning of wheels or tracks that produces a wet slurry, or (5) inadequate traction without blading wet soil or surfacing materials.

Hard frozen conditions means those frozen soil conditions where loaded or unloaded vehicles can travel without sinking into the road surfaces to a depth of more than six inches over a distance of more than 25 feet.

Stable operating surface means a road or landing surface that can support vehicular traffic and has a structurally sound road base appropriate for the type, intensity and timing of intended use.

8. Silvicultural System - Ground Cover

The silvicultural system for the winter operations area is selection and may be operated during the winter period. The residual vegetation and logging debris will provide sufficient ground cover to protect the soil surface.

9. Operations within the WLPZ

All watercourse crossings not constructed to permanent crossing standards shall be removed before the winter period. Road and skid trail crossings with fords may be used during the winter period if dry.

10. Equipment Use Limitations

Equipment use will be keyed to soil conditions as stated above. Use of equipment is prohibited if saturated soil conditions exist. Operation of trucks and heavy equipment on roads and landings shall be limited to those with a stable operating surface. No new road construction shall occur during the winter period.

11. Known Unstable Areas

No known unstable areas exist within the THP area.

ROADS AND LANDINGS

24. Will any roads be constructed? Yes No, or reconstructed? Yes No
If yes, check items "a." through "g."

Will any landings be constructed? Yes No, or reconstructed? Yes No
If yes, check items "h." through "k."

- a. Yes No Will new or reconstructed roads be wider than single lane with turnouts?
- b. Yes No Are logging roads proposed in areas of unstable soils or known slide-prone areas?
- c. Yes No Will new roads exceed a grade of 15% or have pitches of up to 20% for distances greater than 500 feet? Map must identify any new or reconstructed road segments that exceed an average 5% grade for over 200 feet.
- d. Yes No Are roads to be constructed or reconstructed, other than crossings, within the WLPZ of a watercourse? If yes, completion of THP Item 27 a. will satisfy required documentation.
- e. Yes No Will roads be located across more than 100 feet of lineal distance on slopes over 65%, or on slopes over 50% which are within 100 feet of the boundary of a WLPZ?
- f. Yes No Will any roads or watercourse crossings be abandoned?
- g. Yes No Are exceptions proposed for flagging or otherwise identifying the location or roads to be constructed?
- h. Yes No Will any landings exceed one half acre in size? If any landing exceeds one quarter acre in size or requires substantial excavation the location must be shown on the map.
- i. Yes No Are any landings proposed in areas of unstable soils or known slide prone areas?
- j. Yes No Will any landings be located on slopes over 65% or on slopes over 50% which are within 100 feet of the boundary of a WLPZ?
- k. Yes No Will any landings be abandoned?

Refer to the Roads, Watercourses, & Crossings Map at end of Section II for reference locations.

As per 14 CCR § 943.1 (j), if logging roads will be used from the period of October 15th to May 1st, hauling shall not occur when saturated soil conditions exist on the road that may produce sediment in quantities sufficient to cause a visible increase in turbidity of downstream waters in receiving Class I, II, III, or IV waters or that violate Water Quality Requirements.

Road Construction

R1: Approximately 1,000 feet of native surface seasonal road shall be constructed to replace a segment of road within a Class III watercourse. The road location shall be identified by the RPF or supervised designee with pink flagging prior to the preharvest inspection.

As per 14 CCR § 943.2(r), no road construction shall occur under saturated soil conditions that may produce sediment in quantities sufficient to cause a visible increase in turbidity of downstream waters in receiving Class I, II, III, or IV waters or that violate Water Quality Requirements, except that construction may occur on isolated wet spots arising from localized ground water such as springs, provided measures are taken to prevent material from significantly damaging water quality.

Road Abandonment

R2: Approximately 1,000 feet of road, a portion of which is within a Class III watercourse, shall be abandoned. The abandoned segment shall be barricaded at each end to prevent passage by standard production four wheel-drive vehicles. No other abandonment procedures are necessary.

Road Maintenance

Minor road maintenance may be necessary for operations. This may include widening of curve radii, re-alignment of road intersections, and to improve road drainage by removing berms and outslipping.

Temporary Access Roads

Temporary roads may be used to facilitate access by trucks to import material to accommodate the riffle augmentation as part of the meadow restoration. The actual location of these roads is unknown but will be confined to the area where riffle augmentation will occur (refer to the Burney Gardens Project Riffle Augmentation Map at end of Section II and Section V, Burney Gardens Meadow Restoration, Shasta County, California, Meadow Restoration Design, Fall River Resource Conservation District in cooperation with Pacific Gas and Electric, September 10, 2010).

Upon completion of use, temporary roads shall be abandoned by:

- (a) Blockage of roads so that standard production four wheel-drive highway vehicles cannot pass the point of closure at the time of abandonment.
- (b) Stabilization of exposed soil on cuts, fills, or sidecast where deleterious quantities of eroded surface soils may be transported in a watercourse.
- (c) Grading or shaping of road and landing surfaces to provide dispersal of water flow.
- (d) Pulling or shaping of fills or sidecast where necessary to prevent discharge of materials into watercourses due to failure of cuts, fills, or sidecast.
- (e) Removal of watercourse crossings, other drainage structures, and associated fills in accordance with Section II, Item 26b.

Roads in WLPZs and watercourses

R3 Road in the ELZ of a Class III watercourse.

R4 Road in a Class III watercourse. The watercourse channel shall be re-established upon completion of use.

RP1 Appurtenant road in a Class II WLPZ.

Roads in WLPZs and watercourses shall only be bladed when necessary for hauling as determined by the RPF, or his designee. Existing vegetation between the road and the watercourse shall remain undisturbed to the extent practical. Material shall not be sidecast off the road towards the watercourse. Refer to Item 18 for additional information.

Landings

The approximate location of all landings are shown on the Roads, Watercourses, & Crossings Map at end of Section II. The actual location may vary to accommodate equipment limitations and LTO preferences. New landings may be constructed and existing landings may be reconstructed to accommodate limitations of mechanical harvesting and processing equipment. Landings may be enlarged beyond ¼ acre but in no case shall landings exceed ½ acre. It is unlikely that all of the

landings will be used or that all will be larger than ¼ acre. None of the landings will require substantial excavation to enlarge or construct.

As per 14 CCR § 943.5(e), no landing construction shall occur under saturated soil conditions that may produce sediment in quantities sufficient to cause a visible increase in turbidity of downstream waters in receiving Class I, II, III, or IV waters or that violate Water Quality Requirements.

25. If any section in "Item 24" above is answered yes, specify site-specific measures to reduce adverse impacts and list any additional or special information needed by the LTO concerning the construction, maintenance, and/or abandonment of roads or landings, as required by 14 CCR § Article 12. Include required explanation and justification in THP Section III.

WATERCOURSE & LAKE PROTECTION ZONE & DOMESTIC WATER SUPPLY PROTECTION MEASURES

26. a. Yes No Are there any watercourse or lakes which contain Class I through IV waters on or adjacent to the area? If yes, list the class, WLPZ or ELZ width, and protective measures determined from Table I and/or 14 CCR § 916 (936, 956) .4 I of the WLPZ rules for each watercourse. Specify if Class III or IV watercourses have WLPZ, ELZ, or both.

Refer to the Roads, Watercourses, & Crossings Map at end of Section II for watercourse and crossing locations and classifications. Watercourse protection widths shall correspond to the following table.

WATERCOURSE PROTECTION				
Slope Class (%)	Watercourse Class & Minimum Zone Width(feet)			
	Class I		Class II	Class III
	Selection Area	Aspen, Meadow, & Wet Area Restoration		
	WLPZ	WLPZ	WLPZ	None
<30	≥75	≥56	≥50	0

Class I Watercourses (Selection Area)

- The WLPZ shall be clearly identified on the ground by the RPF or supervised designee with blue and white stripe flagging prior to the start of timber operations.
- To ensure retention of shade canopy, filter strip properties and the maintenance of a multi-storied stand for protection of values described in 14 CCR § 936.4(b), a sample area with a base mark below the cutline of harvest trees within the WLPZ shall be done in advance of the preharvest inspection by the RPF, or his designee. Trees designated for harvest within the remainder of the WLPZ shall be marked by the RPF or supervised designee, in advance of falling operations within the WLPZ.
- To protect water temperature, filter strip properties, upslope stability, and fish and wildlife values, at least 50% of the overstory and 50% of the understory canopy covering the ground in the WLPZ and adjacent waters shall be left in a well distributed multi-storied stand composed of a diversity of species similar to that found before the start of operations. The residual overstory canopy shall be composed of at least 25% of the existing overstory conifers. Species composition may be adjusted consistent with the above standard to meet on-site conditions when agreed to in the THP by the RPF and the Director.
- Recruitment of large woody debris for instream habitat shall be provided by retaining at least two living conifers per acre at least 16 inches diameter breast high and 50 feet tall within 50 feet of the watercourse (where they currently exist).
- Accidental depositions of soil or other debris in lakes or below the watercourse or lake transition line shall be removed immediately after the deposition or as approved by the Director.

Class I Watercourses (Aspen, Meadow, & Wet Area Restoration)

- The WLPZ shall be clearly identified on the ground by the RPF or supervised designee with blue and white stripe flagging prior to the start of timber operations. Feller bunchers may operate within the WLPZ but shall not operate within 15 feet of the watercourse transition line.
- Recruitment of large woody debris for instream habitat shall be provided by retaining at least two living conifers per acre at least 16 inches diameter breast high and 50 feet tall within 50 feet of the watercourse (where they currently exist).
- Accidental depositions of soil or other debris in lakes or below the watercourse or lake transition line shall be removed immediately after the deposition or as approved by the Director. Material may be intentionally placed in the channel.

Class II Watercourses (Selection Area)

- The WLPZ will be clearly identified on the ground by the RPF or supervised designee with blue and white stripe flagging prior to the start of timber operations adjacent to the watercourse.
- To ensure retention of shade canopy filter strip properties of the WLPZ and the maintenance of a multi-storied stand for protection of values described in 14 CCR § 936.4(b), harvest trees shall be marked, including a base mark below the cut line, within the WLPZ by the RPF or supervised designee prior to timber falling operations.
- To protect water temperature, filter strip properties, upslope stability, and fish and wildlife values, at least 50% of the total canopy covering the ground shall be left in a well distributed multi-storied stand configuration composed of a diversity of species similar to that found before the start of operations. The residual overstory canopy shall be composed of at least 25% of the existing overstory conifers.
- Recruitment of large woody debris for instream habitat shall be provided by retaining at least two living conifers per acre at least 16 inches diameter breast high and 50 feet tall within 50 feet of the watercourse (where they currently exist).
- Accidental depositions of soil or other debris in lakes or below the watercourse or lake transition line shall be removed immediately after the deposition or as approved by the Director.

Class II Watercourses (Aspen, Meadow, & Wet Area Restoration)

- The WLPZ will be clearly identified on the ground by the RPF or supervised designee with blue and white stripe flagging prior to the start of timber operations adjacent to the watercourse. Feller bunchers may operate within the WLPZ but shall not operate within 15 feet of the watercourse transition line.
- Recruitment of large woody debris for instream habitat shall be provided by retaining at least two living conifers per acre at least 16 inches diameter breast high and 50 feet tall within 50 feet of the watercourse (where they currently exist).
- Accidental depositions of soil or other debris in lakes or below the watercourse or lake transition line shall be removed immediately after the deposition or as approved by the Director.

Class III Watercourses

- An ELZ is not required because the EHR is low and the slopes are less than <30%. Heavy equipment used for harvesting shall not operate within the watercourse.
- Soil deposited during timber operations in a Class III watercourse other than at a temporary crossing shall be removed and debris deposited during timber operations shall be removed or stabilized before the conclusion of timber operations, or before October 15th (if not compatible with meadow restoration activities).

Non Classifiable Watercourses

- Heavy equipment shall not operate within the watercourse.

Springs

- Springs shall be protected with a perimeter EEZ identified by the RPF or supervised designee with blue and white stripe flagging prior to the start of operations adjacent to the spring. Springs associated with classified watercourses shall be protected by the corresponding WLPZ or ELZ. Harvest trees shall be felled away from all springs.

Ponds

- Manmade ponds shall be protected with a perimeter EEZ identified by the RPF or supervised designee with blue and white stripe flagging prior to the start of operations adjacent to the pond.
- b. Yes No Are there any watercourse crossings that require mapping per 14 CCR § 1034(x)(7)?

Refer to the Roads, Watercourses, & Crossings Map at end of Section II for crossing locations.

Road Crossings

Ford crossings are anticipated to be dry at the time of operations. Ford crossings may be used as skid trail crossings if no flowing water is present. If flowing water is present at ford crossings while the crossing is being used for operations, the following limitations shall apply:

- A temporary structure shall be used consisting of a culvert of sufficient capacity with rock fill and running surface comprised of 4-inch fractured (or similar) rock.
- The road approaches shall be armored from the edge of the watercourse for a minimum of 25 feet, or to the nearest waterbreak or point where road drainage does not drain toward the crossing, with a minimum 4-inch compacted depth of 4-inch fractured (or similar) rock.
- Rocking beyond 25 feet will occur where factors such as road gradient, soil types, time, duration, and frequency of use dictate the need.
- The crossing shall be kept to the minimum width to facilitate use.
- The crossing shall be removed as per Crossing Removal below.

C14: Existing Class III road crossing with a failed culvert on an appurtenant road. The crossing shall be converted to a ford prior to the first winter period upon completion of use. Fills shall be excavated to form a channel that is as close as feasible to the natural watercourse grade and orientation, and that is wider than the natural channel. The excavated material and any resulting cut bank shall be sloped back from the channel and stabilized to prevent slumping and to minimize soil erosion. This material shall be stabilized by mulching as per Section II, Item 18.

Skid Trail Crossings

The approximate location of skid trail crossings have been mapped. Crossings of associated overflow, diverging, converging, braided, terminating, and parallel channels of Class III watercourses have not been mapped, however, these channels may be crossed as needed to facilitate operations. No more than 10 crossings per linear mile of watercourse shall be used. The location of crossings are not required to be identified on the ground by the RPF or supervised designee prior to use. Crossings are anticipated to be dry at the time of operations. If flowing water is present while the crossing is being used for operations, the following limitations shall apply:

- A temporary structure shall be used consisting of a culvert to accommodate the flow with logs for fill.
- The logs and culvert shall be wrapped with chokers during construction to facilitate removal (unless a log loader will be used for removal of the structure).
- The logs shall be covered with a minimum 6-inch depth of straw bale flakes or geotextile fabric and a minimum 6-inch compacted depth of native soil.
- The crossing shall be kept to the minimum width to facilitate use.
- The crossing shall be removed as per Crossing Removal below.

Crossing Removal

As per 14 CCR § 943.4(f), drainage structures, if not adequate to carry water from the fifty-year flood level, shall be removed in accordance with 14 CCR § 943.3(d) by the first day of the winter period (November 15th) or by end of timber operations whichever occurs first.

When watercourse crossings, other drainage structures, and associated fills are removed, the following standards shall apply:

- (1) Fills shall be excavated to form a channel that is as close as feasible to the natural watercourse grade and orientation, and that is wider than the natural channel.
- (2) The excavated material and any resulting cut bank shall be sloped back from the channel and stabilized to prevent slumping and to minimize soil erosion. Where needed, this material shall be stabilized as per Item 18 to prevent slumping and minimize soil erosion.

Crossing Maintenance

Culverts shall be checked and cleared by the LTO as part of routine maintenance during operations.

CROSSING INVENTORY TABLE							
ID	Class	Type	Dia.	SAA	Functional	Note	Work Needed
C1	NC	Log	n/a	No	Yes	Degrading	Monitor for risk of failure
C4	III	Ford	n/a	No	Yes	Satisfactory	None
C5	III	Ford	n/a	No	Yes	Satisfactory	None
C8	III	Culvert	72	No	Yes	Satisfactory	None
C9	III	Ford	n/a	No	Yes	Long diagonal crossing	None
C10	III	Ford	n/a	No	Yes	Satisfactory	None
C11	NC	Culvert	18	No	Yes	Culvert is nonfunctional (plugged) and not needed, drainage is accommodated with a ford crossing (dip) through the minimal road fill.	None
C12	NC	Culvert	24	No	Yes	Satisfactory	None
C13	NC	Wood Box	n/a	No	Yes	Fill eroded at inlet and outlet due to degradation of outboard timbers. Erosion has stabilized.	Monitor for risk of failure
C14	III	Culvert	18	No	Yes	Nonfunctional, cindered surface	Convert to ford
C15	III	Culvert	16	No	Yes	New squash pipe on county road, undersized	None
C16	III	Culvert	48	No	Yes	Satisfactory	None
C18	III	Ford	n/a	No	Yes	Satisfactory	None
C25	II	Ford	n/a	No	Yes	Satisfactory	None
C26	I	Bridge	n/a	No	Yes	Satisfactory	None
C27	III	Culvert	18	No	Yes	Satisfactory	None
C29	NC	Culvert	18	No	Yes	Satisfactory	None
C30	II	Culvert	42	No	Yes	Satisfactory	None
C31	III	Ford	n/a	No	Yes	Satisfactory	None
C32	III	Culvert	36	No	Yes	Armored inlet & outlet	None
C33	NC	Culvert	24	No	Yes	Satisfactory	None
C35	III	Ford	n/a	No	Yes	Satisfactory	None
C36	III	Ford	n/a	No	Yes	Satisfactory	None
C37	I	Ford	n/a	No	Yes	Satisfactory	None
C39	III	Culvert	n/a	No	Yes	Satisfactory	None

NC: Non classifiable watercourse
 SAA: Stream Alteration Agreement

- c. Yes No Will tractor road watercourse crossings involve the use of a culvert? If yes, state minimum diameter and length for each culvert (may be shown on map).

Refer to Skid Trail Crossings under Section II, Item 26b.

- d. Yes No Is this THP Review Process to be used to meet Department of Fish and Game CEQA review requirements? If yes, attach the 1603 Addendum below or at end of this Section II; provide the background information and analysis in Section III; list instructions for LTO below for the installation, protection measures, and mitigation measures; as per THP Form Instructions or CDF Mass Mailing, 07/02/1999, "Fish and Game Code 1603 Agreements and THP Documentation".

Crossings

Shasta Forests Timberlands: W.M. Beaty & Associates, Inc. operates under a long term Master Streambed Alteration Agreement No. R1-05-0497 with the California Department of Fish and Game (DFG). Crossings will be evaluated prior to use and an Authorized Activities Notification Form shall be submitted to DFG prior to use if modification of a crossing is needed.

Fruit Growers Supply Co., Pacific Gas & Electric Co., and Sierra Pacific Industries: Crossings shall be evaluated prior to use and a DFG Stream Alteration Agreement shall be obtained prior to use if modification of a crossing is needed.

Riffle Augmentation

The THP review process is to be used to meet the California Environmental Quality Act (CEQA) DFG review requirements.

Refer to the following locations for additional information:

- Item 27, In lieu Practices.
- Section II, Burney Gardens Project Riffle Augmentation Map at end of Section II.
- Section V, Burney Gardens Meadow Restoration, Shasta County, California, Meadow Restoration Design, Fall River Resource Conservation District in cooperation with Pacific Gas and Electric, September 10, 2010.
- Section V, Central Valley Regional Water Quality Control Board, 401 Certification Application.

Heavy equipment may be used in Class I watercourses for instream channel restoration including the construction of ponds, plugs, riffles, etc. and is not required to adhere to the limitations above for timber harvesting. Activities shall comply with associated DFG 1600 Permit, Army Corps of Engineers 404 Permit, and Central Valley Regional Water Quality Control Board (CVRWQCB) 401 Certification. Heavy equipment may operate within and cross watercourse channels as needed to accomplish the restoration activities. Operations shall occur during periods of low flow. Channels shall be dewatered where feasible prior to operations. Operations shall not occur when saturated soil conditions exist or when a stable operating surface does not exist (see Item 23 for definitions). Material including logs, trees, stumps, rootwads, branches, rocks, soil, gravel, etc. may be placed in and excavated from watercourses as needed for ponds, bank revetment, riffles, etc. Instream work will occur as outlined below.

1. Utilize the existing remnant swales for the primary flow by filling sections of the degraded channel in the lower meadow.
2. Construct a series of borrow ponds along these reaches and use the material to fill the incised reaches.
3. Utilize existing sod within the gully bottom as transplants along the fill area and at areas of stress along the design channel.
4. Install revetment at the top of the fill areas (interface with design channel) to prevent erosion from flood flows.
5. Complete the cut and fill process between borrow ponds along the gully to insure minimal risk of channel recapture. Utilize transport machinery within the gully to achieve adequate compaction, matching or exceeding surrounding undisturbed conditions.
6. Utilize conifer revetment along the banks at other riffle areas that require passage of low-flow. This effectively reduces channel width that has been widened by lateral erosion processes.
7. Insert alluvial gravel/cobble mixture within the interlocking branches of the channel revetment to mimic historic streambed dimensions.

8. Revegetation to enhance the recovery of disturbed areas after project implementation will occur as needed. While natural vegetative regeneration is expected, it is likely that some effort to speed this recovery will prove effective. Transplant available sod at key locations and seed other disturbed areas in the WLPZ with a native high elevation seed mix that approximates the species mix of the meadow ecosystem.
9. Grade control structures using on site woody material may be installed in watercourses to mimic natural features.

27. Are site specific practices proposed in-lieu of the following standard WLPZ practices?

- a. Yes No Prohibition of the construction or reconstruction of roads, construction or use of tractor roads or landings in Class I, II, III, or IV watercourses, WLPZs, marshes, wet meadows, and other wet areas except as follows:
1. At prepared tractor road crossings.
 2. Crossings of Class III watercourses which are dry at time of timber operations.
 3. At existing road crossings.
 4. At new tractor and road crossings approved by Department of Fish and Game.
- b. Yes No Retention of non-commercial vegetation bordering and covering meadows and wet areas?
- c. Yes No Directional felling of trees within the WLPZ away from the watercourse or lake?
- d. Yes No Decrease of width(s) of the WLPZ(s)?
- e. Yes No Protection of watercourses which conduct class IV waters?
- f. Yes No Exclusion of heavy equipment from the WLPZ except as follows:
1. At prepared tractor road crossings.
 2. Crossings of Class III watercourses which are dry at time of timber operations.
 3. At existing road crossings.
 4. At new tractor and road crossings approved by Department of Fish and Game.
- g. Yes No Establishment of ELZ for Class III watercourses unless sideslopes are <30% and EHR is low?
- h. Yes No Retention of at least 50% of the overstory canopy in the WLPZ?
- i. Yes No Retention of at least 50% of the understory in the WLPZ?
- j. Yes No Are any additional in-lieu or any alternative practices proposed for watercourse or lake protection?

NOTE: A yes answer to any of items "a." through "j." constitutes an in-lieu practice. If any item is answered yes, refer to 14 CCR § 916 (936, 956).1 and address the following for each item checked yes:

1. The RPF shall state the standard rule;
2. Explain and describe each proposed practice;
3. Explain how the proposed practice differs from the standard practice;
4. The specific location where it shall be applied, see map requirements of 14 CCR § 1034 (x) (15) and (16);
5. Provide in THP Section III an explanation and justification as to how the protection provided is equal to the standard rule and provides for the protection of the beneficial uses of water, as per 14 CCR § 916 (936, 956) .1 (a). Reference the in-lieu and location to the specific watercourse to which it will be applied.

Aspen, Meadow, and Wet Area Restoration

The specific location where these in lieu practices may be applied is the Aspen, Meadow, and Wet Area Restoration as shown on the Silviculture Map at end of Section II.

- a. Roads, skid trails, and landings in sensitive areas (14 CCR § 936.3(c))

One short segment of road in a Class III watercourse (R4), and roads, skid trails, and landings within Class III watercourses, marshes, seasonally wet meadows, and other seasonally wet areas may be used. Roads, skid trails, and landings shall only be used when soils are not saturated and a stable operating surface exists (see Item 23 for definitions). Primary skid trails shall be perpendicular to watercourses where possible and shall be identified by the RPF or supervised designee with yellow flagging prior to use. Roads in watercourses shall not be used as skid trails. Roads and landings shall

be limited to those shown on the Roads, Watercourses, & Crossings Map at end of Section II. However, temporary access roads within the area of the riffle augmentation may be used.

b. Meadow vegetation (14 CCR § 936.3 (d))

Vegetation bordering and covering meadows and wet areas during timber operations may be impacted from harvesting and riffle augmentation and will not be retained and protected during timber operations where it is not compatible with the meadow restoration activities.

c. Directional felling (14 CCR § 936.3(e))

Trees may be felled toward the watercourse where necessary (see Channel Work below).

d. WLPZ reduction (14 CCR § 936.4(b)(5) & 14 CCR § 936.5(e) Table I)

Class I WLPZs will be reduced by a maximum of 25% to a minimum of 56 feet.

f. Heavy equipment in WLPZs (14 CCR § 936.3(c) & 14 CCR § 936.4(d))

Heavy equipment (feller buncher) may be used in the WLPZ for timber harvesting (felling and skidding). Feller bunchers shall operate at least 15 feet from the watercourse transition line but may reach toward the watercourse with the cutting head to sever trees. Feller bunchers shall minimize the amount of maneuvering within the WLPZ to minimize soil disturbance. Feller bunchers shall enter the WLPZ as close to 90 degrees as feasible and entries into the WLPZ shall be spaced a minimum of 40 feet apart. If a feller buncher is not available, trees designated for harvest shall be hand felled and endlined out of the ELZ.

h. Overstory canopy retention (14 CCR § 936.5(e))

Overstory canopy retention may be reduced below 50% in the WLPZ.

i. Understory retention (14 CCR § 936.4(b)(6) & 14 CCR § 936.5(e) "H")

Understory canopy retention may be reduced below 50% in the WLPZ.

j. Additional in-lieu or alternative practices

Watercourse mapping (14 CCR § 936.4(a) & 14 CCR § 1034(x)(9))

The approximate location of the main channel of each watercourse has been mapped.

Marking in the WLPZ (14 CCR § 936.5(e) "D" & "E")

Trees to be harvested or retained will not be marked in the WLPZ.

Large Woody Debris (14 CCR § 936.3(g))

At least two living conifers per acre at least 16 inches diameter breast high and 50 ft. tall within 50 ft. of all Class I and II watercourses will not be retained where they do not exist before timber operations.

Sanitation salvage (14 CCR § 936.3(f))

The silviculture will not be limited to sanitation salvage where less than 50% canopy exists in the WLPZs of Class I and II waters before timber operations.

Quality and beneficial uses of water (14 CCR § 936.3)

Logs, trees, stumps, rootwads, branches, rocks, soil, gravel, etc. may be placed in watercourses to accomplish the riffle augmentation.

Deposition of material in watercourses (14 CCR § 936.3(a))

Slash, debris, soil, or other material resulting from timber operations, falling, or associated activities, may be deposited in Class I and Class II waters below the watercourse or lake transition line.

Heavy equipment and crossing flagging (14 CCR § 936.4(e))

Flagging for heavy equipment use within the WLPZ adjacent to Class I waters and for all tractor road watercourse crossings of all watercourses will not be completed before the preharvest inspection if one is conducted or the start of operations.

28. a. Yes No Are there any landowners within 1,000 feet downstream of the THP boundary whose ownership adjoins or includes a Class I, II, or IV watercourse(s) which receives surface drainage from the proposed timber operations? If yes, the requirements of 14 CCR § 1032.10 apply. Proof of notice by letter and newspaper should be included in THP Section V. If No, "28 b." need not be answered.
- b. Yes No Is an exemption requested of the notification requirements of 14 CCR § 1032.10? If yes, an explanation and justification for the exemption must appear in THP Section III. Specify if requesting an exemption from the letter, the newspaper notice, or both.
- c. Yes No Was any information received on domestic water supplies that required additional mitigation beyond that required by standard Watercourse and Lake Protection rules? If yes, list site specific measures to be implemented by the LTO.
29. Yes No Is any part of the THP area within a Sensitive Watershed as designated by the Board of Forestry and Fire Protection? If yes, identify the watershed and list any special rules, operating procedures or mitigation that will be used to protect the resources identified at risk?

HAZARD REDUCTION

30. a. Yes No Are there roads or improvements which require slash treatment adjacent to them? If yes, specify the type of improvement, treatment distance, and treatment method.
- b. Yes No Are any alternatives to the rules for slash treatment along roads and within 200 feet of structures requested? If yes, RPF must explain and justify how alternative provides equal fire protection. Include a description of the alternative and where it will be utilized below.

Public Roads

Slash created and trees knocked down by timber operations within 100 feet of public roads within and adjacent to the THP area shall be treated by lopping so that no slash remains more than 30 inches above the ground.

Private Roads

Because no permanent private roads exist within or adjacent to the THP area the requirements of 14 CCR § 937.2, Treatment of Slash to Reduce Fire Hazard, does not apply to the private roads within and adjacent to the THP area.

Landing Slash Piles

Landing slash created by timber operations shall be treated by spreading, chipping, grinding, or piling and burning. If burning is used the restrictions under Item 31 shall apply.

31. Yes No Will piling and burning be used for hazard reduction? See 14 CCR § 917.1-11, 937.1-10, or 957.1-10, for specific requirements. Note: LTO is responsible for slash disposal. This responsibility cannot be transferred.

If piles are created for burning, the following restrictions shall apply:

- The LTO shall be responsible for piling and preparation of slash piles for burning.
- The landowner (or agent) shall be responsible for any required burning notification, ignition, and monitoring of weather and burning conditions.
- Piles shall not be burned within the WLPZ or ELZ of a watercourse.

- Piles and concentrations shall be sufficiently free of soil and other noncombustible material for effective burning.
- Piles shall be constructed at or near their final location to minimize the amount of movement and subsequent soil deposition in the piles.
- Piles and concentrations shall be burned at a safe time during the wet fall or winter weather or other safe period following piling.
- Piles and concentrations that fail to burn sufficiently may be further treated.
- All necessary precautions shall be taken to confine such burning to the piled slash.
- The local representative of the Director shall be notified in advance of the time and place of any burning of logging slash. Any burning shall be done in the manner provided by Law.
- Slash burning operations shall be conducted in a manner which will not damage residual trees and reproduction to the extent that they will not qualify to meet the silvicultural and stocking requirements of the rules.

Landing slash piles created for hazard reduction prior to September of each year shall be burned that fall when safe burning conditions occur and prior to April 1st of the following year. Landing slash piles created for hazard reduction after September 1st of each year shall be burned the following fall when safe burning conditions occur as indicated by the onset of fall rains or snow within the THP area and prior to December 31st of that year. This alternative practice is applicable the entire THP area where hazard reduction is required. Refer to Section III, Item 31 for additional information.

BIOLOGICAL AND CULTURAL RESOURCES

32. a. Yes No Are any plant or animal species, including their habitat, which are listed as rare, threatened or endangered under federal or state law, or a sensitive species by the Board, associated with the THP area? If yes, identify the species and the provisions to be taken for the protection of the species.

If any listed species is discovered in or directly adjacent to the THP area and additional protection measures are deemed necessary by the RPF or supervised designee the location and additional protection measures shall be amended into the THP.

Sustained Yield Plan 00-002-R (12/10/10) describes the special status species that are known to, or could potentially occur within the THP area on Shasta Forests Timberlands. Additionally, the general protection measures used by W.M. Beaty & Associates, Inc. for each of these species is detailed in the Shasta Forests SYP 00-002-R (12/10/10), Section FW.II, Listed Species. These protection measures will be used for all ownerships within the THP area. Refer to the Biological Resource Map at end of Section II for the location of the species occurrences within the THP area.

Listed or special status wildlife species known to occur within the THP area include: greater sandhill crane, northern goshawk, and long-haired star-tulip. Listed or special status wildlife species known to occur within the biological assessment area are listed in Section III, Item 32. Additional special status wildlife species which may occur in the general habitat types found within or adjacent to the THP area include Fisher.

During the preparation of this THP, care has been and will continue to be taken to identify any indications that a listed species is potentially present within or adjacent to the THP area. If during operations any listed animal species is discovered or suspected to be using habitat within the plan area, operations shall cease within 0.25 miles (0.5 miles for sandhill cranes and bald eagles) of the site and the RPF, LTO, the California Department of Forestry & Fire Protection (Cal Fire), and DFG shall be notified immediately so that proper mitigations can be employed. See Section III, Item 32 for additional information.

WILDLIFE

Black-Backed Woodpecker: There are no known detections of or suitable habitat for black-backed woodpecker within or adjacent to the THP area. Black-backed woodpecker is currently a California Endangered Species Act (ESA) candidate species. During timber operations, observations of black-backed woodpecker shall be reported to the RPF so that proper mitigations can be implemented.

Fisher: There are no known detections of fisher within or adjacent to the THP area, however habitat for the species exists within and adjacent to the THP area. Fisher is currently a Federal Endangered Species Act (ESA) candidate species. The DFG recommended the species is not warranted for listing under the State ESA and the Fish and Game Commission determined and certified on September 15, 2010 the species as a not warranted for listing under the State ESA. During timber operations, if a fisher den or a female with young is observed, operations shall cease 0.25 miles and the LTO shall notify the RPF so that proper mitigations can be implemented.

Greater sandhill crane: This species is reported to occur within the THP area in Section 1, T33N, R2E. During and prior to operations conducted in any year under this THP, this portion of the THP area shall be surveyed by the RPF or supervised designee for indications of sandhill cranes presence within the THP area. In addition, during all phases of the preparation, implementation, and operations of this THP all field personnel including the LTO shall be vigilant and report any indications or observations of the species to the RPF. If sandhill crane nesting behavior is observed, operations shall cease immediately within 0.5 miles of the nest until a consultation with DFG can be conducted and mitigation measures are developed and amended into the THP.

Northern goshawk: The species is reported to occur within the THP area in Section 14, T33N, R2E. The location of this nest site and buffer zone are indicated on the Biological Resource Map at end of Section II. Direct consultation with Stuart Farber, W.M. Beaty & Associates, Inc. Wildlife Biologist, was conducted and mitigations measures were developed according to 14 CCR § 939.3.

1) Nest Site Zone (14 CCR § 939.3(c)(1)): The nest site zone shall be approximately 150 feet in diameter around the nest tree. No harvesting shall occur year-around in this area, unless with prior concurrence from DFG. The nest site zone shall be flagged by the RPF or supervised designee with pink/black stripe flagging prior to operations.

2) Buffer Zone (14 CCR § 939.3(a)(b)): The buffer zone shall be approximately 53 acres surrounding the nest tree. Only selection is permitted within the buffer zone. The buffer zone shall be flagged by the RPF or supervised designee with pink/black stripe flagging prior to operations. No timber operations shall occur within this buffer zone between March 1st and August 15th, unless a nesting attempt fails sooner or young have fledged and left the buffer zone.

3) Critical Period Buffer (14 CCR § 939.3(d)(4)): The critical period buffer shall be approximately 153 acres surrounding the buffer zone. No timber operations shall occur within the critical period buffer zone between March 15th and June 30th, unless a nesting attempt fails sooner or young have fledged and left the buffer zone. The critical period buffer shall be flagged by the RPF or supervised designee with pink/black stripe flagging prior to operations.

Prior to operations, either a dawn acoustical or stand search survey shall be conducted by the RPF or supervised designee to determine current occupied status of the known nest. In addition, during all phases of the preparation, implementation, and operations of this THP all field personnel including the LTO shall be vigilant and report any indications or observations of the species to the RPF. In the event that a previously unknown goshawk nest is discovered outside the established buffer zones and within 0.25 miles of THP area, operations shall cease immediately within 0.25 miles of the nest until a consultation with DFG can be conducted and mitigation measures are developed and amended into the THP.

PLANTS

Refer to Section III, Item 32, for a description of the scoping process and assessment area. The following previous botanical surveys have been conducted on portions of the THP (see Section V, Attachments and Botanical Survey Map at end of Section II):

- Botanical Survey Report, Dry Garden THP, Fruit Growers Supply Co., prepared by Martin J. Lenz, September 2011.

- Pacific Gas and Electric Company, Burney Gardens Timber Harvest Plan, Sensitive Plants Survey Report, October 2009. This report was prepared by Jones & Stokes for the Burney Gardens THP No. 2-09-109-SHA(4).

Although not threatened or endangered (i.e. California ESA), several special-status plant species are known to occur within the biological assessment area (see Biological & Watershed Assessment Area Map at end of Section IV), however, only one is located in the THP area. Species that are state or federal listed, or California Native Plant Society, California Rare Plant Program, California Rare Plant Rank (CRPR) 1A, 1B, or 2, and known to occur within the THP area are addressed below. Refer to Section III, Item 32, for additional information.

Long-Haired Star-Tulip (*Calochortus longebarbatus* var. *longebarbatus*): CRPR 1B.2. This species is known to occur in the open meadow area of the project and surrounding area (see Biological Resource Map at end of Section II). Approximately 2,100 plants were found during surveys in 2009 by Jones & Stokes (the majority of which are outside the THP area). This species may occur in additional open meadow habitat not previously surveyed. Based on the location within the meadow, this species is occurring along the margins of the wetter portions of the open meadow habitat. These areas remain flooded in shallow water (1 to 3 inches) for a period of 30 to 60 days. Jones & Stokes did not find this species within the plug and pond portion of the riffle augmentation area (see Riffle Augmentation Map at end of Section II). Although a small portion of the riffle augmentation is within the area where this species is reported to occur, the plants are not reported to be within the channel (where the riffle augmentation work will occur).

Where this species exists, timber harvesting operations shall not commence until the soil is dry and this species has set seed. All trees designated for harvest shall be felled away from these population centers. Populations of this species shall be protected by a perimeter EEZ identified by the RPF or supervised designee with red and white stripe flagging prior to the start of timber harvesting operations adjacent to the area. Minor populations that may occur within the traveled surface of haul roads or within the riffle augmentation area are not required to be protected.

If other special status plant species, described above, are detected and the area(s) cannot be excluded from proposed operations, the sites shall be identified by the RPF or supervised designee with red and white stripe flagging and avoided and the DFG shall be notified. No timber harvesting operations shall occur within 50 feet of these flagged areas until a site specific evaluation can be conducted in consultation with the DFG. The intent of the buffers is to protect the site in a way that prevents direct effects on individual plants and minimizes indirect effects on site conditions (i.e., significant alteration of ground conditions, significant changes in shade canopy, or significant changes in microclimate). If timber harvesting operations are proposed to occur within the 50-foot zone, the location and mitigation measures (of equal or greater protection) developed as a result of consultation shall be amended into the THP.

Plant Searches: Additional focused intuitive intensive controlled surveys shall be conducted prior to operations by the RPF or supervised designee in areas of suitable habitat not previously surveyed (see Botanical Survey Map at end of Section II). Because the majority of the meadow restoration area consists of dense lodgepole pine thickets with limited herbaceous vegetation, the areas of suitable habitat to be surveyed consist of small open meadow areas identified from aerial imagery. The survey results shall be submitted to Cal Fire and DFG at least 10 days prior to commencement of operations.

- b. Yes No Are there any non-listed species which will be significantly impacted by the operation? If yes, identify the species and the provisions to be taken for the protection of the species.

NOTE: See THP Form Instructions or the CDF Mass Mailing, 07/02/1999, section on "CDF Guidelines for Species Surveys and Mitigations" to complete these questions.

American Marten: This species is not known to occur within or adjacent to the THP area although habitat does exist. The species is unlisted under the State and Federal ESAs. No indications of the species presence within the THP area have been observed despite repeated site visits by W.M. Beaty & Associates, Inc. forestry and wildlife staff. Habitat for the species does exist within the THP area and care

has been and will continue to be taken during operations to identify any potential American marten dens or other indications of the species presence in the area. During all phases of the preparation, implementation and operations of this THP all field personnel including the LTO shall be vigilant and report any indications or observations of the species to the RPF. If any of roosts of these species are observed, field personnel or the LTO shall notify the RPF so that proper mitigations can be implemented.

Bats: These species are not known to occur within or adjacent to the THP area, but occur in the biological assessment area and potential suitable habitat does exist within the THP area. Fringed myotis, Long-eared myotis, long-legged myotis, palid bat, silver-haired bat, and Yuma myotis are unlisted under the State and Federal ESAs, but are considered state DFG Species of Special Concern. Hoary bat is also an unlisted species but is considered a State Species of Special Concern - Watch List. No indications of any of these species presence within the THP area have been observed despite repeated site visits by W.M. Beaty & Associates, Inc. forestry and wildlife staff. During all phases of the preparation, implementation and operations of this THP all field personnel including the LTO shall be vigilant and report any indications or observations of the species to the RPF. If any of roosts of these species are observed, field personnel or the LTO shall notify the RPF so that proper mitigations can be implemented.

Cascades Frog: This species is not known to occur, but may occur within or adjacent to the THP area. The species is unlisted under the State and Federal ESAs, but is a state species of special concern. Habitat for the species, which includes streams, ponds, and riparian habitats along streams, does exist within the THP area. Provisions in the THP that are important to the LTO to protect the species or its habitat include: (1) ELZ for Class I and II watercourses, (2) retention of understory vegetation with Class I and II ELZ's, and (3) erosion control measures on haul roads and skid trails.

Tailed Frog: This species is not known to occur, but may occur within or adjacent to the THP area. The species is unlisted under the State and Federal ESAs, but is a state species of special concern. Habitat for the species, which includes streams, ponds, and riparian habitats along streams, does exist within the THP area. Provisions in the THP that are important to the LTO to protect the species or its habitat include: (1) ELZ for Class I and II watercourses, (2) retention of understory vegetation with Class I and II ELZ's, and (3) erosion control measures on haul roads and skid trails.

33. Yes No Are there any snags which must be felled for fire protection or safety reasons? If yes, describe which snags are going to be felled and why.

Snags >20 feet tall and >16 inches DBH that are within 100 feet of roads, or landings shall be felled if they lean towards the road or landing and present a safety hazard, or if they are a potential hindrance to future access for initial attack of wildfire as per 14 CCR § 939.1(a)(2).

34. Yes No Are any Late Succession Forest Stands proposed for harvest? If yes, describe the measures to be implemented by the LTO that avoid long-term significant adverse effects on fish, wildlife and listed species known to be primarily associated with late succession forests.

35. Yes No Are any other provisions for wildlife protection required by the rules? If yes, describe.

During operations conducted in any year under this THP all field personnel shall be vigilant for indications that nesting raptors may be present within the THP and surrounding areas. Indications of the presence of nesting raptors include observations such as visual or auditory detection of individual birds, large stick or visible cavity nests, accumulations of whitewash, prey remains or regurgitated pellets, plucking posts, or molted raptor feathers.

Trees containing nests will be examined and/or monitored by or under the supervision of the RPF or supervised designee to determine if they are occupied and to which species they likely belong. If an occupied non-listed raptor nest is discovered within or adjacent to the THP area, operations shall immediately cease within 0.25 miles of the site and the RPF shall be notified. Operations within 0.25 miles shall not resume until protection measures (described below) have been established. Occupied non-listed raptor nests shall be provided buffer zones tailored to site and species specific circumstances. The buffer zones shall be designed by the RPF to avoid or minimize effects of timber operations on the nest

site or nesting birds. Protection measures shall consider the specific habitat requirements of the bird species and measures shall be amended into the THP.

Except for those described in Item 33, snags, cull trees, and any trees containing large stick or obvious cavity nests shall be retained to provide wildlife habitat. All snags with visible nesting sites of eagles, hawks, owls, waterfowl, or any rare or endangered species shall be left standing as prescribed under 14 CCR § 939.1 and § 939.2(d). Other trees and snags within the THP area that have special value to wildlife or contain suspected nests may be identified with a painted "W" and/or a metal "Designated Wildlife Tree" sign during the course of THP preparation and shall similarly be identified and retained.

- 36. a. Yes No Has an archaeological survey been made of the THP area?
- b. Yes No Has a current archaeological records check been conducted for the THP area?
- c. Yes No Are there any archaeological or historical sites located in the THP area? Specific site locations and protection measures are contained in the Confidential Archaeological Addendum in Section VI of the THP, which is not available for general public review.
- 37. Yes No Has any inventory or growth and yield information designated "trade secret" been submitted in a separate confidential envelope in Section VI of this THP?
- 38. Describe any special instructions or constraints that are not listed elsewhere in Section II.

Notification of Commencement

As per 14 CCR § 1035.4, each calendar year, within 15 days before, and not later than the day of the startup of a timber operation, the RPF or LTO, shall notify Cal Fire of the start of timber operations. The notification, by telephone or by mail, shall be directed to the Cal Fire Shasta Trinity Unit, Forest Practice Office Technician, by telephone at (530) 225-2086.

Gas Pipeline

No operations shall occur on the gas pipeline exclusive of use of existing mapped road crossings for hauling.

Water Drafting

The following water drafting locations may be used for dust abatement during operations under this THP Refer to the Roads, Watercourses, & Crossings Map at end of Section II for locations.

C16: Dry Burney Creek (Class III watercourse) culvert crossing.

C37: Burney Creek (Class I watercourse) ford crossing.

C26: Burney Creek (Class I watercourse) bridge crossing.

C30: Water tank supplied by a pipe diversion of a Class II watercourse.

DL2: Class III watercourse impoundment area.

The following limitations shall apply for all drafting locations used for operations:

Waterhole Preparation: Minimum water depth at the deepest part of the pool tail crest for Class I watercourses shall be at least 0.2 feet deep. When diverting water from any Class I or II watercourse, bypass flows shall be maintained that ensure continuous surface flow in downstream reaches, and keep fish and amphibians in downstream reaches in good condition.

Water Truck Operation: The LTO shall inspect all water trucks daily and repair as necessary to prevent leaks of deleterious materials from entering the watercourse. Water truck operators shall monitor their filling progress so that over-filling and spillage does not occur. Drafting shall be limited to one truck at a time at each location (exclusive of water tank and well locations). Water usage at each location is expected to be approximately 20,000 gallons per day of operations. The total estimated usage for each drafting location is approximately 400,000 gallons. These drafting locations will generally be used

during the months of June through November, but some drafting may occur during dry periods in November through May. The estimated filling time at each location is 15 minutes.

Petroleum Leaks: The LTO shall place drip pans, absorbent blankets, sheet barriers, and/or thick straw beds on gravel bars and beneath parked equipment that have small but chronic leaks. Drip pans shall be sufficient in size to capture at least 2 to 3 gallons of leaking fluids. Absorbent materials shall be replaced and disposed of by the LTO as needed to maintain effectiveness. Captured fluids in drip pans shall be properly disposed of by the LTO prior to reaching capacity and prior to weekends or shutdown periods.

Petroleum Spills: A supply of absorbent blankets and plastic trash bags shall be carried on water trucks. Any petroleum or chemical spill shall be removed by the LTO using absorbent blankets or by excavation of the contaminated soil. The absorbent blankets and contaminated soil shall be collected and properly disposed of by the LTO prior to end of the day that the spill occurs. The LTO shall notify the RPF of any spill prior to end of the day in which it occurs. The RPF shall notify Cal Fire, DFG, and CVRWQCB immediately of any spill and Cal Fire, DFG, and CVRWQCB shall be consulted regarding cleanup procedures.

DIRECTOR OF FORESTRY AND FIRE PROTECTION

This Timber Harvesting Plan conforms to the rules and regulations of the Board of Forestry and Fire Protection and the Forest Practice Act:

By: Michael J. Bacca
(Signature)

MICHAEL J. BACCA, RPF #2236
(Printed Name)

JAN 31 2012
(Date)

Forester III, Cascade,
Sierra & Southern Regions
(Title) Forest Practice Manager

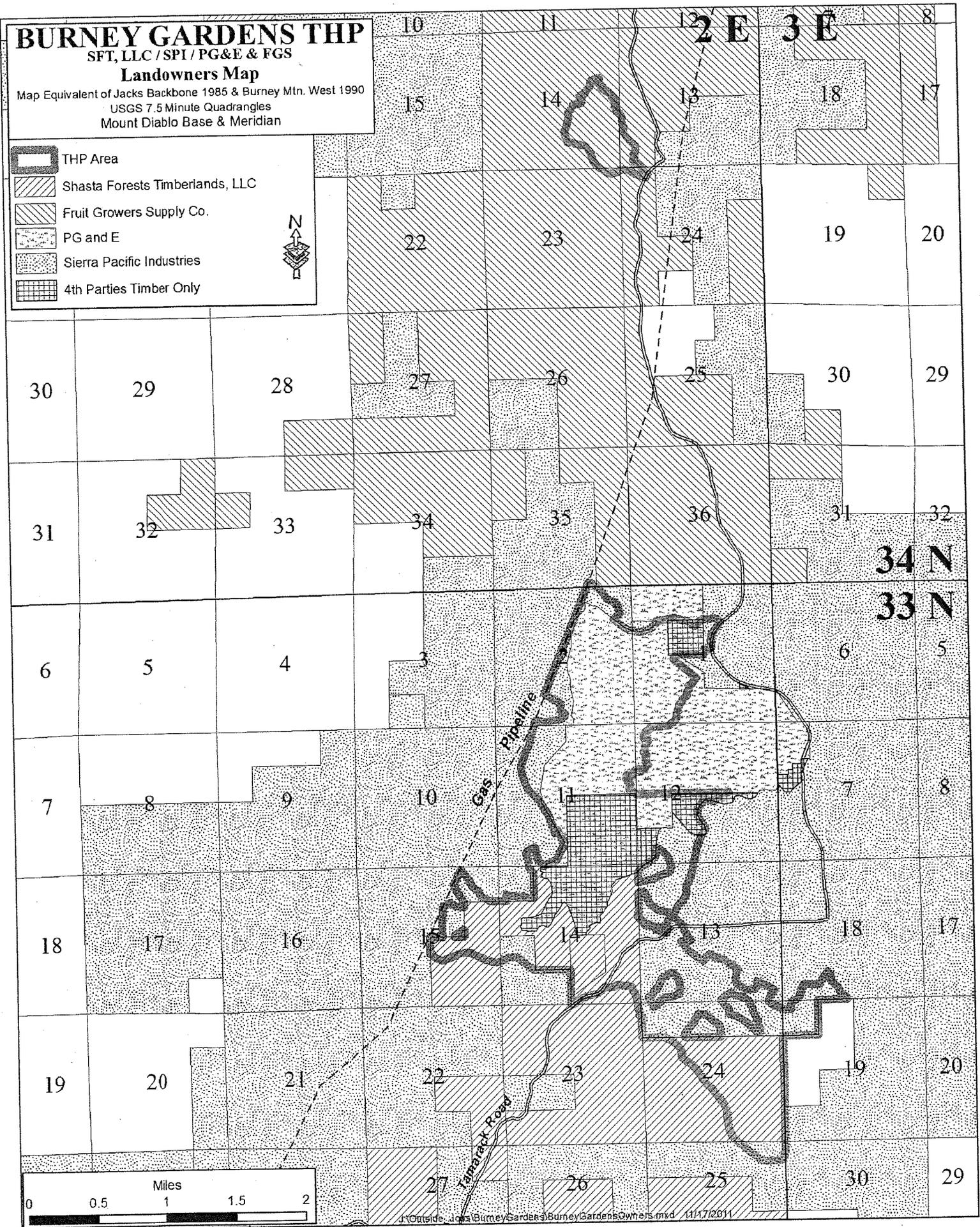
BURNEY GARDENS THP

SFT, LLC / SPI / PG&E & FGS

Landowners Map

Map Equivalent of Jacks Backbone 1985 & Burney Mtn. West 1990
USGS 7.5 Minute Quadrangles
Mount Diablo Base & Meridian

-  THP Area
-  Shasta Forests Timberlands, LLC
-  Fruit Growers Supply Co.
-  PG and E
-  Sierra Pacific Industries
-  4th Parties Timber Only



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BURNEY GARDENS THP

SFT, LLC / SPI / PG&E & FGS

Silviculture Map 1 of 2

Map Equivalent of Jacks Backbone 1985 & Burney Mtn. West 1990

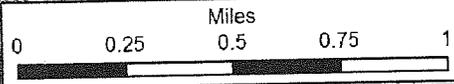
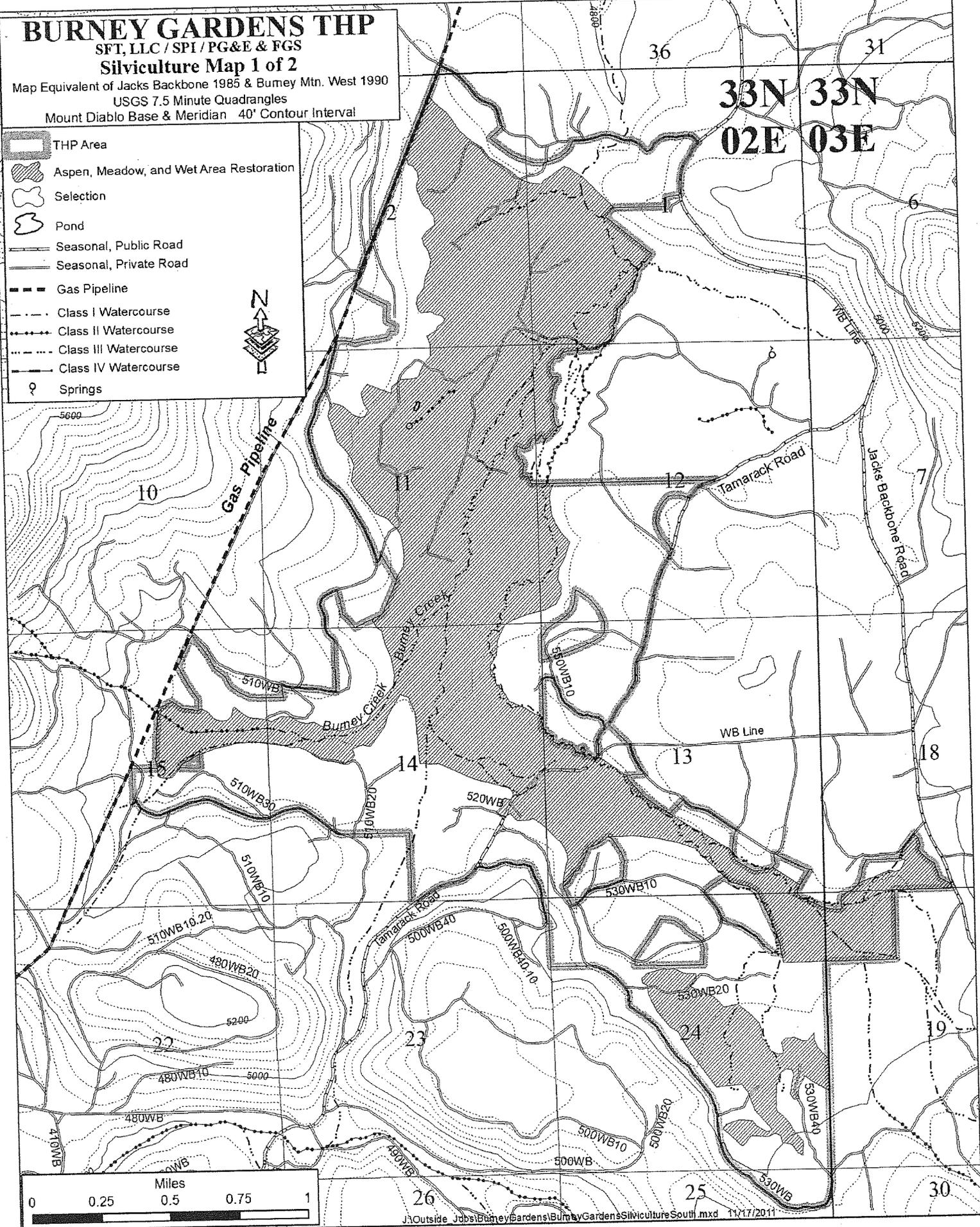
USGS 7.5 Minute Quadrangles

Mount Diablo Base & Meridian 40' Contour Interval

-  THP Area
-  Aspen, Meadow, and Wet Area Restoration
-  Selection
-  Pond
-  Seasonal, Public Road
-  Seasonal, Private Road
-  Gas Pipeline
-  Class I Watercourse
-  Class II Watercourse
-  Class III Watercourse
-  Class IV Watercourse
-  Springs



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02E 03E



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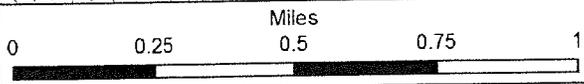
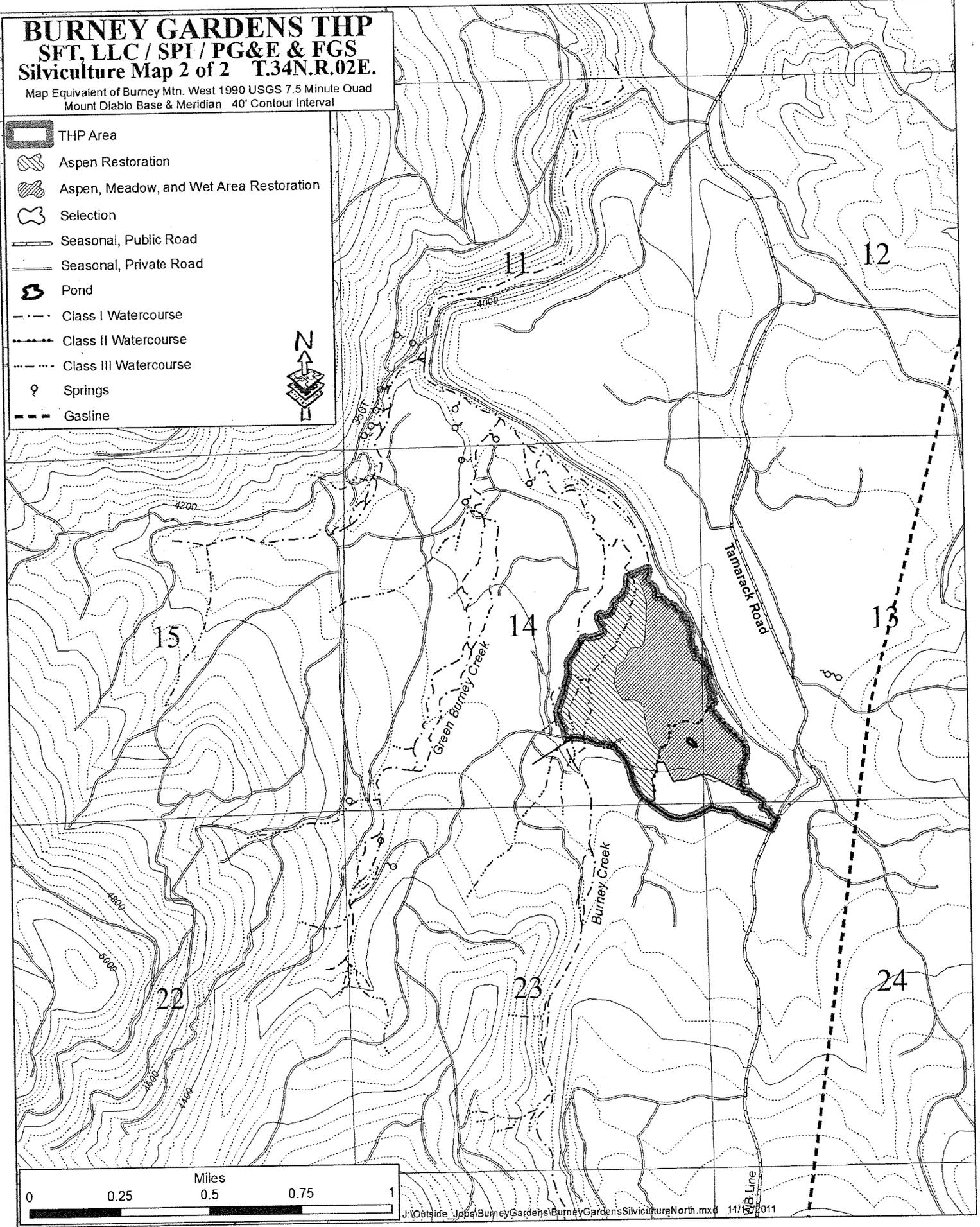
BURNEY GARDENS THP

SFT, LLC / SPI / PG&E & FGS

Silviculture Map 2 of 2 T.34N.R.02E.

Map Equivalent of Burney Mtn. West 1990 USGS 7.5 Minute Quad
 Mount Diablo Base & Meridian 40' Contour Interval

-  THP Area
-  Aspen Restoration
-  Aspen, Meadow, and Wet Area Restoration
-  Selection
-  Seasonal, Public Road
-  Seasonal, Private Road
-  Pond
-  Class I Watercourse
-  Class II Watercourse
-  Class III Watercourse
-  Springs
-  Gasline



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BURNEY GARDENS THP

SFT, LLC / SPI / PG&E & FGS

Roads, Watercourses & Crossings Map 1 of 2

Map Equivalent of Jacks Backbone 1985 & Burney Mtn. West 1990

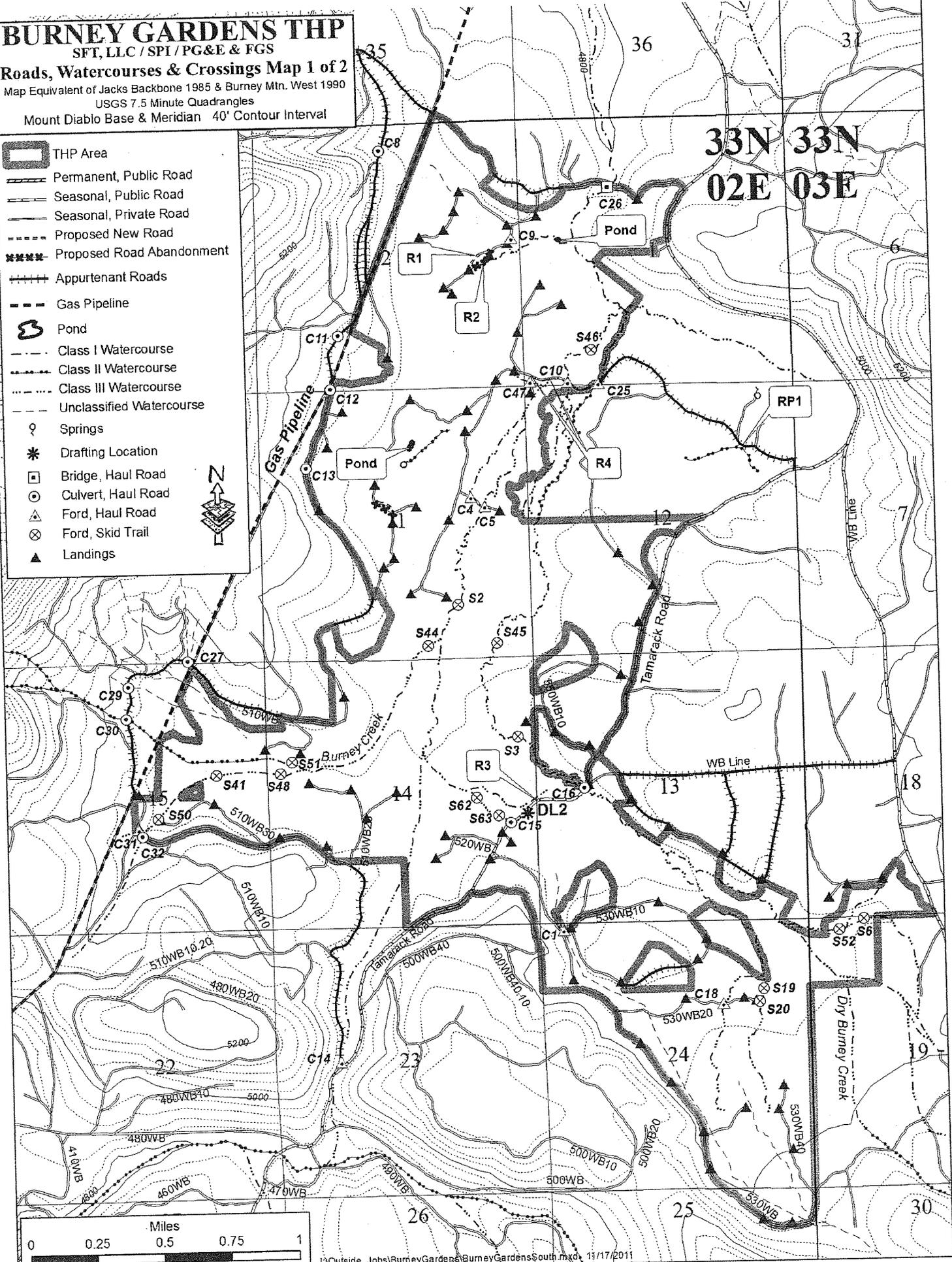
USGS 7.5 Minute Quadrangles

Mount Diablo Base & Meridian 40' Contour Interval

-  THP Area
-  Permanent, Public Road
-  Seasonal, Public Road
-  Seasonal, Private Road
-  Proposed New Road
-  Proposed Road Abandonment
-  Appurtenant Roads
-  Gas Pipeline
-  Pond
-  Class I Watercourse
-  Class II Watercourse
-  Class III Watercourse
-  Unclassified Watercourse
-  Springs
-  Drafting Location
-  Bridge, Haul Road
-  Culvert, Haul Road
-  Ford, Haul Road
-  Ford, Skid Trail
-  Landings



33N 33N
02E 03E



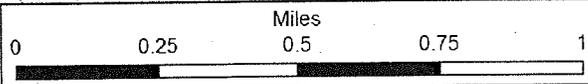
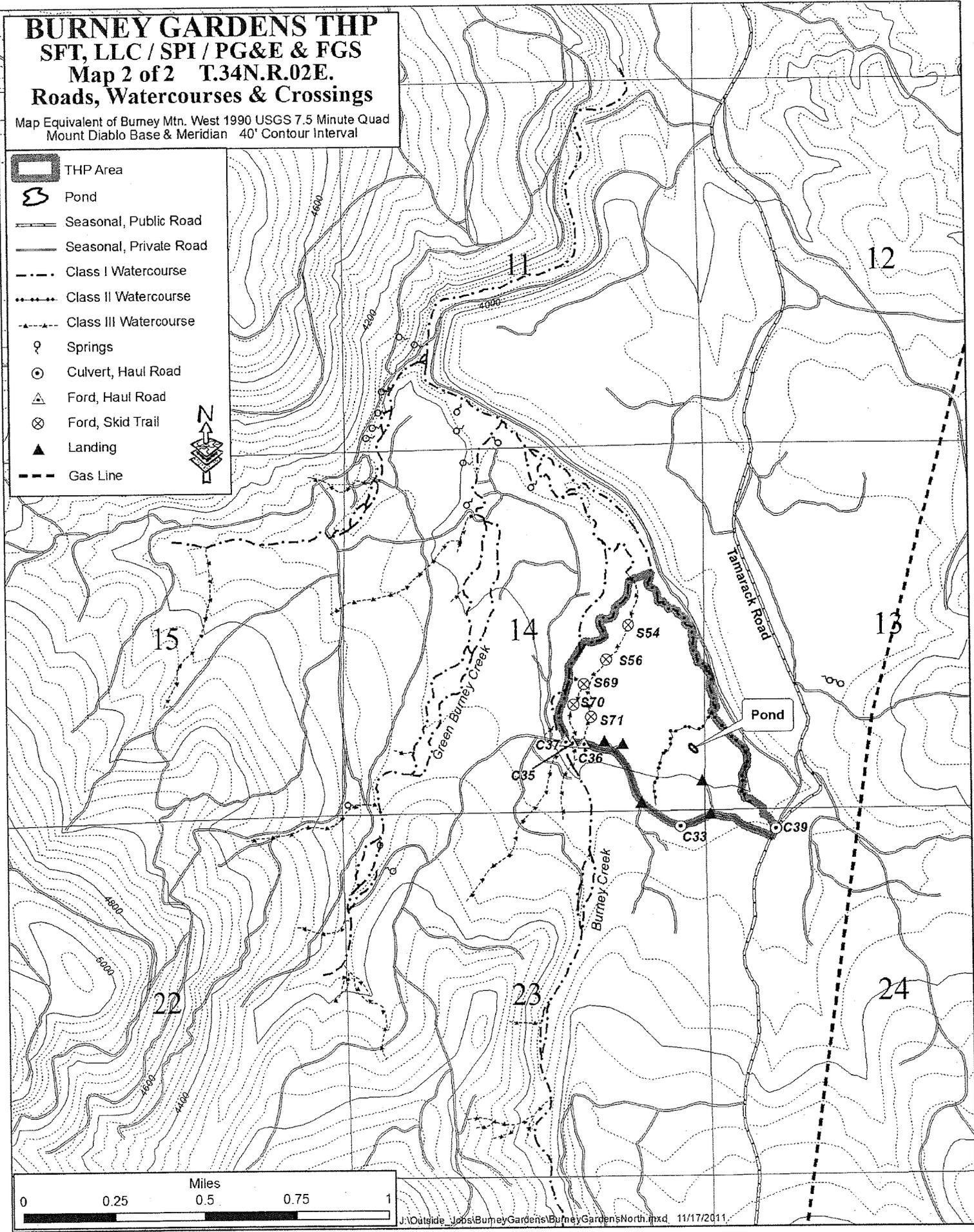
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BURNEY GARDENS THP

SFT, LLC / SPI / PG&E & FGS
 Map 2 of 2 T.34N.R.02E.
 Roads, Watercourses & Crossings

Map Equivalent of Burney Mtn. West 1990 USGS 7.5 Minute Quad
 Mount Diablo Base & Meridian 40' Contour Interval

-  THP Area
-  Pond
-  Seasonal, Public Road
-  Seasonal, Private Road
-  Class I Watercourse
-  Class II Watercourse
-  Class III Watercourse
-  Springs
-  Culvert, Haul Road
-  Ford, Haul Road
-  Ford, Skid Trail
-  Landing
-  Gas Line



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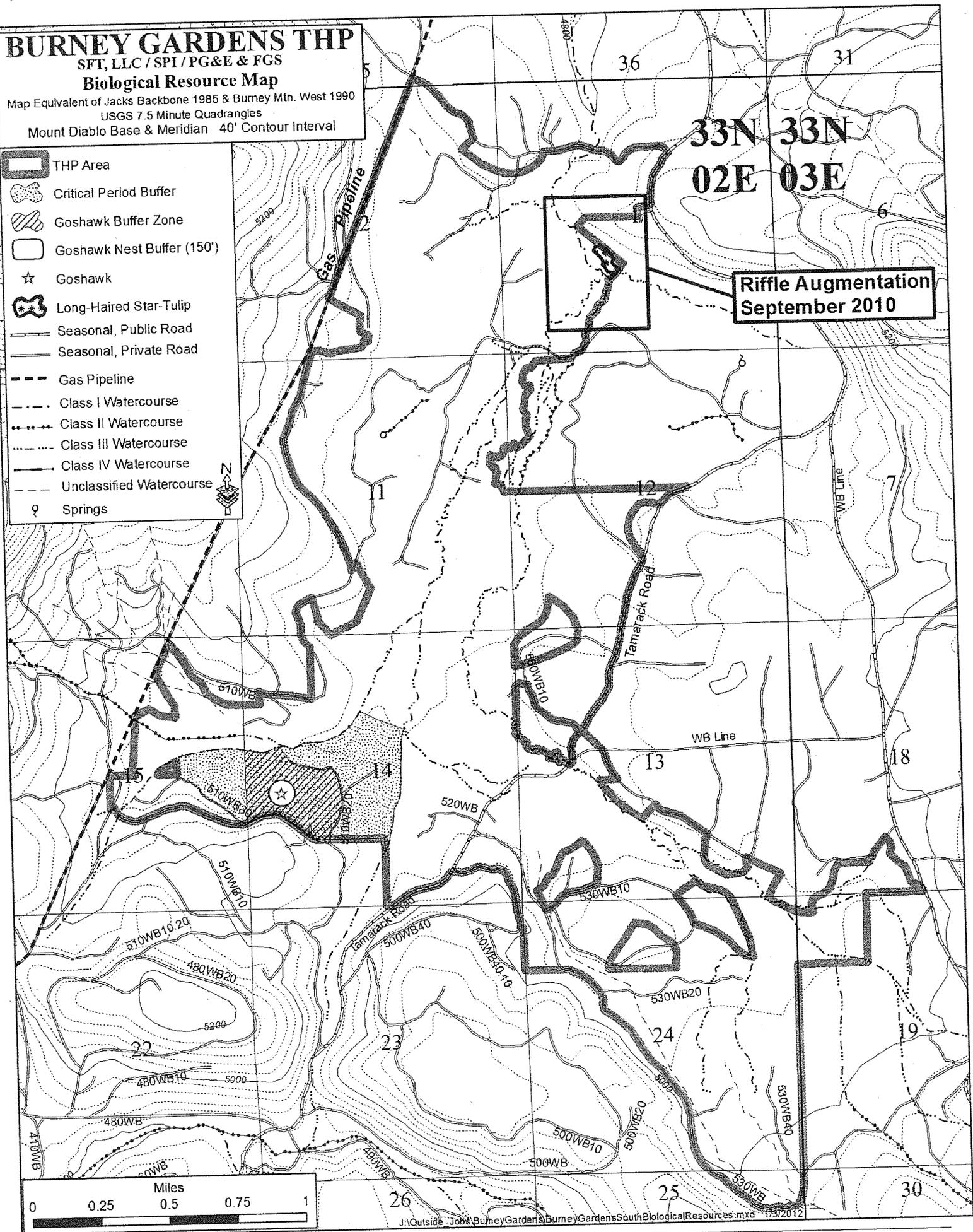
BURNEY GARDENS THP

SFT, LLC / SPI / PG&E & FGS

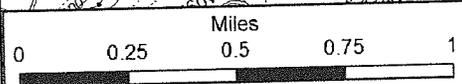
Biological Resource Map

Map Equivalent of Jacks Backbone 1985 & Burney Mtn. West 1990
USGS 7.5 Minute Quadrangles
Mount Diablo Base & Meridian 40' Contour Interval

-  THP Area
-  Critical Period Buffer
-  Goshawk Buffer Zone
-  Goshawk Nest Buffer (150')
-  Goshawk
-  Long-Haired Star-Tulip
-  Seasonal, Public Road
-  Seasonal, Private Road
-  Gas Pipeline
-  Class I Watercourse
-  Class II Watercourse
-  Class III Watercourse
-  Class IV Watercourse
-  Unclassified Watercourse
-  Springs



**Riffle Augmentation
September 2010**



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BURNEY GARDENS THP

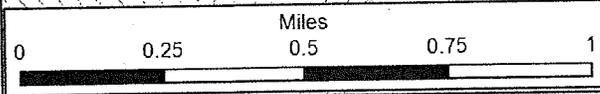
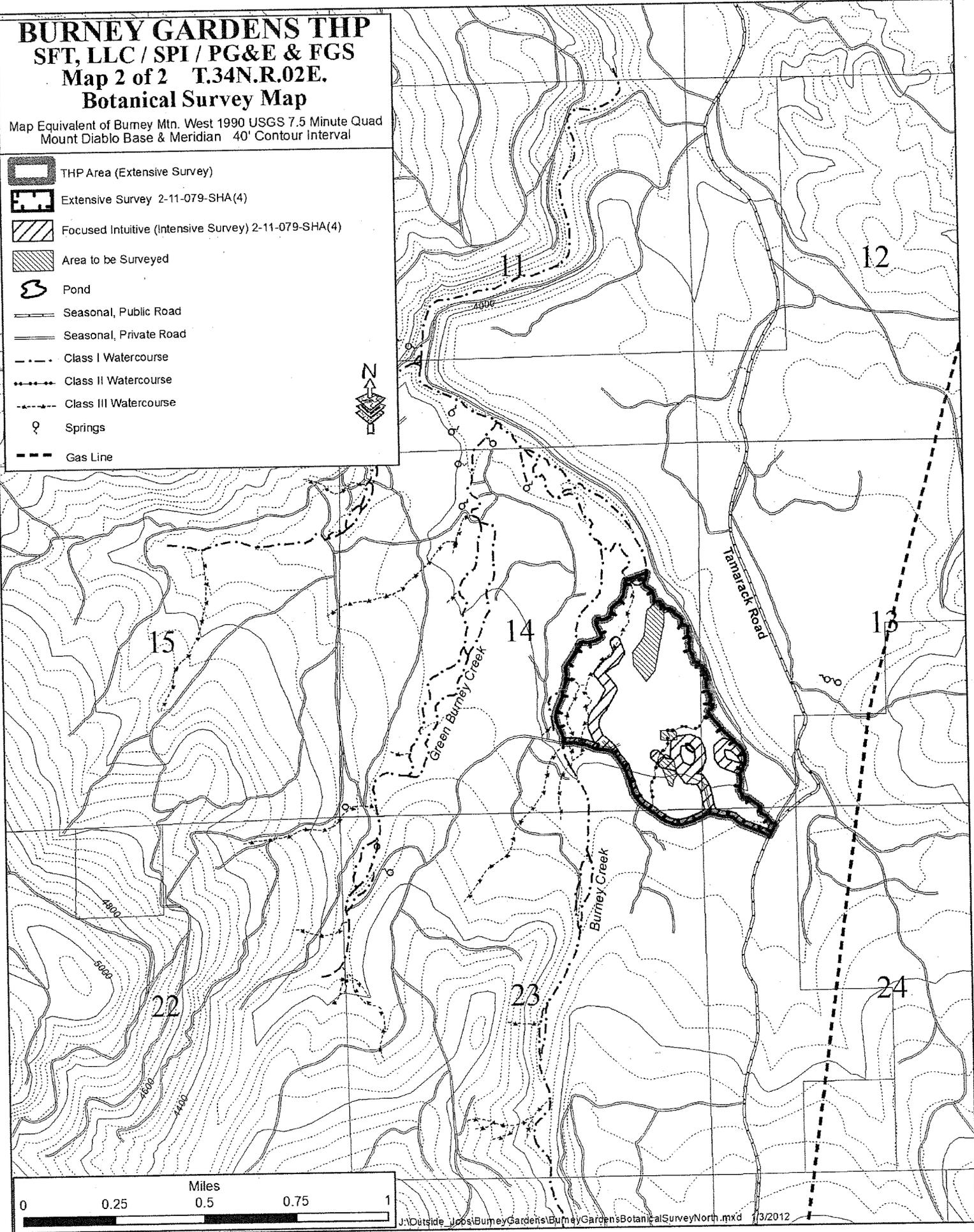
SFT, LLC / SPI / PG&E & FGS

Map 2 of 2 T.34N.R.02E.

Botanical Survey Map

Map Equivalent of Burney Mtn. West 1990 USGS 7.5 Minute Quad
 Mount Diablo Base & Meridian 40' Contour Interval

	THP Area (Extensive Survey)
	Extensive Survey 2-11-079-SHA(4)
	Focused Intuitive (Intensive Survey) 2-11-079-SHA(4)
	Area to be Surveyed
	Pond
	Seasonal, Public Road
	Seasonal, Private Road
	Class I Watercourse
	Class II Watercourse
	Class III Watercourse
	Springs
	Gas Line



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BURNEY GARDENS THP

SFT, LLC / SPI / PG&E & FGS

Botanical Survey Map 1 of 2

Map Equivalent of Jacks Backbone 1985 & Burney Mtn. West 1990

USGS 7.5 Minute Quadrangles

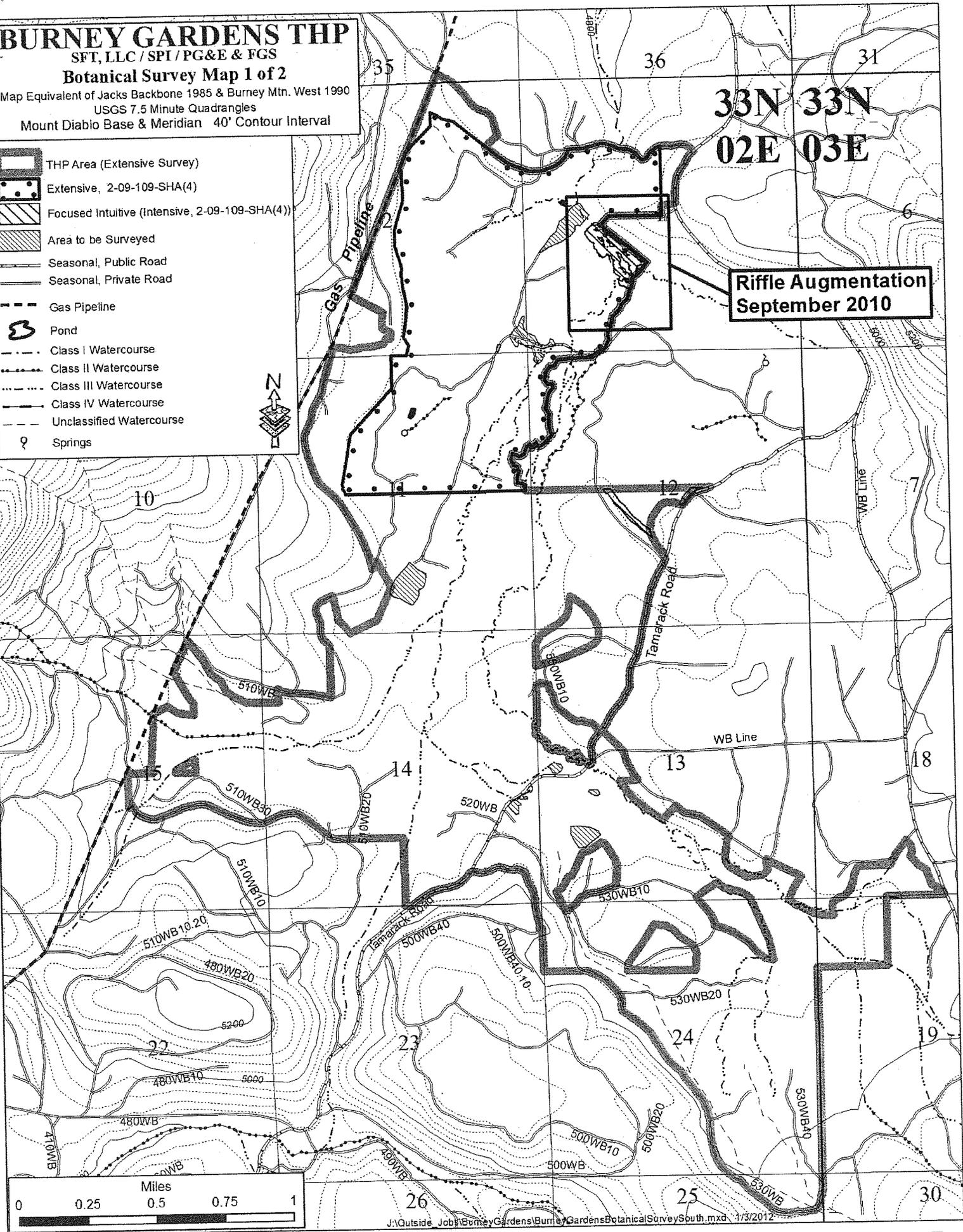
Mount Diablo Base & Meridian 40' Contour Interval

	THP Area (Extensive Survey)
	Extensive, 2-09-109-SHA(4)
	Focused Intuitive (Intensive, 2-09-109-SHA(4))
	Area to be Surveyed
	Seasonal, Public Road
	Seasonal, Private Road
	Gas Pipeline
	Pond
	Class I Watercourse
	Class II Watercourse
	Class III Watercourse
	Class IV Watercourse
	Unclassified Watercourse
	Springs

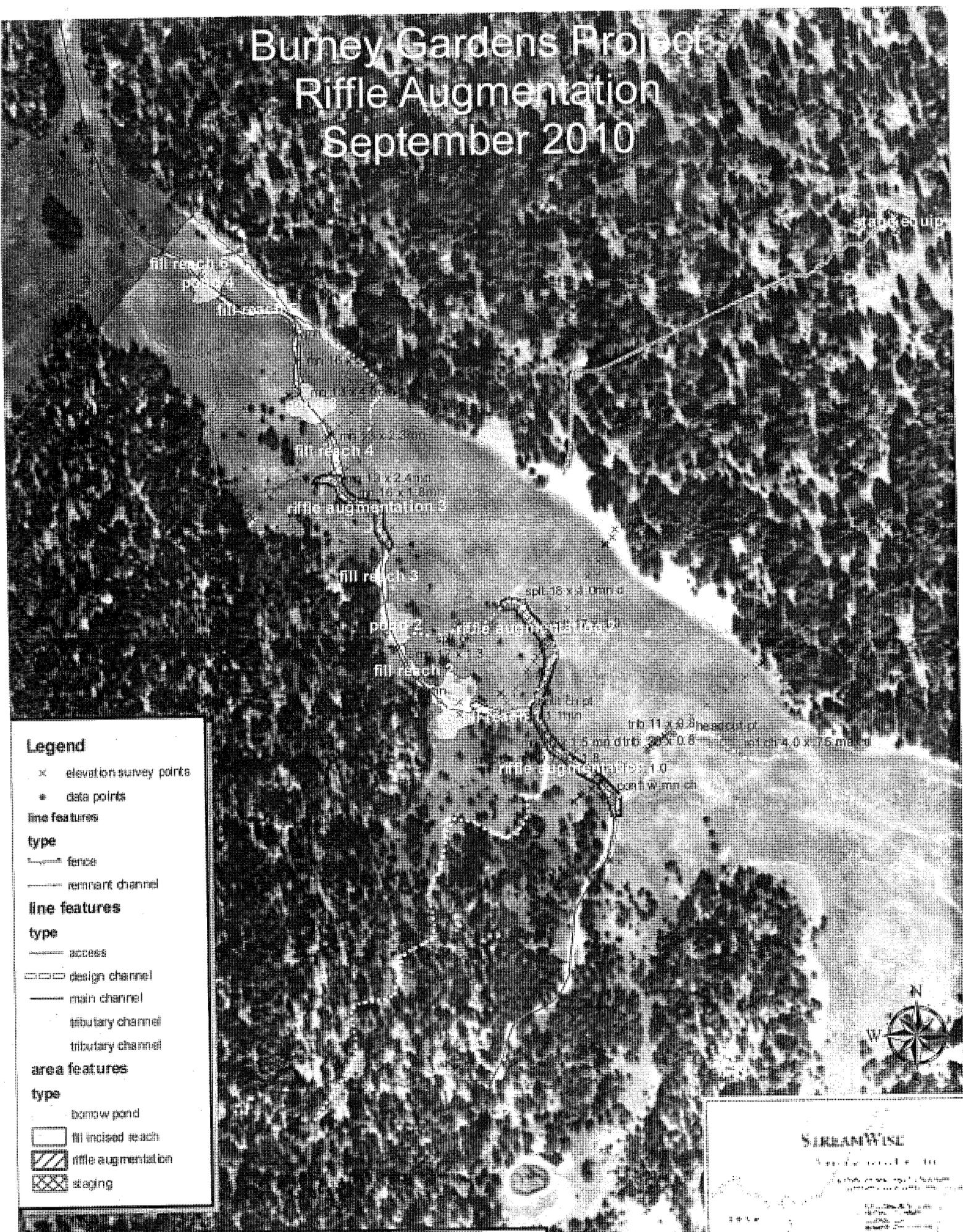


33N 33N
02E 03E

Riffle Augmentation
September 2010

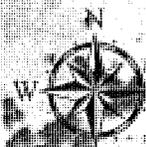


Burney Gardens Project Riffle Augmentation September 2010



Legend

- × elevation survey points
- data points
- line features**
- type**
- fence
- remnant channel
- line features**
- type**
- access
- ▭ design channel
- main channel
- tributary channel
- tributary channel
- area features**
- type**
- borrow pond
- ▨ fill incised reach
- ▩ riffle augmentation
- ▩ staging



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SECTION III: SUPPORT DOCUMENTATION

PROJECT DESCRIPTION

This project is part of the Burney Creek - Hat Creek Community Forestry Project coordinated by the Fall River Resource Conservation District and the Burney - Hat Creek Community Forest and Watershed Group (see Section V, Burney Creek - Hat Creek Community Forestry Project Map in Section V). The Burney Gardens Meadow Restoration Project is designed to restore aspen stands and the natural form and function of the meadow, watercourses, and floodplain to reduce sediment flow into Burney Creek and the Pit River. This objective will be accomplished by restoring the meadow and aspen to its historic pre-European condition as determined by historic aerial imagery. The THP proposes to remove all conifers within the Aspen, Meadow, and Wet Area Restoration. This project will benefit wildlife by enhancing the size of these habitats that are shrinking across the landscape.

Collaboration is key for synergy (agencies, groups, landowners, communities, and partners) in this Sierra Cascade All Lands Enhancement Project. Cooperators/Funding Sources included Burney Creek - Hat Creek Community Forestry and Watershed Group, Fall River Resource Conservation District, Sierra Institute, Sierra Nevada Conservancy, Rocky Mountain Elk Foundation, and others.

The channel restoration work is included in this THP to avoid splitting projects into separate CEQA permitting processes. The meadow restoration/timber harvesting and channel restoration work activities are complimentary projects and there is efficiency in coordinating these systemic processes.

The forest structure is planned to be treated first followed by the riffle augmentation. This timing is necessary because the timber harvesting must occur before the water table of the meadow is raised due to the channel restoration work.

Refer to Section V, Attachments, Burney Gardens Meadow Restoration, Shasta County, California, Meadow Restoration Design, prepared for Fall River Resource Conservation District in cooperation with Pacific Gas and Electric, September 10, 2010.

Other permits associated with this project include: Army Corps of Engineers 404 Permit, Central Valley Regional Water Quality Control Board 401 Certification (see permit application in Section V, Attachments), and integrated Department of Fish and Game 1600 Permit (see Section II and III, Item 26d).

Preconsultation Review

2010: Portions of the THP area were reviewed by Cal Fire (Gary Whitson), DFG (Jennifer Carlson), and CVRWQCB (Matt Boone) as part of the Pacific Gas & Electric Company, Burney Gardens THP, No. 2-09-109-SHA(4).

September 26, 2011: (site visit) USFS, Lassen National Forest (Dr. Bobette Jones), Fall River Resource Conservation District (Todd Sloat), W.M. Beaty & Associates, Inc. (Pete Johnson and Scott Carnegie).

October 13, 2011: (site visit) Cal Fire (Bill Snyder, Mike Bacca, and Gary Whitson), California Geological Survey (Don Lindsay), CVRWQCB (Ben Letton), USFS, Lassen National Forest (Kit Mullen), Sierra Institute (Jonathan Kusel), Fall River Resource Conservation District (Todd Sloat), Fruit Growers Supply Company (Dean Loftus), Sierra Pacific Industries (Herb Baldwin and Chad Arseneau), and W.M. Beaty & Associates, Inc. (Pete Johnson and Scott Carnegie).

October 31, 2011: (site visit) Cal Fire (Brook Darley and Gary Whitson), DFG (Stacy Stanish), CVRWQCB (Matt Boone), Shelly Wingo (U.S. Fish and Wildlife Service), and Fall River Resource Conservation District (Todd Sloat).

November 2, 2011: (site visit) Cal Fire (Richard Jenkins) and W.M. Beaty & Associates, Inc. (Scott Carnegie).

November/December, 2011: (desk review) DFG (Robin Fallscheer).

December 13, 2011: (desk review) Cal Fire (Dale Meese).

SITE DESCRIPTION

Location and Ownership

The THP area is owned by Fruit Growers Supply Company, Pacific Gas and Electric Company, Sierra Pacific Industries, Inc., and Shasta Forests Timberlands, LLC. The portion of the THP area now owned by Pacific Gas & Electric Company was acquired piecemeal from The Red River Lumber Company, the Scott Lumber Company, and various ranchers by the Northern California Power Company with intentions of building a reservoir on site. The dam was never constructed due to the marginal suitability of the site and a lawsuit by local ranchers preventing Northern California Power Company from diverting the water from Burney Creek into Cow Creek. Pacific Gas & Electric Company acquired the property when they purchased Northern California Power Company.

A portion of the THP area is owned by Shasta Forests Timberlands, LLC and is tiered to the approved Shasta Forests SYP No. 00-002-R (12/10/10). Refer to the Shasta Forests SYP, Section WA.II, Shasta Watershed Assessment Area, for a description of the topography, soils, geology and unstable areas, vegetation and stand conditions, and watershed and stream conditions for this portion of the THP area.

The THP area is located in Shasta County approximately 5 miles southwest of Burney. The area is comprised primarily of two mountain meadow systems, The Gardens and an unnamed meadow. The THP is located on the Jacks Backbone 1985 and Burney Mountain West 1990 United States Geological Survey (USGS) 7.5 minute quadrangles. The THP area is within the Cal Water version 2.2.1, No. 5526.330101 Whittington Butte and No. 5526.310102 Dry Burney Creek Planning Watersheds.

The meadow areas have historically been grazed for many generations. Grazing rights within the THP area are leased to local ranchers by the landowners from approximately June 1 to October 1 each year.

Elevations range from approximately 4,100 to 5,000 feet. Slopes range from approximately 0% to 10%. Mean annual precipitation within and near the THP area ranges from approximately 50 to 60 inches depending on elevation and geographic position (see Shasta Forests SYP No. 00-002-R (12/10/10), Map WA-6). About 60% of the precipitation occurs in the form of snow. Summer rainfall seldom occurs, with the exception of infrequent but sometimes intense thunderstorms with a 2-year, 1-hour rainfall intensity of <0.4 inches (see Shasta Forests SYP No. 00-002-R (12/10/10), Map WA-6).

Geology and Soils

Geology in the area consists of Tertiary and Miocene volcanic basalt. No fault zones or unstable areas are located within the THP area (see Shasta Forests SYP, Map WA-Pondosa-3, for the Shasta Forests Timberlands ownership and vicinity).

There are two major soil types within the THP area (see the Shasta Forests SYP, Section WA.IV.B.C, Surface Erosion, for the Shasta Forests Timberlands ownership). The primary soil types within the THP area are Carberry gravelly fine sandy loam and Jacksback loam. These soils were identified using the Natural Resources Conservation Service Soil Survey and the Shasta Forests SYP No. 00-002-R (12/10/10), as well as field observations. Land within the THP area is Dunning site class II and III.

Vegetation and Stand Conditions

Portions of the THP area were originally logged in the early and mid-1900s. The selection area has been managed as an unevenaged forest since that time with periodic re-entries occurring on approximately a 10-year cutting cycle in portions of the area over the past 40 years. No old growth stands remain in the THP area but some large old trees and snags are present as well as culls that were left during the early logging. With very few exceptions, these culls and snags will not be harvested. There is currently no late seral habitat present within the THP area. There are no large old trees or stands within the THP area that have significant or unique characteristics as determined from an on the ground inspection by the RPF.

Based on the associated timber inventories, aerial photography interpretation, and field checking, the California Wildlife Habitat Relationships (CWHR) types for timber stands present within the THP area include

primarily lodgepole (LPN) with Sierra mixed conifer (SMC) on the higher elevations. In general, the timber stands are clumpy, with most trees in the size class 3 and 4 range, and an understory of size class 2 to 3 trees.

There are low to moderate snag densities across the THP area. Large green culls are not intended for harvest. Although merchantable snags may be harvested, where not required to be felled for safety or fire precaution issues, unmerchantable snags ≥ 22 inches dbh will be left to provide wildlife habitat (see Shasta Forests SYP, Section FW.III.A.5, Snags and Large Woody Debris, for the Shasta Forests Timberlands ownership).

The Gardens meadow in the south unit and the unnamed meadow in the north unit are seasonally wet meadows that are typically only wet during the spring and early summer months during snow melt. Generally by mid-summer the meadows become dry.

The meadows have drastically decreased in size over the last 50 years primarily due to lodgepole pine encroachment and fire suppression. The resulting stand of timber that currently exists in the Aspen, Meadow, and Wet Area Restoration is overstocked with small diameter, suppressed lodgepole pine. Aspen are distributed throughout the THP area in varying degrees of density ranging from single occurrences dispersed throughout to well established aspen stands representing a variety of size classes at the south end of The Gardens and the south end of the northern meadow. Other hardwood trees species present include cottonwood and alder.

Vegetation that exists along portions of the watercourses typically lack a hardwood component and contain little to no canopy cover over the watercourse channel. The dominant conifer along many of the watercourses consists of suppressed and overstocked lodgepole pine trees that provides minimal shade to the watercourse.

Tree diameters in the lodgepole pine encroachment area range from 4 to 28 inches dbh and average approximately 6 to 8 inches dbh. Past mortality and windthrow have left a mat of downed logs throughout the area. The blowdown and dense stand of young lodgepole growing up through it combine to produce an unacceptably high wildfire risk for the area.

Watershed and Stream Conditions

Large areas of the THP area are within seasonally flooded meadow areas with very low velocity widespread overland flow during snowmelt. There are also areas where overland flow becomes channelized for short distances and then dissipates into widespread overland flow again. These areas do not meet the definition of Class III watercourses. Several Class III watercourses have been identified within this area.

The lowering base elevation of the channels in the meadows is causing a lowering of the base elevation of upstream channels and erosion. The floodplain gradient is $<1\%$. The meadows are transforming from deposition/response areas suitable for effectively storing sediment to transport reaches.

One Class I watercourse (Burney Creek), two Class II watercourses (Burney Creek and unnamed tributary), and numerous Class III watercourses flow through the THP area and drain into the Pit River at Burney (see Shasta Forests SYP, Section WA.III.C.1, Stream Channel Conditions, for the Shasta Forests Timberlands ownership). Conditions of the watercourses as observed throughout the THP area, generally range from good to moderate exclusive of the downcut segments within the meadow systems where restoration work is proposed under this THP.

Within the south unit, the majority of Burney Creek is ephemeral, exclusive of the upper reaches that are spring fed. No fish were observed in the portion of this watercourse. The unconfined floodplain area in the south unit may limit fish passage. Segments of Burney Creek within the north unit appear to have been channelized resulting in moderate to severe downcutting due to loss of sinuosity and increased velocity. Segments have downcut up to approximately eight feet resulting in steep overhanging banks with continual lateral erosion and bank sloughing. Artificial piles of streambed material were observed on the former floodplain and in the current channel. The channel at the southern edge of the north unit is comprised of rocks up to approximately 24 inches in diameter suggesting a possible high energy debris torrent scoured out the channel in an episodic event. The northern portion of both units have fine sediment accumulations with downcut channels through the deposits. Much of the runoff is no longer able to access the floodplain.

ITEM 14: SILVICULTURAL PRESCRIPTIONSMaximum Sustained Production

As per 14 CCR § 1034(m)(1), the following is a description of the stand before and after harvesting including: volume, growth projection, stocking, and species composition. These values are based primarily on ocular estimates for the areas to be harvested using the selection regeneration method. The primary objective of the selection prescription is for biomass harvesting for fuel reduction, however, sawlog harvesting may occur at the discretion of each timber owner.

Pre-harvest condition:

Volume: Approximately 5 to 10 thousand board feet (mbf) per acre.

Growth projection: Approximately 250 to 500 bf per acre per year.

Stocking: Approximately 100 to 200 square feet of basal area per acre (average 130 BA) and approximately 100 to 200 trees per acre (average 170 TPA).

Species composition: Approximately 40% Ponderosa pine, 10% sugar pine, 10% Douglas-fir, 30% white fir, and 10% incense cedar.

After harvest condition:

Volume: Approximately 4 to 8 mbf per acre.

Growth projection: Approximately 250 to 500 bf per acre per year.

Stocking: Approximately 100 to 180 square feet of basal area per acre (average 130 BA) and approximately 100 to 150 trees per acre (average 130 TPA).

Species composition: Approximately 50% Ponderosa pine, 10% sugar pine, 10% Douglas-fir, 20% white fir, and 10% incense cedar.

Conifer regeneration is encroaching into these unique habitats and creating competition for nutrients from the historically dominated aspen stands. The goal of this project is to harvest encroaching conifers from the Aspen, Meadow, and Wet Area Restoration to reduce competition and to maintain and rejuvenate the aspen stands. Preharvest basal area ranges from approximately 20 to 400 sq. ft. and averaging 100 sq. ft. of 6 to 12-inch dbh lodgepole pine per acre and 2 to 50 sq. ft. of aspen in the stand ranging from 12 to 24-inch dbh trees in the overstory to suppressed saplings in the understory. Lodgepole pine is suppressing the aspen regeneration by outcompeting the existing aspen saplings and lowering the soil temperature due to shading which reduces aspen reproduction by suckering. There is a small component of scattered white fir on the higher ground within the meadow restoration area of the south unit and mixed conifer in the north unit.

Conifer regeneration has encroached significantly into portions of the meadow areas within the THP area lowering the water table and shading out understory vegetation. The Aspen, Meadow, and Wet Area Restoration was laid out with the assistance of aerial imagery. The meadow areas were verified with field observations and other areas with young lodgepole and meadow vegetation were added. The goal of this project is to remove the encroaching conifers from the meadow areas and implement channel restoration work to raise the water table to create a late season wet meadow, reduce erosion and sedimentation, and to improve the wildlife habitat and range value of the area. Any short-term impacts from the project will result in a long-term positive effect.

Aspen, Meadow, and Wet Area Restoration (14 CCR § 933.4(e))

- (1) Project type: Aspen, meadow, and wet area restoration are all included.
- (2) Project type locations: The three project types overlap and are contiguous to each other although shown on the Silviculture Map at end of Section II as two treatments: (1) Aspen, Meadow, and Wet Area Restoration and (2) Aspen Restoration, they are assessed as one silvicultural prescription herein.
- (3) Extent of area and types of treatments: The Aspen, Meadow, and Wet Area Restoration covers approximately 1,360 acres. The majority of the meadow system is within this THP area. The majority of the remaining area of the Burney Gardens Meadow in the south unit is within the adjacent approved Burney

Gardens THP No. 2-09-109-SHA(4). A portion of the meadow system in the south unit is adjacent to the southeast corner of this THP on a small private landowner that is not included.

(4) Condition:

(A) Aspen stands:

Type: The aspen stands are primarily riparian/wet meadow aspen stands, however, upland aspen stands mixed with conifers exist within the Aspen, Meadow, and Wet Area Restoration units.

Spatial extent: The aspen stands are distributed throughout the Aspen, Meadow, and Wet Area Restoration units, but primarily occur in the southern portion of the south unit.

Species composition: Existing vegetation indicates meadow and aspen component existed.

Stand structure: Aspen will shade out with current management and stand conditions. Few residual aspen remain in portions of the area. Regional studies indicate only 20 to 30% of the former aspen stands remain (B. Jones). Removal of conifers within 100 feet of existing aspen will reduce shading and increase soil temperatures to encourage aspen sprouting. Operations may sever stems, however, aspen will resprout if roots are left intact.

Other known aspen stands: Aspen is located approximately two miles south of the south unit at Sheraton Flats, a similar wet meadow system draining to Cow Creek. Scattered aspen stands are located throughout the coniferous stands in the vicinity of the THP area.

(B) Meadows and wet area:

Spatial extent: The meadows and wet areas are distributed throughout the Aspen, Meadow, and Wet Area Restoration units. The wet areas primarily occur at the lower elevation and northern portion of the areas, however, the entire portion of both areas is seasonally flooded.

Species composition: The area includes primarily lodgepole pine, limited occurrences of aspen, and groups of white fir and ponderosa pine where the elevation is slightly higher.

Stand structure: The area is comprised of dense young lodgepole pine that has encroached into the meadow areas. Mature conifers over an understory of lodgepole pine occur along the perimeter in the ecotone areas between the coniferous timber stands and the former meadow area. Aggregate and dispersed retention will be retained to enhance the habitat for all species using the area.

Watercourse conditions:

- a. Sediment effects: Ongoing erosion and sedimentation from the downcut and laterally receding watercourses that largely appear to be related to grazing management practices.
- b. Water temperature effect: Increased water temperatures due to the lack of riparian vegetation along the non-timbered segments that largely appear to be related to grazing management practices.
- c. Organic debris effect: Increased organic debris and nutrient loading due to cattle impacts resulting from the lowered water table and decreased water availability causing cattle to remain in the watercourses for longer periods.
- d. Chemical contamination effect: None observed.
- e. Peak flow effect: Snowmelt results in hydrologic events that continue to erode the now confined, downcut, and channelized watercourses. This is likely due to grazing management practices resulting in sediment transport through these former deposition response reaches.

Other factors: The area is indicative of meadow or wet area geomorphic and hydrological functions.

- (5) Project goals and measures of success: The Burney Gardens Meadow Restoration Project is designed to restore aspen stands and the natural form and function of the meadow, watercourses, and floodplain to reduce sediment flow into Burney Creek and the Pit River. The meadow will be

restored from a transport reach to a response reach and deposition area. This objective will be accomplished by restoring the meadow and aspen to its historic pre-European condition as determined by historic aerial imagery. The THP proposes to remove all conifers within the Aspen, Meadow, and Wet Area Restoration. This project will benefit wildlife by enhancing the size of these habitats that are shrinking across the landscape. Success will be measured by the increased area of meadow vegetation, raised water table, increased forage, increased wildlife habitat, and late season water availability. Meadow vegetation (grasses and forbs) will quickly reoccupy the site. However, meadow vegetation that occupies the site may be different than what currently exists and species locations may move to adjust to potential changes in the hydrology of the meadow. Lodgepole pine and aspen will regenerate and will need maintenance (prescribed fire, herbivory, hand cutting, or biomass). Removal of the lodgepole pine will increase the forage, allow distribution of cattle, and eliminate trailing of cattle along roads and watercourses that results in channelization and gullying.

(6) Projects 20 acres or less: N/A

(7) Monitoring: Project monitoring of the channel restoration work will be directed by Fall River Resource Conservation District in cooperation with the resource agencies and local landowners and managers. Photo points have been established, along with additional points set up during the data collection of the valley transects. Additional photographs and transect resurveys will take place periodically, especially after significant runoff seasons, to monitor channel stability and allow evaluation of project performance.

Grazing management: A livestock management plan will be developed by working with project partners and landowners. The intent is to develop a plan that can be monitored to ensure project goals are met. This will include some fencing and rest of disturbed areas and aspen stands. Both meadow areas are fenced and cross fenced. Pacific Gas & Electric Company has purchased additional fencing materials in anticipation of this project and the adjacent associated Pacific Gas & Electric Company, Burney Gardens THP No. 2-09-109-SHA(4) project. Livestock currently graze the site when water still flows within the stream channels. Since the lodgepole encroachment is so severe, livestock concentrate in the open meadow areas, and during late fall when groundwater has dropped and pools no longer occur in the channel, livestock concentrate in meadow areas where springs or stock ponds have been created. After restoration, livestock forage is expected to be much greater and cattle will therefore be more dispersed through the THP area and upland area. This will greatly limit the impacts to the stream channel. However, if livestock continue to concentrate along the stream channels and cause impacts, the timing of grazing will be delayed in order for the ground conditions to become firm and withstand trampling. In general, a shorter duration of grazing that occurs later in the season will be the likely preferred grazing strategy to meet project goals.

Maintenance: The THP area is surrounded by a road system. The project includes biomass thinning between the road and meadows to facilitate prescribed burning in cooperation with the Cal Fire Vegetation Management Program and the USFS All Lands Initiative. However, prescribed burning does conflict with the closed cone forest type and there is a potential for rapid lodgepole pine reoccupation.

ITEM 17: PROCEDURE FOR DETERMINING EROSION HAZARD RATING

The EHR was calculated separately for each primary soil type within the THP area. Natural Resource Conservation Service, 2003 soil surveys include:

CA-604: Intermountain Area, Parts of Lassen, Modoc, Shasta, and Siskiyou Counties, California

CA-607: Shasta County Area, California

CA-708: Lassen National Forest, Parts of Lassen, Plumas, Butte, Shasta, and Siskiyou Counties, California

The following table contains a list of the primary soil types within the THP area.

SOIL TYPES WITHIN THE THP AREA			
Survey	Soil ID	Soil Name	EHR
CA-604	125	Carberry gravelly fine sandy loam, 2 to 15% slopes	Low
CA-604	190	Jacksback loam, 2 to 9% slopes	Low
CA-607	190im	Jacksback loam, 2 to 9% slopes	Low
CA-607	312im	Stacher gravelly coarse sandy loam, 15 to 30%	Low
CA-708	86	Sheld family-Sheld family, moderately deep complex, 0 to 35% slopes	Low

ITEM 22: ALTERNATIVE PRACTICES TO STANDARD HARVESTING OR EROSION CONTROL RULES

An alternative practice is proposed for waterbreaks on roads and skid trails within the Aspen, Meadow, and Wet Area Restoration as follows:

14 CCR § 934.6 Waterbreaks: The following standards are applicable to the construction of waterbreaks:

(a) except as otherwise provided for in the rules:

(1) All waterbreaks shall be installed no later than the beginning of the winter period of the current year of timber operations.

(2) Installation of drainage facilities and structures is required from October 15th to November 15th and from April 1 to May 1 on all constructed skid trails and tractor roads prior to sunset if the National Weather Service forecast is a "chance" (30% or more) of rain within the next 24 hours.

(b) Waterbreaks shall be constructed concurrently with the construction of firebreaks and immediately upon conclusion of use of tractor roads, roads, layouts, and landings which do not have permanent and adequate drainage facilities, or drainage structures.

(c) Distances between waterbreaks shall not exceed the following standards:

MAXIMUM DISTANCE BETWEEN WATERBREAKS

Estimated Hazard Rating	U.S. Equivalent Measure Road or Trail Gradient (in percent)			
	10 or Less	11-25	26-50	>50
Extreme	100	75	50	50
High	150	100	75	50
Moderate	200	150	100	75
Low	300	200	150	100

The appropriate waterbreak spacing shall be based upon the erosion hazard rating and road or trail gradient.

(d) Cable roads that are so deeply cut as to divert and carry water away from natural drainage patterns for more than 100 feet shall have waterbreaks installed on them at 100 feet intervals, or other appropriate erosion control measure may be applied if specified in the plan.

(e) Waterbreaks shall be installed at all natural watercourses on tractor roads and firebreaks regardless of the maximum distances specified in this section, except where permanent drainage facilities are provided.

(f) Waterbreaks shall be located to allow water to be discharged into some form of vegetative cover, duff, slash, rocks, or less erodible material wherever possible, and shall be constructed to provide for unrestricted discharge at the lower end of the waterbreak so that water will be discharged and spread in such a manner that erosion shall be minimized. Where waterbreaks cannot effectively disperse surface runoff, including where waterbreaks on roads and skid trail cause surface run-off to be concentrated on downslopes, roads or skid trails, other erosion controls shall be installed as needed to comply with Title 14 CCR § 934.

(g) Waterbreaks shall be cut diagonally a minimum of 15.2 cm (6 inches) into the firm roadbed, cable road, skid trail or firebreak surface and shall have a continuous firm embankment of at least 15.2 cm (6 in.) in height immediately adjacent to the lower edge of the waterbreak cut.

(h) Waterbreaks or any other erosion controls on skid trails, cable roads, layouts, firebreaks, abandoned roads, and site preparation areas shall be maintained during the prescribed maintenance period and during timber operations as defined in PRC Sections 4527 and 4551.5 so that they continue to function in a manner which minimizes soil erosion and slope instability and which prevents degradation of the quality and beneficial uses of water. The method and timing of waterbreak repair and other erosion control maintenance shall be selected with due consideration given to the protection of residual trees and reproduction and the intent of 14 CCR § 934.

(i) The prescribed maintenance period for waterbreaks and any other erosion control facilities on skid trails, cable roads, layouts, firebreaks, abandoned roads, and site preparation areas, shall be at least one year.

The Director may prescribe a maintenance period extending as much as three years after filing of the work completion report in accordance with 14 CCR § 1050.

Explanation: The proposed practice is to not construct waterbreaks in the Aspen, Meadow, and Wet Area Restoration. The proposed practice differs from the standard practice in that waterbreaks will not be constructed in the Aspen, Meadow, and Wet Area Restoration.

Location: The specific location where alternative practice will be applied is the Aspen, Meadow, and Wet Area Restoration as shown on the Silviculture Map at end of Section II.

Justification: Large areas of the THP area are within seasonally flooded meadow areas with very low velocity widespread overland flow during snowmelt. There are also areas where overland flow becomes channelized for short distances and then dissipates into widespread overland flow again. Most of the roads and landings in the area designated for Aspen, Meadow, and Wet Area Restoration are seasonally flooded with up to 18 inches of very slow moving water. The meadow area naturally functions as a sediment deposition area. The project includes channel restoration work to correct channelization of watercourses and allow flood flows to dissipate across the flood plain and settle out in the meadow vegetation. Construction of waterbreaks in this area would cause more soil disturbance and be ineffective and unnecessary. The roads will be hydrologically innocuous upon completion of the project.

ITEM 26D: DFG 1603 BACKGROUND INFORMATION AND ANALYSIS

Riffle Augmentation

The project consists of restoring 1,360 acres meadow (open and encroached), and selection (thinning) on 1,170 acres of dense forest south of Burney, in Shasta County, CA so that future thinning and burning may be used to maintain the restoration activity. The meadow is co-owned by four landowners, and consists of forested (i.e. encroached lodgepole) and non-forested meadow habitat. Personal accounts and assessments have revealed that the forested area of the meadow has become much denser in the last 100 years. Lodgepole pine and other conifers have colonized about 1,220 acres of the meadow area and covers nearly 100 percent of the ground. This has resulted in the loss of relict aspen stands or degradation of existing stands. In the non-forested meadow area (ca. 140 acres), past management practices have resulted in entrenchment of the stream channel. As a result, flood flows are contained within the channel and continue to erode soil vertically and laterally. Meadow vegetation dries out earlier in the season from the entrenchment, and active headcutting threatens meadow areas where the stream is hydrologically connected to the floodplain.

The project includes treating the forested and non-forested areas of a north and south meadow. Within the forested areas, nearly all conifer trees will be removed within the floodplain area. Snags and other trees known to be important for wildlife will be left. These remaining "wildlife" trees, and aspen trees, along with a few willows, will provide important structural habitat for migratory and resident birds and foraging habitat and cover for other vertebrates (e.g. elk, black-tailed deer, Douglas squirrel). Although not all of the relict aspen areas have been identified and mapped, approximately 20 acres have been identified and mapped. An additional 40 acres have been estimated to occur and are scattered throughout a dense lodgepole encroached area in

the south meadow. These stands are expected to increase in size after conifer treatment. An additional 1,170 acres that occur outside of the floodplain but adjacent to the meadows will be thinned. These areas have been selected and extend out to existing roads and past landing areas so that fire may be used in the future to control lodgepole encroachment.

In the south open meadow area, degraded meadow habitat (ca. 20 acres) will also be restored. The restoration goal within the open meadow area is to reconnect the stream channel to the floodplain. Channel(s) that are greatly larger than historical dimensions will be filled, while those that are close to historical dimensions will be reveted with trees and gravel/rock material (referred to as riffle augmentation/revetment) so they mimic a natural shape. The methods used include excavating material to create ponds in order to fill the gullies, moving earth material to reconnect remnant channels, shaping fill areas, transplanting willow and sod at key stress areas (e.g. downstream face of plugs), adding gravel/rock to riffles, and removing trees and placing them in riffle augmentation/revetment areas. Surface flow will be re-directed into stable existing remnant channels within the floodplain so that water and sediment can be transported from the meadow and from the upper watershed in a natural manner. Restoration of the channel will improve water quality, stop degradation of adjacent open meadow habitat (i.e. 140 acres), and provide wet conditions suitable for a variety of vertebrate (e.g. greater sandhill crane), invertebrate (e.g. cryptic tadpole shrimp), and plant species (long-haired star-tulip). Since the meadow and stream channels are dry by late summer, all construction activities within the forest and non-forested meadow area will occur when soil conditions are dry.

Also in the south meadow, 2,137 feet of stream channel within the forested area has slightly entrenched. Trees that have fallen into the channel show aggradation of the channel bed and no lateral erosion. Therefore, the project proposes to fell trees and place one or two trees within the stream channel to further assist channel stability. A general rule applied to grade control of streams recommends five times the bankfull width. Bankfull width at the site is approximately ten feet. One to three trees will be placed every fifty feet perpendicular to the stream channel. In addition, there are six sections of stream channel that show more severe lateral erosion. These areas total 300 feet. In these areas, trees will be placed alongside of the eroding bank in order to capture sediment and debris and help stop erosion.

The project is intended to improve water quality. Primarily, the improvements will occur from reduced total suspended solids. The existing gully is expanding laterally, headcutting, and adding higher amounts of sediment to the stream compared to more stable channel conditions. Cut and fill activities conducted in the fall in and adjacent to the gully will have no impact on water quality at that time. Similarly, placement of trees and gravel material in the dry channel will have no impacts on water quality. The current channel condition consists of silt, sand, gravel, cobble, and herbaceous vegetation. During spring, flood flows will no longer rapidly erode the stream channel, the headcut will no longer move upstream, and any sediment transported as the result of construction activities will be much less than the amount that would be transported if restoration was not conducted.

The pond-and-plug technique would require the excavation of 5,445 cubic yards of fill into existing gullies. The fill will be permanent and will not impact water quality because the stream channel will no longer flow through the area to be filled. Excavated material from the creation of ponds will be used to "plug" and prevent the flow of water in the channel. Construction related disturbance to adjacent areas will be limited to the minimum necessary in order to complete the project.

For approximately one third of the project reach, the gully will be filled and ponds will be created. Total length of gully fill is 720 feet. The total cubic yards to fill the gully is 5,445. Total pond area equals approximately 2 acres. The length of channel improved from riffle augmentation is 1,413 feet. Approximately 35,198 cubic yards of gravel will be used for riffle work. Approximately 1,300 linear feet of remnant stream channel will carry the primary flow rather than the existing gully. This channel essentially replaces the gully fill channel length. About 1,000 feet of channel in the forested area will be improved by using trees as grade control. One to three trees will be placed perpendicular to the stream every fifty feet.

Some native herbaceous vegetation (sod) exists within the gully bottom; where present, it will be salvaged and used to vegetate other areas disturbed along the project site. Lodgepole pine will be used for grade control and riffle augmentation.

Project implementation will occur during the driest time of year (late summer) and prior to any significant autumn precipitation events. At completion, disturbed sites will be seeded with a mixture of native grass and forb species recommended by the design consultant and the Partner's for Fish and Wildlife. Local seed collected on site will be used where feasible. Due to the dense growth of herbaceous vegetation throughout the adjacent historical meadow, it is predicted that the disturbed sites will be heavily vegetated within 2 years.

In addition, a livestock management plan will be developed by working with project partners and landowners. The intent is to develop a plan that can be monitored to ensure project goals are met. This will include some fencing and rest of disturbed areas and aspen stands. Livestock currently graze the site when water still flows within the stream channels. Since the lodgepole encroachment is so severe, livestock concentrate in the open meadow areas, and during late fall when groundwater has dropped and pools no longer occur in the channel, livestock concentrate in meadow areas where springs or stock ponds have been created. After restoration, livestock forage is expected to be much greater and cattle will therefore be more dispersed through the THP area and upland area. This will greatly limit the impacts to the stream channel. However, if livestock continue to concentrate along the stream channels and cause impacts, the timing of grazing will be delayed in order for the ground conditions to become firm and withstand trampling. In general, a shorter duration of grazing that occurs later in the season will be the likely preferred grazing strategy to meet project goals.

The Fall River Resource Conservation District partnered with Partners for Fish and Wildlife, and numerous others (e.g. Sierra Nevada Conservancy and Natural Resources Conservation Service) on projects of similar nature. These projects have been considered successful. In some instances, minor adjustments and treatments have been required the following year to improve small areas that did not respond to restoration as planned (e.g. grade control structures, small channel section or headcut). However, after these treatments, the projects have been self-sustaining.

The project coordinator for the Fall River Resource Conservation District is a wildlife biologist and has been involved with several restoration projects in the region. The project coordinator conducted surveys within the THP area in order to identify potential species that may be affected by the project. In addition, Pacific Gas and Electric Company contracted assessment work for special-status species. No special-status species will be directly adversely affected by the proposed project.

The project will be constructed during "no flow" conditions and during the non-nesting period. Pre-construction special-status species surveys will be conducted if construction activities are planned to occur before July 15th.

No mitigation or compensation measures are proposed. However, measures are incorporated into the Project Description which minimize impact on wildlife and vegetation. These measures include starting construction after the growing season (e.g. mid-July), stockpiling soil and sod to place on the disturbed areas, and seeding and mulching disturbed areas.

The Partners for Fish and Wildlife will submit the design plan and binding wetland enhancement agreement to the Army Corps of Engineers 30 days prior to commencement of construction in order to meet the NW27 requirement. The submittal of this information meets NW27 requirements and precludes the need for a Pre Construction Notification (PCN).

ITEM 27: IN LIEU PRACTICES

The specific location where these in lieu practices may be applied is the Aspen, Meadow, and Wet Area Restoration as shown on the Silviculture Map at end of Section II.

a. Roads, skid trails, and landings in sensitive areas

14 CCR § 936.3(c): The timber operator shall not construct or reconstruct roads, construct or use tractor roads or landings in Class I, II, III, or IV watercourses, in the WLPZ, marshes, wet meadows, and other wet areas unless when explained and justified in the THP by the RPF, and approved by the Director.

Explanation: The proposed practice is to one road in a Class III watercourse (R4) and roads, skid trails, and landings in marshes, seasonally wet meadows, and other seasonally wet areas. The proposed practice

differs from the standard practice in that roads, skid trails, and landings may be used in Class III watercourses, marshes, seasonally wet meadows, and other seasonally wet areas.

Justification: Because the project is within seasonally flooded meadows it would not be feasible to avoid use of roads, landings, and skid trails in Class III watercourses, marshes, seasonally wet meadows, and other seasonally wet areas and still accomplish the objectives of the silvicultural prescription and the project. Operations shall not occur in these areas when saturated soils exist or a stable operating surface does not exist. The location of some of these watercourses may be modified as part of the restoration project.

b. Meadow vegetation

14 CCR § 936.3 (d): Vegetation, other than commercial species, bordering and covering meadows and wet areas shall be retained and protected during timber operations unless explained and justified in the THP and approved by the Director. Soil within the meadows and wet areas shall be protected to the maximum extent possible.

Explanation: The proposed practice is to not retain and protect vegetation bordering and covering meadows and wet areas during timber operations. The proposed practice differs from the standard practice in that vegetation bordering and covering meadows and wet areas will not be retained and protected during timber operations where it is not compatible with the meadow restoration activities.

Justification: Retention and protection of vegetation bordering and covering meadow and wet areas is not feasible where meadow restoration activities occur.

c. Directional felling

14 CCR § 936.3(e): Trees cut within the WLPZ shall be felled away from the watercourse by pulling or other mechanical methods if necessary, in order to protect the residual vegetation in the WLPZ. Exceptions may be proposed in the THP and used when approved by the Director.

Explanation: The proposed practice is to allow felling of trees toward the watercourse. The proposed practice differs from the standard practice in that trees may be felled towards the watercourse.

Justification: Felling of trees toward the watercourse will allow for the harvesting of trees leaning towards the watercourse that cannot be felled away as well as allow the felling of trees in the channel as necessary to facilitate riffle augmentation.

d. WLPZ reduction

14 CCR § 936.4(b)(5): If requested by either party, and after on-the-ground inspection, the RPF and the Director may increase or decrease the width of a proposed WLPZ. A decrease shall not exceed 25 percent of the width as determined by the procedure prescribed in Sections 14 CCR § 936.4(c) and § 936.5. Such changes in zone width shall be based on considerations of soil, slope, climatic factors, biologic, hydrologic, and geologic values listed in Section 14 CCR § 936.4(b), silvicultural methods, yarding systems, road location, and site preparation activities. In no case shall the width be adjusted to less than 50 feet for Class I and II waters. Where soil surfaced roads exist within the standard WLPZ, no in-lieu reduction of WLPZ width shall be approved.

14 CCR § 936.5(e) Table I: Class I watercourses with a slope class of <30% shall have a WLPZ width of 75 feet.

Explanation: The proposed practice is to reduce the WLPZ width by a maximum of 25% from 75 feet to a minimum of 56 feet. The proposed practice differs from the standard practice in that the WLPZ width will be reduced from 75 feet to a minimum of 56 feet.

Justification: By decreasing the zone width the feller buncher will be able to reach in and cut the lodgepole out of the inner 15-foot zone where no equipment is allowed and swing the timber outside the zone with minimal driving. Without the WLPZ reduction, the feller buncher would have to drive back and forth further to swing the timber out of the zone increasing ground disturbance.

f. Heavy equipment in WLPZs

14 CCR § 936.3(c): The timber operator shall not construct or reconstruct roads, construct or use tractor roads or landings in Class I, II, III, or IV watercourses, in the WLPZ, marshes, wet meadows, and other wet areas unless when explained and justified in the THP by the RPF, and approved by the Director.

14 CCR § 936.4(d): Heavy equipment shall not be used in timber falling, yarding, or site preparation within the WLPZ unless such use is explained and justified in the THP and approved by the Director.

Explanation: The proposed practice is to use heavy equipment in Class I, II, and III watercourses, in the WLPZ, and wet meadows for timber harvesting (and riffle augmentation (ponds, plugs, riffles, etc.)). The proposed practice differs from the standard practice in that heavy equipment may be used in watercourses and WLPZs, however, harvesting equipment shall not be used within 15 feet from the watercourse transition line.

Justification: This proposed practice will result in less ground disturbance (especially within the 15 feet closest to the watercourse) than if the timber was felled and endlined out of the zone as would be required by the standard rules. Use of heavy equipment in watercourses and WLPZs is necessary to achieve the objectives of the project.

h. Overstory canopy retention

14 CCR § 936.5(e): "G" To protect water temperature, filter strip properties, upslope stability, and fish and wildlife values, at least 50% of the overstory and 50% of the understory canopy covering the ground and adjacent waters shall be left in a well distributed multi-storied stand composed of a diversity of species similar to that found before the start of operations. The residual overstory canopy shall be composed of at least 25% of the existing overstory conifers. Species composition may be adjusted consistent with the above standard to meet on-site conditions when agreed to in the THP by the RPF and the Director.

14 CCR § 936.5(e): "I" To protect water temperature, filter strip properties, upslope stability, and fish and wildlife values, at least 50% of the total canopy covering the ground shall be left in a well distributed multi-storied stand configuration composed of a diversity of species similar to that found before the start of operations. The residual overstory canopy shall be composed of at least 25% of the existing overstory conifers. Due to variability in Class II watercourses these percentages and species composition may be adjusted to meet on-site conditions when agreed to by the RPF and the Director in the THP.

Explanation: The proposed practice is to not retain 50% overstory canopy in the Class I WLPZ and 50% total canopy (25% of existing overstory conifers) in the Class II WLPZ. The proposed practice differs from the standard practice in that 50% overstory canopy in the Class I WLPZ and 50% total canopy (25% of existing overstory conifers) in the Class II WLPZ may not be retained.

Justification: Reduction of the overstory canopy is necessary to achieve the objectives of the silvicultural prescription and the project. If left within the WLPZ the encroaching lodgepole pine will continue to encroach on historic meadow areas impacting wildlife habitat, fire risk, and hydrologic function of the meadow.

i. Understory retention

14 CCR § 936.4(b)(6): Within the WLPZ, at least 75% surface cover and undisturbed area shall be retained to act as a filter strip for raindrop energy dissipation, and for wildlife habitat. This percentage may be adjusted to meet site specific conditions when proposed by the RPF and approved by the Director or where broadcast burning is conducted under the terms of a project type burning permit and in compliance with 14 CCR § 935.2(b).

14 CCR § 936.5(e): "H" At least 50% of the understory vegetation present before timber operations shall be left living and well distributed within the WLPZ to maintain soil stability. This percentage may be adjusted to meet on-site conditions when agreed to in the THP by the RPF and the Director. Unless required by the Director, this shall not be construed to prohibit broadcast burning with a project type burning permit for site preparation.

Explanation: The proposed practice is to not retain at least 75% surface cover and undisturbed area to act as a filter strip for raindrop energy dissipation, and for wildlife habitat and not retain at least 50% understory vegetation in the WLPZ. The proposed practice differs from the standard practice in that at least 75% surface cover and undisturbed area to act as a filter strip for raindrop energy dissipation, and for wildlife habitat and not retain at least 50% understory vegetation in the WLPZ may not be retained in the WLPZ.

Justification: Surface cover and understory vegetation is not targeted for removal, however, the level of vegetation will likely be reduced due to disturbance associated with implementation of the silvicultural prescription and channel restoration work.

j. Additional in-lieu or alternative practicesWatercourse mapping

14 CCR § 936.4(a): The RPF or supervised designee shall conduct a field examination of all lakes and watercourses and shall map all lakes and watercourses which contain or conduct Class I, II, III or IV waters.

14 CCR § 1034(x)(9): Location of all watercourses with Class I, II, III, or IV waters.

Explanation: The proposed practice is to map only the location of the main channel of each watercourse. The proposed practice differs from the standard practice in that only the main channel of each watercourse will be mapped.

Justification: Because of the high number of watercourse channels in this seasonally flooded meadow area it would be impossible to map all associated overflow, diverging, converging, braided, terminating, and parallel channels. The location of these channels change naturally on a frequent basis.

Marking in the WLPZ

14 CCR § 936.5(e): "D" To ensure retention of shade canopy filter strip properties of the WLPZ and the maintenance of a multi-storied stand for protection of values described in 14 CCR § 936.4(b), residual or harvest trees shall be marked, including a base mark below the cut-line within the WLPZ by the RPF, or supervised designee. Outside of watersheds with listed anadromous salmonids, sample marking prior to the preharvest inspection is satisfactory in those cases where the Director determines it is adequate for plan evaluation. When sample marking has been used, the remaining WLPZ shall be marked in advance of falling operations by the RPF, or supervised designee. The sample shall be based upon a field examination and shall be consistent with the applicable provisions of 14 CCR §§ 936.4 and 936.5, representing the range of conditions found within the WLPZ. The Director shall determine if the sample mark is adequate for plan evaluation during the preharvest inspection. If sample marking is allowed, the remaining WLPZ shall be marked by an RPF, or supervised designee, prior to the start of timber operations within or adjacent to the WLPZ. The RPF shall notify the Department when the WLPZ has been identified.

14 CCR § 936.5(e): "E" To ensure retention of shade canopy filter strip properties of the WLPZ and the maintenance of a multi-storied stand for protection of values described in 14 CCR § 936.4(b), residual or harvest trees shall be marked, including a base mark below the cut line, within the WLPZ by the RPF or supervised designee. Outside of watersheds with listed anadromous salmonids, tree marking shall be done prior to timber falling operations. In watersheds with listed anadromous salmonids, trees shall be marked in advance of the preharvest inspection. In watersheds with [listed anadromous salmonids], trees shall be marked in advance of the preharvest inspection. For all nonindustrial timber management plans, sample marking of the WLPZ prior to the preharvest inspection may be allowed. The sample shall be based upon a field examination and shall be consistent with the applicable provisions of 14 CCR §§ 936.4 and 936.5, representing the range of conditions found within the WLPZ. The Director shall determine if the sample mark is adequate for plan evaluation during the preharvest inspection. If sample marking is allowed, the remaining WLPZ shall be marked by an RPF or supervised designee prior to the start of timber operations within or adjacent to the WLPZ. The RPF shall notify the Department when the WLPZ has been identified.

Explanation: The proposed practice is to not mark residual or harvest trees in the WLPZ. The proposed practice differs from the standard practice in that residual or harvest trees will not be marked in the WLPZ.

Justification: Only lodgepole pine and other conifers within 100 feet of existing aspen shall be harvested, therefore, marking is by description.

Large woody debris

14 CCR § 936.3(g): Recruitment of large woody debris for instream habitat shall be provided by retaining at least two living conifers per acre at least 16 inches diameter breast high and 50 ft. tall within 50 ft. of all Class I and II watercourses.

Explanation: The proposed practice is to not retain at least two living conifers per acre at least 16 inches diameter breast high and 50 ft. tall within 50 ft. of all Class I and II watercourses where they do not exist

before timber operations. The proposed practice differs from the standard practice in that at least two living conifers per acre at least 16 inches diameter breast high and 50 ft. tall within 50 ft. of all Class I and II watercourses will not be retained where they do not exist before timber operations.

Justification: Retention of at least two living conifers per acre at least 16 inches diameter breast high and 50 ft. tall within 50 ft. of all Class I and II watercourses is not possible in areas where they do not occur before timber operations.

Sanitation salvage

14 CCR § 936.3(f): Where less than 50% canopy exists in the WLPZs of Class I and II waters before timber operations, only sanitation salvage which protects the values described in 14 CCR § 936.4(b) shall be allowed.

Explanation: The proposed practice is to use the Aspen, Meadow, and Wet Area prescription in the WLPZ of Class I and II waters where less than 50% canopy exists in the WLPZs of Class I and II waters before timber operations. The proposed practice differs from the standard practice in that the silviculture will not be limited to sanitation salvage where less than 50% canopy exists in the WLPZs of Class I and II waters before timber operations.

Justification: The Aspen, Meadow, and Wet Area prescription is the appropriate prescription to achieve the objectives of the project.

RIFFLE AUGMENTATION

Quality and beneficial uses of water

14 CCR § 936.3: The quality and beneficial uses of water shall not be unreasonably degraded by timber operations. During timber operations, the timber operator shall not place, discharge, or dispose of or deposit in such a manner as to permit to pass into the water of this state, any substances or materials, including, but not limited to, soil, silt, bark, slash, sawdust, or petroleum, in quantities deleterious to fish, wildlife, or the quality and beneficial uses of water. All provisions of this article shall be applied in a manner which complies with this standard.

Explanation: The proposed practice is to place logs, trees, stumps, rootwads, branches, rocks, soil, gravel, etc. into the existing and design channels of watercourses. The proposed practice differs from the standard practice in that logs, trees, stumps, rootwads, branches, rocks, soil, gravel, etc. will be placed in watercourses.

Justification: Placement of materials in watercourses is necessary to achieve the objective of the meadow restoration. This material may be deleterious to fish, wildlife, or the quality and beneficial uses of water in the short term but this restoration will result in a positive impact over the long term.

The project is intended to improve water quality. Primarily, the improvements will occur from reduced total suspended solids. The existing gully is expanding laterally, headcutting, and adding higher amounts of sediment to the stream compared to more stable channel conditions. Cut and fill activities conducted in the fall in and adjacent to the gully will have no impact on water quality at that time. Similarly, placement of trees and gravel material in the dry channel will have no impacts on water quality. The current channel condition consists of silt, sand, gravel, cobble, and herbaceous vegetation. During spring, flood flows will no longer rapidly erode the stream channel, the headcut will no longer move upstream, and any sediment transported as the result of construction activities will be much less than the amount that would be transported if restoration was not conducted.

Deposition of material in watercourses

14 CCR § 936.3(a): When there is reasonable expectation that slash, debris, soil, or other material resulting from timber operations, falling or associated activities, will be deposited in Class I and Class II waters below the watercourse or lake transition line or in watercourses which contain or conduct Class IV water, those harvest activities shall be deferred until equipment is available for its removal, or another procedure and schedule for completion of corrective work is approved by the Director.

Explanation: The proposed practice is to place logs, trees, stumps, rootwads, branches, rocks, soil, gravel, etc. in Class I and Class II waters below the watercourse or lake transition line. The proposed practice differs from the standard practice in that slash, debris, soil, or other material resulting from timber operations, falling or associated activities, will be deposited in Class I and Class II waters below the watercourse or lake transition line.

Justification: Placement of materials in watercourses is necessary to achieve the objective of the meadow restoration.

Heavy equipment and crossing flagging

14 CCR § 936.4(e): Flagging for heavy equipment use within the WLPZ adjacent to Class I waters and for all tractor road watercourse crossings of all watercourses must be completed before the preharvest inspection if one is conducted or start of operations, whichever comes first. Flagging for heavy equipment use within the WLPZ adjacent to Class II, III and IV waters may be done at the option of the RPF or as required by the Director on a site-specific basis.

Explanation: The proposed practice is to not flag for heavy equipment use within the WLPZ adjacent to Class I waters and for all tractor road watercourse crossings of all watercourses prior to the preharvest inspection if one is conducted or the start of timber operations, whichever comes first. The proposed practice differs from the standard practice in that flagging for heavy equipment use within the WLPZ adjacent to Class I waters and for all tractor road watercourse crossings of all watercourses will not be completed before the preharvest inspection if one is conducted or the start of operations.

Justification: Because of the high number of watercourses (and associated overflow, diverging, converging, braided, terminating, and parallel channels) and the extensive meadow restoration that is part of this project it would be nearly impossible to clearly flag for heavy equipment use within the WLPZ adjacent to Class I waters and for all tractor road watercourse crossings of all watercourses before the preharvest inspection if one is conducted or start of operations, whichever comes first. The approximate location of all watercourse crossings for timber harvesting are mapped. Additional crossings will be needed for channel restoration work. The RPF or supervised designee will work with the LTO to implement the THP including the channel restoration work. A detailed map of the channel restoration work is included at end of Section II and flagging is not necessary.

Additional Justification: The Aspen, Meadow, and Wet Area Restoration will restore the function of the meadow system and result in a far more hydrologically functional system than currently exists. These in lieu practices are necessary to facilitate removal of encroaching lodgepole pine within the WLPZ and to enable the in channel restoration. The channel restoration will enhance the hydraulic gradient which essentially kills the energy and velocity of the stream flow. This effect will aid in the sediment storage function of the meadow as sediment will settle out across the restored meadow. The project is its own mitigation.

The associated watercourses could be subject to sediment input without adequate mitigation and monitoring, however, the in lieu practices will facilitate management activities while not leading to increased watershed impacts. The use of these in lieu practices should not adversely affect the retention and stabilization of areas in the WLPZ. Slopes leading to the watercourses where these in lieu practices are proposed are <1% slope, well vegetated, and mulched with down wood so sediment input is unlikely to occur from harvesting. Therefore, the use of these in lieu practices should not reduce the function of sediment filtering for which the WLPZ is intended.

Alternatives to the Aspen, Meadow, and Wet Area Restoration were considered, however, there are no feasible alternatives to achieve the objectives of the project. The in-lieu practice will provide equivalent, and possibly better, protection to the beneficial uses of water than would the standard rules when viewed at the project level. Using the in-lieu practice will allow encroaching lodgepole pine to be removed from the WLPZ to achieve the objectives of the Aspen, Meadow, and Wet Area Restoration.

ITEM 31: HAZARD REDUCTION

14 CCR §§ 937.2(a) and 937.5(b): Slash to be treated by piling and burning shall be treated not later than April 1st of the year following creation, or within 30 days following climatic access, or as justified in the plan.

Explanation: The piles and concentrations shall be burned at a safe time during the first wet fall or winter weather or other safe period following piling and according to laws and regulations. This practice differs from the standard practice in that landing slash piles created for hazard reduction may be treated later than April 1st of the year following creation or within 30 days following climatic access. All other provisions of 14 CCR § 937.2(a) for hazard reduction shall be complied with.

Location: The alternative may be used within the entire THP area where slash piles are permissible.

Justification: The protection is at least equal to the standard rule because this alternative will provide equal or greater hazard reduction. Slash will be concentrated in the landings so that it is no longer a fuel component of the forested stands. Disposal by burning would then reduce the fuel loading on a landscape perspective. The total amount of slash created will be relatively low, due to the light harvest. Burning of these landing slash piles in the fall of the year following creation represents a further reduction in fire risk. There are several incidents of burnt piles rekindling following spring burning as well as actual escapes. Allowing fall burning of these landing slash piles will assure better consumption of the material and a cool off period throughout the winter months. Although some scorching of surrounding trees may occur, the extent of this damage will not result in conditions that do not meet the silvicultural and stocking requirements of this THP. No excessive buildup of bark beetle populations is expected to occur as a result of this alternative.

ITEM 32: BIOLOGICAL RESOURCES

The Shasta Forests Sustained Yield Plan 00-002-R (12/10/10), Sections FW.I.A through FW.I.D describe the process used by W.M. Beaty & Associates, Inc. to determine which special status species are known, or could potentially occur within the THP and biological assessment area. This process was used for all ownerships within the THP area. Specific to this THP, the biological information sources described in the Shasta Forests SYP were checked including a query of the California Natural Diversity Database (CNDDDB) (September, 2011 version) and the landowner wildlife databases for those USGS 7.5 minute quadrangles encompassing and adjacent to the THP area that comprise the scoping area. These quadrangles are: Burney, Burney Mountain East, Burney Mountain West, Cassel, Chalk Mountain, Hagaman, Hatchet Mountain Pass, Jacks Backbone, Manzanita Lake, Miller Mountain, Thousand Lakes Valley, and Viola. This methodology provides a reasonable assessment of habitat types, elevations, soils, and vegetative communities that could be present with the THP and is representative of the habitats found in the general landscape. Specific operational mitigation measures for each specific species, if necessary, are described in Section II, Item 32 of this THP. The following table lists the wildlife species that are known to, or could potentially occur within the THP area or biological assessment area (see Biological & Watershed Assessment Area Map at end of Section IV). The biological assessment area includes all areas within one mile of the THP area.

Wildlife Species in Biological Assessment Area						
Common Name	Scientific Name	Status	In SYP	In THP Area	In Assessment Area	Pot. Habitat in THP Area
Birds						
American peregrine falcon	<i>Falco peregrinus anatum</i>	BOF	Y	N	Y	N
Bald eagle	<i>Haliaeetus leucocephalus</i>	FE, SE, BOF	Y	N	Y	N
Bank swallow	<i>Riparia riparia</i>	ST	Y	N	Y	N
Great blue heron	<i>Ardea herodias</i>	BOF	Y	N	Y	N
Greater sandhill crane	<i>Grus Canadensis tabida</i>	ST	Y	Y	Y	Y
Northern goshawk	<i>Accipiter gentilis</i>	BOF	Y	Y	Y	Y
Osprey	<i>Pandion haliaetus</i>	BOF	Y	N	Y	N
Purple martin	<i>Progne subis</i>	SSC	Y	N	Y	N
Willow flycatcher	<i>Empidonax traillii</i>	SE	Y	N	Y	N
Mammals						
American badger	<i>Taxidea taxus</i>	SSC-WL	Y	N	Y	N
California wolverine	<i>Gulo gulo</i>	ST	Y	N	N ¹	N
Fringed myotis	<i>Myotis thysanodes</i>	SSC	Y	N	Y	Y
Gray-headed pika	<i>Ochotona princeps schisticeps</i>	SC	Y	N	Y	N
Hoary bat	<i>Lasiurus cinereus</i>	SSC-WL	Y	N	Y	Y
Long-eared myotis	<i>Myotis evotis</i>	SSC	Y	N	Y	Y
Long-legged myotis	<i>Myotis volans</i>	SSC	Y	N	Y	Y
Fisher	<i>Martes pennanti (pacifica) DPS</i>	FC	Y	N	Y	Y
Marten	<i>Martes americana</i>	SSC-WL	Y	N	Y	N
Sierra Nevada red fox	<i>Vulpes vulpes necator</i>	ST	Y	N	N ¹	N
Silver-haired bat	<i>Lasionycteris noctivagans</i>	SSC-WL	Y	N	Y	Y
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SSC	Y	N	Y	Y
Yuma myotis	<i>Myotis yumanensis</i>	SSC	Y	N	Y	Y
Fish, Amphibians, and Reptiles						
Bigeye marbled sculpin	<i>Cottus klamathensis macrops</i>	SSC	Y	N	N ²	N
California red-legged frog	<i>Rana draytonii</i>	FT, SSC	Y	N ³	N ³	N ³
Cascades frog	<i>Rana cascadae</i>	SSC	Y	N	Y	Y
Chinook salmon -spring	<i>Oncorhynchus tshawytscha</i>	FT	Y	N	Y	N
Foothill yellow-legged frog	<i>Rana boylei</i>	SC, SSC	Y	N	Y	N
Hardhead	<i>Mylopharodon conocephalus</i>	SSC	Y	N	N ²	N
Mountain yellow-legged frog	<i>Rana sierra</i>	FC,SC,SSC	Y	N ³	N ³	N ³
Tailed frog	<i>Ascaphus truei</i>	SSC	Y	N	Y	Y
Pit R. Drainage Rough Sculpin/Shasta Crayfish Spring Stream	Pit R. Drainage Rough Sculpin/Shasta Crayfish Spring Stream	ST	Y	N	N ²	N
Pit roach	<i>Lavinia symmetricus mitrulus</i>	SSC	Y	N	N ²	N
Rough sculpin	<i>Cottus asperimus</i>	ST,FC	Y	N	N ²	N
Shasta crayfish	<i>Pacifastacus fortis</i>	FE, SE	Y	N	N ²	N
Sucker Springs pyrg	<i>Pyrgulopsis rupinicola</i>	none	N	N	Y	N
Two-striped garter snake	<i>Thamnophis hammondi</i>	SSC	N	N	Y	N
Western pond turtle	<i>Emys marmorata</i>	SSC	Y	N	Y	N
Mollusks						
Archimedes pyrg	<i>Pyrgulopsis archimedis</i>	none	N	N	N ²	N
Canary duskysnail	<i>Colligyrus convexus</i>	none	N	N	N ²	N
Great basin rams-horn	<i>Helisoma newberryi</i>	none	N	N	N ²	N
Kneecap lanx	<i>Lanx patelloides</i>	none	N	N	N ²	N
Nugget pebblesnail	<i>Fluminicola seminalis</i>	none	N	N	N ²	N
Scalloped juga	<i>Juga occata</i>	none	N	N	N ²	N
Sucker Springs pyrg	<i>Pyrgulopsis rupinicola</i>	none	N	N	N ²	N
Topaz juga	<i>Juga acutiflora</i>	None	N	N	N ²	N
Western ridged mussel	<i>Gonidea angulata</i>	none	N	N	N ²	N
Habitat						
Northern Basalt Flow Vernal Pool	Northern Basalt Flow Vernal Pool	none	N	N	N ²	N

In SYP	Species was assessed in the Shasta Forests SYP No. 00-002-R (12/10/10).				
N ¹	Species once historically occurred (1920's & 1930's trapping), recent surveys indicate currently absent from area.				
N ²	Species does not occur within planning watershed, but within biological assessment area.				
N ³	THP and biological assessment area outside of the historic and current range of the species.				
BOF	Board of Forestry Sensitive	FC	Federal Candidate	FGC	California Fish and Game Code
FE	Federal Endangered	FP	State Fully Protected	FT	Federal Threatened
SC	State Candidate	SE	State Endangered	SSC	DFG Species of Special Concern
ST	State Threatened	WL	Watch List		

Black-Backed Woodpecker: There are no known detections of, or suitable habitat for black-backed woodpecker within or adjacent to the THP area. Black-backed woodpecker is currently a California Endangered Species Act (ESA) candidate species. The breeding season is April 15 to July 15. Breeding habitat in California is generally Sierras, southern Cascades, and Siskiyou Mountains from Tulare County to the Oregon border – coniferous forests (e.g. Sierran mixed conifer, lodgepole, subalpine, and true fir) above 5,000 feet. Excavates nesting cavities in hard snags with highest densities occurring in intensively burned coniferous forests (generally ≤10-years from burn kill). Primary threat is sanitation/salvage logging during the breeding season of: intensively burned conifer stands, or bug infested/diseased conifers, where most of the trees in the stand have recently died. General threat is the removal of hard/sound snags within their breeding habitat. Elevations within the THP area are less than 5,000 feet, no intensively burned coniferous forests or bug infested/diseased stands of conifers occur within the THP area, only Selection and Aspen, Meadow, and Wet Area Restoration will be used, only the Selection area is likely to be operated during the breeding season, all snags (including those with freshly excavated cavities) will be retained to the extent feasible. During timber operations, observations of black-backed woodpecker shall be reported to the RPF so that proper mitigations can be implemented in cooperation with DFG. No impacts to black-backed woodpecker should result from this THP.

Fairy shrimp: Fairy shrimp are reported to occur within the THP area in several wetland basins. As per the Burney Gardens THP No. 2-09-109-SHA(4), the U.S. Fish and Wildlife Service determined this species is not a federally listed vernal pool fairy shrimp. See Section V, Attachments, Dry-Season Sampling for Federally-Listed Large Branchiopods at the Pacific Gas & Electric Company Burney Garden Aspen and Meadow Restoration Project, August 2009. This report was prepared by Helm Biological Consulting for the Burney Gardens THP, No. 2-09-109-SHA(4). No protection measures are necessary.

Willow flycatcher: The DFG - Region 1 geographic information system-based willow flycatcher potential suitable habitat coverage was reviewed. The coverage, based on a non-ground truthed Landsat coverage, identified 13 areas within the THP area that may be potential suitable habitat for the species. Each area was reviewed and found to not support characteristics described by DFG to potentially support the species including: (1) presence of willow species in open dry or wet meadows habitats and, (2) presence of standing or flowing water and, (3) generally less than 5° slopes. The combination of all three characteristics were not found within the 13 areas or within other portions of the THP area.

Native Plants

The Shasta Forests SYP 00-002-R (12/10/10), Section FW.II.D describes the process used to scope for botanical resources that could potentially be located within the THP area. This process was repeated at a more site specific scale specifically for this THP and for all ownerships within the THP area. The scoping area for this THP included all USGS 7.5 minute quadrangles encompassing and adjacent to the THP area. These quadrangles are: Burney, Burney Mountain East, Burney Mountain West, Cassel, Chalk Mountain, Hagaman, Hatchet Mountain Pass, Jacks Backbone, Manzanita Lake, Miller Mountain, Thousand Lakes Valley, and Viola.

Based on the information gathered during the scoping conducted for this THP, those species that are State or Federal listed, or CRPR 1A, 1B, or 2, and known to occur or have habitat within the biological assessment area (see Biological & Watershed Assessment Area Map at end of Section IV) are assessed. The biological assessment area includes all areas within one mile of the THP area. Most plants identified in the scoping process are not listed species.

Plant Species in Biological Assessment Area						
Scientific Name	Common Name	SYP No.	CRPR Status	In THP Area	In Assessment Area	Potential Habitat in THP Area
<i>Asplenium septentrionale</i>	Northern spleenwort	6	2.3	N	Y	N
<i>Astragalus pulsiferae</i> var. <i>suksdorfii</i>	Suksdorf's milk-vetch	9	1B.2	N	Y	N
<i>Botrychium crenulatum</i>	Scalloped moonwort	14	2.2	N	Y	Y1
<i>Botrychium virginianum</i>	Rattlesnake fern	18	2.2	N	Y	Y1
<i>Brasenia schreberi</i>	Watershield	n/a	2.3	N	Y	Y1
<i>Calochortus longebarbatus</i> var. <i>longebarbatus</i>	Long-haired star-tulip	20	1B.2	Y	Y	Y1
<i>Carex comosa</i>	Bristly sedge	24	2.1	N	Y	Y1
<i>Carex lasiocarpa</i>	Woolly-fruited sedge	26	2.3	N	Y	Y1
<i>Clarkia borealis</i> ssp. <i>borealis</i>	Northern clarkia	33	1B.3	N	Y	Y1
<i>Collomia larsenii</i>	Talus collomia	35	2.2	N	Y	N
<i>Cryptantha crinite</i>	Silky cryptantha	37	1B.2	N	Y	N
<i>Drosera anglica</i>	English sundew	42	2.3	N	Y	Y1
<i>Eriogonum pyrolifolium</i> var. <i>pyrolifolium</i>	Pyrola-leaved buckwheat	49	2.3	N	Y	N
<i>Eriogonum umbellatum</i> var. <i>ahartii</i>	Ahart's buckwheat	n/a	1B.2	N	Y	N
<i>Hierochloa odorata</i>	Nodding vanilla-grass	56	2.3	N	Y	Y1
<i>Hulsea nana</i>	Little hulsea	57	2.3	N	Y	N
<i>Juncus digitatus</i>	Finger rush	60	1B.1	N	Y	Y1
<i>Juncus leiospermus</i> var. <i>leiospermus</i>	Red Bluff dwarf rush	62	1B.1	N	Y	Y1
<i>Juncus luciensis</i>	Santa Lucia dwarf rush	63	1B.2	N	Y	Y1
<i>Lysimachia thyrsiflora</i>	Tufted loosestrife	70	2.3	N	Y	Y1
Northern Interior Cypress Forest	Northern Interior Cypress Forest	n/a		N	Y	N
<i>Orcuttia tenuis</i>	Slender Orcutt grass	79	1B.1	N	N ¹	N
<i>Packera indecora</i>	Rayless mountain ragwort	83	2.2	N	Y	Y1
<i>Packera layneae</i>	Layne's ragwort	n/a	1B.2	N	Y	N
<i>Potamogeton praelongus</i>	White-stemmed pondweed	n/a	2.3	N	Y	Y1
<i>Potamogeton filiformis</i>	Slender-leaved pondweed	93	2.2	N	Y	Y1
<i>Potamogeton zosteriformis</i>	Eel-grass pondweed	95	2.2	N	Y	Y1
<i>Potentilla newberryi</i>	Newberry's cinquefoil	97	2.3	N	Y	N
<i>Silene occidentalis</i> ssp. <i>longistipitata</i>	Long-stiped campion	108	1B.2	N	Y	Y1
<i>Silene suksdorfii</i>	Cascade alpine campion	110	2.3	N	Y	Y1
<i>Smelowskia ovalis</i>	Lassen Peak smelowskia	111	1B.2	N	Y	N
<i>Smilax jamesii</i>	English Peak greenbrier	112	1B.3	N	Y	Y1
<i>Stachys palustris</i> ssp. <i>pilosa</i>	Hairy marsh hedge-nettle	113	2.3	N	Y	Y1
<i>Stellaria longifolia</i>	Long-leaved starwort	114	2.2	N	Y	Y1

- Y1 Potential suitable habitat occurs in portions of THP area and potential for significant disturbance where the species may occur is likely, therefore an intensive survey is proposed in focused intuitive portions of the THP area. These searches shall be conducted during the proper blooming period for each species and reference sites for these species shall be visited, whenever possible, to aid in the proper identification of the species.
- Y2 Potential suitable habitat occurs in riparian habitats such as bogs, fens, meadows, seeps, and channel margins, very limited suitable habitat exists within the THP and limited potential disturbance from proposed operations will occur within riparian habitats, therefore an extensive survey is proposed.
- Y3 Potential suitable habitat occurs in the THP area, the species was addressed in the SYP, and potential adverse impacts from proposed operations are unlikely, therefore no further assessment or searches are necessary.
- N No or no potential suitable habitat occurs within THP area.
- N¹ Species does not occur within the planning watershed, but within the biological assessment area.

The California Rare Plant Rank System	
Rank	Status
1A	Plants Presumed Extinct in California
1B	Plants Rare, Threatened, or Endangered in California and Elsewhere
2	Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere
3	Plants About Which We Need More Information - A Review List
4	Plants of Limited Distribution - A Watch List
Rank	Threat
0.1	Seriously threatened in California (high degree/immediacy of threat)
0.2	Fairly threatened in California (moderate degree/immediacy of threat)
0.3	Not very threatened in California (low degree/immediacy of threats or no current threats known)

Species that are state or federal listed, or California Rare Plant Rank 1A, 1B, or 2, and known to occur within the THP area are addressed below.

Long-haired star-tulip: Most of the plant species occurrences are in areas that will not be directly disturbed from riffle augmentation activities. No individual plants were observed where ponds will be created or gullies filled. This species will not be subject to direct disturbance by the project. However, potential changes in the hydrology of the meadow due to implementation of the project may affect the population. The existing populations are seasonally flooded with shallow water (1 to 3 inches) for a period of 30 to 60 days. The meadow restoration and riffle augmentation may increase the depth and duration of flooding which may indirectly result in the loss of some existing habitat for this species. However, because long-haired star-tulips are typically found in the portion of meadow areas with suitable moisture conditions, the aspen enhancement project may increase the amount of habitat available to them due to removal of the encroaching lodgepole pine and restoration of the meadow habitat. The project is expected to benefit this species from: 1) stopping the headcut and dewatering of the meadow; 2) encouraging shallow seasonal flooding of more area of the meadow; and 3) encouraging longer natural flooding of areas and subsequently increasing the shallow groundwater level. These benefits compensate for any temporary impacts that may occur to individual plants that occur along portions of the gully that will rise by adding material to riffles and along the banks. Therefore, any temporary or permanent impacts to individuals would not represent a significant portion of the local population to be considered a significant impact. No long-term negative impacts to this species are expected to occur as a result of this project. Refer to Section III, Item 26d and Section V, Central Valley Regional Water Quality Control Board, 401 Certification Application, for additional information.

ITEM 33: SNAG FALLING/HAZARD REDUCTION

Felling of hazard snags for hazard reduction within 100 feet of all roads or landings will not result in the loss of habitat elements associated with late seral stage timber stands. These snags in later stages of decay throughout these stand types. All unmerchantable snags and live culls >22 inches dbh shall be retained as wildlife snags unless they present a safety or fire access concern. All snags with visible nesting sites of eagles, hawks, owls, waterfowl, or any rare or endangered species shall be left standing as prescribed under 14 CCR §§ 939.1 and 939.2(d). Trees identified with a painted "W" and/or a metal "Wildlife Tree" sign shall similarly be protected and retained.

ITEM 35: WILDLIFE CONSIDERATIONS

In the preparation of this THP substantial efforts have been made to identify, and minimize to insignificant, any possible adverse impacts of operations on wildlife and sensitive plant species. State and federal agencies have been contacted and several databases have been queried (see Section III, Item 32). All sawlog trees to be harvested shall be marked by the RPF or supervised designee prior to operations (exclusive of the Aspen, Meadow, and Wet Area Restoration) and the RPF or supervised designee will have thoroughly inspected the THP area prior to operations. Accordingly, timber-marking crews have and will continue to examine all trees of merchantable size for potential harvest trees. During this inspection, the RPF or supervised designee shall take care to determine if any large stick or obvious cavity nests are present. All trees containing large nests will be identified with a painted "W" and/or a metal "Wildlife Tree" sign. The implementation of this THP will not result in the substantial modification of existing habitats. The desired future condition for the area is an unevenaged

forest that allows for naturally functioning ecosystem processes and future timber harvests. To meet these goals habitat elements with intrinsic wildlife value have been identified (i.e. snags, cull trees, down woody material) and will be retained following harvest. As described above, only those snags specified in Section II, Item 33 may be felled, all large down woody debris will be left intact where feasible.

ANALYSIS OF THP ALTERNATIVES

1. The Project as Proposed

This alternative would allow the proposed operations under the approved THP. This is the most feasible alternative as it meets the objectives of the purpose and need stated above in addition to the goals of the Forest Practice Act (FPA) and Timberland Productivity Act (TPA). As per 14 CCR § 897(b)(1): The goal of forest management on a specific ownership shall be the production or maintenance of forests which are healthy and naturally diverse, with a mixture of trees and under-story plants, in which trees are grown primarily for the production of high quality timber products, and which meet the following objectives:

- Achieve a balance between growth and harvest over time consistent with the harvesting methods within the rules of the Board.
- Maintain functional wildlife habitat in sufficient condition for continued use by the existing wildlife community within the planning watershed.
- Retain or recruit late and diverse seral stage habitat components for wildlife concentrated in the WLPZs and as appropriate to provide for functional connectivity between habitats.
- Maintain growing stock, genetic diversity, and soil productivity.

All of the goals of the FPA stated above have been complied with in this THP. No significant adverse impacts are expected to result from the proposed operations. Mitigation for significant environmental impacts have been included in the THP and implementation and effectiveness monitoring will be conducted to ensure compliance with the THP. As per 14 CCR § 898, on Timber Production Zone (TPZ) lands, the harvesting per se of trees shall not be presumed to have a significant adverse impact on the environment.

2. No Project

The no project alternative would involve no timber harvesting. The site would remain as is. This alternative is not feasible, as it does not meet the goals of the owners, W.M. Beaty & Associates, Inc., the FPA, or the TPA. Additionally the following effects would result:

- The opportunity for timber harvesting would be lost at this time.
- Erosion would not be curtailed from road maintenance associated with this THP and subsequent timber operations.
- Salvage volume would not be captured resulting in the loss of wood volume and waste of the timber resource.
- Stand vigor would decrease due to overstocked stand conditions that would result from foregoing thinning operations and aggressive fuel reduction efforts.
- The risk of complete stand loss from catastrophic fires would be ever increasing due to the increasingly overstocked high fuel load conditions.
- Wildlife habitat would be adversely affected due to the resulting decadent overstocked and possibly destroyed stands from fires.

3. Alternative Land Uses

Alternative land uses could be conducted on the property, other than the proposed project, while achieving some or all of the landowner's objectives and lessening or avoiding one or more potentially significant effects on the environment. Lands under the proposed THP could be used as a timber preserve. This alternative would be similar in effect to the No Project alternative. This alternative is not feasible, as it does not meet the goals of the owners, W.M. Beaty & Associates, Inc., the FPA, or the TPA.

4. Timing of the Project

This alternative would involve carrying out the project at a different time within the decade. This approach could change the cumulative impacts and allow adjacent areas to adjust to new conditions before carrying

out this project. This alternative is not feasible as the lands are managed on continuous cutting cycles that allows for periodic entries in predetermined areas of the ownership. Delaying this entry would cause an increase in the area treated the following year in order to maintain the stand treatment schedule. W.M. Beaty & Associates, Inc. generally manages these lands using light harvests that do not impact the lands to the point that a recovery period is needed prior to implementing another THP in the same watershed. Timber Harvesting Plans adjacent to each other allow for a continuous stand treatment across the ownership without untreated stand blocks with overstocked high fuel load conditions.

5. Alternative Site

Conducting timber operations on an alternative site within the same ownership if the THP would result in a significant effect that could not be mitigated on the proposed site and the effect could be avoided by moving the THP to another location. This alternative is not necessary, as any significant negative effect from the proposed operations has been mitigated in the THP.

6. Public Acquisition

This alternative consists of limitations on management activities through public acquisition of the land or donation or sale of conservation easements. The landowner must be a willing seller for public acquisition to be a viable alternative and there would have to be willing buyers. A conservation easement could restrict timber harvesting over part or all of the property where the harvesting could cause a significant effect on the environment. The landowner would need to be willing to grant the easement, the easement would need to be tailored to avoid a particular problem, and an entity would need to be found to accept the easement. The entity could be a public agency or possibly a non-profit organization that is involved with conservation easements. A conservation easement could apply to a riparian corridor, a stand of old growth timber, an archaeological site, or a hiking trail corridor. This alternative is not feasible, as it does not comply with the FPA, or the TPA. Additionally the majority of the owners have chosen to have their lands managed for economic return and are therefore not willing sellers.

7. Channel Work

See Section V, Burney Gardens Meadow Restoration, Shasta County, California, Meadow Restoration Design, prepared for Fall River Resource Conservation District in cooperation with Pacific Gas and Electric, September 10, 2010, Alternative Evaluation and Recommended Design.

SECTION IV: CUMULATIVE IMPACTS ASSESSMENT

STATE OF CALIFORNIA
 BOARD OF FORESTRY
 CUMULATIVE IMPACTS ASSESSMENT

- (1) Do the assessment area(s) of resources that may be affected by the proposed project contain any past, present, or reasonably foreseeable probable future projects? Yes No

If the answer is yes, identify the project(s) and the effected resource subject(s).

- (2) Are there any continuing, significant adverse impacts from past land use activities that may add to the impacts of the proposed project? Yes No

If the answer is yes, identify the activities, describing their location, impacts, and the affected resource subject(s).

- (3) Will the proposed project, as presented, in combination with the past, present, or reasonably foreseeable probable future projects identified in items (1) and (2) above, have a reasonable potential to cause or add to significant cumulative impacts in any of the following resource subjects?

<i>Impact Assessment</i>	<i>Yes After Mitigation (a)</i>	<i>No After Mitigation (b)</i>	<i>No Reasonably Potential Significant Effects (c)</i>
1. Watershed			X
2. Soil Productivity			X
3. Biological			X
4. Recreation			X
5. Visual			X
6. Traffic			X
7. Other: Greenhouse Gases			X

- a. Yes, means that potential significant adverse cumulative impacts are left after application of the forest practice rules and mitigations or alternatives proposed by the plan submitter.
- b. No after mitigation means that any potential for the proposed timber operation to cause or add to significant adverse cumulative impacts by itself or in combination with other projects has been reduced to insignificance or avoided by mitigation measures or alternatives proposed in the THP and application of the forest practice rules.
- c. No reasonably potential significant cumulative effects means that the operations proposed under the THP do not have a reasonable potential to join with the impacts of any other project to cause, add to, or constitute significant adverse cumulative impacts.

- (4) If column (a) is checked in (3) above, describe why the expected impacts cannot be feasibly mitigated or avoided and what mitigation measures or alternatives were considered to reach this determination. If column (b) is checked in (3) above describe what mitigation measures have been selected which will substantially reduce or avoid reasonably potential cumulative impacts except for those mitigation measures or alternatives mandated by the application of the rules of the Board of Forestry.
- (5) Provide a brief description of the assessment area used for each resource subject.
- (6) List and briefly describe the individuals, organizations, and records consulted in the assessment of cumulative impacts for each resource subject. Records of the information used in the assessment shall be provided to the Director upon request.

PAST AND FUTURE ACTIVITIES

The assessment area for past and future activities is 33,511 acres and is comprised of all or portions of the following six CalWater version 2.2.1 planning watersheds:

- 5526.310102 Dry Burney Creek
- 5526.330203 Green Burney Creek
- 5507.320102 Huckleberry
- 5526.330202 Jackrabbit Flat
- 5526.330201 Terry Lake
- 5526.330101 Whittington Butte

The assessment area for past and future activities is comprised of the biological and watershed assessment areas (see Biological & Watershed Assessment Area Map at end of Section IV). The watershed assessment area includes the two CalWater version 2.2.1 planning watersheds that the THP lies within. The biological assessment area includes all areas within one mile of the THP area. The guidelines offered by the California State Board of Forestry and Fire Protection, Technical Rule Addendum No. 2, were used as the rationale for the establishment of the assessment area.

The location and boundaries of past, present, and reasonably foreseeable probable future timber harvesting projects on land owned or controlled by the timberland owners of this THP within the watershed assessment area are illustrated on the Past, Present, & Future Projects Map at end of Section IV.

Past Activities

Past activities are limited to those projects submitted within 10 years prior to submission of this THP. Within the assessment area 17,006 acres (51%) has been harvested. The majority of the area was harvested using the evenage clearcut method at 4,147 acres (12%) followed by the shelterwood removal method at 3,585 acres (11%). Unevenage methods used included the selection method at 3,053 acres (9%) followed by the group selection method at 2,478 acres (7%). The remainder of the harvesting was completed using the commercial thinning intermediate treatment at 2,104 acres (6%) followed by the sanitation salvage intermediate treatment at 1,282 acres (4%) along with the fuelbreak special prescription at 96 acres (<1%). The following table contains a list and brief description of past projects that have occurred in the assessment area.

PAST ACTIVITIES IN ASSESSMENT AREA												
Number	Name	Landowner	Acres	CC	CT	FB	GS	SEL	SS	SWR	NH	RW
Dry Burney Creek Planning Watershed												
2-01-213-SHA	Whittington South	SPI	1,904	440	1,389					75		
2-02-225-SHA		SPI	4				4					
2-02-259-SHA	Horse Heaven	FGS	58	58								
2-04-130-SHA	Green Burney	SPI	238	238								
2-04-177-SHA	Jack Daniel	SFT	1,365		89	42		1,234				
2-05-149-SHA		SFT	82					82				
2-06-116-SHA	Tamgard	SPI	385	385								
2-06-129-SHA	Quail Hunt	SPI	108	108								
2-06-138-SHA	Bovine	SPI	12	12								
2-09-070-SHA		SPI	7	7								
2-09-109-SHA	Burney Gardens	PG&E	295	144	151							
2-10-087-SHA	Hunt Ridge	FGS	38	17					21			
2-11-058-SHA	Red Horse	FGS	2	2								
Total			19,471	1,411	1,629	42	4	1,316	21	75	0	0
Green Burney Creek Planning Watershed												
2-03-088-SHA		SPI	729	729								
Total			737	729	729	0	0	0	0	0	0	0
Huckleberry Planning Watershed												
2-02-225-SHA	Old Dan	SPI	696	110			560				26	
2-04-177-SHA		SFT	1,184		11	40		1,133				
2-05-149-SHA	Table Mountain	SFT	2,263			14	1,914	95	201		39	
2-06-138-SHA		SPI	405	405								
Total			1,376	4,548	515	11	54	2,474	1,228	201	0	65
Jackrabbit Flat Planning Watershed												
2-01-114-SHA	Tamzee	FGS	3,252	93	105			59		2,995		
2-05-123-SHA	Jack Whitt	SPI	212	212								
Total			730	3,464	305	105	0	0	59	0	2,995	0
Terry Lake Planning Watershed												
2-05-123-SHA		SPI	9	9								
Total			124	9	9	0	0	0	0	0	0	0
Whittington Butte Planning Watershed												
2-01-114-SHA		FGS	634	28	32			59		515		
2-04-130-SHA		SPI	149	149								
2-05-123-SHA		SPI	282	282								
2-06-116-SHA		SPI	3	3								
2-09-070-SHA	Whittnew	SPI	404	404								
2-10-087-SHA	Hunt Ridge	FGS	667	32	7			391	40			
2-11-079-SHA	Dry Garden	FGS	1,619	280	320				1,020			
Total			11,073	3,758	1,178	359	0	0	450	1,060	515	0
Total			33,511	17,006	4,147	2,104	96	2,478	3,053	1,282	3,585	65
Percent			100%	51%	12%	6%	<1%	7%	9%	4%	11%	<1%

BAA Biological Assessment Area WAA Watershed Assessment Area
 CC Clear cut CT Commercial Thinning FB Fuelbreak
 GS Group Selection SEL Selection SS Sanitation Salvage
 SWR Shelter wood Removal NH No Harvest RW Right-of-Way

Future Activities

Future timber harvesting is anticipated to continue at a similar rate and with similar prescriptions due to the composition of primarily industrial timberlands within the assessment area. A possible instream meadow restoration project is being considered within the meadow along Burney Creek in the area covered by the north unit of this THP.

Cumulative Effects

Although the past activities included a moderate rate of evenage prescriptions, these areas receive prompt and effective reforestation efforts to quickly reestablish the forest stands. Therefore, the impact of the past and future evenage methods will not result in adverse impacts. No cumulative effect on past and future activities is expected to occur as a result of this THP when combined with other past and future activities.

A. WATERSHED RESOURCES

The assessment area for watershed resources is comprised of the two CalWater version 2.2.1 planning watersheds that the THP lies within (5526.330101, Whittington Butte and 5526.310102, Dry Burney Creek) (see Biological & Watershed Assessment Area Map at end of Section IV). The guidelines offered by the California State Board of Forestry and Fire Protection, Technical Rule Addendum No. 2, were used as the rationale for the establishment of the assessment area. Beneficial uses of water, watershed effects, and watercourse condition were assessed.

A.1 WATERSHED DESCRIPTIONS

As authorized in 14 CCR §§ 1091.1(b) and 1091.2 this THP will rely on information and conclusions in the Shasta Forests SYP No. 00-002-R (12/10/10) for the purpose of cumulative watershed impacts assessment on Shasta Forests Timberlands as explained in the Shasta Forests SYP, Section WA.I.A, Introduction. A cumulative impacts assessment is provided for the portion of the THP partially within the SYP assessment area and on other ownerships.

A.1.a Dry Burney Creek Planning Watershed

Planning watershed 5526.330102 comprises the south half of the watershed assessment area and covers 19,471 acres. Elevation ranges from 8,677 feet at Crater Peak to 4,800 feet north of a wet meadow area called "The Gardens". The Dry Burney Creek Planning watershed drains to the Pit River. This planning watershed does not support anadromous salmonids, standard FPR will apply.

Dry Burney Creek flows into Burney Creek from the east. The headwaters of Dry Burney Creek are on the USFS Lassen National Forest and the watercourse flows approximately 3.5 miles northwest into "The Gardens". Burney Creek begins where the Howard Springs drainage and Dry Burney Creek join. Water flows in portions of Dry Burney Creek into late spring. Most of the precipitation between late fall and early spring is in the form of snow. Snowmelt creates flows that form many of the braided channels that flow into Dry Burney Creek. Dry Burney Creek is a Class III watercourse that flows into "The Gardens" on PG&E. The channel gradient of Dry Burney Creek is very low (<1 to 2%) creating many braided channels.

There are many ownerships within this planning watershed. Pacific Gas & Electric Company owns approximately 1,000 acres at "The Gardens" which was originally acquired as a reservoir site. This PG&E property is currently subject to potential disposition by the Pacific Forest and Watershed Stewardship Council. Shasta Forests Timberlands is 1,428 acres (7%) of the planning watershed. The USFS Thousand Lakes Wilderness Area is located in the upper reaches to the southeast. The area west of the wilderness is also managed by the LNF. The remaining property west and northwest of the LNF is managed by large private industrial timberland owners with a few small private parcels scattered between the larger ownerships. Most of the timberland within this planning watershed (exclusive of the wilderness area) is managed for timber production; however, ranchers lease much of this private property for "open range" cattle grazing. There are no known domestic water uses in this planning watershed.

A.1.b Whittington Butte Planning Watershed

Planning watershed 5526.330101 comprises the north half of the watershed assessment area and covers 11,073 acres. Elevation ranges from 5,600 feet on Whittington Butte to 3,960 feet on Burney Creek. The Whittington Butte Planning Watershed drains to the Pit River. Burney Creek is the primary watercourse in this planning watershed. Burney Creek flows north entering the Pit River at Lake Britton. From Lake Britton the water is released into the Pit River which subsequently flows west into the Sacramento River at Shasta Lake. This planning watershed does not support anadromous salmonids, standard FPR will apply.

Burney Creek is the primary watercourse in the planning watershed and is a perennial fish bearing watercourse at the northern end of the planning watershed. The headwaters of Burney Creek are west of the Dry Burney Creek Planning Watershed. Portions of Burney Creek have perennial flow.

Timber stand composition is predominately mixed conifer with lodgepole pine regenerating in many of the wetter areas.

Landowners in the planning watershed consist primarily of Fruit Growers Supply Company, Sierra Pacific Industries, and the USFS Lassen National Forest with a few small private parcels. Most of the timberland within this planning watershed (exclusive of the wilderness area) is managed for timber production; however, ranchers lease much of this private property for "open range" cattle grazing. There are no known domestic water uses in this planning watershed.

The site of the former Green Burney Gardens California Conservation Corps Camp is located in the northeast corner of the planning watershed. Snow Mountain Hydropower is also located in the northeast corner of the planning watershed. This is an active hydropower facility that uses water from Burney Creek at the confluence of Green Burney Creek. The PG&E Canadian Natural Gas Pipeline transects this planning watershed.

A.2. Beneficial Uses of Water

The watershed assessment area is located within the Sacramento River Basin. The Central Valley Regional Water Quality Control Board (CVRWQCB) addresses water quality issues within this basin. The governing document of the Central Valley Region is the 2009 Water Quality Control Plan (Basin Plan), Fourth Edition.

The CVRWQCB lists the following beneficial uses for the Pit River surface water bodies from the mouth of Hat Creek to Shasta Lake:

- Municipal and Domestic Supply
- Agriculture - Irrigation, Stock Watering
- Industry - Power
- Recreation - Contact, Canoeing, Rafting, Other Non-contact
- Fresh Water Habitat - Warm, Cold
- Spawning - Warm, Cold
- Wildlife Habitat

Other beneficial uses include:

- Preservation of rare and endangered species
- Industrial service supply
- Ground water recharge
- Freshwater replenishment

Major capital improvements include:

- Snow Mountain Hydropower
- PG&E Canadian Natural Gas Pipeline

There are several known water diversions and domestic uses within the watershed assessment area. These are described in Water Supply and Hydropower below.

Potential impacts include impacts to threatened and endangered aquatic species, non-point sources including risk of erosion and sedimentation from timber operations, and risk of landslides that may deposit large quantities of sediment into watercourses. These risks should be minimized due to the mitigations included in this THP. Additionally, risk of impacts will be minimized through implementation, forensic, and effectiveness monitoring of activities conducted under the required by the CVRWQCB. This monitoring is qualitative and visual. Adherence to the California Forest Practice Rules as well as voluntary measures applied as necessary to protect watershed resources will further minimize the risk of impacts to beneficial uses.

The Pit River is on the CVRWQCB 303d list for nutrients (agriculture and agriculture-grazing), organic enrichment/low dissolved oxygen (agriculture and agriculture-grazing), and temperature, water (agriculture and agriculture-grazing). Lake Britton on the Pit River is on the CVRWQCB 303d list for mercury (resource extraction). The project will restore meadows and wet areas, and the hydrologic benefits of them, and correct

impacts resulting from grazing. Therefore, no potential impacts of the proposed project are anticipated that when combined with the listed stressors of the watercourses in the concerned watersheds would result in any adverse cumulative watershed impacts.

A.3. Watershed Effects

Sediment effects, water temperature effects, organic debris effects, chemical contamination effects, and peak flow effects were assessed.

A.3.a. Sediment Effects

Due to the gentle topography within all WLPZs and ELZs in the watershed assessment area, the slopes adjacent to most watercourses are stable. This greatly reduces the risk of erosion and sediment input to the watercourses.

The construction of road segments in the 1960s often occurred within current WLPZs and ELZs. The associated watercourses could be subject to sediment input without proper road maintenance, adequate erosion control facilities, and proper grading practices. These roads are generally reused during timber operations and are most often stable roads that will facilitate management activities and not lead to increased watershed impacts if properly maintained during and after operations. Timber harvests within WLPZs and on hill slopes usually retain much more vegetation, canopy, and structure than the Forest Practice Rules require. Therefore, the location of a short segment of road within a WLPZ does not necessarily reduce the function of buffering capacity for which the WLPZ was intended, or indicate the need to abandon or relocate the road segment. Additionally, use of existing roads eliminates the need to construct new roads outside of the WLPZ that would result in further soil disturbance.

Mitigations for the use of roads within WLPZs consist of the prevention of sidecast during road surface grading and waterbreak construction operations and the use of drivable waterbars that cannot be easily damaged from use during wet conditions. In site specific circumstances the road segments within the WLPZ may be surfaced with straw mulch to minimize sediment movement from the road into the adjacent watercourse. Evaluation of each road occurs in the THP preparation process to determine its suitability and the need for improvements to minimize potential impacts associated with sediment delivery to a watercourse. Roads that are not necessary or cannot be used for operations without contributing sediment to the adjacent watercourse will be abandoned. When viewed in relation to what the minimum Forest Practice Rules require for road maintenance, fewer impacts to upslope stability generally result from proposed operations. This is due to the high retention of vegetation after operations, increased stand structure over time, low to moderate bare soil erosion potential, and re-establishment of skid trail waterbreaks.

The watercourse banks and channels within the watershed assessment area are stable for most of their length, exclusive of short degraded segments within the lower meadow reaches, although some changes have and continue to occur.

Improvements to existing crossings, landings and road locations within the plan area are proposed under this THP. These upgrades include the removal of a plugged culvert and re-location and abandonment of a road segment and landing within a Class III watercourse. These improvements will reduce the amount of potential sediment that could be delivered to watercourses caused by road use or crossing failure.

A.3.b. Water Temperature Effects

The early logging entries, which occurred many years prior to the 1973 Forest Practice Act (FPA), removed much of the large timber along watercourses. The result of these historical practices was a reduction in streamside vegetation, particularly coniferous species. These trees previously formed the main canopy that provided shade for the watercourse and are an essential component. Areas of sparse overstory conifer canopy closure exist along Burney Creek within the watershed assessment area. In these areas lacking shade, water temperatures may become elevated and possibly detrimental to some aquatic species in a very localized manner. However, the majority of Burney Creek within the historically timbered areas has ample shade from the streamside canopy. Other portions of Burney Creek are lacking streamside canopy due to the natural physiography of the terrain and the open meadow areas. Presently the majority of Burney Creek, a Class I watercourse, is composed of an overstory characterized by 12 to 24-inch DBH conifers of moderate

density which, when combined with the hardwood and shrub component, are providing a suitable shade component for many reaches. Therefore, increased water temperatures, which could be detrimental to some aquatic species, has not been noted and is not believed to be occurring within the watershed assessment area. The unevenage silvicultural prescriptions used in WLPZs, exclusive of the meadow restoration area, will continue to increase canopy cover and average tree diameter over time.

A.3.c Organic Debris Effects

In many mountain streams, LWD may play an important role in controlling channel morphology, storing sediment and organic debris, and creating fish habitat within this response reach, although the function of LWD in Sierran streams is not as critical as in coastal streams. Organic debris and streamside vegetation is abundant within the majority of the THP area. Most watercourses have adequate vegetation on the banks and an abundance of organic debris, which create diversions and subsequently braided channels. Seasonal flood events periodically flush accumulated debris from many of these Class III watercourses.

A.3.d. Chemical Contamination Effects

Potential sources of contamination effects include run-off from roads that are treated for dust abatement, run-off from herbicide treatments, and contamination from equipment fuels and oils. Watercourse and Lake Protection Zones along Class I and Class II watercourses, ELZs along Class III watercourses, and the water drafting guidelines provided in this THP will mitigate potential chemical contamination. In addition all fuel storage and placement during operations will comply with all state regulations.

The area under this THP will be harvested does not require artificial reforestation to meet MSP or stocking standards and therefore will not require the use of herbicides to facilitate the establishment of regeneration. However, herbicide use is anticipated in many of the group selection harvest areas.

A.3.e. Peak Flow Effects

Annual precipitation in the watershed assessment area is between 30 to 50 inches depending on elevation and geographic position. Approximately 40 to 50% of this precipitation comes in the form of snow. Flood conditions as a result of intense rain are infrequent in the watershed assessment area. Late spring, summer, and early fall rainfalls seldom occur, with the exception of infrequent intense thunderstorms. Rainfall intensity is moderate as indicated by the 2-year, 1-hour rainfall intensity of 0.4 to 0.5 inches. Deep, somewhat porous soils provide adequate infiltration rates for the typical moderate precipitation, thus reducing the risk associated with surface runoff.

Snow pack depths vary from 1 to 4 feet and are generally not sufficient to cause spring snowmelts that produce detrimental flooding. The watershed assessment area is dominated by heavily forested areas with large openings dominated by brush, and other open meadow areas where young evenage stands exist as a result of reforestation efforts. More precipitation reaches the ground in the unforested areas than in the adjacent forested areas. These large open areas and immature evenage stands are susceptible to rapid melting from rain-on-snow events, warm winds, and solar radiation. Rain-on-snow events have the potential to generate higher flows that could result in channel erosion. However, because of the low annual precipitation, moderate precipitation intensity, moderate topography, porous soils, and low percentage of hydrologically immature vegetation types, the watershed assessment area is relatively safe from peak flow effects. The meadow restoration associated with this THP will restore the flood buffering ability of the meadow areas.

A.4. Watercourse Condition

Stream channel condition assessments were conducted for primary watercourses within the watershed assessment area. Peak flows have the greatest effect on stream channel conditions in the watershed assessment area. These effects may be exasperated by management activities when soils become exposed and sediment is transported into the stream channels. Other effects on stream channel conditions that may be caused by management activities is the reduction in streamside vegetation which has an effect on water temperature, sediment transport, and organic matter content. Due to the influence peak flows have on stream channels, a strong emphasis was placed on stream reach responses to peak flows when describing the following stream channel conditions. Further emphasis was placed on streamside vegetation and how it has been affected by past events whether naturally caused or through management activities.

Burney Creek and Dry Burney Creek flow through the THP area and the extensive response/deposition area of "The Gardens". These watercourses have generally uniform gradients and similar watercourse characteristics. Stream channel gradients are low (1 to 3%). Water flowing on loam soils made up of alluvium material deposited through time have formed these watercourses and associated braided channels. Since these watercourses are within the snow zone, the melting of snow and past rain-on-snow events have helped to create many of these braided channels. During normal snow melt and rain-on-snow events it is common and desirable for water to overflow the banks in the meadow areas.

Flow within these watercourses does not occur year around and the duration of flow during the dry months depends on wet season rain and snowfall pack depths. It is common for saturated soil conditions to exist in the meadow areas into July. Lodgepole pine, cottonwood, willow, alder, gooseberry, and wild rose can be found along these watercourses and the density is moderate. Embedded gravels, aggrading, and bank cutting occurs to a moderate degree. This is mostly due to the alluvium deposits, which tend to be unconsolidated and poorly bedded, that make these streamside soils more susceptible to erosion. Another factor contributing to this at a lesser degree is cattle grazing within these lodgepole flats. Streambank trampling and vegetation loss has been observed within these watercourses.

The upper reaches of these watercourses flow on soils that are underlain by volcanic rock making the watercourse banks moderately stable.

The DFG has stocked trout in Burney Creek since the 1950s.

A.5. Cumulative Effects

No cumulative effect on watershed resources is expected to occur as a result of this THP.

B. SOIL PRODUCTIVITY

The assessment area for soil productivity impacts is limited to the THP area. The guidelines offered by the California State Board of Forestry and Fire Protection, Technical Rule Addendum No. 2, were used as the rationale for the establishment of the assessment area. Organic matter loss, surface soil loss, soil compaction, and growing space loss were assessed.

B.1. Organic Matter Loss

Organic material loss is not a concern due to the retention of down woody material, ample vegetative cover, and snags which will mitigate organic material loss. Evenage management reduces ground-cover vegetation and organic matter which generally results in an increase in surface runoff and peak flows. When unevenage management is used, the reduction of ground-cover vegetation and organic matter is primarily limited to skid trails. Additional exposed soils occur on roads and landings.

The harvest under this THP will remove a large portion of the standing biomass from the forested meadow areas, and a moderate portion from the forest areas and therefore a small portion of the site nutrients. However, nutrient availability is not nearly as limiting a factor on forest productivity as are moisture availability and the short duration of the growing season. Removal of a small percentage (<5%) of site nutrients from the forest area will not affect vegetative growth because the soil retains a nutrient bank. The vast majority of site nutrients remain on-site, after commercial thinning, in the form of residual vegetation, harvested tree crown biomass, litter, and that amount held by the soil itself. While thinning may temporarily modify nutrient cycling, it does not interrupt it. A much greater proportion of soil nutrients are removed through uncontrolled, catastrophic fire than through mechanized thinning and chipping operations that tend to reduce occurrences of this type of fire.

B.2. Surface Soil Loss

Soil loss should be insignificant due to standard erosion control practices and the moderate topography within the THP and watershed assessment area. The entire THP area has a low to moderate EHR (California State Board of Forestry and Fire Protection, Technical Rule Addendum No. 1, February 1, 1990) based on slope, high percentage of vegetative cover retained after harvest, and soil characteristics. Winter operating restrictions also reduce the likelihood of soil erosion.

Surface soil loss is most commonly the result of erosion, but mechanical site preparation, skidding, and other ground disturbing operations may also cause displacement. Surface soil loss largely occurs on hillslopes in combination with the removal of high proportions of vegetation.

Proposed operations in the forest areas will generally retain a low EHR due to a high percentage of residual vegetation cover combined with the slope, climate, and soil characteristics. Activities on ownerships that incorporate evenage management methods or the rehabilitation of understocked areas, may temporarily render some sites nearly de-vegetated. Complete elimination of vegetation, however, is not the desired objective and rarely occurs. Reforestation following site preparation is expeditious, encouraging prompt re-establishment of desired surface vegetation and root systems. Soil loss should be insignificant due to standard erosion control practices employed in site preparation contracts which often require the use of brush rakes, retention of topsoil, organic matter, and LWD, and ripping on contour where needed. Site preparation activities that include ripping on contour to ameliorate historical soil compaction also reduce surface soil erosion. This occurs because the increased soil porosity reduces surface runoff and because the ripped rows also function to dissipate surface flow and trap sediment. The low amount of exposed soils, implementation of evenage implementation guideline parameters, standard Forest Practice Rules, and operational mitigations included in THPs will reduce to insignificance any soil loss impacts from proposed operations.

Snags and down woody debris are considered important components for stabilizing surface soil and will be retained to the extent that they meet stand management and regeneration objectives.

Roads and landings used in conjunction with timber operations are maintained in accordance with the requirements of the Forest Practice Rules. The required and prudent use of waterbreaks, stabilization of road running surfaces, and maintenance of drainage ditches are generally sufficient to minimize surface soil losses.

B.3. Soil Compaction

Some initial harvest entries within the assessment area may have occurred during adverse conditions and resulted in soil compaction. Historically, heavy equipment was used to harvest large timber with much less regard for soil resources than is currently used.

The THP area is generally managed on a 10 to 15-year cutting cycle with occasional sanitation-salvage intermediate treatments in between. This frequent re-entry cycle creates additional risk of soil compaction from frequent use of ground-based mechanical harvesting equipment. Risk would naturally increase during periods with multiple salvage entries. These salvage entries have generally been light harvests which cause limited disturbance on a per acre basis. Regular entries within the THP area typically use the selection regeneration method. These are low volume per acre harvests which do not pose a high risk of soil compaction at water contents near field capacity. Other evenage harvests within the watershed assessment area occur once in the life of the stand with intermediate treatments to control stocking. This reduces the risk of soil compaction due to the infrequent entries. Additionally, most compaction occurs on skid trails and landings which are not devoted to growing timber. Most skid trails and landings are already in place and used for subsequent management activities so the effect of operations proposed under this THP on cumulative soil productivity from soil compaction are insignificant.

Mechanical site preparation activities and some intensive harvest prescriptions have the potential to result in soil compaction due to the extensive ground coverage by heavy equipment. Compaction potential is greatest when soil moisture is near field capacity. Soil compaction can affect site productivity by reducing large pores that transmit air and water in the soil and by restricting root penetration. Some soil types may be susceptible to compaction from certain harvesting and site-preparation activities, particularly clay soils near field capacity. The soil texture predominant within the THP area is loam and sandy loam. These texture classes are relatively resistant to compaction. Harvest operations are restricted during the winter period, from November 15th to April 1st, to prevent compaction of soils when soil moisture is near field capacity. Winter operation limitations will adequately mitigate possible adverse impacts to soil compaction.

Mechanical site preparation is typically limited to summer and early fall months (July 1st – September 15th) when soils are not excessively wet. In areas where compaction has historically occurred, site preparation often includes ripping to a depth of at least 20" to ameliorate the effects of compaction. This improves the physical

properties of the soil which improves water percolation and retention and root growth. Ripping on contour has the added benefit of reducing surface soil erosion by trapping sediment and reducing surface runoff. Site preparation will not occur on this THP.

B.4. Growing Space Loss

The loss of growing space on property devoted to commercial timber production is primarily associated with road building. No additional loss of growing space should occur on the THP area as the only new road construction planned will replace an existing road that will be abandoned. For all operations on the THP area, existing tractor roads will be used to the greatest extent practical. Any "loss" of growing space from roads, landings, and skid trails is accounted for in a reduction of the LTSY. Growing space, and resultant LTSY, will be slightly increased due to the short segments of proposed road abandonment.

B.5. Cumulative Effects

No cumulative effect on soil productivity is expected to occur as a result of this THP.

C. BIOLOGICAL RESOURCES

The assessment area for biological resources is the THP area plus one mile (see Biological & Watershed Assessment Area Map at end of Section IV). The boundaries for this assessment represent an area where species using large home ranges could possibly be affected. The guidelines offered by the California State Board of Forestry and Fire Protection, Technical Rule Addendum No. 2, were used as the rationale for the establishment of the assessment area. Known rare, threatened, or endangered species, significant known wildlife or fisheries resource concerns, aquatic and near-water habitat conditions, and biological habitat condition were assessed.

C.1. Known Rare, Threatened, or Endangered Species

There are no known rare, threatened, or endangered species within the THP area or within the biological assessment area that will be affected by the project.

C.2. Significant Known Wildlife or Fisheries Resource Concerns

The following listed species are within the THP area and mitigations are provided.

Fisher: *Federal Candidate*. There are no known detections of fisher within or adjacent to the THP area, however habitat for the species exists within and adjacent to the THP area. Fisher is currently a federal ESA candidate species. The Department of Fish and Game recommended the species is not warranted for listing under the state ESA and Fish and Game Commission determined and certified on September 15, 2010 the species as a not warranted for listing under the state ESA. During timber operations, if a fisher den or a female with young is observed, operations shall cease 0.25 miles and the LTO shall notify the RPF so that proper mitigations can be implemented.

Greater sandhill crane: *State Threatened*. This species has been reported to exist within the THP area in Section 1, T33N, R2E. During and prior to operations conducted in any year under this THP, field personnel shall remain vigilant for indications of sandhill cranes presence within the THP area. If sandhill crane nesting behavior is observed, operations will cease immediately within 0.5 miles of the nest until a consultation with DFG can be conducted.

Northern goshawk: *BOF Sensitive*. The species is reported to occur within the THP area in Section 14, T33N, R2E. The location of this nest site and buffer zone are indicated on the Biological Resource Map at end of Section II. Direct consultation with WBA Wildlife Biologist Stuart Farber was conducted and mitigations measures were developed according to 14 CCR § 939.3.

Long-Haired Star Tulip (*Calochortus longebarbatus* var. *longebarbatus*): *CRPR 1B.2*. This species is known to occur in the open meadow area of the project and surrounding area. Approximately 2,100 plants were found during surveys in 2009, and more likely occur in additional open meadow habitat that were not surveyed outside of the THP area. Based on the location within the meadow, this species is occurring in the wettest portions of open meadow habitat. These areas remain flooded in shallow water (1-3 inches) for a period of 30-60 days. Because operations will not take place until the soil is dry there is a high likelihood that the plants will have gone to seed before operations commence.

C.3. Aquatic and Near-Water Habitat Conditions

Pools and riffles, large woody material, and near-water vegetation were assessed.

C.3.a. Pools and Riffles

Refer to Section III, Site Description, Watershed and Stream Conditions, and Section IV, Watershed Resources, Watercourse Condition, for stream channel conditions. As part of the riffle augmentation within the Burney Gardens Meadow, channel(s) that are larger than historical dimensions will be filled, while those that are close to historical dimensions will be reveted with trees and gravel/rock material (referred to as riffle augmentation/revetment) so they mimic a natural shape. The methods used include excavating material to create ponds in order to fill the gullies, moving earth material to reconnect remnant channels, shaping fill areas, transplanting willow and sod at key stress areas (e.g. downstream face of plugs), adding gravel/rock to riffles, and removing trees and placing them in riffle augmentation/revetment areas.

C.3.b. Large Woody Material

Large woody debris (LWD) is an important aspect of the watercourses in the watershed assessment area. It not only provides habitat for aquatic species but perhaps more importantly it provides structure and stability to the watercourses and serves other hydrologic functions such as sediment storage and metering. This LWD component aids in reducing the amount of scour, bank cutting, and down cutting within the watercourses which helps limit the amount of sediment from channel erosion that is transported downstream.

The channel and banks of each of the transport reaches are formed primarily from bedrock or colluvial material made up of medium to large sized boulders. The response reaches of each watercourse are primarily made up of alluvial material that has been transported down from these upper reaches. In many mountain streams, LWD may play an important role in controlling channel morphology, storing sediment and organic debris, and creating fish habitat within response reaches, although the function of LWD in Sierran streams is not as critical as in coastal streams (Berg et al. 1998). Large woody debris may be more important as a structural component in response reaches than it is along transport reaches because of stream gradient, width and the general difference in watercourse bank and channel substrate.

Streamside conifers, on a long term basis, are the primary source for LWD. Due to the removal of much of the conifer component along the watercourses from historical logging, some areas of the watercourses have a decreased source of LWD. In general, the present riparian overstory is characterized by 12 to 24-inch DBH sized conifers of low to moderate density with a low density of hardwoods and an understory of brush. Over time, the hardwood density will decrease as the conifer density increases, exclusive of the aspen restoration area. The first harvest entry resulted in a short term reduction of potential LWD. This short term reduction is being made up by current standing cull retention standards, and the retention standards within Forest Practice Rules in WLPZs. Additionally, hardwoods have and will continue to serve as a LWD source.

The majority of the watercourses, however, do currently possess adequate quantities of organic debris, and some segments even have excess quantities, which may create problems with culvert maintenance and fish migration. All permanent culvert crossings are generally inspected at least every two years and more frequently if they are within an active timber sale. Efforts have been made to upgrade or remove culverts that have been identified as high risk or routinely require removal of accumulated debris. These culvert crossings are either reconstructed to accommodate the estimated 100-year flood flow, including debris and sediment, or converted to fords with a temporary structure for hauling as necessary.

Recruitment of LWD is accomplished through mortality of large trees left as culls during past logging. Additionally, trees that lean across watercourses that cannot be feasibly removed will be left. All snags in the WLPZ which do not contain sound sawlog volume or have evidence of use by wildlife will be left as well. Generally there is not a lack of LWD in the watercourses and the level should increase over time because the management techniques used on all ownerships of the THP area will maintain and grow large trees within WLPZs.

A substantial amount of downed woody debris exists within the meadow areas. Most of this debris is comprised of lodgepole pine with diameters less than 16 inches. Some larger debris is located on the higher elevations

where mixed conifer stands occur. Larger trees will be retained within the area and along watercourses for habitat needs.

C.3.c. Near-Water Vegetation

The existing vegetation is structurally diverse along segments of the Class I watercourses. Alders, aspen, cottonwood, bracken fern, *Ceanothus* spp., conifers, serviceberry, snowbrush, vine maple, and dogwood, as well as grasses and forbs are present to various degrees along the watercourse banks and the forest and meadow areas. Much of the vegetation along with watercourses is comprised of a sod layer of meadow species. Some riparian areas within the THP area have been affected by past grazing management practices. Observed impacts to riparian areas include minor stream bank trampling, loss of streamside vegetation, and minor turbidity. Landowners and the Fall River RCD will work with grazing lease holders where possible (some land is open range) as modified terms of leases to more actively apply impact avoidance measures relative to grazing leases. Generally, grazing related impacts do not affect vegetative diversity at the watershed scale. Restoration of the meadows from removal of the encroaching lodgepole pine will rejuvenate this meadow vegetation. Within the open meadow areas where channel restoration will occur, meadow vegetation dries out earlier in the season from the entrenchment, and active headcutting threatens meadow areas where the stream is hydrologically connected to the floodplain. Some herbaceous vegetation (sod) exists within the gully bottom; where present, it will be salvaged and used to vegetate other areas disturbed along the project site. Lodgepole pine will be used for grade control and riffle augmentation.

C.4. Biological Habitat Condition

The THP area is made up of second growth Sierran mixed conifer, white fir, and lodgepole pine stands. Based on ownership timber inventories and ocular estimates, the CWHR types present primarily include SMC 4M, 4P, 3D, and 2D and LPN 2D and 3D. In general, the timber stands are clumpy, with most trees in the size class 3 and 4 range and an understory of size class 2-3 trees. In some areas, the understory is moderately to severely overstocked. Other areas have been biomass thinned within the last five years and have a sparse understory. Size 5 class trees are interspersed throughout the selection area at varying densities.

Within the forest area, there are small to medium openings (2-5 acres) comprised of both manzanita (*arctostaphylos* spp.) and *ceanothus* spp. or grasses and forbs. Other understory hardwoods include black oak (*quercus* spp.), vine maple (*acer* spp.), dogwood (*cornus* spp.), aspen (*populus tremloides*), and cottonwood (*populus* spp.) along watercourses. In many of the timber stands there is a moderate to well-developed brush component in the understory. This evaluation resulted from numerous trips to the area by WBA forestry and wildlife staff and through contacts and conversations with state and federal agency personnel and adjacent land managers. The desired future condition for the portion of the THP area to be treated with selection is a functioning forest that will allow for naturally functioning ecosystem processes and future commercial harvests. To meet these goals, habitat elements with intrinsic wildlife value have been identified (i.e. snags, cull trees, down woody material) and will be retained following harvest. Only those snags specified in Item 33 will be felled, all large down woody debris will be left intact, and areas of hardwoods will remain where they currently exist.

The vegetation and stand conditions and the biological resources sections included in Section III, Site Description, adequately address assessment and mitigation of possible biological impacts. Positive biological cumulative impacts associated with the selection operations proposed here should be noted. These include reduction of unnaturally high fuel loading and subsequent risk reduction of catastrophic wildfire and increased forage production in areas that are treated.

C.4.a. Snags/Den/Nest Trees

Very few trees with evidence of use by wildlife exist within the assessment area. This is primarily due to the large areas of unnatural lodgepole pine encroached meadow habitat. The mixed conifer stands adjacent to the meadow areas contain more snags, den, and nest sites due to the forests structure.

C.4.b. Downed Large Woody Debris

A substantial amount of downed woody debris exists within the meadow areas. Most of this debris is comprised of lodgepole pine with diameters less than 16 inches. Some larger debris is located on the higher elevations

where mixed conifer stands occur. Larger trees will be retained within the area and along watercourses for habitat needs.

C.4.c. Multistory Canopy

The majority of the assessment area is comprised of lodgepole pine encroached meadow structure. Within this area there is limited multistory canopy due to the dense stands of small diameter lodgepole pine. However, this area was historically open meadow with scattered trees on the higher elevations without a multistory canopy. Some larger trees and snags do exist within the area that provide nest, roost, and perch sites. The area around the meadows contains a mixed conifer habitat that provides the habitat functions that are mostly absent within the meadow areas. The degree to which a distinct multistoried canopy is present in the selection area will not be significantly altered within the plan area and will therefore not influence the overall availability of this habitat component at the landscape level.

C.4.d. Road Density

Overall, the density of roads within these watersheds is low, with some roads receiving moderate amounts of vehicular traffic from recreation and timber management activities. The presence of elk, deer, coyotes, mountain lions, bears, and bobcats in the area was noted during field reconnaissance and because only limited road segments will be built and other road segment abandoned during this operation, it is unlikely that there will be an adverse impact on large mammals due to a change in road density.

C.4.e. Hardwood Cover

No hardwoods >20-inch DBH are scheduled for harvest during this operation; thus, there will not be a landscape level impact associated with a reduction of mast producing trees.

C.4.f. Late Seral Forest Characteristics

Although no old growth stands remain on the area, but some large old trees are present that were left as culls during the early logging. With very few exceptions, these trees will not be harvested. No remnant patches of late seral forest remain within the THP area.

C.4.g. Late Seral Habitat Continuity

The area has been managed as a mixed conifer forest since the initial harvest entries with periodic re-entries occurring approximately every 10 years. The THP area has been extensively harvested over the past 25-45 years and there is no late seral habitat present.

C.4.h. Special Habitat Elements

In general, the forest stands retain: 1) variable stocking, including some large, old trees that considerably exceed cumulative mean annual increment; 2) background levels of disease and parasites; 3) large snags and downed logs in some areas; 4) plant assemblages that represent a variety of stages in forest development. These features have been described by the Western Section of The Wildlife Society as contributing to healthy forest stands and high biological diversity.

C.5. Cumulative Effects

No cumulative effect on biological resources is expected to occur as a result of this THP.

D. RECREATIONAL RESOURCES

The assessment area for recreational impacts is the THP area plus 300 feet. The guidelines offered by the California State Board of Forestry and Fire Protection, Technical Rule Addendum No. 2, were used as the rationale for the establishment of the assessment area.

No recreational Special Treatment Areas described by the California State Board of Forestry and Fire Protection are on or contiguous to the recreational impacts assessment area. The landowners allow limited recreational uses by the public. Access to Class I watercourses is not restricted for use by recreational anglers.

A positive impact to recreational resources can be expected to occur as a result of future timber operations. Increased forage production for herbivores may occur where thinning results in an increase in understory

vegetation, thereby improving deer habitat and potential for hunter success. The meadow restoration will create large openings in the forest cover that provide foraging areas for deer and desirable hunting areas. Near stream forestry practices will continue to protect water quality and support healthy fish populations for recreational anglers.

The road maintenance that is associated with harvesting operations will provide improved access and safety to the public and benefit all recreational users. Closure of these roads to the public is not the objective of the landowners and is only done where damage is frequent and would result in other negative adverse watershed impacts.

No cumulative effect on recreational resources is expected to occur as a result of this THP.

E. VISUAL RESOURCES

The assessment area for visual resources is that portion of the THP area that is visible to significant numbers of people within 3 miles. The guidelines offered by the California State Board of Forestry and Fire Protection, Technical Rule Addendum No. 2, were used as the rationale for the establishment of the assessment area.

No visual value Special Treatment Areas described by the Board of Forestry are on or contiguous to the plan area. No portion of the THP area is visible to significant numbers of people.

No cumulative effect on visual resources is expected to occur as a result of this THP.

F. VEHICULAR TRAFFIC IMPACTS

The assessment area for traffic impacts is the first public roads over which logging traffic must travel. The guidelines offered by the California State Board of Forestry and Fire Protection, Technical Rule Addendum No. 2, were used as the rationale for the establishment of the assessment area.

All of the logging truck traffic use the Shasta County Tamarack Road to State Highway 299 via private logging roads. The Tamarack Road and Highway 299 regularly experience heavy traffic associated with logging activity and other commercial transportation.

No cumulative effect on vehicular traffic impacts is expected to occur as a result of this THP.

G. GREENHOUSE GAS IMPACTS

The assessment area for greenhouse gas impacts is the THP area.

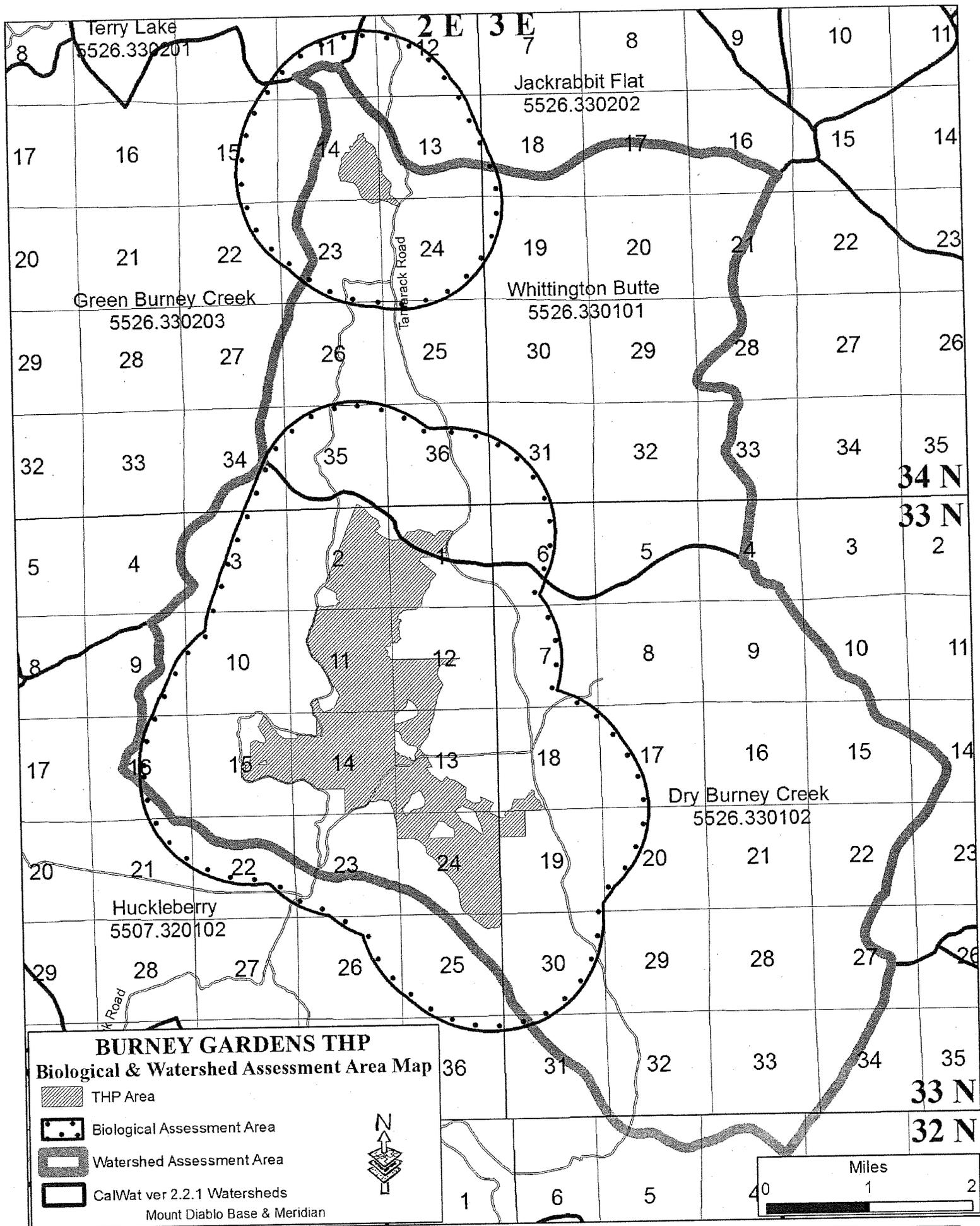
An evaluation of the potential cumulative impacts associated with climate change and increased gas emissions which may result from the proposed harvest operations when compared to the impacts of past, present and reasonably foreseeable future projects was conducted. The Greenhouse Gas Emissions Calculator released by Cal Fire dated June 11, 2010, was used to predict the potential environmental impact from greenhouse gas emissions related to this project. This project is very atypical in that it includes a meadow restoration project that is intended to remove encroaching lodgepole pine from a meadow that was historically devoid of trees. As such, to accomplish the objectives of the aspen, meadow, and wet area restoration portion of the project, this "forested" area will be "deforested". This will result in a short term loss of carbon storage, which will be offset by the reduction in fire hazard and subsequent CO₂ emissions, and water quality impacts that would result from the area being untreated and subject to catastrophic wildfire.

The results of the analysis indicate carbon stocks will decline as a result of operations under this THP but will recoup within a period of 11 years due to growth after harvest. Planned operations in the THP area over a 100-year planning horizon will result in the total sequestration of approximately 29,698 metric tons of carbon dioxide equivalent. This THP area is only a portion of the area owned by the landowners. The landowners manage their timber on an area controlled re-entry schedule, and harvest less biomass than growth. As such, there is no net impact from greenhouse gas emission when viewed on an ownership level.

No cumulative effect on greenhouse gas emissions is expected to occur as a result of this THP.

H. REFERENCES

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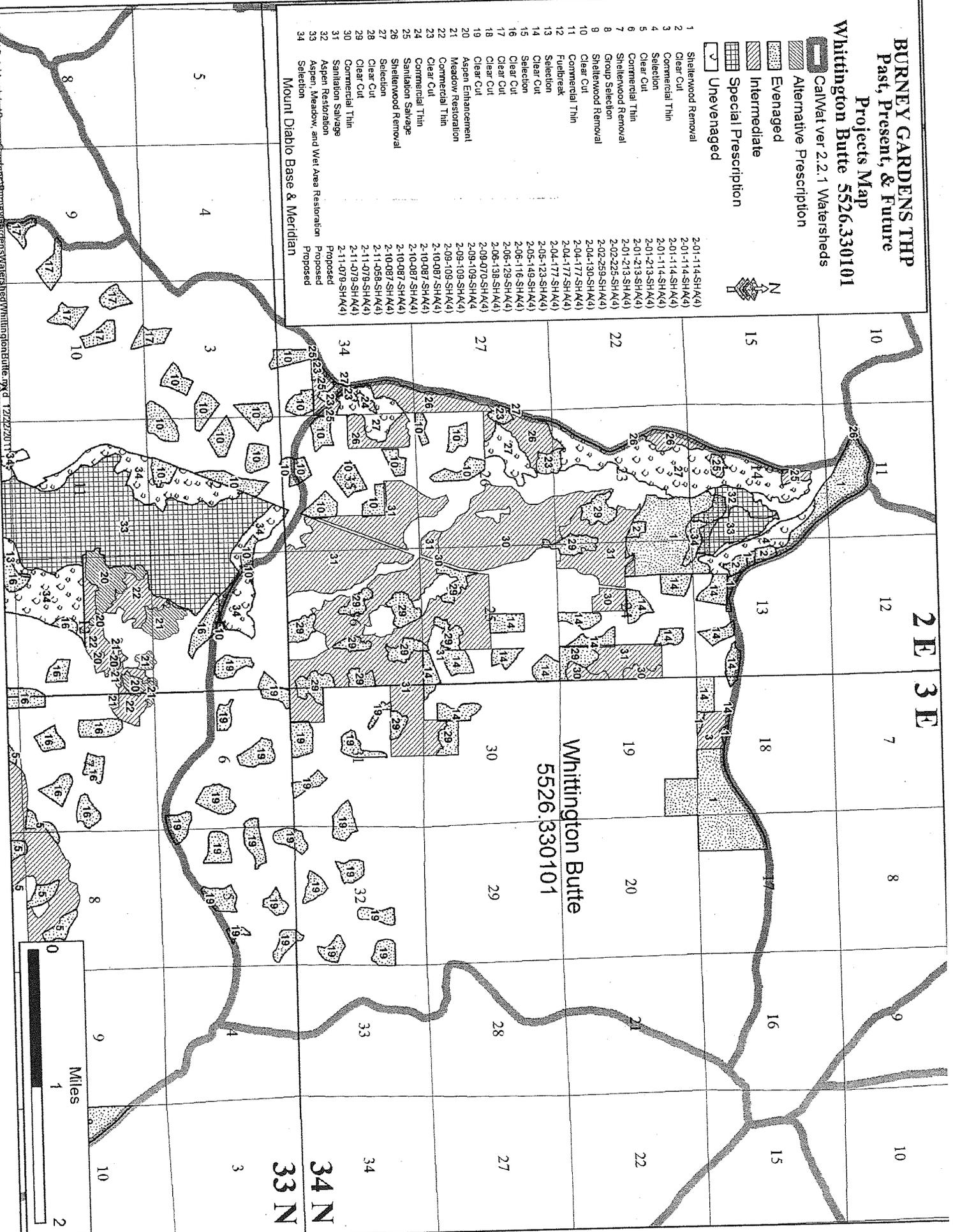
BURNEY GARDENS THP
Past, Present, & Future

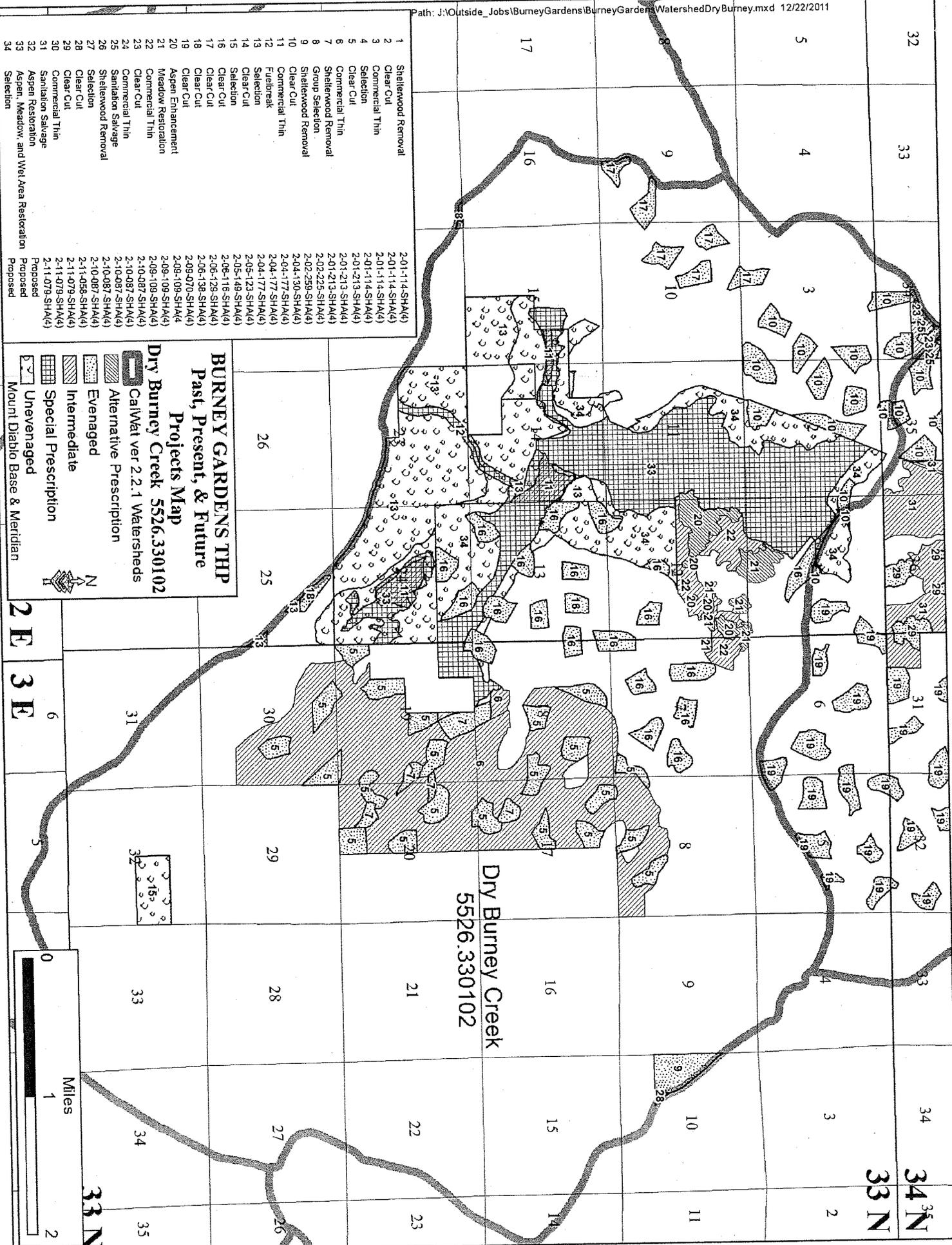
Projects Map
Whittington Butte 5526.330101
 CalWat ver 2.2.1 Watersheds

- Alternative Prescription
- Evenaged
- Intermediate
- Special Prescription
- Unevenaged



- 1 Shelterwood Removal 2-01-114-SH(A4)
- 2 Clear Cut 2-01-114-SH(A4)
- 3 Commercial Thin 2-01-114-SH(A4)
- 4 Selection 2-01-213-SH(A4)
- 5 Commercial Thin 2-01-213-SH(A4)
- 6 Shelterwood Removal 2-01-213-SH(A4)
- 7 Group Selection 2-02-225-SH(A4)
- 8 Shelterwood Removal 2-02-259-SH(A4)
- 9 Clear Cut 2-04-130-SH(A4)
- 10 Commercial Thin 2-04-177-SH(A4)
- 11 Fuelbreak 2-04-177-SH(A4)
- 12 Selection 2-05-123-SH(A4)
- 13 Clear Cut 2-05-149-SH(A4)
- 14 Selection 2-06-116-SH(A4)
- 15 Clear Cut 2-06-129-SH(A4)
- 16 Clear Cut 2-06-138-SH(A4)
- 17 Clear Cut 2-09-070-SH(A4)
- 18 Clear Cut 2-09-109-SH(A4)
- 19 Aspen Enhancement 2-09-109-SH(A4)
- 20 Meadow Restoration 2-09-109-SH(A4)
- 21 Commercial Thin 2-10-087-SH(A4)
- 22 Clear Cut 2-10-087-SH(A4)
- 23 Commercial Thin 2-10-087-SH(A4)
- 24 Sanitation Salvage 2-10-087-SH(A4)
- 25 Shelterwood Removal 2-10-087-SH(A4)
- 26 Selection 2-11-058-SH(A4)
- 27 Clear Cut 2-11-079-SH(A4)
- 28 Clear Cut 2-11-079-SH(A4)
- 29 Commercial Thin 2-11-079-SH(A4)
- 30 Sanitation Salvage 2-11-079-SH(A4)
- 31 Aspen Restoration 2-11-079-SH(A4)
- 32 Mount Diablo Base & Meridian Proposed
- 33 Proposed
- 34 Proposed



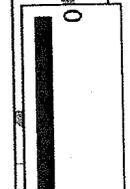
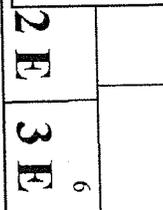


1	Shelterwood Removal	2-01-114-SHAD4
2	Clear Cut	2-01-114-SHAD4
3	Commercial Thin	2-01-114-SHAD4
4	Selection	2-01-114-SHAD4
5	Clear Cut	2-01-213-SHAD4
6	Commercial Thin	2-01-213-SHAD4
7	Shelterwood Removal	2-01-213-SHAD4
8	Group Selection	2-02-225-SHAD4
9	Shelterwood Removal	2-02-259-SHAD4
10	Clear Cut	2-04-130-SHAD4
11	Commercial Thin	2-04-177-SHAD4
12	Fuelbreak	2-04-177-SHAD4
13	Selection	2-04-177-SHAD4
14	Clear Cut	2-05-123-SHAD4
15	Selection	2-05-123-SHAD4
16	Clear Cut	2-06-116-SHAD4
17	Clear Cut	2-06-129-SHAD4
18	Clear Cut	2-06-138-SHAD4
19	Clear Cut	2-09-070-SHAD4
20	Aspen Enhancement	2-09-109-SHAD4
21	Meadow Restoration	2-09-109-SHAD4
22	Commercial Thin	2-10-087-SHAD4
23	Clear Cut	2-10-087-SHAD4
24	Commercial Thin	2-10-087-SHAD4
25	Sanitation Salvage	2-10-087-SHAD4
26	Shelterwood Removal	2-10-087-SHAD4
27	Selection	2-11-079-SHAD4
28	Clear Cut	2-11-079-SHAD4
29	Clear Cut	2-11-079-SHAD4
30	Commercial Thin	2-11-079-SHAD4
31	Sanitation Salvage	2-11-079-SHAD4
32	Aspen, Meadow, and Wet Area Restoration	2-11-079-SHAD4
33	Proposed	Proposed
34	Selection	Proposed

BURNEY GARDENS THP
Past, Present, & Future
Projects Map
Dry Burney Creek 5526.330102
 CalWat ver 2.2.1 Watersheds

Alternative Prescription
 Evenaged
 Intermediate
 Special Prescription
 Unevenaged

Dry Burney Creek
 Mount Diablo Base & Meridian



Project Carbon Accounting: Inventory, Growth, and Harvest

This worksheet addresses the sequestration and emissions associated with the project area's balance of harvest, inventory, and growth plus any emissions associated with site preparation. Complete the input for Steps 0-8 on this worksheet.

Forest Type		Harvest Periods		Inventory			Growth Rates		Harvest Volume									
Multipliers to Estimate Carbon Tonnes per MBF (Sampson, 2002)		Time of Harvest (Years from project approval)		Conifer Live Tree Volume (MBF/acre) - Prior to Harvest			Conifer Growth Rate BF/Acre/Year		Conifer Harvest Volume (MBF/acre)									
Forest Type	Step 0: Identify the approximate percentage of conifers by volume within the harvest plan. Must sum to 100%.	Multiplier from Cubic Feet (Merchantable) to Total Biomass	Pounds Carbon per Cubic Foot	Step 1: Enter the anticipated future harvest entries. The harvest cycles should be subject to management plan, if available.			Step 2: Enter the anticipated conifer inventory (net/acre) present in project area prior to harvest.		Step 3: Enter the estimated harvested inventory (net/acre) present in project area prior to harvest.		Step 4: Enter the average annual periodic growth of conifers between harvests based on estimated growth in project area for each harvest cycle identified in Step 1.		Step 5: Enter the average annual periodic growth of hardwoods between harvests based on estimated growth in management plan, if available.		Step 6: Enter the estimated conifer harvested per acre at current and future entries. The estimates should be based on projections from the management plan, if available.		Step 7: Enter estimated hardwood harvested/ treated basal area (BA/Acre)	
				User must enter harvest cycles for 100 years and/or entry cycles.	Conifer Live Tree Volume (MBF/acre) - Prior to Harvest	Hardwood Live Tree Volume (BA square feet/acre) - Prior to Harvest	Conifer Growth Rate (BF/Acre/Year)	Hardwood Growth Rate (BA/Acre/Year)	Conifer Harvest Volume (MBF/acre)	Hardwood Harvested/ Treated Basal Area (BA/Acre)								
Conifer	0.155	1.93	14.38	0	2	2	50	0.01	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	13.42	0	2.25	5.32	50	0.01	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	12.14	0	2.5	5.4	50	0.01	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	11.8	0	2.25	5.8	50	0.01	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	11.78	0	3	6	50	0.01	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	2.214	0	3.25	6	50	0.01	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.93	2.214	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Hardwoods	0.87	1.95	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Conifer	0.87	1.95	0	0	0	0												

Project Carbon Accounting: Harvested Wood Products and Processing Emissions

This worksheet addresses the non-biological emissions associated with the project area's harvesting activities. Complete the input for Steps 15-16 on this worksheet.

Harvest Periods	Quantity of Forest Carbon Delivered to Mills				Non-Biological Emissions Associated with Mills	Quantity of Forest Carbon Remaining Immediately After Milling (Mill Efficiency)		Long-Term Sequestration in Wood Products	
	Conifer Percentage Delivered to Mills	Hardwood Percentage Delivered to Mills	Conifer CO ₂ e Delivered to Mills / Acre	Hardwood CO ₂ e equivalent Delivered to Mills / Acre		Computed, Remaining CO ₂ e equivalent after Milling Efficiency for Conifers	Computed, Remaining CO ₂ e equivalent after Milling Efficiency for Hardwoods	Computed, CO ₂ e Equivalent Tonnes in Conifer Wood Products in Use-100 Year Weighted Average / Acre and Landfill	Computed, CO ₂ e Equivalent Tonnes in Hardwood Wood Products in Use-100 Year Weighted Average / Acre
from Inventory, Growth, and Harvest Page (Time of Harvest as years from project approval)	Step 15. Insert the Percentage of conifer trees harvested that are subsequently delivered to sawmills	Step 15. Insert the percentage of hardwoods harvested or treated that are subsequently delivered to sawmills	Computed: The merchantable portion determined by the conversion factors (Sampson, 2002) on the Inventory, Growth, and Harvest worksheet. This is multiplied by the percent delivered to mills to reflect the carbon delivered to mills.	Computed: The merchantable portion determined by the conversion factors (Sampson, 2002) on the Inventory, Growth, and Harvest worksheet. This is multiplied by the percent delivered to mills to reflect the carbon delivered to mills.	Assumption: 20 kw/hour (mill energy use) / (40 m3 lumber processed/hour) / (25 metric tonnes/skew hour) = m3 processed	Calculated: The CO ₂ e associated with processing the logs at the mill	Computed: The difference between carbon delivered to mills and carbon remaining after milling is assumed to be emitted immediately	Estimate: The carbon in landfills at year 100 is 29.8% of the initial carbon produced in wood products.	Estimate: The carbon in landfills at year 100 is 29.8% of the initial carbon produced in wood products.
0	100%	0%	2.39	0.00	-0.02	1.80	0.00	1.22	0.00
20	100%	0%	2.39	0.00	-0.02	1.80	0.00	1.22	0.00
40	100%	0%	2.39	0.00	-0.02	1.80	0.00	1.22	0.00
60	100%	0%	2.39	0.00	-0.02	1.80	0.00	1.22	0.00
80	100%	0%	2.39	0.00	-0.02	1.80	0.00	1.22	0.00
100	100%	0%	2.39	0.00	-0.02	1.80	0.00	1.22	0.00
0	100%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	100%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	100%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	100%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	100%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum of emissions associate with processing of lumber					-0.11	Sum of CO ₂ e equivalent in wood products		7.31	0.00

Summary		Beginning Stocks	Ending Stocks	Years until Carbon Stocks are Recouped from Initial Harvest (Includes Carbon in Live Trees, Harvested Wood Products, and Landfill)
Emissions Source/Sink/Reservoir	Metric Tonnes CO2 Equivalent Per Acre Basis			
Live Trees (Conifers and Hardwoods)	16.82		26.19	
Wood Products			7.31	
Site Preparation Emissions			0.00	
Non-biological emissions associated with harvesting			-1.72	
Non-biological emissions associated with milling			-0.11	
Sum of Net Emissions/Sequestration over Identified Harvest Cycles (CO2 metric tonnes)			14.85	
Project Summary				
Project Acres	Step 17- Insert the acres that are part of the harvest area.		2,000	
Total Project Sequestration over defined Harvesting Periods (CO2 metric tonnes)			29,698	

Years	Conifer												
	Starting Inventory (MBF/Acre)	Starting Inventory (CO2-e Tonnes/Acre)	Harvest (MBF/Acre)	Annual Inventory Estimate (MBF/Acre)	Estimated CO2 equivalent in inventory (Metric Tonnes/Acre)	Estimated CO2 equivalent harvested in total tree (Metric Tonnes/Acre)	Portion of Harvest Delivered to Mill	Amount CO2 equivalent transferred to the mill (bole portion w/o bark of the tree) (Metric Tonnes/Acre)	In Use Decay Curve of Wood Products (Conifer) (%)	CO2-e in in-use harvested wood products (Metric Tonnes/Acre)	Fraction of CO2 equivalent remaining in landfills (%)	CO2-e in Landfills (Metric Tonnes/Acre)	Combined CO2-e in Landfills and In-use (Metric Tonnes/Acre)
Pre-harvest	2	14	1	1	9	5	100%	2	0.68	2	0.02	0.04	1.66
1				1	9				0.64	2	0.04	0.08	1.61
2				1	10				0.60	1	0.05	0.12	1.56
3				1	10				0.57	1	0.07	0.16	1.53
4				1	10				0.55	1	0.08	0.19	1.50
5				2	11				0.52	1	0.09	0.22	1.47
6				2	11				0.49	1	0.11	0.26	1.45
7				2	11				0.46	1	0.12	0.28	1.43
8				2	12				0.44	1	0.13	0.31	1.41
9				2	12				0.42	1	0.14	0.34	1.39
10				2	12				0.41	1	0.15	0.36	1.37
11				2	13				0.41	1	0.16	0.38	1.37
12				2	13				0.40	1	0.17	0.41	1.36
13				2	13				0.39	1	0.18	0.43	1.35
14				2	14				0.38	1	0.19	0.45	1.34
15				2	14				0.36	1	0.19	0.46	1.33
16				2	14				0.36	1	0.20	0.48	1.33
17				2	15				0.35	1	0.21	0.50	1.33
18				2	15				0.34	1	0.22	0.51	1.32
19				2	16				0.33	1	0.22	0.53	1.32
20			1	2	11	5		2	0.32	2	0.23	0.59	2.97
21				2	11				0.32	2	0.23	0.64	2.92
22				2	11				0.31	2	0.24	0.69	2.87
23				2	12				0.30	2	0.25	0.75	2.84
24				2	12				0.30	2	0.25	0.79	2.81
25				2	12				0.29	2	0.26	0.83	2.78
26				2	13				0.29	2	0.26	0.87	2.75
27				2	13				0.28	2	0.26	0.92	2.73
28				2	13				0.28	2	0.27	0.95	2.71
29				2	14				0.27	2	0.27	0.99	2.69
30				2	14				0.27	2	0.28	1.02	2.67
31				2	14				0.26	2	0.28	1.05	2.66
32				2	15				0.26	2	0.28	1.08	2.66
33				2	15				0.25	2	0.29	1.11	2.64
34				2	16				0.25	1	0.29	1.14	2.63
35				2	16				0.25	1	0.29	1.17	2.62
36				2	16				0.24	1	0.30	1.19	2.62
37				2	16				0.24	1	0.30	1.22	2.62
38				2	17				0.23	1	0.30	1.24	2.61
39				2	17				0.23	1	0.31	1.26	2.60
40				2	17				0.23	1	0.31	1.28	2.60
41			1	2	12	5		2	0.23	3	0.31	1.45	4.25
42				2	13				0.22	3	0.31	1.45	4.15
43				2	13				0.22	3	0.32	1.51	4.12
44				2	13				0.22	3	0.32	1.56	4.08
45				2	14				0.21	3	0.32	1.61	4.05
46				2	14				0.21	2	0.33	1.65	4.02
47				2	15				0.20	2	0.33	1.70	4.00
48				2	15				0.20	2	0.33	1.74	3.98
49				2	15				0.20	2	0.33	1.78	3.95
50				2	16				0.20	2	0.33	1.81	3.93
51				2	16				0.19	2	0.33	1.85	3.92
52				2	16				0.19	2	0.33	1.88	3.91
53				2	17				0.19	2	0.33	1.90	3.89
54				2	17				0.19	2	0.34	1.96	3.90
55				3	18				0.18	2	0.34	1.99	3.88
56				3	18				0.18	2	0.34	2.01	3.87
57				3	18				0.18	2	0.34	2.04	3.86
58				3	19				0.18	2	0.34	2.06	3.85
59				3	19				0.18	2	0.35	2.11	3.87
60				3	19				0.17	3	0.35	2.17	5.51
61			1	2	14	5		2	0.17	3	0.35	2.23	5.45
62				2	14				0.17	3	0.35	2.29	5.40
63				2	15				0.17	3	0.35	2.35	5.36
64				2	15				0.16	3	0.36	2.42	5.34
65				2	16				0.16	3	0.36	2.47	5.30
66				2	16				0.16	3	0.36	2.51	5.27
67				2	17				0.16	3	0.36	2.56	5.24
68				2	17				0.16	3	0.36	2.60	5.21
69				2	17				0.15	3	0.37	2.65	5.21
70				2	18				0.15	2	0.37	2.70	5.18
71				3	18				0.15	2	0.37	2.73	5.16
72				3	18				0.15	2	0.37	2.76	5.15
73				3	18				0.15	2	0.37	2.79	5.12
74				3	19				0.15	2	0.38	2.86	5.15
75				3	19				0.15	2	0.38	2.88	5.12
76				3	19				0.14	2	0.38	2.91	5.11
77				3	20				0.14	2	0.38	2.94	5.10
78				3	20				0.14	2	0.38	2.96	5.09
79				3	20				0.14	2	0.38	3.02	5.11
80				3	16	5		2	0.14	4	0.38	3.09	6.75
81				2	16				0.14	4	0.38	3.14	6.69
82				2	17				0.13	3	0.38	3.20	6.63
83				2	17				0.13	3	0.38	3.26	6.59
84				2	17				0.13	3	0.39	3.35	6.58
85				2	17				0.13	3	0.39	3.40	6.54
86				3	18				0.13	3	0.39	3.44	6.50
87				3	18				0.13	3	0.39	3.49	6.48
88				3	19				0.13	3	0.39	3.53	6.45
89				3	19				0.13	3	0.40	3.61	6.45
90				3	19				0.12	3	0.40	3.64	6.42
91				3	19				0.12	3	0.40	3.67	6.40
92				3	20				0.12	3	0.40	3.70	6.38
93				3	20				0.12	3	0.40	3.73	6.35
94				3	21				0.12	3	0.40	3.82	6.38
95				3	21				0.12	3	0.40	3.84	6.36
96				3	22				0.12	2	0.40	3.87	6.35
97				3	22				0.12	2	0.40	3.89	6.33
98				3	22				0.11	2	0.40	3.91	6.31
99				3	22				0.11	2	0.41	3.99	6.35
100			1	2	18	5		2	0.11	4	0.41	4.05	7.99

Years

Hardwood

	Starting Inventory (BA/Acre)	Starting Inventory CO2-e (Metric Tonnes/Acre)	Harvest (BA/Acre)	Annual Inventory (BA/Acre)	Estimated CO2 equivalent in Inventory (Metric Tonnes/Acre)	Estimated CO2 equivalent harvested in total tree (Metric Tonnes/Acre)	Portion of Harvest Delivered to Mill (%)	Amount CO2 equivalent transferred to the mill (bole portion w/o bark of the tree) (Metric Tonnes/Acre)	In Use Decay Curve of Wood Products (Conifer) (Metric Tonnes/Acre)	CO2-e in in-use harvested wood products (Metric Tonnes/Acre)	Fraction of CO2 equivalent remaining in landfills (%)	CO2-e in Landfills (Metric Tonnes/Acre)	Combined CO2-e in Landfills and In-use (Metric tonnes/Acre)
Pre-harvest	5	3	-	5	3	-	0%	-	0.57	-	0.02	-	-
1	-	-	-	5	3	-	-	-	0.53	-	0.02	-	-
2	-	-	-	5	3	-	-	-	0.49	-	0.03	-	-
3	-	-	-	5	3	-	-	-	0.46	-	0.05	-	-
4	-	-	-	5	3	-	-	-	0.44	-	0.06	-	-
5	-	-	-	5	3	-	-	-	0.41	-	0.07	-	-
6	-	-	-	5	3	-	-	-	0.39	-	0.08	-	-
7	-	-	-	5	3	-	-	-	0.37	-	0.09	-	-
8	-	-	-	5	3	-	-	-	0.35	-	0.10	-	-
9	-	-	-	5	3	-	-	-	0.33	-	0.11	-	-
10	-	-	-	5	3	-	-	-	0.32	-	0.12	-	-
11	-	-	-	5	3	-	-	-	0.32	-	0.12	-	-
12	-	-	-	5	3	-	-	-	0.32	-	0.12	-	-
13	-	-	-	5	3	-	-	-	0.32	-	0.12	-	-
14	-	-	-	5	3	-	-	-	0.32	-	0.12	-	-
15	-	-	-	5	3	-	-	-	0.28	-	0.14	-	-
16	-	-	-	5	3	-	-	-	0.26	-	0.14	-	-
17	-	-	-	5	3	-	-	-	0.26	-	0.14	-	-
18	-	-	-	5	3	-	-	-	0.26	-	0.14	-	-
19	-	-	-	5	3	-	-	-	0.22	-	0.16	-	-
20	-	-	-	5	3	-	-	-	0.22	-	0.16	-	-
21	-	-	-	5	3	-	-	-	0.22	-	0.16	-	-
22	-	-	-	5	3	-	-	-	0.22	-	0.16	-	-
23	-	-	-	5	3	-	-	-	0.22	-	0.16	-	-
24	-	-	-	5	3	-	-	-	0.22	-	0.16	-	-
25	-	-	-	5	3	-	-	-	0.19	-	0.17	-	-
26	-	-	-	5	3	-	-	-	0.19	-	0.17	-	-
27	-	-	-	5	3	-	-	-	0.19	-	0.17	-	-
28	-	-	-	5	3	-	-	-	0.19	-	0.17	-	-
29	-	-	-	5	3	-	-	-	0.19	-	0.17	-	-
30	-	-	-	5	3	-	-	-	0.17	-	0.18	-	-
31	-	-	-	5	3	-	-	-	0.17	-	0.18	-	-
32	-	-	-	5	3	-	-	-	0.17	-	0.18	-	-
33	-	-	-	5	3	-	-	-	0.17	-	0.18	-	-
34	-	-	-	5	3	-	-	-	0.17	-	0.18	-	-
35	-	-	-	5	3	-	-	-	0.15	-	0.19	-	-
36	-	-	-	5	3	-	-	-	0.15	-	0.19	-	-
37	-	-	-	5	3	-	-	-	0.15	-	0.19	-	-
38	-	-	-	5	3	-	-	-	0.15	-	0.19	-	-
39	-	-	-	5	3	-	-	-	0.15	-	0.19	-	-
40	-	-	-	5	3	-	-	-	0.13	-	0.19	-	-
41	-	-	-	5	3	-	-	-	0.13	-	0.19	-	-
42	-	-	-	5	3	-	-	-	0.13	-	0.19	-	-
43	-	-	-	5	3	-	-	-	0.13	-	0.19	-	-
44	-	-	-	5	3	-	-	-	0.13	-	0.19	-	-
45	-	-	-	5	3	-	-	-	0.12	-	0.20	-	-
46	-	-	-	5	3	-	-	-	0.12	-	0.20	-	-
47	-	-	-	5	3	-	-	-	0.12	-	0.20	-	-
48	-	-	-	5	3	-	-	-	0.12	-	0.20	-	-
49	-	-	-	5	3	-	-	-	0.12	-	0.20	-	-
50	-	-	-	5	3	-	-	-	0.11	-	0.20	-	-
51	-	-	-	6	3	-	-	-	0.11	-	0.20	-	-
52	-	-	-	6	3	-	-	-	0.11	-	0.20	-	-
53	-	-	-	6	3	-	-	-	0.11	-	0.20	-	-
54	-	-	-	6	3	-	-	-	0.10	-	0.20	-	-
55	-	-	-	6	3	-	-	-	0.10	-	0.20	-	-
56	-	-	-	6	3	-	-	-	0.10	-	0.20	-	-
57	-	-	-	6	3	-	-	-	0.10	-	0.20	-	-
58	-	-	-	6	3	-	-	-	0.10	-	0.20	-	-
59	-	-	-	6	3	-	-	-	0.09	-	0.21	-	-
60	-	-	-	6	3	-	-	-	0.09	-	0.21	-	-
61	-	-	-	6	3	-	-	-	0.09	-	0.21	-	-
62	-	-	-	6	3	-	-	-	0.09	-	0.21	-	-
63	-	-	-	6	3	-	-	-	0.09	-	0.21	-	-
64	-	-	-	6	3	-	-	-	0.08	-	0.21	-	-
65	-	-	-	6	3	-	-	-	0.08	-	0.21	-	-
66	-	-	-	6	3	-	-	-	0.08	-	0.21	-	-
67	-	-	-	6	3	-	-	-	0.08	-	0.21	-	-
68	-	-	-	6	3	-	-	-	0.08	-	0.21	-	-
69	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
70	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
71	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
72	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
73	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
74	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
75	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
76	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
77	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
78	-	-	-	6	3	-	-	-	0.07	-	0.21	-	-
79	-	-	-	6	3	-	-	-	0.06	-	0.21	-	-
80	-	-	-	6	3	-	-	-	0.06	-	0.21	-	-
81	-	-	-	6	3	-	-	-	0.06	-	0.21	-	-
82	-	-	-	6	3	-	-	-	0.06	-	0.21	-	-
83	-	-	-	6	3	-	-	-	0.06	-	0.21	-	-
84	-	-	-	6	3	-	-	-	0.06	-	0.22	-	-
85	-	-	-	6	3	-	-	-	0.06	-	0.22	-	-
86	-	-	-	6	3	-	-	-	0.06	-	0.22	-	-
87	-	-	-	6	3	-	-	-	0.06	-	0.22	-	-
88	-	-	-	6	3	-	-	-	0.06	-	0.22	-	-
89	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
90	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
91	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
92	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
93	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
94	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
95	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
96	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
97	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
98	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
99	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-
100	-	-	-	6	3	-	-	-	0.05	-	0.22	-	-

Years	Total					
	CO2-e in Standing Inventories (Metric Tonnes/Acre)	CO2-e in Harvested Wood Products (Metric Tonnes/Acre)	CO2-e in Inventories and in Harvested Wood Products (Metric Tonnes/Acre)	Initial CO2-e in Forest	Years in Which Project Sequestration Exceed Initial CO2-e Prior to Harvest (Metric Tonnes) (101 indicates that the emissions from harvest have not been recouped from sequestration and storage)	Number of Years for Growth and Harvested Wood Products to Achieve pre-Harvest Sequester CO2-e
Pre-harvest				17		11
1	13.83	1.66	13			101
2	14.20	1.61	13			101
3	14.56	1.56	14			101
4	14.92	1.53	14			101
5	15.29	1.50	14			101
6	15.65	1.47	15			101
7	16.01	1.45	15			101
8	16.38	1.43	15			101
9	16.74	1.41	16			101
10	17.10	1.39	16			101
11	17.47	1.37	16			11
12	17.83	1.37	17			12
13	18.19	1.36	17			13
14	18.55	1.35	18			14
15	18.92	1.34	18			15
16	19.28	1.33	18			16
17	19.65	1.33	19			17
18	20.01	1.33	19			18
19	20.38	1.32	19			19
20	20.74	1.32	20			101
21	15.80	2.97	16			101
22	16.16	2.92	17			22
23	16.53	2.87	17			23
24	16.89	2.84	17			24
25	17.25	2.81	18			25
26	17.62	2.78	18			26
27	17.98	2.75	18			27
28	18.34	2.73	19			28
29	18.71	2.71	19			29
30	19.07	2.69	19			30
31	19.43	2.67	20			31
32	19.80	2.66	20			32
33	20.16	2.66	20			33
34	20.53	2.64	21			34
35	20.89	2.63	21			35
36	21.25	2.62	21			36
37	21.62	2.62	22			37
38	21.98	2.62	22			38
39	22.34	2.61	22			39
40	22.71	2.60	23			40
41	17.77	4.25	20			41
42	18.13	4.20	20			42
43	18.49	4.15	20			43
44	18.86	4.12	20			44
45	19.22	4.08	21			45
46	19.58	4.05	21			46
47	19.95	4.02	21			47
48	20.31	4.00	22			48
49	20.68	3.98	22			49
50	21.04	3.95	23			50
51	21.40	3.93	23			51
52	21.77	3.92	23			52
53	22.13	3.91	23			53
54	22.49	3.89	24			54
55	22.86	3.90	24			55
56	23.22	3.88	25			56
57	23.58	3.87	25			57
58	23.95	3.86	25			58
59	24.31	3.85	26			59
60	24.67	3.87	26			60
61	19.73	5.51	23			61
62	20.10	5.45	23			62
63	20.46	5.40	23			63
64	20.83	5.36	24			64
65	21.19	5.34	24			65
66	21.55	5.30	24			66
67	21.92	5.27	25			67
68	22.28	5.24	25			68
69	22.64	5.21	25			69
70	23.01	5.21	26			70
71	23.37	5.18	26			71
72	23.73	5.16	26			72
73	24.10	5.15	27			73
74	24.46	5.12	27			74
75	24.82	5.15	27			75
76	25.19	5.12	28			76
77	25.55	5.11	28			77
78	25.91	5.10	28			78
79	26.28	5.09	29			79
80	26.64	5.11	29			80
81	21.70	6.75	26			81
82	22.07	6.68	26			82
83	22.43	6.63	26			83
84	22.79	6.59	27			84
85	23.16	6.58	27			85
86	23.52	6.54	27			86
87	23.88	6.50	28			87
88	24.25	6.48	28			88
89	24.61	6.45	28			89
90	24.97	6.45	28			90
91	25.34	6.42	29			91
92	25.70	6.40	29			92
93	26.06	6.38	30			93
94	26.43	6.35	30			94
95	26.79	6.33	30			95
96	27.15	6.36	31			96
97	27.52	6.35	31			97
98	27.88	6.33	31			98
99	28.24	6.31	32			99
100	28.61	6.35	32			100
100	23.67	7.99	29			

SECTION V: ATTACHMENTS

- Fruit Growers Supply Company: Timber and Timberland Owner Notification Letter
- Pacific Gas & Electric Company: Timber and Timberland Owner Notification Letter
- Sierra Pacific Industries: Timber and Timberland Owner Notification Letter
- Certified Mail Receipts for Timberland Owner Letters
- Erosion Hazard Rating Worksheets
(2 pages)
- Burney Creek - Hat Creek Community Forestry Project Map
- Burney Gardens Meadow Restoration, Shasta County, California, Meadow Restoration Design, prepared for Fall River Resource Conservation District in cooperation with Pacific Gas and Electric, September 10, 2010
(12 pages)
- Helm Consulting Branchiopod Survey Report
(39 pages)
- Pacific Gas and Electric Company, Burney Gardens Timber Harvesting Plan, Sensitive Plants Survey Report
(50 pages)
- Botanical Survey Report, Dry Garden THP, Fruit Growers Supply Co.
(8 pages)
- Central Valley Regional Water Quality Control Board, 401 Certification Application
(8 pages)

FORESTLAND
MANAGEMENT



W. M. BEATY &
ASSOCIATES, INC.

845 BUTTE ST. / P.O. BOX 990898
REDDING, CALIFORNIA 96099-0898
530-243-2783 / FAX 530-243-2900
www.wmbeaty.com

November 22, 2011

CERTIFIED MAIL

Mr. John Eacker
FRUIT GROWERS SUPPLY COMPANY
37530 State Highway 299 E
Burney CA 96013-4320

Re: BURNEY GARDENS THP
Timberland Owner Notification

Dear Mr. Eacker:

As discussed with you previously, W. M. Beaty & Associates, Inc. will include Fruit Growers Supply Company as a timber and timberland owner in the above referenced Timber Harvesting Plan. Operations will conform to all applicable California Forest Practice Rules.

As per 14 CCR § 1035.1(a)(2), we are required notify you that the landowner is responsible for inspection and any needed repair and maintenance of roads, landings, and erosion control facilities and structures associated with this harvest operation as described in 14 CCR § 1050. The prescribed erosion control maintenance period may be up to three years after filing of the work completion report.

Thank you for your cooperation.

Sincerely,

W. M. BEATY & ASSOCIATES, INC.

Scott P. Carnegie
Project Forester
RPF No. 2540
(530) 336-6986

SPC:klh

FORESTLAND
MANAGEMENTW. M. BEATY &
ASSOCIATES, INC.845 BUTTE ST. / P.O. BOX 990898
REDDING, CALIFORNIA 96099-0898
530-243-2783 / FAX 530-243-2900
www.wmbeaty.com

November 22, 2011

CERTIFIED MAIL

Mr. Steve Yonge
PACIFIC GAS & ELECTRIC COMPANY
3600 Meadow View Dr
Redding CA 96002-9701Re: BURNEY GARDENS THP
Timberland Owner Notification

Dear Mr. Yonge:

As discussed with you previously, W. M. Beaty & Associates, Inc. will include Pacific Gas & Electric Company as a timber and timberland owner in the above referenced Timber Harvesting Plan. Operations will conform to all applicable California Forest Practice Rules.

As per 14 CCR § 1035.1(a)(2), we are required notify you that the landowner is responsible for inspection and any needed repair and maintenance of roads, landings, and erosion control facilities and structures associated with this harvest operation as described in 14 CCR § 1050. The prescribed erosion control maintenance period may be up to three years after filing of the work completion report.

Thank you for your cooperation.

Sincerely,

W. M. BEATY & ASSOCIATES, INC.

Scott P. Carnegie
Project Forester
RPF No. 2540
(530) 336-6986

SPC:klh

FORESTLAND
MANAGEMENT



W. M. BEATY &
ASSOCIATES, INC.

845 BUTTE ST. / P.O. BOX 990898
REDDING, CALIFORNIA 96099-0898
530-243-2783 / FAX 530-243-2900
www.wmbeaty.com

November 22, 2011

CERTIFIED MAIL

Mr. Herb Baldwin
SIERRA PACIFIC INDUSTRIES
PO Box 496014
Redding CA 96049-6014

Re: BURNEY GARDENS THP
Timberland Owner Notification

Dear Mr. Baldwin:

As discussed with you previously, W. M. Beaty & Associates, Inc. will include Sierra Pacific Industries as a timber and timberland owner in the above referenced Timber Harvesting Plan. Operations will conform to all applicable California Forest Practice Rules.

As per 14 CCR § 1035.1(a)(2), we are required notify you that the landowner is responsible for inspection and any needed repair and maintenance of roads, landings, and erosion control facilities and structures associated with this harvest operation as described in 14 CCR § 1050. The prescribed erosion control maintenance period may be up to three years after filing of the work completion report.

Thank you for your cooperation.

Sincerely,

W. M. BEATY & ASSOCIATES, INC.

Scott P. Carnegie
Project Forester
RPF No. 2540
(530) 336-6986

SPC:kh

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none"> Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the mailpiece, or on the front if space permits. 		A. Signature <input checked="" type="checkbox"/> Agent <input checked="" type="checkbox"/> Addressee <i>John Eacker</i>	
1. Article Addressed to:		B. Received by (Printed Name)	C. Date of Delivery
MR. JOHN EACKER FRUIT GROWERS SUPPLY CO. 37530 STATE HIGHWAY 299E BURNEY CA 96013-4320		<i>John Eacker</i>	<i>11-29-11</i>
		D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input checked="" type="checkbox"/> No	
		3. Service Type <input checked="" type="checkbox"/> Certified Mail <input type="checkbox"/> Express Mail <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Insured Mail <input type="checkbox"/> C.O.D.	
		4. Restricted Delivery? (Extra Fee) <input type="checkbox"/> Yes	
2. Article Number (Transfer from service label)		7007 2560 0003 2536 0257	
PS Form 3811, February 2004		Domestic Return Receipt	
		102595-02-M-1540	

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none"> Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the mailpiece, or on the front if space permits. 		A. Signature <input type="checkbox"/> Agent <input checked="" type="checkbox"/> Addressee <i>Steve Yonge</i>	
1. Article Addressed to:		B. Received by (Printed Name)	C. Date of Delivery
MR. STEVE YONGE PACIFIC GAR & ELECTRIC CO. 3600 MEADOW VIEW DR REDDING CA 96002-9701			<i>11-23-11</i>
		D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No	
		3. Service Type <input checked="" type="checkbox"/> Certified Mail <input type="checkbox"/> Express Mail <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Insured Mail <input type="checkbox"/> C.O.D.	
		4. Restricted Delivery? (Extra Fee) <input type="checkbox"/> Yes	
2. Article Number (Transfer from service label)		7007 2560 0003 2536 0264	
PS Form 3811, February 2004		Domestic Return Receipt	
		102595-02-M-1540	

SENDER: COMPLETE THIS SECTION		COMPLETE THIS SECTION ON DELIVERY	
<ul style="list-style-type: none"> Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired. Print your name and address on the reverse so that we can return the card to you. Attach this card to the back of the mailpiece, or on the front if space permits. 		A. Signature <input type="checkbox"/> Agent <input checked="" type="checkbox"/> Addressee <i>Marty Rovac</i>	
1. Article Addressed to:		B. Received by (Printed Name)	C. Date of Delivery
MR. HERB BALDWIN SIERRA PACIFIC INDUSTRIES PO BOX 496014 REDDING CA 96049-6014		<i>MARTY ROVAC</i>	
		D. Is delivery address different from item 1? <input type="checkbox"/> Yes If YES, enter delivery address below: <input type="checkbox"/> No	
		3. Service Type <input checked="" type="checkbox"/> Certified Mail <input type="checkbox"/> Express Mail <input type="checkbox"/> Registered <input checked="" type="checkbox"/> Return Receipt for Merchandise <input type="checkbox"/> Insured Mail <input type="checkbox"/> C.O.D.	
		4. Restricted Delivery? (Extra Fee) <input type="checkbox"/> Yes	
2. Article Number (Transfer from service label)		7007 2560 0003 2536 0233	
PS Form 3811, February 2004		Domestic Return Receipt	
		102595-02-M-1540	

**ESTIMATED SURFACE SOIL EROSION HAZARD
RM - 87 (4/84)**

**STATE OF CALIFORNIA
BOARD OF FORESTRY**

I. SOIL FACTORS

A. SOIL TEXTURE	Fine	Medium	Course	FACTOR RATING BY AREA		
				CA-604 (125)	CA-604 (190)	CA-604 (313)
DETACHABILITY	Low	Moderate	High	6	5	7
RATING	1 - 9	10 - 18	19 - 30			
PERMEABILITY	Slow	Moderate	Rapid	4	4	3
RATING	5 - 4	3 - 2	1			

B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK

Rating	Shallow	Moderate	Deep	3	1	1
	1" - 19"	20" - 39"	40" - 60"(+)			
	15 - 9	8 - 4	3 - 1			

C. PERCENT SURFACE COARSE FRAGMENTS GREATER THAN 2 MM IN SIZE INCLUDING ROCKS OR STONES

Rating	Low	Moderate	High	10	10	8	FACTOR RATING BY AREA		
	(-)10 - 39%	40 - 70%	71 - 100%				125	190	313
	10 - 6	5 - 3	2 - 1						
SUBTOTAL							23	20	19

II. SLOPE FACTOR

Slope Rating	5 - 15%	16 - 30%	31 - 40%	41 - 50%	51 - 70%	71 - 80%(+)	1	1	1
		1 - 3	4 - 6	7 - 10	11 - 15	16 - 25			

III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE

Rating	Low	Moderate	High	4	4	4
	0 - 40%	41 - 80%	81 - 100%			
	15 - 8	7 - 4	3 - 1			

IV. TWO-YEAR, ONE-HOUR, RAINFALL INTENSITY (Hundredths Inch)

Rating	Low	Moderate	High	Extreme	12	12	12		
	(-)30 - 39	40 - 59	60 - 69	70 - 80(+)					
	1 - 3	4 - 7	8 - 11	12 - 15					
TOTAL SUM OF FACTORS							40	37	36

EROSION HAZARD RATING

<50	50 - 65	66 - 75	>75	L	L	L
LOW (L)	MODERATE (M)	HIGH (H)	EXTREME (E)			
THE DETERMINATION IS						

**ESTIMATED SURFACE SOIL EROSION HAZARD
RM - 87 (4/84)**

**STATE OF CALIFORNIA
BOARD OF FORESTRY**

I. SOIL FACTORS

A. SOIL TEXTURE	Fine	Medium	Course	FACTOR RATING BY AREA		
				CA-708 (86)	CA-607 (190im)	CA-607 (313im)
DETACHABILITY	Low	Moderate	High	20	15	23
RATING	1 - 9	10 - 18	19 - 30			
PERMEABILITY	Slow	Moderate	Rapid	1	4	1
RATING	5 - 4	3 - 2	1			

B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK

Rating	Shallow	Moderate	Deep	1	1	1
	1" - 19"	20" - 39"	40" - 60"(+)			
	15 - 9	8 - 4	3 - 1			

C. PERCENT SURFACE COARSE FRAGMENTS GREATER THAN 2 MM IN SIZE INCLUDING ROCKS OR STONES

Rating	Low	Moderate	High	5	5	6	FACTOR RATING BY AREA		
	(-)10 - 39%	40 - 70%	71 - 100%				86	190 im	313 im
	10 - 6	5 - 3	2 - 1						
SUBTOTAL							27	25	31

II. SLOPE FACTOR

Slope	5 - 15%	16 - 30%	31 - 40%	41 - 50%	51 - 70%	71 - 80%(+)	1	1	1
Rating	1 - 3	4 - 6	7 - 10	11 - 15	16 - 25	26 - 35			

III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE

Rating	Low	Moderate	High	4	4	4
	0 - 40%	41 - 80%	81 - 100%			
	15 - 8	7 - 4	3 - 1			

IV. TWO-YEAR, ONE-HOUR, RAINFALL INTENSITY (Hundredths Inch)

Rating	Low	Moderate	High	Extreme	12	12	12
	(-)30 - 39	40 - 59	60 - 69	70 - 80(+)			
	1 - 3	4 - 7	8 - 11	12 - 15			
TOTAL SUM OF FACTORS					44	42	48

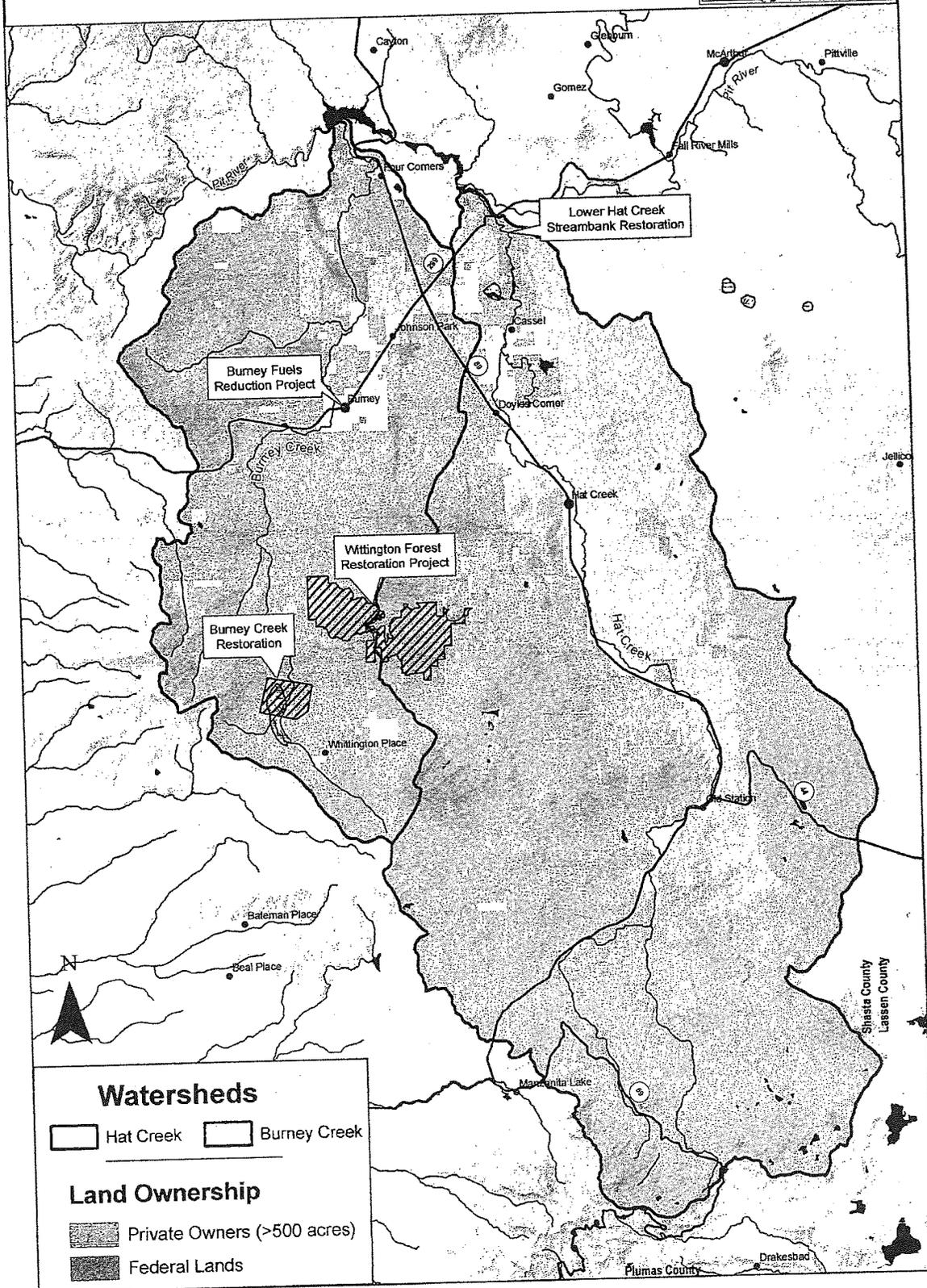
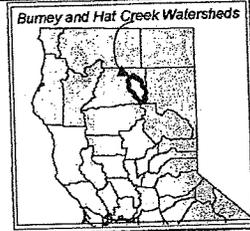
EROSION HAZARD RATING

<50	50 - 65	66 - 75	>75	L	L	L
LOW (L)	MODERATE (M)	HIGH (H)	EXTREME (E)			
THE DETERMINATION IS						

Burney Creek – Hat Creek Community Forestry Project

Fall River Resource Conservation District

Sierra Institute for Community and Environment



Watersheds

Hat Creek Burney Creek

Land Ownership

Private Owners (>500 acres)
 Federal Lands

Burney Gardens Meadow Restoration

Shasta County, California

Meadow Restoration Design

prepared for

Fall River Resource Conservation District

in cooperation with

Pacific Gas and Electric

September 10, 2010

STREAMWISE
Stream Assessment and Restoration

*Applying to the latest trends and current
stream flow, pressure, and habitat*

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McArthur, CA
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Project Purpose: Utilize geomorphic survey data as the foundation for a restoration action plan to restore the health and function of the riparian ecosystem across the Burney Gardens meadow.

StreamWise was directed by the Fall River Resource Conservation District (FRRCD) to assess conditions along a mid-elevation riparian meadow in Shasta County, CA, referred to in this report as the Burney Gardens Meadow. The assessment is followed by design recommendations to restore the health and function of the channel and meadow ecosystem that have been impacted by channel incision.

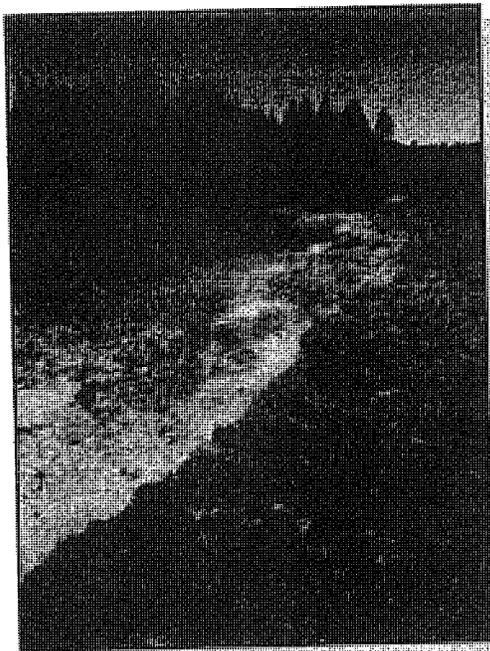
Narrative

Setting, History and Current Conditions

The meadow is situated approximately ten miles south of Burney accessed by Highway 299, then south along Tamarack Road in Shasta County, California (see *Location Map, Appendix A*). The upper portion of Burney Creek feeds into and across the meadow, originating from hillslopes within the Thousand Lakes Wilderness. The property is owned and managed by Pacific Gas and Electric. Livestock grazing and recreational purposes (hunting) have been the primary land uses for approximately a century.

Major portions of the Burney Gardens meadow system remain in verdant condition, with wetland vegetative components dependent upon groundwater availability provided by ephemeral runoff and some spring seepage from adjacent hillslopes. Some channel sections retain the

historic wetland perennial vegetative component that provides channel stability. However, sections of the channel length through the lower meadow site are incised below the historic elevation and flow access to the floodplain has been compromised.



Impacted channel reach. August 2010

Typical causes for channel incision can include intensive grazing, streambank willow and other riparian vegetation removal, channelization by ditching, flood flow erosion and capture of cattle trails or access roads, levee construction, or concentration of flow by artificial constrictions such as bridges, culverts, or diversions. During recent survey work, no evidence of mechanical alterations to the channel was noted. Therefore, it is likely that damage to the channel and loss of floodplain connection is primarily due to a combination of cattle grazing (hoof action along the stream banks during periods of soil saturation) and vegetative reduction along the channel as a result of grazing activity.

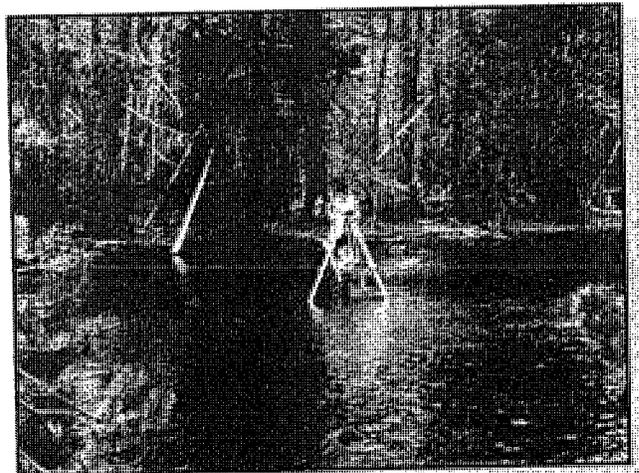
Verification of this conclusion can be documented at the lower fence boundary where the grazing management below the fence has been far less intensive. Below the fence, wetland riparian grasses dominate the channel edges and the channel morphology exhibits a much lower width to depth ratio, as is the stable condition for this valley type. With the reduced grazing pressure

below the fence, the stream is barely visible as it passes through lush sedge species (*see photo page 10*). This condition is likely to approximate the “reference reach” dimensions and condition of the meadow prior to disruption by intensive grazing.

Other stream types are more resistant to the negative effects of cattle concentrations, such as steep, rocky streams with boulder and bedrock grade control. The mountain meadow stream type is usually a narrow, deep channel meandering through low-gradient wetlands. This stream type is highly susceptible to damages from hoof action, due to the long period of soil saturation and the typical steep (or overhanging) bank angle. Once the vegetative component along the banks has been compromised by grazing activity, the subsequent increase in velocity tends to increase erosional rates. After the initial lateral and vertical erosion, the dimension of the channel gradually increases, further exacerbating the erosional tendencies. The end result of this process is gully formation, seen in the early stages in the lower meadow reach.

Assessment Methods

The assessment process requires survey and data collection tasks as the basis for production of a final restoration plan to address impacts of gully formation and restore the health and function of the meadow systems. These data include the longitudinal profile and cross-sectional surveys at several locations along the meadow. From the survey data are derived valley slope, channel slope, channel dimensions, channel and valley thalweg points, sinuosity, and basic conditions of vegetative cover and channel substrate. These data are compared to measured parameters of the stable (or reference reach) condition to determine the degree of channel degradation within the project area.



Initial assessment survey.

May 24, 2010

Using the collected data to produce charts and diagrams, a conceptual restoration design was produced, based on the topographic and geomorphic features depicted by the survey data. This report provides design specifications for restoration work, and is intended to provide specific direction to implement the construction of the restoration alternative, as selected by the FR RCD in cooperation with the involved resource agencies, the Technical Advisory Committee, and the landowner.

Future Consequences

Future flood flows are very likely to cause further erosion, even though the gully formation process is still in the early stages in most areas. Once the initial vertical incision is underway, the erosive force is gradually transferred to lateral erosion and widening of the gully in an attempt to dissipate the energy of the flood forces. This cycle of erosion in incised streams is common, and typically results in enlarged gullies that proceed to erode laterally until a sufficient width of new floodplain surface is established in the gully bottom that will dissipate the energy

of flood flows. This will eventually require the full width of the meadow in many areas. Evidence of this lateral erosion response is apparent at several locations along the gully where bank collapse has widened the channel to a considerable width.

The current condition of the project reach is in the early stages of vertical and lateral channel erosion, and as such, allows consideration of cost effective solutions to restore the natural channel form and function.

Channel Conditions Summary by Reach

A. Upper Meadow Reach

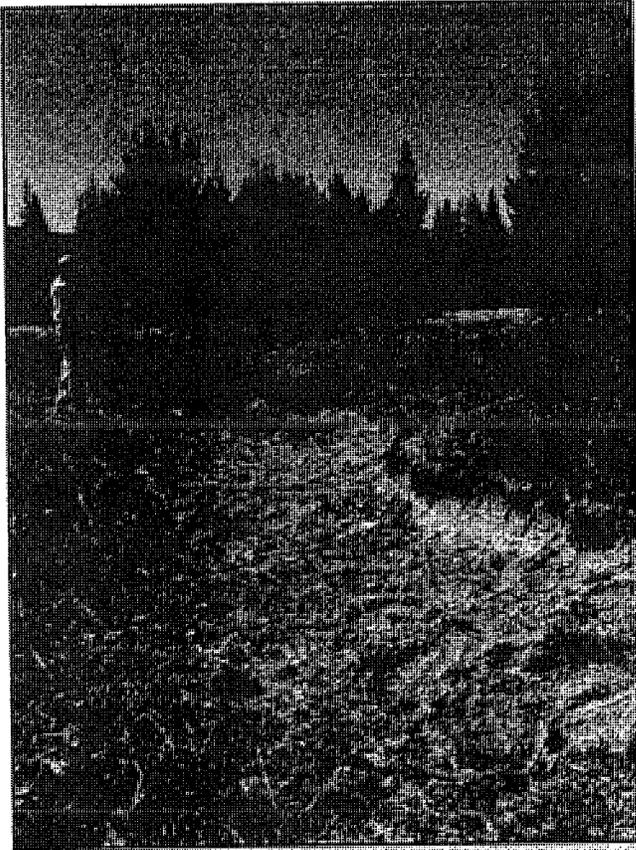
channel condition:	good
floodplain condition:	excellent
channel/floodplain connection:	excellent
channel gradient:	0.1%
restoration opportunity:	unnecessary
priority for action:	low

notes: channel shows signs of bank collapse from grazing
 no vertical incision has yet occurred
 some channel sections contained within forested reaches
 future grazing may impact channel stability
 management changes may suffice to restore natural form

B. Lower Meadow Reach - (proposed project area)

channel condition:	slightly incised
floodplain condition:	moderately impacted
channel/floodplain connection:	degraded
channel gradient:	0.1%
restoration opportunity:	action needed
priority for action:	high

notes: remnant channels in several locations
 main channel incisement 1 to 4 feet
 lateral erosion apparent at all locations
 future grazing may impact project stability
 channel below fence in excellent condition



Fence line channel comparison. August 2010

Causes for Departure

Field surveys indicate that pressure from grazing is the primary factor effecting channel stability within the project area. Intensive grazing impacts channel stability through bank damage from hoof action and vegetative reduction along the stream that increases localized velocities, initiating vertical and lateral erosional processes. Conditions above and below the fence line at the lower end of the proposed project make this conclusion inescapable.

Burney Gardens erosional processes are currently active, and the grazing management protocol prevents riparian recovery. Any action to restore the channel and floodplain connection to historic condition must also include measures to insure a return to a vigorous riparian corridor to insure long-term success of the project. Revegetation efforts, exclusion fencing, and/or a detailed grazing management strategy must be incorporated to help meet this objective following restoration activities.

Alternative Design Concepts

The current channel condition is in a state of disequilibrium with the water and sediment supplied from the watershed. This is evident by the continuing erosional tendencies of the stream channel bed and banks. These processes are active and are viewed by the landowner and resource agencies as problematic. From the landowner perspective, the channel continues to erode valuable land, and the deepened gully tends to dry the surrounding meadow, reducing productivity and groundwater storage capacity.

From the resource agency perspective, the creek no longer offers valuable habitat for fish or riparian obligate species, and chronic lateral erosion supplies accelerated rates of sediment transport to downstream resources. The riparian corridor is discontinuous and declining, impacted by the lowered groundwater elevation.

To address all these concerns, it is prudent to consider restoration methods that will mimic historic conditions of channel and floodplain connection and stream equilibrium. Restoration methods should strive to minimize long-term maintenance by restoring the natural channel and floodplain connection, providing an efficient means of dissipating flood energy. This can best be accomplished by strict adherence to restoration specifications that approximate the reference reach dimension, pattern and profile.

To restore floodplain function and reduce rates of lateral erosion, flood flows must have access to a broad floodplain surface on a regular interval. Research into the recurrence interval of such an event indicates that flood flows should spill out across the floodplain surface approximately two out every three years. To accomplish this, the stream dimensions must be restored to a cross-sectional area small enough to allow for frequent floodplain inundation. There are several methods that may potentially achieve this goal.

1. **Pond-and-Plug Method:** Erase the deepened gully by excavating borrow ponds along its length and using the fill material to fill the gully to floodplain elevation. The flow is returned to the meadow surface into a series of remnant channels that approximate historic channel dimensions. This eliminates the deep gully and the tendency for the meadow to become desiccated from the drainage influence of the gully system.

2. **Floodplain Enhancement:** In some cases, the extent of the lateral and vertical erosion has progressed to the point where filling the incised gully is impractical. In these systems, the lateral erosion has often progressed to such width that a new inset floodplain is beginning to form within the confines of the gully walls. If the lateral erosion rates are still high, this indicates the necessity of the stream system to widen the inset floodplain further to dissipate the flood flow energy. In such cases, the inset floodplain can be mechanically widened to enhance the dissipation function of the feature. The historic channel elevation is not restored, and the water table within the meadow is not raised with this method, but the rate of lateral erosion can be reduced by mechanically assisting the natural erosional process that forms the new floodplain surface at the lower elevation.

3. **Riffle Augmentation:** If the incision process is in the very early stages of development, where the channel is deeply cut, but lateral erosion processes are not yet predominant, then riffle augmentation may suffice to restore the channel dimensions to a more functional condition. Riffle augmentation uses natural materials such as juniper trees to line the banks of the incised reach, then river gravel from a local source is used to restore the bed elevation of each riffle within the reach. This method is cost-effective only if the gully is in a very early stage of incision and the juniper and gravel sources are available nearby.

Other "hard-engineered" methods of bank stabilization (rip-rap, gabion walls, etc.) have not proven to be cost-effective means of stabilization in meadow channels, nor do such methods meet the objectives to restore the natural form and function of the channel, or reduce the long-term maintenance of the project. This assessment will not evaluate these methods of bank stabilization, due to their poor track record in this setting.

Alternative Evaluation and Recommended Design

Burney Gardens is moderately impacted and requires action to restore the historic stable channel dimension and conditions. Significant changes in grazing management strategy must accompany any such restoration action to prevent recurrence of the channel degradation. Of the three alternative actions outlined above, two methods best fit the long-term project objectives. Riffle Augmentation and/or Pond-and -Plug methodology will restore the natural channel condition and floodplain connection in the lower meadow reach.

Alternative 1 (Pond and Plug Method) meets the objectives of the landowner and resource agencies to restore productivity, reduce erosional forces that expand the gully, raise groundwater elevations, reduce sediment transport to downstream resources, and improve in-stream fish habitat and riparian corridor conditions. Survey data indicates that this method is feasible and

cost-effective. The floodplain is of sufficient width to allow for excavation of borrow ponds without significant risk of channel capture during flood flows. Remnant channels exist that provide for low-flow conditions to pass through the meadow at historic bed elevation.

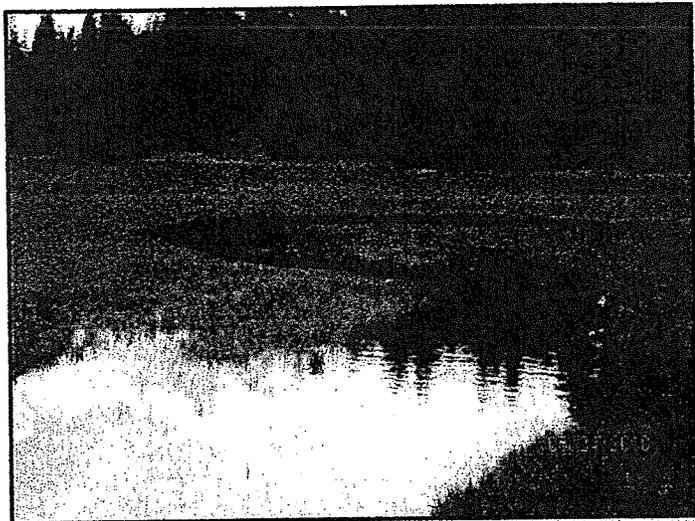
Alternative 2 (Inset Floodplain Enhancement) would meet the objective of reduced lateral erosion rates, but would fail to raise the groundwater surface elevation and restore the productivity of the meadow and riparian corridor.

Alternative 3 (Riffle Augmentation) would also return the channel to more functional dimension. However, there is no on-site source of alluvial gravel that might provide for a nearby supply of materials. Juniper is also scarce, although other conifer species are abundant that may suffice for bank revetment. Gravel/cobble material could be acquired from a local commercial source.

Preferred Alternatives: After consideration of the above alternatives, it was determined that a combination of pond-and plug and riffle augmentation would be likely to best fulfill the restoration objectives. The presence of numerous remnant channels surrounding the incised channel offer "reference reach" channels to carry low-flow volumes following restoration. These remnants make pond-and-plug methodology appropriate for the site. However, certain sections of the low-flow channel intersect and follow the existing impacted channel for short distances, requiring the existing channel to be repaired to mimic historic stable dimensions. This repair is best accomplished by riffle augmentation methods that bring the bed elevation and stream width of those reaches back to a more appropriate level.

Raising the bed elevation will allow for frequent flood flows across the meadow and recharge of the groundwater table. Spreading flood flows across the broad floodplain will reduce erosional pressure on the channel bed and banks. The enhanced water table will provide for increased meadow forage production and riparian recovery.

The danger of following this method lies in the tendency for the stream to initiate the gully formation process that results in channel incisement. To avoid this scenario, management practices must be adjusted to recognize the value of a healthy riparian corridor to reduce flow velocity and provide sufficient resistance to vertical and lateral erosion. Stream channel disturbance can be minimized either by deferral of grazing, exclusion fencing, or careful periodic grazing rotation to prevent channel degradation. Alterations to the grazing management strategy may be developed in coordination with FR RCD and USDA-NRCS assistance.



Remnant channel at bankfull condition. June 2010

Recommended Design Features

1. Utilize the existing remnant swales for the primary flow by filling sections of the degraded channel in the lower meadow.
2. Construct a series of four borrow ponds along these reaches and use the material to fill the incised reaches.
3. Utilize existing sod within the gully bottom as transplants along the fill area and at areas of stress along the design channel.
4. Install revetment at the top of the fill areas (interface with design channel) to prevent erosion from flood flows.
5. Complete the cut and fill process between borrow ponds along the gully to insure minimal risk of channel recapture. Utilize transport machinery within the gully to achieve adequate compaction, matching or exceeding surrounding undisturbed conditions.
6. Utilize juniper or fir revetment along the banks at other riffle areas that require passage of low-flow. This effectively reduces channel width that has been widened by lateral erosion processes.
7. Insert alluvial gravel/cobble mixture within the interlocking branches of the channel revetment to mimic historic stream bed dimensions.
8. Transplant available sod at key locations and seed other disturbed areas with native high-elevation seed mix that approximates the species mix of the meadow ecosystem.

Project Monitoring and Revegetation

Project monitoring should be directed by FR RCD staff in cooperation with the resource agencies, local landowners and managers. Photo points have been established, along with additional points set up during the data collection of the valley transects. Additional photographs and transect resurveys should take place periodically, especially after significant runoff seasons, to monitor channel stability and allow evaluation of project performance.

A basic revegetation plan to enhance the recovery of disturbed areas after project construction is also recommended. While natural vegetative regeneration is expected, it is likely that some effort to speed this recovery will prove effective.

SUGGESTED PROJECT SCHEDULE

2011 Tasks	Construction Season by Week					
Stage materials						
Pond and plug incised reaches						
Riffle augmentation						
Transplant or revegetate key disturbed areas						

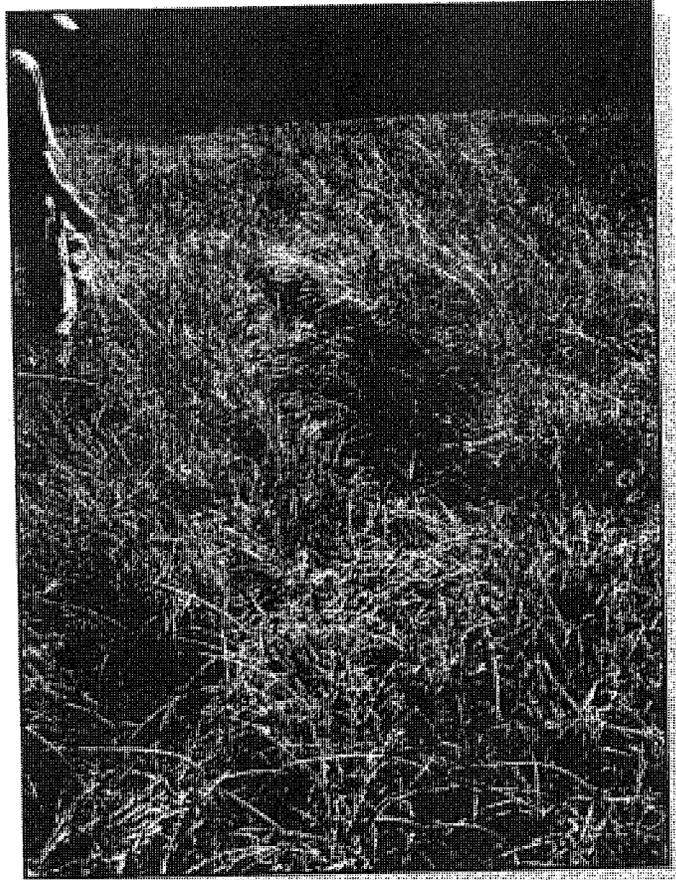
**PROJECT COST ESTIMATES
(materials, machinery, and labor)**

Season	2010	2011
complete survey & design specifications	complete	
permit preparation	in process	
project management		17,000
construction contract		79,000
Total		96,000

The above cost estimates are based on current construction costs, proposed methods, and design and are subject to change dependent upon final approved design specifications. Rough estimates were made for cost of materials and transport of fill to the gully sites. An assumption was made that all revetment materials and the fill would be excavated on site or from nearby sources delineated on the design map. The estimates of project supervision, machinery expenses, and labor costs are based on current rates and could increase as costs increase, especially if project construction is delayed beyond the estimated time schedule.

To compute cut and fill volumes, cross-sections of the existing gully were used to calculate fill area. These area figures were multiplied by channel length to compute fill volume in the vicinity of the transect. A shrinkage factor of 1.50 was applied to estimate compacted fill volume. Additional survey work would serve to refine these estimates, but additional surveys cannot resolve variables of materials compaction, ground moisture, and additional gully erosion volumes prior to the construction period. Contractors will need to consider these variables, along with fluctuations in constructions costs (fuel, labor, etc.) when developing project budgets.

It is strongly recommended that any Request for Proposals dealing with restoration work on Burney Gardens be written to utilize the current proposed project design and construction oversight (design/build). By retaining current design personnel, the project proponents insure a seamless transition between project design and implementation of such design. Selection of contractors should favor past experience in pond-and-plug implementation, as variable ground conditions are inherent to this type of project and require significant level of flexibility and foresight during construction.



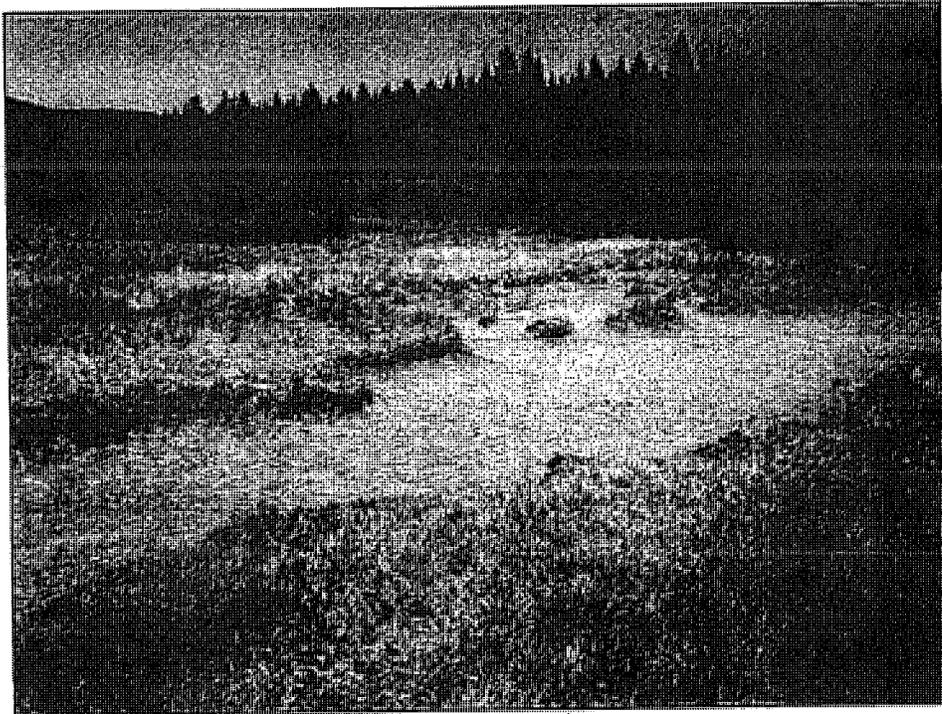
Typical reference reach channel conditions. June 2010

StreamWise looks forward to working with the FR RCD, project landowners and resource agencies to restore the health and function of the Burney Gardens Meadow.

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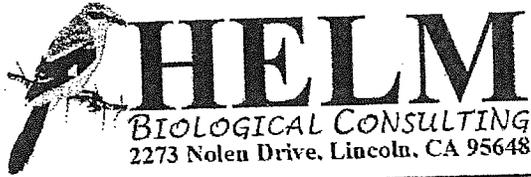
**DRY-SEASON SAMPLING
FOR
FEDERALLY-LISTED LARGE BRANCHIOPODS
AT THE
PACIFIC GAS & ELECTRIC COMPANY
BURNEY GARDEN
ASPEN AND MEADOW RESTORATION PROJECT**



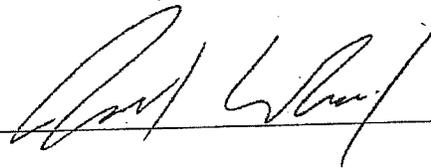
Prepared for: **ENTOMOLOGICAL CONSULTING SERVICES, LTD.**
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Pleasant Hill, CA 94523-2188
Contact: Richard Arnold
(925) 825-3784

Prepared by: **HELM BIOLOGICAL CONSULTING**
2273 Nolen Drive
Lincoln, CA 95648
Contact: Brent Helm
(916) 543-7397.

August 2009



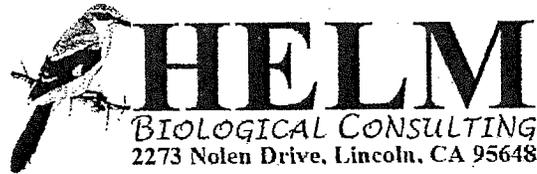
"I certify that the information in this survey report and attached exhibits fully and accurately represent my work."

Todd F. Wood Signature 

Date 08/15/09

Large Branchiopod Dry-Season Sampling
PG&E Burney Garden

Ph: (916) 543-7397
Fax: (916) 543-7398



**DRY-SEASON SAMPLING
FOR
FEDERALLY-LISTED LARGE BRANCHIOPODS
AT THE
PACIFIC GAS & ELECTRIC COMPANY
BURNEY GARDEN
ASPEN AND MEADOW RESTORATION PROJECT**

INTRODUCTION

Helm Biological Consulting was contracted by Entomological Consulting Services, Ltd. to conduct dry-season sampling for large branchiopods (fairy shrimp, tadpole shrimp, and clam shrimp) that are listed as threatened or endangered under the federal Endangered Species Act (ESA) (e.g., vernal pool fairy shrimp [*Branchinecta lynchi*] and vernal pool tadpole shrimp [*Lepidurus packardii*]) at the Pacific Gas & Electric (PG&E) Company Burney Garden Aspen and Meadow Restoration Project (hereafter "Project").

The Project is located west of Scott Lumber Road and east of Tamarack Road in Central Shasta County, California (Figure 1). Additionally, the Project is located in Sections 1, 2, 7, 11, 12, 13, and 14, Township 33 North, and Range 2 East of the Jacks Backbone U.S. Geological Survey 7.5 minute topographic quadrangle map (Center coordinates in North American Datum 1983 Universal Transverse Mercator [UTM] Zone 10 North: UTM Northing 4510422.7 and UTM Easting 609172.0).

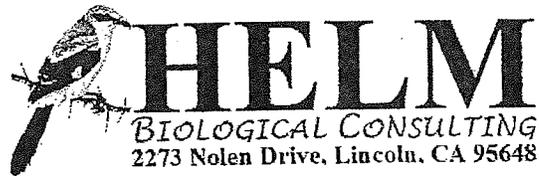
The purpose of the Project is to restore and enhance existing aspen and meadow habitat to ensure they persist and continue to provide an important habitat component within the forest matrix.

Background

While conducting routine biological surveys during the winter of 2008-2009, Steve Young of PG&E observed tadpole shrimp and fairy shrimp with in several basins at the Project. The fairy and tadpole shrimp were not identified to species (nor collected), so

Large Branchiopod Dry-Season Sampling
PG&E Burney Garden

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they could possibly be species that are federally-listed (such as the vernal pool tadpole shrimp or the vernal pool fairy shrimp). Even though, the elevation of the Project is roughly 5,000 feet above mean sea level and the types of habitats occurring on site (rain melt pools within wet meadows) are not typically those known to support federally-listed large branchiopods more investigation needed to be conducted.

Hence, Dr. Dick Arnold of Entomological Consulting Services, Ltd. contracted Helm Biological Consulting to conduct an assessment of the habitats occurring on site for the potential to support federally-listed large branchiopods. The results of the habitat assessment concluded that further data was needed to preclude the absence of the federally-listed as threatened vernal pool fairy shrimp on site and that the tadpole shrimp occurring was most likely the non-listed cryptic tadpole shrimp (*Lepidurus cryptus*) (Helm Biological Consulting, LLC 2009). According to Mr. Younge (pers. comm.) the (USFWS) U.S. Fish and Wildlife Service concurred with the findings of HBC (2009) habitat assessment.

Therefore, the focus of this dry-season sampling survey is to identify the species or at minimum the genera of fairy shrimp that occurs on site. Given the location of the project and the types of habitats occurring on site only three genera of fairy shrimp have potential to occur: *Branchinecta*, *Streptocephalus*, and *Eubranchipus*.

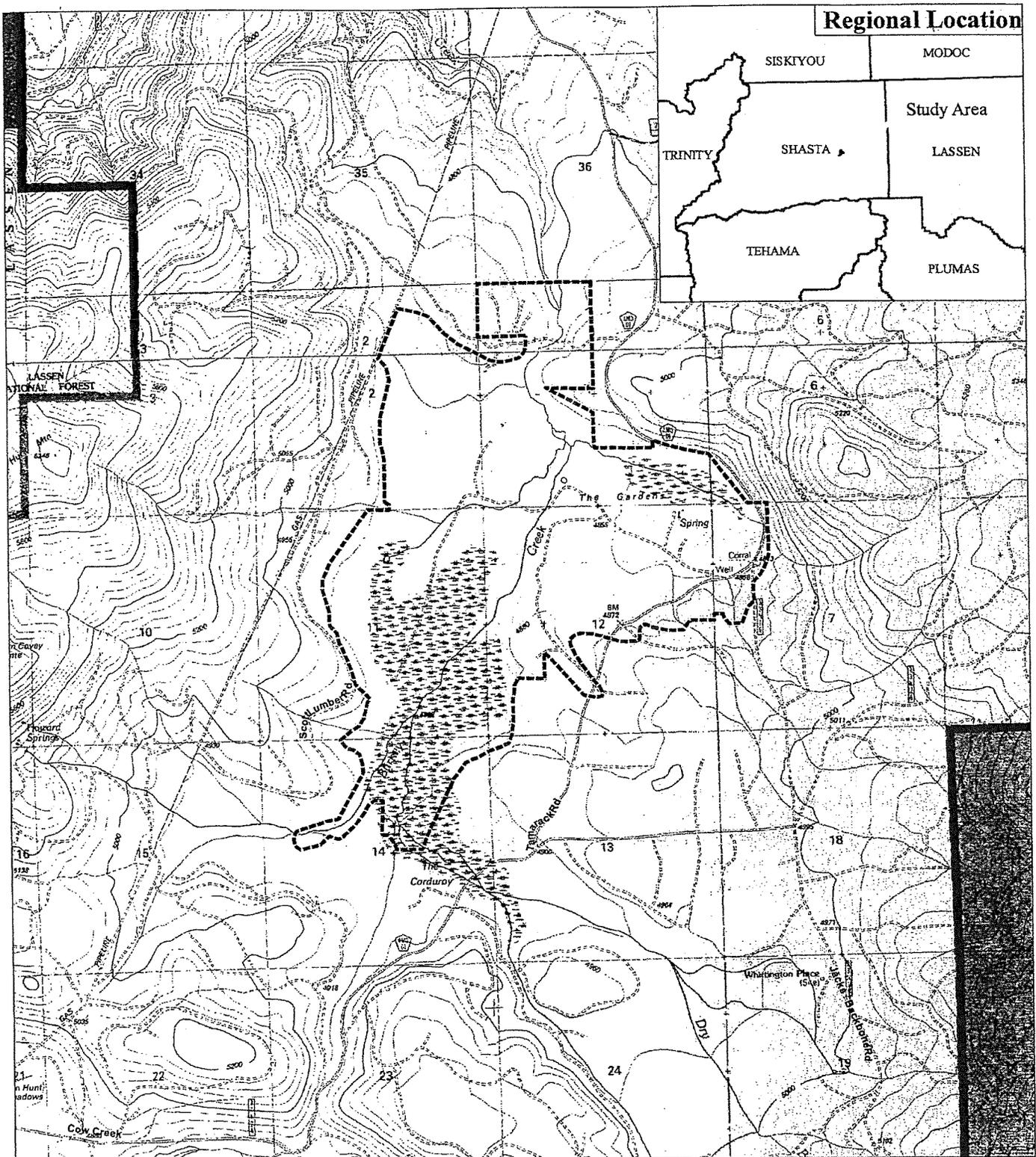
The different Genera of fairy shrimp occurring in California (*Branchinecta*, *Streptocephalus*, *Eubranchipus*, *Linderiella*, and *Thamnocephalus*) can be readily identifiable from one another by comparing and contrasting the morphological characteristic of their cysts under a microscope and in some cases, the identification of species using cysts can occur. However, many species, such as those within the Genus *Branchinecta* have cysts characteristics that overlap among certain members, making positive identification of species difficult or impossible.

It was our optimism that dry-season sampling would yield cysts belonging to *Streptocephalus* or *Eubranchipus*, and thus ruling out the possibility of the vernal pool fairy shrimp occurring on site.

This report discusses the methods and results of the dry-season sampling for the presence of federally-listed large branchiopods at the Project.

Large Branchiopod Dry-Season Sampling
PG&E Burney Garden

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Regional Location



Property Center Coordinates in NAD UTM Zone 10 N
 Northing 4510422.7 Easting 609172.0

1:36,000
 1 inch equals 3,000 feet

 Study Area



Prepared By: 
 Date: 6-18-09

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Figure 1. PG&E Burney Gardens Aspen and Meadow Restoration Project Location

(Source: U.S. Geological Survey Jacks Backbone and Burney MT West 7.5 minute Topographical Quadrangle Map)



METHODS

Mr. Todd Wood conducted dry-season sampling on July 16, 2009 as authorized by the U.S. Fish and Wildlife Service (USFWS) (Appendix A). Sampling was conducted under permit TE-795930-5 of Section 10(a)(1)(A) of the federal Endangered Species Act, 16 U.S.C. 1531 *et seq.*, and its implementing regulations.

Dry-season sampling involved the collection of a minimum of ten sub-samples of soil, mainly from the lowest topographic areas within basins that Steve Younge observed fairy shrimp and tadpole shrimp. Soil samples were placed in liter size plastic freezer bags and marked with the project name, basin number, and date. The soil was then transported to Helm Biological Consulting's, LLC laboratory for processing and analysis.

In the laboratory, a brine solution was prepared by mixing table salt (NaCl) with lukewarm tap water in a large container. The collected soil material was placed in the brine solution. The soil material was then gently worked by hand to breakdown any persistent soil structure. The organic material rising to the top of the brine solution was skimmed off and placed in a 710-micron diameter pore-size sieve stacked atop a 75-micron diameter pore-size sieve. The soil material was processed through the top sieve by flushing it with lukewarm tap water while gently rubbing it with a soft-bristle brush. The soil retained from the 75-micron diameter pore size sieve was then removed and thinly (≈ 1.0 mm) spread into plastic petri dishes.

The contents of each petri dish were examined under a 10 to 252-power zoom binocular microscope. A minimum of 0.5-hour was spent searching the contents of each petri dish for large branchiopod cysts (embryonic eggs). Helm Biological Consulting's, LLC large branchiopod cyst reference collection and scanning electron micrographs of cysts (Hill and Shepard 1998, Mura 1991, and Gilchrist 1978) were used to identify and compare any cysts observed within the soil samples.



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Livestock Grazing Management Plan

*Pacific Gas and Electric Company
Burney Gardens
Burney, CA*

Introduction: Burney Gardens is located approximately 10 miles (as a crow flies) southwest of the town of Burney in Shasta County, CA. In 2009, Pacific Gas and Electric Company (PG&E) developed a Timber Harvesting Plan (THP) and initiated planning for a habitat restoration project and in the Burney Gardens area to improve meadow and aspen habitat conditions by removing encroaching lodgepole pine (*Pinus contorta*) trees and thinning nearby forested areas. After the THP was developed, adjacent landowners (Sierra Pacific Industries, Inc. [SPI], Shasta Forest Timberlands, Inc. [SFT], Fruit Growers Supply Co., [FG]) and PG&E decided to expand the restoration treatment area leading to the development of a new THP.

This grazing management plan was developed as technical assistance to PG&E from the Natural Resource Conservation Service (NRCS) and the Fall River Resource Conservation District (FRRCD) to ensure livestock grazing continues in Burney Gardens while enhancing and sustaining the valuable native habitats of this mountain meadow area. This grazing management plan has been developed specifically for PG&E lands; however, because little fencing is present in the Burney Gardens area, information within this plan can be utilized by adjacent landowners to assist with their livestock management programs.

PG&E leases out their Burney Gardens property on an annual basis for grazing in the summer and fall months (Approximately June – October depending on accessibility). Most recently, the leasee managed 71 cow/calf pairs.

The goals of this plan include the following:

- Protect and enhance wetland features (e.g. stream channel, aspen)
- Increase the quantity and quality of forage for livestock and other herbivores
- Provide reliable habitat for livestock
- Reduce trailing that results in potential surface flow features
- Ensure existing grade control within the stream (i.e. sodded riffles) are not damaged by livestock
- Create and encourage high biological diversity



Planned Grazing Improvements: This plan is being created as part of a larger conservation plan. The conservation plan includes structural practices such as fencing that will be installed which will support the implementation of this grazing management plan. The restoration plan that has been developed is expected to:

- a) protect existing open meadow areas from further degradation such as headcut extension and channel widening; and
- b) decrease the extent of lodgepole pine encroachment and subsequent increase in herbaceous cover and biomass. Restoration activities in the open meadow area will fill oversized channels, create ponds, and create hydraulic continuity so that wetland features are protected and sustained.

Two types of infrastructure are proposed: fencing and livestock/wildlife watering facilities. A livestock exclusion fence will be installed around the restoration site so that vegetation can become rapidly established and develop a tough sod layer that will help stabilize soil and the stream channel. In addition, temporary fencing is proposed for aspen stands. The fencing may be removed after a period of three years in the open meadow area if vegetation becomes well established (grazing management parameters will still apply). Fencing shall remain around aspen stands until aspens grow above the browse height of livestock and wildlife, generally about 4-5 feet high.

During the early grazing season (i.e. June) at the site, Burney Creek and its tributaries are still flowing and livestock have ample water available. As the season progresses, the creeks dry up and only deeper pools retain water as they reflect the shallow ground water level. By late summer (i.e. September), shallow groundwater is at the lowest levels (up to six feet below the surface), and only the deepest pools and ponds retain water. During these times, average distance between the ponds and/or available water is approximately 4,000 feet, which may cause distribution of cattle and utilization of forage to decrease.

Appendix A: Conservation Plan Map for location of planned practices.

Site Description: This grazing management plan focuses on a combined 596 acres of forestland, perennial meadowland and wetlands within the Burney Creek watershed on PG&E land. The meadow comprises 160 of those acres while the rest is forested. Approximately 76 acres of the forested areas have been commercially thinned at the time of this document creation. Elevation of the site is about 4800 feet. Burney Creek, along with numerous seasonal drainages, converge and inundate this area for a long duration of time during the spring and summer seasons, helping to create the wetland conditions. Soils on the property consist of Gardens-Jacksback complex, 0-2% slopes, across the meadow and Jacksback loam, 2-9% slopes, in the forested areas. Burney Gardens is generally flooded for very long periods and the water table is at the surface to approximately 36" below the surface from the wet season through as late as July. Both of these factors impair livestock operations in winter and spring and dictate when livestock graze the property.



A continuous, season-long grazing scheme is used for the Burney Gardens area. Cattle freely move throughout the 160 open meadow acres but movement within the dense forest structure within the perimeter fence is limited. The livestock generally distribute themselves where high quality forage and available water is present. Water availability varies with the season and water year, but a few locations usually always provide a drinking source later in the year. These locations include two stock ponds, a spring area near an old cabin, and deeper pools within Burney creek in the lower portion of the meadow (Appendix B: Livestock Watering Locations Map).

Baseline Conditions: In mid-September and late October, 2013, pedestrian surveys of the gardens were conducted by Todd Sloat (FRRCD), Sheli Wingo (Partners) and Jenna Brazil (NRCS). Only rough composition data was collected, as it was too late in the season to collect production data.

Common plant species noted across the meadow included rush (*Juncus* spp), sedge (*Carex* spp), bentgrass (*Agrostis* spp), bluegrass (*Poa* spp), tufted hairgrass (*Deschampsia cespitosa*), and other perennial forbs. The forested areas include plant species such as lodgepole pine (*Pinus contorta*), white fir (*Abies concolor*), quaking aspen (*Populus tremuloides*), serviceberry (*Amelanchier alnifolia*), and huckleberry (*Vaccinium* spp).

The information provided below is based on total dry-weight production numbers (lbs/ac) in a normal year supplied through the Intermountain Soil Survey. It was agreed upon between all parties that production (clipping and weighing forage) and cover data shall be collected during peak growth next season (2014) and prior to livestock grazing in order to “field truth” the Intermountain Soil Survey and provide the landowner with more accurate data. Forage collection will also need to be conducted in the treated forested areas as work is completed, for this will presumably increase forage availability.

Forage production and Animal Unit Months (AUMs) for each pasture are illustrated in Table 1 below. AUMs= The amount of forage that the cow/calf pair will consume in 1 month.

For calculating AUMs, utilization percentages (Utilization % = How much of the current year’s growth will be grazed by the end of the growing season) for the meadow was established at 50% due to high productivity and moisture availability, allowing for a shorter recovery time. Utilization percentages for the forested areas were established at 40% based on its anticipated production potential (soil type, soil moisture content). Accessibility and usability of forage were also factors when adjusting the AUMs. Production will need to be field-verified and adjusted accordingly. As mentioned above, AUMs will presumably increase as forestland is thinned.



Table 1. Forage production and Animal Unit Months (AUMs) for each pasture

Field #	Meadow (assuming 100% accessible and usable)	Forestland - treated (assuming 100% accessible and usable)	Forestland – untreated (assuming 50% accessible and 100% usable)
Forage (lbs/ac)	1600 (soil survey)	750 (est)	150 (est)
AUMs	152	24	24

An example for interpreting data in Table 1 is as follows:

Meadow:

152 AUMs/4 month grazing period = 38 cow/calf pair for 4 months **OR**
 152 cow/calf pairs for 1 month

The preliminary information indicates that there is an estimated total of 200 AUMs available within the grazing unit, estimating a carrying capacity of 50 pair (200 AUMs/4 months = 50). Stocking rates should be adjusted as the amount of forage fluctuates. Monitoring of the vegetation trend will help grazier achieve stocking rate adjustments (Appendix C: Worksheet-Forage Inventory Based on Current Stocking Rate, Trend, Health, and Utilization).

Grazing Plan: In order to meet the goals and objectives for the ranch, a grazing system will be created that will be beneficial to the vegetation, the health of the animals, and long term economics of the ranch. The timing and duration of grazing will be calculated by assessing the forage amount and factoring in the size of each land use, as well as the numbers of the animal units. Formulas for calculations are displayed in Appendix D.

Grazing Parameters: Forage production, and therefore carrying capacity (the number of animals that a field can accommodate without overgrazing), varies greatly from month to month and year to year. The stocking rate should be adjusted according to seasonal and annual changes in the carrying capacity. To be sustainable, the rotation length (i.e. “rest” period) must be long enough to allow the field full recovery before coming back to it. A good rule of thumb when determining the rest period is to determine how long it takes in the vicinity for a new grazed grass plant to grow 3-4 new mature leaves. Generally, during peak growth in spring (or on irrigated fields) the recovery period is short (30-45 day rest period needed) while in late fall the recovery period is long (60-120 day rest period needed).

With the above in mind, livestock should not start grazing the pastures at the start of each grazing period until average herbaceous vegetation growth reaches 6-8” in height. Livestock grazing should cease in each pasture when the average stubble height is 3-4”.

The land use types available within Burney Gardens include perennial meadowland and forestland (treated and non-treated). The current leasee runs 71 pair. The cattle graze the property annually from June – October. This system has a forage demand of 284 AUMs. According to above production data estimates, the current condition of the site allows for approximately 200



AUMs. Based on these preliminary numbers there is an existing forage deficit; however, production data shall be collected during peak forage growth next season to verify estimates.

Given the anticipated moisture conditions of the meadow that will likely exist during the early part of the season of use, the cattle shall be encouraged to graze the forested uplands at the start of the season (June – July). Assuming the above estimates of annual forage production within the forestland is accurate; production availability should enable approximately 48 pair to graze for the first month in the forested areas. Livestock use on wet soils leads to trampling and compaction while stunting forage growth. Meadow use shall be deferred until soils are dry enough that impacts won't occur.

Estimated days of grazing available per land use area are displayed in Table 2 below (Based on forage calculations and estimated carrying capacity of grazing unit).

Table 2. *Estimated days of grazing available per land use area*

Field	Meadow	Untreated Forest	Treated Forest
Days of grazing per 50 pair	93	16	15

Cross fencing within the grazing unit is highly recommended for rotational grazing management. If cross-fencing is not feasible, other methods of distributing cattle shall be used such as strategic placement of watering points and salt/mineral blocks. Lack of cattle dispersment leads to reduced rest periods for forage, higher risk of internal parasite infection, and uneven grazing. Older plants will generally be avoided and younger plants will not have time to recover before they are regrazed, therefore, affecting root and plant growth and decreasing forage intake. Salt and mineral blocks shall not be placed in riparian areas or the meadow; a minimum of ¼ mile away from water sources will encourage upland feed. Grazier shall periodically rotate supplement sites to reduce livestock concentration areas as associated resource degradation.

Table 3 *An illustrated example of the grazing system*

Table 3. Year 1						
Month	June	July	August	September	October	November
Field	Days of Month					
Meadow			July (as soil condition permits) – October 1			
Untreated Forestland	June – July (as soil conditions permit)					
Treated Forestland	June – July (as soil conditions permit)					

**Contingency Plan:**

Flexibility is required in any grazing management plan to adjust for changes in forage production, availability of water for livestock, drought, fire, flooding, and other natural events. A grazing contingency plan shall be carried out by the leasee if resource degradation within the grazing unit is at risk.

Some options for the client include:

- 1) Reassess impact of forage availability. As a general rule, more stubble than indicated within this plan should be left after grazing to be used as a buffer.
- 2) Use additional grazing grounds.
- 3) Adjust livestock inventory to reduce and balance total forage required with available forage supply. Cull late calving cows, older cows, and less productive cows. Wean beef cows early (3 months). Remove yearlings early and sell or drylot.
- 4) Provide supplemental feed if economically feasible.
- 5) Consider more splitting of fields (i.e. temporary electric fence) and intensively grazing the paddocks (short duration, high frequency). This allows a rest period for the grasses, reduces selectivity in a cow's grazing habit, enhances forage utilization rate, and can improve carrying capacity.

Monitoring: A monitoring plan shall be developed with appropriate records to assess whether the grazing strategy is meeting objectives. A monitoring plan should provide enough information to assist the land manager with decisions concerning the grazing schedule and stocking rates.

PG&E currently manages the grazing practices on their property in the Burney Gardens area. They inspect the site annually, and when necessary, make improvements to fences and other infrastructure (e.g. roads). Future site inspections and monitoring will be conducted by PG&E, but the Fall River RCD and W.M. Beaty and Assoc. Inc. (W.M. Beaty) staff will also perform site inspections, monitoring and reporting consistent with permitting and compliance requirements. It's possible, although unlikely, that the inspections and/or monitoring require additional work that would affect the grazing plan. Table 4 below outlines the proposed and required site inspections, monitoring and reporting.

In instances where W.M. Beaty and/or Fall River RCD inspections identify maintenance needs, they will provide PG&E written notification. PG&E will then review the suggestion and make a final decision on the specific maintenance to be implemented or not implemented.



Table 4. Proposed and required site inspections, monitoring and reporting

Site Inspection or Monitoring Activity	Rationale and/or Requirement	Responsible Party and Timing
Stream Channel Stability	Not required by any permits but needed to ensure areas held together after the first winter	Fall River RCD; occurs each spring for first three years post construction
WQ Certification Notice Monitoring	Per the THP WQ permit. <u>Implementation monitoring</u> prior to winter to ensure erosion control is adequate. <u>Forensic monitoring</u> conducted after 5 inches of precipitation and again after 15 inches. Effectiveness monitoring conducted each spring to ensure erosion control and crossing functioned and are not damaged	Registered Professional Forester (RPF) for appropriate ownership; implementation monitoring occurs post treatment and prior to winter; forensic monitoring occurs after precipitation trigger; Effectiveness monitoring occurs each spring/early summer (i.e. June)
Plant surveys	Per the THP; species specific monitoring consistent with the Botanical Survey Map (pg. 36) of TH.	RPF will contract work to qualified botanist; surveys to occur prior to operations
Aspen locations	Not required by THP but needed to meet project objectives	Following operations, the FRRCD will delimit aspen locations with a GPS.
General Habitat Photographs	Not required by THP but needed to meet project objectives	Photo monitoring stations will be established in open meadow and forest structure prior to operations. Photographs will be recorded each year for three years post operations
Avian Monitoring	Pre-construction monitoring for greater sandhill cranes (GSCR) and northern goshawk (NOGO) are required for the THP. In addition, standardized point count stations have been established within the forest structure and monitored once. These are not required but part of the project objectives.	Surveys for GSCR and NOGO are to be conducted prior to operations if they will occur prior to August 1 st . The RFP is responsible for the NOGO and Fall River RCD for the GSCR. Point count surveys will occur once or twice each year between June 1 and July 15. These surveys will be conducted by qualified biologists if funding is available.

This management plan has been prepared based upon current conditions found in the field. At the end of each grazing period, in each field, the vegetation should appear to be grazed uniformly. If the visual inspection shows certain species or areas are being grazed heavily while others under-utilized, then adjustments to livestock grazing intensity, stocking rate, and/or timing of grazing may need to be made and considered.

Attachments



APPENDIX A

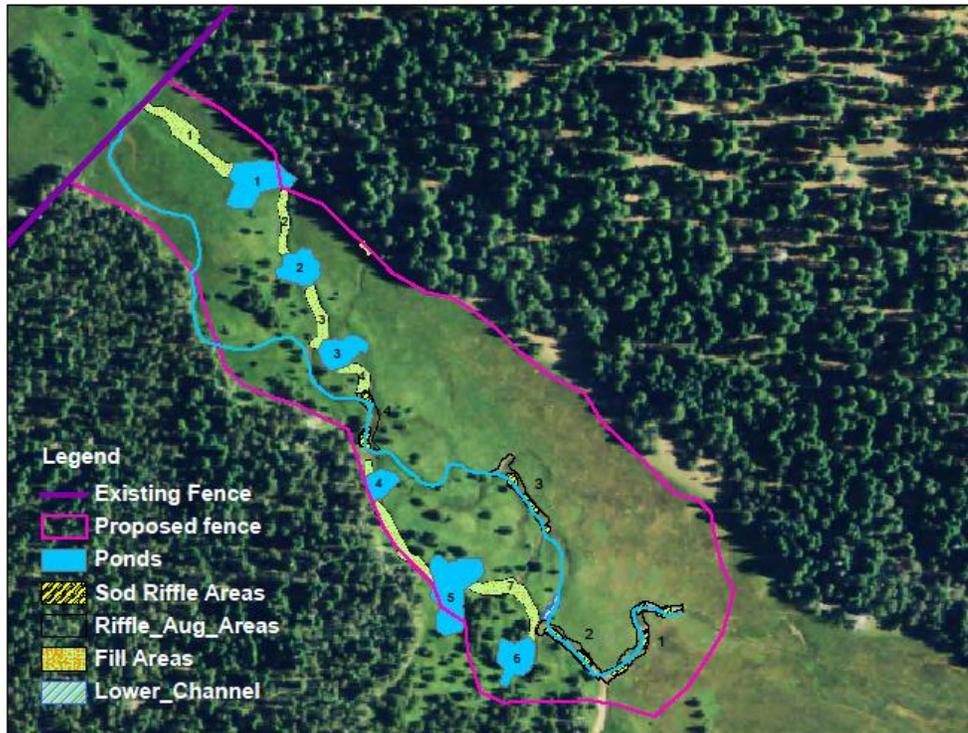
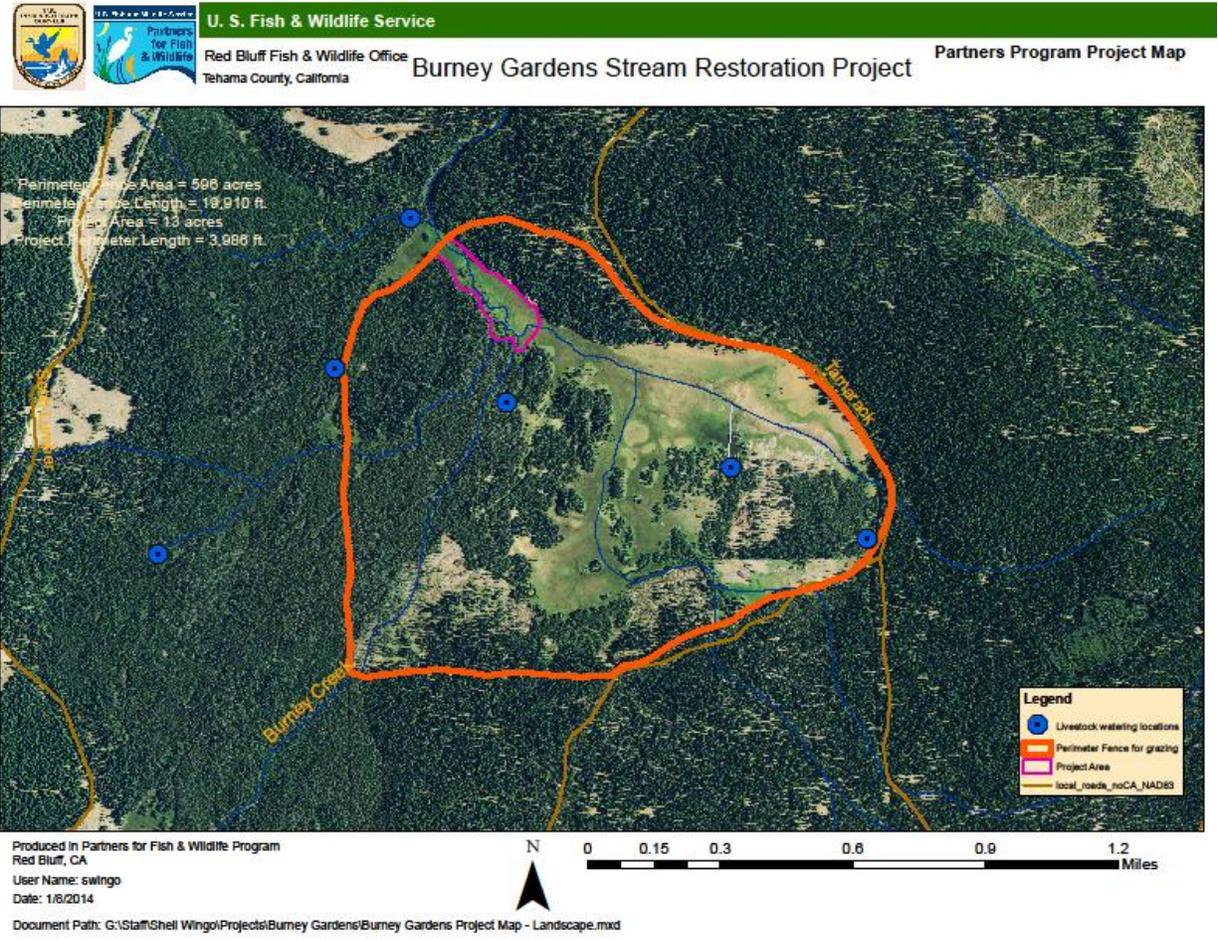


Figure 6. Proposed Fence and Construction Elements (e.g. ponds)



APPENDIX B





APPENDIX D

Forage Calculation Examples

Production (lbs/acre) =

Meadow:

Production -1600 lbs/acre

50% harvest efficiency

95% stocking rate adjustment

160 acres

1600 X .50 X .95 X 160 acres = 121,600 lbs of forage available

Carrying Capacity =

Meadow:

121,600 lbs of forage available

Demand = 26 lbs/day x 120 days = 3,120 lbs forage required for one animal

121,600 lbs/3,120 lbs = 38 cow calf pairs for 4 months of grazing

= 152 Animal Unit Months (AUMs) *(the amount of forage that 1000 pounds of animal will consume in 1 month)*

Days of Grazing Available =

Production - 1600 lbs/acre

50% harvest efficiency

95% stocking rate adjustment

160 acres

Avg. animal unit weight – 1000 lbs

Intake rate in % body weight – 2.6%

50 cow-calf pairs

days = $\frac{121,600 \text{ lbs of forage available}}{1000 \times 0.026 \times 50}$ (intake per day)

= 93 days

Livestock Grazing Management Plan

Shasta Forest Timberlands

*Burney Gardens
Burney, CA*

Introduction: Burney Gardens is located approximately 10 miles (as a crow flies) southwest of the town of Burney in Shasta County, CA. In 2009, Pacific Gas and Electric Company (PG&E) developed a Timber Harvesting Plan (THP) and initiated planning for a habitat restoration project and in the Burney Gardens area to improve meadow and aspen habitat conditions by removing encroaching lodgepole pine (*Pinus contorta*) trees and thinning nearby forested areas. After the THP was developed, adjacent landowners (Sierra Pacific Industries, Inc. [SPI], Shasta Forest Timberlands, Inc. [SFT], Fruit Growers Supply Co., [FG]) and PG&E decided to expand the restoration treatment area leading to the development of a new THP.

This grazing management plan was developed as technical assistance to Shasta Forest Timberlands, Inc. (SFT) from the Natural Resource Conservation Service (NRCS) and the Fall River Resource Conservation District (FRRCD) to ensure livestock grazing continues in Burney Gardens while enhancing and sustaining the valuable native habitats of this mountain meadow area. This grazing management plan has been developed specifically SFT. However, little fencing is present in this area of Burney Gardens and the same lease runs livestock on Sierra Pacific Industries, Inc. lands. Therefore, livestock may have a greater potential of forage available to them in this area than is identified within this plan.

SFT leases out their Burney Gardens property on an annual basis for grazing in the summer and fall months (Approximately June – October depending on accessibility). Most recently, the leasee managed a total 74 cow/calf pairs on these areas.

The goals of this plan include the following:

- Protect and enhance wetland features (e.g. stream channel, aspen)
- Increase the quantity and quality of forage for livestock and other herbivores
- Provide reliable habitat for livestock
- Reduce trailing that results in potential surface flow features
- Ensure existing grade control within the stream (i.e. sodded riffles) are not damaged by livestock
- Create and encourage high biological diversity

Planned Grazing Improvements: This plan is being created as part of a larger conservation plan. The conservation plan includes structural practices such as fencing that may be installed which will support the implementation of this grazing management plan. The restoration plan that has been developed is expected to:

-
- a) enhance aspen communities; and
 - b) decrease the extent of lodgepole pine encroachment and subsequent increase in herbaceous cover and biomass.

Two types of infrastructure may be needed based on monitoring of site conditions after project implementation (i.e. fencing and livestock/wildlife watering facilities. A livestock exclusion fence may be installed around small and isolated patches of aspen. This is intended to speed up the recruitment of aspen complexes and allow growth to extend above the brose height of livestock (generally about 5 feet). The fencing may be removed after a period of three years in the open meadow area if vegetation becomes well established (grazing management parameters will still apply).

During the early grazing season (i.e. June) at the site, Burney Creek and its tributaries are still flowing and livestock have ample water available. As the season progresses, the creeks dry up and only deeper pools retain water as they reflect the shallow ground water level. By late summer (i.e. September), shallow groundwater is at the lowest levels (up to six feet below the surface), and only the deepest pools and ponds retain water. During these times, average distance between the ponds and/or available water is approximately 4,000 feet, which may cause distribution of cattle and utilization of forage to decrease.

Site Description: This grazing management plan focuses on a combined 2,530 acres of forestland, perennial meadowland and wetlands within the Burney Creek watershed on SPI and SFT land. Little open meadow habitat is available as most of this is located to the north on PG&E lands. None of the forested treatments have been implemented with the exception of * acres of selection on SPI land in 2014.

Elevation of the site is about 4800 feet. Burney Creek, along with numerous seasonal drainages, converge and inundate this area for a long duration of time during the spring and summer seasons, helping to create the wetland conditions. Soils on the property consist of Gardens-Jacksback complex, 0-2% slopes, across the meadow and Jacksback loam, 2-9% slopes, in the forested areas. Burney Gardens is generally flooded for very long periods and the water table is at the surface to approximately 36" below the surface from the wet season through as late as July. Both of these factors impair livestock operations in winter and spring and dictate when livestock graze the property.

A continuous, season-long grazing scheme is used for the Burney Gardens area. Cattle freely move throughout the 2,000 acres but movement within the dense forest structure within the perimeter fence is limited. The livestock generally distribute themselves where high quality forage and available and where water is present. Water availability varies with the season and water year, but a few locations usually always provide a drinking source later in the year. These locations include deeper pools within Burney creek where Tamarack road crosses the lower areas of the meadow, and a spring-tributary in the southwestern portion of the THP (Appendix A: Ownership Location, THP Boundary, Livestock Watering Locations Map).

Baseline Conditions: Surveys of site conditions have been conducted on various dates since 2013 which estimated forage production and rough species composition.

Common plant species noted in small meadow openings consisted of rush (*Juncus* spp), sedge (*Carex* spp), bentgrass (*Agrostis* spp), bluegrass (*Poa* spp), tufted hairgrass (*Deschampsia cespitosa*), and other perennial forbs. The forested areas include plant species such as lodgepole pine (*Pinus contorta*), white fir (*Abies concolor*), quaking aspen (*Populus tremuloides*), serviceberry (*Amelanchier alnifolia*), and huckleberry (*Vaccinium* spp).

The information provided below is based on total dry-weight production numbers (lbs/ac) in a normal year supplied through the Intermountain Soil Survey. Specific site data was collected in 2015 prior to livestock grazing in order to “field truth” the Intermountain Soil Survey and provide the landowner with more accurate data. Forage collection will also need to be conducted in the treated forested areas after work is completed, for this will presumably increase forage availability.

Forage production and Animal Unit Months (AUMs) for each pasture are illustrated in Table 1 below. AUMs= The amount of forage that the cow/calf pair will consume in 1 month.

For calculating AUMs, utilization percentages (Utilization % = How much of the current year’s growth will be grazed by the end of the growing season) for the meadow was established at 50% due to high productivity and moisture availability, allowing for a shorter recovery time. Utilization percentages for the forested areas were established at 40% based on its anticipated production potential (soil type, soil moisture content). Accessibility and usability of forage were also factors when adjusting the AUMs. Production will need to be field-verified and adjusted accordingly. As mentioned above, AUMs will presumably increase as forestland is thinned.

Table 1. Forage production and Animal Unit Months (AUMs) for each pasture

Field #	Meadow Forestland Areas (assuming 100% accessible and usable)	Meadow Forestland- treated (assuming 100% accessible and usable)	Upland Forestland – untreated (assuming 50% accessible and 100% usable)
Acres	1,360	0	1,170
Forage (lbs/ac)	150	750 (est)	100
AUMs	152	0	72

An example for interpreting data in Table 1 is as follows:

Meadow and Forestland:

224 AUMs/4 month grazing period = **56 cow/calf pair** for 4 months **OR**
 224 cow/calf pairs for 1 month

The preliminary information indicates that there is an estimated total of 224 AUMs available within the grazing unit, estimating a carrying capacity of 56 pair (224 AUMs/4 months = 56). Stocking rates should be adjusted as the amount of forage fluctuates. Monitoring of the vegetation trend will help grazer achieve stocking rate adjustments (Appendix D: Worksheet- Forage Inventory Based on Current Stocking Rate, Trend, Health, and Utilization).

Grazing Plan: In order to meet the goals and objectives for the area, a grazing system will be created that will be beneficial to the vegetation, the health of the animals, and long term economics of the owners. The timing and duration of grazing will be calculated by assessing the forage amount and factoring in the size of each land use, as well as the numbers of the animal units. Formulas for calculations are displayed in Appendix D.

Grazing Parameters: Forage production, and therefore carrying capacity (the number of animals that a field can accommodate without overgrazing), varies greatly from month to month and year to year. The stocking rate should be adjusted according to seasonal and annual changes in the carrying capacity. To be sustainable, the rotation length (i.e. “rest” period) must be long enough to allow the field full recovery before coming back to it. A good rule of thumb when determining the rest period is to determine how long it takes in the vicinity for a new grazed grass plant to grow 3-4 new mature leaves. Generally, during peak growth in spring (or on irrigated fields) the recovery period is short (30-45 day rest period needed) while in late fall the recovery period is long (60-120 day rest period needed).

With the above in mind, livestock should not start grazing the pastures at the start of each grazing period until average herbaceous vegetation growth reaches 6-8” in height. Livestock grazing should cease in each pasture when the average stubble height is 3-4”.

The habitat use types available within Burney Gardens include forestland (treated and non-treated). The current leasee runs 74 cow/calf pairs. The cattle graze the property annually from June – October. This system has a forage demand of 224 AUMs, or 56 cow/calf pairs for four

months. According to above production data estimates, the current condition of the site may not support the existing AUMs. However, livestock may actually be using more area than the acres identified as there is limited fencing, and production data is highly variable and may have been underestimated during field surveys.

Given the anticipated moisture conditions of the forested meadow areas that will likely exist during the early part of the season of use, the cattle shall be encouraged to graze the forested uplands at the start of the season (June – July). Assuming the above estimates of annual forage production within the forestland is accurate; production availability should enable well above the existing stock rate for the first month in the forested areas. Livestock use on wet soils leads to trampling and compaction while stunting forage growth. Meadow use shall be deferred until soils are dry enough that impacts won't occur.

Estimated days of grazing available per land use area are displayed in Table 2 below (Based on forage calculations and estimated carrying capacity of grazing unit).

Table 2. *Estimated days of grazing available per land use area*

Field	Meadow Forestland	Meadow Forestland Treated	Upland Forestland
Days of grazing per 150 pair	74	0	42

Cross fencing within the grazing unit is currently not feasible due to the density of forest structure. In general, it is highly recommended for rotational grazing management. Therefore, other methods of distributing cattle shall be used such as strategic placement of watering points and salt/mineral blocks. Lack of cattle dispersment leads to reduced rest periods for forage, higher risk of internal parasite infection, and uneven grazing. Older plants will generally be avoided and younger plants will not have time to recover before they are regrazed, therefore, affecting root and plant growth and decreasing forage intake. Salt and mineral blocks shall not be placed in riparian areas or the meadow; a minimum of ¼ mile away from water sources will encourage upland feed. Grazier shall periodically rotate supplement sites to reduce livestock concentration areas as associated resource degradation.

Contingency Plan:

Flexibility is required in any grazing management plan to adjust for changes in forage production, availability of water for livestock, drought, fire, flooding, and other natural events. A grazing contingency plan shall be carried out by the leasee if resource degradation within the grazing unit is at risk.

Some options for the client include:

- 1) Reassess impact of forage availability. As a general rule, more stubble than indicated within this plan should be left after grazing to be used as a buffer.
- 2) Use additional grazing grounds.

-
- 3) Adjust livestock inventory to reduce and balance total forage required with available forage supply. Cull late calving cows, older cows, and less productive cows. Wean beef cows early (3 months). Remove yearlings early and sell or drylot.
 - 4) Provide supplemental feed if economically feasible.
 - 5) Consider more splitting of fields (i.e. temporary electric fence) and intensively grazing the paddocks (short duration, high frequency). This allows a rest period for the grasses, reduces selectivity in a cow's grazing habit, enhances forage utilization rate, and can improve carrying capacity.

Monitoring: A monitoring plan shall be developed with appropriate records to assess whether the grazing strategy is meeting objectives. A monitoring plan should provide enough information to assist the land manager with decisions concerning the grazing schedule and stocking rates.

SPI and SFT currently manages the grazing practices on their property in the Burney Gardens area. They inspect the site annually, and when necessary, make improvements to fences and other infrastructure (e.g. roads). Future site inspections and monitoring will be conducted by SPI and SFT, but the Fall River RCD and W.M. Beaty and Assoc. Inc. (W.M. Beaty) staff will also perform site inspections, monitoring and reporting consistent with permitting and compliance requirements. It's possible, although unlikely, that the inspections and/or monitoring require additional work that would affect the grazing plan. Table 4 below outlines the proposed and required site inspections, monitoring and reporting.

In instances where SPI, W.M. Beaty and/or Fall River RCD inspections identify maintenance needs, they will provide the land managers written notification. SPI and SFT will then review the suggestion and make a final decision on the specific maintenance to be implemented or not implemented.

Table 3. Proposed and required site inspections, monitoring and reporting

Site Inspection or Monitoring Activity	Rationale and/or Requirement	Responsible Party and Timing
Stream Channel Stability	Not required by any permits but needed to ensure areas held together after the first winter	Fall River RCD; occurs each spring for first three years post construction
WQ Certification Notice Monitoring	Per the THP WQ permit. <u>Implementation monitoring</u> prior to winter to ensure erosion control is adequate. <u>Forensic monitoring</u> conducted after 5 inches of precipitation and again after 15 inches. Effectiveness monitoring conducted each spring to ensure erosion control and crossing functioned and are not damaged	Registered Professional Forester (RPF) for appropriate ownership; implementation monitoring occurs post treatment and prior to winter; forensic monitoring occurs after precipitation trigger; Effectiveness monitoring occurs each spring/early summer (i.e. June)
Plant surveys	Per the THP; species specific monitoring consistent with the Botanical Survey Map (pg. 36) of TH.	RPF will contract work to qualified botanist; surveys to occur prior to operations
Aspen locations	Not required by THP but needed to meet project objectives	Following operations, the FRRCD will delimit aspen locations with a GPS.
General Habitat Photographs	Not required by THP but needed to meet project objectives	Photo monitoring stations will be established in open meadow and forest structure prior to operations. Photographs will be recorded each year for three years post operations
Avian Monitoring	Pre-construction monitoring for greater sandhill cranes (GSCR) and northern goshawk (NOGO) are required for the THP. In addition, standardized point count stations have been established within the forest structure and monitored once. These are not required but part of the project objectives.	Surveys for GSCR and NOGO are to be conducted prior to operations if they will occur prior to August 1 st . The RFP is responsible for the NOGO and Fall River RCD for the GSCR. Point count surveys will occur once or twice each year between June 1 and July 15. These surveys will be conducted by qualified biologists if funding is available.

This management plan has been prepared based upon current conditions found in the field. At the end of each grazing period, in each field, the vegetation should appear to be grazed uniformly. If the visual inspection shows certain species or areas are being grazed heavily while others under-utilized, then adjustments to livestock grazing intensity, stocking rate, and/or timing of grazing may need to be made and considered.

Attachments

APPENDIX A. Project Photographs.



Example of forested area with aspen that PG&E treated in 2013



Example of dense lodgepole pine in most of the forested areas



The site remains very wet during the early summer during average rain and snowfall years



Numerous dead trees have fallen and the area overall is very susceptible to fire

APPENDIX C

Forage Calculation Examples

Production (lbs/acre) =

Forestland Meadow:

Production -150 lbs/acre

50% harvest efficiency

95% stocking rate adjustment

1,360 acres

$150 \times .50 \times .95 \times 1,360 \text{ acres} = 96,900 \text{ lbs of forage available}$

Carrying Capacity =

96,900 lbs of forage available

Demand = 26 lbs/day x 120 days = 3,120 lbs forage required for one animal

96,900 lbs/3,120 lbs = 31 cow calf pairs for 4 months of grazing

= 152 Animal Unit Months (AUMs) (*the amount of forage that 1000 pounds of animal will consume in 1 month*)

Production (lbs/acre) =

Forestland Upland:

Production -100 lbs/acre

50% harvest efficiency

95% stocking rate adjustment

1,170 acres

$100 \times .50 \times .95 \times 1,170 \text{ acres} = 55,575 \text{ lbs of forage available}$

Carrying Capacity =

55,575 lbs of forage available

Demand = 26 lbs/day x 120 days = 3,120 lbs forage required for one animal

55,575 lbs/3,120 lbs = 18 cow calf pairs for 4 months of grazing

= 72 Animal Unit Months (AUMs) (*the amount of forage that 1000 pounds of animal will consume in 1 month*)

Days of Grazing Available –Forested Meadow =

Production - 150 lbs/acre
50% harvest efficiency
95% stocking rate adjustment
1,360 acres
Avg. animal unit weight – 1000 lbs
Intake rate in % body weight – 2.6%
74 cow-calf pairs

$$\begin{aligned} \# \text{ days} &= \frac{\mathbf{96,900 \text{ lbs of forage available}}}{1000 \times 0.026 \times 50 \text{ (intake per day)}} \\ &= \mathbf{74 \text{ days}} \end{aligned}$$

Days of Grazing Available –Forested Upland =

Production - 100 lbs/acre
50% harvest efficiency
95% stocking rate adjustment
1,170 acres
Avg. animal unit weight – 1000 lbs
Intake rate in % body weight – 2.6%
74 cow-calf pairs

$$\begin{aligned} \# \text{ days} &= \frac{\mathbf{55,575 \text{ lbs of forage available}}}{1000 \times 0.026 \times 50 \text{ (intake per day)}} \\ &= \mathbf{42 \text{ days}} \end{aligned}$$

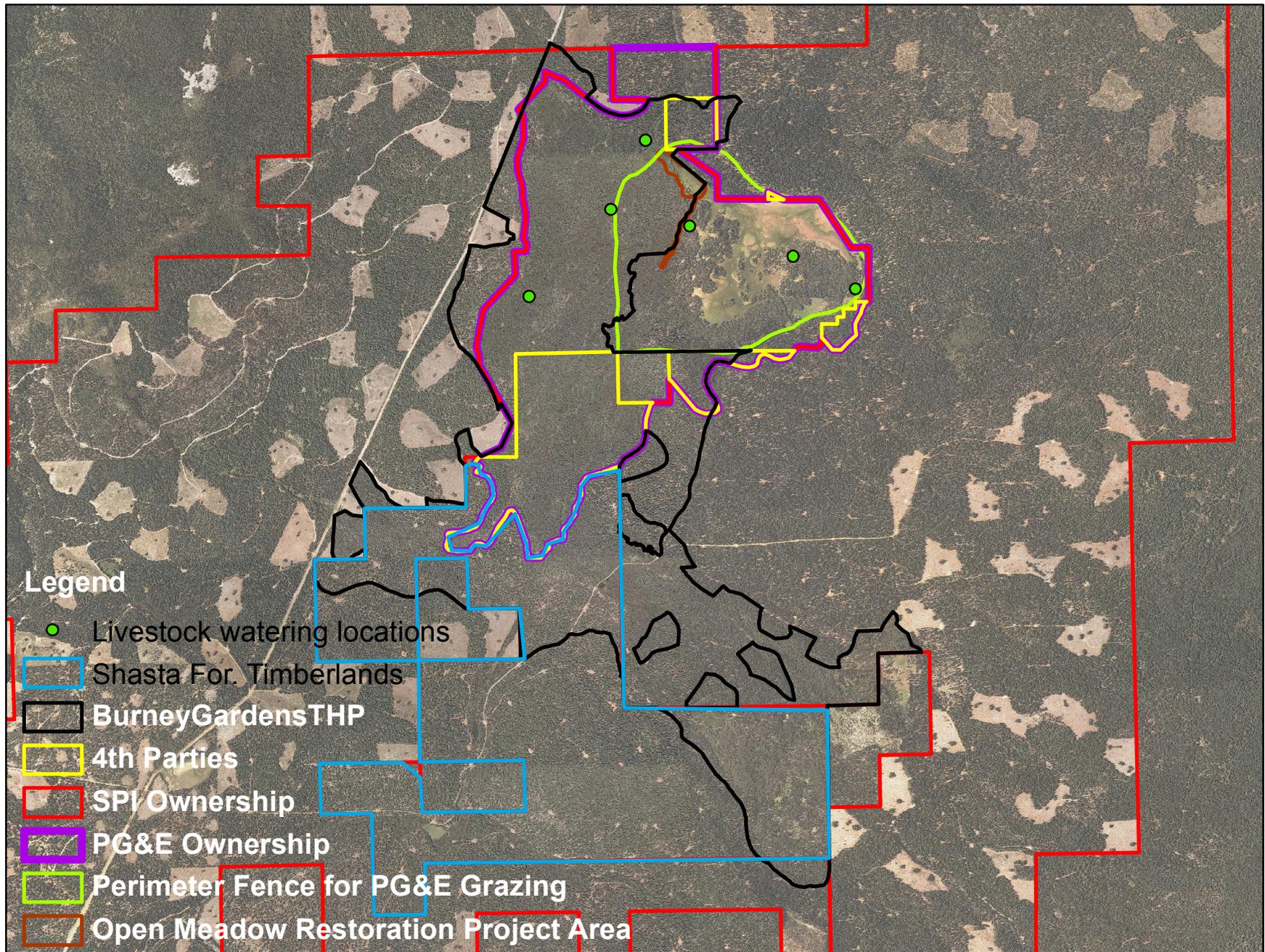


Figure 1. Project Area, Burney Gardens Meadow

BURNEY GARDENS MEADOW RESTORATION PROJECT FOREST MANAGMENET PLAN



May 2015

Prepared for: Pacific Gas & Electric Company, Sierra Pacific Industries, Inc., Fruit Growers Supply Company, Fourth Parties, and Shasta Forests Timberlands, LLC.

Prepared by: Fall River Resource Conservation District

Introduction

This Forest Management Plan (FMP) has been developed for landowners who have participated in developing the Burney Gardens Meadow Restoration (BGMR) Project and is supported by the Sierra Nevada Conservancy (SNC) through an agreement with the Fall River Resource Conservation District (FRRCD). Development of the BGMR project was originally initiated by Pacific Gas & Electric Company (PG&E), one of four private landowners in the area. PG&E proposed to enhance meadow conditions on approximately 137 acres, particularly in areas with aspen, by developing a Timber Harvesting Plan (THP) in 2009. Subsequent to this plan development, other landowners and land managers, including PG&E, discussed their project and supported the habitat improvement approach. The landowners decided to expand the treatment area and include the entire landform (i.e. Burney Gardens Meadow) rather than stop at ownership boundaries. A new THP was developed in 2012 and approved in 2013 (THP No. 8-12-001-SHA(4)). The effort was vetted through the Burney-Hat Creek Community Forest and Watershed Group and provides an excellent example of integrating permitting approaches and cooperation of multiple land managers to enhance conditions for habitat types (i.e. open meadow with aspen) that are limited within the region and throughout the western U.S. Although the title of the document uses the word “plan,” there are no binding commitments for any of the landowners/managers within this document. Rather, the landowners and managers must follow the prescriptions within the THP that is administered and regulated by Cal Fire.

Conifer densification and encroachment are occurring in all western forest communities due to the lack of disturbance and past resource management practices that have altered forest structure and hydrology. Conifer encroachment had reduced aspen community health and condition and meadow extent and function. During the last 20 years much attention has been given to the decline of aspen and meadow communities (Shepperd et al. 2006). Several land managers, both private and federal, have implemented projects with the intent to expand and enhance degraded aspen communities and maintain and improve aspen health. In some settings, conifers, particularly lodgepole pine (*Pinus contorta*), have invaded into meadows that are believed to have lacked any significant woody conifer cover. Numerous studies have been conducted to determine the factors responsible for the lodgepole encroachment and those factors have included a combination of changes in hydrologic conditions, vegetation, and fire history (see summary in Gross and Coppelatta 2013). However, lodgepole encroachment into meadows is likely very site dependent and the relative contribution of these and potential other factors make assessments difficult.

The landowners and other partners held numerous meetings to assess, plan, and develop treatment options for the Burney Gardens Meadow (BGM). This included site visits with experts in aspen ecology, meadow restoration, and forest treatments. Information was shared through the Burney-Hat Creek Community Forest and Watershed Group and more detailed planning was conducted during private landowner meetings. The final THP included treating both forested and open meadow areas, and the project identified the following objectives: 1) sustain and enhance aspen; 2) minimize fire risk; 3) reconnect the stream channel to the floodplain; 4) provide diverse habitat for multiple species; 5) provide employment opportunities through management practices. Finally, the THP boundary was located adjacent to roads so that future management could include burning the area and be conducted in an efficient and safe manner.

This FMP provides a description of current site conditions, a review of treatments, current research results relative to aspen health and lodgepole encroachment, and strategies to manage the area for future conditions.

Current Conditions and Management Practices in the Burney Garden Meadow: The project area is one of the largest riparian wet meadow complex surrounded by upland forest communities in the region. A complete description of the project area can be found in Section 3 of the THP. Rain and snowmelt within the watershed creates surface runoff which generally trends south and flows into BGM. The meadow slope is nearly flat (<.5%), and a natural valley volcanic constriction point at the bottom end of the meadow results in shallow standing water for several months, in some years, within much of the project area (see Figure 2). Numerous small surface flow features are present throughout this area, some of which have been identified and others which have not. The prominent surface flow features consist of Burney Creek and two unnamed tributaries. These surface flow features become dry, usually between June and August, and do not have fish species present. Shallow flooding of the entire area is common and the site supports a very high shallow ground water elevation (e.g. 0-3 feet below the surface) during the summer months (June through August). Within this “riparian-meadow “complex, approximately 85% is dominated by lodgepole while the rest is open and dominated by a diversity of herbaceous species. The majority of the forested area within the riparian-meadow complex consists of dense, small sized (<1’ diameter at breast height [dbh]) lodgepole pine.

At slightly higher elevations surrounding the meadow, upland rather than wetland species are dominant and consist of mixed conifer species. In these areas, a diversity of tree species are present in the upper canopy and understory vegetation varies greatly depending upon the density and cover of overstory species. In areas heavily forested, there is little herbaceous vegetation present, and the ground is covered with leaf litter and various sized branches. In more open canopy, a diversity of herbaceous and shrub species occur.

Several locations within the BGM have aspen present and these communities have been overtopped by conifers and/or regeneration is absent or low. These conditions put the aspen communities at high risk to die. In addition to known aspen locations in the BGM, several more locations likely occur but the forest structure is so dense that only a few individual trees are present and they have likely gone undetected. Stand sizes range from individual trees to 1-2 acres. The aspen distribution within the project site is principally limited to the low elevation wetland-meadow zone and the adjacent margin into upland areas. A few isolated aspen trees have been observed within the upland zone.

Existing management within and adjacent the BGMR project area consists of selective harvesting, clearcutting, and livestock grazing. Selective harvesting occurs primarily within the upland vegetation zone, while clearcutting has been applied within the wetland zone where aspen are present and lodgepole pine density is high. It should be noted that the near complete removal of conifer within the meadow zone is not technically defined within PG&E’s THP or the more recent Burney Gardens THP as clearcutting. Rather, it is defined as “meadow enhancement,” and the overall effect is similar to clearcutting. Livestock grazing also occurs throughout the project area but their access is greatly limited by the density of lodgepole pine encroachment. Individual property ownership Grazing Management Plans have been or are being developed for each landowner.

In general, the meadow portion of the BGMR project area is not managed for forest products as the site is too wet and supports conifer species that are less valuable as sawlogs. The combination of these two factors, and possibly others, has resulted in a very dense unhealthy forest structure.

Lodgepole Encroachment and Aspen Condition: Aspen are a shade intolerant, disturbance dependent species with reproductive traits that allow it regenerate following disturbances either through asexual reproduction or seeding. Aspen have been the focus of several research projects in the region. Multiple agents have been identified as resulting in aspen degradation including fire suppression, heavy grazing, insects/disease, invasive species, altered hydrology, and climatic change (see Estes 2013). Conifer encroachment, typically attributed to lack of disturbance due to fire suppression, is often thought to be the primary agent affecting aspen. In low elevation areas, aspen occur as a seral species, one of the first species to establish after disturbance, but eventually are out competed by conifers in the absence of future disturbance. Fire removes competing conifers and/or creates establishment sites for aspen. Fire can also top-kill aspen triggering a hormonal response which stimulates sprouting of aspen. Aspen regeneration is susceptible to browsing by herbivores including deer, elk, and livestock. Heavy livestock grazing was determined to negatively affect aspen (Sampson 1919 in Estes 2013, Jones et al. 2011), particularly during the mid and late periods of the growing season, but more moderated and less intensive livestock grazing strategies, including rest periods, occur in many areas where aspen occur and exhibit healthy characteristics. Wildlife browsing in some areas can also impede aspen regeneration especially in unhealthy stands and in fawning areas.

The USFS recently prepared two documents which summarize the historic range of variability for meadows and aspen within California (Estes 2013, and Gross and Coppoletta 2013). The documents provide a very thorough literature review of factors affecting lodgepole encroachment and aspen distribution and health as summarized earlier. The factors principally believed to be affecting aspen health within the BGMR project area is the lack of disturbance which has resulted in maturation of conifers, particularly lodgepole pine. Within the recent geologic past (<10,000 years ago), it seems reasonable to assume that changes in wet and dry periods, natural ignition and spread of forest fires, and possibly burning by Native Americans, played a role in the meadow transitioning between a heavily forested landform (as it exists today) and a more open area. The landowners and project partners want to sustain and enhance aspen in the area to promote the ecological services that these communities provide (e.g. landscape heterogeneity, higher levels of biodiversity, forage, and increased soil moisture availability), and therefore have created the proposed treatments to manage lodgepole pine and create the proper growth environment for aspen and meadows.

There have been recent efforts by various land managers to limit lodgepole encroachment following treatments within meadows. The two primary methods utilized include burning and mechanical removal. Frenzel (2012) found that burning decreased the abundance of young/small lodgepole pine and did not result in increased establishment or invasion by lodgepole seedlings post-fire. However, burning was only effective on very small individuals (<5 cm diameter) and larger trees were simply not affected. The limited effects of burning on lodgepole has also been found by others, and multiple challenges are associated with burning including regulatory constraints, appropriate vegetation to carry fire, and risk to property values if the fire escapes the treatment area. Nevertheless, burning has been found to result in other ecological benefits, particularly changes in species composition where less desirable plants are replaced by others, and in some instances, these plants are considered important to Native American people for education and traditional use values. Also, if conditions are suitable and timed correctly, the cost associated with burning could be much less than mechanical treatment and performed in a much shorter implementation time period.

Mechanical and/or hand treatment is the most commonly used method to control lodgepole encroachment. The USFS and other land managers have conducted several treatments of areas to remove lodgepole pine and promote species diversity, including creating better aspen stands. Small

lodgepole pine (< 10 years old) is best removed by hand treatments, usually using small chainsaws, shovels, and machetes.

Land management actions known to improve aspen health include the removal of competing conifers and minimizing browsing by herbivores. The Lassen National Forest, Eagle Lake Ranger District has conducted many aspen improvement projects and identified a few key elements for successful treatments:

- Remove all conifers < 30 inches diameter breast height (dbh) which do not exhibit legacy characteristics using a whole tree removal approach during dry soil conditions
-
- Use a single entry (e.g. heavy equipment) to limit compounding effects from heavy equipment and to eliminate the potential to damage suckers
- Conduct the conifer removal treatment outward from the aspen clone up to at least 150 feet
- Pile larger amounts of biomass outside of the treatment area for later burning
- Conduct prescribed burning within the aspen stand after the next cohort of aspen is successfully recruited and only if light surface fuels exist within the stand
- Fence aspen units that receive excessive browsing from livestock and/or wildlife to reduce browse impacts immediately following project implementation, or when monitoring indicates that browsing pressure is impeding successful aspen recruitment
- Develop grazing strategies that limit mid to late season browsing where aspen are present
- Protect existing mature aspen trees for their wildlife value, seed source to recruit regeneration, and photosynthetic input to the roots during logging and vegetation treatment operations
- Conduct burning of debris piles outside the perimeter of aspen rooting zones because of their susceptibility to heat damage

Proposed Treatment within the THP Area: Forest treatments vary within the project area depending upon location. The Silviculture Map 1 of 2 in Section II of the THP (provided herein as Appendix B) depicts various treatment areas. These include “Selection” (1,170 acres), and “Aspen, Meadow, Wet Area Restoration” (1,360 acres). Within the Aspen, Meadow, and Wet Area Restoration locations, all aspen trees > 3 inches dbh are planned to be retained, where feasible, and all conifers within 100 feet of aspen can be harvested. Fire resistant conifers (i.e. Ponderosa pine) that occur on the northern side of aspen stands, and additional conifers species > 30 inches diameter at breast height (dbh) can be retained. Beyond 100 feet of the aspen community, all lodgepole pine, exclusive of those retained for wildlife habitat, occurring within this area can be removed, and other conifer species can be thinned using the spacing guidelines under the “selection” prescription.

A wide range of options are present for Selection logging, and in general allow the landowner flexibility to manage this area to meet their ownership and project objectives. The RPF has at their discretion to leave trees which would be considered valuable as wildlife habitat.

The objective of the Selection logging is to improve existing stand health, vigor, and spacing to allow trees to grow unimpeded for 10 years and to increase average tree diameter. Trees will be selected for harvest based on health, species, vigor, crown ratio, defect, position, and spacing considerations to achieve a healthy well-manage forest of a variety of size classes. Sanitation, salvage, thinning, and promotion of advanced regeneration is a primary goal. Trees will be selected for harvest in the following order:

1. Salvage and sanitation trees. Target trees are those exhibiting blister rust, cankers, dwarf mistletoe, forks, crooks, sweep, insect attack, rot, defoliation, etc.
2. Decadent and culminated overstory trees and suppressed understory trees. Target trees are those with rounded tops, low crown ratio, poor vigor, etc.
3. Thinning from above to harvest dominant trees that are suppressing desirable crop trees and advanced reproduction.
4. Thinning of codominant and intermediate trees.

Treatments with the Watercourse and Lake Protection Zone (WLPZ) vary by treatment type, distance to stream, and stream class type (i.e. Class I, Class II, Class III). The below table summarizes this information.

Table 2. Distance of Treatments within Watercourse Lake and Protection Zone for Stream Classes

Watercourse Protection				
Slope Class (%)	Watercourse Class & Minimum Zone Width (feet)			
	Class I		Class II	Class III
	Selection Area	Aspen, Meadow, & Wet Area Restoration		
	WLPZ	WLPZ	WLPZ	WLPZ
<30	≥ 75	≥ 56	≥ 50	0

Within the Class I Watercourses and Selection treatments areas, a minimum of 50% of overstory and 50% of understory canopy within the WLPZ will be retained in a well distributed multi-storied stand composed of a diversity of species similar to that found prior to treatment. The residual overstory canopy shall also be composed of at least 25% of the existing overstory conifers. In addition, at least two living conifers/acre, which are at least sixteen inches dbh and fifty feet tall will be retained within 50 feet of the watercourse (where they currently exist). Within the Aspen, Meadow, and Wet Area treatment zone and Class I watercourses, at least two living conifers/acre, which are at least sixteen inches dbh and fifty feet tall will be retained within 50 feet of the watercourse (where they currently exist).

Within the Class II Watercourses and Selection treatment areas, at least 50% of the total canopy covering the ground shall be left in a well distrusted multi-storied stand configuration composed of a diversity of species similar to that found before the start of operations. The residual overstory canopy shall also be composed of at least 25% of the existing overstory conifers. In addition, at least two living

conifers/acre, which are at least sixteen inches dbh and fifty feet tall will be retained within 50 feet of the watercourse (where they currently exist). Within the Aspen, Meadow, and Wet Area treatment zone and Class I watercourses, at least two living conifers/acre, which are at least sixteen inches dbh and fifty feet tall will be retained within 50 feet of the watercourse (where they currently exist).

A complete list of treatment details can be found in Section II of the THP.

Expected Outcomes in Treatment Areas: The expected outcomes differ within the two treatment areas. Within the Wet Meadow Complex area (i.e. Aspen, Meadow, and Wet Area), and excluding the watercourse zones, the landowners prefer to create an “open” meadow habitat with a hardwood component following treatment. This is desired for multiple reasons. First, fewer lodgepole pines will result in increased light availability and proper growing conditions to promote the establishment and expansion of aspen. Less shade and competition for water will also allow for a greater diversity of herbaceous species to colonize and grow within the meadow. Greatly reducing the amount of lodgepole pine also breaks up the continuity of canopy fuels so that any future canopy fire will not be able to pass through this area. Finally, a more open meadow system will create more favorable habitat conditions for those wildlife species (e.g. greater sandhill crane, western meadowlarks, coyotes, deer) which currently have limited open habitat available in the region.

Within and alongside watercourses the expected outcomes would be to have a diversity of species occurring alongside these surface flow features. However, there is uncertainty whether many conifer species naturally occurred within the wet meadow along Burney Creek and the tributaries within this expansive wetland. Regardless of what vegetation type is found and eventually grows within these areas, the principal concern is that the surface flow features remain stable, have consistent grade control, and serve to transport water and sediment through them.

Expected outcomes of vegetation within the Selection areas is more likely to vary within the project area as there are multiple landowners which have various obligations to produce forest products. Overall, landowners expressed the desire to include these areas within the THP so that future management could utilize the road system around the wet meadow for management purposes (e.g. hauling biomass, establish fire breaks, etc.). Therefore, treatment of these areas would be designed to increase forest resiliency to fire, drought, and insect and disease by reducing conifer density, creating variable densities, and maintaining different size and tree species to meet multiple objectives.

Proposed Management Strategies: This section presents management strategies with the intent to maintain individual ownership/management flexibility, while also providing guidance on methods that are likely to meet the objective of maintaining an open wet meadow complex and/or greatly expanding aspen within the meadow. Once the individual landowners/managers are able to implement initial conifer removal treatments within the wet meadow complex, follow-up treatments will need to be addressed so that lodgepole do not encroach again, at least to their present undesirable state. The two primary options include prescribed burning and/or mechanical/hand removal of young lodgepole. Burning the Burney Gardens site will likely take extensive planning and could include utilizing Cal Fire and/or the U.S. Forest Service fire crews. Challenges include identifying and resolving liability issues should a control burn escape and result in property damage, ensuring livestock grazing retains sufficient fuels to carry fire, and being ready for the limited number of appropriate “burn days” as regulated by the CA Air Resources Board. More serious discussion with all project partners should commence once the area is treated if fire is entertained as a treatment option maintain the proper growing environment for aspen and meadow communities.

Mechanical, including mastication, and hand removal of lodgepole can be utilized to limit future lodgepole encroachment. The landowners are tasked with balancing a selected method with costs associated with treatment. Cutting lodgepole by hand when they are younger would allow them to be left in place and would negate a removal cost. Fire crews, inmate crews, and/or volunteers working days could help defray these costs, and stakeholders such as the Fall River RCD may be able to secure grant funds to pay for some activities. The approach would take numerous individuals as the treatment area is very large. Mastication of young lodgepole when they are young could also be conducted and the traditional concern of fuel loading on the ground would be negated due to the extensive flooding of the area. Small sized wood particles would likely decompose into the soil profile and/or be transported through flooding and deposited alongside of surface flow paths further downstream. This treatment would need to be conducted with the soil is firm (i.e. late fall) to minimize soil compaction and the creation of surface flow paths from equipment travel routes. Mechanical removal of the lodgepole when they become too large is diverse, costly, and highlights the challenge of the current project. Meeting the project objectives clearly has cost and risk associated with implementing and maintaining the BGMR project but could be offset by the ecological services provided by aspen and meadow and creating large opening to reduce the rate of spread and severity of a wildland fire burning through the area. Finally, fencing may need to be considered to protect aspen communities from heavy browsing.

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