DEPARTMENT OF FORESTRY AND FIRE PROTECTION
135 Ridgway Avenue
Santa Rosa, California 95401
(707) 576-2275
Website: www.fire.ca.gov

Date: December 22, 2014
THP #: 1-13-096 MEN

Lee Susan
16575 Franklin Road
Fort Bragg, CA 95437

LETTER OF CONFORMANCE

Enclosed is a true copy of your Timber Harvesting Plan (THP) identified by the number shown above. The Director of Forestry and Fire Protection finds that the plan conforms with the Rules and Regulations of the Board of Forestry pursuant to the provisions of the Z'Berg-Nejedly Forest Practice Act of 1973. Conformance is indicated by the facsimile signature of the Director's duly constituted representative being shown on the attached copy of the plan.

You may begin the timber operations proposed in the plan according to the conditions specified therein, and subject to the Forest Practice Act, Forest Practice Rules of the Forest District in which the operations will take place, related Board of Forestry regulations and other applicable laws, regulations and ordinances.

The Forest Practice Act requires the filing of the two reports listed below for each timber harvesting operation undertaken:

1. Timber Operations Work Completion Report: Within one month after completion of work described in a Timber Harvesting Plan, excluding work for stocking, a report shall be filed by the timber owner or his agent with the Director that all work, except stocking, has been completed.

2. Report of Stocking:
   A. NA Within six months after completion of timber operations covered by this THP, a Report of Stocking shall be filed by the timber owner or his agent with the Director.

   B. NA Within five years after completion of timber operations covered by this THP, a Report of Stocking shall be filed by the timber owner or his agent with the Director.

   C. Stocking obligations do not apply because:
   X Timberland Conversion Permit is in effect.
   NA The THP is for road right-of-way construction only.

In future correspondence, please refer to the THP number in the upper right corner of the attached plan.

Sincerely,

LESLIE A. MARKHAM
Deputy Chief, Forest Practice
RPF #2529

cc: TO, TLO, PS: City of Fort Bragg
Unit, File, ftp://thp.fire.ca.gov/THPLibrary/North_Coast_Region/

DECEMBER 22, 2014
Date of Director's Decision

OFFICIAL NOTICE OF THE DIRECTOR OF FORESTRY'S DETERMINATION OF CONFORMANCE OF TIMBER HARVESTING PLAN OR AMENDMENT TO TIMBER HARVESTING PLAN WITH THE FOREST PRACTICE ACT AND BOARD OF FORESTRY REGULATIONS

The Director of Forestry found, on the date shown above, that the Timber Harvesting Plan, Non-Industrial Timber Management Plan (NTMP), or amendment (AM) listed below is in conformance with the Forest Practice Act, and Board of Forestry regulations pursuant thereto. This notice is posted in compliance with sections 1037.1 and 1037.8, Title 14, California Code of Regulations.

Copies of this Harvest Document and related documents are available for inspection at: 17501 No. Highway 101, Willits, CA 95490 (707) 459-7440.

Plan number County	Submitter	Acres	Location	Waterway	Silviculture or Proposed Amendment
1-13-096 MEN MENDOCINO	CITY OF FORT BRAGG	8	SEC 16 T18N R17W MDBM	NEWMAN GULCH	CONVERSION

TO POSTING AGENCY: Please post this Notice at the place where official notices concerning Environmental Quality Act compliance are usually posted. If there are questions concerning posting, please contact: Forest Practice Office, California Department of Forestry and Fire Protection, 135 Ridgway Avenue, Santa Rosa, CA 95401
Telephone : (707) 576-2959

cc: RPF, TO/TLO/SUBMITTER, UNIT, CC , SAC, RU, OTHER, PURCHASER, POST, FILE
(DFW, WQ, PR, CP via \\Fphqthp\thphome\THPLibrary\North_Coast_Region)

Posting Period is 30 Days

DEPARTMENT OF FORESTRY AND FIRE PROTECTION
135 Ridgway Ave.
Santa Rosa, CA 95401
Website: www.fire.ca.gov
(707) 576-2959

Date: December 22, 2014
Ref: 1-13-096 MEN

Teresa Spade, Assistant Planner
City of Fort Bragg
416 N. Franklin Street
Fort Bragg, CA 95437

Dear Ms. Spade:

You attended a preharvest inspection (PHI) for Timber Harvesting Plan (THP) 1-13-096 MEN on October 29, 2013. You emailed a copy of a letter addressed to the California Department of Fish and Wildlife (CDFW) to CDFW with a "cc" to the Registered Professional Forester (RPF) who prepared the plan, the CAL FIRE inspector, other agency representatives and the Fort Bragg City Manager; all participants in the PHI. Your letter was in response to issues discussed by CDFW at the PHI, but prior to the submission of a written report by that agency. The Department's inspector forwarded your cover email and attached letter to this office with the note: "Please accept this document as public comment for THP #1-13-096 MEN." Upon review of this correspondence it was determined not to be public comment. As the City of Fort Bragg is the Timber Owner, Timberland Owner and Plan Submitter of Timber Harvesting Plan (THP) 1-13-096 MEN, and you participated in the PHI representing the landowner, your letter should have been filed as part of the review documents in the record for this plan. It also appears that your intent was not for this letter to be treated as public comment as it was not addressed to the CAL FIRE office in Santa Rosa (the office where the plan was filed). Code section 14 CCR 1037.3[d] states: "... All comments regarding plans shall be in writing and shall be addressed to the Director at the appropriate CAL FIRE Review Team Office where the plan is filed." Your cover email and letter were addressed to Terra Fuller of the California Department of Fish and Wildlife.

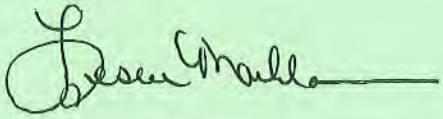
Since November 6, 2013 (more than a year ago) when this office received the cover email and your letter, the review team agencies have submitted their PHI reports. Issues raised in those reports (PHI recommendations) have been addressed by the RPF who prepared the plan. On August 13, 2014 the Fort Bragg Planning Commission approved the Mitigated Negative Declaration (MND) for the larger project, construction of a ~6.5 acre reservoir for which ~8 acres of timberland will be converted to non-timberland. The Second Review Team Meeting for the THP took place on December 4, 2014. The Department's conclusion at second review was that the plan conforms to the Forest Practice Rules and: "The potential significant effects of this plan or amendment have been considered during the review and: ... Potential significant effects have been mitigated through the review process." The CAL FIRE office in Sacramento issued a

Timberland Conversion Permit on December 19, 2014 for this project (reference THP page 23.1 – 23.2). The issues raised by all of the review team agencies, including CDFW, during the review process have been found by the Department to have been adequately addressed by the record as a whole.

Please consider this letter as the Department's explanation as to why an "Official Response to Significant Environmental Points Raised during Public Review of THP 1-13-096 MEN" is not required. Other than your cover email and letter, described above, no public comment has been received in the year that has elapsed between when the plan was submitted on October 11, 2013 opening the comment period and December 15, 2014 when the comment period officially closed. The plan was found to be in conformance with the Forest Practice Act on December 22, 2014 and approved on that date.

Thank you for your input on the plan. I hope you will continue to support timber operations, which are done professionally and in compliance with the rules and regulations required by the Forest Practice Act.

Sincerely,



LESLIE MARKHAM
Deputy Chief, Forest Practice
RPF 2529

STAFF FORESTER: staff
cc: RPF, Unit, File; Timber Owner, Timberland Owner, and/or Submitter
CP, CDFW, DPR, & RWB (through ftp://thp.fire.ca.gov/THPLibrary/North_Coast_Region/)

FOR ADMIN. USE ONLY
Amendments-date & S or M

1. _____ 7. _____
2. _____ 8. _____
3. _____ 9. _____
4. _____ 10. _____
5. _____ 11. _____
6. _____ 12. _____

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

THP Name: **"City of Fort Bragg"**

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

If this is a Modified THP, check box [ ]

FOR ADMIN. USE ONLY

THP No. 1-13-096 MEN
Dates Rec'd Oct. 11, 2013
Date Filed OCT 21 2013
Date Approved DEC 22 2014
Date Expires DEC 21 2019
Extensions 1) [ ] 2) [ ]

One 2-year extension possible

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 the end of the appropriate section of your THP. If writing an electronic version, insert additional space for your answer. Please distinguish answers from question 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:** Name City of Fort Bragg

Address 416 North Franklin Street

City Fort Bragg State CA Zip 95437 Phone 707-961-2827

Signature Linda Ruffing Date 10.4.13

NOTE: The timber owner is responsible for payment of a yield tax. Timber Yield Tax information may be obtained at the Timber Tax Division, 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

2. **TIMBERLAND OWNER(S) OF RECORD:** Name City of Fort Bragg

Address 416 North Franklin Street

City Fort Bragg State CA Zip 95437 Phone 707-961-2827

Signature Linda Ruffing Date 10-4-13

3 **LICENSED TIMBER OPERATOR(S):** Name Unknown Lic. No. _____

Address _____

City _____ State _____ Zip _____ Phone _____

Signature _____ Date _____

4. **PLAN SUBMITTER(S):** Name: City of Fort Bragg

Address 416 North Franklin Street

City Fort Bragg State CA Zip 95437 Phone 707-961-2827

(submitter must be from 1, 2, or 3 above. He/she must sign below. Ref. Title 14 CCR 1032.7)

Signature Linda Ruffing Date 10.4.13

RECEIVED
DEC 29 2014
CITY OF FORT BRAGG
COMMUNITY DEVELOPMENT DEPT

RECEIVED
OCT 11 2013
COAST AREA OFFICE
RESOURCE MANAGEMENT

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2013

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5. **If LTO is not present on-site list person to contact on-site who is responsible for the conduct of the operation and represents the interests of the LTO. If unknown, so state and name must be provided for inclusion into the THP prior to the start of timber operations.**

Name: Unknown

Address _____

City _____ State _____ Zip _____ Phone _____

[X] 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?

_____

Who is responsible for erosion control maintenance after timber operations have ceased and until certification of the Work Completion Report?

LTO

The Erosion control maintenance period on permanent and seasonal roads and associated landings that are not abandoned in accordance with 14 CCR 923.8 shall be three years pursuant to 14 CCR 916.9.1. The Timberland owner shall assume responsibility after the certification of the Work Completion Report.

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

[X] Date of conformance, or [ ] _____(date)

b) **Expected date of completion of timber operations:**

[X] 5 years from date of conformance, or [ ] _____(date)

7. **The timber operation will occur within the:**

[X] 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:_____
[ ] Special Treatment Area(s), identify:

_____

[ ] Other _____

8. **Location of the timber operation by legal description:**

Base and Meridian: [X] Mount Diablo [ ] Humboldt [ ] San Bernardino

Section	Township	Range	Acreage	County	Assessor's Parcel Number*
16	18N	17W	008	Mendocino	_____
		TOTAL ACREAGE	008	(Logging Area Only)	* Optional

Planning Watershed(s): CALWATER Version, Identification Number and name: Cal 2.2 Mouth of Noyo River #1113.200403
USGS Quadrangles: Fort Bragg 7 ½', 1978

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

TCP submitted concurrently expected approval 11/15/2013

10. **[ ] Yes [X] No Is there an approved Sustained Yield Plan for this property? Number _____; Date app.**

[ ] Yes [X] No Has a Sustained Yield Plan been submitted but not approved?

11. [ ] Yes [X] 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 [X] 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. [X] Yes [ ] No **Is a Notice of Intent necessary for this THP?**
[X] Yes [ ] No **If yes was the Notice of Intent posted as required by 14 CCR 1032.7 (g)?**

13. **RPF preparing the THP:** Name Lee Susan RPF Number 2127

Address 16575 Franklin Road

City Fort Bragg State CA Zip 95437 Phone 707-964-4566

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

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

The plan submitter will provide the LTO with a copy of the plan.

I or my supervised designee will meet with the LTO prior to commencement of operations to advise of sensitive conditions and provisions of the plan pursuant to Title 14 CCR 1035.2.

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):**
I am responsible for the preparation of this THP and responding to the agency concerns throughout the THP Review process. I will be the RPF providing professional advice pursuant to 14 CCR 1035(d)(1). Supervision will be provided at sufficient frequencies in order to review the progress of operations and to advise the LTO on issues pertaining to the LTOs' proper implementation of the plan.

d) **Additional required work requiring an RPF which I do not have the authority or responsibility to perform:**
None.

e) **After considering the rules of the Board of Forestry and the mitigation measures, 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)
[X] 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 the 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 of 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) 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 _____ RPF #2127 Date 10/29/13

(prior to page revision RPF had a 7/1/2013 signature date)

PART OF PLAN

RECEIVED

OCT 30 2013

COAST AREA OFFICE
RESOURCE MANAGEMENT

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 required must be included in Section III of the THP.

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 913.11 (933.11, 953.11). If more than one method or treatment will be used show boundaries on map and list approximate acreage for each.**

[ ] Clearcutting _____ ac. **[ ] Shelterwood Prep. Step _____ ac.** **[ ] Seed Tree Seed Step ___ ac.**
[ ] Shelterwood Seed Step ___ ac. **[ ] Seed Tree Removal Step ___ ac.**
[ ] Shelterwood Removal Step_____ ac.
[ ] Selection _____ac. **[ ] Group Selection ____ ac.** **[ ] Transition _____ ac.**
[ ] Commercial Thinning _____ac. **[ ] Road Right of Way____ ac.** **[ ] Sanitation Salvage ___ ac,**
[ ] Special Treatment Area_____ac. **[ ] Rehab. of Understocked Area ___ ac.** **[ ] Fuelbreak _____ ac.**
[ ] Alternative _____ac. **[X] Conversion __8___ ac.** **[ ] Non-Timberland Area ____ac.**
Total acreage 008 **ac. : Explain if total is different from that in 8.**
MSP Option Chosen (a) [ ] (b) [ ] (c) [ ] Not Applicable
MSP options are not applicable as the site is being converted from timber production to municipal water supply uses.

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

c. [ ] Yes [X] No Will evenage regeneration step units be larger than those specified in the rules (20 acre tractor,30 acre cable)? If yes, provide substantial evidence that the THP contains measures to accomplish any subsections (A) - (E) of 14 CCR 913 (933, 953). 1 (a) (2) in subsection 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 a 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.
A 10 foot wide vegetative buffer is to be maintained along the West property boundary otherwise all timber within the flagged project boundary of the conversion area is to be harvested.

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

e. Forest Products to be Harvested: Sawlogs, chip logs, pulpwood and fuel wood.

f. **[ ] Yes [X] No Are group B species proposed for management?**
[ ] Yes [X] No Are group B or non-indigenous A species to be used to meet stocking standards?
[ ] Yes [X] 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.

Group A verses Group B species distribution is not an issue in this situation since harvesting is limited to the conversion area associated with reservoir construction.

g. **Other instructions to LTO concerning felling operations.**
1. Nothing contained in this THP shall be construed as a requirement to work in an unsafe manner.
2. All applicable rules and regulations apply.

h. **[ ] Yes [X] No Will artificial regeneration be required to meet stocking standards?**

i. **[ ] Yes [X] No Will site preparation be used to meet stocking standards? If yes, provide the information required for a site preparation addendum.**

j. If the rehabilitation method is chosen provide a regeneration plan as required by 14 CCR 913. 4(b)
Not Applicable

ESTS

15. a. [X] Yes [ ] No Is this THP within an area that the Board of Forestry has declared a Zone of Infestation or Infection pursuant to PRC 4712-4718? If yes identify feasible measure being taken to mitigate adverse infestation and infection impacts from the timber operation. See 917 (937, 957) 9(a).

b. [ ] Yes [X] No If outside a declared zone, are there any insect, disease or pest problems significance in the THP area? If yes, describe the propose measures to improve the health vigor and productivity of the stand (s).

PINE PITCH CANKER
The THP area is within an area declared a 'Zone of Infestation or Infection' by the Board of Forestry with regard to Pine Pitch Canker. Pine trees are located within project clearing limits. Brood material is defined in CCR895.1 as "...any cut or downed portion of a tree's stem greater than three inches with intact undeteriorated bark." Brood material will be treated by lopping all branches from the sides and tops of those portions of pine stems which are 3" or more in diameter, and branches shall be scattered or otherwise removed away from the stems so that stems have maximum exposure to solar radiation. No pine material infected with the fungus or infested with insects capable of vectoring the fungus to new hosts shall leave the zone of infestation unless properly treated.

SUDDEN OAK DEATH
The THP is located in an area designated as a Zone of Infestation with regard to Sudden Oak Death (SOD). At issue is the movement of potential host species either within or outside of the Zone of Infestation. The nearest confirmed sites are (August 2009, *California Oak Mortality Task Force Report*) the Pinewood Campground Loop in MacKerricher State Park and (February 2012, *California Oak Mortality Task Force Report*) the Inglenook area, approximately 4.5 miles and 6.3 miles respectively, northwest of the plan area. At this time, there are no known sites of infestation within ¼ mile of the THP area. Despite this apparent absence of SOD, the following shall apply:

a) At this time, infected counties include: 1) Alameda 2) Contra Costa 3) Humboldt 4)Lake 5) Marin 6) Mendocino 7) Monterey 8) Napa 9) San Francisco 10) San Mateo 11) Santa Clara 12) Santa Cruz 13) Solano 14) Sonoma. This area is considered the Zone of Infestation for Sudden Oak Death.

b) There are both "Regulated Host Species" and "Associated Species".

Regulated *Phytophthoraramorum* Hosts of Concern when Filing Timber Harvest Documents

Scientific Name	**Common Name**
Acer macrophyllum	Bigleaf maple
Adiantum aleuticum	Western maidenhair fern
Adiantum jordanii	California maidenhair fern
Aesculus californica	California buckeye
Arbutus menziesii	Madrone
Arctostaphylos manzanita	Manzanita
Frangula californica(=*Rhamnuscalifornica*)	California coffeeberry
Frangula purshiana(=*Rhamnuspurshiana*)	Cascara
Heteromeles arbutifolia	Toyon
Lithocarpus densiflorus	Tanoak
Lonicera hispidula	California honeysuckle
Maianthemumracemosum (=Smilacinaracemosa)	False Solomon's seal
*Pseudotsuga menziesii*var.*menziesii*	Douglas-fir
Quercus agrifolia	Coast live oak
Quercus chrysolepis	Canyon live oak
Quercus kelloggii	California black oak
*Quercus parvula*var. *shrevei*	Shreve's oak
Rhododendron spp.	Rhododendron (including azalea)
Rosa gymnocarpa	Wood rose
Sequoia sempervirens	Coast redwood
Trientalis latifolia	Western starflower
Umbellularia californica	California bay laurel/pepperwood
Vaccinium ovatum	Evergreen huckleberry

Of these species the following are known to occur in the THP area: Arbutus menziesii (Pacific Madrone), Arctostaphylos sp. (manzanita), Lithocarpus densiflorus (tanoak), *Lonicera hispidula* (honeysuckle), Pseudotsuga menziesii (Douglas-fir), *Rhododendron macrophyllum* (rhododendron), *Sequoia sempervirens* (coast redwood), western starflower (Trientalis latifolia), accinium ovatum (black huckleberry) and *Rosa gymnocarpa* (wood rose).

c) Host material permitted for removal:
- Firewood may be harvested from the THP area, so long as such wood is not smaller than four inches in diameter and does not leave the existing Zone of Infestation.
- The only *host material* that may be harvested for commercial purposes are tanoak and madrone logs. They may be harvested and shipped to destinations within the existing Zone of Infestation, subject to the requirements of the Compliance Agreement. If debarked, they may be harvested and shipped to any destination without restriction.

d) Host material shall not be moved outside of the existing Zone of Infestation.

e) This THP shall serve as the Compliance Agreement for removal of commercial host material from the THP area, within the Zone of Infestation.

f) Information regarding Compliance:
(1) The potential destination(s) of commercial host material is unknown at this time. Prior to removal of the above noted commercial host materials from the THP area, the plan shall be amended to clarify the specific destination for these materials.
(2) Basal trunk/burl sprouts, small branches (less than 1 inch in diameter), and leaves (needles) of coast redwood and Douglas-fir are considered host materials. These host materials shall not be removed from the THP area except as provided for above in c.
(3) Chips or other host material, less than 4 inches in diameter, shall not be removed from the THP area.
(4) Movement of host material greater than 4 inches in diameter (as described in (c), above) does not require a closed container.
(5) Host debris (not actual logs - just leaves, twigs, and branches of host species, listed in item (b), above) shall be inspected for, and substantially removed from, equipment/vehicles prior to departure from the plan area. The usual inspection shall consist of walking around each vehicle/piece of heavy equipment, including any load, and visually scanning for the presence of host debris, prior to movement from the THP area. This is the responsibility of the LTO responsible for hauling operations.

g) The RPF responsible for providing professional advice to the licensed timber operator pursuant to 14 CCR 1035.1(e), shall inform the LTO regarding regulations pertaining to SOD, current SOD hosts, extent of the regulated area, and operational requirements pertaining to the Compliance Agreement (this THP), prior to start-up of initial timber operations and throughout active timber operations as necessary regarding plan amendments to such.

An amendment will be submitted if SOD information or mitigation measures change.

HARVESTING PRACTICES

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

	GROUND BASED*		CABLE		SPECIAL
a)	[X] Tractor, including end/long lining	d)	[ ] Cable, ground lead	g)	[ ] Animal
b)	[X] Rubber tired skidder, Forwarder	e)	[ ] Cable, high lead	h)	[ ] Helicopter
c)	[X] Feller buncher	f)	[ ] Cable, Skyline		[ ] 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 [X] Extreme [ ]
If more than one rating is checked, areas must be delineated on map 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 916 (936, 956) .7.

14CCR916.9(k) Year-round logging road, landing and tractor road use limitations:
(1) Logging roads, landings or tractor roads shall not be used when visibly turbid water from the road, landing or tractor road (skid trail) or an inside ditch associated with the logging road, landing or tractor road 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 violate Water Quality Requirements.
(2) Log hauling on logging roads and landings shall be limited to those which are hydrologically disconnected from watercourses to the extent feasible, and exhibit a stable operating surface in conformance with (1) above.
(3) Concurrent with use for log hauling, approaches to logging road watercourse crossings shall be treated for erosion control as needed to minimize soil erosion and sediment transport and to prevent the discharge of sediment into watercourses and lakes in quantities deleterious to the beneficial uses of water.
(Note: No logging road watercourse crossings are associated with the project area.)
(4) Concurrent with use for log hauling, all traveled surfaces of logging roads in a WLPZ or within any ELZ or EEZ designated for watercourse or lake protection shall be treated for

erosion control as needed to minimize soil erosion and sediment transport and to prevent the discharge of sediment into watercourses and lakes in quantities deleterious to the beneficial uses of water.
(Note: No logging roads are located within, WLPZ's, EEZ's or ELZ's are associated with the project area.)
(5) Grading to obtain a drier running surface more than one time before reincorporation of any resulting berms back into the road surface is prohibited.

14CCR916.9(l) Extended Wet Weather Period:
October 15 to May 1 shall be considered the extended wet weather period and the following shall apply:
(1) No timber operations shall take place unless the approved plan incorporates a complete winter period operating plan pursuant to 14 CCR § 914.7 [934.7, 954.7] subsection (a) that specifically addresses, where applicable, proposed logging road, landing or tractor road construction, reconstruction and use during the extended wet weather period. Where logging road watercourse crossing construction or reconstruction is proposed an implementation schedule shall be specified.
(Note: Logging road watercourse crossing construction or reconstruction is not proposed.)

(2) Unless the winter period operating plan proposes operations during an extended wet weather period with low antecedent soil wetness, no tractor roads shall be constructed, reconstructed, or used on slopes that are over 40 percent and within 200 feet of a Class I, II, or III watercourse, as measured from the watercourse or lake transition line during the extended wet weather period.
(Note: There are no slopes >40% associated with the project area.)
(3) Logging roads, landings and tractor roads shall not be used when sediment from the logging road, landing or tractor road surface may be transported to a watercourse or a drainage facility 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.
(4) Logging roads and landings shall not be used for log hauling when saturated soil conditions 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 specified in (3) above.

14CCR916.9(m) Tractor Road Drainage Facility Installation:
"All tractor roads shall have drainage and/or drainage collection and storage facilities installed as soon as practical following yarding and prior to either i) the start of any rain which causes overland flow across or along the disturbed surface within a WLPZ or within any ELZ or EEZ designated for watercourse or lake protection, or ii) any day with a National Weather Service forecast of a chance of rain of 30 percent or more, a flash flood warning, or a flash flood watch."

14CCR916.9(n) Treatments to stabilize soils within the WLPZ, and within any ELZ or EEZ:
(Note: No watercourses, WLPZ's, EEZ's or ELZ's are associated with the project area.)

14CCR 923.2(m): "Sidecast or fill material extending more than 20 feet in slope distance from the outside edge of new or existing reconstructed logging roads, where the sidecast or fill material has access to a watercourse or lake which is protected by a WLPZ shall be seeded, planted, mulched, removed, or treated as specified in the THP, to adequately reduce soil erosion." *(Note: The project area is located on slopes which are generally less than 15% and conditions associated with 14CCR 923.2(m) will not occur due to site characteristics.)*

Per 14CCR 923.5(f)(4): Sidecast or fill material extending more than 20 feet in slope distance from the outside edge of the landing and which has access to a watercourse or lake shall be seeded, planted, mulched, removed, or treated as specified in the THP, to adequately reduce soil erosion. *(Note: The project area is located on slopes which are generally less than 15% and conditions associated with 14CCR 923.5(f)(4) will not occur due to site characteristics.)*

When watercourse crossings are to be removed the following will apply:
14 CCR 923.3(d) 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 by seeding, mulching, rock armoring, or other suitable treatment. *(Note: No watercourses are associated with the project area.)*

Drainage Structure Installation

- All Forest Practice Rules regarding waterbreak construction and placement apply. Water breaks shall be installed at the spacing specified below in Table 1 as per CCR914.6.
- Timing of installation of drainage facilities is addressed below in Table 2.
- Use limitations on permanent, seasonal logging roads and tractor roads are given in Table 3.
- A drainage facility shall also be installed at all watercourse crossings and permanent culverts, regardless of the maximum distances specified in order to prevent watercourse overflow down roads or tractor roads, and/or to minimize fill failure due to culvert plugging.
- Where actual 'water bars' are installed they shall be constructed to the standards of 14 CCR 914.6(g).
- On logging roads with gradients of 7% or less a combination of sloping, crowning, and rolling dips may be used in place of or in conjunction with defined waterbreaks.

Additional Protection outside the Winter Period

Outside of the 'Winter Period' (November 15th to April 1st) are two periods considered for additional protection. Within these periods installation of erosion control structures are required more frequently and additional restrictions are placed on road use. These two periods are:

- The Fall Operating Period (FOP) extends from October 15 to November 15.
- The Spring Operating Period (SOP) extends from April 1 to but not including May 1.

Weather Information Resources: There are requirements for the LTO to monitor rainfall amounts during the FOP and the SOP. Hourly rainfall data can be accessed via the internet at (http://raws.boi.noaa.gov/obs/CA_MCGUIRES.txt). This site is updated HOURLY at 55 minutes past the hour, GMT. The site displays total season accumulation with measurements listed for several hours. The weather station is located at McGuire's Pond on Highway 20, approximately 13 miles from Fort Bragg. Daily weather forecasts can be obtained via commercially available weather radios which broadcast the NWS forecast. The broadcast for the Fort Bragg area is on a frequency of 162.55 MHz. Alternatively, forecast information can be obtained via the internet at www.wrh.noaa.gov\eureka.

Table 1: **MAXIMUM** Distance Between Waterbreaks*

	Gradient of Seasonal Logging Road or Tractor Road			
EHR Rating	**10% or less**	**11-25%**	**25-50%**	**>50%**
Extreme	100'	75'	50'	50'
High	150'	100'	**75'**	**50'**
Moderate	200'	150'	100'	75'
Low	300'	200'	150'	100'

Road and Tractor Road Related Active Erosion Sites

Existing road surface drainage is generally adequate to prevent extensive rill and gully erosion, however increased water break densities as required by the FPA and as proposed under the THP will reduce the potential for road surface erosion on the primary seasonal roads associated with the plan area. Defined tractor roads in this area are limited due to the gentler ground and the ability of skidding equipment to operate in this area without constructing skid roads. Our review of the project area did not result in the identification of any active erosion sites. Non-specific remedial work such as installation of water breaks on tractor roads will reduce the potential for future sediment production from the harvest area. These general mitigations are detailed above under THP Item 18 and not individually itemized in a site specific fashion. No slides are associated with the project area.

MND Mitigation Measure 5: For Potential Impacts to Wetlands and Other Waters.

All work involving or associated with soil movement and or digging should occur during the dry season. A grading permit will be obtained and construction Best Management Practices will be implemented, including silt fencing and straw wattles to control erosion and sediment transport that may flow into surrounding natural habitats, particularly along the north end of the unit nearest to Newman Gulch. Best Management Practices shall be utilized along existing roads as their location provides an existing buffer to the Newman Gulch stream and associated wetland areas. The natural topography surrounding the proposed reservoir shall be left intact as much as is feasible, such that runoff to the surrounding landscape is minimized.

Table 2: Drainage Facility Installation Deadlines

Time Interval	Tractor Roads	Seasonal Logging Roads
May 1st to October 15th Normal Operating Period	a) Immediately upon completion of use. {914.6(b)} b) Prior to the start of any rain which causes overland flow across or along the disturbed surface within a WLPZ or within any ELZ or EEZ designated for watercourse or lake protection. {916.9(m)(1)} c) Prior to any day with NWS forecast of a chance of rain of 30% or more, or a flash flood warning, or a flash flood watch. {916.9(m)(2)}	a) Immediately upon completion of use unless such roads have permanent and adequate drainage facilities, or drainage structures. {914.6(b)} b) By October 15th unless such roads are both proposed for use during the winter period and actually are/will be used during that period.
October 15th to November 15th Fall Operating Period (FOP)	*a) Immediately upon completion of use. {914.6(b)}* *b) Prior to the start of any rain which causes overland flow across or along the disturbed surface within a WLPZ or within any ELZ or EEZ designated for watercourse or lake protection. {916.9(m)(1)}* *c) Prior to any day with NWS forecast of a chance of rain of 30% or more, or a flash flood warning, or a flash flood watch. {916.9(m)(2)}*	a) No later than the beginning of the winter period of the current year of operations except as otherwise provided for in the rules. {914.6(a)(1)} b) Immediately upon completion of use unless such roads have permanent and adequate drainage facilities, or drainage structures. {914.6(b)} c) For roads proposed for use after October 15th which are actually being used waterbreaks shall be installed prior to the start of rain which generates overland flow.
November 15th to April 1st Winter Period	*No timber operations during the mid-winter period.*	*No timber operations during the mid-winter period.*
April 1st to but NOT including May 1st Spring Operating Period (SOP)	a) Immediately upon completion of use. {914.6(b)} b) Prior to the start of any rain which causes overland flow across or along the disturbed surface within a WLPZ or within any ELZ or EEZ designated for watercourse or lake protection. {916.9(m)(1)} c) Prior to any day with NWS forecast of a chance of rain of 30% or more, or a flash flood warning, or a flash flood watch. {916.9(m)(2)}	a) Immediately upon completion of use unless such road have permanent and adequate drainage facilities, or drainage structures. {914.6(b)}

Table 3:Logging Road and Landing Use and Tractor Road Use Schedule

Time Interval	Tractor Roads	Seasonal and Permanent Logging Roads
May 1st to October 15th Normal Operating Period	a) No use where saturated conditions exist. b) No use where a stable operating surface does not exist. c) Tractor roads shall not be used when visibly turbid water from the tractor road or an inside ditch associated with the tractor road may reach a watercourse or lake in amounts sufficient to cause a turbidity increase in Class I, II, III or IV waters. {916.9(k)(1)}	a) Logging roads and landings shall not be used when visibly turbid water from the road, landing or an inside ditch associated with the logging road or landing may reach a watercourse or lake in amounts sufficient to cause a turbidity increase in Class I, II, III or IV waters. {916.9(k)(1)} b) No road construction shall occur under saturated soil conditions, 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. {923.2(r)} c) Operations and maintenance shall not occur when sediment discharged from landings or roads will reach watercourses or lakes in amounts deleterious to the quality and beneficial uses of water {923.6} d) Except for emergencies and maintenance needed to protect water quality, use of heavy equipment for maintenance is prohibited during wet weather where roads or landings are within a WLPZ. {923.4(o)}
October 15th to November 15th Fall Operating Period (FOP)	a – c above PLUS d) Tractor roads shall not be used when visibly turbid water from the tractor road or an inside ditch associated with the tractor road may reach a watercourse or lake in amounts sufficient to cause a turbidity increase in Class I, II, III or IV waters. {916.9(k)(1) e) Operate only if <1/4 inch rain in previous 24 hour period or less than 4 inches rainfall in the water year totals, *>2" after October 15th, cease use for 24 hours following a ¼" or greater precipitation event.*	a – d above PLUS e) Logging roads and landings shall not be used when sediment from the logging road or landing surface is transported to a watercourse or a drainage facility that discharges into a watercourse in amounts sufficient to cause a visible increase in turbidity in Class I, II, III, or IV waters. {916.9(l)(3)}
November 15th to April 1st Winter Period	*No timber operations during the mid-winter period.*	*No timber operations during the mid-winter period.*
April 1st to but not including May 1st Spring Operating Period (SOP)	a –c above PLUS f) Operate only if <1/4 inch rain in previous 24 hour period, *>2" after October 15th, cease use for 24 hours following a ¼" or greater precipitation event.*	a – e above

Given that the project area is to be basically cleared in its entirety additional erosion and sediment prevention measures are to be taken as follows:

- A sediment barrier consisting of a silt fence consistent with the Standard Silt Fence Design Criteria located at the end of THP Section II or a straw bale barrier consistent with the Standard Straw Bale Barrier Design Criteria located at the end of THP Section II will be put in place where run off could exit the project area.
- When the project area is winterized and prior to installation of permanent run-off controls included in the project design sediment traps consistent with the Standard Sediment Trap Design Criteria located at the end of THP Section II will be installed along the northern (down slope) end of the cleared area.
- When the project area is winterized and prior to installation of permanent surface cover specified in the project design bare soil will be mulched to minimize the potential for sediment mobilization.

Given the gentle slopes (<10%+/-) the relative small project size and lack of onsite watercourses the above measures will effectively minimize the potential for sediment yield occurring on site and impacting off site resources.

Additional measures to be utilized by The City of Fort Bragg in their project implementation to minimize the potential for inadvertent erosion and sediment production as specified in their Mitigated Negative Declaration Include the following:

Storm Water Pollution Prevention Plan (SWPPP)

Sediment and pollution prevention measures included in the SWPPP will be implemented to control sediment and pollutants during construction and prevent construction activities from having a negative effect on offsite water qualities. Through implementation of the SWPPP, project storm water will be treated to meet state and federal storm water requirements, including treatment of storm water quality and quantity so that they are not substantially altered from existing conditions. The City is developing their SWPPP for the project and the SWPPP will be appended to the THP when it is available and prior to timber operations.

Dust Abatement

The City of Fort Bragg has a substantial municipal water system in place and any water needed for dust abatement or other construction purposes can be obtained from that source. Water drafting for dust abatement is not proposed.

Additional measures to be utilized by The City of Fort Bragg in their project implementation to minimize the potential for impacts associated with dust as specified in their Mitigated Negative Declaration are as follows:

In order to minimize dust and keep dust from leaving the project site, a dust prevention and control plan shall be submitted for approval by the City Engineer in conjunction with the grading plan. The dust prevention and control plan shall demonstrate that the discharge of dust from the construction site will not occur, or can be controlled to an acceptable level depending on the particular site conditions and circumstances. The plan shall include the following information and provisions:

2.A - The plan shall address site conditions during construction operations, after normal working hours, and during various phases of construction.
2.B - The plan shall include the name and the 24 hour phone number of a responsible party in case of emergency.
2.C - If the importing or exporting of dirt is necessary as demonstrated by the cut and fill quantities on the grading plan, the plan shall also include the procedures necessary to keep the public streets and private properties along the haul route free of dirt, dust, and other debris.
2.D - When an entire project is to be graded and the subsequent construction on the site is to be completed in phases, the portion of the site not under construction shall be treated with dust preventive substance or plant materials and an irrigation system.
2.E - Grading shall be designed and grading activities shall be scheduled to ensure that repeat grading will not be required, and that completion of the dust-generating activity (e.g., construction, paving or planting) will occur as soon as possible.
2.F - The area disturbed by clearing, earth-moving, excavation operations or grading shall be minimized at all times.
2.G - All visibly dry disturbed soil road surfaces shall be watered to minimize fugitive dust emissions. Dust emissions shall be controlled by watering a minimum of two times each day, paving or other treatment of permanent on-site roads and construction roads, the covering of trucks carrying loads with dust content, and/or other dust-preventive measures (e.g., hydroseeding, etc.).
2.H - All unpaved surfaces, unless otherwise treated with suitable chemicals or oils, shall have a posted speed limit of 10 miles per hour.
2.I - Earth or other material that has been transported by trucking or earth moving equipment, erosion by water, or other means onto paved streets shall be promptly removed.
2.J - Asphalt, oil, water or suitable chemicals shall be applied on materials stockpiles, and other surfaces that can give rise to airborne dusts.
2.K - All earthmoving activities shall cease when sustained winds exceed 15 miles per hour.
2.L - The operator shall take reasonable precautions to prevent the entry of unauthorized vehicles onto the site during non-work hours.
2.M - The operator shall keep a daily log of activities to control fugitive dust.
2.N - Graded areas shall be revegetated as soon as possible, but within no longer than 30 days, to minimize dust and erosion. Disturbed areas of the construction site that are to remain inactive longer than three months shall be seeded and watered until grass cover is grown and maintained; and
2.O - Appropriate facilities shall be constructed to contain dust within the site as required by the City Engineer.

19. **[ ] Yes [X] No Are tractor constructed layouts to be used? If yes, specify the location and extent of use:**

20. **[ ] Yes [X] 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?**

21. **Within the THP area will ground based equipment be used on:**

a) [ ] Yes [X]No Unstable soils or slide areas? Only if unavoidable.
b) [ ] Yes [X] No Slopes over 65%?
c) [ ] Yes [X] No Slopes over 50% with high or extreme EHR?
d) [ ] Yes [X] No Slopes between 50% and 65% with moderate EHR where heavy equipment will not be restricted to the limits described in 14 CCR 914 (934, 954) .2 (f)(2)(i) or (ii)?
e) [ ] Yes [X] 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 and provide explanation and justification required per 14 CCR 914 (934. 954).2 (d). CDF requests the RPF consider flagging tractor road location if a) is yes. If b., c., or d. is yes: 1) The location of tractor roads must be flagged on the ground prior to the PHI or start of operations is a PHI is not require d, and 2) you must clearly explain the proposed exception and justify why the standard rule is not feasible or would not comply with 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.

22. **[ ] Yes [X] 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 914.9 in Section III. List specific instructions to the LTO.**

WINTER OPERATIONS

23. a. **[ ] Yes [X] No Will timber operations occur during the winter period? If yes, complete c) and d).**
b. **[ ] Yes [X] No Will mechanical site prep occur during the winter period? If yes, complete d).**
c. **[ ] I choose the in-lieu of option as allowed in 14 CCR 914 (934, 954).7 (c). Specify below the procedures listed subsection (1) and (2) and list the spite specific measure 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. **[X] I choose to prepare a winter operating plan per 14 CCR 914 (934, 954).7 (b)**

Per 14 CCR 916.9(k and l), the following will apply:

916.9 (k) Year-round logging road, landing and tractor road use limitations –

(1) Logging roads, landings or tractor roads shall not be used when visibly turbid water from the road, landing or tractor road (skid trail) or an inside ditch associated with the logging road, landing or tractor road 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 violate Water Quality Requirements.
(2) Log hauling on logging roads and landings shall be limited to those which are hydrologically disconnected from watercourses to the extent feasible, and exhibit a stable operating surface in conformance with (1) above.
(3) Concurrent with use for log hauling, approaches to logging road watercourse crossings shall be treated for erosion control as needed to minimize soil erosion and sediment transport and to prevent the discharge of sediment into watercourses and lakes in quantities deleterious to the beneficial uses of water.
(Note: No logging road watercourse crossings are associated with the project area.)
(4) Concurrent with use for log hauling, all traveled surfaces of logging roads in a WLPZ or within any ELZ or EEZ designated for watercourse or lake protection shall be treated for erosion control as needed to minimize soil erosion and sediment transport and to prevent the discharge of sediment into watercourses and lakes in quantities deleterious to the beneficial uses of water.
(Note: No logging roads are located within, WLPZ's, EEZ's or ELZ's are associated with the project area.)
(5) Grading to obtain a drier running surface more than one time before reincorporation of any resulting berms back into the road surface is prohibited.

916.9 (l) Extended Wet Weather Period

October 15 to May 1 shall be considered the extended wet weather period and the following shall apply:
(1) No timber operations shall take place unless the approved plan incorporates a complete winter period operating plan pursuant to 14 CCR § 914.7 [934.7, 954.7] subsection (a) that specifically addresses, where applicable, proposed logging road, landing or tractor road construction, reconstruction and use during the extended wet weather period. Where logging road watercourse crossing construction or reconstruction is proposed an implementation schedule shall be specified.
- *Logging road watercourse crossing construction or reconstruction is not proposed.*

(2) Unless the winter period operating plan proposes operations during an extended wet weather period with low antecedent soil wetness, no tractor roads shall be constructed, reconstructed, or used on slopes that are over 40 percent and within 200 feet of a Class I, II, or III watercourse, as measured from the watercourse or lake transition line during the extended wet weather period.
- *Slopes over 40 percent are not associated with the project area.*

(3) Logging roads, landings and tractor roads shall not be used when sediment from the logging road, landing or tractor road surface may be transported to a watercourse or a drainage facility 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.
(4) Logging roads and landings shall not be used for log hauling when saturated soil conditions 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 specified in (3) above.

Winter period operating plan per 14 CCR 914.7(b):

(1) Erosion Hazard Rating: The Erosion Hazard Rating for the plan area is High.

(2) Mechanical Site Preparation Methods: Mechanical site preparation may include chipping, grinding or piling and burning of slash and other vegetative material.

(3) Yarding System: No yarding operations are proposed during the winter period. Tractor yarding may occur under defined limits during the FOP and SOP.

(4) Operating Period: The following are the operating periods of various activities proposed. See also 'Equipment Use Limitations (#10 below).

0. Fall Operating Period (FOP) October 15th through the end of November 14th:
- *Tractor yarding*
- *Timber felling*
- *Decking, loading, installation of drainage facilities and structures.*
- *Use of existing seasonal and permanent roads for loading, skidding, hauling, access, equipment transport, and road maintenance.*
- *Road and landing construction and reconstruction may occur during this period.*
- *Tractor road construction and reconstruction and use may occur during this period, subject to the limitations of 14 CCR 916.9(l) or as permitted under (#10, Equipment Use Limitations) below.*

1. Winter Period, November 15th to April 1st
No timber operations during the mid-winter period.

2. Spring Operating Period (SOP) April 1 through end of April 30th:
- *Tractor yarding*
- *Timber felling*
- *Decking, loading, installation of drainage facilities and structures.*
- *Use of existing seasonal and permanent roads for loading, skidding, hauling, access, equipment transport, and road maintenance.*
- *Road and/or landing construction and reconstruction may occur during this period.*
- *Tractor road construction and reconstruction and use may occur during this period, subject to the limitations of 14 CCR 916.9(l) or as permitted under (10, Equipment Use Limitations) below.*

(5) Erosion Control Facilities Timing: Please refer to Table 2 in Item 18.

(6) Consideration of form of precipitation-rain or snow: Any precipitation is expected to occur in the form of rain. Hail may occur during colder spells. Due to moderate climate of the area soil conditions are not expected to become hard frozen.

(7) Ground Conditions: Tractor road construction, reconstruction, use, or yarding shall not occur during saturated soil conditions. Use of logging roads and landings shall not occur when saturated soil conditions exist on the road, or when stable operating surfaces do not exist on the road. Due to climate of the area, soil conditions are not expected to become hard frozen. See other restrictions on operations after rainfall events elsewhere in this Item. (see below, #10, Equipment Use Limitations)

(8) Silvicultural system -ground cover: Site conditioning for reservoir construction will result in the removal of most vegetative material within the 8+/- acre project area. The potential for sediment production to occur as a result of this condition is mitigated by the gentle ground and absence of watercourses.

(9) Operations within the WLPZ: Operations within WLPZs are not proposed.

(10) Equipment Use Limitations:

Fall Operating Period (FOP) October 15th to November 15th :

- *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 operating surface does not exist, or when visibly turbid water from the road, landing, or tractor road surface or inside ditch may reach a watercourse or lake. Grading to obtain a drier running surface more than one time before reincorporation of any resulting berms back into the road surface is prohibited.*

Winter Period, November 15th to April 1st:

- *No timber operations during the mid-winter period .*

Spring Operating Period (SOP), April 1st to May 1st:

- *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 operating surface does not exist, or when visibly turbid water from the road, landing, or tractor road 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.*

(11) Known Unstable areas:

Operations associated with known unstable areas are not proposed.

NOTE: ***LTO****: See Item 18 (Table 2) regarding drainage facilities and timing of installation.*

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 tractor roads shall have drainage and/or drainage collection and storage facilities installed as soon as practical following yarding and prior to either (1) the start of any rain which causes overland flow across or along the disturbed surface within a WLPZ or within any ELZ or EEZ designated for watercourse or lake protection, or (2) any day with a National Weather Service forecast of a chance of rain of 30 percent or more, a flash flood warning, or a flash flood watch.

ROADS AND LANDINGS

24. Will any roads be constructed? [ ] Yes [X] No. or reconstructed? [ ] Yes [X] No. If yes check items a through g. Will any landings be constructed? [X] Yes [ ] No. or reconstructed? [ ] Yes [X] No. If yes check items h through k.

a. [ ] Yes [X] No Will new roads be wider than single lane with turnouts?

b. [ ] Yes [X] No Are logging roads or landings proposed in areas of unstable soils or known slide prone areas?

c. [ ] Yes [X] 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 grade of 20% for over 200 feet.

d. [ ] Yes [X] 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 [X] No Will roads or landings longer than 100 feet in length be located on slopes over 65%, or on slopes over 50% which are within 100 feet of the boundary of a WLPZ?

f. [ ] Yes [X] No Will any roads, watercourse crossings, or associated landings be abandoned?

g. [ ] Yes [X] No Are exceptions proposed for flagging or otherwise identifying the location of roads to be constructed?

h. [ ] Yes [X] No Will landings exceed one-half acre in size? If landings exceed one quarter acre in size or requires substantial excavation, the location must be shown on a map.

i. [ ] Yes [X] No Are landings proposed in unstable soils or known slide prone areas?

j. [ ] Yes [X] No Will 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 [X] No Will any landings be abandoned?

25. If any section in Item #24 is answered yes, specify site-specific measures to reduce adverse impacts and list any additional or special information concerning the construction, maintenance and/or abandonment of roads or landings.

WATERCOURSE AND LAKE PROTECTION ZONE (WLPZ) AND DOMESTIC WATER SUPPLY PROTECTION MEASURES:

26. a. [ ] Yes [X] No Are there any watercourse or lakes which contain Class I through IV waters on or adjacent to the plan 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 (c) of the WLPZ rules for each watercourse. Specify if Class III or IV watercourses have WLPZ, ELZ or both.

b. [ ] Yes [X] No Are there any watercourse crossings that require mapping per 14 CCR 1034 (x) (7)?

c. [ ] Yes [X] 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).

d. [ ] Yes [X] 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 the 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".

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

a. [ ] Yes [X] 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 [X] No **Retention of non-commercial vegetation bordering and covering meadows and wet areas?**

c. [ ] Yes [X] No **Directional felling of trees within the WLPZ away from the watercourse or lake?**

d. [ ] Yes [X] No **Increase or decrease of width(s) of the WLPZ(s)?**

e. [ ] Yes [X] No **Protection of watercourses which conduct class IV waters?**

f. [ ] Yes [X] 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 [X] No **Establishment of ELZ for Class III watercourse unless sideslopes are <30% and EHR is low?**

h. [ ] Yes [X] No **Retention of 50% of the overstory canopy in the WLPZ.?**

i. [ ] Yes [X] No **Retention of 50 % of the understory in the WLPZ?**

j. [ ] Yes [X] No **Are any additional in-lieu or any alternative practices proposed for watercourse or lake protection?**

Note: A yes answer to 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 rule; 2. Explain and describe each proposed practice, 3. Explain how the proposed practice differs from that of 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 how the protection provided is equal to the standard rule and provides for the protection of beneficial uses of water per 14 CCR 916 (936, 956).1(a). Reference the in-lieu and location to the specific watercourse to which it will be applied.

28. [X] Yes [ ] No **Are there any landowners within 1000' downstream of the THP boundary whose ownership adjoins or includes 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 the THP Section V. If No, 28 b. need not be answered.**

[ ] Yes [X] No **Is an exemption requested of the notification of requirements of 1032.10? If yes, explanation and justification for the exemption must appear in THP Section III. Specify if requesting an exemption from the letter, newspaper or both?**

[ ] Yes [X] 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 [X] No **Is any part of the THP area within a Sensitive Watershed as designated by the Board of Forestry? 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. **[X] 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.**

Fire Hazard reduction is required within 200 feet of houses identified on the THP Map. Fire hazard reduction will be accomplished in accordance with Title 14 CCR 917.2 which is reproduced here in part for ease of reference:
"(a) Slash to be treated by piling and burning shall be treated not later than April 1 of the year following its creation, or within 30 days following climatic access, or as justified in the plan. Within 100 feet of the edge of the traveled surface of public roads, and within 50 feet of the edge of the traveled surface of permanent private roads open for public use where permission to pass is not required, slash created and trees knocked down by road construction or timber operations shall be treated by lopping for fire hazard reduction, piling and burning, chipping, burying or removal from the zone. All woody debris created by timber operations greater than one inch but less than eight inches in diameter within 100 feet of permanently located structures maintained for human habitation shall be removed or piled and burned; all slash created between 100-200 feet of permanently located structures maintained for human habitation shall be lopped for fire hazard reduction, removed, chipped or piled and burned ..."

Lopping is defined in Title 14 CCR 895.1 as follows:
"Lopping For Fire Hazard Reduction" means severing and spreading slash so that no part of it generally remains more than 30 inches above the ground except where a specific rule provides another standard."

(Note: Slash removal is anticipated to be near 100% due to the planned reservoir construction which is the purpose of the clearing project and therefore hazard reduction will occur at levels well beyond the minimum requirements expressed in CCR917.2.)

[ ] Yes [X] No Are there any alternatives to the rules for slash treatment along roads and within 200' of structures requested? If yes RPF must explain and justify how alternatives provides equal fire protection. Include a description of the alternative and where it will be utilized.

31. **[X] Yes [ ] No Will piling and burning be used for hazard reduction? See 14 CCR 917 (937, 957).1-11 for specific requirements. Note LTO is responsible for slash disposal. This responsibility cannot be transferred.**

Hazard reduction efforts may include piling and burning as well as chipping and grinding.

Pursuant to the City of Fort Bragg's Mitigated negative declaration, if burning of vegetation is required for removal, permission shall be obtained from the Fort Bragg Fire Department prior to burning, and all safety measures required by the Fort Bragg Fire Department shall be adhered to in order to minimize wildfire risk.

BIOLOGICAL AND CULTURAL RESOURCES

32. **[X] Yes [ ] No Are any plant or animal species, including their habitat, which are listed as rare , endangered or threatened 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.**

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

Potential habitat for, coho, steelhead, osprey and northern spotted owls is present within the Biological Assessment Area. Please refer to THP Section IV and Section V for additional information. During the pre-operative meeting the RPF or his supervised designee will advise the LTO of potential habitat for species listed in Item 32, including nesting hawks and owls. If the LTO should find any of these species or those mentioned in Item 32 in Section III, they shall stop operations immediately and contact the RPF.

Coho Salmon

The plan is located in a planning watershed with Coho salmon as per the list provided at http://dfg.ca.gov/habcon/timber/files/Coho_Watershed_List_070912.pdf. Please refer to THP Section IV for additional specific information concerning this species. The proposed harvest has been designed to provide compliance with all of the rules stipulated under 14 CCR 916.9 & 923.9."

NSO

The THP area contains habitat marginally suitable for Northern Spotted Owls. **NSOs are not known to occur within 0.7** miles of the THP. According to the CDFG database, known NSO activity centers are all located more than 0.7 miles from the project area. The proposed timber operation will comply with 14CCR919.9(e) in that operations will be conducted such that the provisions of the USFWS Take Avoidance Scenario 4 will be met. Take avoidance will be accomplished by not impacting NSO habitat within 0.7 miles of NSO activity centers and conducting surveys to insure that previously undetected NSO activity centers are not within the vicinity of the project area.

- No timber operations shall occur until such time as all NSO surveys for the current period are complete and the results have been provided to CAL FIRE.
- Surveys that deviate from USFWS protocol will follow the recommendations of the USF&WS and or Cal Fire to ensure that sufficient data are collected for determining take avoidance.
- NSO survey data will be submitted to Cal Fire who will review the data and comment as appropriate.
- There are no known NSO activity centers within 0.7 miles of the THP area.
- If any known activity centers lie within 1000 feet (0.50 mile for helicopter yarding) of the THP or appurtenant facilities then the standard protection measures as described below will be applied to those activity centers until the subsequent surveys can determine their status.
- If a northern spotted owl activity center is located, the following standard protection measures will be adopted.
- If future years, no timber operations shall occur until surveys have been provided to CAL FIRE for review and evaluated for consistency with the plan and protocols, and amended into the plan. Surveys for NSOs will be conducted in conformance with the USFWS approved NSO survey protocols.

The proposed project is in compliance with the USFWS Attachment A Take Avoidance Analysis – Coast 3/15/2011. THP area contain marginally suitable foraging habitat for NSOs. There are no known NSO activity centers within 0.7 miles of the plan boundary.

VI. Post-Harvest Habitat Retention and Typing

Within the 0.7 mile radius (985 acres) of each Activity Center please use the following:

1) Retain habitat to maximize attributes desirable for NSO.

2) Retain at least 500 acres of suitable (Nesting/Roosting/Foraging) NSO habitat, post-harvest, as follows:

a) Retain 200 acres of Nesting/Roosting Habitat within a 0.7 mile radius of the Activity Center consisting of:
i) 100 acres of the 200 acres of Nesting/Roosting habitat retained should be contiguous, or contiguous as possible with the Activity Center.
ii) An additional 100 acres of Nesting/Roosting with in the 0.7 mile radius:
(I) If the second 100 acres of Nesting/Roosting habitat is also contiguous with the Activity Center, or within the same drainage, operations should retain a minimum of 66% of the pre-harvest basal area per acre of trees at least 11" DBH.
(2) If the remaining 100 acres of Nesting/Roosting habitat is not contiguous with the Activity Center, retain at least Nesting/Roosting habitat.

b) Retain at least 300 acres of Suitable NSO habitat, post-harvest, of at least Foraging quality.

3) Remove no more than 1/3 of the remaining suitable habitat in excess of 500 acres within 0.7 mile of an Activity Center during the life of the timber operations.

EXCEPTIONS: None.
There are no known NSO activity centers within .7 miles of the plan boundary.

PART OF PLAN

VII. Road Use

To avoid take of NSO from noise disturbance (see U.S. Fish and Wildlife Service 2006) road use within 0.25 mile (1,320 feet) of a NSO Activity Center during the breeding season is prohibited until July 10, unless:

1) Non-nesting, or nesting failure at the Activity Center has been determined by an Activity Center Search (2011 NSO Protocol) conducted on or after May 15th, or;
2) The Activity Center is within 165 feet of major highway that typically has continuous traffic year around (Hwy 1, 36, 101, 128, 299, etc.) and the appurtenant road is not within 165 feet of the Activity Center.
3) After July 9th until the end of the breeding season road use within the 100-acre core is restricted to existing road use, maintenance and map point work.

EXCEPTIONS: None.

Timber Harvest Operations

A 0.25 mile seasonal restriction on timber operations (except for road use after July 9th) applies to every known NSO Activity Center during the breeding season, unless it is determined via a site monitoring visit, "Activity Center Search" (2011 NSO Protocol), that NSO are not nesting, or nesting failure has occurred. If it cannot be determined whether NSO are nesting, or nesting failure cannot be determined, the 0.25 mile seasonal restriction stays in effect for timber operations until after July 31st.

For all known Activity Centers, timber operations should adhere to the following recommendations:

1) Within the 100-acre Core Area polygon of an NSO Activity Center:
a) Outside the breeding season, limited timber operations (i.e., road use and maintenance, map point work, tail-hold placements, use of existing skid roads, and loading) may be conducted, provided no trees >11 inches DBH are cut or removed by the operations, and no logs are yarded through the Core Area.
b) During the NSO breeding season, timber operations (including use of roads before July 9th), are not allowed within the 100-acre Core Area polygon, except as allowed in subsections 4 and 5, below.

EXCEPTIONS to 1) a) above: None.
EXCEPTIONS to 1) b) above: None.

2) Timber Operations outside the 100-acre Core Area polygon, but within 0.25 mile of an NSO Activity Center:
a) Outside the breeding season, timber operations may be conducted.
b) During the breeding season, no timber operations should proceed unless protocol surveys do not detect nesting NSOs.

EXCEPTIONS to 2) a) above: None.
EXCEPTIONS to 2) b) above: None.

3) For all NSO Activity Centers, prior to May 15th (until the required May 15 or later survey is completed):
a) Timber operations (except helicopter yarding or staging) may be conducted only on those THP areas >0.25 mile from the Activity Center.
b) Helicopter yarding and staging may occur only on those THP areas >0.5 mile from the Activity Center.

EXCEPTIONS to 3) a) above: None.
EXCEPTIONS to 3) b) above: None.

4) For NSO Activity Centers where reproductive status has been determined to be non-nesting or failed nesting:
a) Limited timber operations (road use and maintenance, map point work, use of existing skid roads, tail-hold placements and loading) may be conducted within the 100-acre Core Area polygon of the Activity Center provided no trees >11 inches DBH are cut or removed by the operations, and no logs are yarded through the Core Area.
b) Full timber operations, including helicopter yarding and staging, may be conducted within 0.25 mile but not within the 100-acre core polygon of the Activity Center. Helicopter fly-overs shall not occur within 1000 ft. of the Activity Center

EXCEPTIONS to 4) a) above: None.
EXCEPTIONS to 4) b) above: None.

5) For NSO Activity Centers, where reproductive status has been determined to be nesting:
a) For Activity Centers where fledging status has not been determined, timber operations may be conducted only on those THP areas that are >0.25 mile from the Activity Center until the end of the breeding season.
b) Helicopter yarding and staging may occur only on those THP areas >0.5 mile from the Activity Center.

EXCEPTIONS to 5) a) above: None.
EXCEPTIONS to 5) b) above: None.

6) For NSO Activity Centers, where fledging status has been determined (either nest failure or fledglings have left the Core Area):
a) Full timber operations, including helicopter yarding and staging, may be conducted within 0.25 mile but not within the 100-acre core polygon of the Activity Center. Helicopter fly-overs shall not occur within 1000 feet of the Activity Center.
b) Limited timber operations (road use and maintenance, map point work, use of existing skid roads, tail-hold placements and loading) may be conducted within the 100-acre core polygon of the Activity Center, provided no trees >11 inches DBH are removed by the operations, and no logs are yarded through the Core Area.

EXCEPTIONS to 6) a) above: None.
EXCEPTIONS to 6) b) above: None.

7) For any NSO Activity Center, regardless of reproductive status:
a) If NSO move to a new location (>l000 feet from the historical Activity Center) and reproductive behavior is confirmed at the new site, request technical assistance to evaluate the status of the historical Activity Center.

EXCEPTIONS to 7) a) above: None.

Botanical Resources
A botanical survey was completed for the project area in 2008 by Redwood Coast Associates. A supplemental survey was conducted in 2013 and is enclosed in THP section 5 for reference. Bolander's reed grass and pygmy cypress are the only special status plant species located within the project area. According to the Biological assessment approximately 72 pygmy cypress trees are currently growing within the projects clearing limits. According to the Biological Assessment completed for the project, approximately 30 individual Bolander's reed grass plants are located in the project area.

Bolander's reed grass
Bolander's reed grass is a CNPS 4.2 ranked species. This species is not included on any Federal or State lists. No mitigation is warranted under CEQA for the loss of these 30 individuals as a result of the project.

Pygmy Cypress
The Pygmy Cypress is a species which is globally rare and locally common. The Pygmy cypress is strongly linked with local coastal terraces where a shallow soil perched above a hardpan creates a poorly drained and nutrient deficient site condition. The Pygmy cypress does occur in adjacent areas of timber bearing soils as well. The Pygmy cypress can seed vigorously on areas of exposed soil. Impacts to the Pygmy cypress population were addressed in the early stages of project development by sighting the proposed reservoir in an area which is underlain by the Quinliven-Femcreek forest soil type rather than the Blacklock – Aborigine soils which are typical of the true pygmy conditions with which Pygmy Cypress is associated. The City of Fort Bragg's property is approximately 35.8 acres in size and the 8+/- acre reservoir project was sighted at its current location to avoid the unique pygmy forest conditions in the northeast portion of the property and riparian habitats in the Newman Gulch area. It is anticipated that natural regeneration will occur from adjacent seed sources on portions of the project area that are not actually occupied by improvements.

The City of Fort Bragg will take additional measures as specified in their *Summers Lane Reservoir Pygmy Cypress Mitigation Planting Area and Plan* a copy of which is located in Section V of this THP.

Invasive Plant Species
The City of Fort Bragg will take the following measures, as specified in their Mitigated Negative Declaration, to minimize the potential for adverse impacts associated with invasive species which might if introduced successfully compete against native plant communities.

- Heavy equipment shall be washed prior to initial use on the site in order to remove any potential invasive seed contamination sources.
- After the completion of the all construction-related activities, all areas of bare soil around the reservoir will be replanted with native vegetation appropriate to the site, and wetland vegetation where appropriate. Vegetation planted around the perimeter of the reservoir shall be locally-native species from local propagule sources if feasible, and should be planted during the wet season or whenever soils are moist, in order to achieve the highest feasible survival rate.
- Areas of disturbed soil shall be mulched, seeded, or planted and covered with native vegetation as soon as possible after clearing.
- No exotic plants shall be planted during or following site development. Plant species listed as invasive (High, Moderate, or Limited) on the California Invasive Plant Inventory (Cal-IPC 2006) shall not be installed anywhere in the Project Area as they would pose a risk to the surrounding plant community. All reasonable efforts should be made to control and remove existing or newly established populations of exotic species. Some examples of invasive plants likely to be found that should be monitored and controlled are English ivy (*Hedera helix*), Himalayan blackberry (*Rubus armeniacus*), French broom (*Genista monspessulana*), pampas grass (*Cortaderia* spp.), and forget-me-not (*Myosotis latifolia*).

Bat Species
The City of Fort Bragg will take the following measures, as specified in their Mitigated Negative Declaration, to minimize the potential for adverse impacts to bat species which might roost within the project area.

- Removal of potential bat roost habitat (large trees or snags) or construction activities near potential bat roost habitat will take place In September and October to avoid impacts to bat maternity or hibernation roosts.
- If this work window is not feasible, prior to construction, bat roost surveys will be conducted in the Project Area to determine if bats are occupying roosts. If bats are present, a suitable buffer around the roost site will be instated or bats will be excluded from the roost using methods recommended by a qualified biologist.
- Installation of outdoor artificial lighting in or adjacent to the Project Area will be avoided, unless required for public safety. If outdoor artificial lighting is placed within the Project Area, it will incorporate measures to lessen potential impacts to bats such as: prismatic glass coverings, cutoff shields, embedded road lights, narrow spectrum bulbs, or other appropriate lighting technology.

Red Tree Vole AKA Sonoma Tree Vole

The City of Fort Bragg will take the following measures, as specified in their Mitigated Negative Declaration, to minimize the potential or adverse impacts to Sonoma Tree Voles which might utilize the project area.

- Preconstruction surveys for the Sonoma Tee Vole will be performed prior to construction activities. Tree vole survey methodology should follow the Survey protocol for the Red Tree Vole (*Arborimus longicaudus*) in the Record of Decision of the Northwest Forest Plan), Version 2.1, Revision, October 2002 or any subsequent revision.
- Occupied trees will be avoided to the fullest extent possible. If disturbance of occupied trees is unavoidable, consultation with CDFW will be initiated to determine the appropriate mitigation measures. Measures may include the preservation or avoidance of suitable habitat.

Nesting Special Status Bird Species and Other Breeding Birds

The City of Fort Bragg will take the following measures, as specified in their Mitigated Negative Declaration, to minimize the potential for adverse impacts to nesting special status bird species and other breeding birds which might utilize the project area.

- Conduct as much ground disturbance and vegetation (tree and shrub) removal as is feasible between September 1 and January 15, outside of the breeding season for most bird species.
- If ground disturbance or removal of vegetation occurs between January 16 and August 31, preconstruction surveys will be performed prior to such disturbance to determine the presence and location of nesting bird species.
- If nests are present, establishment of temporary protective breeding season buffers will avoid direct mortality of these birds. The appropriate buffer distance is species specific and will be determined by a qualified biologist as appropriate to prevent nest abandonment and direct mortality during construction.
- If outdoor artificial lighting is placed within the Project Area, it will incorporate measures to lessen potential impacts to avian species such as: prismatic glass coverings, cutoff shields, embedded road lights, narrow spectrum bulbs, or other appropriate lighting technology.

Special Status Herpetofauna

The City of Fort Bragg will take the following measures, as specified in their Mitigated Negative Declaration, to minimize the potential for adverse impacts to special status herpetofauna which might utilize the project area.

- A biologist or other qualified professional shall conduct a survey for coastal tailed frogs, northern red legged frogs foothill yellow–legged frogs, and southern torrent salamanders within one week of commencing project activities. The survey may occur during day or night. For night surveys, the surveyor shall use a portable light for use in detecting frog's eye shine. Surveys shall include the project site and an area that extends 30 feet up and downstream of the project site.
- Before starting project activities, the biologist or qualified professional shall conduct a coastal tailed frog, northern red legged frog, foothill yellow–legged frog, and southern torrent salamander awareness training for all on-site workers involved in the project. This training will include photos and/or drawings of each species, a discourse on key physical features and general life history of each species and an overview of herpetofauna protection measures to follow to minimize loss of each species during project activities. A copy of the training materials shall be kept at the project site at all times during project activities, and available to all on-site workers for reference.
- At the beginning of each work day, trained on-site workers shall survey the project area for coastal tailed frogs, northern red-legged frogs, foothill yellow–legged frogs, and southern torrent salamanders. If at any point during surveys or project activities one of these species is identified within 30 feet of the project area, the individuals shall be carefully removed and placed well outside (at least 300 feet away) the project area.
- No herbicide use or pile burning shall occur within 300 feet of the watercourse.
- If water drafting from the watercourse is to occur for dust abatement purposes, drafting must be done with a hose placed in a bucket in a deep pool. The bucket must be covered by <1 inch mesh, and the mouth of the hose must be covered by ¼ inch mesh.
- A SWPPP will be implemented to control sediment and pollutants during construction and prevent construction activities from having a negative effect on water quality and quantities in preserved portions of the Study Area. Through implementation of the SWPPP, project stormwater will be treated to meet state and federal stormwater requirements, including treatment of stormwater quality and quantity so that they are not substantially altered from existing conditions.
- Installation of artificial lighting in the Project Area will be avoided, unless required for public safety. If outdoor artificial lighting is placed within the Project Area, it will incorporate measures to lessen potential impacts to frog species such as: prismatic glass coverings, cutoff shields, embedded road lights, narrow spectrum bulbs, or other appropriate lighting technology.

Disturbance to Special Status Migratory Fish

The City of Fort Bragg will take the following measures , as specified in their Mitigated Negative Declaration, to minimize the potential for adverse impacts to special status migratory fish and other aquatic species which could be impacted by project activities.

- Appropriate BMPs during construction activities, such as the use of a silt fence or other erosion control measures to prevent sediment from entering the water column, will protect in-migrating adults and out-migrating smolts from potential disturbance from increased turbidity. Erosion control devices should not contain monofilament as this may pose a potential entanglement hazard to sensitive amphibian species that may occur in the area. Potential discharge of the reservoir into Newman Gulch should be done with the consultation of the National Marine Fisheries Service (NMFS) to ensure there are no potential impacts to migrating salmonid species.

Impacts to Wetlands and Other Waters.
The City of Fort Bragg will take the following measures, as specified in their Mitigated Negative Declaration, to minimize the potential for adverse impacts to offsite wetlands and other waters which could be impacted by project activities.

- All work involving or associated with soil movement and or digging should occur during the dry season. A grading permit will be obtained and construction Best Management Practices will be implemented, including silt fencing and straw wattles to control erosion and sediment transport that may flow into surrounding natural habitats, particularly along the north end of the unit nearest to Newman Gulch. Best Management Practices shall be utilized along existing roads as their location provides an existing buffer to the Newman Gulch stream and associated wetland areas. The natural topography surrounding the proposed reservoir shall be left intact as much as is feasible, such that runoff to the surrounding landscape is minimized.

Osprey:
No Osprey have been detected within the THP area. If Osprey are observed actively nesting in the THP area during the period of March 1 to August 1, halt operations within 150 feet of the suspected nest site and notify the RPF. Operations within 150 feet shall not commence until appropriate measures have been taken by the Plan Submitter and approved by the Department.

Great Blue Heron:
No rookeries are known to exist in the THP area. If Herons are noted nesting in the THP area during the period of March 15 to July 15, halt operations within 150 feet of the suspected nesting site and notify the Plan Submitter. If five or more nests are noted in close proximity to one another halt all operations within 300 feet of the suspected nesting site and notify the Plan Submitter. Do not recommence operations until appropriate measures have been taken by the Plan Submitter and approved by the Department.

Bald Eagle and Peregrine Falcon:
These species are not known to occur in the THP area. If one of these species is found to be nesting in the THP area, halt operations within 372 feet of the suspected nesting site and notify the Plan Submitter. Do not recommence operations until appropriate measures have been taken by the Plan Submitter and approved by the Department.

Golden Eagle:
This species is not known to occur in the THP area. If this species is found to be nesting in the THP area halt operations, within 333 feet of the suspected nesting site and notify the Plan Submitter. Do not recommence operations until appropriate measures have been taken by the Plan Submitter and approved by the Department.

Great Egret:
No Great Egret rookeries are known to exist in the THP area. If Egrets are noted nesting in the THP area during the period of March 15 to July 15, halt operations within 150 feet of the suspected nesting site and notify the Plan Submitter. If 5 or more nests are noted in close proximity to one another, halt operations within 300 feet of the suspected nesting site and notify the Plan Submitter. Do not recommence operations until appropriate measures have been taken by the Plan Submitter and approved by the Department.

Northern Goshawk:
This species is not known to occur in the THP area. If this species is found to be nesting in the THP area halt operations, within 263 feet of the suspected nesting site and notify the Plan Submitter. Do not recommence operations until appropriate measures have been taken by the Plan Submitter and approved by the Department.

Note to LTO: When/if an occupied site of a listed bird species is discovered during timber operations, you are also required to notify, in addition to the Plan Submitter, those parties listed in 14 CCR 919.2(d).

Additional Note to LTO: When/if a nest of a bird species is discovered during timber operations and you know that it is not one of the above species, but are unsure if it is a potential unlisted raptor nest:

- **Immediately protect the nest from damage that may result from timber operations.**
- **Immediately contact the Plan Submitter.**

Note to Review Staff: The distances noted in the above instructions are arrived at by taking the minimum sized buffer zone, which would apply to the appropriate species (with the exception of Osprey, which has no minimum buffer), and determining the radius of a circle with that same area.

Pacific Fisher:
The Pacific Fisher is currently under review for listing as a candidate species by CDFW. Fisher may generally be associated with either late-successional forests or second growth forests containing late-successional structural elements such as high densities of large conifer (esp. Douglas-fir) and hardwood, snags, deformed trees, large woody debris, high canopy closure, etc. Fisher use cavities in large diameter trees and snags for natal and maternal dens and more rarely, downed logs and brush piles. For resting sites fisher will also use large limbs (platforms), tree cavities, rock piles, and sub-nivean cavities. The fisher is an opportunistic hunter and feeds on a variety of vertebrates, including birds, rabbits, and rodents, including wood rats. Given the rural residential nature of the project setting use of this area for habitation by the Pacific Fisher is highly unlikely however the following will apply should a Pacific Fisher be sighted.

❖ If a fisher is sighted in the harvest unit during timber operations, all vegetation disturbing activities will be suspended within that unit and the RPF will be notified. If a den or habitation of a fisher is discovered, all operations (per PRC Section 4527) will additionally be suspended within a 375-foot radius buffer around the den or habitation. The Department of Fish and Wildlife and Department of Forestry and Fire Protection will then be immediately notified. After consultation, a minor amendment to the THP reflecting the protections agreed upon by the Plan submitter and the Department of Fish and Wildlife shall be filed with the Director of the Department of Forestry and Fire Protection.

33. [X] 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.**

All snags will be removed from the project area in order to prepare the site for reservoir construction.

34. [ ] Yes [X] 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 [X] No **Are any other provisions for wildlife protection required by the rules? If yes, describe.**

36. **a. [X] Yes [ ] No Has an archaeological survey been made of the THP area?**
b. [X] Yes [ ] No Has an archaeological records check been conducted for the THP area?
c. [ ] Yes [X] 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.

If any person excavating or otherwise disturbing the earth discovers any archaeological site during project construction, the following actions shall be taken:

1) cease and desist from all further excavation and disturbances within 25 feet of the discovery;
2) notify the Fort Bragg Public Works Department and CalFire within 24 hours of discovery; and
3) retain a professional archaeologist to determine appropriate actions in consultation with stakeholders.

37. [ ] Yes [X] 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 which are not listed elsewhere in Section II.**

- (914.5(b)) Non-biodegradable refuse, litter, trash and debris resulting from timber operations and other activity in connection with the operations shall be disposed of concurrently with the conduct of timber operations.
- Prior to felling the faller shall examine the canopy of the tree for active nests. If a probable nest is encountered, the faller shall cease operations and contact the RPF. The RPF shall determine whether the nest is active and the species of the occupant. If the nest is determined to be active, the RPF shall implement measures to protect the nest tree, screening trees, perch trees, and replacement trees and immediately notify the Department of fish and Game and CDF if an a nest occupied by a listed species is located.
- Flagging code as follows:
  THP Boundary Pink with black lettering

The City of Fort Bragg will take the following additional measures, as specified in their Mitigated Negative Declaration, to minimize the potential for inadvertently causing other adverse impacts to various resources as a result of project related activities.

Mitigation Measure 1: Native, drought resistant trees and shrubs shall be retained per the discretion of the Licensed Timber Operator, or planted 10 feet apart (at least one every 100 square feet, after the conversion) along the entire west side of the reservoir within the 10 foot wide visual buffer area between the proposed berm and the western property boundary. At least half of the native vegetation shall be of a species which is expected to reach a height of at least 20 feet at maturity.

Mitigation Measure 2: Dust Abatement (See THP Section II, Item 18)

Mitigation Measure 3: The City shall secure all necessary permits for the proposed development from City, County, State and Federal agencies having jurisdiction. All plans submitted with required permit applications shall be consistent with this analysis.

Mitigation Measure 4: Pygmy Cypress (See THP Section II Item 32 and THP Section V "*Summers Lane Reservoir Pygmy Cypress Mitigation Planting Area and Plan*")

Mitigation Measure 5: Potential Impacts to Wetlands and Other Waters (See THP Section II Item 18)

Mitigation Measure 6: Impacts from Invasive Species Caused by the Project. (See THP Section II Item 32)

Mitigation Measure 7: Disturbance to Wildlife Species (See THP Section II Item 32)

Mitigation Measure 8: Archaeological Resources (See THP Section II Item 36)

Mitigation Measure 9: Site grading associated with the construction of the reservoir shall conform to the recommendations outlined in the Holdrege & Kull report, Summer's Lane Reservoir, Fort Bragg, California, Geotechnical Investigation Report, dated October 2, 2009 (Project #70315-01), Section 8, Earthwork Grading Recommendations, which is included as Attachment 5 of the SUMMERS LANE RESERVOIR Grading Permit (GP) 2013-08.

Mitigation Measure 10: Construction of the reservoir shall conform to the recommendations outlined in the Holdrege & Kull report, Summer's Lane Reservoir, Fort Bragg, California, Geotechnical Investigation Report, dated October 2, 2009 (Project #70315-01), including the requirement that any rigid structures that are constructed across the toe of the earthen levee slopes shall have articulated connections that can accommodate up to at least 25 inches of displacement.

Mitigation Measure 11: Any topsoil or other soil materials excavated to accommodate the reservoir and not used onsite shall be temporarily stored on the property until such time as the materials can be used locally for City projects. Any topsoil or other soil materials excavated to accommodate the reservoir and not used onsite shall be temporarily stored on the property until such time as the materials can be used locally for City projects. This measure is specified as a GHG reducing mitigation recognizing locally produced products are likely to have a lower carbon foot print than products which are consumed or utilized at greater distances from their source points.

Mitigation Measure 12: To the extent feasible gasoline and oil conservation measures shall be incorporated into the project. Heavy equipment used at the project site shall be in good working condition and inspected regularly. Equipment shall be turned off immediately when not in use unless warm-up of equipment would use more gas than leaving equipment running.

Mitigation Measure 13: Any chipped wood not utilized on site shall be temporarily stored on the property until such time as it can be used locally for other City projects, or used for fuel either locally or at a nearby (Scotia or Eureka) cogeneration plant.

Mitigation Measure 14: The Storm Water Pollution Prevention Plan shall include measures for prevention of gasoline, oil and lubricant spills, and an action plan for clean-up of any accidental fluids or other contaminants spilled or encountered during conversion and construction activities.

Mitigation Measure 15: Should the public be allowed to cut firewood on the property after timber harvest is complete, a full sized shovel shall be visible in each vehicle accessing the property, to be used to cover any fire with dirt. A fire truck or water truck shall be kept at the site during firewood removal activities, and at least one person shall be assigned at the site to oversee firewood cutting efforts and operate water equipment if needed.

Mitigation Measure 16: If burning of vegetation is required for removal, permission shall be obtained from the Fort Bragg Fire Department prior to burning, and all safety measures required by the Fort Bragg Fire Department shall be adhered to in order to minimize wildfire risk.

Mitigation Measure 17: On a regular basis, the valves will be inspected to ensure functionality and the low flow spillway will be inspected for clogging. As feasible, the reservoir shall be maintained, in fair weather when water quality is clear, such that water is constantly flowing to prevent stagnation.

Mitigation Measure 18: **All timber harvest activities and reservoir construction activities shall occur between the hours of 8:00am and 5:00pm during weekdays.**

Mitigation Measure 19: Prior to initiation of project construction, the City shall meet with a representative of County Department of Transportation, and assess and record the current surface conditions of the county maintained portion of Summer's Lane. Prior to completion of the project, any damage caused by the project to the County road shall be repaired to a condition equaling or exceeding the condition of the County road prior to the project.

The THP boundary shall be identified by the RPF or his designee with pink "Timber Harvest Boundary" flagging prior to the commencement of timber operations.

- Pursuant to 14 CCR 1100.3(a) the timberland conversion permit (see pages 23.1-23.2) shall be recorded with the County prior to timber operations.

1035.4 Notification of Commencement of Operations

Each calendar year, within fifteen days before, and not later than the day of the start up of a timber operation, the Timber Harvesting Plan Submitter unless the THP identifies another person as responsible, shall notify CDF of the start of timber operations. The notification, by telephone or by mail, shall be directed to the appropriate CDF Ranger Unit Headquarters, Forest Practice Inspector, or other designated personnel.

The LTO will be responsible for making the required notification per 14CCR1035.4. Notification can be made by any of the following methods: Telephone to MEU @(707) 459-7440; Mail to MEU @ 17501 North Highway 101, Willits, CA 95490, Email the current office technician using the formula—First Name.Last Name@fire.ca.gov

Conditions stated in Section V of the THP which pertain to NCRWQCB waste discharge requirements will not be enforced by the Department unless those same conditions are subject to the Forest Practice Act/Rules and included as enforceable provisions in Section II of the THP.

DIRECTOR OF FORESTRY AND FIRE PROTECTION

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

By: _____ 12/22/14
(Signature) (Date)

Leslie A. Markham — County Chief
(Printed Name) (Title)

PROFESSIONAL FORESTER
Leslie A. Markham
No. 2529
STATE OF CALIFORNIA

PART OF PLAN

RECEIVED
JAN 03 2014
COAST AREA OFFICE
RESOURCE MANAGEMENT

DEPARTMENT OF FORESTRY AND FIRE PROTECTION
P.O. Box 944246
SACRAMENTO, CA 94244-2460
(916) 653-7772
Website: www.fire.ca.gov

December 18, 2014

Ms. Marie Jones
City of Fort Bragg
416 North Franklin Street
Fort Bragg, CA 95437

Re: Summers Lane Reservoir

Dear Ms. Jones:

Enclosed is the approved Timberland Conversion Permit (TCP) Number 610 for the development of a new 45 acre-foot raw water reservoir with a maximum depth of 24 feet to cover approximately 6.5 acres for total of approximately 8 acres. Please record this TCP with the Mendocino County Recorder. After you have recorded the TCP, the original will be returned to this office by the County. *CAL FIRE* will then return the original recorded document to you for your records.

The TCP is not valid until recorded and expires on December 31, 2019, unless an extension is requested prior to that date. Please note that prior to conducting timber operations, the Department of Forestry and Fire Protection's approval of a Timber Harvesting Plan (THP) is required.

Sincerely,

William D Solinsky

William D. Solinsky, RPF No. 2297
Forester III, THP Administration
Forest Practice Program

Encl.

Cc. Keith Larkin, CAL FIRE Region Chief, Santa Rosa
Christopher Rowney, CAL FIRE Unit Chief, Mendocino Unit
Craig Pedersen, CAL FIRE Deputy Chief, Mendocino Unit
Lee Susan, Project RPF

STATE OF CALIFORNIA
DEPARTMENT OF FORESTRY AND FIRE PROTECTION
RM-56 (7/02)

RECORDING REQUESTED BY
AND WHEN RECORDED MAIL TO:

California Department of Forestry and Fire Protection
Forest Practice – Timberland Conversion
P.O. Box 944246
Sacramento, California 94244-2460

For Recorder's Use

TIMBERLAND CONVERSION PERMIT NO. 610

Forest District: Coast **Administrative Unit:** Mendocino Unit

Issued to: City of Fort Bragg
416 N. Franklin Street
Fort Bragg, CA 95437

This permit exempts the permittee from the stocking requirements of the Forest Practice Act and the related Board of Forestry & Fire Protection regulations (including the forest practice rules of the above named Forest District) to establish a non-timber growing use. All other requirements of the Forest Practice Act, and related rules and regulations shall apply. The exemption shall apply to the area described as follows, and shown in the application, consisting of approximately 17 acres of timberland.

Subdivisions	Sec.	Twp.	Rng.	B&M
Portion NW ¼, NW ¼	16	18 North	17 West	Mount Diablo

Assessor Parcel Number(s): 019-070-13

Conditions:
1) This permit is issued in accordance with Public Resources Code, §4621-4628, and the Board of Forestry Regulations. The practices set forth in the applicant's conversion plan are hereby made a part of the conditions under which this permit is valid for the period shown on the permit.
2) This permit may be voluntarily terminated by the holder(s) by completing and signing the reverse side and sending it to the Director at Sacramento, California.
3) The Director may suspend or revoke this permit for misrepresentation of the facts in the application or conversion plan, for failure to conform with the provisions of the conversion plan (including conditions set through environmental review) or if significant work has not been accomplished in accord with the conversion plan within 18 months of approval.
4) The privilege granted to the holder of this permit is subject to the additional conditions shown, and is nontransferable for any purpose without written approval of the Director.

Additional Conditions:
1) ***The permittee shall comply with all applicable City, County, State and Federal codes, ordinances or other regulations and shall obtain all necessary approvals.***
2) ***The permittee shall obtain the Director's approval of a Timber Harvesting Plan prior to commencing timber operation for conversion purposes.***
3) ***The Timber Harvesting Plan shall be consistent with the final environmental document prepared by the lead agency.***

This permit shall be valid from the date recorded with the Mendocino County Recorder, and **shall expire on December 31, 2019** unless renewed before the expiration date.

Duane Shintaku 12/19/14

Duane Shintaku, Deputy Director **Date**
California Department of Forestry
and Fire Protection

State of California
County of Sacramento

On 12-19-14 before me, L. Cano Notary Public, personally appeared Duane Shintaku who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) **is/are** subscribed to the within instrument and acknowledged to me that **he/she/they** executed the same in **his/her/their** authorized capacity(ies), and that by **his/her/their** signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

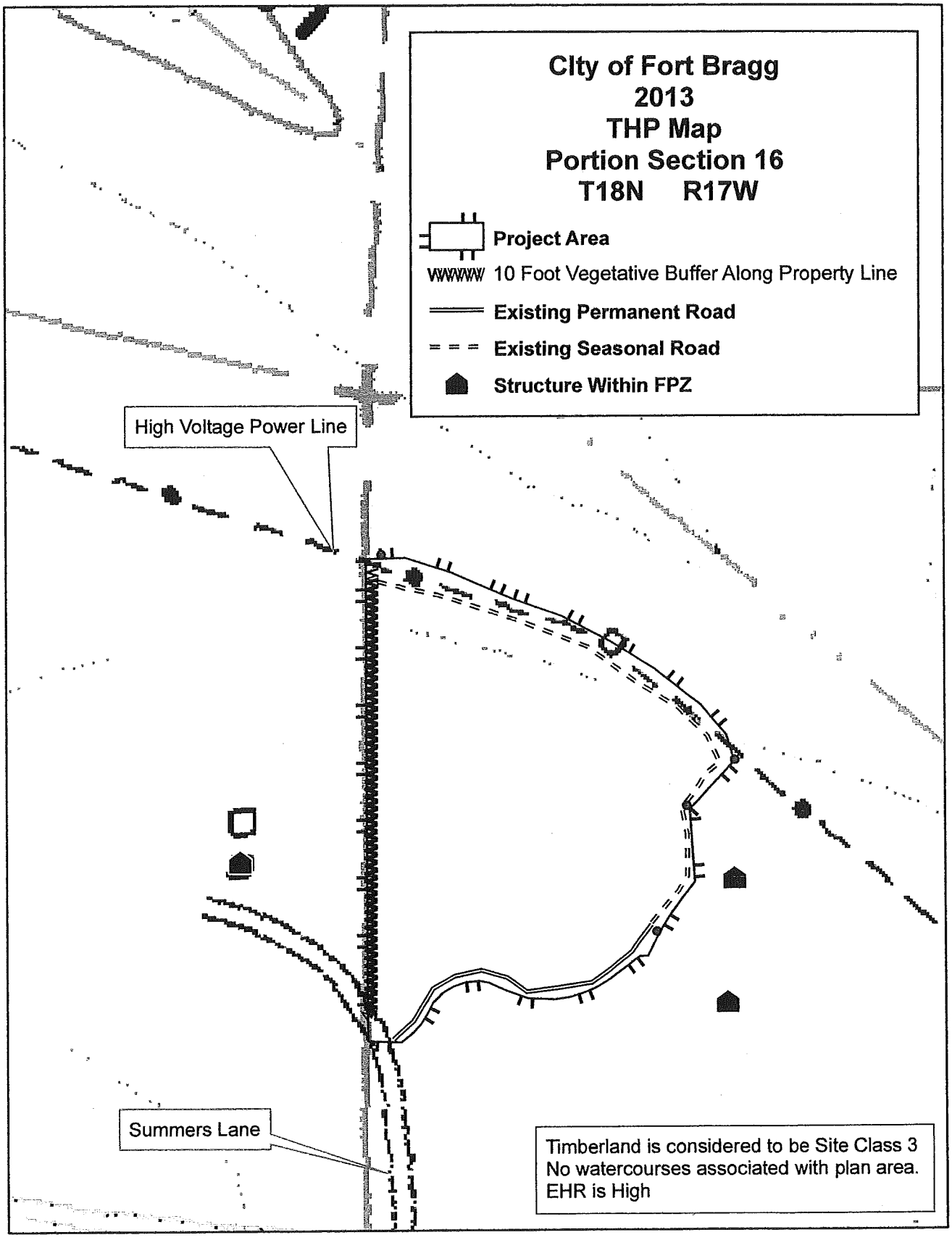
I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

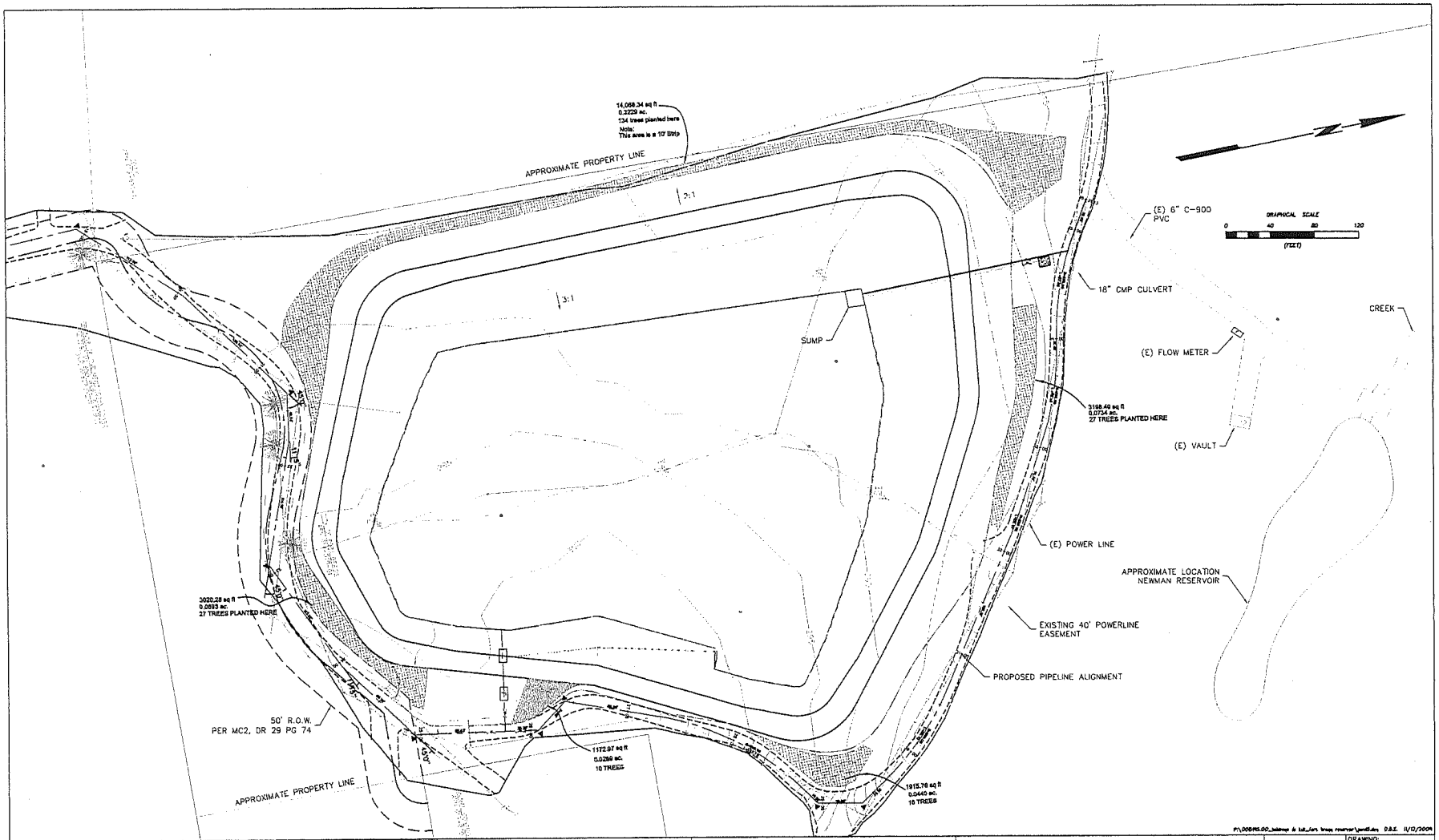
WITNESS my hand and official seal:

Signature L. Cano

L. CANO
Commission # 2027848
Notary Public - California
Sacramento County
My Comm. Expires Jun 7, 2017

RECEIVED
DEC 19 2014
COAST AREA OFFICE
RESOURCE MANAGEMENT


Clty of Fort Bragg
2013
THP Map
Portion Section 16
T18N R17W
Project Area
10 Foot Vegetative Buffer Along Property Line
Existing Permanent Road
Existing Seasonal Road
Structure Within FPZ
High Voltage Power Line
Summers Lane
Timberland is considered to be Site Class 3
No watercourses associated with plan area.
EHR is High
N
1:3,000



NO.	DATE	REVISIONS	BY	CHK

DRAWN BY: | PROJECT NO:
ENGINEER: | SCALE:
CHECKED BY: | APPROVED BY:
DATE: | DATE:

LEGEND:

REPRESENTS 100 SQ FT AREA FOR PYGMY CYPRESS TREE AND AREA DEDICATED FOR RE-POPULATION.

PROPOSED SUMMER'S LANE RESERVOIR

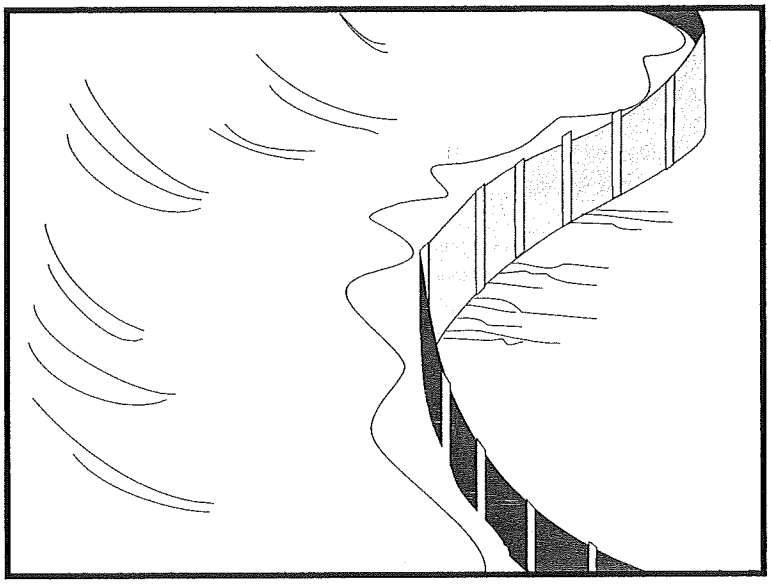
FOR THE CITY OF FORT BRAGG
416 N. FRANKLIN STREET
FORT BRAGG, CA. 95410

PYGMY CYPRESS TREE
RE-POPULATION

DRAWING:
SHEET: 1 OF 1
REVISION NO:
DATE: 11/18/09

Silt Fence

SE-1



Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Category**

☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

SE-10 Storm Drain Inlet Protection

SE-14 Biofilter Bags

Description and Purpose

A silt fence is made of a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They could also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion and around inlets within disturbed areas (SE-10). Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows. Silt fences are most effective when used in combination with erosion controls. Suitable applications include:

- Along the perimeter of a project.
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Around inlets.
- Below other small cleared areas.

CASQA
CALIFORNIA STORMWATER

Limitations

- Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.
- Do not use in locations where ponded water may cause a flooding hazard. Runoff typically ponds temporarily on the upstream side of silt fence.
- Do not use silt fence to divert water flows or place across any contour line. Fences not constructed on a level contour, or fences used to divert flow will concentrate flows resulting in additional erosion and possibly overtopping or failure of the silt fence.
- Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.
- Not effective unless trenched and keyed in.
- Not intended for use as mid-slope protection on slopes greater than 4:1 (H:V).
- Do not use on slopes subject to creeping, slumping, or landslides.

Implementation

General

A silt fence is a temporary sediment barrier consisting of woven geotextile stretched across and attached to supporting posts, trenched-in, and, depending upon the strength of fabric used, supported with plastic or wire mesh fence. Silt fences trap sediment by intercepting and detaining small amounts of sediment-laden runoff from disturbed areas in order to promote sedimentation behind the fence.

The following layout and installation guidance can improve performance and should be followed:

- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 ft at any point along the silt fence.
- The maximum length of slope draining to any point along the silt fence should be 200 ft or less.
- The maximum slope perpendicular to the fence line should be 1:1.
- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 ft^2 of ponding area should be provided for every acre draining to the fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where feasible.

- Silt fences should remain in place until the disturbed area is permanently stabilized, after which, the silt fence should be removed and properly disposed.
- Silt fence should be used in combination with erosion source controls up slope in order to provide the most effective sediment control.
- Be aware of local regulations regarding the type and installation requirements of silt fence, which may differ from those presented in this fact sheet.

Design and Layout

The fence should be supported by a plastic or wire mesh if the fabric selected does not have sufficient strength and bursting strength characteristics for the planned application (as recommended by the fabric manufacturer). Woven geotextile material should contain ultraviolet inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 °F to 120 °F.

- Layout in accordance with attached figures.
- For slopes steeper than 2:1 (H:V) and that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to install additional protection immediately adjacent to the bottom of the slope, prior to installing silt fence. Additional protection may be a chain link fence or a cable fence.
- For slopes adjacent to sensitive receiving waters or Environmentally Sensitive Areas (ESAs), silt fence should be used in conjunction with erosion control BMPs.

Standard vs. Heavy Duty Silt Fence

Standard Silt Fence

- Generally applicable in cases where the slope of area draining to the silt fence is 4:1 (H:V) or less.
- Used for shorter durations, typically 5 months or less
- Area draining to fence produces moderate sediment loads.

Heavy Duty Silt Fence

- Use is generally limited to 8 months or less.
- Area draining to fence produces moderate sediment loads.
- Heavy duty silt fence usually has 1 or more of the following characteristics, not possessed by standard silt fence.
  - Fence fabric has higher tensile strength.
  - Fabric is reinforced with wire backing or additional support.
  - Posts are spaced closer than pre-manufactured, standard silt fence products.
  - Posts are metal (steel or aluminum)

Materials

Standard Silt Fence

- Silt fence material should be woven geotextile with a minimum width of 36 in. and a minimum tensile strength of 100 lb force. The fabric should conform to the requirements in ASTM designation D4632 and should have an integral reinforcement layer. The

reinforcement layer should be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric should be between 0.1 sec^{-1} and 0.15 sec^{-1} in conformance with the requirements in ASTM designation D4491.

- Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.

- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15 gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.

Heavy-Duty Silt Fence

- Some silt fence has a wire backing to provide additional support, and there are products that may use prefabricated plastic holders for the silt fence and use metal posts or bar reinforcement instead of wood stakes. If bar reinforcement is used in lieu of wood stakes, use number four or greater bar. Provide end protection for any exposed bar reinforcement for health and safety purposes.

Installation Guidelines – Traditional Method

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line of the proposed silt fence (trenches should not be excavated wider or deeper than necessary for proper silt fence installation).

- Bottom of the silt fence should be keyed-in a minimum of 12 in.

- Posts should be spaced a maximum of 6 ft apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.

- When standard strength geotextile is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy–duty wire staples at least 1 in. long. The mesh should extend into the trench.

- When extra-strength geotextile and closer post spacing are used, the mesh support fence may be eliminated.

- Woven geotextile should be purchased in a long roll, then cut to the length of the barrier. When joints are necessary, geotextile should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.

- The trench should be backfilled with native material and compacted.

- Construct silt fences with a setback of at least 3 ft from the toe of a slope. Where, due to specific site conditions, a 3 ft setback is not available, the silt fence may be constructed at the

toe of the slope, but should be constructed as far from the toe of the slope as practicable. Silt fences close to the toe of the slope will be less effective and more difficult to maintain.

- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case should the reach exceed 500 ft.
- Cross barriers should be a minimum of $^1/_3$ and a maximum of ½ the height of the linear barrier.
- See typical installation details at the end of this fact sheet.

Installation Guidelines - Static Slicing Method

- Static Slicing is defined as insertion of a narrow blade pulled behind a tractor, similar to a plow blade, at least 10 inches into the soil while at the same time pulling silt geotextile fabric into the ground through the opening created by the blade to the depth of the blade. Once the gerotextile is installed, the soil is compacted using tractor tires.
- This method will not work with pre-fabricated, wire backed silt fence.
- Benefits:
    - Ease of installation (most often done with a 2 person crew). In addition, installation using static slicing has been found to be more efficient on slopes, in rocky soils, and in saturated soils.
    - Minimal soil disturbance.
    - Greater level of compaction along fence, leading to higher performance (i.e. greater sediment retention).
    - Uniform installation.
    - Less susceptible to undercutting/undermining.

Costs

- It should be noted that costs vary greatly across regions due to available supplies and labor costs.
- Average annual cost for installation using the traditional silt fence installation method (assumes 6 month useful life) is $7 per linear foot based on vendor research. Range of cost is $3.50 - $9.10 per linear foot.
- In tests, the slicing method required 0.33 man hours per 100 linear feet, while the trenched based systems required as much as 1.01 man hours per linear foot.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair undercut silt fences.

- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed, and replaced with new silt fence barriers.
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- Silt fences should be left in place until the upstream area is permanently stabilized. Until then, the silt fence should be inspected and maintained regularly.
- Remove silt fence when upgradient areas are stabilized. Fill and compact post holes and anchor trench, remove sediment accumulation, grade fence alignment to blend with adjacent ground, and stabilize disturbed area.

References

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, United States Environmental Protection Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group-Working Paper, USEPA, April 1992.

Sedimentation and Erosion Control Practices, and Inventory of Current Practices (Draft), UESPA, 1990.

Southeastern Wisconsin Regional Planning Commission (SWRPC). Costs of Urban Nonpoint Source Water Pollution Control Measures. Technical Report No. 31. Southeastern Wisconsin Regional Planning Commission, Waukesha, WI. 1991

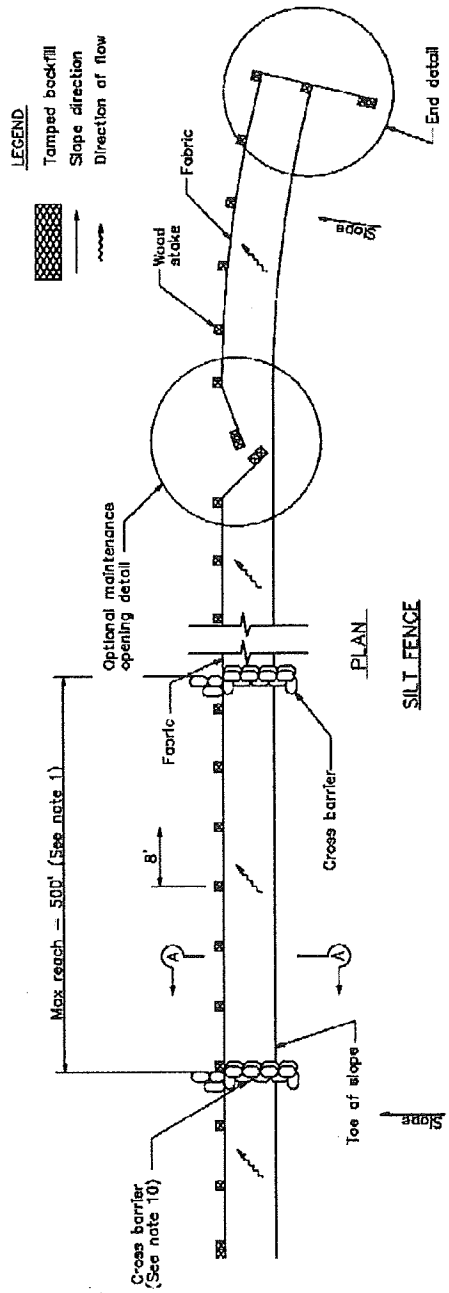
Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), March 2003.

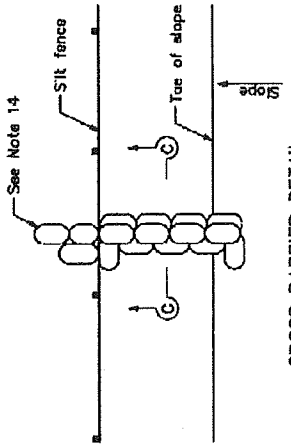
Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

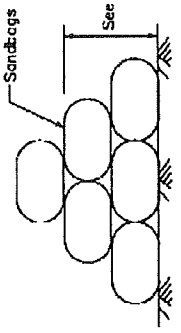
U.S. Environmental Protection Agency (USEPA). Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. U.S. Environmental Protection Agency, Office of Water, Washington, DC, 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.Soil Stabilization BMP Research for Erosion and Sediment Controls: Cost Survey Technical Memorandum, State of California Department of Transportation (Caltrans), July 2007.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

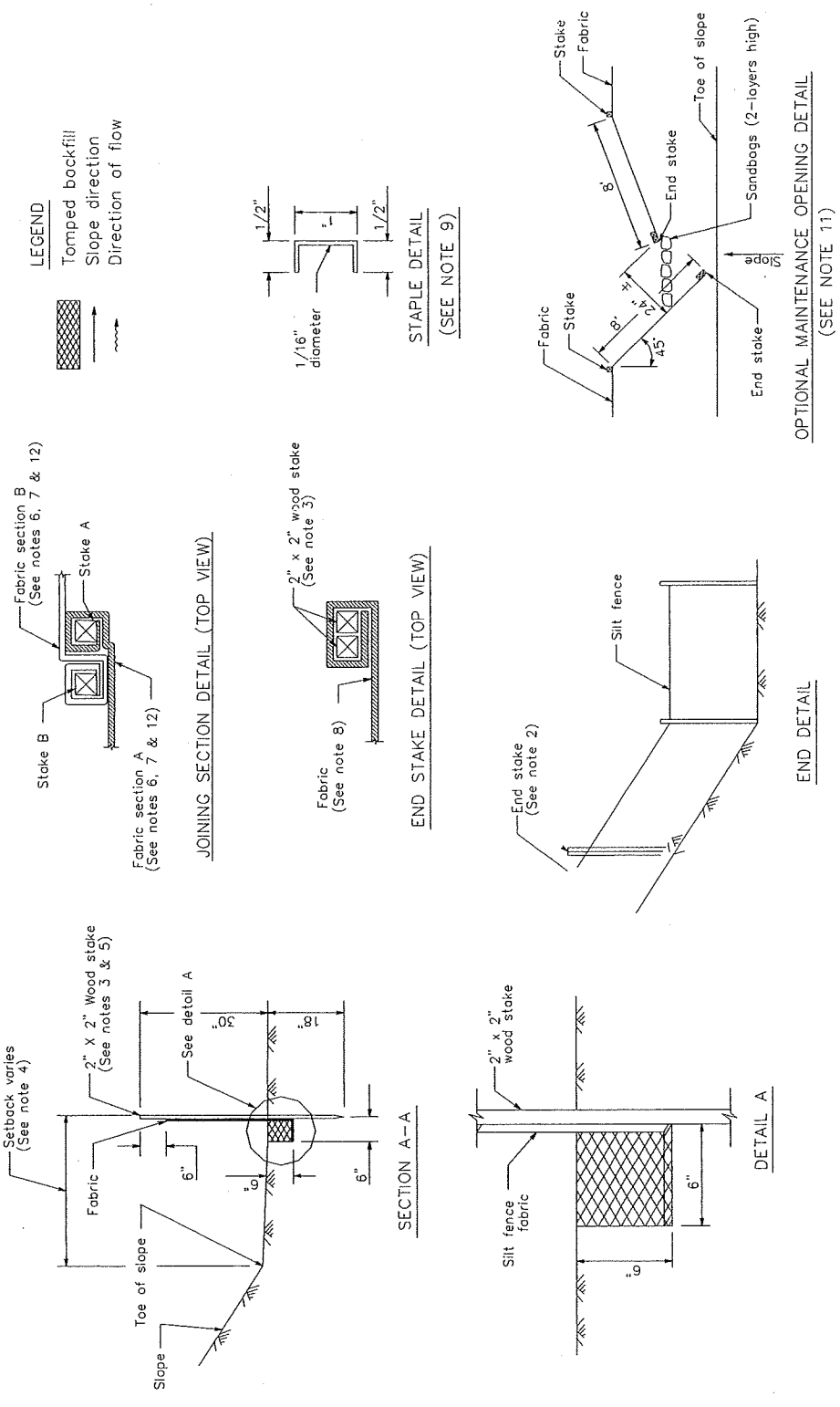




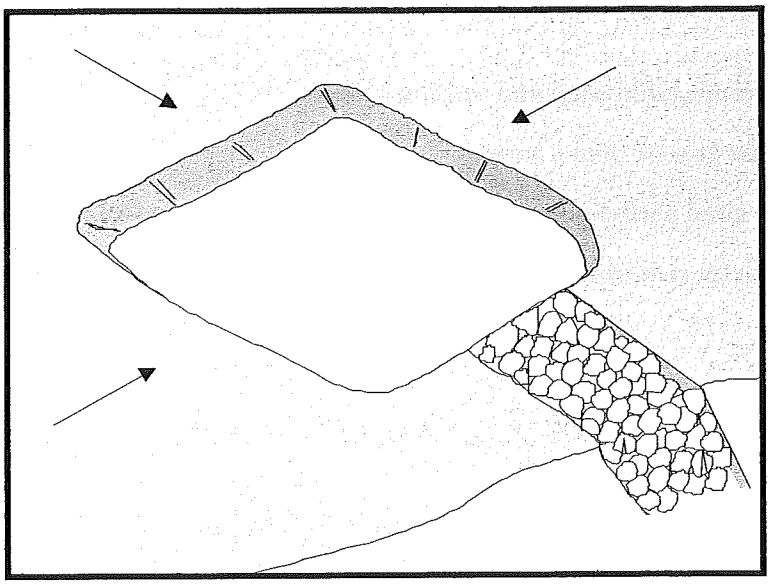


NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the linear barrier, in no case shall the reach length exceed 500'.
2. The last 8'-0" of fence shall be turned up slope.
3. Stake dimensions are nominal.
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 8'-0" maximum and shall be positioned on downstream side of fence.
6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
7. Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire.
8. For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.
9. Minimum 4 staples per stake. Dimensions shown are typical.
10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.
14. Add 3-4 bags to cross barrier on downgradient side of silt fence as needed to prevent bypass or undermining and as allowable based on site limits of disturbance.


LEGEND
Tamped backfill
Slope direction
Direction of flow
1/2"
1/16" diameter
1/2"
STAPLE DETAIL
(SEE NOTE 9)
Stake
Fabric
8'
End stake
Toe of slope
Sandbags (2-layers high)
Fabric
Stake
8'
4'
4'
45°
Slope
End stake
OPTIONAL MAINTENANCE OPENING DETAIL
(SEE NOTE 11)
Fabric section B
(See notes 6, 7 & 12)
Stake A
Stake B
Fabric section A
(See notes 6, 7 & 12)
JOINING SECTION DETAIL (TOP VIEW)
2" x 2" wood stake
(See note 3)
Fabric
(See note 8)
END STAKE DETAIL (TOP VIEW)
Silt fence
End stake
(See note 2)
END DETAIL
Setback varies
(See note 4)
2" X 2" Wood stake
(See notes 3 & 5)
See detail A
30"
18"
Fabric
6"
6"
6"
Toe of slope
Slope
SECTION A-A
2" x 2"
wood stake
Silt fence
fabric
6"
6"
DETAIL A

Sediment Trap SE-3



Description and Purpose

A sediment trap is a containment area where sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out or before the runoff is discharged. Sediment traps are formed by excavating or constructing an earthen embankment across a waterway or low drainage area.

Suitable Applications

Sediment traps should be considered for use:

- At the perimeter of the site at locations where sediment-laden runoff is discharged offsite.
- At multiple locations within the project site where sediment control is needed.
- Around or upslope from storm drain inlet protection measures.
- Sediment traps may be used on construction projects where the drainage area is less than 5 acres. Traps would be placed where sediment-laden stormwater may enter a storm drain or watercourse. SE-2, Sediment Basins, must be used for drainage areas greater than 5 acres.
- As a supplemental control, sediment traps provide additional protection for a water body or for reducing sediment before it enters a drainage system.

Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-2 Sediment Basin (for larger areas)

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Limitations

- Requires large surface areas to permit infiltration and settling of sediment.
- Not appropriate for drainage areas greater than 5 acres.
- Only removes large and medium sized particles and requires upstream erosion control.
- Attractive and dangerous to children, requiring protective fencing.
- Conducive to vector production.
- Should not be located in live streams.

Implementation

Design

A sediment trap is a small temporary ponding area, usually with a gravel outlet, formed by excavation or by construction of an earthen embankment. Its purpose is to collect and store sediment from sites cleared or graded during construction. It is intended for use on small drainage areas with no unusual drainage features and projected for a quick build-out time. It should help in removing coarse sediment from runoff. The trap is a temporary measure with a design life of approximately six months to one year and is to be maintained until the site area is permanently protected against erosion by vegetation and/or structures.

Sediment traps should be used only for small drainage areas. If the contributing drainage area is greater than 5 acres, refer to SE-2, Sediment Basins, or subdivide the catchment area into smaller drainage basins.

Sediment usually must be removed from the trap after each rainfall event. The SWPPP should detail how this sediment is to be disposed of, such as in fill areas onsite, or removal to an approved offsite dump. Sediment traps used as perimeter controls should be installed before any land disturbance takes place in the drainage area.

Sediment traps are usually small enough that a failure of the structure would not result in a loss of life, damage to home or buildings, or interruption in the use of public roads or utilities. However, sediment traps are attractive to children and can be dangerous. The following recommendations should be implemented to reduce risks:

- Install continuous fencing around the sediment trap or pond. Consult local ordinances regarding requirements for maintaining health and safety.
- Restrict basin side slopes to 3:1 or flatter.

Sediment trap size depends on the type of soil, size of the drainage area, and desired sediment removal efficiency (see SE-2, Sediment Basin). As a rule of thumb, the larger the basin volume the greater the sediment removal efficiency. Sizing criteria are typically established under the local grading ordinance or equivalent. The runoff volume from a 2-year storm is a common design criteria for a sediment trap. The sizing criteria below assume that this runoff volume is 0.042 acre-ft/acre (0.5 in. of runoff). While the climatic, topographic, and soil type extremes make it difficult to establish a statewide standard, the following criteria should trap moderate to high amounts of sediment in most areas of California:

- Locate sediment traps as near as practical to areas producing the sediment.
- Trap should be situated according to the following criteria: (1) by excavating a suitable area or where a low embankment can be constructed across a swale, (2) where failure would not cause loss of life or property damage, and (3) to provide access for maintenance, including sediment removal and sediment stockpiling in a protected area.
- Trap should be sized to accommodate a settling zone and sediment storage zone with recommended minimum volumes of 67 yd^3/acre and 33 yd^3/acre of contributing drainage area, respectively, based on 0.5 in. of runoff volume over a 24-hour period. In many cases, the size of an individual trap is limited by available space. Multiple traps or additional volume may be required to accommodate specific rainfall, soil, and site conditions.
- Traps with an impounding levee greater than 4.5 ft tall, measured from the lowest point to the impounding area to the highest point of the levee, and traps capable of impounding more than 35,000 ft^3, should be designed by a Registered Civil Engineer. The design should include maintenance requirements, including sediment and vegetation removal, to ensure continuous function of the trap outlet and bypass structures.
- The outlet pipe or open spillway must be designed to convey anticipated peak flows.
- Use rock or vegetation to protect the trap outlets against erosion.
- Fencing should be provided to prevent unauthorized entry.

Installation

Sediment traps can be constructed by excavating a depression in the ground or creating an impoundment with a small embankment. Sediment traps should be installed outside the area being graded and should be built prior to the start of the grading activities or removal of vegetation. To minimize the area disturbed by them, sediment traps should be installed in natural depressions or in small swales or drainage ways. The following steps must be followed during installation:

- The area under the embankment must be cleared, grubbed, and stripped of any vegetation and root mat. The pool area should be cleared.
- The fill material for the embankment must be free of roots or other woody vegetation as well as oversized stones, rocks, organic material, or other objectionable material. The embankment may be compacted by traversing with equipment while it is being constructed.
- All cut-and-fill slopes should be 3:1 or flatter.
- When a riser is used, all pipe joints must be watertight.
- When a riser is used, at least the top two-thirds of the riser should be perforated with 0.5 in. diameter holes spaced 8 in. vertically and 10 to 12 in. horizontally. See SE-2, Sediment Basin.
- When an earth or stone outlet is used, the outlet crest elevation should be at least 1 ft below the top of the embankment.

- When crushed stone outlet is used, the crushed stone used in the outlet should meet AASHTO M43, size No. 2 or 24, or its equivalent such as MSHA No. 2. Gravel meeting the above gradation may be used if crushed stone is not available.

Costs

Average annual cost per installation and maintenance (18 month useful life) is $0.73 per ft^3 ($1,300 per drainage acre). Maintenance costs are approximately 20% of installation costs.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Inspect outlet area for erosion and stabilize if required.
- Inspect trap banks for seepage and structural soundness, repair as needed.
- Inspect outlet structure and spillway for any damage or obstructions. Repair damage and remove obstructions as needed.
- Inspect fencing for damage and repair as needed.
- Inspect the sediment trap for area of standing water during every visit. Corrective measures should be taken if the BMP does not dewater completely in 72 hours or less to prevent vector production.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the trap capacity. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed of at an appropriate location.
- Remove vegetation from the sediment trap when first detected to prevent pools of standing water and subsequent vector production.
- BMPs that require dewatering shall be continuously attended while dewatering takes place. Dewatering BMPs shall be implemented at all times during dewatering activities.

References

Brown, W., and T. Schueler. The Economics of Stormwater BMPs in the Mid-Atlantic Region. Prepared for Chesapeake Research Consortium, Edgewater, MD, by the Center for Watershed Protection, Ellicott City, MD, 1997.

Draft – Sedimentation and Erosion Control, an Inventory of Current Practices, USEPA, April 1990.

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Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

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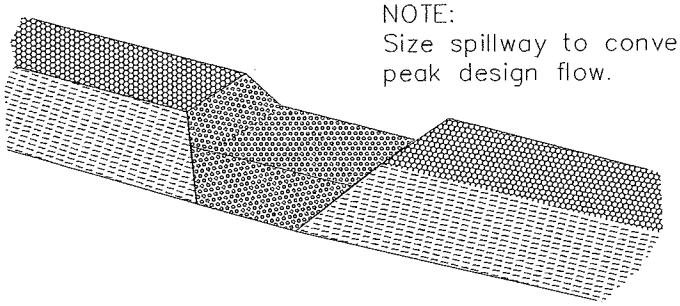
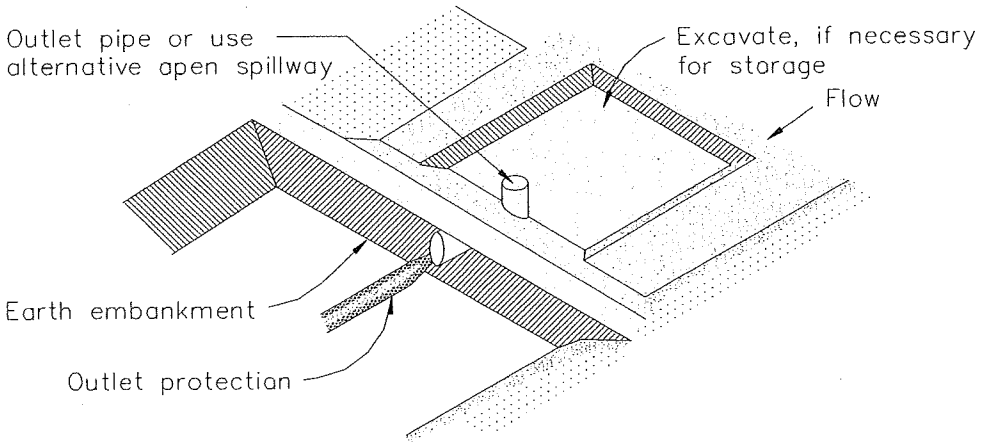
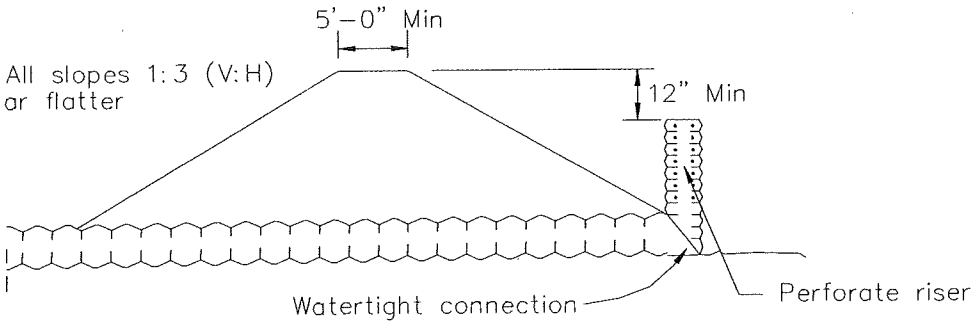


TYPICAL OPEN SPILLWAY

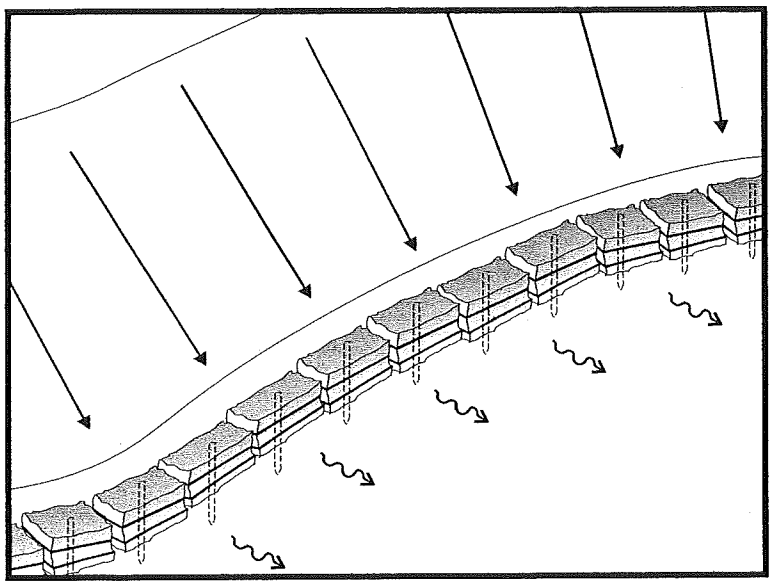




EMBANKMENT SECTION THRU RISER

TYPICAL SEDIMENT TRAP
NOT TO SCALE

Straw Bale Barrier SE-9



Description and Purpose

A straw bale barrier is a series of straw bales placed on a level contour to intercept sheet flows. Straw bale barriers pond sheet- flow runoff, allowing sediment to settle out.

Suitable Applications

Straw bale barriers may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow

Categories

EC	Erosion Control	☒
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

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- At the top of slopes to divert runoff away from disturbed slopes
- As check dams across mildly sloped construction roads

Limitations

Straw bale barriers:

- Are not to be used for extended periods of time because they tend to rot and fall apart
- Are suitable only for sheet flow on slopes of 10 % or flatter
- Are not appropriate for large drainage areas, limit to one acre or less
- May require constant maintenance due to rotting
- Are not recommended for concentrated flow, inlet protection, channel flow, and live streams
- Cannot be made of bale bindings of jute or cotton
- Require labor-intensive installation and maintenance
- Cannot be used on paved surfaces
- Should not to be used for drain inlet protection
- Should not be used on lined ditches
- May introduce undesirable non-native plants to the area

Implementation

General

A straw bale barrier consists of a row of straw bales placed on a level contour. When appropriately placed, a straw bale barrier intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding provides quiescent conditions allowing sediment to settle. Straw bale barriers also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets, which erode rills, and ultimately gullies, into disturbed, sloped soils.

Straw bale barriers have not been as effective as expected due to improper use. These barriers have been placed in streams and drainage ways where runoff volumes and velocities have caused the barriers to wash out. In addition, failure to stake and entrench the straw bale has allowed undercutting and end flow. Use of straw bale barriers in accordance with this BMP should produce acceptable results.

Design and Layout

- Locate straw bale barriers on a level contour.
  - Slopes up to 10:1 (H:V): Straw bales should be placed at a maximum interval of 50 ft (a closer spacing is more effective), with the first row near the toe of slope.
  - Slopes greater than 10:1 (H:V): Not recommended.

- Turn the ends of the straw bale barrier up slope to prevent runoff from going around the barrier.
- Allow sufficient space up slope from the barrier to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, consider moving the barrier away from the slope toe to facilitate cleaning. To prevent flow behind the barrier, sand bags can be placed perpendicular to the barrier to serve as cross barriers.
- Drainage area should not exceed 1 acre, or 0.25 acre per 100 ft of barrier.
- Maximum flow path to the barrier should be limited to 100 ft.
- Straw bale barriers should consist of two parallel rows.
  - Butt ends of bales tightly
  - Stagger butt joints between front and back row
  - Each row of bales must be trenched in and firmly staked
- Straw bale barriers are limited in height to one bale laid on its side.
- Anchor bales with either two wood stakes or four bars driven through the bale and into the soil. Drive the first stake towards the butt joint with the adjacent bale to force the bales together.
- See attached figure for installation details.

Materials

- ***Straw Bale Size:*** Each straw bale should be a minimum of 14 in. wide, 18 in. in height, 36 in. in length and should have a minimum mass of 50 lbs. The straw bale should be composed entirely of vegetative matter, except for the binding material.
- ***Bale Bindings:*** Bales should be bound by steel wire, nylon or polypropylene string placed horizontally. Jute and cotton binding should not be used. Baling wire should be a minimum diameter of 14 gauge. Nylon or polypropylene string should be approximately 12 gauge in diameter with a breaking strength of 80 lbs force.
- ***Stakes:*** Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable. Steel bar reinforcement should be equal to a #4 designation or greater. End protection should be provided for any exposed bar reinforcement.

Costs

Straw bales cost $5 - $7 each. Adequate labor should be budgeted for installation and maintenance.

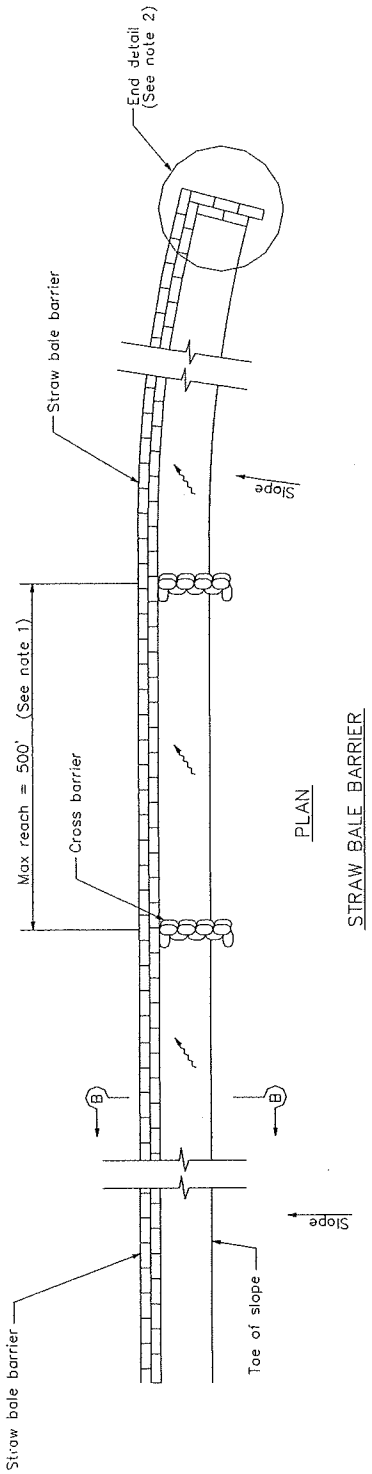
Inspection and Maintenance

Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Straw bales degrade, especially when exposed to moisture. Rotting bales will need to be replaced on a regular basis.
- Replace or repair damaged bales as needed.
- Repair washouts or other damages as needed.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Remove straw bales when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area. Removed sediment should be incorporated in the project or disposed of.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.



PLAN

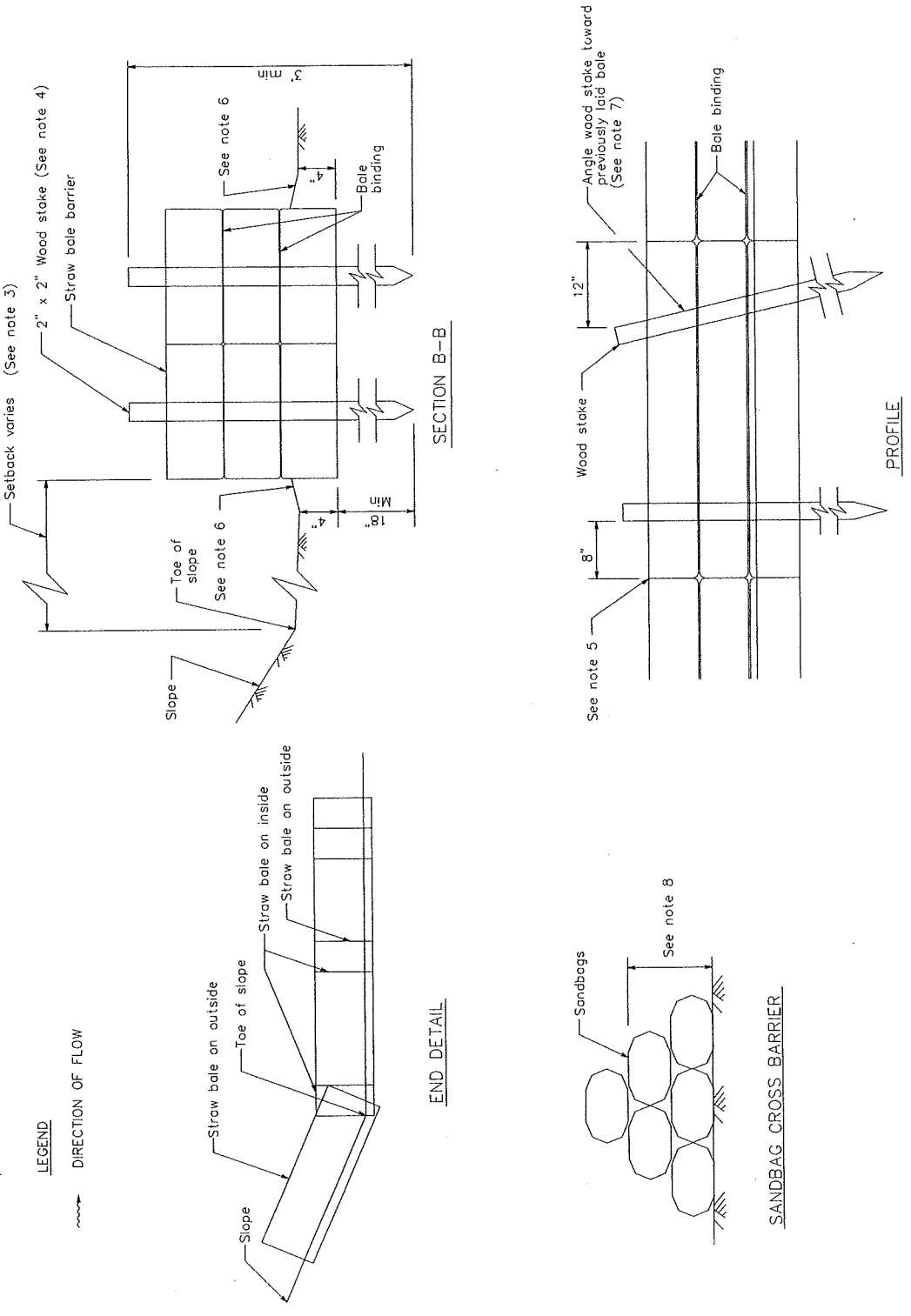
STRAW BALE BARRIER

LEGEND

DIRECTION OF FLOW

NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/2 the height of the linear barrier. In no case shall the reach length exceed 500'.
2. The end of barrier shall be turned up slope.
3. Dimension may vary to fit field condition.
4. Stake dimensions are nominal.
5. Place straw bales tightly together.
6. Tamp embedment spoils against sides of installed bales.
7. Drive angled wood stake before vertical stake to ensure tight abutment to adjacent bale.
8. Sandbag cross barriers should be a min of 1/2 and a max of 2/3 the height of the linear barrier.
9. Sandbag rows and layers should be offset to eliminate gaps.


Setback varies (See note 3)
2" x 2" Wood stake (See note 4)
Straw bale barrier
3' min
See note 6
4"
Bale binding
Min 18"
4"
Toe of slope
See note 6
Slope
SECTION B-B
Angle wood stake toward previously laid bale (See note 7)
Bale binding
12"
Wood stake
8"
See note 5
PROFILE
LEGEND
DIRECTION OF FLOW
Straw bale on outside
Straw bale on inside
Straw bale on outside
Toe of slope
Slope
END DETAIL
Sandbags
See note 8
SANDBAG CROSS BARRIER

Summers Lane Reservoir Pygmy Cypress Mitigation Planting Area and Plan

19701 Summers Lane Fort Bragg, CA 95437 APN 019-070-13

City of Fort Bragg

PART OF PLAN

BACKGROUND INFORMATION

PROJECT SUMMARY: The City of Fort Bragg plans to developa new 45 acre-feet raw water reservoir to store raw water from Waterfall Gulch to meetdrought-related water storage needs of the Fort Bragg water service area. In order to facilitate this development, approximately eight acres of second and third growth redwood dominated mixed coniferous forest would need to be cleared. The project area was most recently logged in 1993.

The project area was surveyed for protected and sensitive plant and animal species in 2008 and 2009 by Redwood Coast Associates and WRA, Inc. The project area was surveyed again in 2013 by Darcy Mahoney. Measures have been developed to avoid where possible, and otherwise minimize impacts to protected and sensitive plant and animal species as outlined in the Timber Harvest Plan and CEQA Mitigated Negative Declaration for the project. An estimated 72 pygmy cypress (*Hesperocyparis pygmaea*) trees are currently present in the project area, constituting approximately 1/7th of the canopy cover, and will need to be removed to accommodate the project. Because pygmy cypress is a rare tree that only occurs within Mendocino and Sonoma Counties, this mitigation and monitoring plan has been designed to assure that a sufficient number of pygmy cypress trees are replanted in the project area (3:1 ratio) that at least the number of trees that must be removed will eventually grow back and reach maturity within the project area.

BIOLOGICAL IMPORTANCE OF PLANTS TO BE IMPACTED: Pygmy cypress (*Hesperocyparis pygmaea)* is an evergreen perennial tree native to the pygmy forests of Mendocino and Northern Sonoma Counties, and is naturally found nowhere else in the world. The pygmy forest plant community is located on coastal terraces generally found from two to five miles east of the ocean. The soil on pygmy terraces is highly leached of nutrients and acidic. For this reason, vegetative growth is slow, causing stunting, and a limited number of plant species have adapted to and are present within this habitat type.

Pygmy cypress can and do grow outside of these nutrient poor, acidic conditions, and when they take root in nutrient rich soil they grow much taller than the cypress found within the pygmy forest. In more nutrient rich habitats, however, other tree species are able to outcompete pygmy cypress for sunlight, and they can become overshaded and eventually die out.

Pygmy cypress is not currently listed as a Federally Endangered Species or State Endangered Species, however it is listed by the California Native Plant Society as a 1B.2 species, which indicates that pygmy cypress is endemic to and considered fairly endangered in California.

The individuals found at the project site have taken root in the nutrient rich soils of the redwood dominated mixed coniferous forest. They are taller than the cypress found in the pygmy forest, and it is likely cleared areas resulting from during past logging efforts accommodated establishment within the project area.

PART OF PLAN

EXISTING CONDITIONS

The project area is typical of a marine terrace soil with a second growth redwood forest. Thisarea is adjacent to the Celeri & Sons Rhododendron Nursery, and was logged as recently as 1993. As a result, the stand here supports a relatively young age class with 90 percent of the stand at a diameter at breast height (DBH) of 24 inches or smaller. The forest stand supports redwood (*Sequoia sempervirens*), Douglas fir (*Pseudotsugamenziesii*), pygmy cypress, Bishop pine (*Pinusmuricata*), grand fir (*Abiesgrandis*), and tan oak (*Lithocarpusdensiflorus*). The project area is a forest edge area subject to the affect westerly winds. Vigor and health is declining in the Douglas fir, pygmy cypress, and Bishop pine trees. A number of trees have been blown over and it is anticipated that blow down will continue as some species decline and gap areas increase.

Pygmy cypress now occurs as a minor component of the forest canopy, composing approximately 10 percent of the total basal area of the project area. The diameter at breast height (DBH) ranges from seedlings (less than 1/4 inch) to 24 inches. Approximately 68 percent of the pygmy cypress trees in the project area have a DBH of 16 inches or smaller. Seedlings are sparse and restricted to canopy gaps along the roads.

In Blacklock or aboriginal soils pygmy cypress typically dominates the canopy but is limited in height to less than two meters, and is the climax community. However in deeper, well-drained soils, like those in the project area, pygmy cypress typically persists as a mid-successional species and is usually outcompeted by faster growing and taller conifers including redwood and Douglas fir.

Prior to logging, the area was likely dominated by redwood and Douglas fir and supported an occasional pygmy cypress in gaps created from natural processes. Over time the shade-intolerant cypress species likely declined until another gap or disturbance provided an opportunity for germination or release of suppressed seedlings and saplings. Logging activities and roadbuilding created gaps in the canopy and disturbance to the understory and soils. Species such as pygmy cypress benefited from the disturbance and germination of these species was likely stimulated by opening of the canopy.

The shade-intolerant pioneer species pygmy cypress and Bishoppine are declining in both the overstory and understory. Absent disturbance, shade-tolerant species will outcompete the pioneer components of the stand over time.

PLANTING AND MONITORING PLAN

The proposed reservoir project will permanently remove approximately 72 special status pygmy cypress trees with an average diameter at breast height (DBH) of 18 inches from the project area. As mitigation for these impacts, planting areas have been established (the "mitigation area") to replace the trees at a 3:1 ratio. The size of the mitigation area was selected to allow for establishment of over 216 mature trees, with each tree occupying an estimated 100-square foot area (Figure A), although it is not expected that trees will grow in a uniform manner. To allow for immediate visual buffering of the project on the west side, where the reservoir will be visible from the neighboring residential property, some trees and brush will remain after the timber harvest and conversion. Approximately 56 cypress would be planted within this visual buffer area, which is 10 feet wide and approximately 560 feet long. The number of cypress that will establish within this buffer area will depend on how many adequately sized clearings are created during the timber harvest and clearing operations, and how much healthy mature

vegetation can safely remain. Additional planting areas will be created as needed if inadequate rooms exists in the visual buffer area for cypress establishment and growth.

Methods for establishing and maintaining 216 pygmy cypress are described as follows. Topsoil to be disturbed or removed by project construction will be stockpiled temporarily onsite. Once the project has been completed the topsoil will be spread over the 0.54-acre mitigation area. It is expected that pygmy cypress will germinate naturally from the existing seed bank in the topsoil, due to relatively exposed conditions of bare soil and location next to the newly-constructed reservoir. In case of inadequate existing seed bank in the topsoil, seedling and cone collection shall occur prior to vegetation removal for the project. 100-200 seed cones shall be collected and 50 or more seedlings shall be salvaged and transplanted to containers and stored at a local nursery.

Three years after construction activities the mitigation area (Figure A) will be surveyed for number of trees per acre. If the number of trees per acre is equal to or greater than the 3:1 ratio, then no more visits shall be required. If after year three, the densities are below the designated ratio, then the area should be replanted back to the mitigated ratio with seedlings, either germinated from seed or collected from site. Seedlings will be planted by hand in native topsoil, in a hole deep enough to allow roots to be positioned downward and not curved over. Seedlings will be planted in the late fall or early winter to increase survival rates. At year 5, the area should be re-surveyed. If stocking or replanting goals have been achieved then no more surveys shall be required. If the density is below, then replanting of dead and dying trees back to the mitigated ratio shall occur, and no more monitoring shall be required.

During the initial visit at three years (and at year 5) all competing conifer seedlings and invasive species in the mitigation area shall be removed in an effort to reduce competition and the potential spread of invasive species.

At year three and year five monitoring, a short summary report of conditions will be documented and placed in the project file at City Hall. The summary reports will contain information on the number of cypress trees established, dimensions, and any actions taken including weeding and planting. Photographs will be taken and included with the summary reports.

The pygmy cypress which will occur onsite after construction are expected to have a higher lifespan than the pre-project cypress would have since competition for sunlight will be reduced, particularly in areas outside of the westerly visual buffer area. If no project were to occur in the conversion area, the existing pygmy cypress trees would likely diminish as the forest canopy matures. The mitigation area along the roads and near the reservoir will create a permanent gap in the canopy, pygmy cypress will be able to persist for longer duration than if it were in a forested environment absent of disturbance.

CONCLUSION

The loss of approximately 72 pygmy cypress trees will be temporary. Once construction of the reservoir is complete, the planting area will be covered with topsoil that was removed prior to construction, in an effort to minimize the replanting effort. The goal is to achieve a 3 to 1 replacement within five years for pygmy cypress tress impacted by the construction. It will likely take 10-20 years before a similar age class or diameter distribution to the one being lost will be achieved.

SECTION III TIMBER HARVEST PLAN ADDITIONAL INFORMATION

1034(jj) Description of Physical Conditions

The purpose of the proposed timber harvest is to clear a forested area to allow for construction of an off channel reservoir to augment the City of Fort Bragg's municipal water supply. The proposed timber harvest is located approximately 2 miles inland from the coast and generally East of the city of Fort Bragg. The harvest area is located in the Newman Gulch watershed which drains into the Noyo River. The reservoir property is located on a 40+/- acre parcel owned by the City of Fort Bragg and is zoned for "Public Facilities". The proposed harvest will occur on a coastal terrace which has an average slope of less than 10%. The gentle ground minimizes the affect of the generally northerly aspect of the site. The elevation of the project area is approximately 300 feet above sea level.

The project area is located within the Coastal Belt Franciscan Assemblage. SCS soil maps indicate that Quinliven-Ferncreek Soils complex is the primary soil type on this site. The project area is considered to be low Site 3 timberland based on our field observations.

The timber is an open stand of young growth redwood, Douglas-fir, tanoak and miscellaneous hardwoods. Hardwoods are a minimal component of this timber stand. The area will be cleared to facilitate reservoir construction.

Summary of Estimated Stand Conditions for Project Area		
	% Stand Composition by BA	Average BA/AC
Douglas-fir	16%	28 Sq. Ft.
redwood	39%	66 Sq. Ft.
grand fir	09%	16 Sq. Ft.
western hemlock	07%	12 Sq. Ft.
Bishop pine	10%	18 Sq. Ft.
pygmy cypress	10%	18 Sq. Ft.
Hardwoods	09%	14 Sq. Ft.
	Total 100%	172 Sq. Ft.

No watercourses are associated with the project area.

Class I Watercourse Crossings (Per 14CCR 916.9(f)(1)(B),(C)):
There are no Class 1 watercourses associated with the plan area.

PROJECT ALTERNATIVE ANALYSIS

I. Requirements under CEQA

As a certified regulatory program under CEQA, the THP process is exempt from the requirement to prepare Environmental Impact Reports (EIRs) and related provisions of CEQA. However, a THP must include "a description of the proposed activity with alternatives to the activity, and mitigation measures to minimize any significant adverse effect on the environment of the activity." CEQA § 21080.5(d) (3) (A); 14 CCR §§15250-15253.

CDF has informed RPFs that they must submit an alternatives analysis with proposed THPs and has given RPFs guidance in preparing that analysis, based on the CEQA guidelines that control the alternatives analysis in EIRs (14 CCR §15126.6). Those CEQA guidelines are not directly applicable to the THP process as a certified regulatory program. However, they provide the only available guidance on preparing an alternatives analysis. Nevertheless, there are some important differences between the THP process and the EIR process that make the EIR guidelines difficult to apply.

By definition, an EIR must be prepared where the lead agency has identified potentially significant effects from the project as proposed. In the EIR process, where the lead agency determines that the project as proposed would not result in significant environmental effects, the agency prepares a negative declaration or a mitigated negative declaration – rather than an EIR. Where an EIR is necessary, it must describe reasonable alternatives to the project or to the location of the project that would avoid or substantially lesson those significant effects the lead agency has identified. An EIR must also develop mitigation measures that serve the same purpose.

As proposed the THP is more like a "mitigated negative declaration" than an EIR. A mitigated negative declaration is prepared for a proposed project where "revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed negative declaration is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur.

Under CEQA, no alternatives analysis is required for projects where a mitigated negative declaration is adopted for a project. 14 CCR 15071. Presumably, that is because the project has been designed to meet CEQA's mandate to avoid or substantially lessen significant effects of projects with feasible mitigation measures or feasible alternatives. Pub. Res. Code §21002.

The certified regulatory program's CEQA process for THPs is designed to have the same result as a mitigated negative declaration, i.e., as proposed, a THP will be designed to avoid significant environmental effects or to mitigate such effects to the point where no significant effects will occur. The THP process is based on the Forest Practice Rules, which reflect a layer of analysis that is not utilized in the EIR process. That is, the Forest Practice Rules are developed and adopted by the Board of Forestry as programmatic prescriptions and best management practices designed to mitigate or avoid significant impacts of timber harvesting, road building and other timber operations as they are applied by the RPF in preparing a THP. In addition to requiring RPFs to apply these prescriptions in preparing THPs, the Forest Practice Rules require plan submitters to conduct a site-specific analysis of potentially significant individual and cumulative effects that may not have been avoided or mitigated by simply applying the prescriptions contained in the Forest Practice Rules. The RPF must incorporate feasible measures in the THP to avoid or mitigate such effects.

In preparing this THP, the RPF has applied the prescriptive standards of the Forest Practice Rules. In addition, the RPF has adopted additional measures in the plan as necessary to mitigate or avoid potentially significant site-specific individual and cumulative effects identified during THP preparation. Accordingly, the RPF has submitted a THP that already serves CEQA's objective of avoiding or substantially lessening significant environmental effects.

Applying the EIR-related alternatives requirements to the THP process, the RPF faces the paradox of identifying alternatives to the THP that will avoid or substantially lessen any of the significant environmental effects of the THP where none has been identified -- because the RPF has, as required by the Forest Practice Rules, already incorporated measures into the THP that will avoid or substantially lessen potentially significant effects.

Although no potentially significant environmental effects have been identified in the THP as proposed, the RPF has analyzed alternatives which could avoid or substantially lessen environmental effects that are typically identified in the preparation and review of THPs in this region (as discussed above, many if not all such effects are addressed in the THP when first submitted for review). The RPF has used CEQA's EIR-related guidelines as well as CDF's guidance dated June 10, 1997 for addressing alternatives in the THP process.

CEQA does not require any fixed number of alternatives, and does not require inclusion of every conceivable alternative. Further, CEQA does not require the consideration of alternatives whose effect cannot reasonably be ascertained and whose implementation is remote and speculative. 14 CCR §15126 (f) (3). Instead, the CEQA Guidelines provide that a "reasonable range" of alternatives must be selected for discussion, applying a rule of reason. CEQA Guidelines 14 CCR 15126(a)(f). In accordance with CEQA's principles, the alternatives selected for detailed examination in this THP are limited to ones that would avoid or substantially lessen any of the significant effects of the project, assuming that such impacts had been identified, and that could feasibly attain most of the basic objectives of the project.

Finally, under CEQA, the alternatives considered need only relate to the project as a whole, not to its various parts. *Big Rock Mesas Property Owners Assoc. v. Board of Supervisors (1977), 73 Cal.App.3d 218, 227.* The following discussion summarizes our evaluation of project alternatives.

II. Project Description, Purpose and Need

Project Description: the THP describes the proposed project in detail. In short, the plan proposes to harvest 8+/- acres of cutover young growth timber to allow for construction of a reservoir which will be used to augment the City of Fort Bragg's municipal water supply. A range of harvest methods were considered for use based on their compatibility with on site field conditions. Due to gentle terrain the THP proposes use of ground based skidding for removal of timber. The road system is in generally good condition. Limited wet weather operations are proposed as described in THP Item #23.

The City of Fort Bragg's objective is to create an off channel reservoir to augment the Cities municipal water supply. This THP is one step in the planning and permitting process necessary to accomplish their goal.

III. Alternatives Considered But Not Selected For Detailed Examination

As required, the RPF considered six alternatives relevant to the THP: (1) the project as proposed; (2) the no project alternative; (3) alternatives for harvesting the stand; (4) alternative project location; (5) conservation easement or public purchase; (6) alternative land use. Of these possible alternatives, three were selected for more detailed examination. The alternatives that were considered but rejected for detailed discussion are summarized below.

A. Conservation Easement and Public Purchase:
This property is owned by the City of Fort Bragg and is zoned for "public purposes". Sale of the property to another government entity or granting of a conservation easement would prevent the basic purpose of the project which is to construct an off channel reservoir to augment the City's municipal water supply. The "*Conservation Easement and Public Purchase*" alternative is not considered to be a viable option since it appears to be contrary to basic purpose of the project.

B. Alternative Land Uses:
This alternative would involve the landowner using the property for a use other than that which is proposed. The number of possible uses for any parcel of land is very large. The basic purpose of the project which is to construct an off channel reservoir to augment the City's municipal water supply would not be achieved if an alternative land use was pursued. The "*Alternative Land Uses*" alternative is not considered to be a viable option since it is contrary to basic purpose of the project.

C. No Project Alternative:
This alternative would preclude the City's plan to augment its municipal water supply. The "No Project" alternative is not considered to be a viable option since it is contrary to basic purpose of the project.

IV. Alternatives Selected For Detailed Examination

A. Alternative Location of the Project:
This alternative would involve carrying out the project at a different location. The City owns approximately 35.8 acres at this location which zoned for Public Facilities. The Summer's Lane parcel is already utilized by the City in its municipal water supply operation. Water mains and other infra-structure are already onsite and in place which will greatly reduce development costs of this site as opposed to other locations which are not adjacent to existing municipal water supply infra-structure. The reservoir has been planned for the current location based on avoidance of Riparian areas, pygmy soils and steeper slopes. Other more feasible sites which could further reduce potential significant effects are not available. Since deliberation concerning alternative sites was a basic element of preliminary project planning and the proposed project location is a result of that planning, this alternative has been thoroughly evaluated and we believe the best location for the project has been selected. The City has been planning this project for a number of years and has a significant investment in the planning and design of the proposed project.

Recently a potentially available parcel referred to as the Highway 20 Regional Park Property was suggested as an alternative. This alternative was considered and is not considered to be the most beneficial site for the following reasons:

a) *The property referred to as the Highway 20 Regional Park Property is not well situated relative to existing municipal water supply infra-structure. Beyond acquiring the property itself additional easements would likely be necessary.*

b) *The City evaluated alternative sites for the project long ago and determined the Summer's Lane site to be the most beneficial when all factors were considered. At that time engineering plans and designs were made at significant expense. Alternative sites do not have more favorable characteristics which would warrant discarding all of the design and planning expense already incurred at tax payer expense.*

c) *With regards to the Highway 20 Regional Park Property there are many special status species considerations associated with this property as well and depending on the exact location relocating the project to this property would not likely resolve concerns over this issue.*

B. The Project as Proposed:

The project as proposed will help the City of Fort Bragg meet their water supply needs. Potentially significant impacts on the environment, including wildlife habitat and fisheries, which could result from harvest operations such as these have been analyzed and mitigated or reduced to insignificance. As discussed above, the THP as proposed, with all the mitigation measures adopted in the plan, will not result in significant adverse environmental effects. The project was planned to minimize adverse environmental effects by locating the project to avoid sensitive natural habitats and minimize the potential for sediment protection. Project planners used multiple site surveys to assess whether previously unknown wildlife or cultural resources may be present. This project has been designed to meet a public need for a secure water supply while minimizing the potential for adverse impacts to public trust wildland resources.

C. Alternative approach to harvesting in the proposed stand (silviculture).

All timber in the 8+/- acre project area will be harvested to clear the site for reservoir construction. Other harvest alternatives are not feasible.

V. Comparison of Project and Project Alternatives:

Since the plan as proposed, meets the projects primary objectives and with all the incorporated mitigations will not result in significant adverse effects, it is selected as the alternative for going forward. Since the proposed THP meets the basic objectives of CEQA, the selection of another alternative to this THP is not necessary to serve the basic purpose of avoiding or substantially lessening significant impacts of the THP. It is entirely consistent with CEQA and pertinent case law to approve a project that has its potential environmental impacts avoided or reduced to relative insignificance as is the case here, rather than selecting a separate project alternative that would itself result in no significant adverse impacts even if alternative would be environmentally superior. See *Laurel Hills Homeowners Association v. City Council of the City of Los Angeles* (1978) 83 Cal. App.3d 515, 520; *Laurel Heights Improvement Association of San Francisco, Inc. v. The Regents of the University of California (1988) 47 Cal.3d 376, 401.*

SECTION IV
CUMULATIVE IMPACTS ASSESSMENT

1. Do the assessment area(s) of resources that may be affected by the proposed project contain any past, present, or reasonable foreseeable, probable, future projects?

Yes **XX** No _____

The following is a list of past and present timber harvest plans within the **5,223** acre **Mouth of Noyo River** (1113.200403) watershed assessment area. The selected assessment area for this THP is considered to be an appropriate assessment area for evaluation of harvest levels and their potential watershed impacts. To be concise the following list of plans represents the ten year prior harvest history for both the watershed and terrestrial biological assessment areas.

THP#	Silviculture(2)	Yarding System(1)	Acres*	Plan Location (all MDB&M)
13-075M	CONV, RW	T	020	T18N, R17W, S 9, 15, 16
06-089M**	CONV	T	---	T18N, R17W, S 16
08-144M	SEL, CC, RW	T/C	240	T18N, R17W, S 9, 10, 14, 15, 22, 23
08-197M	CC	T	002	T18N, R17W, S 10, 11
05NTMP-004M	SEL	T	014	T18N, R17W, S 8
97NTMP-022M	SEL	T	163	T18N, R17W, S 3, 10, 11
93NTMP-007M	SEL	T/C	093	T18N, R17W, S 3, 10

* Approximate acres within assessment area
** Expired without implementation

(1) Equipment:	(2) Silviculture:	
T = Tractor	CC = Clearcut	SRW = Shelterwood Removal Cut
C = Cable	SEL = Selection	ST = Seed Tree Seed Cut
H = Helicopter	CT = Commercial Thin	STR = Seed Tree Removal Cut
	TR = Transition	GS = Group Selection
	SPC = Shelterwood Prep Cut	SS = Sanitation- Salvage
	RUA= Rehabilitation	OR= Overstory Removal
	AP = Alternative Prescription	SSC = Shelterwood Seed Cut
	NC = No Cut	RW = road right-of-way clearing

Harvest acreages in the above table indicate that a total 532 acres or 10% +/- of the acreage in this watershed assessment area have been the subject of approved harvest permits in the past 10 years. 270 acres in the above listed total are approved under Non-Industrial Timber Management Plans. NTMP's by their nature restrict harvest levels to growth rates over a 10 year period. Considering that volume growth may be approximately 3% in these areas, a timber owner operating under a NTMP would be expected to cut no more than 30% of their stand in any 10 year period. With this in mind it may be more appropriate to consider site disturbance for a NTMP in a 10 year period to be closer to 30% of the stand rather than the entire acreage as reported in this summary.

The project proposes an additional clearing of 8+/- acres within this assessment area. Harvested acreage for noted above will increase by approximately 0.2% of the WAA as a result of the proposed harvest. This list of past harvesting activities and the harvest rates over the past ten years has been considered within the discussions written for the various resource areas below in this section.

The City of Fort Bragg has not commercially harvested timber in more than 10 years. The landowner has no known plans for other timber operations within the next five years.

Past Projects: Early Land Use in the Assessment Area
Industrial scale logging began on the Mendocino coast in the 1850s or 1860s and progressed throughout the assessment areas by the early 1900s. Drainages were utilized for log transport, including ground lead skidding operations and the use of tramways and/or railroads along watercourses. Beginning in the late 1930s, many railroad grades were converted to truck roads, and tractor logging in the mid 1900s focused mainly on the logging of residuals, pockets of old-growth which were bypassed in earlier logging endeavors and the beginnings of second-growth logging in some areas. Portions of the assessment area were utilized for ranching activities, most probably involving periodic burning in an effort to maintain grazing land, throughout most of the early 1900s.

Other Ongoing Activities and Known Future Projects:
The landowner has no plans for other timber operation plans within the next five years. I am not aware of any additional projects, which are being planned within the Lower Noyo River assessment area at this time. Based on the extent to which timber resources are present within these assessment areas additional future harvesting on other ownerships is probable. When additional harvesting is conducted in the assessment area, this activity will undoubtedly be conducted according to the Forest Practice Act and therefore the probability of significant adverse impacts will be minimized. Recently studies have begun concerning a solid waste transfer station facility which could be located off Highway 20 within the WAA. This project is tentative and in the early planning stages. Impacts of a solid waste transfer station, such as traffic and garbage dumping are not likely to be incremental to potential significant impacts associated with the current municipal water supply project.

2. Are there any continuing significant adverse impacts from past land use activities that may add to the impacts of the proposed project?

Yes XX No _____

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

The activities that have caused the continuing significant impacts are discussed above as earlier past projects. All resource subjects have been affected by these past projects. Where the affects from these past projects are considered significant, a discussion can be found under the affected resource assessment area, below.

Watershed, biological, and possibly soil productivity resources continue to be impacted by historical logging activities that occurred prior to the implementation of the modern Forest Practice Act. The effects of historical logging activities are noted for a much higher level of environmental impacts than exists under the current Forest Practice Rules. These logging activities which occurred many years ago significantly affected watershed, biological, and soil productivity resources in an adverse manner at that time, and in some cases are responsible for fresh inputs of sediment via failures of old structures in current times.

Continuing effects of pre-Forest Practice Act land use activities include elevated background levels of sediment in streams, reduced shade canopy and protective cover along some streams or portions of streams and a reduction of terrestrial habitat for species which prefer larger older trees. The Noyo River is listed as a 303d impaired water body for sediment and temperature related concerns.

More modern timber harvesting operations have been conducted pursuant to the Z'berg Nejedly Forest Practices Act of 1973 and the associated regulations of the Board of Forestry. These projects have been conducted in a sensitive manner resulting in continuing improvement of watershed wide aquatic habitat and other environmental resource parameters. Continuing use of current best management practices and implementation of proactive mitigations conducted in conjunction with this and other proposed projects will insure that continued progress towards recovery is not impeded.

Considering the impacts of historic timber harvesting on the Noyo River watershed, it is necessary to assess the potential impact that this project may have on sediment discharge and stream temperatures. Sediment production is addressed by utilizing modern harvest practices, which minimize soil disturbing activities in areas, which have characteristically high sediment delivery ratios such as, steep slopes, unstable areas and WLPZ's. Water temperature issues are addressed by application of WLPZ shade canopy retention standards. Sites where the potential for elevated sediment production exists have been identified and sites that can be rehabilitated through remedial action are itemized in the THP and corrective action is called for. The potential for the proposed harvest to contribute to a significant adverse impact by increasing sediment or temperature levels in the downstream fluvial system is considered to be low for the following reasons:

a. The project area is located on a coastal terrace and no watercourses are located within the project area.
b. Gentle slopes associated with the project area minimize the potential for sediment production.
c. An Erosion Control Plan has been developed for the project to insure that the potential for inadvertent sediment production is minimized
d. The project area was sited away from watercourses and therefore shade canopy reduction and potential for associated stream water temperature increases will not be a factor.
e. No new road construction is proposed.

Considering these practices the potential for significant amounts of sediment to be discharged into watercourses has been mitigated and water temperature increases are not anticipated. Therefore, even though the watershed is impaired from past land-use activities, this project will not have a significant additive effect.

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

	Yes, after mitigation(a)	No, after mitigation(b)	No reasonably potential significant effects(c)
1. Watershed			XX
2. Soil Productivity			XX
3. Biological		XX	
4. Recreation			XX
5. Visual			XX
6. Traffic			XX

(a) Yes, after mitigation, means that potential significant adverse cumulative impacts are left after application of the forest practice rules and mitigation or alternatives proposed in the THP.

(b) No, after mitigation, means that any potential for the proposed timber operations to cause or add to significant adverse cumulative impacts by itself or in combination with other projects has been substantially 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 these determination impacts. If column (b) is checked in (3) above, describe what mitigation measures have been selected which will substantially reduce or avoid reasonably potential significant cumulative impacts except for those mitigation measures or alternatives mandated by application of the rules of the Board of Forestry.

A) Watershed Resources – (b) No, after mitigation:

a) Sediment effects – Sediment-induced cumulative watershed effects occur when earthen materials transported by surface or mass wasting erosion enter a stream or stream system at separate locations and are then combined at a downstream location to produce a change in water quality and channel conditions. Please see THP Section 2, Item 18 for detailed soil stabilization measures to be taken and the discussion above regarding the 303d listing of Noyo River for a summary of project conditions and parameters which will act to minimize the potential for sediment production.

b) Water Temperature Effects – Water temperature related to cumulative watershed effects are changes in water chemistry or biological properties caused by the combination of solar warmed water from two or more locations where stream canopy has been removed. Increased solar radiation resulting from harvesting of streamside shade canopy can contribute to elevated water temperatures. Typically, WLPZ's are established adjacent to perennial streams and harvesting in the WLPZ is restricted. Due to the small size of the project area and its upper hill slope location watercourses are not associated with the project area therefore limiting the potential for harvesting in this area to adversely affect downstream water temperatures.

.he absence of watercourses will prevent the proposed project from increasing downstream water temperatures. Based on the above referenced site conditions (lack of summertime stream flow) and project limitations (small size and upper hillslope location) and my past experience with water temperature monitoring on similar Mendocino County streams, I believe, I have sufficient reason to conclude that the proposed timber operation will not have a significant adverse cumulative impact on stream temperatures.

c) Organic Debris Effects – Cumulative watershed effects produced by organic debris can occur when logs, limbs and other organic material are introduced into a stream or lake at two or more locations. Decomposition of this debris, particularly the smaller sized and less woody material removes dissolved oxygen from the water and can cause impacts similar to those resulting from increased water temperatures. Introductions of excessive small organic debris can also increase water acidity. Large organic debris is an important stabilizing agent that should be maintained in small to medium size, steep gradient channels, but the sudden introduction of large, unstable volumes of larger debris can obstruct and divert stream flow against erodible banks, block fish migration, and may cause debris torrents during periods of high flow.

No watercourses are associated with this harvest area and the ground is too gentle to anticipate mass wasting events which could transport LWD into the fluvial system therefore there is no natural mechanism which would deliver LWD from the project area to down slope watercourses. Based on the absence of watercourses and the gentle ground associated with the project area, I believe, I have sufficient reason to conclude that the proposed timber operation will not have a significant adverse cumulative impact on organic debris levels found in association with watercourses.

d) Chemical Contamination Effects – Potential sources of chemical cumulative watershed effects include run-off from roads treated with oil or other dust-retarding materials, direct application or run-off from pesticide treatments,

contamination by equipment fuels and oils and the introduction of nutrients released during slash burning or wildfire from two or more locations.

Adverse cumulative effects from chemical contamination are not expected based upon the following observations and rationale:
No chemical point sources are known to currently exist on-site. The potential for accidental contamination will be minimized by:

1) Locating the project area well away from watercourses;
2) Utilizing the existing road system within the plan area which avoids watercourses;
3) Herbicide use is not proposed in association with the management of timber on this property. By avoiding herbicide use project implementation can occur without contributing to potential cumulative herbicide use impacts.

e) Peak Flow Effects – Cumulative watershed effects that are caused by management induced peak flow increases in streams, during storm events, are difficult to anticipate. Peak flow increases may result from management activities that reduce vegetative cover, compact soils, or change hydrological connectivity of the fluvial system in ways that alter time of concentration during high intensity winter storm events. Typically anthropogenically induced changes in peak flows are small relative to the magnitude of natural peak flows resulting from medium and large storms.

Past research done on the South Fork of Casper Creek, in Mendocino County, has shown that no significant increases in large winter peak storm flows occurred following removal of 65% of the forest canopy, and compaction of 15% of the watershed with tractor roads, landings, and logging roads (Wright and others 1990). The Casper Creek and Noyo River atersheds exist in the same rain dominated hydro-geologic environment. Also, these watersheds are subject to the same regional flood events, although flood frequencies may slightly differ according to basin characteristics and varying micro-site effects. The proposed logging operations are far less in magnitude for this project as compared to what has occurred in Caspar Creek.

I considered the potential for this specific project to alter hydrologic processes and impact peak stream flows. Since this operation is located in the redwood region at lower elevations, impacts associated with rain on snow events were considered to be unlikely. Watercourse crossings are not proposed therefore the potential for watercourse diversion is minimized and flows from watercourses will not be diverted from one drainage to another thereby altering peak flows. Soil compaction and associated increased run-off is not considered significant due to the small project size and intended reservoir construction which will directly capture onsite rainfall. Based on the above factors and my 30+ years of field experience with similar timber harvesting operations I believe that my reasoned analysis concluding that increased peak flows are not likely to occur is substantially justified.

f) Fog Drip
While there may be a slight reduction in fog drip as a result of this operation, it is not expected to be significant based on small project size and the projects close proximity to the coast. The proposed harvest area is within the influence of coastal weather patterns where fog is frequently heavy during the summer months. Studies on the Little North Fork Noyo River done by Burns (1969) and Valentine/Jameson (1993) both indicate a similar stream volume and velocity during the late summer months which would indicate that ground water and the influence of fog drip have not been significantly affected by timber harvesting within the Little North Fork Noyo River drainage over the intervening 24 year period. No significant decrease in water yield is expected from any potential decrease in fog drip that may occur. Decreases in evapotranspiration (water output) through the removal of trees should offset any potential decrease in fog drip (water input).

B) Soil Productivity – (c) No reasonably foreseeable impacts

The project area is being cleared to provide a site for a small off channel reservoir to be constructed by the City of Fort Bragg to augment their municipal water system. Soils in this area are suitable for this purpose. Given that the site is to be dedicated to this use productivity of the site is maintained although water will be produced rather than wood products.

C) Biological Resources – (b) No, with mitigation

a) Rare Plants & Wildlife – Northern Spotted Owls, coho salmon and steelhead are known to occur in the vicinity of the plan area. Consultation with the NDDB and other sources indicated no other known occurrences of State or Federally listed Threatened and Endangered Species within the THP area. Review of database information identifies a number of other animal and plant species outside of the plan area, which will be given consideration. It is not expected that the proposed operations will affect any of these species adversely. The project foot print is limited to approximately 8+/- acres leaving approximately 75% of this parcel in its current state and available for wildlife use.

b) Aquatic and near-water habitat

No watercourses or wetlands are associated with the project area. Soil Stabilization requirements itemized in Section 2 of the THP and the FPR minimize the potential for sediment production. The lack of watercourses and gentle slopes makes the project area not suitable for in-stream LWD recruitment. Likewise the lack of watercourses on site or adjacent to the project area negate the potential for impacts to near stream vegetation.

c) Biological Habitat Components

The project area is currently occupied by a cut over young growth forest which does not provide any unique wildlife habitats not readily available offsite. The project is bounded variously by a commercial nursery on one side a dog pound on another side and high voltage transmission lines across the northern border. The project area does not have a unique abundance of snags den or nest trees. Down woody debris is typical of the surrounding area. Multistory canopy is present but consistent in nature with other multi-story habitats associated with other selectively harvested young growth forests within the BAA. Density of frequently used roads in this area is quite high due to residential development South and West of the project area. Hardwoods are a minor stand component and most of the hardwoods on site are small in size and likely not significant suppliers of forage. This entire watershed has been previously harvested. Stands which meet the criteria for Late Seral stage forest habitat , as defined in 14 CCR 895.1 and in the CDF Technical Rule Addendum #2, do not exist within the assessment area to my knowledge. Based on the developed nature of the project site and the lack of late seral stage forest habitat within the assessment area late seral habitat continuity is not an issue with this project.

Global Warming Issues

The scientific literature on the phenomenon of global warming, and impact of greenhouse gas emissions on the State of California, as well as to the remainder of the Earth, is growing, conflicted, and politically charged. Consensus is growing on the occurrence of global warming, although there is considerable debate regarding the causes (Bast and Taylor, 2007; Ferguson, 2006). The Stern Review of the Economics of Climate Change (2006) was a comprehensive report commissioned by the British government, and provided projections of economic cost based on assumptions of impacts. Studies of past and present temperatures show a natural variability of Earth's climate. Past climates were as warm as (and even warmer than) what we currently experience, and such warm periods were typically, relatively short-lived

respites from ice-age conditions that dominated the past half-million years (Ferguson, 2006).

Regardless of the aforementioned issue, the State of California has recognized climate change and global warming as a threat to health, safety, and the economy. Global warming could result in reductions in water supply due to changes in snow pack levels, adverse health impacts from increases in air pollution, adverse impacts on agriculture caused by changes in quantity and quality of water supplies and significant increases in diseases and pests, increased risk of catastrophic wildfires, and significant impacts to consumers and businesses due to increased costs of goods and services (AB 1493, 2002). In response, the State of California has enacted legislation and policies designed to reduce greenhouse gas emissions and to increase energy efficiency (AB 1493, 2002; AB 32, 2006; Gov. Schwarzenegger Executive Order S-3-05). The Executive Order established greenhouse gas emission targets using 1990 thresholds, and established the California Climate Action Team to coordinate the State's efforts to reduce and report on progress of those efforts and on impacts of global warming to the State.

Carbon dioxide (CO_2) is considered the greenhouse gas (GHG) that has the greatest effect on the dynamic of global warming due to the fact that it composes the vast majority of the releases by human activities. There are two basic ways carbon emissions are reduced. First is efficiency, where technology or conservation reduces carbon emissions through the use of less energy (electricity, fuel, heat, etc.) to accomplish an activity. Second is storage, which can be accomplished through geologic or terrestrial sequestration.

Forest activities can result in emissions through harvesting, wildfire, pest mortality and other natural and anthropogenic events. However, forestry is a net sink for carbon, the primary greenhouse gas. Plants absorb CO_2 from the air, and use the carbon as a building block of plant tissue through the process of photosynthesis. Worldwide forests store approximately 2,000 billion tons (Gt) +/- 500 of CO_2 (National Energy Technology Laboratory, 2000). An acre of mature redwood can store between 600-700 ton/ac of CO_2, which is the highest of any forest type on Earth. Though redwood forests can store the largest amounts of GHGs per acre of any forest type, the expanse of this forest type is not significant on a global level. The most recent draft Greenhouse Gas Inventory shows the forestry sector to be a net sink with emissions of 6.1 MMT CO_2 EQ. and emissions reductions of 21 MMT CO_2 EQ (Bemis, 2006).

The forest sector offers the ability to reduce emissions through a suite of possible activities: 1) substitute wood products for more energy-intensive products, 2) reduce consumption of energy in growing timber, harvesting, and wood processing, 3) reduce biomass burning (wildfires), 4) afforest marginal croplands, 5) reduce conversion of forestland to non-forest use, 6) improve forest management, 7) reduce harvest, 8) increase agro-forestry, 8) plant trees in urban areas, 9) other combinations (Joyce and Nungesser, 2000).

This proposed reservoir project minimizes GHG impact by locating the reservoir on marginal timberland where carbon sequestration occurs at a slower rate and minimizing the overall project foot print to approximately 25% of the property. Carbon from trees harvested will be sequestered for decades or longer in the form of the wood products cut from the logs. Additional carbon will be sequestered in the remaining forested area.

5. Provide a brief description of the assessment area used for each resource subject.

The assessment area for watershed resources

The Mouth of Noyo River drainage (#1113.200403) is the watershed assessment areas to be utilized. The assessment area is as shown on the attached map. The CWE assessment areas to be utilized were selected based on its size, proximity to the plan area and in consideration of the dominant drainage patterns in this area. The assessment area is consistent with the March 16th, 1994 CDF recommended guidelines to RPFs which states: "The watershed assessment area for assessing cumulative watershed effects should be selected to include an area of manageable size (usually an order 3 or 4 watershed)

relative to the THP that maximizes the opportunity to detect an impact". The assessment area is of a size where the combined impacts of this THP, existing conditions attributed to past projects and possible impacts from anticipated future projects could be detected if they were significant.

The assessment area for visual resources includes all of the area within a 0.7 mile radius of the plan area. The rationale for this particular size and shape is as follows:

1. This area was chosen for consistency and as an area where potential adverse effects to visual resources might occur.
2. This area includes nearly all of the possible vantage points from which this THP area could be seen.

The assessment area for biological resources is the watershed assessment area described above. The rationale for this particular size and shape is as follows:

1. Terrestrial plants and animals further away from the harvest area will be less affected by the disturbance than those within the plan area and watershed assessment area.
2. Rural land management history within the assessment area is similar in intensity and nature to the larger surrounding area.
3. Rural land management history within the assessment area is representative of large timber holdings in the area where more intensive forest management is common and therefore the potential for diluting adverse cumulative effects by using a large assessment area is minimized.

The assessment area for soil productivity resources is the same as the THP area since this is the area where potential significant effects to soil productivity may reasonably be expected to occur.

The assessment area for recreation resources is the THP area, plus the area within 300 feet of the THP boundaries. The assessment area as described seems appropriate for an assessment of potential significant effects to the recreational resources which may occur in the vicinity of the plan area.

The assessment area for traffic resources is Summers Lane to Highway 20, hence East to Highway 101 and Highway 101 between Eureka and Cloverdale. Log trucks hauling timber from the harvest area will use Summers Lane for approximately ¾ mile. Summers Lane is a two lane surfaced County maintained road which has a suitable grade and alignment for safe passage of commercial traffic. Logging traffic commonly uses State highways 20 and 101 in Mendocino and Humboldt Counties without incident or congestion.

I. CUMULATIVE WATERSHED EFFECTS ASSESSMENT

A. Beneficial Uses

List the on-site and downstream beneficial uses of water that you are aware of and that could be affected by project activities. Spawning and rearing habitat for coho salmon, steelhead trout and other aquatic wildlife. Also, habitat for non-aquatic wildlife. Other potential beneficial uses include water supply, recreation, ground water recharge and scientific study.

NCRWQCB Basin plan identifies the following actual or potential beneficial uses of water for the Noyo River Hydrologic area 113.20:

USE	NOYO RIVER
MUN	E
AGR	E
IND	E
PRO	P
GWR	E
FRSH	E
NAV	E
POW	E
REC1	E
REC2	E
COMM	E
AQUA	E
WARM	
COLD	E
SAL	
EST	E
MAR	
WILD	E
ASBS	
RARE	E
MIGR	E
SPWN	E
SHELL	
WQE	
FLD	
WET	
CUL	

P=Potential
E=Existing

Note: The list of beneficial uses in this table reflects demands on the water resources of the region; water quality objectives based on those uses will adequately protect the quality of the region's waters for future generations.

MUN: Municipal and domestic supply. Includes usual uses in community or military water systems and domestic uses from individual water supply system.

AGR: Agricultural supply. Includes crop, orchard and pasture irrigation, stock watering, support of vegetation for range grazing, and all uses in support of farming and ranching operations.

IND: Industrial service supply. Includes uses that do not depend primarily on water quality, such as mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, and oil well repressurization.

PRO: Industrial process supply. Includes process water supply and all uses related to the manufacturing of products.

GWR: Groundwater recharge. Natural or artificial recharge for future extraction for beneficial uses and to maintain salt balance or halt saltwater intrusion into freshwater aquifers.

FRSH: Freshwater replenishment. Provides a source of freshwater for replenishment of inland lakes and streams of varying salinities.

NAV: Navigation. Includes commercial and naval shipping.

POW: Hydropower generation.

REC1: Water recreation, body contact. Includes all recreational uses involving actual body contact with water, such as swimming, wading, water-skiing, skin-diving, surfing, sport fishing; used in therapeutic spas and other uses where ingestion of water is reasonably possible.

REC2: Non-contact water recreation. Recreational uses that involve the presence of water, but do not require contact with water, such as picnicking, sunbathing, hiking, beach combing, camping, pleasure boating, tidepool and marine life study, hunting, and aesthetic enjoyment in conjunction with the above activities as well as sightseeing.

COMM: Ocean commercial and sport fishing. The commercial collection of various types of fish and shellfish, including those taken for bait purposes and sport fishing in oceans, bays, estuaries, and similar non-freshwater areas.

AQUA:	Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.
WARM:	Warm freshwater habitat. Provides a warm water habitat to sustain aquatic resources associated with a warm water environment.
COLD:	Cold freshwater habitat. Provides a cold water habitat to sustain aquatic resources associated with a cold water environment.
SAL:	Saline water habitat. Provides inland saline water habitat for aquatic and wildlife resources.
WILD:	Wildlife habitat. Provides a water supply and vegetative habitat for the maintenance of wildlife.
RARE:	Preservation of rare and endangered species. Provides an aquatic habitat necessary, at least in part, for the survival of certain species established as being rare and endangered.
MAR:	Marine habitat. Provides for the preservation of the marine ecosystem, including the propagation and sustenance of fish, shellfish, marine mammals, waterfowl, and vegetation such as kelp.
MIGR:	Fish migration. Provides a migration route and temporary aquatic environment for anadromous or other fish species.
SPWN:	Fish spawning. Provides a high-quality aquatic habitat, especially suitable for fish spawning.
SHELL:	Shellfish harvesting. The collection of shellfish such as clams, oysters abalone, shrimp, crab, and lobster for either commercial or sport purposes.
WQE:	Uses of waters, including wetlands and other waterbodies, that support natural enhancement or improvement of water quality in or downstream of a waterbody including, but not limited to, erosion control, filtration and purification of naturally occurring water pollutants, streambank stabilization, maintenance of channel integrity, and siltation control.
FLD:	Uses of riparian wetlands in flood plain areas and other wetlands that receive natural surface drainage and buffer its passage to receiving waters.
WET:	Uses of water that support natural and man-made wetland ecosystems, including, but not limited to, preservation or enhancement of unique wetland functions, vegetation, fish, shellfish, invertebrates, insects, and wildlife habitat.
CUL:	Uses of water that support the cultural and/or traditional rights of indigenous people such as subsistence fishing and shellfish gathering, basket weaving and jewelry material collection, navigation to traditional ceremonial locations, and ceramonial uses.

B. Watershed Assessment Area

Describe the watershed assessment area, including the reasons for selected boundaries.
The Mouth of Noyo River drainage (#1113.200403) is the watershed assessment areas to be utilized. The assessment area is as shown on the attached map. The CWE assessment areas to be utilized were selected based on its size, proximity to the plan area and in consideration of the dominant drainage patterns in this area. The assessment area is consistent with the March 16th, 1994 CDF recommended guidelines to RPFs which states: "The watershed assessment area for assessing cumulative watershed effects should be selected to include an area of manageable size (usually an order 3 or 4 watershed) relative to the THP that maximizes the opportunity to detect an impact". The assessment area is of a size where the combined impacts of this THP, existing conditions attributed to past projects and possible impacts from anticipated future projects could be detected if they were significant.

C. Current Stream Channel Conditions

1. Is there one or more order 2 or larger streams that (1) flows through or adjacent to the project area, (2) will receive runoff from areas disturbed by project activities, and (3) has a contributing watershed area of more than 300 acres upstream from the point where the stream flows out of the project area?

Yes _____ No XX

2. Using a copy of attached Table 1, describe the condition of the order 2 or larger stream channels, or apparently different segments of these channels, that lie within the project boundary and are downstream of the point where the contributing watershed area of the stream is less than 300 acres.

(Enter stream channel or segment identification letters or numbers at the top of the form, identify the CDF water class and the stream order number in the next row, then assign ratings on none, slight, moderate, or high to each of the listed channel conditions. The location of identified channels and channel segments should be shown on an attached watershed map. Attach additional rating pages and explanatory notes as needed.)

3. Are you aware of any current stream channel conditions, including those listed in previous section C.2, that occur outside of the project boundary, but within the assessment area, that are contributing to a reduction in the beneficial uses of water listed in section A?

Yes XX No _____

Most of the timbered portion of the CWE assessment area was harvested during the historic logging period and prior to the advent of a modern Forest Practice Act. The railroad logging of the late 1800's and early 1900's required extensive excavation for railroad grades which were primarily located in close proximity to major watercourses. Most of these grades have contributed significant sediment to the fluvial system in the past but have generally stabilized over time. Some of these railroad grades were modified into truck roads and subsequently left un-maintained. These legacy truck roads tend to be more significant sources of continuing sediment delivery due to their proximity to watercourses and the tendency for truck roads to use fill for crossing tributaries as opposed to the trestles used by the railroad. Impacts associated with this early harvest triggered a positive response to questions concerning past projects under item "B". While stream channels are continuing to recover the area as a whole now appears to be generally well vegetated and stabilized.

4. Are you aware of any current stream channel conditions, including those listed in previous section C.2, that occur outside of the assessment area and that are contributing to a reduction in the beneficial uses of water listed in section A?

Yes XX No _____

Comments:
Within the WAA initial logging was via railroad in conjunction with steam donkeys and tractors around 1880-1940 followed by the widespread use of tractors and logging trucks in the 1940-70s. Stream clearance activities, prompted by choking amounts of logging debris, followed in at least some drainages. Impacts associated with the land management practices of the past 100+ years as described in this report continue to have an influence on current stream channel conditions across the entire Noyo River drainage.

D. PAST PROJECTS

Based on your review for this assessment and knowledge of watershed conditions on and off the proposed project area, have past projects in the watersheds on channels within the assessment area resulted in any of the following impacts? (Yes or No)

1.	Increased sediment inputs that embedded gravels, filled pools, or caused channel aggradation within some portion of the stream system?	[Y] N
2.	Increased channel downcutting or bank erosion as a result of increased flows, sediment transport, or other channel modifications?	[Y] N
3.	Increased water temperatures resulting from canopy removals along stream channel?	[Y] N
4.	Inputs of unstable organic debris to streams or lakes?	[Y] N
5.	Removal of large organic debris leading to loss of pool habitat?	[Y] N
6.	Chemical inputs to streams or lakes?	Y [N]
7.	Other (describe)	Y [N]

Comments:
Pre-Forest Practice Act logging activities resulted in significant inputs of soil and woody debris to watercourses in the assessment area. A significant amount of sediment may still reside within the stream channel and along stream banks. This sediment deposit is slowly working its way through the system and will continue to do so as subsequent winter storms and high flows move this sediment downstream. In addition, 1960s-1980s removal of large woody debris from Class I watercourses within the assessment area for the purpose of improved fish passage had an adverse impact on pool habitat and released of large amounts of stored sediment. Over time, LWD will be added to the river by windthrow, large landslides, undercutting, etc. The proposed timber harvest will not further impact the beneficial uses of water within this watershed due to small project size, absence of watercourses in the project area and soil stabilization measures to be employed. Original logging within the watershed included the removal of all merchantable timber and is expected that most if not all streamside trees were harvested over a short period of time 80 to 120 years ago. This removal of the overstory would be expected to cause increases in stream temperatures. Over the intervening years this canopy has returned and now provides substantial canopy for the watercourse channels.

E. Potential On-Site Effects
Based on current conditions and your knowledge of the impacts of similar past projects, what is the potential of the proposed project, as described and mitigated, to produce the following individual effects? (High, Moderate, Low)

1. Increased stream or lake sediment from:

a. Channel or bank erosion	H	M	[L]
b. Streamside or inner gorge mass wasting that could directly enter a stream channel.	H	M	[L]
c. Debris flows or torrents that could move directly into the stream system from sideslopes, swales, small channels, roads, landings, or skid trails.	H	M	[L]
d. Debris flows or torrents caused by debris jams.	H	M	[L]
e. Sideslopes mass wasting that directs surface runoff into gullies, swales, or small channels connected to the stream system.	H	M	[L]
f. Sheet, rill, or gully erosion that could be discharged into the stream system from roads, landings, or skid trails (include all disturbed areas from the top of the cut to the bottom of the fill).	H	M	[L]
g. Sheet, rill, or gully erosion from harvested or site preparation areas that could enter the stream system.	H	M	[L]
2. Openings created by project activities along stream channels that could result in substantially increased stream temperature.	H	M	[L]
3. Increased amounts of small organic debris in streams or lakes as a result of project activities.	H	M	[L]
4. Movement of roadway chemicals, machinery fuels, pesticides, nutrients released by burning, or other chemicals into streams or lakes as a result of project activities.	H	M	[L]
5. Increased peak flows as a result of vegetation removal, snow accumulation in new openings, or more efficient runoff routing created by project activities.	H	M	[L]
j. Inputs of large organic debris in streams or lakes as a result of project			

	activities.	H	M	L
7.	Extraction of large organic debris from streams or lakes as a result of project activities.	H	M	L
8.	Loss of future large organic debris as a result of streamside timber harvesting.	H	M	L
9.	Other factors (list)	H	M	L

No watercourses are associated with the 8+/- acre project area. Slopes are typically <15% and an erosion control plan will be implemented to insure the potential for sediment production is minimized.

F. Future Projects

Based on your review of current watershed conditions, the effects of past projects, and accounting for currently proposed mitigation measures - Are the identified future projects likely to result in (Yes or No)?

1.	Increased sediment inputs that will fill pools, embed stream gravels, or cause channel aggradation in some portion of the system?	Y	N
2.	Increased channel down cutting or bank erosion from increased flows, sediment transport, or other stream modifications?	Y	N
3.	Additional openings along stream channels that could result in unacceptable increases in water temperatures.	Y	N
4.	New inputs of organic debris to streams or lakes.	Y	N
5.	Extraction of large organic debris from streams or lakes?	Y	N
6.	Chemical inputs to streams or lakes?	Y	N
7.	Other factors (list)	Y	N

The RPF is aware that preliminary discussion of a 20+/- acre conversion is occurring on another ownership within the WAA. The purpose of the conversion being considered is to construct a log yard to store and merchandize local forest products. Other additional future projects have not been identified however future harvesting in this WAA is anticipated and future Timber Harvest Plans will likely be prepared and regulated according to the Forest Practice Act and the Forest Practice Rules and are not likely to cause significant adverse environmental impacts. Implementation of the measures proposed within individual THPs along with responsible logging practices within the framework of the rules of the FPA will minimize the potential for significant adverse effects.

G. Interactions

Considering the combined impacts of:

- Beneficial uses of water described in Part A,
- Current stream channel conditions from Part C,
- Effects of past projects listed in Part D, and
- Expected on-site effects of the proposed project from Part E;

What is the potential for developing adverse cumulative watershed effects in the assessment area, as described in Part B, as a result of:

1. The proposed project combined with the ongoing effects of past projects, but without the expected impacts of future projects? H M [L]

2. The proposed project combined with the effects of past projects and the expected impact of future projects listed in Part F? H M [L]

H. Impact Evaluation

Will the proposed project, as presented, in combination with the impacts of past and future projects, as identified in Parts C through F and with the interactions rated in Part G above, have a reasonable potential to cause or add to significant cumulative impacts to watershed resources.

Yes (after mitigation) ---------- ____
No (after mitigation) ---------- ____
No (no reasonable potential signlficant effects) ---------- XX

II. CUMULATIVE SOIL PRODUCTIVITY IMPACTS ASSESSMENTS

A. Soil Productivity Impacts Inventory

Cumulative soil productivity impacts occur when the combined impacts of a sequence of management activities produce a significant reduction in soil productivity. These impacts may occur as part of separate activities on the same project, as residual effects of past projects, and as the likely impacts of future projects.

Forest management activities are required to be conducted in a manner that assures "where feasible, the productivity of timberlands is restored, enhanced, or maintained." Therefore, productivity losses resulting from site disturbance in excess of that required by suitable silvicultural and harvesting practices, where conducted individually or in sequence, must be considered as significant.

Impact significance must also be considered relative to the soil productivity potential of the area in question. Losses that can be considered acceptable on highly productive lands may be unacceptable, or even exceed the productivity potential, of lower site lands. For example, productivity reductions from loss of growing space associated with development of roads and skid trails necessary for timber management on high site lands may be greater than the total unit-area productivity of a poor site.

B. Soil Productivity Resources Assessment

Site factors to be assessed for cumulative soil productivity impacts include:

1. Organic matter loss
2. Surface soil loss
3. Soil compaction
4. Growing space loss

The relationship between these site factors and soil productivity is described in Section B of the Appendix to Technical Rule Addendum No. 2 of the Forest Practice Rules.

The potential impact of successive management activities must be assessed for each of these factors individually and in combination, and the overall impact should be classed as significant when:

- The area disturbed by proposed timber operations will exceed that required by the silvicultural and harvest systems approved for use under proposed THP, including unnecessary duplication of existing skid trails, roads, landings, yarding disturbance and mechanical site preparation.
- The amount of organic matter loss and soil displacement with use of the proposed silvicultural and harvesting systems will substantially exceed that of other, feasible systems.
- The amount of compaction and puddling with use of the proposed silvicultural and harvesting systems will substantially exceed that of other, feasible systems, under the soil moisture conditions expected at the time of proposed operations.
- The combined loss of soil productivity from loss of growing space, organic matter loss, soil displacement, and soil compaction from the proposed operations will substantially exceed that of other feasible combinations of silvicultural and harvesting systems.

C. Impacts evaluation

Will the proposed project, as presented, alone or in combination with the impacts of past and future projects have a reasonable potential or cause or add to significant, cumulative soil productivity impacts as a result of:

	Yes, after mitigation	No, after Mitigation	No reasonably potential significant impacts
1. Organic matter loss			XX
2. Surface soil loss			XX
3. Soil compaction			XX
4. Growing space loss			XX
5. Any combination of items 1 through 4			XX

The proposed project involves clearing a site for an 8+/- acre reservoir to augment the City of Fort Bragg's municipal water supply. The City, who owns this property, has determined that the flow of benefits associated with reservoir construction of this site constitute the highest and best for the site to meet the City's needs. The project area is a low Site 3 timberland and the flow of benefits derived from growing timber on this small area is easily outweighed by the benefits associated with reservoir construction which will help insure Fort Bragg's future water supply. To accomplish the goal of creating a reservoir, organic material and topsoil will be cleared off and stock piled to allow construction to occur on mineral soil. After reservoir construction is completed topsoil will be replaced on peripheral areas where appropriate. Soil compaction will be required for a structurally competent reservoir to be created. While soil compaction has negative impacts on growth rates, compacted soil has superior engineering properties for purposes such as the proposed reservoir construction. Soil loss will be minimal due to the gentle slopes involved and the erosion control measures to be applied. Growing space loss will be limited to the area needed to accomplish the reservoir project.

III. CUMULATIVE BIOLOGICAL RESOURCE IMPACTS ASSESSMENT

A. Biological Resource Inventory

1. Identify any of the following categories of listed species known or potentially may occur in the Biological Assessment Area(s) for the proposed timber operations:

- Federally and/or State Threatened or Endangered.
- Sensitive Species (as defined in the Forest Practice Rules)
- Species of Special Concern (as defined by the California Department of Fish and Game).

2. Identify any other wildlife or fisheries resource concerns known or suspected to occur within the Biological Assessment Area(s), including the reasons for boundary selection.

The entire timbered environment and significant elements of the aquatic environment were substantially altered by land use activities which have occurred over the past 150 or more years in the biological assessment area. These activities affected various biological resources to an indeterminate degree. There are no known recent trends which have produced significant cumulative impacts upon biological resources within the assessment area. The assessment area may include habitat for many of the listed species and sensitive species. All native species are considered in the evaluation, with special consideration given to State and Federally listed Threatened and Endangered Species as well as sensitive species.

The most recently available version of the Natural Diversity Data Base (NDDB) section of the Department of Fish and Game has been consulted for occurrences of special animals, plants and natural communities. Scoping included consideration of the Inglenook, Dutchman's Knoll, Mendocino, Fort Bragg, Noyo Hill and Mathison Peak 7.5' quadrangles. The NDDB is the most complete single source of information on California's sensitive species and natural communities, but is a positive sightings database. The California Rare Plant Rank lists and other information sources of anecdotal information have utilized as well. The following is a matrix and descriptions of all rare, threatened, or endangered species, Sensitive Species, and Species of Special Concern that have a reasonable potential to occur in or near the Biological Assessment Area.

SCINAME	COMNAME	FEDSTATUS	CALSTATUS	DFGSTATUS	CNPSLIST
Abronia umbellata var. breviflora	pink sand-verbena	None	None		1B.1
Accipiter gentilis	northern goshawk	None	None	SSC	
Agelaius tricolor	tricolored blackbird	None	None	SSC	
Agrostis blasdalei	Blasdale's bent grass	None	None		1B.2
Arborimus pomo	Sonoma tree vole	None	None	SSC	
Arctostaphylos nummularia ssp. mendocinoensis	pygmy manzanita	None	None		1B.2
Ascaphus truei	Pacific tailed frog	None	None	SSC	
Astragalus agnicidus	Humboldt milk-vetch	None	Endangered		1B.1
Blennosperma nanum var. robustum	Point Reyes blennosperma	None	Rare		1B.2
Calamagrostis crassiglumis	Thurber's reed grass	None	None		2.1
Calileptoneta wapiti	Mendocino leptonetid spider	None	None		
Calystegia purpurata ssp. saxicola	coastal bluff morning-glory	None	None		1B.2
Campanula californica	swamp harebell	None	None		1B.2
Carex californica	California sedge	None	None		2.3
Carex lenticularis var. limnophila	lagoon sedge	None	None		2.2
Carex livida	livid sedge	None	None		1A
Carex lyngbyei	Lyngbye's sedge	None	None		2.2
Carex saliniformis	deceiving sedge	None	None		1B.2
Carex viridula ssp. viridula	green yellow sedge	None	None		2.3
Castilleja affinis ssp. litoralis	Oregon coast paintbrush	None	None		2.2
Castilleja ambigua var. humboldtiensis	Humboldt Bay owl's-clover	None	None		1B.2
Castilleja mendocinensis	Mendocino Coast paintbrush	None	None		1B.2
Charadrius alexandrinus nivosus	western snowy plover	Threatened	None	SSC	
Chorizanthe howellii	Howell's spineflower	Endangered	Threatened		1B.2
Clarkia amoena ssp. whitneyi	Whitney's farewell-to-spring	None	None		1B.1
Coastal and Valley Freshwater Marsh	Coastal and Valley Freshwater Marsh	None	None		
Coastal Brackish Marsh	Coastal Brackish Marsh	None	None		
Coelus globosus	globose dune beetle	None	None		
Collinsia corymbosa	round-headed Chinese-houses	None	None		1B.2
Coptis laciniata	Oregon goldthread	None	None		2.2
Cornus canadensis	bunchberry	None	None		2.2
Cuscuta pacifica var. papillata	Mendocino dodder	None	None		1B.2
Erigeron supplex	supple daisy	None	None		1B.2

Erysimum concinnum	bluff wallflower	None	None		1B.2
Erysimum menziesii	Menzies' wallflower	Endangered	Endangered		1B.1
Eucyclogobius newberryi	tidewater goby	Endangered	None	SSC	
Fen	Fen	None	None		
Fratercula cirrhata	tufted puffin	None	None	SSC	
Gilia capitata ssp. pacifica	Pacific gilia	None	None		1B.2
Gilia millefoliata	dark-eyed gilia	None	None		1B.2
Grand Fir Forest	Grand Fir Forest	None	None		
Hemizonia congesta ssp. congesta	white seaside tarplant	None	None		1B.2
Hesperevax sparsiflora var. brevifolia	short-leaved evax	None	None		1B.2
Hesperocyparis pygmaea	pygmy cypress	None	None		1B.2
Horkelia marinensis	Point Reyes horkelia	None	None		1B.2
Juncus supiniformis	hair-leaved rush	None	None		2.2
Lasiurus cinereus	hoary bat	None	None		
Lasthenia californica ssp. bakeri	Baker's goldfields	None	None		1B.2
Lasthenia californica ssp. macrantha	perennial goldfields	None	None		1B.2
Lilium maritimum	coast lily	None	None		1B.1
Lycopodium clavatum	running-pine	None	None		4.1
Mendocino Pygmy Cypress Forest	Mendocino Pygmy Cypress Forest	None	None		
Microseris borealis	northern microseris	None	None		2.1
Mitellastra caulescens	leafy-stemmed mitrewort	None	None		4.2
Northern Coastal Salt Marsh	Northern Coastal Salt Marsh	None	None		
Noyo intersessa	Ten Mile shoulderband	None	None		
Oceanodroma homochroa	ashy storm-petrel	None	None	SSC	
Oenothera wolfii	Wolf's evening-primrose	None	None		1B.1
Packera bolanderi var. bolanderi	seacoast ragwort	None	None		2.2
Pandion haliaetus	osprey	None	None	WL	
Phacelia insularis var. continentis	North Coast phacelia	None	None		1B.2
Pinus contorta ssp. bolanderi	Bolander's beach pine	None	None		1B.2
Plebejus idas lotis	lotis blue butterfly	Endangered	None		
Progne subis	purple martin	None	None	SSC	
Puccinellia pumila	dwarf alkali grass	None	None		2.2
Rana aurora	northern red-legged frog	None	None	SSC	
Rana boylii	foothill yellow-legged frog	None	None	SSC	

Rana draytonii	California red-legged frog	Threatened	None	SSC	
Rhyacotriton variegatus	southern torrent salamander	None	None	SSC	
Rhynchospora alba	white beaked-rush	None	None		2.2
Sanguisorba officinalis	great burnet	None	None		2.2
Sidalcea malachroides	maple-leaved checkerbloom	None	None		4.2
Sidalcea malviflora ssp. purpurea	purple-stemmed checkerbloom	None	None		1B.2
Sphagnum Bog	Sphagnum Bog	None	None		
Trifolium trichocalyx	Monterey clover	Endangered	Endangered		1B.1
Triquetrella californica	coastal triquetrella	None	None		1B.2
Usnea longissima	long-beard lichen	None	None		
Viola palustris	alpine marsh violet	None	None		2.2

BIRDS:

***Accipiter cooperii* Cooper's Hawk**

The Cooper's hawk is a forest hawk widely distributed throughout the United States year round. This species is present throughout most of California and is a fairly common accipiter in the coastal redwood eco-region. This species is listed as a Species of Special Concern by the CDF&G.

Cooper's hawks feed on a variety of small animals including small mammals, rodents, birds, reptiles and amphibians. Cooper's hawks frequently hunt in broken forested areas and in semi-open meadows and fields. This species may nest in either coniferous or deciduous forests where suitable platform structures to support a nest exist and near water sources. When in predominately coniferous forests, nests are typically located below the lowest live limbs. Cooper's hawks also occur in urban parks and residential areas. Cooper's hawks are highly adaptable and quickly acclimatize and thrive in human altered environments. Like many raptors, Cooper's hawk populations were highly impacted by organochorine pesticides. Since the ban on the use of DDT, their populations appear stable.

No nesting structures were observed in the THP area that are attributable to this species. With the relative abundance and wide-spread distribution of this species no significant adverse impacts are expected.

Reference Literature:

California Wildlife Habitat Relationships System. 2001. California Department of Fish and Game, California Interagency Wildlife Task Group. http://www.dfg.ca.gov/whdab/M132.html

Wheeler, B.K. 2003. Raptors of western North America. Princeton University Press, Princeton, N.J.

***Accipiter gentilis* Northern Goshawk**

The northern goshawk is a forest hawk with a Holarctic distribution, occupying a wide variety of temperate and boreal forests in North America (Squires and Reynolds 1997). In California, northern goshawks occur in the Klamath, Cascade, Sierra Nevada, and North Coast Ranges. This species is listed as a Species of Special Concern by CDFG and is a Board of Forestry Sensitive Species.

At large spatial scales, the goshawk is a forest habitat "generalist"(e.g. occurring in a variety of coniferous, deciduous, and mixed forest types). Habitat requirements at the stand level are fairly narrow. Regardless of forest type, goshawks nest in large trees in forest stands containing a high density of large trees and high canopy closure. Nest sites tend to be located near water on north or west facing, gentle to moderate slopes and near small forest openings or habitat edges. Canopy overstory depth and percent shrub cover were the best variables in predicting goshawk occupancy in nesting stands in Washington. At the landscape scale, these researches found the best variables predicting occupancy was proportion of late seral forest (60-75% of forests with >70% canopy closure of conifers and >10% of the canopy in trees >21 in.) and reduced landscape heterogeneity. No information on nesting habitat in coastal redwood forests is currently available, partly because of the low densities at which goshawks are found in this forest type.

Northern goshawks are generally associated with mature, unmanaged forests, although they will occupy residual mature stands in managed forests if the required habitat components are present. The typical suitable nesting habitat condition at ten nests in northwest California included a mature Douglas-fir stand within a young growth Douglas-fir tract with a scattered hardwood component.

Telemetry studies suggest that goshawks prefer to forage in areas with large trees, high basal area, and high canopy cover. However, goshawks have also been observed foraging in forest openings and clear-cuts. Goshawks in Nevada will forage in open sagebrush away from trees.

The lack of historical records in the coastal redwood region suggests that goshawks occurred there in low densities, perhaps due to the dense understory conditions typically found in this eco-region. Goshawks are also infrequently found on the Oregon Coast Range, which may be due to the dense understory vegetation occurring in that eco-region. The plan area is not believed to be habitat for the goshawk, due primarily to the coastal setting, sparse timber and immediate proximity to Fort Bragg.

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***Accipiter striatus* Sharp Shinned Hawk**

The sharp shinned hawk is a forest hawk widely distributed year round throughout much of North America. This species is present throughout the majority of California and is a fairly common accipiter in the coastal redwood eco-region. This species is listed as a Species of Special Concern by the CDF&G.

Nesting requirements usually include small or moderate-sized trees in coniferous or coniferous-hardwood mixed stands with dense branches, sparse ground cover and near water, though this is not exclusive (Wheeler 2003). The species may forage in open areas near the forests edge, in the upper canopy of tall trees, or beneath the canopy in small trees (Wheeler 2003).

No nesting structures were observed during extensive fieldwork conducted during plan preparation in the THP area that may be attributable to this species. With the relative abundance and widespread distribution of this species no significant adverse impacts are expected.

Reference Literature:
California Wildlife Habitat Relationships System. 2001. California Department of Fish and Game, California Interagency Wildlife Task Group. http://www.dfg.ca.gov/whdab/M132.html

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***Agelaius tricolor* Tricolored Blackbird**
The tricolored blackbird is a year round resident and its distribution in the United States is mostly restricted to California. It is considered locally common throughout the central valley and in coastal areas south of Sonoma County. This species is listed as a Species of Special Concern by the CDF&G. Tricolored blackbirds are associated with emergent wetlands for nesting and foraging. Nests are usually located in dense grasses, cattails, or dense shrubs near fresh water sources. Tricolored blackbirds are ground foragers, feeding on insects, grains, and weed seeds. Major threats to this species include urban development and wetland destruction. The project is located away from watercourses and wetlands therefore no adverse impacts are expected for this species.

***Aquila chrysaetos* Golden Eagle**
Golden eagles are widely distributed across North America during summer months and are year round residents throughout much of the western United States. The golden eagle is sparsely distributed throughout most of California, occupying primarily mountain and desert habitats. The largest populations in California are found in the interior Coast Ranges, particularly south of San Francisco Bay, and in the Great Basin habitats of northeastern California. Although they nest on the perimeters of the Central Valley in oak woodland habitats, none are known from the valley itself, with the exception of an historically active site on the Sutter Buttes. The lowest densities appear to occur in the Coastal Redwood eco-region. This species is listed as a Species of Special Concern by the CDFG and a Board of Forestry Sensitive Species.

Golden eagle territories typically consist of a group of 1-13 nests and a surrounding hunting range. Golden eagles construct their nests on cliff ledges, on high rocky outcrops, or in large trees. In the interior Coast Ranges, tree nests are more commonly used. In the Great Basin and southern California desert regions, cliff-nesting habitat is more available and is more commonly used by nesting eagles. Grassland, oak savanna, and open woodland and chaparral habitats provide suitable foraging habitat for golden eagles. Golden eagles are perch and aerial foraging opportunists with their diet consisting mainly of small mammals including jackrabbits, hares, and squirrels, such as the California ground squirrel and Belding's ground squirrel (in northeastern California). In some regions, game birds and waterfowl are an important food source during the winter. Because cattle grazing promotes large populations of ground squirrels, open, grazed rangelands are also highly compatible golden eagle foraging habitat.

In western North America, the golden eagle population is estimated at 100,000 birds. Although populations in Alaska and Canada appear stable, some small but steady regional declines have been reported in southern California due to

urbanization and in the intermountain West due to widespread fires altering foraging habitat for jackrabbits. However, declines in productivity have not been observed.

No golden eagle nests are known to occur in the planning area. Golden eagles are known to nest in Mendocino County, east of the planning area. The Biological Assessment Area is generally considered too densely forested to support nesting golden eagles. However, because the species is wide-ranging, individuals may seek out foraging opportunities in grazing areas in the Biological Assessment Area, although this is unlikely. Since the plan area is in a semi-developed area and outside the preferred habitat types of the golden eagle no significant adverse impacts are expected.

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Ardea herodias **Great Blue Heron**
Great blue heron range throughout North America except for extremely high latitudes and elevations. This species is found in a variety of aquatic habitat including salt and freshwater marshes, estuaries, mudflats, lagoons, lakes, rivers, and flooded fields. This species is listed as a Board of Forestry Sensitive Species.

Great blue herons nest from late February to July. Nesting usually occurs colonially or solitary in secluded groves of live or dead trees near shallow-water feeding areas. Throughout much of the species' range, rookeries are found in riparian conifer and hardwood forests, usually in the tallest trees or shrubs available.

In the coastal redwood eco-region, great blue herons are thinly scattered over many aquatic habitats, including coastal rivers, forest ponds, lowland marshes, bottomland pastures, coastal bays, and lagoons (Harris 1991). One known rookery occurs near the mouth of the Ten Mile River. Other incidental sightings of great blue herons along Big River are common and blue herons can be observed at McGuire's Pond. Due to the harvest areas upslope location Blue Herons are not anticipated to utilize the project area.

Reference Literature:
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***Brachyramphus maramoratus* Marbled Murrelet**

Marbled murrelets (hereafter murrelets) are a small near-shore seabird distributed from Alaska to northern California. In California, murrelets occur from the Oregon border to the Santa Cruz Mountains. Although marbled murrelets live primarily in near-shore marine environments, during the nesting season they fly inland to nest in low-elevation old-growth and mature coniferous forests. Murrelets are listed as Federally Threatened, State Endangered, and are a Board of Forestry Sensitive Species.

The murrelet nesting period begins in late March, and most young fledge by mid-September. Murrelets incubate only one egg in each nesting attempt, however, there is some evidence that murrelets in California and Oregon may try to re-nest after a failed nesting attempt or may even try two clutches. Murrelets do not construct their nests, but use wide horizontal limbs located in the canopies of old growth or second growth coniferous forests as a nesting platform. Although most nests have been located in conifers, one nest was recently located in a hardwood in British Colombia.

The majority of existing data indicate that murrelets are found primarily in old-growth or mature forest conditions. Throughout its range, excluding Alaska, murrelet habitat can be generally characterized on several spatial scales. At the site (stand) scale the best variables predicting site occupancy are platform density, number of platform trees, greater tree heights and canopy complexity (including number of canopy layers), larger tree diameters, densities of large trees, proximity to other occupied sites, elevation, and slope. In California, the best predictors of stand occupancy were large trees (>39 in. DBH), low elevation slopes, and proximity to streams. In Douglas-fir stands in southern Oregon, murrelets mostly occupied stands in low-elevation slopes with west facing aspects. In both states, cool temperatures and high rainfalls were found to be important climatic variables.

The only known study conducted at the microsite scale in California occurred in the Santa Cruz Mountains in Central California. Murrelets in this study area selected forested areas with greater basal area of trees >47 in. DBH and were located lower on slopes. Nest areas were also closer to streams; however, this variable and position on slope are likely highly correlated. In a study combining data from Washington and Oregon, including data from the Klamath Mountains in southwest Oregon, murrelets select areas within sites exemplified by many platform trees, high platform density, larger platforms, more moss, more horizontal cover, and increased flight access, including distance to edges.

At the nest tree scale, average nest tree characteristics in California appear to be similar to those found in Oregon and Washington with the exception that the majority of nest trees in California have been found in coast redwood. Nest tree characteristics may be summarized as follows:

- Located near openings (natural or man-made) in the canopy for access.
- Large potential nest platforms
- Substrate for nest cup
- Horizontal and/or vertical cover over nest limb
- Sufficient tree heights for murrelet take offs and stall landings

Nest limb descriptions in California show murrelets using large limbs with significant substrate depths and overhead cover. Habitat selection studies in Washington and Oregon confirmed that murrelets overwhelmingly select nest limbs with greater platform widths, extensive moss cover, greater substrate depths, and a high percentage of vertical cover. As

these variables appear biologically meaningful, it is logical to infer that they may be equally important for nesting murrelets in California.

Although there are several recorded instances of murrelets using a residual tree in otherwise younger stands for nesting, these residual trees are located in watersheds where other occupied sites are present, such as the residual tree in Big Creek Basin, Santa Cruz Mountains and the nest tree located in Alder Creek on Mendocino Redwood Company property. The Alder Creek tree is also located approximately 650 ft from suitable habitat, although occupancy status of this habitat is not yet known. Several researchers have suggested that use of residual trees is more likely if the stand is located near suitable old growth habitat (within 200 m.) and when the residuals are clustered within the stand. Use of residuals may also be more likely if they are located in watersheds where other occupied sites exist. Although reproductive success in these residuals is not well known, the murrelet nest located in the Big Creek Basin residual tree apparently failed. Landscape level studies have found that occupied sites across the species range are located in closer proximity to other occupied sites. None of these conditions (e.g. proximity to other suitable habitat/occupied sites nor known occupied sites in the Biological Assessment Area) exists for this THP.

Because so few murrelet occupied sites have been found on managed forests in California, our understanding of the microhabitat requirements of the bird changes, as new occupied sites are located. The discovery of more nest and occupied sites will assist in the determination of the range and variability of microhabitat requirements of nesting marbled murrelets. The nests that have been measured across the species range (excluding Alaska) suggest that the number of potential nest sites on trees may one of the best predictors of stand occupancy. Murrelets require a broad flat surface (referred to as a platform) on a large lateral limb or other lateral structure; large lateral limbs are usually found on trees with larger diameters and/or on older-aged trees. Potential nest platforms include mistletoe blooms, deformed limbs, and areas where a tree may have been damaged.

Surveys for murrelets are currently required in all stands that support potential habitat. Here, potential habitat is defined as mature, old growth, or younger coniferous forests with multiple residual conifers in smaller clumps, which have deformations or other structures suitable for nesting. Although this definition is general, it encompasses some of the new information on murrelet nesting, including documented activity in younger forests (40-80 years) in the Oregon coast range and sites found in 1995 along Alder Creek. Nonetheless, nearly all marbled murrelet nest trees have been located in old growth and mature stands or stands with old-growth characteristics.

The plan area is not associated with marbled murrelet habitat and therefore no impacts to this species are expected.

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Casmerodius albus **Great Egret**

Great egrets range throughout the United States during summer months except for extremely high latitudes and elevations. In California, great egrets occur as year round residents in the Sacramento Valley and along the coast in the north. This species is listed as a Board of Forestry Sensitive Species.

Great egrets are large, colonially nesting water birds that feed on fish, snakes, amphibians, snails, crustaceans, insects, and small mammals. This species is found in a variety of aquatic habitat including salt and freshwater marshes, estuaries, mudflats, lagoons, lakes, rivers, and flooded fields.

Great egrets nest in groves of large trees, usually near water, and often-in mixed colonies with great blue herons. Because great egrets are sensitive to disturbance during nesting, rookeries usually occur in isolated locations. Great egrets can be found foraging throughout the year in coastal lagoons, saltwater marshes, tidal mudflats, bays, estuaries, freshwater marshes, irrigation canals, flooded fields, and slow-moving water around lakes and streams.

Breeding occurs from March to July. Breeding occurs primarily in the Central Valley, the Sacramento-San Joaquin Valley Delta, around San Francisco Bay, and along the central coast. Additional nesting colonies occur around Humboldt Bay, on the Modoc Plateau, near the Salton Sea, and along the Colorado River. Great egrets disperse along the entire California coast during the winter.

Great egrets were hunted almost to extinction for their plumage in the late 19th and early 20th centuries. With passage of the Migratory Bird Act, populations increased dramatically throughout their range. The use of organochloride pesticides (DDT) caused population declines through eggshell thinning leading to lower reproductive success. As with most species in this Family, the greatest threat to great egrets today is localized agricultural expansion and wetland drainage for urbanization. Human intrusion often results in the abandonment of nests.

This species is common along the north coast in winter. Incidental sightings of this species have been reported along the Ten Mile and Big Rivers. No known rookeries occur within the Biological Assessment Area. No significant adverse impacts are expected since the project area is located well outside the Great egret's normal habitat.

Reference Literature:
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Chaetura vauxi **Vaux's Swift**

Vaux's swifts occur as a summer resident from southeast Alaska south to central California. The majority of nesting habitat for this species is natural and artificial cavities, although nesting does occur in other structures such as chimneys and smoke stacks. In coast redwood forests, the Vaux's swifts roost and nest in large hollow trees. This species is listed as a Species of Special Concern by CDF&G. The main limiting factor for this species nesting on forested landscapes is the abundance of large, hollow trees or snags. Based on the projects small size in comparison to the amount of timberland available in the BAA no significant adverse impacts are expected.

Reference Literature:
California Wildlife Habitat Relationships System. 2001. California Department of Fish and Game, California Interagency Wildlife Task Group. http://www.dfg.ca.gov/whdab/M132.html

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Stokes, D. and L. Stokes. 1996. Stokes field guide to birds: western region. Little, Brown, and Company Press, New York, New York.

Charadrius alexandrinus nivosus **Western Snowy Plover**

This species is associated with sandy beaches at marine or estuarine shores. It is also found near salt pond levees and the shores of large alkali flats. It requires sandy, gravely or friable soils for nesting. This species is listed as Federally Threatened and Species of Special Concern by CDF&G. The major threats to the snowy plover are nest destruction/disturbance on beaches and coastal development. This species has been observed at MacKerricher State Park and the Ten Mile Dunes Recreation Area, a few miles north of Fort Bragg. As no suitable habitat exists within the Biological Assessment Area, no significant adverse impacts are expected.

***Circus cyaneus* Northern Harrier**
Northern harriers are distributed throughout North America during the breeding season, and throughout much of the United States year around, including the coastal redwood region. This species is listed as a Species of Special Concern by CDF&G. Northern harriers typically nest near ground level in moist open areas such as wet meadows, freshwater and saltwater marshes, abandoned fields etc. As the project is located away from the above described habitats, no adverse impacts are expected for this species.

***Dendroica petechia brewsteri* Yellow Warbler**
Yellow warblers are neo-tropical migrants widely distributed throughout North America during summer months. In California, yellow warblers occur in desert, montane, and coastal wooded or mixed conifer habitats with substantial shrubs. This species is listed as a Species of Special Concern by CDF&G. Yellow warblers commonly nest in riparian areas associated with willows and alders though both nesting and foraging can occur in upland forest habitats. Based on the absence of riparian habitat within the plan area and the projects small size in comparison to the amount of timberland available in the BAA no significant adverse impacts to this species are expected.

***Falco peregrinus* Peregrine Falcon**
Peregrine falcons are distributed worldwide, with the exception of Antarctica. The breeding range in California includes most of the Coast Range, inland north coastal mountains, Klamath Mountains, Cascade Ranges, and the Sierra Nevada. Although uncommon, wintering birds can be seen throughout California. This species is listed as Federally and State Endangered and is a Board of Forestry Species of Special Concern.

Peregrines typically feed on highly mobile, flocking, and colonial nesting birds, such as shorebirds, waterfowl, and doves and pigeons. It has been suggested that the distribution of peregrines is limited by the distribution of prey species of this type.

Peregrine falcons nest on cliff ledges, small outcrops and in trees. Along coastal areas from California northward to British Columbia, nesting also occurs on "sea stacks". A number of re-introduced pairs also nest on tall buildings and nests have been located on bridges and towers. Cliffs that provide lodges, potholes, or small caves, usually with an overhang, and that are relatively inaccessible to mammalian predators are required components of nesting habitat. Nest sites usually provide a panoramic view of open country, are near water, and are typically associated with local abundance of passerine, waterfowl, or shorebird prey.

Peregrine populations underwent massive declines throughout North America beginning in the early 1950s and reached a low point in the 1970s. The subsequent recovery has been very rapid, primarily as a result of reintroducing birds reared in captivity, protection from persecution under federal and state laws, and the ban on the use of pesticides.

One of the densest Peregrine falcon populations in the state is located along the coast from Sonoma County north. A Peregrine falcon nests are known to occur in the North Fork Usal Creek area, North Fork Noyo headwaters, Reeves Canyon and Rancheria Creek drainages. .

Due to a lack of potential nesting locations and no historical or recent sightings within the Biological Assessment Area, no significant adverse impacts are expected.

***Fratercula cirrhata* Tufted Puffin**
This species is a coastal shorebird distributed from Alaska to California and does not generally enter into forested regions. This species is listed as a Species of Special Concern by CDF&G. Because this species does not utilize the habitat present within or near the THP, no significant adverse impacts are expected.

***Haliaeetus leucocephalus* Bald Eagle**
Bald eagles are widely distributed across North America during summer months and are year round residents throughout much of the United States. During summer months, bald eagles may be found across most of California with the exception of the southeast portion and may be found year around in the north-central portion of the state. This species is listed as State Endangered and is a Board of Forestry Sensitive Species.

Bald eagle nest sites are always associated with a lake, river, or other large water body that supports abundant fish and waterfowl prey items. In California, 70% of the breeding eagle population is associated with water bodies over 200 ha (494 ac). Nest trees are usually within 1 mile (1.6 km) of water and are typically in mature and old-growth conifer stands. Nests are constructed in trees that provide an unobstructed view of the water body and that are typically the dominant or co-dominant tree in the surrounding stand. Snags and dead-topped trees are important for perch and roost sites. Nest sites are usually located in areas lacking human disturbance, however, numbers of bald eagle territories are increasing in areas in close proximity to humans including urban parks, neighborhoods, and golf courses.

Historically, bald eagles bred in a variety of habitats in California, including offshore islands, on coastal cliffs and pinnacles, and along coastal rivers, interior valley streams and wetlands, and mountain lakes and rivers. Nest trees included a wide variety of hardwoods as well as conifers. However, most eagle nesting territories are now found in mountainous habitats in ponderosa pine and mixed conifer forests. Ponderosa pine is the tree most often used for nesting, although nest sites have been observed in a variety of tree species. The only known occurrence of a bald eagle nesting in a redwood is on the Mad River in Humboldt County on Green Diamond Resource Company ownership.

Bald eagles are territorial during the breeding season, but densities and home range sizes are highly variable because of large variations in the dispersion and availability of potential nest sites and prey. For example, in western Washington, the mean density of occupied nests <2 km from 6416 km of forested marine shorelines was 1 nest/10.4 km while the density of occupied nests along 1728 km of inland waters in eastern Washington was 1 nest/34.6 km. These densities suggest that the Washington nesting population of bald eagles is near, or at, saturation. Other reported densities range from 0.08 nests per km of shoreline in British Columbia to 0.56 in Alaska. In Oregon, the average inter-nest distance among eight pairs was 3.2 km. Bald eagles winter communally along specific rivers, lakes, or reservoirs that support prey species and have large trees or snags for perch sites and night roosts.

Bald eagles were highly persecuted up until 1940, when they were afforded protection under the Bald Eagle Protection Act. Further dramatic declines in bald eagle populations occurred during the next 3 decades from the use of pesticides, especially organochlorine pesticide (DDT), which bio-accumulates through the food chain and causes eggshell thinning and breakage. DDT was banned in the U.S. in 1972, and since that time bald eagle populations have rebounded dramatically. For example, in 1963, a total of 417 active occupied sites were known in the lower 48 states, while in 1998, an estimated 5,748 breeding sites were reported. The bald eagle population in the lower 48 states has approximately doubled every 7 to 8 years during the past 30 years.

In 1999, 199 known nest sites were recorded in California, with most nest sites found in northern California. No bald eagle nests are known to occur in the planning area. Two nests were reported along Big River and additional nests along the Ten Mile River in Mendocino County prior to 1940. The nearest record of nesting bald eagles is Booneville, from former CDF&G biologist Ted Wooster in 1999. Since nesting Bald Eagles are not known to occur within the assessment

area and because the plan will maintain suitable perching trees in timber stands within WLPZs and adjacent areas, no significant adverse impacts are expected.

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***Icteria virens* Yellow Breasted Chat**
Yellow breasted chats are neo-tropical migrants widely distributed throughout North America during summer months. In California, yellow breasted chats occur in both coastal and Sierra foothill riparian habitats, although they are uncommon along the coast in northern California. This species is listed as a Species of Special Concern by CDF&G. Yellow breasted chats are closely associated with dense thickets of willow and shrubs near watercourses for nesting and foraging. Based on the absence of riparian habitat within the plan area and the projects small size in comparison to the amount of timberland available in the BAA no significant adverse impacts to this species are expected.

***Pandion haliaetus* Osprey**
The osprey is a migratory, fish-eating hawk with one of the broadest geographic distributions of any bird. The species is widely distributed throughout Eurasia, the Americas, Africa, and Australia. In California, ospreys breed throughout northern California from the Cascade Range south to Marin County and throughout the Sierra Nevada. This species is listed as a Species of Special Concern by the CDF&G and is a Board of Forestry Sensitive Species.

Large river systems in northwestern California support numerous breeding pairs. The essential habitat requirements of osprey include a water body with abundant and accessible fish and nearby nest sites. Foraging almost exclusively on fish, ospreys are only found in association with lakes, reservoirs, coastal bays, ocean coastlines, or large rivers and deltas. Nests are usually within 1,000 ft of a food source, but are occasionally as far away as 1 mile. Nests are typically constructed on top of tall, broken-top trees or snags, which are often taller than the surrounding vegetation. Nest sites are usually in open forest habitat or along the edge of a water body for easy accessibility. Artificial nest platforms are readily used and often result in higher productivity than natural nest sites.

Osprey were highly impacted by organochloride pesticide (DDT) use from the late 1940's to the mid-1970s, and pesticide poisoning extirpated smaller populations in several states. The ban on DDT lead to an explosion of osprey populations with numbers increasing in the U.S. alone from an estimated 8,000 pairs in 1981 to over 14,000 nesting pairs in 1994. The number of breeding pairs in California was estimated from 500-700 in 1994 and populations continue to grow.

Ospreys are readily observed along the Mendocino County Coastline. There are no known historic osprey nest sites within the proposed plan area. No nesting ospreys have been observed in or around the THP area. No significant adverse impacts are expected based on the above.

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***Progne subis* Purple Martin**
The purple martin is a neo-tropical migrant occurring throughout much of the United States. Purple martin are summer residents in California, utilizing a variety of open forest habitats (including redwood), woodlands, and riparian areas, and nesting mostly in woodpecker cavities. It feeds primarily on insects caught on the wing, but will also forage on the ground. It is listed as a Species of Concern by the CDF&G. The primary threats to this species are loss of riparian habitat, removal of snags, and competition for nest cavities with other species, including introduced European starlings and house sparrows. Based on the absence of riparian habitat within the plan area and the projects small size in comparison to the amount of timberland available in the BAA no significant adverse impacts to this species are expected.

***Strix occidentalis caurina* Northern Spotted Owl**
The northern spotted owl (hereafter spotted owl) is one of three spotted owl subspecies inhabiting western North America. The range of the spotted owl extends from southwestern British Columbia to Northwestern California south to Marin County, California. The eastern edge of its range corresponds roughly with the eastern periphery of the Cascade Range and the Central Valley in California. This sub-species is listed as Federally Threatened. This sub-species is also formally being considered for listing under CESA by CDF&G and is a Board of Forestry Sensitive Species. Throughout its range, the spotted owl is associated primarily with mature/old conifer forests. Studies of habitat use indicate that owls generally select mature/old forests for nesting, roosting, and foraging in an amount equal to or greater than expected, and younger forests in an amount less than expected. However, spotted owl populations in some physiographic provinces deviate from this general pattern.

Spotted owl home range sizes vary widely between forest type, physiographic province, and individual spotted owls. Spotted owl home range size in the California coast redwood zone averaged 1,476 ac [Irwin & Rock 2005], while home range sizes in the Eastern Cascade physiographic province in Washington averaged 8,072 ac. Several studies found a negative correlation between home range size and the proportion of mature/old forests in the home range and breeding densities negatively correlated with the amount of forest fragmentation. However, as spotted owls persist in relatively small home ranges in regions with little mature/old forests remaining, other factors likely influence home range size. For example, spotted owl home range sizes were smaller when wood rats were the primary prey, while spotted owl home range sizes were larger when flying squirrels dominated the spotted owl's diet. In addition, spotted owl home range size tends to be negatively correlated with the abundance of wood rats.

Habitat use studies in many of the forest types and physiographic provinces across the spotted owl's range have led to an emphasis on the importance of forest structure. Optimal spotted owl habitat has been characterized as uneven-aged forest

with a multi-layered canopy, high canopy closure, large overstory trees, and a considerable degree of decadence, such as trees with broken tops and cavities for nesting, dead snags, decaying logs, and woody debris on the forest floor.

Deviations from the general patterns of mature/old forest habitat associations occur at both the individual and population levels. This is particularly true in the coastal redwood forest zone, where substantial spotted owl populations persist in forests much younger than those typically inhabited in other forest types and eco-regions. In the coastal redwood forest zone, spotted owls nesting and roosting occur in areas dominated by younger age classes, and relatively high breeding densities have been reported in managed forests from this region. Although spotted owls in the coastal redwood region use younger stands for nesting and roosting, several studies indicate that spotted owl use of nesting and roosting habitat may still be dependent on forest structural attributes associated with mature/old forest. At the landscape level, habitat mosaics surrounding spotted owl nests in the coastal redwood zone contain a greater amount of younger 31-45 yr and 45-60 yr age class forest than unused sites.

The location and habitats of the spotted owls within the Biological Assessment Area are well known due to extensive monitoring conducted since 1989. Operations will not occur until take avoidance determination has been made. No NSO activity centers are known to occur within 0.7 miles of the project area therefore changes in habitat will not significantly affect known NSO. Given the lack of NSO in this area, the projects small size in comparison to the amount of timberland available in the BAA and the extremely marginal nature of the NSO habitat within the project area no significant adverse impacts are expected.

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MAMMALS:

***Antrozous pallidus* Pallid Bat**

The pallid bat is a common, widely distributed species throughout California. Day roost habitat includes caves, crevices, mines, and occasionally buildings and tree hollows. Habitat preferences appear to be rocky outcrops, cliffs, and crevices with open habitats for foraging. This species is listed as a Species of Special Concern by the CDF&G. The NDDB has no listing for the pallid bat in Mendocino County, although the species is known to exist in Sonoma & Marin Counties. The California Wildlife Habitat Relationship System suggests a low likelihood of occurrence in coastal redwood forests. Because the assessment area does not contain the highest use habitats and the projects small size in comparison to the amount of timberland available in the BAA and given special mitigation measures incorporated into THP Section II to insure bat species are not significantly impacted no significant adverse impacts to this species are expected.

***Arborimus pomo* Sonoma Tree Vole**

The Sonoma tree vole (*Arborimus pomo*) is an arboreal, small rodent restricted to coastal forests in the humid fog belt in northwestern California where their range extends from Sonoma County northward into Del Norte County. The red tree vole (*A. longicaudus*) and the Sonoma red tree vole were split in 1991 based on genetic studies. This species is listed as a Species of Concern by the CDF&G.

The Sonoma tree vole (hereafter tree vole) has a specialized diet consisting of the soft tissue of Douglas-fir needles. It will also feed on needles, buds, and bark of Douglas-Fir and other conifers. The tree vole is a nocturnal rodent that is active year round.

It has been suggested that old-growth forest appears to be optimum habitat due to tall, multi-layered canopies retaining humidity and intercepting fog, thereby functioning as both a source of free water and a climatic buffer and that red tree vole nests were most abundant in old-growth forests. However, recent findings suggest that red tree voles may not be old-growth dependent and occur in a variety of stand ages such as closed sapling-pole-saw timber, large saw timber, and old-growth coniferous forest stands. In a study on industrial timberlands, investigators found tree vole nest abundance increased with stand age however, none of the stands sampled were old growth. Another investigator found significantly more Sonoma tree voles nests in mature (>61 cm DBH) stands than in young or pole stands, although nests were found in younger stands. Basal area of Douglas-fir (75-90 m^2/ha) and percent slope (25-37%) were the best variables explaining tree vole nest abundance. Hardwoods are not recognized as an important habitat component; however, nests have been located in tanoaks.

Tree vole nests occur in the Biological Assessment Area. Based on mitigation measures incorporated into THP Section II, the open and sparse nature of the stand and the projects small size in comparison to the amount of timberland available in the BAA no significant adverse impacts to this species are expected.

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Martes pennanti pacifica **Pacific Fisher**

In accordance with a recent Superior Court for the State of California decision, the California Fish and Game Commission is in the process of potentially reinstating the Pacific Fisher as a Candidate Species under the California Endangered Species Act (CESA).

The Pacific fisher is a large member of the weasel family occurring in Canada and the U.S., including portions of the Pacific Northwest into northern California. According to CAL FIRE and CDFW range maps (CAL FIRE, August, 2009; CDFW CWHR, Version 8.2) fishers are considered rare or absent in the coastal redwood forests of Mendocino County, and are based on limited anecdotal sightings occurring in this region. These un-substantiated sightings should be viewed with caution as they are inherently unreliable. According to range maps produced by Bill Zelinski and Keith Slauson,

foremost experts on fisher in California, the fisher's range based on verifiable records includes eastern Mendocino County but excludes the coastal region. Substantial survey efforts in coastal Mendocino County supports this observation as track plate surveys and camera surveys have failed to provide physical evidence of fisher in coastal redwood forests. Meso-carnivore track plate surveys conducted by the prior landowner Georgia-Pacific in the 1990s failed to detect fisher, as well as camera surveys conducted in 2003 on the adjacent ownership of Jackson State Demonstration Forest. The most comprehensive and systematic meso-carnivore surveys conducted to date are on the adjacent Mendocino Redwood Company ownership wherein surveys conducted from 2004 to present have failed to detect fisher. In terms of anecdotal evidence, the hundreds of field hours spent by biologists during 20 years of northern spotted owl surveys on Campbell managed timberlands have failed to sight fisher. The lack of fisher detections during meso-carnivore surveys in the region and the lack of sightings by biologists in the assessment area suggest that fisher are either absent, or are so rare as to escape detection.

There have been limited fisher habitat studies on coastal redwood managed forests in northern California. These studies, conducted in Del Norte and Humboldt County, only examined habitat where fisher were detected and were not directed at characterizing den or rest sites, therefore, they are of limited utility when characterizing a range of fisher habitat requirements in the coastal redwood region. These detection surveys suggest fishers occur less commonly (e.g. significantly lower detection rates) in coast redwood forests closer to the coast than in Douglas-fir/hardwood forests dominating more xeric inland sites. Fisher detection rates were positively correlated with stands of large diameter mixed Douglas-fir and hardwood, elevation, log volume, and moderate slopes. Fisher may generally be associated with either late-successional forests or second growth forests containing late-successional structural elements such as high densities of large conifer (esp. Douglas-fir) and hardwood, snags, deformed trees, large woody debris, high canopy closure, etc. Fisher use cavities in large diameter trees and snags for natal and maternal dens and more rarely, downed logs and brush piles. For resting sites fisher will also use large limbs (platforms), tree cavities, rock piles, and sub-nivean cavities. The fisher is an opportunistic hunter and feeds on a variety of vertebrates, including birds, rabbits, and rodents, including wood rats.

Although the range of habitat requirements for fisher in coastal redwood forests is unknown, the typically described habitat for fishers is not generally present within the assessment area. Green Diamond Resources, which manages redwood/Douglas-fir in northern California has conducted several studies regarding fishers on their ownership, and states "Green Diamond's work on this species demonstrated that most of the same conservation measures developed for the owls were also beneficial for fishers."[1] Ongoing habitat relationship studies being conducted on the Hoopa Valley Tribal ownership in the Klamath Region has suggested merit in this generalized approach on industrial managed landscapes.

The project area is located on the western edge of a large block of habitat comprised of several major forestland ownerships including Hawthorne Timber Company, The Conservation Fund, Jackson Demonstration State Forest, California State Department of Parks and Recreation and the Mendocino Redwood Company. Management practices on the above ownerships range from timber production utilizing various silvicultural practices to no harvest mandates. Since the redwood forest type is not the Pacific Fishers preferred habitat type and since sightings of this species in Mendocino are limited to a few historical reports it is very unlikely that the Pacific Fisher resides within the assessment area. Given the semi-developed nature of the project area and the projects small size in comparison to the amount of timberland available in the BAA no significant adverse impacts to this species are expected.

Myotis lucifugus **Little Brown Myotis**
This species of bat has a moderate range, but is locally common within its range. This species is listed as a Species of Special Concern by the CDF&G. Populations appear to be limited by the availability of roosting sites, which are

[1] http://www.greendiamond.com/environment/wildlife.asp#owl

primarily buildings, trees, rocks, wood, and occasionally caves. The little brown myotis may roost in cavities and fire scars present on some residual wildlife trees. Because the assessment area does not contain the highest use habitats and the projects small size in comparison to the amount of timberland available in the BAA and given special mitigation measures incorporated into THP Section II to insure bat species are not significantly impacted no significant adverse impacts to this species are expected.

Myotis yumanensis **Yuma Myotis**
The Yuma Myotis appears to prefer open forests and woodlands adjacent to water sources to forage over. This species will roost in buildings mines, caves, or crevices. A lack of suitable roosting locations within the assessment area indicates that the area may not be heavily used by this species. This species is listed as a Species of Special Concern by the CDF&G. Because the assessment area does not contain the highest use habitats and the projects small size in comparison to the amount of timberland available in the BAA and given special mitigation measures incorporated into THP Section II to insure bat species are not significantly impacted no significant adverse impacts to this species are expected.

Corynorhinus townsendii **Townsend's Big-eared bat**
Townsend's big-eared bats are candidates for listing under the California Endangered Species Act (CESA). The Townsend's big-eared bat is a medium-sized bat that occurs throughout California and western North America, except at extreme high-elevations. Townsend's big-eared bats use caves, mines, buildings and old growth conifers with large basal hollows (none of which are known to be present on this ownership) for roosting and maternity colonies. This species uses open areas including forest edges and riparian corridors along larger watercourses for foraging and is also known for picking prey off of vegetation.

Although Townsend's big-eared bats occur throughout California, except at high elevations (e.g. alpine habitats), their occurrence is generally spotty, apparently limited by occurrence of roost opportunities. Roosting, maternity and hibernacula sites in California include limestone caves, lava tubes, abandoned mines, buildings, barns, and other abandoned anthropogenic structures (Williams 1986).

In the coastal forests of northern California, this species is known to roost in large basal hollows of old growth redwood trees (Fellers and Pierson 2002, Mazurek 2004). Mazurek (2004) confirmed the use of two old-growth trees with large basal hollows as Townsend's big-eared bat maternity roosts in Grizzly Creek State Park, Humboldt County. These trees exhibited diameters at breast height (dbh) of approximately 10 feet and 15 feet with basal hollow openings of approximately 30 square feet (12 feet high x 2.5 feet wide) and 75 square feet, (15.4 feet high x 4.9 feet wide) respectively. Mazurek (2004) further surveyed an additional 180 trees with basal hollows, of which 13 (7%) were likely used as maternity roosts based on guano DNA analysis. Average dbh of the 13 trees was approximately 9 feet; however, no range of dbh was provided. This study was located within old-growth forest where basal hollows occur in much higher densities than typically occurs on industrial timberland forests. In Mendocino County, another study on industrial managed landscapes examining wildlife use of 15 isolated legacy trees with basal hollows compared to those without did not find any evidence of roosting by Townsend big-eared bats (Zielinski and Mazurek 2004). Lastly, in a study of roosting and foraging behavior of Townsend's big-eared bats in Sonoma County of coastal California, basal hollows in six redwood trees used by daytime roosting males had a minimum dbh of approximately 4 feet with basal hollow openings ranging between approximately 3 and 83 square feet, however these basal hollows were not used as maternity roosts (Fellers and Pierson 2002). Density of trees with basal hollows in the area was not indicated, however, the area was described generally as second growth redwood, and therefore the density of trees with basal hollows was likely low to moderate in occurrence. Frequency and intensity of use of isolated basal hollows by roosting Townsend's big-eared bats, especially for maternity roosts or hibernacula is unknown, but based on the studies conducted to date, use of these basal hollow isolates may be low in Mendocino County and consist mainly of daytime roosting sources.

Colony size ranges from a few dozen to several hundred. Some colonies are known to change roosts during the maternity season based on changing thermal regimes within the roosts; using cooler roosts earlier in the year (Peirson et al. 1991) and warmer roosts after pups are born. These roost changes may depend on the type and structure of the roost itself (Sherwin et al. 2003). Maternal colonies form between March and June and one pup per female is born between May and July (Pearson et al. 1952; Harvey et al. 2011). Young begin to disperse in September and October (Pearson et al. 1952, Tipton 1983). Maternity roosts and hibernacula sites may be sensitive to anthropogenic disturbance, resulting in abandonment. However, types and frequency of disturbance leading to abandonment has not been documented in Townsend's big-eared bat use of basal hollows. Mazurek (2004) describes one of the basal hollows used as a maternity colony in Grizzly Creek occurring directly adjacent to a "high traffic foot trail".

There are no known Townsend's big-eared bat colonies and no known mine shafts or caves present on this property. Abandoned anthropogenic structures are not known to be present on the timberland owner's property within the Plan boundary or within 300 feet of the Plan boundary on the timberland owner's property. Large old-growth trees with basal hollows could be considered as cave (Mazurek 2004) and function as maternity roosts or hibernacula roosts. On the timberland owner's property there are no known trees which have the characteristics required to provide maternity and/or hibernaculum colony roost habitats. Potential roost structures include large trees (≥8 feet dbh; adapted from maternity roosts in large redwood trees with average dbh of 9 feet as described by Mazurek 2004) with large basal hollows and an internal roost area large enough for flying forays (larger than the entrance). The roost entrance in general must be at least 10 square feet in size with a minimum opening dimension of 2 feet. The roost ceiling must be dome-like (allowing for multiple bats to roost in clusters) and occur at least 1 foot above the top of the entrance (allows for better protection from predators and changing microclimates). The only light penetrating the roost area must originate from the roost entrances so that the internal roost area remains semi-dark to dark (Fellers and Pierson, 2002).

Because no habitat suitable for maternity roosts or hibernacula is known to occur in the THP area or within 300 feet of the THP area no significant adverse impacts are expected to this species.

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Taxidae taxus **American Badger**

The American badger is an uncommon permanent resident throughout most of California. This species is listed as a Species of Special Concern by the CDF&G. The American badgers preferred habitat is open stages of shrub, forest, and herbaceous habitats with friable soils. Habitat types used by this species do not occur within the THP area and no occurrences of this species are known to have been reported in this area. No significant adverse impacts are expected.

FISH:

Eucyclogobius newberryi **Tidewater Goby**

Taxonomy: Tidewater gobies are the only species in the genus *Eucyclogobius* and are most closely related to marine gobies.

Distribution: Tidewater gobies are endemic to California and live in lagoons of coastal streams from Del Norte County south to San Diego County. They are generally absent from areas where streams do not form lagoons. Historically they were present in at least 87 coastal areas, but are now gone from many areas, particularly lagoons entering San Francisco Bay and in Southern California.

Life History: Tidewater gobies have adapted for life in coastal lagoons at the mouths of inflowing streams. They prefer lagoons that are seasonally blocked by sandbars and thus brackish, with cool temperatures and bottoms of sand and silt. Salinities of less than 10 ppt are preferred, and consequently in larger lagoons they are only found in upstream areas. They also require well-oxygenated water, and are usually absent from areas that stagnate or stratify. Their optimal habitats are shallow lagoons (20-100 cm depth) surrounded by beds of vegetation.

Although predation from birds and larger fish (salmonids and other piscivores) does occur at some level, tidewater goby populations are essentially controlled by environmental factors. When winter storm conditions breach lagoon barriers a temporary tidal environment is created, causing populations to plummet. However, they quickly recover in summer. Thus tidewater gobies are for the most part an annual species with only a few individuals living longer than a year.

In spawning, the behavior of tidewater gobies is unusual. The females compete for males and are therefore the more brightly colored and aggressive sex. Males construct spawning burrows. The eggs are adhered to the burrow wall by the female and fertilized by the male. The male then guards the eggs during incubation. Although spawning can occur at all times of the year, most activity occurs from April to November. Tidewater gobies typically do not migrate for spawning.

Status: Somewhere between 25% and 50% of the tidewater goby populations have been lost in the last 100 years, most of them south of Point Conception. Thus the tidewater goby was listed as Endangered by the USFWS in 1994 and was listed as Endangered by the State of California in 1987 giving the fish protected status in the state. In 2001 the USFWS proposed to de-list the northern population, citing studies that showed greater northern populations than what had been previously found. However, after some consideration the de-listing proposition was not enacted.

Coastal development projects that result in the loss of coastal salt marsh habitat are currently one of the major factors adversely affecting the tidewater goby. Secondary factors thought to adversely affect the species are:

- Sedimentation of wetlands due to poor watershed management
- Diking and draining of wetlands
- Breaching of sandbars at estuary mouths
- Pollution
- Predation from non-native species such large mouth bass and sunfish

It is believed that their populations are significantly more robust in Mendocino, Humboldt, and Del Norte County estuaries than those found in Southern California. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species and its habitat.

***Lampetra tridentata, Lampetra ayresi, Lampetra richardsoni* Lampreys**

Lampreys are specialized aquatic vertebrates, eel-like in form but lacking the jaws and paired fins of true fishes. They are distantly related to some of the earliest known vertebrates, the jawless fishes. Like their ancient ancestors, lampreys have a vertebral notochord, a cartilaginous skeleton, a singe nostril, a small brain, and two semicircular canals in each side of the head, rather than the three found in the bony fishes. Three species of lamprey are found in the rivers and streams of the redwood region, Pacific Lamprey *(Lampetra tridentata)*, River Lamprey, (*Lampetra ayresi*), and Western Brook Lamprey, (*Lampetra richardsoni*). They presumably inhabit (in their larval form) most streams and rivers within Mendocino County.

Lampreys have two distinct life cycle stages, the non-predatory larval (ammocoete) portion (3-7 years) spent in rivers and streams, and the predatory adult portion (6-19 months) spent at sea. In their relatively short predaceous phase, adult lamprey latch onto the side of a large fish with their sucker-like mouth and rasp a hole with its powerful tongue, which is covered with sharp, horny plates. The feeding lamprey then extract blood and body fluids until satiated, in some cases causing mortality in the prey species (preferences varying by lamprey species). Near the end of the adult phase, lampreys migrate from the ocean into tributary streams to spawn, where they build nests in gravel bottomed areas, spawn, and die. After the embryos hatch, the emergent ammocoetes are carried downstream to mud- or sand-bottomed backwaters where they burrow in and spend the next few years living on a diet of algae and detritus. Eventually, the ammocoetes undergo a dramatic metamorphosis from a reclusive riverine detrivore to an active marine predator and migrate back to the ocean. In this process they develop large eyes, a sucking disc, silver sides and dark blue backs, and radical changes in their internal anatomy. Some lampreys (Western Brook Lamprey in this region) have evolved into non-predatory species, essentially lengthening the larval portion of their life cycle and compressing the adult phase. The adults do not migrate or eat, solely attaining the adult form for spawning purposes. The non-predaceous species is therefore non-anadromous.

Lampreys in riverine habitat are not known to be limited by stream temperature; however some literature suggests that high levels of fine material in stream substrate may limit spawning success, emergence, and growth in ammocoetes. Relatively little research has been conducted on these three species, so their population status is unknown. According to Moyle in Inland Fishes of California, it is generally believed that these fishes are presently less numerous than their historic populations, due to pollution and disturbance of their spawning and rearing habitat. Most lampreys are still

present in their native areas, but the large runs that once occurred in streams such as the Eel River are greatly reduced. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species and its habitat.

Lavinia symmetricus California Roach, Lavinia symmetricus navarroensis Navarro Roach

Taxonomy: The taxonomy of the California roach is not well understood. Some biologists believe that the highly distinctive forms characterizing the six or seven subspecies are different enough to be recognized as separate species. Under the single species classification, eight subspecies are recognized, with the Navarro roach (*Lavinia symmetricus navarroensis*) being the form endemic to the Navarro River and possibly to other streams in this area.

Distribution: California roach are distributed throughout the Sacramento-San Joaquin Basin. On the coast, they are found in the Navarro, Gualala, and Russian Rivers, streams tributary to Tomales Bay, Pescadero Creek, and in the Monterey Bay drainages. Although roach populations have diminished in some drainages from anthropogenic factors, they have also increased their range in others due to introduction. Consequently, in this region they can be found in the Eel River drainage, where they formerly did not occur. CDF&G's Steelhead Research and Monitoring Program has identified a few individuals in the Noyo River during trapping operations, although they are not normally known to occur there.

Life History: California roach are found in a wide variety of habitats, although they appear to be excluded in some drainages by nonnative piscivorous fishes. Roach are generally found in small warm streams; in coastal streams they frequently occur in the lower reaches. These fish are tolerant of relatively high temperature ranges (30-35°C) and low oxygen levels (1-2ppm), a characteristic that enables them to survive in conditions too extreme for other fishes. Roach eed largely by browsing on the bottom, but also occasionally prey on drift organisms including terrestrial insects. They are omnivores, primarily feeding on filamentous algae.

Status: Although there is still some question as to whether the Navarro roach is a separate species, this is the closest subspecies of roach that may be affected by timber operations in this area. The Navarro populations are presently believed to be abundant and possibly increasing because of anthropogenic increases in water temperature. Due to the stable population status of these fish in the Navarro River, no significant adverse impacts are expected to this species or its habitat from timber operations in the Noyo River drainage.

***Oncorhynchus kisutch* Coho Salmon**

Taxonomy: Coho salmon are one of the six species of "salmon," two species of "salmon-trout," and several species of "trout" within the genus *Oncorhynchus*. Within this group, they are more closely related to Chinook salmon (*O. tshawytscha*) than to other salmon. In California, Coho populations are considered to be at the southernmost extent of their range and have adapted to what is considered extreme conditions for the species.

Distribution: Coho salmon historically spawned and reared in most coastal streams from central California to near Point Hope, Alaska in North America, and in Asia from North Korea to the Anadyr River in Russia. In California, spawning populations once ranged in most coastal streams from the Smith River in Del Norte County south to the San Lorenzo River in Santa Cruz County. By 1991, about half of the historic Coho streams in California had lost their populations, and it appears they are still declining. Small populations are presently scattered in coastal streams and rivers from Del Norte to Santa Cruz Counties. In the ocean, Coho spawned in California generally remain in waters off California and southern Oregon.

Along coastal Mendocino County, juvenile Coho are found in higher densities on all major rivers and their tributaries within five miles of the coast, especially larger watercourses with north-south aspects or geomorphic and climatic features that maintain cool temperature regimes. As distance from the coast increases along these watercourses, Coho densities attenuate.

Life History: Most juvenile Coho rear in riverine habitat with highest densities found in deep (>1m), cool pools with abundant cover, particularly in summer. They will utilize a variety of habitats where cover, depth, temperature, and velocities are appropriate. They are typically associated with abundant instream shelter such as logs, root wads, and undercut banks. In California streams, which undergo pronounced seasonal differences, juveniles show major shifts in habitat preferences throughout the year. In springtime, when flows are moderate and fish are small, they are widely distributed throughout all riverine habitat types. As stream flows diminish in summer, fish concentrate in pools or deep runs. During winter they seek refuge from high flows in off-channel pools and smaller tributary streams. Shelter complexity is particularly important during this over wintering stage. It should be noted that some juvenile rearing occurs in freshwater estuaries and lagoons.

In California streams, temperature is a major factor limiting juvenile Coho. Stream temperatures of 12 –14 C are optimal, and these fish generally do not persist in streams where temperatures reach 22 -25°C for extended periods. Researchers in the Mattole River watershed found Coho to be absent from sites where the maximum temperature exceeded 18°C for extended periods. Temperatures above 25 -26°C are considered lethal.

Coho typically prefer clear water, as even moderate silt loads will damage the gills of young Coho and reduce growth rates. High turbidity and silt loads can be detrimental to all juvenile stages, from incubation and emergence to growth nd feeding.

Emigration to the ocean in California usually takes place in March, April and May, when groups of 10-50 fish abandon shelter habitat and enter the main stem of the river system. Most downstream movements occur at night but are not continuous, interspersed with periods of feeding and holding in areas of low velocity. As fish enter the estuary they transform into smolts and linger for a period to adjust their osmoregulatory system to seawater. After entering the ocean, young salmon at first remain close to the parent stream, but eventually move northward along the continental shelf of California and Southern Oregon.

Status: Two Coho salmon ESUs in California were listed in 1996 and 997 as Threatened by NMFS due to a 90 – 95 % population decline over a fifty year period. Both ESUs, the Southern Oregon Northern California (SONC) and the Central California Coast (CCC).

On Aug 5, 2004, the California State Fish and Game Commission listed Coho as Endangered South of Punta Gorda. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species or its habitat.

***Oncorhynchus mykiss* Steelhead / Rainbow Trout**

Taxonomy: Steelhead and rainbow trout are considered one of the two species of "salmon-trout" within the genus *Oncorhynchus.* Within this group, they are more closely related to "salmon" than to other "trout" (cutthroat). They are the most abundant and widespread native salmonid in western North America. They are successful because of their ability to adapt to a wide variety of habitats and their flexible life history patterns. As a result many populations have evolved distinctive characteristics and have been given taxonomic (subspecies) recognition. In California, as in all the western states, the mixing of hatchery-reared fish into native populations has further blurred the sometimes vague distinctions between sub-groups.

It is generally believed that, prior to the disruption of the rainbow trout gene pool by introductions of hatchery fish, there were three distinct groups: redband trout of the upper Columbia and Fraser River basins, redband trout of the Sacramento-San Joaquin River drainage, and coastal rainbow trout. Red band trout is the general name given to the mostly resident forms in the interior basins, whereas coastal rainbow trout is the name used to refer to the anadromous and resident coastal forms. Steelhead trout is the name awarded to the anadromous (migratory) component of the coastal group; however, within this group non-migratory populations (resident) are also present.

Within the California coastal rainbow trout stock (O. m. irideus), NOAA Fisheries (formerly NMFS) has recognized six distinct Evolutionarily Significant Units (ESUs) based on analysis of genetic and life history data:

- Klamath Mountain Province steelhead
- Northern California steelhead
- Central Valley steelhead
- Central Coast steelhead
- South/Central Coast steelhead
- Southern steelhead

Populations of "steelhead" within the Northern California steelhead ESU are found in almost all permanent fish-bearing rivers in coastal Mendocino County.

Distribution: The Pacific coast rainbow trout were originally native to streams from Alaska down to Baja California. In California they were originally distributed in all permanent streams from San Diego north to the Klamath River drainage. The Northern California steelhead ESU includes all trout from Redwood Creek (Humboldt County) to the Gualala River (Sonoma County), including the Big River drainage. It should be noted that rainbow trout have been introduced into most cold-water streams and lakes not only throughout North America, but also throughout the world.

Life History: California rainbow trout have life history patterns that are both flexible and variable. However, two basic life history patterns seem to exist: migratory and resident. Both types can exist in the same population, but the dominance of one type or another is the defining trait for the population. Migratory populations are either sea-run (anadromous), lake-run (limnodromous), or within river-run (potodromous). Anadromous steelhead and limnodromous trout migrate from the ocean and lakes to tributary streams to spawn, whereas potodromous trout migrate within rivers to spawning areas.

Anadromous steelhead are additionally defined by two life history patterns: winter and summer. Sexually mature winter steelhead enter the stream from the ocean during winter high flows to migrate, spawn, and potentially return to the ocean. In contrast, summer steelhead enter rivers as immature fish during spring flows and migrate to headwater reaches where they over-summer and mature in deep pools. They then spawn during the following winter or spring flows. Summer steelhead are not found south of the Mattole River drainage in Humboldt County.

In contrast to this complex migratory life history pattern for anadromous steelhead, resident trout often spend their entire lives within a small stream reach, although some migration is also known to occur within this group. Juvenile steelhead and trout have the same habitat requirements for instream rearing, regardless of the life history strategy of their progenitors. They are found in cool, clear, fast flowing streams where riffles predominate, where cover from terrestrial vegetation, undercut banks, and boulders is abundant, and where invertebrate food sources are plentiful. Cool temperature is a primary habitat characteristic needed for optimal growth of rainbow trout. Temperatures above 23°C are usually lethal, with optimal temperatures ranging around 15-18°C.

As a further reflection of their life history plasticity, the age at which juvenile steelhead migrate downstream to the ocean is highly variable, presumably dependent on various factors such as, genetics, river characteristics, and stochastic climatic events. Generally, steelhead will spend 1-3 years in the stream; locally they appear to spend about two years in fresh water. After entering the ocean, where they may forage from 1-4 years, steelhead grow rapidly on a diet of fish, squid, and crustaceans taken in ocean surface waters. The distribution of California stocks within the ocean is poorly understood, but research suggests that most California fish do not wander far from the California coast.

Having reached maturity in the marine pasture, California winter steelhead enter coastal streams when winter stream flows permit passage back to their natal spawning areas. They may move upstream any time during the period from December – March, peaking typically in January and February. The life history patterns for steelhead and rainbows are defined by variability that presumably allows them to maintain abundance and diversity in the face of highly variable ocean and stream conditions.

Status: Steelhead were listed as Threatened by NMFS in 2000 in the Northern California steelhead ESU for the following reasons:

- Increased water temperature from loss of shading
- Siltation of holding pools and spawning riffles
- Predation from introduced pikeminnows in the Eel River
- Interactions with hatchery steelhead
- Fisheries (high seas gill netting)

Steelhead in this ESU are still widely distributed, but their numbers continue to decline, possibly at less than 10 % of their former abundance. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species or its habitat.

***Oncorhynchus tshawytscha* Chinook Salmon**

Taxonomy: Within the genus *Oncorhynchus*, Chinook salmon are most closely related to Coho salmon. Within the species there are many distinct populations, usually recognized as "runs" or "stocks," that show genetically based adaptations to local and regional environments. In California there are at least seventeen distinct runs, recognized by river system and the timing of the run. Stocks within major tributaries are often recognized independently as well, based on differences in genetics and life histories. Nevertheless, of the seventeen major recognized runs, thirteen occur within the larger river systems of California's north coast, from the Smith River to the Russian River, and four stocks are endemic to California's Central Valley. NOAA Fisheries recognizes six Evolutionarily Significant Units (ESU) of geographically proximate Chinook populations in California, of which the California Coastal Chinook ESU encompasses coastal Mendocino County. The present and historic status of these fish in streams in this region is largely unknown.

Distribution: In North America Chinook salmon spawn in streams from Alaska to the San Joaquin and Kings Rivers in the Central Valley, although they are found in the ocean as far south as southern California. The California Coastal ESU includes Chinook spawned in rivers and streams south of the Klamath River to the Russian River, California. Anecdotal accounts and some research indicate the presence of Chinook within the relatively smaller streams of coastal Mendocino County, specifically the Big, Ten Mile, and Noyo Rivers and even Wages Creek. Although their numbers in this region are unknown, it is generally believed they were a lesser component of the instream salmonid community being largely overshadowed by Coho and steelhead. Hatchery Chinook were planted in the Ten Mile River in the 1970s, but spawning surveys indicate that returning spawners diminished over time. An additional question is whether local Chinook are progeny from a coastal "run" or "strays" from larger rivers, such as the Klamath, Eel or Sacramento.

Life History: Although Chinook have a great array of life history patterns that allow them to take advantage of many riverine environments, two basic life history patterns predominate: stream-type and ocean-type. Stream-type Chinook have adults that run up streams in spring or summer, before they have reached maturity, and juveniles that spend a long time (usually >1 year) in fresh water. Ocean-type Chinook have adults that spawn soon after entering fresh water, from summer to late fall and winter, and juveniles that spend a relatively short time (3-12 months) rearing in fresh water. In this area it is unlikely that stream-type Chinook occur, due to the relatively small river systems, especially in summer. The ocean-type life history strategy allows fish to take advantage of high quality spawning and rearing areas, which are often too warm in summer to support salmonids. This strategy may be advantageous for Chinook in this region. Ocean-type Chinook (and hatchery fish) often display a high rate of "straying" which may account for local populations. California Chinook generally remain off the California coast, presumably due to high rates of feed production linked to ocean upwelling and the California Current.

Status: All Chinook salmon runs in California have declined, some to extinction. In this region, Chinook were listed as Threatened by NMFS in 1999 in the California Coastal Chinook ESU. Chinook are generally regarded as large river fish; therefore the single biggest factor for their decline has been the construction of massive dams and diversions on all major rivers. In the Central Valley dams have blocked Chinook access from over half the streams they once used. Although each run has special problems associated with it, the general factors for decline are:

- Dams and diversions causing loss of access to historic habitat and limiting water resources
- Over harvesting in the ocean and rivers which depletes wild runs
- Loss of floodplains and estuarine habitat caused by diking and draining
- Enhanced predation of juveniles by non-native predatory species, such as striped bass.
- The false assumption of wild-run abundance due to wild runs mixing with hatchery fish
- Competition from hatchery-reared juveniles and adults
- Diseases introduced from hatchery-reared fish
- Pollution and urbanization
- Increases in stream temperature from loss of shading in riparian areas
- Siltation of spawning areas from logging and road building
- Global warming, as it affects the marine environment

The present status of Chinook populations in coastal Mendocino County streams is mostly unknown due to a nearly total lack of biological information for coastal Chinook salmon south of the Eel River. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species or its habitat.

(For additional discussion of mitigation and protection measures specific to this THP, see the "**Coho, Steelhead and Chinook Salmon Assessment: Pre and Post Harvest**", below.)

REPTILES and AMPHIBIANS:

Ascaphus truei **Coastal Tailed Frog**

The coastal tailed frog is a stream-breeding frog generally associated with high gradient, cold, permanent headwater streams. This species is occurs in British Columbia, Washington, Oregon, and Northern California primarily west of the

Cascade crest. Species distribution in California includes Humboldt and Mendocino counties. This species is listed as a Species of Special Concern by CDFG. The coastal tailed frog lays its eggs in cold, fast-flowing streams and tadpoles attach themselves to the underside of rocks. Tailed frogs are dependent on permanent stream flow because the tadpoles require several years to metamorphose into adults. Research in Oregon suggests that streams with substrates with low amounts of fine sediments are preferred for breeding habitat. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species or its habitat.

Emmys (Clammy) marmoreal **Northern Pacific Pond Turtle**
The Pacific pond turtle is a freshwater turtle that generally occurs in permanent ponds, lakes, wetlands, and slowing-moving sections of rivers and streams. The northern Pacific pond turtle is a subspecies of the Pacific pond turtle and occurs in Washington, Oregon, and California. This subspecies is listed as a Species of Special Concern by CDFG. Pond turtles bury their eggs on shore but spend most of their life in or near aquatic habitat. Suitable aquatic habitat must include structures such as partially submerged logs for basking sites. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species and or habitat.

Platoon elongates **Del Norte salamander**
The Del Norte salamander is a woodland salamander found in coastal forests under woody substrate and in rock rubble and talus. The range of this species includes Northern California and Southern Oregon. Records for this species in California include locations in Del Norte, Siskiyou, Trinity, and Humboldt counties, but not Mendocino County. This species is listed as Species of Special Concern by CDFG. The Del Norte salamander is considered to have a life history similar to other Plethodontid salamanders: egg clutches laid under moist substrate and protected by females until hatching, and relatively small home ranges. No adverse impacts are expected for this species or its habitat because it does not occur in this area.

Rena aurora **Northern Red-legged Frog**
The northern red-legged frog is a pond-breeding frog usually associated with ponds, wetlands, and other lentic aquatic habitat, and adjacent terrestrial areas. The northern red-legged frog is a subspecies of the red-legged frog and occurs in British Columbia, Washington, Oregon, and the northwest coast of California. This subspecies is listed as a Species of Special Concern by CDFG. The red-legged frog lays egg masses in still water in the spring. Larvae hatch and metamorphose in a single season. Adults have been known to travel long distances in upland forest but return to breeding sites to reproduce. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species or its habitat.

Rena aurora draytonii **California Red-legged Frog**
The California red-legged frog is a pond-breeding frog usually associated with ponds, wetlands, and other lentic aquatic habitat, and adjacent terrestrial areas. The California red-legged frog is a subspecies of the red-legged frog and occurs in California and Baja California, Mexico. Mendocino County is considered the extreme north end of the range of this subspecies and the taxonomic break between *R. a. aurora* and *R.a. draytonii* has yet to be clearly understood. Populations of this subspecies in central and southern California are listed as Threatened under the federal Endangered Species Act. This subspecies is listed as a Species of Special Concern by CDFG. This frog lays egg masses in still water in the spring. Larvae hatch and metamorphose in a single season. Adults generally occur in the vicinity of breeding

habitat. Although it is unclear whether the range of this subspecies occurs in this area, the lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species or its habitat.

***Rana boylii* Foothill Yellow-legged Frog**

The foothill yellow-legged frog is a stream-breeding frog associated with permanent streams. This frog is distributed from western Oregon to southern California in the coast range and the west side of the Cascade and Sierran crests. This species is listed as a Species of Special Concern by CDFG. The yellow-legged frog lays egg masses in pools in streams in the spring. Larvae hatch and metamorphose in a single season. Adults appear to remain close to aquatic habitat, probably because of the dry upland conditions in their range. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species or its habitat.

***Rhyacotriton variegatus* Southern Torrent Salamander**

The southern torrent salamander is a stream-breeding salamander that occurs in cold, permanent headwater streams and seeps. This salamander occurs in western Oregon and northwestern California south to Mendocino County. This species is listed as a Species of Special Concern by CDFG. The southern torrent salamander lays eggs in the interstitial spaces between gravel in the water and may be sensitive to excessive fine sediments in the stream. This salamander is dependent on permanent water because larvae take several years to metamorphose into adults. Adults of this species remain close to cold permanent water throughout its life probably because of dry conditions in adjacent upland areas. Due to lack of watercourses associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species or its habitat.

MOLLUSKS:

***Helminthoglypa Pomoensis* Pomo Bronze Shoulderband**

The Pomo Bronze Shoulderband is a large snail, which is found in heavily timbered Redwood Canyons. Based on a lack of this species preferred habitat within the project area no significant adverse impacts are expected to this species.

INSECTS:

***Lycaeides argyrognomon lotis* Lotis Blue Butterfly**

Federal Endangered. This species is thought to inhabit wet, poorly drained willow-sphagnum bogs. Because the habitat for this species does not occur within or adjacent to the THP, no significant adverse impacts are expected.

PLANTS and PLANT COMMUNITIES:

***Abronia umbellate* ssp *breviflora* Pink Sand Verbena**
CNPS List 1B. This species is associated with coastal dunes and strands. As these habitat types do not generally occur in conjunction with coniferous forest areas, and as no dunes or strands are located in the THP area, no significant adverse impacts are expected.

***Agrostis blasdalei* Blasdale's Bent Grass**
CNPS List 1B. This species is associated with coastal bluffs, scrub and coastal prairies. Because these habitat types do not exist within the THP area, no significant adverse impacts are expected.

***Alisma gramineum* Narrow-Leaved Water Plantain**
CNPS List 2. This perennial herb inhabits assorted shallow freshwater marshes and swamps in elevation ranges of 3500 to 5600 feet. The plan area is below the elevational range of this species. Due to lack of watercourses or wet areas associated with the project area and other measures minimizing sediment production no significant adverse impacts are expected to this species or its habitat.

***Arctostaphylos mendocinensis* Pygmy Manzanita**
CNPS List 1B. This species is associated with the Pygmy Forest habitat community. A botanical survey was conducted and this species was not found to occur in the project area.

***Astragalus agnicidus* Humboldt Milk-vetch**
CNPS List 1B, California Endangered. This species is found in broadleaved upland forest and north coast coniferous forest habitat types. This species has never been found in the vicinity of the plan area and therefore it is anticipated that the species will not be affected by the proposed operation. A botanical survey was conducted and this species was not found to occur in the project area.

***Blennosperma nanum* var. *robustum* Point Reyes Blennosperma**
CNPS List 1B. This species is found in coastal scrubs and prairies. Microsites are usually open coastal hills in sandy soil. It is associated with coastal lupines and Mendocino County Indian Paintbrush. A botanical survey was conducted and this species was not found to occur in the project area.

***Boschniakia hookeri* Small Groundcone**
CNPS List 2. This parasitic perennial herb is limited to North America and more specifically a redwood forest type. The botanical assessment will include habitat required by this species. A botanical survey was conducted and this species was not found to occur in the project area.

***Calamagrostis crassiglumis* Thurber's Reed Grass**
CNPS List 2. This species is commonly generally found in coastal scrub and freshwater marshes. Microsites may include marshy swales within grassland or coastal scrub. As these habitat elements are not associated with this THP, no significant adverse impacts are expected.

***Calamagrostis foliosa* Leafy Reed Grass**
CNPS List 4, California Rare. This species is found in coastal bluff scrub and north coast coniferous forest habitat types. A botanical survey was conducted and this species was not found to occur in the project area.

***Campanula californica* Swamp Harebell**
CNPS List 1B. The preferred habitat is bogs, fens, and other wet meadow areas in and around coastal prairie, freshwater marsh, closed cone coniferous forest and north coast coniferous forest habitat, including along the western edge of the redwood forest type. A botanical survey was conducted and this species was not found to occur in the project area.

***Carex arcta* Northern Cluster Sedge**
CNPS List 2. This species is found in bogs, fens and North coast coniferous forest habitat types. The botanical assessment will include habitat required by this species. A botanical survey was conducted and this species was not found to occur in the project area.

***Carex californica* California Sedge**
CNPS List 2. This species is associated with closed cone coniferous forests, coastal prairies, meadows, marshes, and swamps. A botanical survey was conducted and this species was not found to occur in the project area.

***Carex livida* Livid Sedge**
CNPS List 1A. This species is associated with bogs and fens. It has not been observed in Mendocino County since 1866. The NDDB cites "Smith & Wheeler' as being doubtful that this species will ever be found in California again. A botanical survey was conducted and this species was not found to occur in the project area.

***Carex lyngbyei* Lyngbye's Sedge**
CNPS List 2. This perennial herb is associated with both freshwater and brackish marshes and swamps located at or near sea level. A botanical survey was conducted and this species was not found to occur in the project area.

***Carex saliniformis* Deceiving Sedge**
CNPS List 1B. This species is found in moist to wet open areas, such as meadows in close proximity to the coast. A botanical survey was conducted and this species was not found to occur in the project area.

***Carex viridula* var. *viridula* Green Sedge**
CNPS List 2. This species is usually found in freshwater bogs, fens and marshes within the North Coastal Coniferous forests. A botanical survey was conducted and this species was not found to occur in the project area.

***Castilleja affinis* ssp. *litoralis* Oregon coast Indian paintbrush**
CNPS List 2. This herb inhabits coastal dunes, scrub and bluff scrub. The proposed THP is not located within or near these types of coastal habitat, therefore no significant impacts are expected.

***Castilleja ambigua* ssp. *humboldtiensis* Humboldt Bay Owl's Clover**
CNPS List 1B. This species is found in salt marshes, primarily in the Humboldt Bay region. Because there are no salt marshes within or near the THP area, no significant impacts are expected.

***Castilleja mendocinensis* Mendocino Coast Indian Paintbrush**
CNPS List 1B. This species is associated with coastal bluffs, scrub, closed cone forests and prairies. Because these habitats are not located within or near the THP area, no significant adverse impacts are expected.

***Chorizanthe howellii* Howell's Spineflower**
CNPS List 1B, California Threatened, Federal Endangered. This species is associated with coastal dunes and scrub. Because these habitats are not located within or adjacent to the THP area, no significant adverse impacts are expected.

***Clarkia amoena ssp. whitneyi* Whitney's Farewell-to-Spring**
CNPS List 1B. This species is found in coastal bluff scrub and coastal scrub habitats less than 100m. Because these habitats are not found within or adjacent to the THP area, there are no significant impacts expected.

Coastal and Valley Freshwater Marsh
Impacts to this habitat type are not anticipated from the proposed harvest based on non-occurrence of the habitat type in or around the plan area and on the use of modern harvesting procedures, which minimize impacts to the fluvial system.

Coastal Brackish Marsh
Because there are no brackish marshes within or associated with this THP area, no significant adverse impacts are expected for this habitat type. Impacts to this habitat type are not anticipated from the proposed harvest based on non-occurrence of the habitat type in or around the plan area and on the use of modern harvesting procedures, which minimize impacts to the fluvial system.

Coastal Terrace Prairie
Because there are no coastal terrace prairies within or associated with this THP area, no significant adverse impacts are expected for this habitat type.

***Collinsia corymbosa* Round-headed Chinese Houses**
CNPS List 1B. This species is found in coastal sand habitat. Because there is no coastal sand habitat within or adjacent to the THP area, there are no significant impacts expected.

***Cupressus goveniana* ssp. *pigmea* Pygmy Cypress**
CNPS List 1B. This species is associated with the Mendocino Pygmy Forest habitat type. This species does occur within the project area. Impacts to the Pygmy cypress population were addressed in the early stages of project development by sighting the proposed reservoir in an area which is underlain by the Quinliven-Fernckeek forest soil type rather than the Blacklock – Aborigine soils which are typical of the true pygmy conditions with which Pygmy Cypress is associated. The City of Fort Bragg's property is approximately 35.8 acres in size and the 8+/- acre reservoir project was sighted at its current location to avoid the unique pygmy forest conditions in the northeast portion of the property and riparian habitats in the Newman Gulch area. It is anticipated that natural regeneration will occur from adjacent seed sources on portions of the project area that are not actually occupied by improvements.

Additionally, the City of Fort Bragg plans to replant Pygmy Cypress at a rate of 3:1 to further minimize the potential for the project to have a long term adverse cumulative effect on this species when this project is considered in conjunction with the potential for other future development within this species limited range. Please refer to the *Summers Lane Reservoir Pygmy Cypress Mitigation Planting Area and Plan* in Section 5 of the THP for a complete list of measures to be taken relative to the re-population of pygmy cypress on the project area.

***Erigeron biolettii* Streamside Daisy**
CNPS List 3. This species is found in broadleaved upland forest, cis-montane woodland, and North coast coniferous forest habitat types. A botanical survey was conducted and this species was not found to occur in the project area.

***Erigeron supplex* Supple Daisy**
CNPS List 1B. This species is found on coastal areas and coastal bluffs. Because there are none of these habitat types on or near the THP area, no significant adverse impacts are expected.

***Erysimum menziesii* ssp. *menziesii* Menzies Wallflower**
CNPS List 1B, California Endangered, Federal Endangered. This species is found in coastal strands and dunes. Microsites are dunes and coastal strand from 0-35 meters. It is associated with coastal lupines and Mendocino Coast Indian Paintbrush. As the habitat that this species is associated with is not located within or near the THP, no significant adverse impacts are expected.

***Erythronium revolutum* Coast Fawn Lily**
CNPS List 2. This species is found on stream banks and in wet places in woodlands. A botanical survey was conducted and this species was not found to occur in the project area.

Fen
A fen is typically defined as a lowland area that is wet or marsh-like. The Inglenook Fen is located inside MacKerricher State Park which is described as the best example of a fen in the region. Some components of the Inglenook Fen include saturated soils and heavy riparian vegetation. Since there are no habitat types in or directly adjacent to the plan area that meet the definition of this type of habitat, no adverse impacts are expected.

***Frittilaria roderickii* Roderick's Frittilary**
CNPS List 1B, California Endangered. This species is found in coastal bluff scrub, coastal prairie, and valley foothill grassland habitat types. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

***Gilia capitata ssp. capitata* Pacific Gilia**
CNPS List 1B. This species is found in coastal dune areas. Because there are no coastal dunes within or adjacent to the project area, no significant adverse impacts are expected.

***Gilia millefoliata* Dark-eyed Gilia**
CNPS List 1B. This species is found in coastal dune areas. Because there are no coastal dunes within or adjacent to the project area, no significant adverse impacts are expected.

***Glyceria grandis* American Manna Grass**
CNPS List 2. This species is found in bog, fen, meadow, marsh, swamp, streambank and lake margin habitat types. A botanical survey was conducted and this species was not found to occur in the project area.

Grand Fir Forest
Grand fir trees do exist within the THP, however they do not dominate the stands; redwood and Douglas-fir are the primary species within the THP area. Based on the non-occurrence of this pure grand fir habitat type no adverse impacts to this habitat type are foreseen.

***Hemizonia congesta ssp. leucocephala* Hayfield Tarplant**
CNPS List 3. This species is found in coastal scrub and valley foothill grassland habitat types. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

***Hesperolinon adenophyllum,* Glandular Western Flax**
CNPS List 1B. This annual herb occupies chaparral sites, foothill woodland forest types, valley grassland plant communities, and usually on serpentine soils. None of these habitats exist within, or adjacent to, the project area.

Because there is no appropriate habitat for this species associated with this project area, no significant adverse impacts to this species or its habitat are expected.

***Horkelia marinensis* Point Reyes Horkelia**
CNPS List 1B. The preferred habitat of this species is sandy coastal flats less than 100 feet in elevation. A botanical survey was conducted and this species was not found to occur in the project area.

***Horkelia tenuiloba* Thin-Lobed Horkelia**
CNPS List 1B. This species is found in broadleaved upland forest and chaparral habitat types. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

***Juncus supiniformis* Hair-Leaved Rush**
CNPS List 2. This species is found in bog, fen, marsh, and swamp habitat types near the coast. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

***Lasthenia macrantha ssp. bakeri* Baker's Goldfields**
CNPS List 1B. This species is found in closed-cone forest opening and coastal scrub habitat types. A botanical survey was conducted and this species was not found to occur in the project area.

***Lasthenia macrantha ssp. macrantha* Perennial Goldfields**
CNPS List 1B. This species is found in coastal scrub, coastal bluff scrub, and coastal dune habitat types. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

***Lilium maritimum* Coast Lily**
CNPS List 1B. This plant species is a Federal Species of concern. The general habitat type is closed-cone coniferous forest, coastal prairie, coastal scrub, north coast coniferous forest, broadleaved upland forest, and marsh and swamp. Historically the microhabitat for the coast lily has been in sandy soil, often on raised hummocks or bogs. A botanical survey was conducted and this species was not found to occur in the project area.

***Limnanthes bakeri* Baker's Meadowform**
CNPS List 1B, California Rare. This annual herb inhabits wet, open areas such as meadows, seeps, marshes, swamps, and grasslands. A botanical survey was conducted and this species was not found to occur in the project area.

***Lupinus milo-bakeri* Milo Baker's Lupine**
CNPS List 1B, California Threatened. This endemic, annual herb is most commonly found in Foothill Woodland and Valley Grassland plant communities. This species is listed as rare and threatened by the State. Because the project is dominated by north coast coniferous forest, habitat for this species does not exist within the project area, and no significant adverse impacts to this species or its habitat are expected.

***Lycopodium clavatum* Running-Pine**
CNPS List 2. This species is found in marsh, swamp, and North coast coniferous forest habitat types. A botanical survey was conducted and this species was not found to occur in the project area.

Mendocino Pygmy Cypress Forest
This habitat community is associated with Blacklock soils on gentle sloping marine terraces. Blacklock soils associated with this property were excluded from the project area so that a loss of this unusual habitat type would not occur.

***Microseris borealis* Northern Microseris**
CNPS List 2. This species is associated with bogs, fens and maybe wet areas. The Inglenook Fen is located inside MacKerricher State Park, many miles northwest of the THP area. No wet areas are located within the project boundary. A botanical survey was conducted and this species was not found to occur in the project area.

***Mona Della villas ssp. globes* Robust Mona Della**
CNPS List 1B. This species is found in chaparral, cismontane woodland, and coastal scrub habitat types. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

***Navarre leucocephala* ssp. *Bakeri* Baker's Navarretia**
CNPS List 1B. This species is associated with vernal pools of meadows and low flats within foothill woodland regions, with alkali or adobe soils. There are no vernal pools and no alkali or adobe soils within the project area. Because appropriate habitat for this species does not exist in the project area, no significant adverse impacts to this species or its habitat are expected.

Northern Coastal Salt Marsh
Impacts to this habitat type are not anticipated from the proposed harvest based on non-occurrence of the habitat type in or around the plan area and on the use of modern harvesting procedures, which minimize impacts to the fluvial system.

***Phacelia insularis* var. *continentis* North Coast Phacelia**
CNPS List 1B. This species is found in coastal scrub and dunes. Microsites are open maritime bluffs with sandy soil less than 200 feet in elevation. It is associated with coastal lupines and Mendocino Coast Indian Paintbrush. Because appropriate habitat for this species does not exist in the project area, no significant adverse impacts to this species or its habitat are expected.

***Pinus contorta* ssp. *bolanderi* Bolander's Beach Pine**
CNPS List 1B. This species is associated with Pygmy Forest habitat. A botanical survey was conducted and this species was not found to occur in the project area.

***Pleuropogon hooverianus* North Coast Semaphore Grass**
CNPS List 1B, California Threatened. This species is associated with moist grassy areas, vernal pools in broadleaf upland forests and north coast coniferous forests. A botanical survey was conducted and this species was not found to occur in the project area.

***Potamogeton epihydrus* ssp. *nuttallii* Nuttall's Pondweed**
CNPS List 2. This perennial herb prefers freshwater wetlands under natural conditions and in shallow waters. This native to California has been observed in El Dorado, Modoc, Mariposa, Plumas, and Shasta Counties. CNPS has ranked this species as very rare. No Freshwater Marsh exists within the plan area. Impacts to this plants habitat type are not anticipated from the proposed harvest based on non-occurrence of the habitat type in or around the plan area and on the use of modern harvesting procedures, which minimize impacts to the fluvial system.

***Puccinellia pumila* Dwarf Alkali Grass**
CNPS List 2. This species is associated with coastal salt marshes and swamps. Impacts to this plants habitat type are not anticipated from the proposed harvest based on non-occurrence of the habitat type in or around the plan area and on the use of modern harvesting procedures, which minimize impacts to the fluvial system.

***Rhynchospora alba* White Beaked-rush**
CNPS List 2. This species is associated with bog and fen, meadow, marsh, and swamp habitat types. A botanical survey was conducted and this species was not found to occur in the project area.

***Sanguisorba officinalis* Great Burnet**
CNPS List 2. This species is associated with bogs, fens and seepage areas along stream borders, often in serpentine soils. A botanical survey was conducted and this species was not found to occur in the project area.

***Senecio bolanderi* var. *bolanderi* Seacoast Ragwort**
CNPS List 2. This species is associated with coastal scrub and north coast coniferous forest. This species has a potentially wide range of distribution but is expected to be more likely to occur near the coast. A botanical survey was conducted and this species was not found to occur in the project area.

***Sidalcea calycosa spp rhizomata* Point Reyes Checkerbloom**
CNPS List 1B. This species is associated with marshes and swamps near the coast below 30m elevation. These habitat types are not present in the THP area, and this species is not expected to exist in the THP area. No significant adverse impacts are expected.

***Sidalcea malachroides* Maple-Leaved Checkerbloom**
CNPS List 1B. This plant has a wide distribution of habitat preferences, with a preferred microhabitat of woodlands and clearings near the coast, often in disturbed areas. A botanical survey was conducted and this species was not found to occur in the project area.

***Sidalcea malviflora* ssp. *purpurea* Purple-stemmed Checkerbloom**
CNPS List 1B. This perennial endemic herb is typically found in broadleaved upland forests and coastal prairie. Historically this species has been commonly located in San Francisco and San Mateo with few observations in southern Mendocino. A botanical survey was conducted and this species was not found to occur in the project area.

Sphagnum Bog
Sphagnum bogs are generally associated with Mendocino Pygmy Forest areas. This habitat type is not present in the THP area, and therefore no significant adverse impacts are expected to this habitat type or species utilizing this habitat type are anticipated.

***Tracyina rostrata* Beaked Tracyina**
CNPS List 1B. This species is found in cismontane woodland and valley/foothill grassland habitat types. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

***Trichodon cylindrus* cylindrical trichodon**
CNPS List 2. This species is found in broadleaved upland forest and upper montane coniferous forest habitat types. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

***Triquetrella californica* Coastal Triquetrella**
CNPS List 1B. This byrophyte is found in coastal scrub and coastal bluff scrub. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

Upland Douglas-fir Forest
The THP area is not located within a pure, upland Douglas-fir forest. The dominant species is coast redwood with co-dominant Douglas-fir and mixed hardwoods in the understory. Upland Douglas-fir forests are defined by old-growth, dominant Douglas-fir with an evergreen hardwood component. This habitat type is not present in the THP area, and therefore no significant adverse impacts are expected to this habitat type or species utilizing this habitat type are anticipated.

Viburnum ellipticum **Oval-Leaved Viburnum**
CNPS List 2. This species is found in chaparral, cismontane woodland, and lower montane coniferous forest habitat types. Because there are no such habitat types within or adjacent to the project area, no significant adverse impacts are expected.

Viola palustris **Marsh Violet**
CNPS List 2. This species is associated with wet, brushy areas in coastal scrub or coastal bogs. There are no coastal scrub or coastal bog habitats within the plan area. Other wet areas are protected by ELZ's. Given these factors, no significant adverse impacts are expected.

LICHENS:

Usnea longissima **Methuselah's Beard Lichen**
This lichen is usually associated with overstory canopies of mature forests. However, occurrences have been detected in a variety of stands. The occurrence of this species was not detected in this area. A botanical survey was conducted and this species was not found to occur in the project area.

Coho, Steelhead and Chinook Salmon Assessment: Pre and Post Harvest

Class I Watercourse Assessment:

Shade and Temperature
No Class 1 watercourses are associated with the plan area.

Low-vegetated cover and Stream bank Stability
No Class 1 watercourses are associated with the plan area.

Erosion Control
An erosion control plan has been prepared which identifies actions to be taken to minimize the potential for inadvertent sediment production.

LWD Loads and Recruitment
No Class 1 watercourses are associated with the plan area.

Water Drafting
Water drafting from Class 1 watercourses is not proposed.

Existing WLPZ Facilities
No Class 1 watercourses are associated with the plan area.

Class II Watercourse Assessment

Shade and Temperature

No Class 2 watercourses are associated with the plan area.

Low-vegetated cover and Stream bank Stability

No Class 2 watercourses are associated with the plan area.

Erosion Control

An erosion control plan has been prepared which identifies actions to be taken to minimize the potential for inadvertent sediment production.

LWD Loads and Recruitment

No Class 2 watercourses are associated with the plan area.

Maintenance Period

Per 14 CCR 1050(d) & (e), "Upon approving a work completion report, the Director may prescribe a maintenance period which extends for as much as three years after filing the work completion report based on physical evidence (such as location of erosion controls in disturbed areas with high or extreme hazard, on steep or unstable slopes, or within or adjacent to the standard width of a watercourse or lake protection zone) that erosion controls need to be maintained for the extended maintenance period in order to minimize soil erosion or slope instability or to prevent degradation of the quality and beneficial uses of water. Also, after approving the work completion report, the director may extend the prescribed maintenance period for as much as three years after filing of the work completion report if subsequent inspection by the department during the prescribed maintenance period show that erosion controls have failed or are likely to fail to minimize soil erosion or slope instability or to prevent degradation of the quality and beneficial uses of water.

Per 14 CCR 916.9(p) The erosion control maintenance period on permanent and seasonal roads and associated landings that are not abandoned in accordance with 14 CCR 923.8 shall be three years.

Class III Watercourse Assessment

There are no Class III watercourses within the proposed project area.

B. Habitat Condition

Describe the pre-project condition of the following terrestrial habitat components within the project area and assessment area(s). Lastly, rate the anticipated post-project condition of these habitat components after completion of the proposed project.

Habitat Components	Pre-Project On-Site	Pre-Project Off-site	Post-Project On-Site
1. Presence of snags / dens / nest trees	H M **L** N	H M **L** N	H M L **N**
2. Amount of downed large woody debris . .	H **M** L N	**H** M L N	H M L **N**
3. Presence of multistory canopy . . .	H M **L** N	H **M** L N	H M L **N**
4. Road density	H M **L** N	H M **L** N	H M **L** N
5. Presence of hardwoods	H **M** L N	**H** M L N	H M L **N**
6. Continuity of late seral stage forest	H M L **N**	H M L **N**	H M L **N**

C. Presence of Significant Wildlife Areas

Are any of the following significant wildlife areas located on-site of your proposed operation and off-site within the assessment area(s)?

	On-Site		Off-Site	
5. Wetlands	Y	**N**	**Y**	N
6. Riparian areas	Y	**N**	**Y**	N
7. Other	Y	N	Y	N

Will your operation significantly affect the use of these areas by wildlife?

Yes _____ No **XX**

The project area is currently occupied by a cut over young growth forest which does not provide any unique wildlife habitats not readily available offsite. The project is bounded variously by a commercial nursery on one side a dog pound on another side and high voltage transmission lines across the northern border. The project area is not associated with watercourses or wetlands and is limited to approximately 8+/- acres of coastal terrace. The proposed construction of an off channel reservoir to augment the City of fort Bragg's municipal water supply is a well thought out project which is clearly in the public interest. Water to be impounded in the new reservoir will come from existing collection sources located in Waterfall Gulch to the West. Waterfall Gulch flows into the Noyo River estuary where tidal influence is the primary determinant of stream volumes and other aquatic habitat characteristics. Given the source of the water supply relative to the mouth of the Noyo River, no significant adverse effect to aquatic species is likely to occur through a potential increase in the City's water storage capacity.

D. Other Projects

Identify and discuss the effects of the following projects within the assessment area(s) that might interact with the effects of the proposed timber operation:

1. Past and future projects in the biological assessment area(s) under the ownership or control of the timber/timberland owner that did or could cause a significant impact on biological resources.

All of the timbered portion of the biological assessment area has been harvested within the past 120 years. Item 1 of Section IV lists harvesting activity that has occurred within the past 10 years. Short-term impacts on biological resources have occurred during the timber operations of these stands, mostly from heavy equipment activity. However, the long term effect of these timber harvests has been beneficial to many biological resources through increased forage potential. Many wildlife species occur in managed forest areas and appear to do well. Most of the biological assessment area is not habitat for many of the species of special concern. Nesting, roosting, and foraging habitat does occur within the assessment area for the northern spotted owl, and suitable spawning and rearing habitat for Coho and Steelhead Salmon is present within the watershed.

Additional timber harvests within the biological assessment area are anticipated to occur within the next 10 years as previously described. These future timber harvests will be subject to the Forest Practice Rules, which regulate scope and intensity of harvesting.

2. Past and future projects planned or expected in the biological assessment area(s) not under the control of the timber / timberland owner that did or could cause a significant impact on biological resources.

Future timber harvests, on non-federal lands, are regulated by the Forest Practice Act and the Forest Practice Rules. Based on the history of harvest in this area and the continued presence of timber resources within the BAA additional timber harvesting is anticipated on other private ownerships. Responsible logging practices within the framework of the rules of the FPA will minimize the potential for significant adverse impacts on biological resources.

E. Interactions

Considering the interactions between:
- the biological resources of the assessment area (Parts A & C)
- current habitat condition on-site and off-site (Part B)
- the ongoing effects of past projects (Part D)
- the effects of future projects (Part D)

What is the potential for developing significant cumulative effects on the biological resources of the assessment area(s) as a result of:

1. The proposed project combined with the effects of past projects without the impacts of future projects?

H M [L]

2. The proposed project combined with the effects of past projects and the expected impacts of future projects listed in Part D?

H M [L]

F. Impacts Evaluation

Based on the information gathered by the RPF, the contents of the THP, the forest practice rules, information from the review of other plans, the magnitude of impacts identified in parts A through D, and the interactions rated in Part E, is the proposed project likely to produce significant adverse cumulative effects to the biological resources within the assessment area(s)?

Yes _____ No XX

Will the proposed project, as presented, in combination with the impacts of past and future projects as identified in Parts A through D, the interactions rated in Part E, and considering feasible alternatives and mitigation actions, have a reasonable potential to cause or add to significant cumulative impacts to biological resources within the assessment area(s)?

1. Yes, after mitigation ..... _____
2. No, after mitigation XX
3. No; no reasonably potential significant effects ..... _____

IV. CUMULATIVE RECREATION RESOURCES IMPACTS ASSESSMENT

A. Recreational Resources Inventory

The recreational assessment area is the area that includes the logging area plus 300 feet.

To assess recreational cumulative impacts: Identify the recreational activities involving significant numbers of people in and within 300 feet of logging area (example: fishing, hunting, hiking, picnicking, camping).

Identify any recreational Special Treatment Areas described in the Board of Forestry rules on the plan area or contiguous to the area.

The Mendocino Coast Recreation District owns property to the East and South of the project area. That property is currently undeveloped. No significant public recreation occurs within 300 feet of the project area.

If a public use of the area is identified, continue to Part B.

B. Change in Recreational Resources.

Discuss whether the timber operation will significantly alter the recreational opportunities on the logging area or within 300 feet of the logging area.

No significant public recreation currently occurs within 300 feet of the project area and none is anticipated post harvest.

C. Other Projects:

Information on other projects in the assessment area that might interact with the effects of the proposed timber operation need to be identified and discussed. Discuss the following:

1. Any past or future projects in the recreational assessment area that are under the ownership or control of the timber / timberland owner that will impact recreational opportunities used by the public identified in Part A, above.

No other projects within the assessment area that are under the control of the timberland owner will impact recreational opportunities in the assessment area.

2. Any known future projects planned or expected in the area for assessment of recreational impacts that are not under the control of the timber / timberland owner that will impact recreational opportunities used by the public identified in Part A, above.

There are no known planned future harvests which would impact adjacent recreational opportunities.

D. Impacts Evaluation

Will the proposed project, as presented, in combination with the impacts of past and future projects, as identified in Parts A through C above, have a reasonable potential to cause or add to significant cumulative impacts to recreation resources?

Yes, after mitigation	
No, after mitigation	
No; no reasonable potential significant effects	XX

V. CUMULATIVE VISUAL RESOURCE IMPACTS ASSESSMENT

A. Visual Resource Inventory

To assess visual cumulative effects:

1. Identify any Special Treatment Areas designated as such by the Board of Forestry because of their visual values on or near the plan area?
   NONE.
2. Determine how far the proposed timber operation is from the nearest point that significant numbers of people can view the timber operation. At distances of greater than 3 miles from viewing points activities are not easily discernible and will be less significant.

The harvest area is not within the view of significant numbers of the general public within the 3-mile radius.

3. Identify the manner in which the public identified in 1. and 2. will view the proposed timber operation (from a vehicle on a public road, from a stationary public viewing point or from a pedestrian pathway).

The harvest area is not within the view of significant numbers of the general public within the 3-mile radius.

If the information in item 1. or 2. identifies a significant visual resource, continue with section B below.

B. Change in Visual Resource

Discuss the probability of the timber operation changing the visual setting viewed by the public as a result of vegetation removal, creation of slash and debris, or soil exposure.

The harvest area will be visible to people who are standing at the border between the project area and the neighboring properties to the West and South. The City of Fort Bragg will maintain a 10 foot vegetative buffer along the western project boundary as shown on the THP Map.

C. Other Projects

Information on other projects in the assessment area that might interact with the effects of the proposed timber operation need to be identified and discussed. Discuss the following:

1. Any past and future projects in the visual assessment area that are under the ownership or control of the timber / timberland owner and that could interact to cause a significant change in any identified visual resource.

None.

2. Known future projects in the visual assessment area that are not under the control of the timber / timberland owner and could interact with any identified visual resources.

The RPF is not aware of other projects.

D. Impacts Evaluation

Will the proposed project, as presented, in combination with the impacts of past and future projects, as identified in Parts A through C above, have a reasonable potential to cause or add to significant cumulative impacts to visual resources?

Yes, after mitigation	
No, after mitigation	
No: no reasonably potential significant effects	XX

VI. CUMULATIVE VEHICULAR TRAFFIC IMPACTS ASSESSMENT

A. Traffic Resource Inventory

The traffic assessment area involves the first roads not part of the logging area on which logging traffic must travel. To assess traffic cumulative effects:

1. Identify whether any publicly owned roads will be used for the transport of wood products. (If the answer to item A. indicates that public roads will not be used, then no further assessment is needed).

The haul route will be Summers Lane to Highway 20, hence East to Highway 101 and Highway 101 between Eureka and Cloverdale. Log trucks hauling timber from the harvest area will use Summers Lane for approximately ¾ mile. Summers Lane is a two lane surfaced County maintained road which has a suitable grade and alignment for safe passage of commercial traffic. Logging traffic commonly uses State highways 20 and 101 in Mendocino and Humboldt Counties without incident or congestion.

2. Identify any public roads that have not been used recently for the transport of wood products and will be used to transport wood products from the proposed timber harvest.
   Summers Lane has been used only intermittently by logging trucks.

3. Identify any public roads proposed for transport of wood products that have existing traffic or maintenance problems.

Traffic and maintenance on these high standard rural roads and highways are not expected to be significantly impacted by the temporary increase in traffic associated with this small short term project.

The City of Fort Bragg will take the following additional measures, as specified in their Mitigated Negative Declaration, to minimize the potential for inadvertently causing other adverse impacts to public roads as a result of project activities.

- Prior to issuance of the grading permit, the applicant shall meet with a representative of County Department of Transportation, and assess and record the current surface conditions of the county maintained portion of Summer's Lane. Prior to final signoff on the grading permit, any damage caused by the project to the county road shall be repaired to a condition equaling or exceeding the condition of the county road prior to the project.

B. Activity Levels

Discuss how the logging vehicles used in the timber operation will change the amount of traffic on public roads, especially during heavy traffic conditions

The haul route will be Summers Lane to Highway 20, hence East to Highway 101 and Highway 101 between Eureka and Cloverdale. Log trucks hauling timber from the harvest area will use Summers Lane for approximately ¾ mile. Summers Lane is a two lane surfaced County maintained road which has a suitable grade and alignment for safe passage of commercial traffic. Logging traffic commonly uses State highways 20 and 101 in Mendocino and Humboldt Counties without incident or congestion. Traffic congestion is typically not a problem in the rural area where log hauling would occur.

C. Other Projects

Information on other projects in the assessment area that might interact with the effects of the proposed timber operation need to be identified and discussed. Discuss the following.

1. Other past or future projects on lands under the control of the timber / timberland owner that will add significantly to traffic on public roads during the period these roads are used by logging vehicles from the proposed timber operation.

Logging traffic from other active THPs may utilize the same portions of Highway 20 and Highway 101 as will be utilized for the proposed THP. These routes historically have logging traffic from many sources and the addition temporary of log truck traffic from this small project will not have a significant impact on the normal flow of traffic.

2. Any known future projects not under the control of the timber / timberland owner that will impact public road traffic during the period that these roads are used by logging vehicles from the proposed timber operation.

All of the routes described historically have logging traffic from many sources and the addition of log truck traffic from this and other timber harvest areas under the control of the timberland owner will not have a significant impact on the normal flow of traffic. Over the past decade log and lumber truck traffic has significantly decreased within the assessment area.

D. Impacts Evaluation

Will the proposed project, as presented, in combination with the impacts of past and future projects, as identified in Parts A through C above, have a reasonable potential to cause or add to significant cumulative impacts to vehicular traffic on public roads?

Yes, after mitigation	
No, after mitigation	
No: no reasonably potential significant effects	XX

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.

List of references consulted during this
Cumulative Impacts Assessment

1. Water Quality Control Plan for the North Coast Region; North Coast Regional Water Quality Control Board; January 2013 http://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/

2. California Department of Forestry and Fire Protection Guidelines for Assessment of Cumulative Impacts; CDF; August 13, 1991.

3. Mean Annual Precipitation in the California Region; USDI Geological Survey, Water Resources Division; 1972.

4. Aerial Photographs; NAIP 2005, 2009, 2012.

5. The Casper Cutting Trials: A Case Study Report 25 Years After Harvest; James L Lindquist & Jackson State Forest, June, 1988.

6. A Guide to Wildlife Habitats of California; California Department of Forestry and Fire Protection; 1988.

7. Northern Spotted Owl Information; California Department of Forestry and Fire Protection; 8/2/90.

8. Methods and Materials for locating and Studying Spotted Owls; Eric Forsman; 1983; USFS (PNW-162).

9. Natural Diversity Database; Natural Heritage Division, California Department of Fish and Game. (2013) http://imaps.dfg.ca.gov/viewers/cnddb_quickviewer/app.asp

10. Guide to the California Wildlife Habitat Relationships System; Daniel A. Airola; Prepared for the California Department of Fish and Game; 1988.

11. Peterson Field Guides: Western Birds; Third Edition; Roger Tory Peterson; 1990.

12. Empirical Yield Tables for Young-Growth Redwood; James L. Lindquist & Marshal N. Palley; August, 1963.

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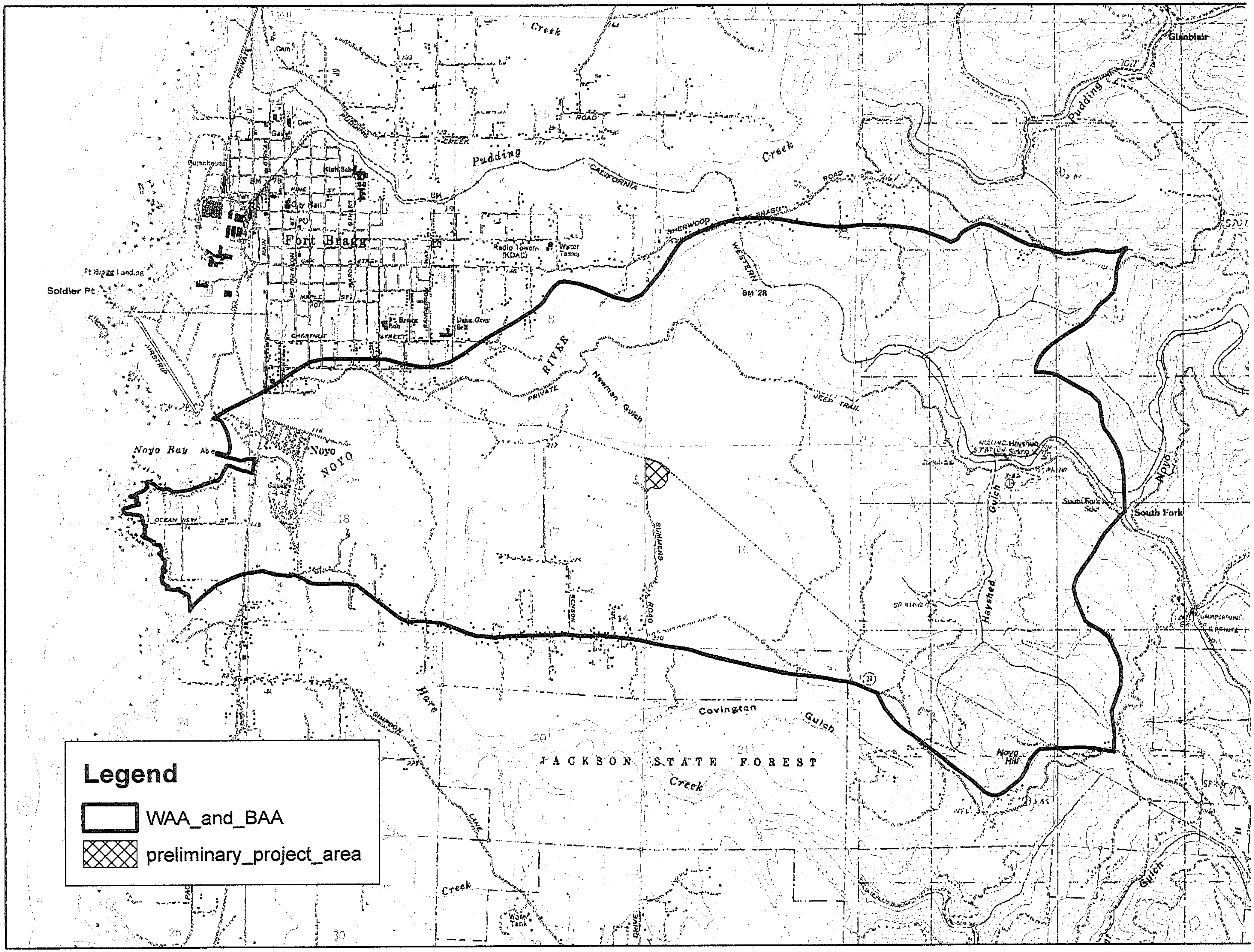
Legend
WAA_and_BAA
preliminary_project_area
Fort Bragg
Soldier Pt
Noyo Bay
Noyo
NOYO
RIVER
Newman Gulch
Pudding Creek
CALIFORNIA
WESTERN
SHERWOOD
ROAD
JEEP TRAIL
PRIVATE
SUMMERS ROAD
Covington Gulch
JACKSON STATE FOREST
Creek
Hare Creek
Hayshed Gulch
Noyo Hill
South Fork
Glenblair
AIRSTRIP
Ft Bragg Landing
Radio Towers (KDAC)
Water Tanks
ROAD

N

1:40,000

Project Carbon Accounting: Inventory, Growth, and Harvest

This worksheet addresses the sequestation 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	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)
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 re-entry cycles should be supported by management plan, if available.	**Step 2.** Enter the estimated conifer inventory (mbf/acre) present in project area prior to harvest.	**Step 3.** Enter the estimated hardwood inventory (basal area per 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 management plan, if available. Must be entered for each harvest cycle identified in Step 1.	**Step 5.** Insert 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 estimate should be based on projections from the management plan, if available.	1
Douglas-fir	19%	1.675	14.38	0	17	14	17.34275	0.024267	18	13
Redwood	42%	1.675	13.42	20	1.348855	1.48594	23.35817	0.038105	0	0
Pines	11%	2.254	12.14	40	1.8140184	2.20804	31.46007	0.05385	0	0
True firs	28%	2.254	11.18	60	2.4432186	3.28104	42.37215	0.07872	0	0
Hardwoods	[redacted]	2.214	11.78	80	3.2808828	4.87544	57.08814	0.11648	0	0
		Pounds per Metric Tonne		100	4.4320468	7.24484	76.88388	0.178026	0	0
Conversion of Board Feet to Cubic Feet	0.185		2,204	0	0	0			0	0
Multipliers to Estimate Total Carbon Tonnes per MBF	Conifer	1.80		0	0	0	0	0	0	0
	Hardwoods	1.95		0	0	0	0	0	0	0
Multipliers to Estimate Merchantable Carbon Tonnes per MBF	Conifer	0.96		0	0	0	0	0	0	0
	Hardwoods	0.88		0	0	0	0	0	0	0

User must enter harvest cycles to 100 years and/or at leest three entry cycles.

Note: Post harvest volume and growth is based on a retained buffer along the western project boundary and replanting of approximately 1/2 acre of forest vegetation when the construction project is completed.

Harvest Periods	Inventory Conversion to Carbon (prior to harveet)		Inventory Conversion to Carbon Dioxide Equivalent (prior to harvest)		Site Preparation	
from above (Time of Harvest as years from project approval)	Conifer Live Tree Tonnes (C/acre)	Hardwood Live Trees Tonnes (C/acre)	Conifer Live Tree Tonnes (CO_2 equivalent/acre)	Hardwood Live Tree Tonnes (CO_2 equivalent/acre)	**Step 8.** Enter the value (in bold) for each harvest cycel that best reflects the site preparation activites, as averaged across the project area:	
	Computed: MBF * Conifer Multiplier from Step 0.	**Computed:** BA*Volume/Basal Area Ration (to convert to MBF) * Hardwood Multiplier from Step 0.	**Computed:** Conversion of carbon to CO_2 (3.67 tonnes CO2 per 1 tonne Carbon)	**Computed:** Conversion of carbon to CO_2 (3.67 tonnes CO2 per 1 tonne Carbon)	**Heavy**- 50% or more of the project area is covered with brush and removed as part of site preparation or stumps are removed (mobile emissions estimated at .428 metric tonnes CO2e per acre, biological emissions estimated at 2 metric tonnes CO2e per acre) **Medium** - >25% <50% of the project area is covered with brush and removed as part of site preparation (mobile emissions estimated at .202 metric tonnes CO2e per acre, biological emissions estimated at 1 metric tonne per acre). **Light** - 25% or less of the project area is covered with brush and is removed as part of site preparation (mobile emissions estimated at .08 metric tonnes CO2e per acre, biological emissions estimated at .5 metric tonnes per acre). **None** - No site preparation is conducted.	
0	31	2	113	8	Heavy	-2.46
20	2	0	8	1	None	0
40	3	0	12	1	None	0
60	4	0	16	2	None	0
80	6	1	22	3	none	0
100	8	1	29	4	None	0
0	0	0	0	0	None	0
0	0	0	0	0	None	0
0	0	0	0	0	None	0
	Difference between ending stocks and beginning stocks		-83	-3.82	Sum of emissions (Metric Tonnes CO2e) per acre	-2.46

Project Carbon Accounting: Harvesting Emissions

This worksheet addresses the non-biological emissions associated with the project area's harvesting activities. Complete the input for Steps 9- 14 on this worksheet.

Harvest Periods	Felling Operations	Production per Day	Emissions Associated with Yarders and Loaders			Emissions Associated with Tractors and Skidders			Emissions Associated with Helicopters			Landing Saws	Trucking Emissions		
from Inventory, Growth, and Harvest Page (Time of Harvest se years from project approval)	**Assumption:** ((.25 gallons gasoline per MBF harvested * 5.33 (pounds carbon per gallon))/2205(conversion to metric tonnes)* mbf per acre harvested	MBF (all species) Yarded Delivered to Landing	**Assumption:**(((35 gallons diesel per day per piece of equipment * 8.12 pounds carbon / gallon)/2205 to convert to metric tonnes carbon)* 3.67 to convert to metric tonnes CO2 equivalent)/Production per Day			**Assumption:** (((55 gallons diesel per day per piece of equipment * 8.12 pounds carbon / gallon)/2205 to convert to metric tonnes carbon)* 3.67 to convert to metric tonnes CO2 equivalent)/Production per Day			**Assumption:** (((200 gallons jet fuel per day per piece of equipment * 5 pounds carbon / gallon)/2205 to convert to metric tonnes carbon)* 3.67 to convert to metric tonnes CO2 equivalent)/Production per Day			**Assumption:** (((.16 gallons gasoline per MBF * 5.33 (pounds carbon per gallon))/2205(conversion to metric tonnes)* 3.67 to convert to metric tonnes CO2 equivalent)/mbf per acre harvested. Applies to all species whether harvested or not.	**Assumption:** Round Trip Hours/Load average (from below, to compute the mbf/hour) /((6 gallons diesel/hour * 8.12 pounds carbon/gallon)/2205 (conversion to metric tonnes carbon))*3.67 (conversion to metric tonnes carbon dioxide equivalent)		
	Computed. Metric Tonnes CO2 equivalent per mbf harvested Applies to all species whether harvested or treated	**Step 9.** Enter the estimated volume delivered to the landing in a day.	**Step 10.** Enter number of pieces of equipment in use per day for each harvest entry	**Computed.** Yarders and Loaders CO2 equivalent/mbf (metric tonnes)	**Computed.** Yarders and Loaders CO2 equivalent per Acre Harvested (metric tonnes)	**Step 11.** Enter number of pieces of equipment in use per day for each harvest entry	**Computed.** Tractor and skidder CO2 equivalent/mbf (metric tonnes)	**Computed.** Tractors and Skidders CO2 equivalent per Acre Harvested (metric tonnes)	**Step 12.** Enter number of pieces of equipment in use per day for each harvest entry	**Computed.** Helicopter CO2 equivalent/mbf (metric tonnes)	**Computed.** Helicopters CO2 equivalent per Acre Harvested (metric tonnes)	**Computed.** Landing Saws CO2 equivalent per Acre Harvested (metric tonnes)	**Steps 13 and 14 below**		**Computed.** Estimated Metric Tonnes CO2e per harvested acre for each harvesting period.
0	(0.04)	21	1	-0.02	-0.20	1	-0.03	-0.32	0	0.00	0.00	-0.02	**Step 13.** Enter Estimated Load Average: MSF/Truck	4.5	-0.177632653
20	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00			0
40	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00	**Step 14.** Enter Estimated Round Trip Haul In Hours	4	0
60	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00			0
80	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00			0
100	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00			0
0	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00			0
0	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00			0
0	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00			0
0	-	0	0	0.00	0.00	0	0.00	0.00	0	0.00	0.00	0.00			0
Sum Emissions	**-0.04**				**-0.20**			**-0.32**			**0.00**	**-0.02**			**-0.18**

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 CO2e Delivered to Mills / Acre	Herdwood CO2 equivalent Delivered to Mills / Acre	**Assumption.** 20 kw/hour (mill energy use) /(40mbf lumber processed/hour) *(.05 metric tonnes/kw hour) * mbf processed	**Computed.** Remaining CO2 equivalent after Milling Efficiency for Conifers	**Computed.** Remaining CO2 equivalent after Milling Efficiency for Herdwoods	**Computed.** CO2 Equivalent Tonnes in Conifer Wood Products in Use-100 Yeer Weighted Average / Acre and Landfill	**Computed.** CO2 Equivalent Tonnes in Herdwood Wood Products in Uee-100 Yeer 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 thet ere subsequently delivered to sewmills	**Step 16.** Insert the percentage of herdwoods harvested or treated thet are subeequently delivered to sewmills	**Computed:** The merchentable portion determined by the conversion factors (Sempeon, 2002) on the Inventory, Growth, and Harvest worksheet. This is multiplied by the percent delivered to mille to reflect the carbon delivered to mills.	**Computed:** The merchentable portion determined by the conversion factors (Sempson, 2002) on the Inventory, Growth, and Hervest worksheet. This is multiplied by the percent delivered to mills to reflect the carbon delivered to mills.	**Calculated.** **The CO2e associated with processing the loge at the mill**	The difference between carbon delivered to mills and carbon remaining after milling is assumed to be emitted immediately		**Estimate.** The weighted average carbon remaining in use at yeer 100 is 46.3%	**Estimate.** The weighted average carbon remaining in use at year 100 is 23.0%
						The efficiency rating from mills in Califomie is 0.67 (DOE 1605b) for conifers	The efficiency rating from mills in Califomie is .5 (DOE 1605b) for herdwoods	**Estimate.** The carbon in landfills at year 100 is 29.9% of the initial carbon produced in wood products.	**Estimate.** The carbon in landfills at year 100 is 29.6% of the initial carbon produced in wood products.
0	75%	0%	42.21	0.00	-0.30	28.28	0.00	21.52	0.00
20	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0	0%	0%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Sum of emissions associate with processing of lumber			-0.30	Sum of CO2 equivalent in wood products		21.52	0.00

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Summary			Years until Carbon Stocks are Recouped from Initial Harvest (Includes Carbon in Live Trees, Harvested Wood Products, and Landfill)
	Beginning Stocks	Ending Stocks	
Emissions Source/Sink/Reservoir	Metric Tonnes CO2 Equivalent Per Acre Basis		Not Applicable to Conversion Analysis
Live Trees (Conifers and Hardwoods)	120.06	33.23	
Wood Products		21.52	
Site Preparation Emissions		-2.49	
Non-biological emissions associated with harvesting		-0.76	
Non-biological emissions associated with milling		-0.30	
Sum of Net Emissions/Sequestration over Identified Harvest Cycles (CO2 metric tonnes)		-68.88	
Project Summary			
Project Acres	Step 17- Insert the acres that are part of the harvest area.	6	
Total Project Sequestration over defined Harvesting Periods (CO2 metric tonnes)		(551)	

TimberHarvest Plan
SECTION 5

City of Fort Bragg
2013

NOTICE OF INTENT TO HARVEST TIMBER

A Timber Harvesting Plan or an amendment to an existing plan that may be of interest to you has been submitted to the California Department of Forestry & Fire Protection. The Department will be reviewing the proposed timber operation for compliance with various laws and rules. This review requires the addressing of any concerns you may have with what is being proposed. The following briefly describes the proposed timber operation and where and how to get more information.

The review times given to the Department to review the proposed timber operation are variable in length, but limited. To ensure the Department receives your comments please read the following:

The earliest possible date the Department may approve the plan or amendment is: 10/25/2013

NOTE: THIS DATE IS PROBABLY NOT THE ACTUAL APPROVAL DATE AND CLOSE OF PUBLIC COMMENT. Normally, a much longer period of time is available for preparation of comments. Please check with the Department, prior to the above listed date, to determine the actual date that the public comment period closes.

The plan or amendment was submitted to the Department on: 10/10/2013

Questions about the proposed timber operation or laws and rules governing timber operations should be directed to:

California Department of Forestry & Fire Protection
Forest Practice Program
135 Ridgway Avenue
Santa Rosa, CA 95401
(707) 576-2959
SantaRosaPublicComment@fire.ca.gov

The public may review the plan or amendment at the above Department office or purchase a copy of the plan or amendment. The cost to obtain a copy is 10 cents for each page, $2.50 minimum per request. (To be completed by the Department upon receipt. The cost to obtain a copy of the plan or amendment is:_____.)

Information about the plan or amendment follows:

1. Timberland Owner where the timber operation is to occur: **City of Fort Bragg**

2. Registered Professional Forester who prepared the plan or amendment: **Lee Susan RPF #2127**

3. Name of individual who submitted the plan or amendment: **City of Fort Bragg**
4. Location of the proposed timber operation (county, legal description, approximate direction & approximate distance of the timber operation from the nearest community or well-known landmark):

Portion Section 16, T18N, R17W, MDB&M. The plan area is located approximately 2 miles southeast of downtown City of Fort Bragg in Mendocino County.

5. The name of and distance from the nearest perennial stream and major watercourse flowing through or downstream from the timber operation:

Newman Gulch is approximately 200 feet distant from the plan area.

6. Acres proposed to be harvested: **8 acres +/-**

7. The regeneration methods and/or intermediate treatments to be used:

Clear-cut and clearing to facilitate conversion of site to provide for off channel reservoir construction to augment the City of Fort Bragg's municipal water supply.

8. Is there a known overhead power line, except lines from transformers to service panels, within the plan area? Yes _X_ No ____ **Power lines are adjacent to the project area.**

A map is attached to help in locating where the proposed timber operation is to occur.

Hawthorne Timber Company
1 S.W. Columbia, Suite 1720
Portland, OR 97204

Don Celeri
30001 Sherwood Road
Fort Bragg, CA 95437

Debra Lewis
31900 Johnson Lane
Fort Bragg, CA 95437

Mendocino Coast Recreation and Park District
213 East Laurel Street
Fort Bragg, CA 95437

Mendocino Coast Humane Society
19691 Summers Lane
Fort Bragg, CA 95437

Georgia Pacific Corporation
3001 JFK BLVD Suite B
North Little Rock, AR 72116

Fort Bragg Advocate-News
450 N. Franklin Street
PO Box 1188
Fort Bragg, California 95437
707-964-5642

SUMMIT FORESTRY
16575 FRANKLIN ROAD
FORT BRAGG CA 95437

Legal No. **0004806814**

PROOF OF PUBLICATION (2015.5 C.C.P.)

STATE OF CALIFORNIA COUNTY OF MENDOCINO

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the Office Clerk of the Fort Bragg Advocate-News, a newspaper of general circulation by the Superior Court of the County of Mendocino, State of California under the date of May 9, 1952 - Case Number 9151, that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been printed in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates:

03/28/2013

I certify (or declare) under penalty or perjury that the foregoing is true and correct.

Dated at Fort Bragg, California,
March 28, 2013

Sandi Mosden

SANDI MOSDEN, CLERK

PUBLIC NOTICE
TIMBER HARVEST PLAN

A timber harvest plan is being prepared on property that drains into Newman Gulch which is a tributary of the Noyo River. The legal description for the area where timber harvesting is to occur is as follows: Portion Section 16, T18N, R17W, M.B.D.M. Information is being requested concerning the presence of domestic water supplies which use these watercourses as their source. Please provide any pertinent information within 10 days from the date of this publication to: Summit Forestry, 16575 Franklin Road, Fort Bragg, CA 95437
Publish:
03/28/2013

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Summit Forestry

Lee Susan
16575 Franklin Road
Fort Bragg, CA 95437
(707) 964-4566
summit@mcn.org

March 20, 2013

Hawthorne Timber Company
1 S.W. Columbia, Suite 1720
Portland, OR 97204

Dear Neighbor,

A timber harvest plan is being prepared on property that drains into Newman Gulch which is a tributary to the Noyo River. I am requesting information concerning domestic water supplies, which use these streams or their tributaries as their source. If you know of any such domestic water supplies please contact me within 10 days of the date on which this letter was postmarked. The legal description for the area where timber harvesting is to occur is as follows: Portion Section 16, T18N, R17W, M.B.D.M. A preliminary map of the proposed harvest area is enclosed for your reference. This notice is being sent to you because you may be a landowner within 1,000 feet downstream of the proposed THP boundary whose ownership adjoins or includes a Class I, II, or IV watercourse(s) which receives surface drainage from the proposed timber operations. Thank you for your cooperation.

Sincerely yours,

Lee Susan
Forester #2127

Summit Forestry

Lee Susan
16575 Franklin Road
Fort Bragg, CA 95437
(707) 964-4566
summit@mcn.org

March 20, 2013

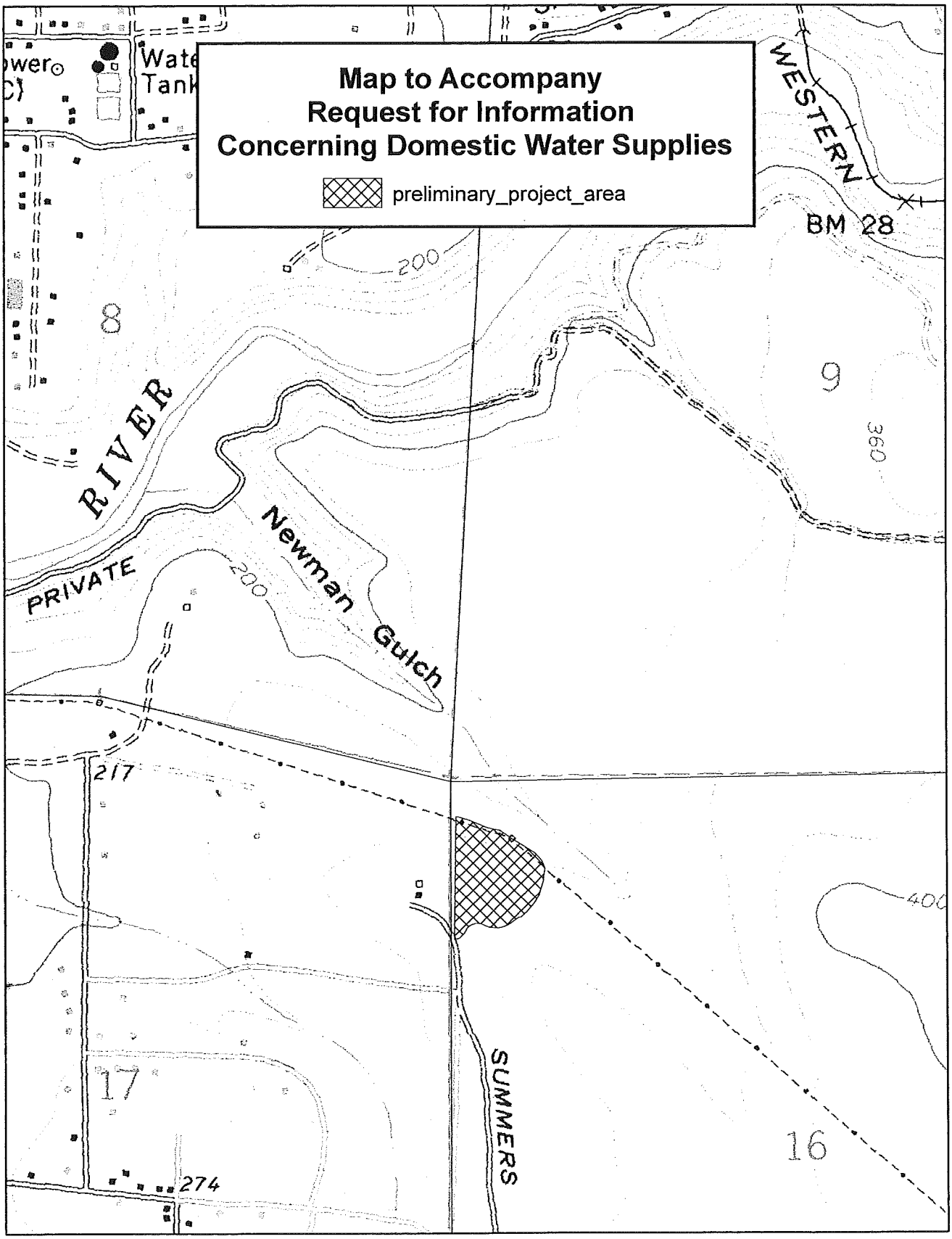
Georgia Pacific Corporation
3001 JFK Blvd Suite B
North Little Rock, AR 72116

Dear Neighbor,

A timber harvest plan is being prepared on property that drains into Newman Gulch which is a tributary to the Noyo River. I am requesting information concerning domestic water supplies, which use these streams or their tributaries as their source. If you know of any such domestic water supplies please contact me within 10 days of the date on which this letter was postmarked. The legal description for the area where timber harvesting is to occur is as follows: Portion Section 16, T18N, R17W, M.B.D.M. A preliminary map of the proposed harvest area is enclosed for your reference. This notice is being sent to you because you may be a landowner within 1,000 feet downstream of the proposed THP boundary whose ownership adjoins or includes a Class l, II, or IV watercourse(s) which receives surface drainage from the proposed timber operations. Thank you for your cooperation.

Sincerely yours,

Lee Susan
Forester #2127


Map to Accompany
Request for Information
Concerning Domestic Water Supplies
preliminary_project_area
WESTERN
BM 28
200
8
9
360
RIVER
Newman Gulch
PRIVATE
200
217
400
17
16
274
SUMMERS
N
1:12,000

Summit Forestry
Lee Susan
16575 Franklin Road
Fort Bragg, CA 95437
(707) 964-4566
summit@mcn.org

June 10, 2013

City of Fort Bragg
416 North Franklin Street
Fort Bragg, CA 95437

Dear Staff,

Pursuant to the 1/1/01 reversion of Title 14 CCR 1035.1(a)(2) and item "13 a" of the THP which I have prepared for your property, I am writing to explain some of the obligations a plan submitter and landowner incurs when they harvest timber on their property.

1) The California Code of Regulations Title 14 CCR 1035 specifies plan submitter responsibilities pertinent to the harvesting of timber. A copy of Title 14 CCR 1035 has been enclosed for your reference.

2) The State of California has certain minimum stocking requirements for timberland which must be maintained or re-established following harvesting. These stocking requirements do not apply to your project based on the planned conversion of the area to facilitate reservoir construction. If the site is harvested and for some reason the conversion is not completed as planned the harvested area would have to be restocked as specified in Title 14 CCR 912.7, which I have enclosed for your reference.

3) The State of California requires that erosion control structures be maintained. Primarily, this would include keeping waterbars operational and keeping culverts open to the unrestricted flow of water. Current regulations require that erosion control features be maintained for up to three years after the THP has been completed.

If you have any questions concerning what is required please feel free to call me at any time.

Sincerely yours,

Lee Susan
Forester # 2127
encl.

Excerpt from California Forest Practice Regulations

912.7 Resource Conservation Standards for Minimum Stocking

The following resource conservation standards constitute minimum acceptable stocking in the Coast (Northern, Southern) Forest District after timber operations have been completed.

(a) Rock outcroppings, meadows, wet areas, or other areas not normally bearing commercial species shall not be considered as requiring stocking and are exempt from such provisions.

(b) An area on which timber operations have taken place shall be classified as acceptably stocked if either of the standards set forth in (1) or (2) below are met within five years after completion of timber operations unless otherwise specified in the rules.

(1) An area contains an average point count of 300 per acre on Site I, II and III lands or 150 on site IV and V land to be computed as follows:

(A) Each countable tree (Ref. CCR, Title 14, Sec. 895.1) which is not more than 4 inches d.b.h. counts 1 point.

(B) Each countable tree over 4 in. but less than 12 in. d.b.h. counts 3 points.

(C) Each countable tree over 12 inches d.b.h. counts as 6 points.

(D) Root crown sprouts over 1 ft. in height will be counted, using the average stump diameter at 1 ft. above the average ground level of the original stump, counting 1 sprout for each ft. of stump diameter to a maximum of 6 per stump.

(2) The average residual basal area measured in stems 1 in. or larger in diameter, is at least 85 square ft. per acre on Site I lands, and 50 square ft. per acre on lands of Site II classification or lower. Site classification shall be determined by the RPF who prepared the plan.

(c) The resource conservation standards of the rules may be met with Group A and/or B commercial species. The percentage of the stocking requirements met with Group A species shall be no less than the percentage of the stand basal area they comprised before harvesting. The site occupancy provided by Group A species shall not be reduced relative to Group B species. When considering site occupancy, the Director shall consider the potential long term effects of relative site occupancy of Group A species versus Group B species as a result of harvest. If Group A species will likely recapture the site after harvest, Group B species do not need to be reduced. The time frames for recapturing the site shall be consistent with achieving MSP. The Director may prohibit the use of Group A and/or B commercial species which are non-indigenous or are not physiologically suited to the area involved. Exceptions may be approved by the Director if the THP provides the following information and those exceptions are agreed to by the timberland owner:

(1) Explain and justify with clear and convincing evidence how using Group A nonindigenous, or Group B species to meet the resource conservation standards will meet the intent of the Forest Practice Act as described in PRC Sec. 4513. The discussion shall include at least:

(A) The management objectives of the post-harvest stand;

(B) A description of the current stand, including species composition and current stocking levels within the area of Group B species. The percentage can be measured by using point-count, basal area, stocked plot, or other method agreed to by the Director.

(C) The percentage of the post-harvest stocking to be met with Group B species. Post harvest percentages will be determined on the basis of stocked plots. Only the methods provided by 14 CCR 1070-1075 shall be used in determining if the standards of PRC Sec. 4561 have been met.

(D) A description of what will constitute a countable tree, as defined by PRC Sec. 4528 for a Group B species and how such a tree will meet the management objectives of the post-harvest stand. The Director, after an initial inspection pursuant to PRC Section 4604, shall approve use of Group B species, as exceptions to the pre-harvest basal area percentage standard, if in his judgment the intent of the Act will be met, and there will not be an immediate significant and long-term harm to the natural resources of the state.

Excerpt from California Forest Practice Regulations

1035 Plan Submitter Responsibility

The plan submitter, or successor in interest, shall:

(a) Ensure that an RPF conducts any activities which require an RPF.

(b) Provide the RPF preparing the plan or amendments with complete and correct information regarding pertinent legal rights to, interests in, and responsibilities for land, timber, and access as these affect the planning and conduct of timber operations.

(c) Sign the THP certifying knowledge of the plan contents and the requirements of this section.

(d) (1) Retain an RPF who is available to provide professional advice to the LTO and timberland owner upon request throughout the active timber operations regarding:

A) the plan,

B) the Forest Practice Rules, and

C) other associated regulations pertaining to timber operations,

(2) The plan submitter may waive the requirement to retain an RPF to provide professional advice to the LTO and timberland owner under the following conditions:

A) the plan submitter provides authorization to the timberland owner to provide advice to the LTO on a continuing basis throughout the active timber operations provided that the timberland owner is a natural person who personally performs the services of a professional forester and such services are personally performed on lands owned by the timberland owner;

B) the timberland owner agrees to be present on the logging area at a sufficient frequency to know the progress of operations and advise the LTO, but not less than once during the life of the plan; and

C) the plan submitter agrees to provide a copy of the portions of the approved THP and any approved operational amendments to the timberland owner containing the General Information, Plan of Operations, THP Map, Yarding System Map, Erosion Hazard Rating Map and any other information deemed by the timberland owner to be necessary for providing advice to the LTO regarding timber operations.

(3) All agreements and authorizations required under 14 CCR § 1035(d)(2) shall be documented and provided in writing to the Director to be included in the plan.

(e) Within five working days of change in RPF responsibilities for THP implementation or substitution of another RPF, file with the Director a notice which states the RPF's name and registration number, address, and subsequent responsibilities for any RPF required fieldwork, amendment preparation, or operation supervision. Corporations need not file notification because the RPF of record on each document is the responsible person.

(f) Provide a copy of the portions of the approved THP and any approved operational amendments to the LTO containing the General Information, Plan of Operations, THP Map, Yarding System Map, Erosion Hazard Rating Map and any other information deemed by the RPF to be necessary for timber operations .

(g) Notify the Director prior to commencement of site preparation operations. Receipt of a burning permit is sufficient notice.

(h) Disclose to the LTO, prior to the start of operations, through an on-the-ground meeting, the location and protection measures for any archaeological or historical sites requiring protection if the RPF has submitted written notification to the plan submitter that the plan submitter needs to provide the LTO with this information.

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

STATE OF CALIFORNIA
BOARD OF FORESTRY

All soils are from the western Mendocino county soil series.

I. SOIL FACTORS

A. SOIL TEXTURE	FINE	MEDIUM	COARSE	A 196	B	C	D	E	F
1.DETACHABILITY RATING	Low 1-9	Moderate 10 - 18	High 19 - 30	23					
2.PERMEABILITY RATING	Slow 5 - 4	Moderate 3 - 2	Rapid 1	4					

B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK

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

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

Rating	Low (-)10-39% 10 - 6	Moderate 40-70% 5 - 3	High 71-100% 2 - 1	10					
SUBTOTAL				38					

II . SLOPE FACTOR

Slope	5-15%	16-30%	31-40%	41-50%	51-70%	71-80%+	2					
Rating	1 - 3	4 - 6	7 - 10	11 - 15	16 - 25	26 - 35						

II. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE

Rating	Low 0-40% 15 - 8	Moderate 41 - 80% 7 - 4	High 81-100%. 3 - 1	15					

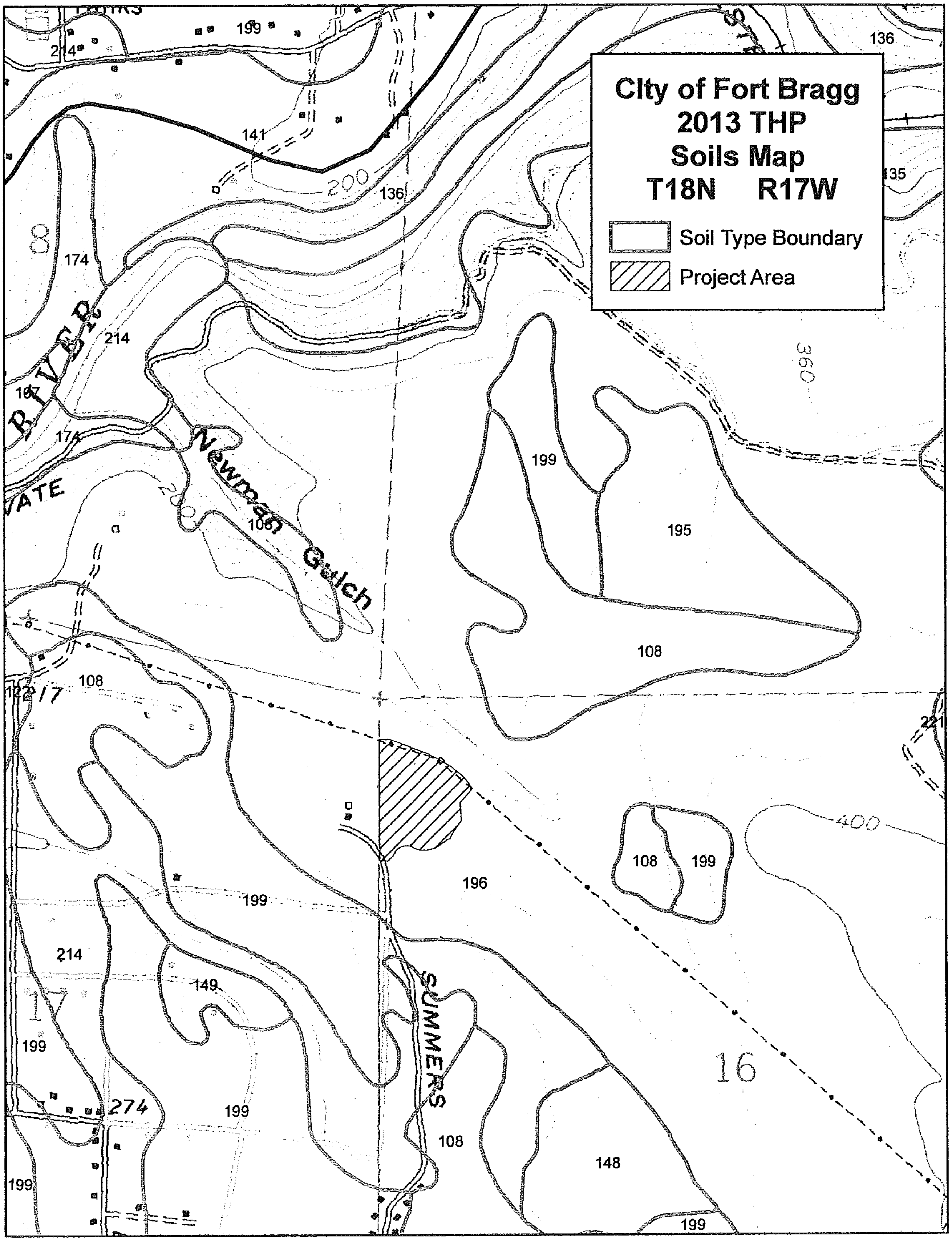
IV. TWO - YEAR ONE - HOUR RAINFALL INTENSITY (Hundredths Inch)

Rating	Low (-)30 - 39 1 - 3	Moderate 40-59 4 - 7	High 60 - 69 8 - 11	Extreme 70-80+ 12 - 15	12					

< 50 Low (L)	50-65 Moderate (M)	66 - 75 High (H)	>75 Extreme (E)	**67**					

THE DETERMINATION IS	**H**					

196 = Quinliven - Ferncreek Soils Complex 2-15 percent slopes


City of Fort Bragg
2013 THP
Soils Map
T18N R17W
Soil Type Boundary
Project Area
Newman Gulch
SUMMERS
RIVER
199
214
141
136
200
174
8
167
108
122
217
149
17
274
196
195
148
16
400
360
135
221

N

1:12,000

196—Quinliven-Ferncreek complex, 2 to 15 percent slopes

This map unit is on marine terraces. The vegetation is mainly redwood, Douglas-fir, and bishop pine. Elevation ranges from 100 to 1,000 feet. The average annual precipitation is 40 to 65 inches, the average annual air temperature is about 53 degrees F, and the average frost-free period is 290 to 365 days. This unit is about 60 percent Quinliven sandy loam and 25 percent Ferncreek sandy loam. The Quinliven and Ferncreek soils occur as areas so intricately intermingled that it was not practical to map them separately at the scale used. Included with these soils in mapping are small areas of Caspar and Harecreek soils. Also included are small areas that have slopes of 15 to 30 percent. Included areas make up about 15 percent of the total acreage of the unit. The percentage varies from one area to another. The Quinliven soil is very deep and is moderately well drained. It formed in marine sediments. Typically, the surface is covered with a mat of litter about 5 inches thick. The surface layer is light gray sandy loam about 4 inches thick. The next layer is white and very pale brown loam about 7 inches thick. The upper 7 inches of the subsoil is light yellowish brown loam. The next 14 inches is brownish yellow clay. Below this is 19 inches of brownish yellow clay that has red mottles. The lower 9 inches of the subsoil is yellowish red clay loam that has strong brown and light gray mottles. The substratum to a depth of 64 inches or more is yellowish red sandy loam that has strong brown mottles. In some areas the surface layer is loamy sand or loam. Permeability is slow in the Quinliven soil. Available water capacity is high. The effective rooting depth is limited by saturation between the depths of 48 and 72 inches for brief periods following episodes of heavy rain from December through April. Surface runoff is slow or medium, and the hazard of water erosion is slight or moderate if the surface is left bare. The Ferncreek soil is very deep and is somewhat poorly drained. It formed in marine sediments. Typically, the surface is covered with a mat of litter about 2 inches thick. The surface layer is gray and white sandy loam about 7 inches thick. The upper 17 inches of the subsoil is very pale brown and light yellowish brown clay loam and clay. The next 9 inches is brownish yellow clay that has reddish yellow and red mottles. The lower 10 inches of the subsoil is brownish yellow sandy clay loam that has red and white mottles. The substratum to a depth of 61 inches or more is yellow sandy loam that has red and white mottles. Permeability is slow in the Ferncreek soil. Available water capacity is high. The effective rooting depth is limited by saturation for brief or long periods following episodes of heavy rain from December through April. The saturated zone starts between the depths of 24 and 48 inches and extends to a depth of more than 60 inches. Surface runoff is slow or medium, and the hazard of water erosion is slight or moderate if the surface is left bare. This unit is used for timber production, for homesite development, or as watershed. Redwood, Douglas-fir, bishop pine, and tanoak are the main tree species on this unit. On the basis of a 100-year site curve, the mean site index for redwood is 124 on the Quinliven soil and 136 on the Ferncreek soil. On the basis of a 100-year site curve, the mean site index for Douglas-fir is 135 on the Quinliven soil and 159 on the Ferncreek soil. The potential annual production from a fully stocked stand of redwood is 895 board feet per acre on the Quinliven soil and 1,060 board feet per acre on the Ferncreek soil. Areas that are subject to strong, persistent winds, which limit tree height, are less productive than other areas of this unit. Trees of limited extent include western hemlock, grand fir, and Mendocino cypress. The main limitations affecting the harvesting of timber are the hazard of erosion and the seasonal wetness. The surface layer of these soils is subject to sheet and rill erosion when exposed. Disturbance of the protective layer of duff can be minimized by the careful use of wheeled and tracked equipment. Establishing plant cover on steep cut and fill slopes reduces the hazard of erosion. Another limitation is low bearing strength when the soils are saturated. Using wheeled and tracked equipment when the soils are moist produces ruts, compacts the surface, and can damage the roots of trees. Unsurfaced roads and skid trails are slippery and soft when wet. They may be impassable during rainy periods. Suitable surfacing of roads is needed for use during wet seasons. The design of roads should offset the limited ability of the soils to support a load. Roads are dusty when dry. Surface treatment may be desirable during periods of heavy use. Rock for construction of roads generally is not available in areas of this unit. Plant competition is a concern affecting the production of timber. When openings are made in the canopy, invading brushy plants that are not controlled can delay the establishment of seedlings. Because the surface layer of these soils has a low capacity to hold nutrients and water, the establishment of seedlings may be difficult. Reforestation can be

accomplished by planting redwood and Douglas-fir seedlings. Natural reforestation by redwood sprouts and Douglas-fir seed trees provides variable stocking results. Both overstocked and understocked areas are common. Among the common forest understory plants are tanoak, brackenfern, bedstraw, salal, California huckleberry, and swordfern. The main limitations affecting homesite development are the slope, the low strength, the seasonally saturated soil conditions, and the restricted permeability. Excavations for roads and buildings increase the hazard of erosion. Revegetating disturbed areas around construction sites as soon as possible helps to control erosion. The design of access roads should control surface runoff and help to stabilize cut slopes. The design of buildings and roads should offset the limited ability of the soils to support a load. Surface drainage may be needed for roads and buildings. The seasonal wetness and the restricted permeability in the subsoil increase the possibility of failure of septic tank absorption fields. Alternative systems may be needed, such as those in which leach lines are placed in a mound above the soil surface. The capability classification is IIIe-3(4), nonirrigated.

Erosion Control Plan for the City of Fort Bragg THP

This document addresses the requirements of North Coast Regional Water Quality Control Board Order R1-2004-0030, General Waste Discharge Requirements (GWDR), for Erosion Control Plans (ECPs) related to timber harvest activities on Non-Federal lands in the North Coast Region. An Erosion Control Plan is defined in 'The Order' as:

A. "Erosion Control Plan" means a plan designed and implemented to prevent and minimize the discharge of sediment to waters of the state in violation of applicable water quality requirements or other conditions of this Order. The Erosion Control Plan (ECP) shall be developed by a qualified professional, included in the approved Project or submitted with the application when seeking coverage under these General WDRs, and shall incorporate Regional Water Board staff recommendations generated as part of the Project review and approval process that were designed to prevent and minimize discharge of sediment. The ECP shall include but is not limited to, a map clearly showing the location(s) of the site(s) that could discharge sediment, site specific designs and/or management measures to prevent and minimize the discharge of sediment, and a time schedule for implementation of site specific designs and/or management measures.

The proposed project is a Timber Harvest Plan filed in conjunction with a Timberland Conversion application for an 8+/- acre area where an off channel reservoir is to be constructed. All timber in this area will be removed in order to prepare the site for the construction of the reservoir. The yarding method will be tractor. Almost all areas will be subject to significant ground disturbance. No new road construction is proposed.

I. Road Inventory and Treatment of Controllable Sediment Sources

The RPF has conducted an inspection of the project area to determine if any active erosion sites or controllable sediment discharge sources are associated with the project area. The inventory method consisted of a complete ground assessment of the project area. There are no watercourses associated with the project area which is located on a coastal terrace. Slopes within the project area are typically <10%. The project area is directly accessed by Summers Lane which is a County maintained road and therefore appurtenant road conditions are not a concern for this project. There are no active erosion sites or controllable sediment discharge sources are associated with the project area.

Implementation Schedule

No active erosion sites or controllable sediment discharge sources are associated with the project area therefore an implementation schedule for corrective actions has not been developed.

II. General Prevention and Minimization Measures

The following discussion conforms to Section III (D)(3) of the GWDR.

Prevention and minimization measures will be implemented concurrent with operations. The soil stabilization measures proposed within the THP are designed to prevent or minimize the potential for future sediment delivery.

This THP has been designed to accommodate the objective of developing an off channel reservoir without inadvertently impacting public trust resources. The project has been developed utilizing a strategy that emphasizes additional protection to those mechanisms which can most directly affect the beneficial uses of water. Prevention and minimization measures are specified in the THPs and include, but not limited to, the following (as contained in the THP):

– Harvesting Practices

- Tractor yarding is prescribed for gentle slopes where constructed skid trails are unnecessary. Steeper slopes were excluded from the project area to minimize the potential for sediment production.

– Soil Stabilization

- Disturbance to soils with high delivery potential has been avoided by locating the project away from watercourses and steep slopes.
- No operations are proposed in any WLPZ, ELZ or EEZ.
- The haul route also avoids sensitive areas such as watercourses and steep slopes.
- Drainage facilities will be installed to minimize erosion on skid trails and roads, except where roads are surfaced (rocked) with sufficient cross drains (ditch relief culverts) to minimize erosion. These measures include:
  - Waterbreak construction
  - Outsloping with rolling dips
  - Inside ditches with adequate drainage relief
  - Maximum spacing of waterbreaks are based on Erosion Hazard Rating (EHR) and road or trail slope gradient as shown per THP Section 2

Given that the project area is to be basically cleared in its entirety additional erosion and sediment prevention measures are to be taken as follows:

- A sediment barrier consisting of a silt fence consistent with the Standard Silt Fence Design Criteria located at the end of THP Section II or a straw bale barrier consistent with the Standard Straw Bale Barrier Design Criteria located at the end of THP Section II will be put in place around the project perimeter.
- When the project area is winterized and prior to installation of permanent run-off controls included in the project design sediment traps consistent with the Standard Sediment Trap Design Criteria located at the end of THP Section II will be installed along the northern (down slope) end of the cleared area.
- When the project area is winterized and prior to installation of permanent surface cover specified in the project design bare soil will be mulched to minimize the potential for sediment mobilization.

Given the gentle slopes (<10%+/-) the relative small project size and lack of onsite watercourses the above measures will effectively minimize the potential for sediment yield occurring on site and impacting off site resources.

Additional measures to be utilized by The City of Fort Bragg in their project implementation to minimize the potential for inadvertent erosion and sediment production as specified in their Mitigated Negative Declaration include the following:

Storm Water Pollution Prevention Plan (SWPPP)

Sediment and pollution prevention measures included in the SWPPP will be implemented to control sediment and pollutants during construction and prevent construction activities from having a negative effect on offsite water qualities. Through implementation of the SWPPP, project storm water will be treated to meet state and federal storm water requirements, including treatment of storm water quality and quantity so that they are not substantially altered from existing conditions. The City is developing their SWPPP for the project and the SWPPP will be appended to the THP when it is available and prior to timber operations.

Dust Abatement

Additional measures to be utilized by The City of Fort Bragg in their project implementation to minimize the potential for impacts associated with dust as specified in their Mitigated Negative Declaration are as follows:

In order to minimize dust and keep dust from leaving the project site, a dust prevention and control plan shall be submitted for approval by the City Engineer in conjunction with the grading plan. The dust prevention and control plan shall demonstrate that the discharge of dust from the construction site will not occur, or can be controlled to an acceptable level depending on the particular site conditions and circumstances. The plan shall include the following information and provisions:

2.A - The plan shall address site conditions during construction operations, after normal working hours, and during various phases of construction.

2.B - The plan shall include the name and the 24 hour phone number of a responsible party in case of emergency.

2.C - If the importing or exporting of dirt is necessary as demonstrated by the cut and fill quantities on the grading plan, the plan shall also include the procedures necessary to keep the public streets and private properties along the haul route free of dirt, dust, and other debris.

2.D - When an entire project is to be graded and the subsequent construction on the site is to be completed in phases, the portion of the site not under construction shall be treated with dust preventive substance or plant materials and an irrigation system.

2.E - Grading shall be designed and grading activities shall be scheduled to ensure that repeat grading will not be required, and that completion of the dust-generating activity (e.g., construction, paving or planting) will occur as soon as possible.

2.F - The area disturbed by clearing, demolition, earth-moving, excavation operations or grading shall be minimized at all times.

2.G - All visibly dry disturbed soil road surfaces shall be watered to minimize fugitive dust emissions. Dust emissions shall be controlled by watering a minimum of two times each day, paving or other treatment of permanent on-site roads and construction roads, the covering of trucks carrying loads with dust content, and/or other dust-preventive measures (e.g., hydro-seeding, etc.).

2.H - All unpaved surfaces, unless otherwise treated with suitable chemicals or oils, shall have a posted speed limit of 10 miles per hour.

2.I - Earth or other material that has been transported by trucking or earth moving equipment, erosion by water, or other means onto paved streets shall be promptly removed.

2.J - Asphalt, oil, water or suitable chemicals shall be applied on materials stockpiles, and other surfaces that can give rise to airborne dusts.
2.K - All earthmoving activities shall cease when sustained winds exceed 15 miles per hour.
2.L - The operator shall take reasonable precautions to prevent the entry of unauthorized vehicles onto the site during non-work hours.
2.M - The operator shall keep a daily log of activities to control fugitive dust.
2.N - Graded areas shall be re-vegetated as soon as possible, but within no longer than 30 days, to minimize dust and erosion. Disturbed areas of the construction site that are to remain inactive longer than three months shall be seeded and watered until grass cover is grown and maintained; and
2.O - Appropriate facilities shall be constructed to contain dust within the site as required by the City Engineer.

Site Grading

Additional measures to be utilized by The City of Fort Bragg in their project implementation to minimize the potential for inadvertent erosion and sediment production associated with site grading as specified in their Mitigated Negative Declaration include the following:

- Site grading associated with the construction of the reservoir shall conform to the recommendations outlined in the Holdrege & Kull report, Summer's Lane Reservoir, Fort Bragg, California, Geotechnical Investigation Report, dated October 2, 2009 (Project #70315-01), Section 8, Earthwork Grading Recommendations.

Stability Relative to Seismic Events

Additional measures to be utilized by The City of Fort Bragg in their project implementation to minimize the potential for inadvertent erosion and sediment production associated with seismic events, as specified in their Mitigated Negative Declaration, include the following:

- Construction of the reservoir shall conform to the recommendations outlined in the Holdrege & Kull report, Summer's Lane Reservoir, Fort Bragg, California, Geotechnical Investigation Report, dated October 2, 2009 (Project #70315-01), including the requirement that any rigid structures that are constructed across the toe of the earthen levee slopes shall have articulated connections that can accommodate up to at least 25 inches of displacement.

III. Fuel Management Plan

The following discussion conforms to Section III (E) of the GWDR.

If applicable, a Fuel Management Plan (FMP) will be prepared to protect water quality from the use and storage of petroleum products and to assure that all State and Federal regulations pertaining to the handling and storage of fuel are adhered to during logging operations. An FMP has been prepared, as fuel storage may exceed the 1320 gallons as specified under Section III (E) (1) of the GWDR.

Fuel Management Plan per Section III (E) (1) of the GWDR

- All State & Federal regulations pertaining to the storage and handling of fuel must be adhered to during logging operations. These regulations include the California Above Ground Petroleum Storage Act with 1991 amendments and the Environmental Protection Agency regulations on Oil Pollution Prevention (40 CFR 112).
- If a fuel leak occurs, the LTO shall:
  - Contact the Plan Submitter by phone at 707-961-2827.
  - Contact the local fire department with jurisdiction (911), if a fire hazard occurs.
  - Contact the Department of Fish and Game for spills that have the potential to contaminate a watercourse. Contact DFG by phone at 707-944-5544.
- Secondary impermeable containment shall be installed at all refueling/service areas that are regulated by the aforementioned laws.

IV. Inspection and Reporting Plan

To insure proper function of erosion control measures inspections of the plan area will be made. Inspections are required once the startup of timber operations has begun within the THP area. Inspections will be scheduled to include at least the following:

- By November 15 to assure Project areas are secure for the winter;
- After April 1 and before June 15 to assess the effectiveness of erosion control measures and to determine if any new controllable sediment discharge sources have developed.

Inspections will be conducted each year according to the schedule specified above until the Project has been completed and a Notice of Termination has been submitted.

Inspections will include, at a minimum, logging area roads that could discharge sediment, sites and locations addressed in the sediment prevention plan if any, and controllable sediment discharge sources, if any, contained in the ECP. The THP Map shows the location of the project area. An annual summary report will be submitted to the Regional Board staff. Inspections will continue through the life the THP and will conclude when CAL FIRE signs the completion report. Inspections will accomplish the following objectives:

- Observe specific sites, if any, which are included in the ECP to ensure that measures to prevent and minimize sediment discharge are functioning as intended.
- Observe all roads in the logging area, and identify and correct new or existing problems that could result in adverse impacts to water quality in a timely manner.

Inspectors will inspect all accessible portions of the road system that have the potential to discharge sediment to watercourses to ensure roads are draining adequately and watercourse crossings are functioning properly and indentify any new sediment production sites that may have developed.

Inspectors will note the conditions of erosion control sites, if any, and note any failures or ineffectiveness of management measures.

If any new controllable sediment discharge sources are identified during inspections, prevention and minimization measures will be implemented as soon as is feasible. Equipment, materials, and workers will be mobilized for rapid response to failures and emergencies, and implement, as feasible, emergency management measures depending upon field conditions and worker safety for access. New controllable sediment discharge sources will be evaluated and addressed in accordance with sediment minimization goals.

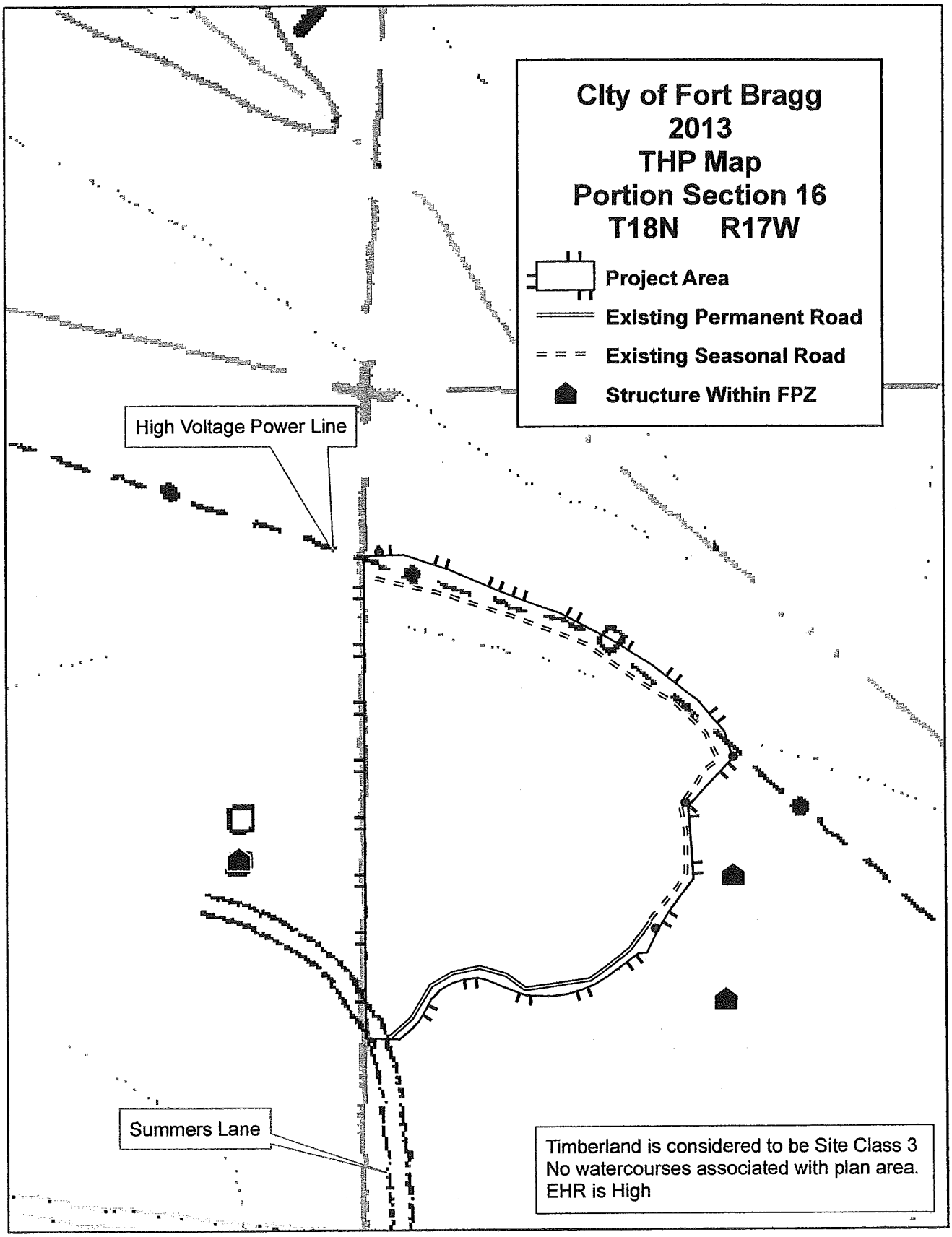
Reporting Requirements

An inspection summary report will be submitted to the Executive Officer by June 30th for each year of coverage under the Categorical Waiver and upon termination of coverage. The inspection summary report will include the following information:

- the inspector's name,
- the location of each inspection,
- the title and name of the person submitting the summary report,
- a brief narrative description of observed conditions,
- a description of any new controllable sediment discharge sources identified during inspections or throughout the course of routine timber harvest activities,
- a description of any corrective action taken to prevent and minimize sediment discharge as a result of observations made during the inspections, as well as the date the corrective action was taken,
- a description of prevention and minimization measures contained in the ECP implemented up to the date of submission of the report, the date those measures were implemented, and an evaluation of the effectiveness of those measures,
- a description of situations where management measures have been ineffective and when repairs or design changes will be implemented.

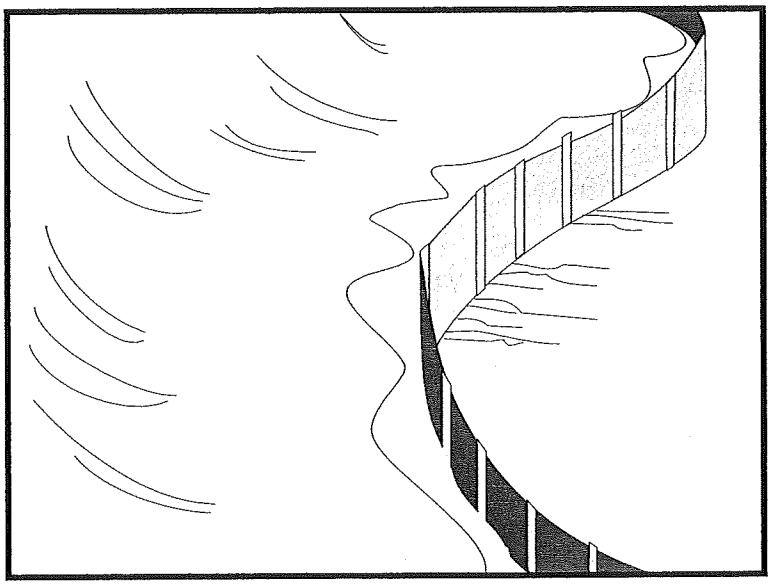
The plan submitter maintains a staff of professionals who are competent to evaluate the effectiveness of mitigation measures to be utilized. The person(s) listed below can respond to any questions or comments related to this project.

Teresa Spade
416 North Franklin Street
Fort Bragg, CA 95437
707-961-2827


City of Fort Bragg
2013
THP Map
Portion Section 16
T18N R17W
Project Area
Existing Permanent Road
Existing Seasonal Road
Structure Within FPZ
High Voltage Power Line
Summers Lane
Timberland is considered to be Site Class 3
No watercourses associated with plan area.
EHR is High
N

1:3,000

Silt Fence SE-1



Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:
☑ **Primary Category**
☒ **Secondary Category**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-5 Fiber Rolls
SE-6 Gravel Bag Berm
SE-8 Sandbag Barrier
SE-10 Storm Drain Inlet Protection
SE-14 Biofilter Bags

Description and Purpose

A silt fence is made of a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support. The silt fence detains sediment-laden water, promoting sedimentation behind the fence.

Suitable Applications

Silt fences are suitable for perimeter control, placed below areas where sheet flows discharge from the site. They could also be used as interior controls below disturbed areas where runoff may occur in the form of sheet and rill erosion and around inlets within disturbed areas (SE-10). Silt fences are generally ineffective in locations where the flow is concentrated and are only applicable for sheet or overland flows. Silt fences are most effective when used in combination with erosion controls. Suitable applications include:

- Along the perimeter of a project.
- Below the toe or down slope of exposed and erodible slopes.
- Along streams and channels.
- Around temporary spoil areas and stockpiles.
- Around inlets.
- Below other small cleared areas.

CASQA
CALIFORNIA STORMWATER

Limitations

- Do not use in streams, channels, drain inlets, or anywhere flow is concentrated.
- Do not use in locations where ponded water may cause a flooding hazard. Runoff typically ponds temporarily on the upstream side of silt fence.
- Do not use silt fence to divert water flows or place across any contour line. Fences not constructed on a level contour, or fences used to divert flow will concentrate flows resulting in additional erosion and possibly overtopping or failure of the silt fence.
- Improperly installed fences are subject to failure from undercutting, overtopping, or collapsing.
- Not effective unless trenched and keyed in.
- Not intended for use as mid-slope protection on slopes greater than 4:1 (H:V).
- Do not use on slopes subject to creeping, slumping, or landslides.

Implementation

General

A silt fence is a temporary sediment barrier consisting of woven geotextile stretched across and attached to supporting posts, trenched-in, and, depending upon the strength of fabric used, supported with plastic or wire mesh fence. Silt fences trap sediment by intercepting and detaining small amounts of sediment-laden runoff from disturbed areas in order to promote sedimentation behind the fence.

The following layout and installation guidance can improve performance and should be followed:

- Use principally in areas where sheet flow occurs.
- Install along a level contour, so water does not pond more than 1.5 ft at any point along the silt fence.
- The maximum length of slope draining to any point along the silt fence should be 200 ft or less.
- The maximum slope perpendicular to the fence line should be 1:1.
- Provide sufficient room for runoff to pond behind the fence and to allow sediment removal equipment to pass between the silt fence and toes of slopes or other obstructions. About 1200 ft^2 of ponding area should be provided for every acre draining to the fence.
- Turn the ends of the filter fence uphill to prevent stormwater from flowing around the fence.
- Leave an undisturbed or stabilized area immediately down slope from the fence where feasible.

- Silt fences should remain in place until the disturbed area is permanently stabilized, after which, the silt fence should be removed and properly disposed.
- Silt fence should be used in combination with erosion source controls up slope in order to provide the most effective sediment control.
- Be aware of local regulations regarding the type and installation requirements of silt fence, which may differ from those presented in this fact sheet.

Design and Layout

The fence should be supported by a plastic or wire mesh if the fabric selected does not have sufficient strength and bursting strength characteristics for the planned application (as recommended by the fabric manufacturer). Woven geotextile material should contain ultraviolet inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 °F to 120 °F.

- Layout in accordance with attached figures.
- For slopes steeper than 2:1 (H:V) and that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to install additional protection immediately adjacent to the bottom of the slope, prior to installing silt fence. Additional protection may be a chain link fence or a cable fence.
- For slopes adjacent to sensitive receiving waters or Environmentally Sensitive Areas (ESAs), silt fence should be used in conjunction with erosion control BMPs.

Standard vs. Heavy Duty Silt Fence

Standard Silt Fence

- Generally applicable in cases where the slope of area draining to the silt fence is 4:1 (H:V) or less.
- Used for shorter durations, typically 5 months or less
- Area draining to fence produces moderate sediment loads.

Heavy Duty Silt Fence

- Use is generally limited to 8 months or less.
- Area draining to fence produces moderate sediment loads.
- Heavy duty silt fence usually has 1 or more of the following characteristics, not possessed by standard silt fence.
  - Fence fabric has higher tensile strength.
  - Fabric is reinforced with wire backing or additional support.
  - Posts are spaced closer than pre-manufactured, standard silt fence products.
  - Posts are metal (steel or aluminum)

Materials

Standard Silt Fence

- Silt fence material should be woven geotextile with a minimum width of 36 in. and a minimum tensile strength of 100 lb force. The fabric should conform to the requirements in ASTM designation D4632 and should have an integral reinforcement layer. The

reinforcement layer should be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric should be between 0.1 sec^{-1} and 0.15 sec^{-1} in conformance with the requirements in ASTM designation D4491.

- Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.

- Staples used to fasten the fence fabric to the stakes should be not less than 1.75 in. long and should be fabricated from 15 gauge or heavier wire. The wire used to fasten the tops of the stakes together when joining two sections of fence should be 9 gauge or heavier wire. Galvanizing of the fastening wire will not be required.

Heavy-Duty Silt Fence

- Some silt fence has a wire backing to provide additional support, and there are products that may use prefabricated plastic holders for the silt fence and use metal posts or bar reinforcement instead of wood stakes. If bar reinforcement is used in lieu of wood stakes, use number four or greater bar. Provide end protection for any exposed bar reinforcement for health and safety purposes.

Installation Guidelines – Traditional Method

Silt fences are to be constructed on a level contour. Sufficient area should exist behind the fence for ponding to occur without flooding or overtopping the fence.

- A trench should be excavated approximately 6 in. wide and 6 in. deep along the line of the proposed silt fence (trenches should not be excavated wider or deeper than necessary for proper silt fence installation).

- Bottom of the silt fence should be keyed-in a minimum of 12 in.

- Posts should be spaced a maximum of 6 ft apart and driven securely into the ground a minimum of 18 in. or 12 in. below the bottom of the trench.

- When standard strength geotextile is used, a plastic or wire mesh support fence should be fastened securely to the upslope side of posts using heavy–duty wire staples at least 1 in. long. The mesh should extend into the trench.

- When extra-strength geotextile and closer post spacing are used, the mesh support fence may be eliminated.

- Woven geotextile should be purchased in a long roll, then cut to the length of the barrier. When joints are necessary, geotextile should be spliced together only at a support post, with a minimum 6 in. overlap and both ends securely fastened to the post.

- The trench should be backfilled with native material and compacted.

- Construct silt fences with a setback of at least 3 ft from the toe of a slope. Where, due to specific site conditions, a 3 ft setback is not available, the silt fence may be constructed at the

toe of the slope, but should be constructed as far from the toe of the slope as practicable. Silt fences close to the toe of the slope will be less effective and more difficult to maintain.

- Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case should the reach exceed 500 ft.
- Cross barriers should be a minimum of $^1/_3$ and a maximum of ½ the height of the linear barrier.
- See typical installation details at the end of this fact sheet.

Installation Guidelines - Static Slicing Method

- Static Slicing is defined as insertion of a narrow blade pulled behind a tractor, similar to a plow blade, at least 10 inches into the soil while at the same time pulling silt geotextile fabric into the ground through the opening created by the blade to the depth of the blade. Once the gerotextile is installed, the soil is compacted using tractor tires.
- This method will not work with pre-fabricated, wire backed silt fence.
- Benefits:
    - Ease of installation (most often done with a 2 person crew). In addition, installation using static slicing has been found to be more efficient on slopes, in rocky soils, and in saturated soils.
    - Minimal soil disturbance.
    - Greater level of compaction along fence, leading to higher performance (i.e. greater sediment retention).
    - Uniform installation.
    - Less susceptible to undercutting/undermining.

Costs

- It should be noted that costs vary greatly across regions due to available supplies and labor costs.
- Average annual cost for installation using the traditional silt fence installation method (assumes 6 month useful life) is $7 per linear foot based on vendor research. Range of cost is $3.50 - $9.10 per linear foot.
- In tests, the slicing method required 0.33 man hours per 100 linear feet, while the trenched based systems required as much as 1.01 man hours per linear foot.

Inspection and Maintenance

- BMPs must be inspected in accordance with General Permit requirements for the associated project type and risk level. It is recommended that at a minimum, BMPs be inspected weekly, prior to forecasted rain events, daily during extended rain events, and after the conclusion of rain events.
- Repair undercut silt fences.

- Repair or replace split, torn, slumping, or weathered fabric. The lifespan of silt fence fabric is generally 5 to 8 months.
- Silt fences that are damaged and become unsuitable for the intended purpose should be removed from the site of work, disposed, and replaced with new silt fence barriers.
- Sediment that accumulates in the BMP should be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height.
- Silt fences should be left in place until the upstream area is permanently stabilized. Until then, the silt fence should be inspected and maintained regularly.
- Remove silt fence when upgradient areas are stabilized. Fill and compact post holes and anchor trench, remove sediment accumulation, grade fence alignment to blend with adjacent ground, and stabilize disturbed area.

References

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Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group-Working Paper, USEPA, April 1992.

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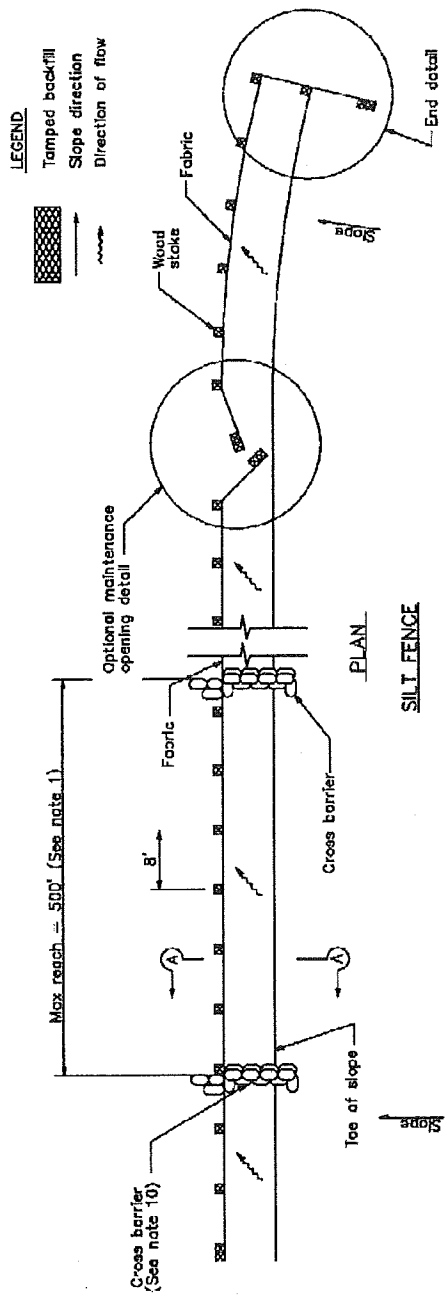
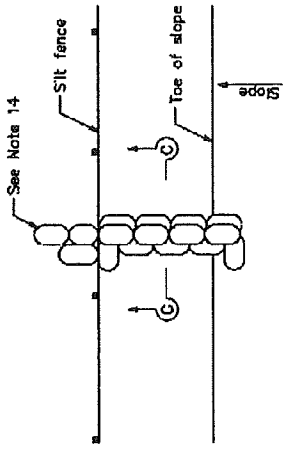
Stormwater Management Manual for The Puget Sound Basin, Washington State Department of Ecology, Public Review Draft, 1991.

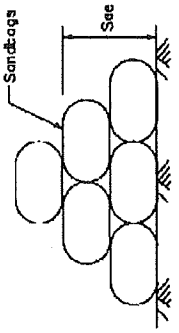
U.S. Environmental Protection Agency (USEPA). Stormwater Management for Industrial Activities: Developing Pollution Prevention Plans and Best Management Practices. U.S. Environmental Protection Agency, Office of Water, Washington, DC, 1992.

Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.Soil Stabilization BMP Research for Erosion and Sediment Controls: Cost Survey Technical Memorandum, State of California Department of Transportation (Caltrans), July 2007.

Erosion and Sediment Control Manual, Oregon Department of Environmental Quality, February 2005.

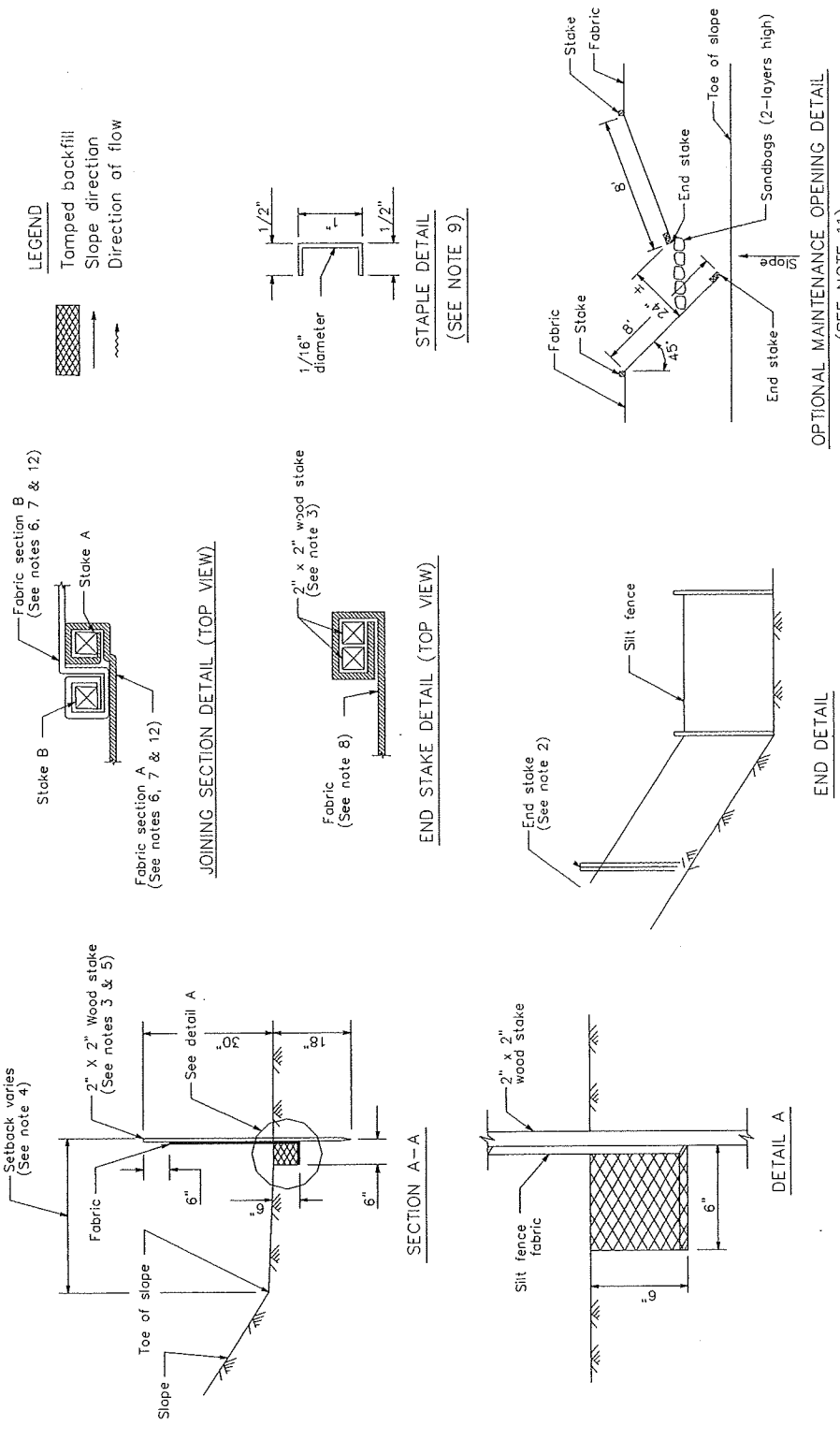




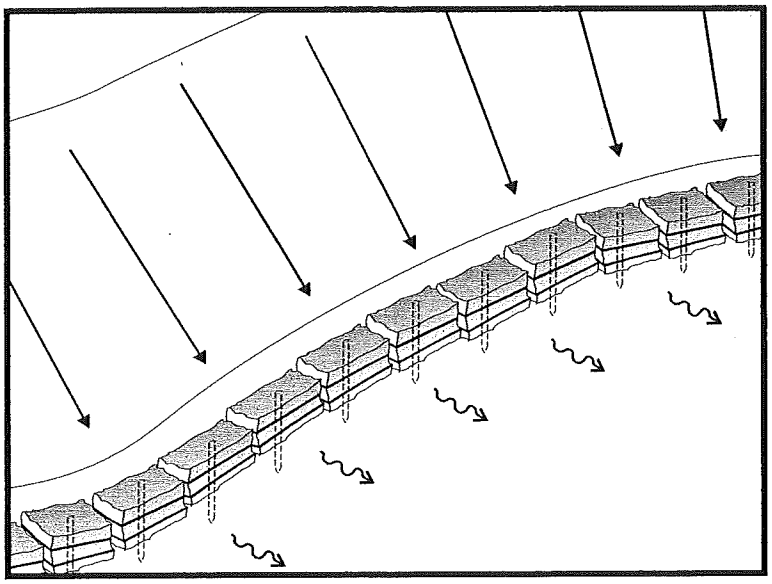


NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the linear barrier, in no case shall the reach length exceed 500'.
2. The last 8'-0" of fence shall be turned up slope.
3. Stake dimensions are nominal.
4. Dimension may vary to fit field condition.
5. Stakes shall be spaced at 8'-0" maximum and shall be positioned on downstream side of fence.
6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.
7. Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire.
8. For end stake, fence fabric shall be folded around two stakes are full turn and secured with 4 staples.
9. Minimum 4 staples per stake. Dimensions shown are typical.
10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.
11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.
12. Joining sections shall not be placed at sump locations.
13. Sandbag rows and layers shall be offset to eliminate gaps.
14. Add 3-4 bags to cross barrier on downgradient side of silt fence as needed to prevent bypass or undermining and as allowable based on site limits of disturbance.


LEGEND
Tamped backfill
Slope direction
Direction of flow
1/2"
1/16" diameter
1/2"
STAPLE DETAIL
(SEE NOTE 9)
Stake
Fabric
Toe of slope
8'
End stake
Sandbags (2-layers high)
Slope
Fabric
Stake
8'
4'
2'
45°
End stake
OPTIONAL MAINTENANCE OPENING DETAIL
(SEE NOTE 11)
Fabric section B
(See notes 6, 7 & 12)
Stake A
Stake B
Fabric section A
(See notes 6, 7 & 12)
JOINING SECTION DETAIL (TOP VIEW)
2" x 2" wood stake
(See note 3)
Fabric
(See note 8)
END STAKE DETAIL (TOP VIEW)
Silt fence
End stake
(See note 2)
END DETAIL
Setback varies
(See note 4)
2" X 2" Wood stake
(See notes 3 & 5)
See detail A
30"
18"
Fabric
6"
6"
6"
Toe of slope
Slope
SECTION A-A
2" x 2"
wood stake
Silt fence
fabric
6"
6"
DETAIL A

Straw Bale Barrier SE-9



Description and Purpose

A straw bale barrier is a series of straw bales placed on a level contour to intercept sheet flows. Straw bale barriers pond sheet- flow runoff, allowing sediment to settle out.

Suitable Applications

Straw bale barriers may be suitable:

- As a linear sediment control measure:
  - Below the toe of slopes and erodible slopes
  - As sediment traps at culvert/pipe outlets
  - Below other small cleared areas
  - Along the perimeter of a site
  - Down slope of exposed soil areas
  - Around temporary stockpiles and spoil areas
  - Parallel to a roadway to keep sediment off paved areas
  - Along streams and channels
- As linear erosion control measure:
  - Along the face and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow

Categories

EC	Erosion Control	☒
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-1 Silt Fence

SE-5 Fiber Rolls

SE-6 Gravel Bag Berm

SE-8 Sandbag Barrier

CASQA
CALIFORNIA STORMWATER

- At the top of slopes to divert runoff away from disturbed slopes
- As check dams across mildly sloped construction roads

Limitations

Straw bale barriers:

- Are not to be used for extended periods of time because they tend to rot and fall apart
- Are suitable only for sheet flow on slopes of 10 % or flatter
- Are not appropriate for large drainage areas, limit to one acre or less
- May require constant maintenance due to rotting
- Are not recommended for concentrated flow, inlet protection, channel flow, and live streams
- Cannot be made of bale bindings of jute or cotton
- Require labor-intensive installation and maintenance
- Cannot be used on paved surfaces
- Should not to be used for drain inlet protection
- Should not be used on lined ditches
- May introduce undesirable non-native plants to the area

Implementation

General

A straw bale barrier consists of a row of straw bales placed on a level contour. When appropriately placed, a straw bale barrier intercepts and slows sheet flow runoff, causing temporary ponding. The temporary ponding provides quiescent conditions allowing sediment to settle. Straw bale barriers also interrupt the slope length and thereby reduce erosion by reducing the tendency of sheet flows to concentrate into rivulets, which erode rills, and ultimately gullies, into disturbed, sloped soils.

Straw bale barriers have not been as effective as expected due to improper use. These barriers have been placed in streams and drainage ways where runoff volumes and velocities have caused the barriers to wash out. In addition, failure to stake and entrench the straw bale has allowed undercutting and end flow. Use of straw bale barriers in accordance with this BMP should produce acceptable results.

Design and Layout

- Locate straw bale barriers on a level contour.
  - Slopes up to 10:1 (H:V): Straw bales should be placed at a maximum interval of 50 ft (a closer spacing is more effective), with the first row near the toe of slope.
  - Slopes greater than 10:1 (H:V): Not recommended.

- Turn the ends of the straw bale barrier up slope to prevent runoff from going around the barrier.
- Allow sufficient space up slope from the barrier to allow ponding, and to provide room for sediment storage.
- For installation near the toe of the slope, consider moving the barrier away from the slope toe to facilitate cleaning. To prevent flow behind the barrier, sand bags can be placed perpendicular to the barrier to serve as cross barriers.
- Drainage area should not exceed 1 acre, or 0.25 acre per 100 ft of barrier.
- Maximum flow path to the barrier should be limited to 100 ft.
- Straw bale barriers should consist of two parallel rows.
  - Butt ends of bales tightly
  - Stagger butt joints between front and back row
  - Each row of bales must be trenched in and firmly staked
- Straw bale barriers are limited in height to one bale laid on its side.
- Anchor bales with either two wood stakes or four bars driven through the bale and into the soil. Drive the first stake towards the butt joint with the adjacent bale to force the bales together.
- See attached figure for installation details.

Materials

- ***Straw Bale Size:*** Each straw bale should be a minimum of 14 in. wide, 18 in. in height, 36 in. in length and should have a minimum mass of 50 lbs. The straw bale should be composed entirely of vegetative matter, except for the binding material.
- ***Bale Bindings:*** Bales should be bound by steel wire, nylon or polypropylene string placed horizontally. Jute and cotton binding should not be used. Baling wire should be a minimum diameter of 14 gauge. Nylon or polypropylene string should be approximately 12 gauge in diameter with a breaking strength of 80 lbs force.
- ***Stakes:*** Wood stakes should be commercial quality lumber of the size and shape shown on the plans. Each stake should be free from decay, splits or cracks longer than the thickness of the stake, or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable. Steel bar reinforcement should be equal to a #4 designation or greater. End protection should be provided for any exposed bar reinforcement.

Costs

Straw bales cost $5 - $7 each. Adequate labor should be budgeted for installation and maintenance.

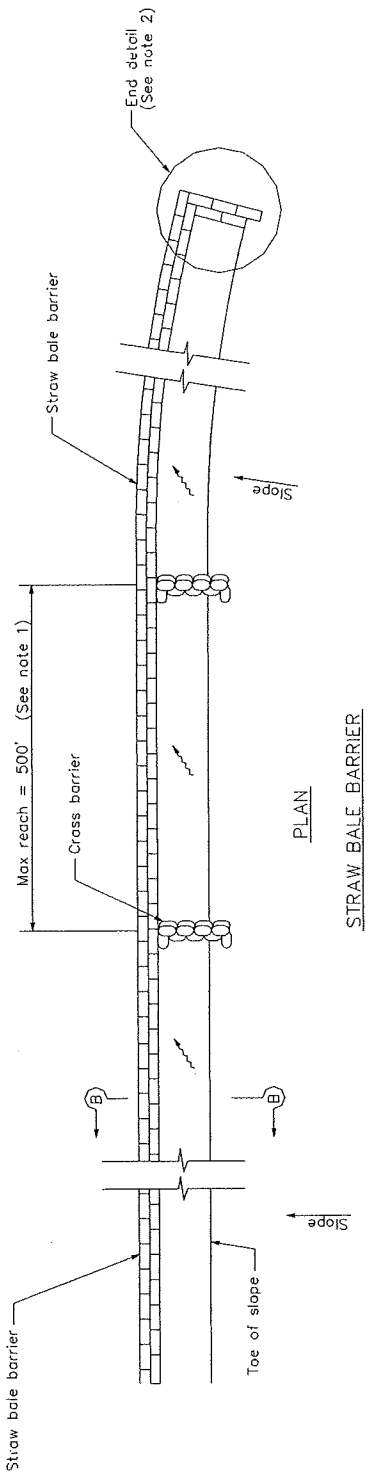
Inspection and Maintenance

Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Straw bales degrade, especially when exposed to moisture. Rotting bales will need to be replaced on a regular basis.
- Replace or repair damaged bales as needed.
- Repair washouts or other damages as needed.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the barrier height. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed at an appropriate location.
- Remove straw bales when no longer needed. Remove sediment accumulation, and clean, re-grade, and stabilize the area. Removed sediment should be incorporated in the project or disposed of.

References

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.



PLAN

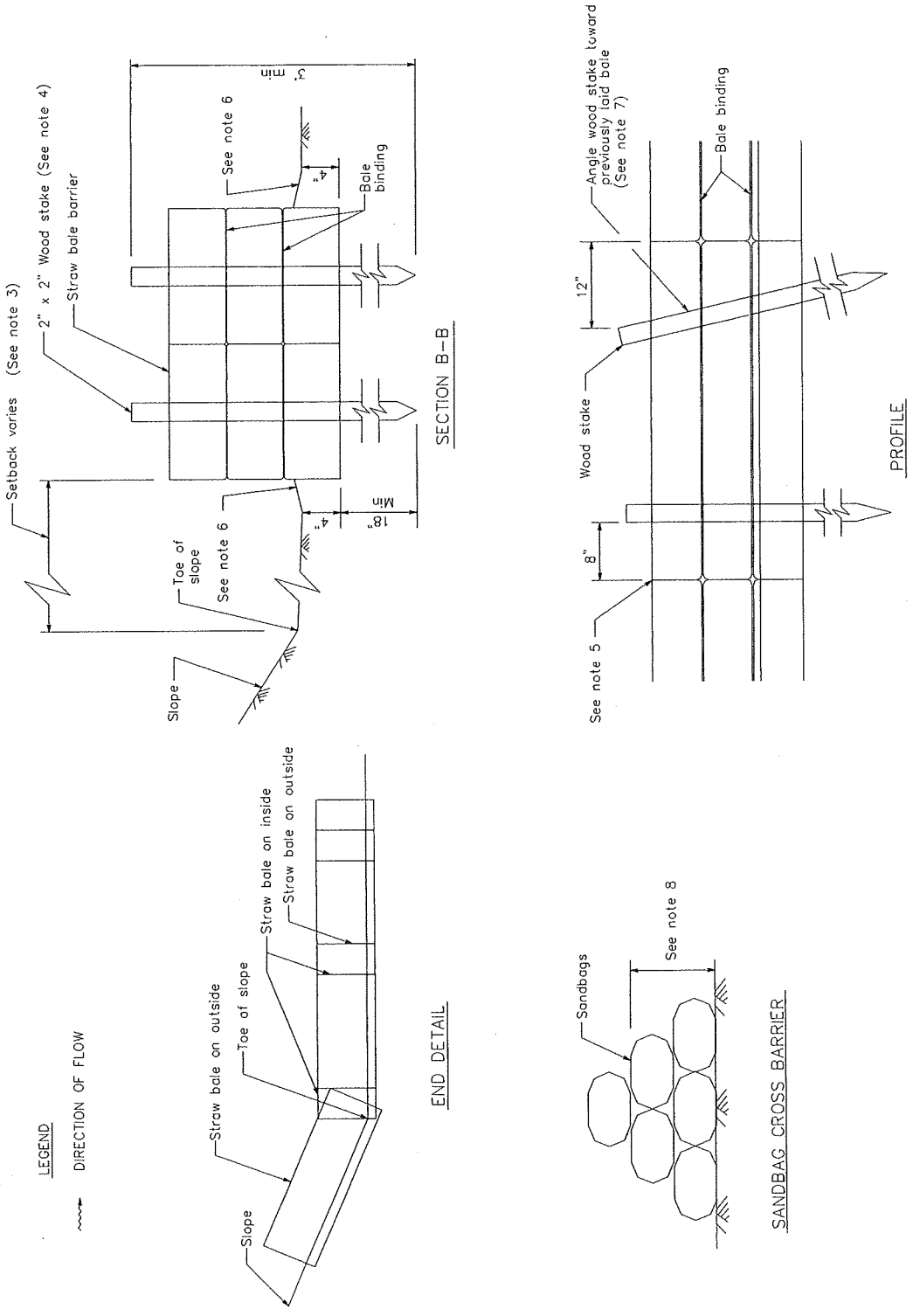
STRAW BALE BARRIER

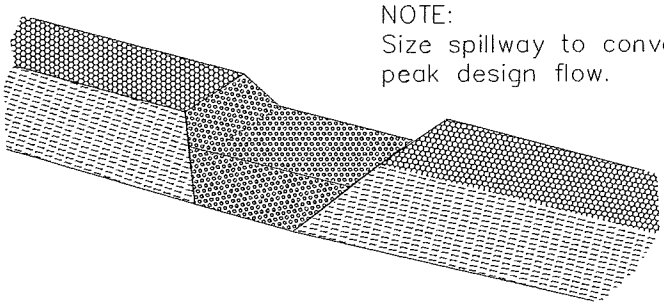
LEGEND

DIRECTION OF FLOW

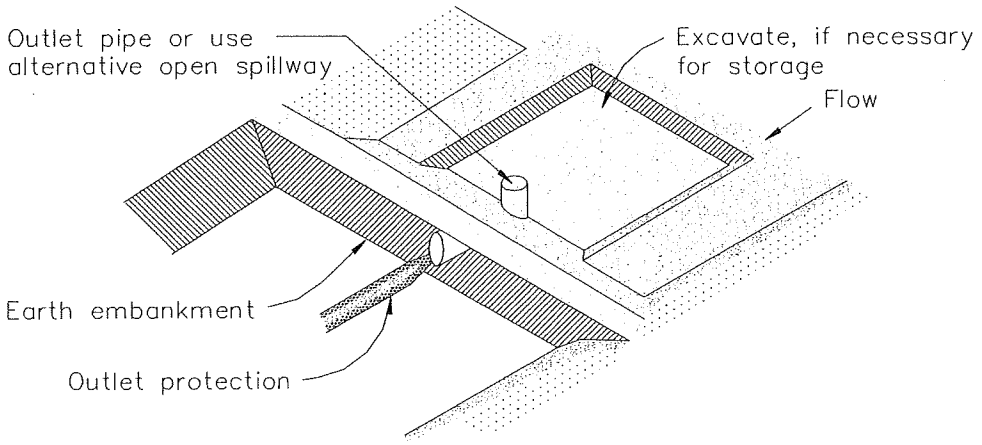
NOTES

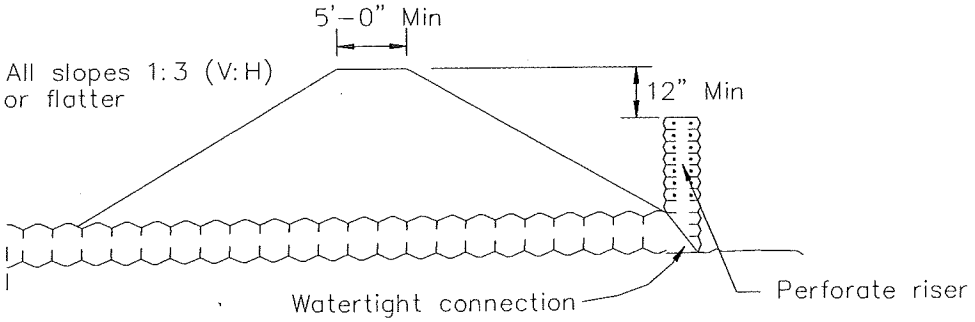
1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/2 the height of the linear barrier. In no case shall the reach length exceed 500'.
2. The end of barrier shall be turned up slope.
3. Dimension may vary to fit field condition.
4. Stake dimensions are nominal.
5. Place straw bales tightly together.
6. Tamp embedment spoils against sides of installed bales.
7. Drive angled wood stake before vertical stake to ensure tight abutment to adjacent bale.
8. Sandbag cross barriers should be a min of 1/2 and a max of 2/3 the height of the linear barrier.
9. Sandbag rows and layers should be offset to eliminate gaps.


Setback varies (See note 3)
2" x 2" Wood stake (See note 4)
Straw bale barrier
See note 6
Bale binding
3' min
4"
Min
18"
4"
Toe of slope
See note 6
Slope
SECTION B-B
Angle wood stake toward previously laid bale (See note 7)
Bale binding
12"
Wood stake
8"
See note 5
PROFILE
LEGEND
DIRECTION OF FLOW
Straw bale on inside
Straw bale on outside
Straw bale on outside
Toe of slope
Slope
END DETAIL
Sandbags
See note 8
SANDBAG CROSS BARRIER



TYPICAL OPEN SPILLWAY





EMBANKMENT SECTION THRU RISER

TYPICAL SEDIMENT TRAP
NOT TO SCALE

National Management Measures to Control Nonpoint Source Pollution from Urban Areas, United States Environmental Protection Agency, 2002.

Proposed Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters, Work Group-Working Paper, USEPA, April 1992.

Stormwater Quality Handbooks - Construction Site Best Management Practices (BMPs) Manual, State of California Department of Transportation (Caltrans), November 2000.

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Water Quality Management Plan for the Lake Tahoe Region, Volume II, Handbook of Management Practices, Tahoe Regional Planning Agency, November 1988.

- When crushed stone outlet is used, the crushed stone used in the outlet should meet AASHTO M43, size No. 2 or 24, or its equivalent such as MSHA No. 2. Gravel meeting the above gradation may be used if crushed stone is not available.

Costs

Average annual cost per installation and maintenance (18 month useful life) is $0.73 per ft^3 ($1,300 per drainage acre). Maintenance costs are approximately 20% of installation costs.

Inspection and Maintenance

- Inspect BMPs prior to forecast rain, daily during extended rain events, after rain events, weekly during the rainy season, and at two-week intervals during the non-rainy season.
- Inspect outlet area for erosion and stabilize if required.
- Inspect trap banks for seepage and structural soundness, repair as needed.
- Inspect outlet structure and spillway for any damage or obstructions. Repair damage and remove obstructions as needed.
- Inspect fencing for damage and repair as needed.
- Inspect the sediment trap for area of standing water during every visit. Corrective measures should be taken if the BMP does not dewater completely in 72 hours or less to prevent vector production.
- Sediment that accumulates in the BMP must be periodically removed in order to maintain BMP effectiveness. Sediment should be removed when the sediment accumulation reaches one-third of the trap capacity. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed of at an appropriate location.
- Remove vegetation from the sediment trap when first detected to prevent pools of standing water and subsequent vector production.
- BMPs that require dewatering shall be continuously attended while dewatering takes place. Dewatering BMPs shall be implemented at all times during dewatering activities.

References

Brown, W., and T. Schueler. The Economics of Stormwater BMPs in the Mid-Atlantic Region. Prepared for Chesapeake Research Consortium, Edgewater, MD, by the Center for Watershed Protection, Ellicott City, MD, 1997.

Draft – Sedimentation and Erosion Control, an Inventory of Current Practices, USEPA, April 1990.

Manual of Standards of Erosion and Sediment Control Measures, Association of Bay Area Governments, May 1995.

Metzger, M.E., D.F. Messer, C.L. Beitia, C.M. Myers, and V.L. Kramer, The Dark Side of Stormwater Runoff Management: Disease Vectors Associated with Structural BMPs, 2002.

- Locate sediment traps as near as practical to areas producing the sediment.
- Trap should be situated according to the following criteria: (1) by excavating a suitable area or where a low embankment can be constructed across a swale, (2) where failure would not cause loss of life or property damage, and (3) to provide access for maintenance, including sediment removal and sediment stockpiling in a protected area.
- Trap should be sized to accommodate a settling zone and sediment storage zone with recommended minimum volumes of 67 yd^3/acre and 33 yd^3/acre of contributing drainage area, respectively, based on 0.5 in. of runoff volume over a 24-hour period. In many cases, the size of an individual trap is limited by available space. Multiple traps or additional volume may be required to accommodate specific rainfall, soil, and site conditions.
- Traps with an impounding levee greater than 4.5 ft tall, measured from the lowest point to the impounding area to the highest point of the levee, and traps capable of impounding more than 35,000 ft^3, should be designed by a Registered Civil Engineer. The design should include maintenance requirements, including sediment and vegetation removal, to ensure continuous function of the trap outlet and bypass structures.
- The outlet pipe or open spillway must be designed to convey anticipated peak flows.
- Use rock or vegetation to protect the trap outlets against erosion.
- Fencing should be provided to prevent unauthorized entry.

Installation

Sediment traps can be constructed by excavating a depression in the ground or creating an impoundment with a small embankment. Sediment traps should be installed outside the area being graded and should be built prior to the start of the grading activities or removal of vegetation. To minimize the area disturbed by them, sediment traps should be installed in natural depressions or in small swales or drainage ways. The following steps must be followed during installation:

- The area under the embankment must be cleared, grubbed, and stripped of any vegetation and root mat. The pool area should be cleared.
- The fill material for the embankment must be free of roots or other woody vegetation as well as oversized stones, rocks, organic material, or other objectionable material. The embankment may be compacted by traversing with equipment while it is being constructed.
- All cut-and-fill slopes should be 3:1 or flatter.
- When a riser is used, all pipe joints must be watertight.
- When a riser is used, at least the top two-thirds of the riser should be perforated with 0.5 in. diameter holes spaced 8 in. vertically and 10 to 12 in. horizontally. See SE-2, Sediment Basin.
- When an earth or stone outlet is used, the outlet crest elevation should be at least 1 ft below the top of the embankment.

Limitations

- Requires large surface areas to permit infiltration and settling of sediment.
- Not appropriate for drainage areas greater than 5 acres.
- Only removes large and medium sized particles and requires upstream erosion control.
- Attractive and dangerous to children, requiring protective fencing.
- Conducive to vector production.
- Should not be located in live streams.

Implementation

Design

A sediment trap is a small temporary ponding area, usually with a gravel outlet, formed by excavation or by construction of an earthen embankment. Its purpose is to collect and store sediment from sites cleared or graded during construction. It is intended for use on small drainage areas with no unusual drainage features and projected for a quick build-out time. It should help in removing coarse sediment from runoff. The trap is a temporary measure with a design life of approximately six months to one year and is to be maintained until the site area is permanently protected against erosion by vegetation and/or structures.

Sediment traps should be used only for small drainage areas. If the contributing drainage area is greater than 5 acres, refer to SE-2, Sediment Basins, or subdivide the catchment area into smaller drainage basins.

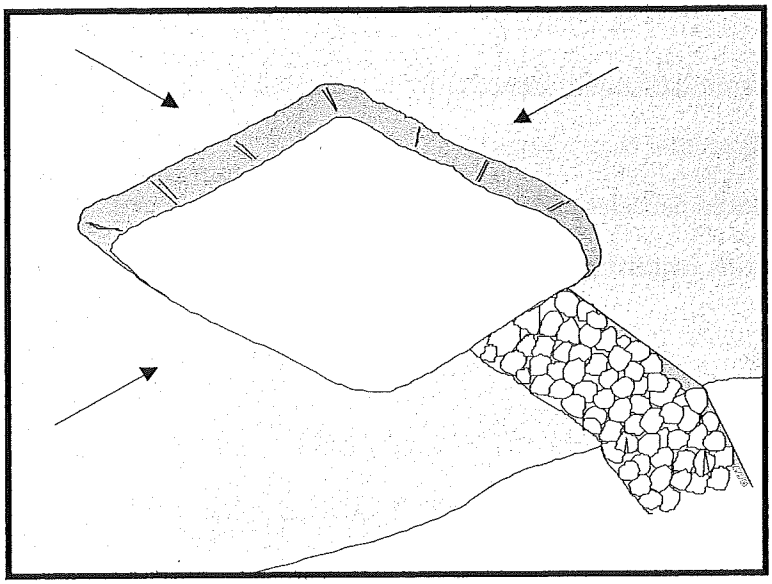
Sediment usually must be removed from the trap after each rainfall event. The SWPPP should detail how this sediment is to be disposed of, such as in fill areas onsite, or removal to an approved offsite dump. Sediment traps used as perimeter controls should be installed before any land disturbance takes place in the drainage area.

Sediment traps are usually small enough that a failure of the structure would not result in a loss of life, damage to home or buildings, or interruption in the use of public roads or utilities. However, sediment traps are attractive to children and can be dangerous. The following recommendations should be implemented to reduce risks:

- Install continuous fencing around the sediment trap or pond. Consult local ordinances regarding requirements for maintaining health and safety.
- Restrict basin side slopes to 3:1 or flatter.

Sediment trap size depends on the type of soil, size of the drainage area, and desired sediment removal efficiency (see SE-2, Sediment Basin). As a rule of thumb, the larger the basin volume the greater the sediment removal efficiency. Sizing criteria are typically established under the local grading ordinance or equivalent. The runoff volume from a 2-year storm is a common design criteria for a sediment trap. The sizing criteria below assume that this runoff volume is 0.042 acre-ft/acre (0.5 in. of runoff). While the climatic, topographic, and soil type extremes make it difficult to establish a statewide standard, the following criteria should trap moderate to high amounts of sediment in most areas of California:

Sediment Trap SE-3



Categories

EC	Erosion Control	
SE	Sediment Control	☑
TC	Tracking Control	
WE	Wind Erosion Control	
NS	Non-Stormwater Management Control	
WM	Waste Management and Materials Pollution Control	

Legend:

☑ **Primary Objective**

☒ **Secondary Objective**

Targeted Constituents

Sediment	☑
Nutrients	
Trash	☑
Metals	
Bacteria	
Oil and Grease	
Organics	

Potential Alternatives

SE-2 Sediment Basin (for larger areas)

Description and Purpose

A sediment trap is a containment area where sediment-laden runoff is temporarily detained under quiescent conditions, allowing sediment to settle out or before the runoff is discharged. Sediment traps are formed by excavating or constructing an earthen embankment across a waterway or low drainage area.

Suitable Applications

Sediment traps should be considered for use:

- At the perimeter of the site at locations where sediment-laden runoff is discharged offsite.
- At multiple locations within the project site where sediment control is needed.
- Around or upslope from storm drain inlet protection measures.
- Sediment traps may be used on construction projects where the drainage area is less than 5 acres. Traps would be placed where sediment-laden stormwater may enter a storm drain or watercourse. SE-2, Sediment Basins, must be used for drainage areas greater than 5 acres.
- As a supplemental control, sediment traps provide additional protection for a water body or for reducing sediment before it enters a drainage system.

CASQA
CALIFORNIA STORMWATER

Summers Lane Reservoir Pygmy Cypress Mitigation Planting Area and Plan

19701 Summers Lane Fort Bragg, CA 95437 APN 019-070-13

City of Fort Bragg

BACKGROUND INFORMATION

PROJECT SUMMARY: The City of Fort Bragg plans to developa new 45 acre-feet raw water reservoir to store raw water from Waterfall Gulch to meetdrought-related water storage needs of the Fort Bragg water service area. In order to facilitate this development, approximately eight acres of second and third growth redwood dominated mixed coniferous forest would need to be cleared. The project area was most recently logged in 1993.

The project area was surveyed for protected and sensitive plant and animal species in 2008 and 2009 by Redwood Coast Associates and WRA, Inc. The project area was surveyed again in 2013 by Darcy Mahoney. Measures have been developed to avoid where possible, and otherwise minimize impacts to protected and sensitive plant and animal species as outlined in the Timber Harvest Plan and CEQA Mitigated Negative Declaration for the project. An estimated 72 pygmy cypress (*Hesperocyparis pygmaea*) trees are currently present in the project area, constituting approximately $1/7^{th}$ of the canopy cover, and will need to be removed to accommodate the project. Because pygmy cypress is a rare tree that only occurs within Mendocino and Sonoma Counties, this mitigation and monitoring plan has been designed to assure that a sufficient number of pygmy cypress trees are replanted in the project area (3:1 ratio) that at least the number of trees that must be removed will eventually grow back and reach maturity within the project area.

BIOLOGICAL IMPORTANCE OF PLANTS TO BE IMPACTED: Pygmy cypress (*Hesperocyparis pygmaea)* is an evergreen perennial tree native to the pygmy forests of Mendocino and Northern Sonoma Counties, and is naturally found nowhere else in the world. The pygmy forest plant community is located on coastal terraces generally found from two to five miles east of the ocean. The soil on pygmy terraces is highly leached of nutrients and acidic. For this reason, vegetative growth is slow, causing stunting, and a limited number of plant species have adapted to and are present within this habitat type.

Pygmy cypress can and do grow outside of these nutrient poor, acidic conditions, and when they take root in nutrient rich soil they grow much taller than the cypress found within the pygmy forest. In more nutrient rich habitats, however, other tree species are able to outcompete pygmy cypress for sunlight, and they can become overshaded and eventually die out.

Pygmy cypress is not currently listed as a Federally Endangered Species or State Endangered Species, however it is listed by the California Native Plant Society as a 1B.2 species, which indicates that pygmy cypress is endemic to and considered fairly endangered in California.

The individuals found at the project site have taken root in the nutrient rich soils of the redwood dominated mixed coniferous forest. They are taller than the cypress found in the pygmy forest, and it is likely cleared areas resulting from during past logging efforts accommodated establishment within the project area.

EXISTING CONDITIONS

The project area is typical of a marine terrace soil with a second growth redwood forest. Thisarea is adjacent to the Celeri & Sons Rhododendron Nursery, and was logged as recently as 1993. As a result, the stand here supports a relatively young age class with 90 percent of the stand at a diameter at breast height (DBH) of 24 inches or smaller. The forest stand supports redwood (*Sequoia sempervirens*), Douglas fir (*Pseudotsugamenziesii*), pygmy cypress, Bishop pine (*Pinusmuricata*), grand fir (*Abiesgrandis*), and tan oak (*Lithocarpusdensiflorus*). The project area is a forest edge area subject to the affect westerly winds. Vigor and health is declining in the Douglas fir, pygmy cypress, and Bishop pine trees. A number of trees have been blown over and it is anticipated that blow down will continue as some species decline and gap areas increase.

Pygmy cypress now occurs as a minor component of the forest canopy, composing approximately 10 percent of the total basal area of the project area. The diameter at breast height (DBH) ranges from seedlings (less than 1/4 inch) to 24 inches. Approximately 68 percent of the pygmy cypress trees in the project area have a DBH of 16 inches or smaller. Seedlings are sparse and restricted to canopy gaps along the roads.

In Blacklock or aboriginal soils pygmy cypress typically dominates the canopy but is limited in height to less than two meters, and is the climax community. However in deeper, well-drained soils, like those in the project area, pygmy cypress typically persists as a mid-successional species and is usually outcompeted by faster growing and taller conifers including redwood and Douglas fir.

Prior to logging, the area was likely dominated by redwood and Douglas fir and supported an occasional pygmy cypress in gaps created from natural processes. Over time the shade-intolerant cypress species likely declined until another gap or disturbance provided an opportunity for germination or release of suppressed seedlings and saplings. Logging activities and roadbuilding created gaps in the canopy and disturbance to the understory and soils. Species such as pygmy cypress benefited from the disturbance and germination of these species was likely stimulated by opening of the canopy.

The shade-intolerant pioneer species pygmy cypress and Bishoppine are declining in both the overstory and understory. Absent disturbance, shade-tolerant species will outcompete the pioneer components of the stand over time.

PLANTING AND MONITORING PLAN

The proposed reservoir project will permanently remove approximately 72 special status pygmy cypress trees with an average diameter at breast height (DBH) of 18 inches from the project area. As mitigation for these impacts, planting areas have been established (the "mitigation area") to replace the trees at a 3:1 ratio. The size of the mitigation area was selected to allow for establishment of over 216 mature trees, with each tree occupying an estimated 100-square foot area (Figure A), although it is not expected that trees will grow in a uniform manner. To allow for immediate visual buffering of the project on the west side, where the reservoir will be visible from the neighboring residential property, some trees and brush will remain after the timber harvest and conversion. Approximately 56 cypress would be planted within this visual buffer area, which is 10 feet wide and approximately 560 feet long. The number of cypress that will establish within this buffer area will depend on how many adequately sized clearings are created during the timber harvest and clearing operations, and how much healthy mature

vegetation can safely remain. Additional planting areas will be created as needed if inadequate rooms exists in the visual buffer area for cypress establishment and growth.

Methods for establishing and maintaining 216 pygmy cypress are described as follows. Topsoil to be disturbed or removed by project construction will be stockpiled temporarily onsite. Once the project has been completed the topsoil will be spread over the 0.54-acre mitigation area. It is expected that pygmy cypress will germinate naturally from the existing seed bank in the topsoil, due to relatively exposed conditions of bare soil and location next to the newly-constructed reservoir. In case of inadequate existing seed bank in the topsoil, seedling and cone collection shall occur prior to vegetation removal for the project. 100-200 seed cones shall be collected and 50 or more seedlings shall be salvaged and transplanted to containers and stored at a local nursery.

Three years after construction activities the mitigation area (Figure A) will be surveyed for number of trees per acre. If the number of trees per acre is equal to or greater than the 3:1 ratio, then no more visits shall be required. If after year three, the densities are below the designated ratio, then the area should be replanted back to the mitigated ratio with seedlings, either germinated from seed or collected from site. Seedlings will be planted by hand in native topsoil, in a hole deep enough to allow roots to be positioned downward and not curved over. Seedlings will be planted in the late fall or early winter to increase survival rates. At year 5, the area should be re-surveyed. If stocking or replanting goals have been achieved then no more surveys shall be required. If the density is below, then replanting of dead and dying trees back to the mitigated ratio shall occur, and no more monitoring shall be required.

During the initial visit at three years (and at year 5) all competing conifer seedlings and invasive species in the mitigation area shall be removed in an effort to reduce competition and the potential spread of invasive species.

At year three and year five monitoring, a short summary report of conditions will be documented and placed in the project file at City Hall. The summary reports will contain information on the number of cypress trees established, dimensions, and any actions taken including weeding and planting. Photographs will be taken and included with the summary reports.

The pygmy cypress which will occur onsite after construction are expected to have a higher lifespan than the pre-project cypress would have since competition for sunlight will be reduced, particularly in areas outside of the westerly visual buffer area. If no project were to occur in the conversion area, the existing pygmy cypress trees would likely diminish as the forest canopy matures. The mitigation area along the roads and near the reservoir will create a permanent gap in the canopy, pygmy cypress will be able to persist for longer duration than if it were in a forested environment absent of disturbance.

CONCLUSION

The loss of approximately 72 pygmy cypress trees will be temporary. Once construction of the reservoir is complete, the planting area will be covered with topsoil that was removed prior to construction, in an effort to minimize the replanting effort. The goal is to achieve a 3 to 1 replacement within five years for pygmy cypress tress impacted by the construction. It will likely take 10-20 years before a similar age class or diameter distribution to the one being lost will be achieved.

Summers Lane Reservoir
Botanical Survey Report

Project Description

The botanical survey was conducted for the proposed timber harvest plan associated with Fort Bragg City's Summers Lane Reservoir project on Assessor's Parcel No. 190-70-01 in T18N, R17W, Section 16, MDBM. This parcel is 40 acres, twenty-nine of which were selectively logged in 1991. The proposed project is to convert approximately 8 acres of the previously-logged area to a reservoir for the City of Fort Bragg.

The vegetational habitat of the project area is primarily North Coast coniferous forest, but also includes a component of closed-cone coniferous forest. The conversion will utilize tractors to remove the vegetation of the existing site.

Survey Method

The scoping strategy, survey method and impact assessments used for this survey are consistent with the Department of Fish and Wildlife's "Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Plant Communities (DFW 2000).

Rare plant lists were obtained from a nine-quadrangle query of the California Native Plant Society's Inventory of Rare and Endangered Plants for those species which could have the potential for occurring within the project area. These plant lists are included in the Addendum.

Surveys were conducted on April 10, 2013, May 6, 2013, and June 12, 2013 during the listed species' bloom periods or when plant parts could be identified by the surveyor. These surveys were meandering throughout the project area on old skid trails, non-disturbed areas, and adjacent roads. Approximately 3 hours were spent surveying the site.

Plants were identified to the lowest taxonomic level necessary to make sure that they were not species of special concern. Species not identified on site were keyed in the office using the references cited at the end of this report.

Survey Results and Discussion

The site is forestland with dominant species of redwood (*Sequoia sempervirens*), Douglas-fir (*Pseudotsuga menziesii*), Bishop pine (*Pinus muricata*), grand fir (*Abies grandis*), western hemlock (*Tsuga heterophylla*), tanoak (*Notholithocarpus densiflorus*), and pygmy cypress (*Hesperocyparis pygmaea*). The western half of the parcel has a closed canopy of timber with a sparse understory, while the

eastern half has experienced significant "blowdown" of the timber, with a more open canopy and dense understory species of evergreen huckleberry (*Vaccinium* ovatum) and hairy manzanita (*Arctostaphylos columbiana*).

Species Observed

The following species were observed during the survey:

Scientific Name	Common Name
Abies grandis	grand fir
Agrostis spp.	bent grass
Aira spp.	silver hair grass
Anaphalis margaritacea	pearly everlasting
Anthoxanthum odoratum	sweet vernal grass
Arctostaphylos columbiana	hairy manzanita
Arbutus menziesii	Pacific madrone
Baccharis pilularis	coyote bush
Bellis perennis	English daisy
Blechnum spicant	deer fern
Briza maxima	largerattlesnake grass
Calypso bulbosa	calypso orchid
Cardamine californica	milkmaids
Carex abrupta	abrupt-beak sedge
*Carex concinnoides**	Northwestern sedge (keyed by botanist Hulse-Stephens)
Carex deweyana leptopoda	Dewey's sedge
Carex gynodynama	wonder-woman sedge
Carex obnupta	slough sedge
Ceanothus thyrsiflorus	blue blossom
Cerastium glomeratum	mouse ear chickweed
Clintonia andrewsiana	clintonia
Corallorhiza maculata.	spotted coral-root orchid (not blooming
Cortaderia selloana	pampas grass
Cotoneaster pannosa	cotoneaster
Cynosurus echinatus	hedgehog dogtail grass
Cytisus monspessulanus	French broom
Cytisus scoparius	Scotch broom
Fragaria vesca	strawberry
Galium aparine	cleavers
Galium muricatum	bedstraw
Gaultheria shallon	salal
Geranium disectum	cutleaf geranium
Gnaphalium spp.	cudweed
Goodyera oblongifolia	rattlesnake plantain
Hedera helix	English ivy
Hieracium albiflorum	white hawkweed
Hierochloe occidentalis	sweetgrass
Holcus lanatus	velvet grass
Hypochaeris spp.	false dandelion
Ilex aquifolium	English holly
Iris douglasiana	Douglas' iris
Juncus effusus	common rush
Juncus patens	spreading rush
Lathyrus vestitus	hillside pea
Lonicera hispidula	hairy honeysuckle

Luzula parviflora	small-flowered wood rush
Madia madioides	woodland madia
Myrica californica	wax-myrtle
Notholithocarpus densiflorus	tanoak
Oxalis oregana	redwood sorrel
Pinus muricata	Bishop pine
Plantago lanceolata	English plantain
Polystichum munitum	sword fern
Prunella vulgaris	self-heal
Pseudotsuga menziesii	Douglas-fir
Pteridium aquilinum pubescens	bracken fern
Rhamnus purshiana	Cascara buckthorn
Rhododendron macrophyllum	western rhododendron
Rosa spp.	rose
Rubus ursinus	Pacific blackberry
Rumex crispus	curly dock
Sanicula crassicaulis	Pacific sanicle
Satureja douglasii	yerba buena
Sequoia sempervirens	redwood
Smilacina racemosa	solomon seal (fat)
Toxicodendron diversilobum	poison oak
Trifolium dubium	hop clover
Trillium ovatum	trillium
Umbellularia californica	California bay
Vaccinium ovatum	evergreen huckleberry
Vaccinium parvifolium	red huckleberry
Viola sempervirens	redwood violet
Whipplea modesta	modesty

Impacts Assessment and Mitigation Measures

This 8-acre project is located within a 40 acre parcel which was situated to avoid true pygmy soils and riparian habitats, leaving the most valuable habitat for special species outside the footprint of the reservoir project.

Of those special species listed in the addendum, only pygmy cypress (*Hesperocyparis* pygmaea) occurs in the project area. An earlier survey (Redwood Coast Associates, 2008) noted Bolander's reed grass (*Calamagrostis bolanderi*), but this species was not observed during this survey. Both of these species readily re-seed on disturbed ground. Based on the surveyor's experience with these species, bare soil conditions created by the project will allow sufficient regeneration of these species to occur on the project site from adjacent cypress and reed grass plants, and no additional mitigation would be needed for replacement of these species.

Submitted by:

Darcie Mahoney

Darcie Mahoney, Licensed Forester #2397
Author and Surveyor of Botanical Report, 13 June 2013

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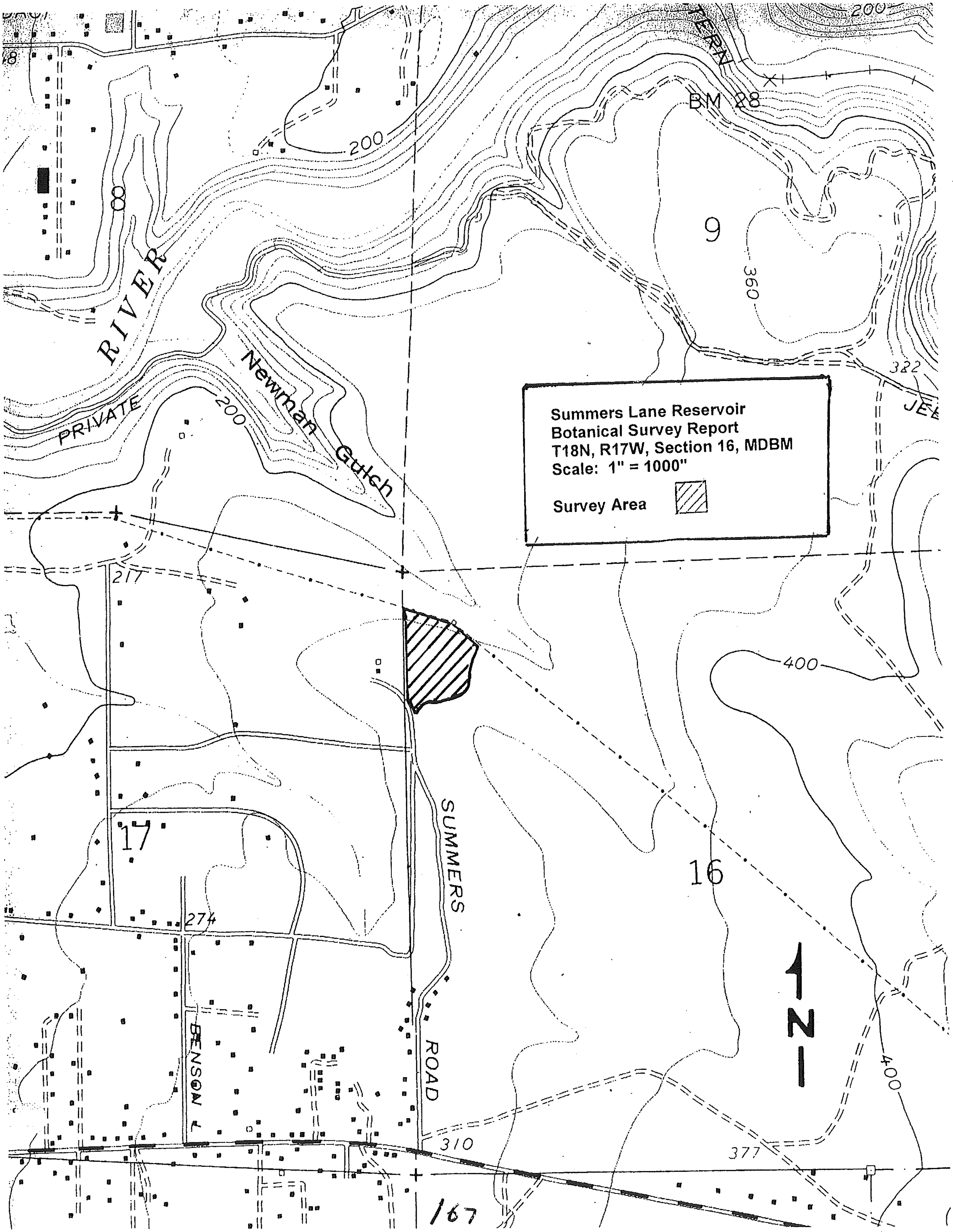
Summers Lane Reservoir
Botanical Survey Report
T18N, R17W, Section 16, MDBM
Scale: 1" = 1000"
Survey Area
RIVER
PRIVATE
Newman Gulch
SUMMERS
ROAD
BENSON
BM 28
8
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17
200
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Addendum

California Native Plant Society
Inventory of Rare and Endangered Plants

for

Closed-cone coniferous forest
and
North Coast coniferous forest

CNPS California Native Plant Society Inventory of Rare and Endangered Plants

Plant List

14 matches found. *Click on scientific name for details*

Search Criteria

Found in Mendocino County, Elevation is above 200 or below 360 feet,
Community = Closed-cone coniferous forest

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Arctostaphylos nummularia ssp. mendocinoensis	pygmy manzanita	Ericaceae	perennial evergreen shrub	1B.2	S1	G3?T1
Calamagrostis bolanderi	Bolander's reed grass	Poaceae	perennial rhizomatous herb	4.2	S3.2	G3
Campanula californica	swamp harebell	Campanulaceae	perennial rhizomatous herb	1B.2	S3	G3
Carex californica	California sedge	Cyperaceae	perennial rhizomatous herb	2.3	S2?	G5
Castilleja mendocinensis	Mendocino Coast paintbrush	Orobanchaceae	perennial herb (hemiparasitic)	1B.2	S2.2	G2
Ceanothus confusus	Rincon Ridge ceanothus	Rhamnaceae	perennial evergreen shrub	1B.1	S2.2	G2
Ceanothus gloriosus var. gloriosus	Point Reyes ceanothus	Rhamnaceae	perennial evergreen shrub	4.3	S3.3	G3G4T?
Hesperocyparis pygmaea	pygmy cypress	Cupressaceae	perennial evergreen tree	1B.2	S2	G2
Lasthenia californica ssp. bakeri	Baker's goldfields	Asteraceae	perennial herb	1B.2	SH	G3TH
Lilium maritimum	coast lily	Liliaceae	perennial bulbiferous herb	1B.1	S2	G2
Lotus formosissimus	harlequin lotus	Fabaceae	perennial rhizomatous herb	4.2	S3.2	G4
Microseris paludosa	marsh microseris	Asteraceae	perennial herb	1B.2	S2.2	G2
Pinus contorta ssp. bolanderi	Bolander's beach pine	Pinaceae	perennial evergreen tree	1B.2	S2	G5T2
Trifolium trichocalyx	Monterey clover	Fabaceae	annual herb	1B.1	S1	G1

Suggested Citation

California Native Plant Society (CNPS). 2013. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Accessed on Monday, March 25, 2013.

CNPS California Native Plant Society Inventory of Rare and Endangered Plants

Plant List

32 matches found. *Click on scientific name for details*

Search Criteria

Found in Mendocino County, Elevation is above 200 or below 360 feet,
Community = North Coast coniferous forest

Scientific Name	Common Name	Family	Lifeform	Rare Plant Rank	State Rank	Global Rank
Calamagrostis bolanderi	Bolander's reed grass	Poaceae	perennial rhizomatous herb	4.2	S3.2	G3
Calamagrostis foliosa	leafy reed grass	Poaceae	perennial herb	4.2	S3.2	G3
Calochortus uniflorus	large-flowered mariposa lily	Liliaceae	perennial bulbiferous herb	4.2	S3	G4
Calystegia purpurata ssp. saxicola	coastal bluff morning-glory	Convolvulaceae	perennial herb	1B.2	S2.2	G4T2
Campanula californica	swamp harebell	Campanulaceae	perennial rhizomatous herb	1B.2	S3	G3
Carex arcta	northern clustered sedge	Cyperaceae	perennial herb	2.2	S1S2	G5
Carex viridula var. viridula	green yellow sedge	Cyperaceae	perennial herb	2.3	S1.3	G5T5
Coptis laciniata	Oregon goldthread	Ranunculaceae	perennial rhizomatous herb	2.2	S3	G4G5
Cornus canadensis	bunchberry	Cornaceae	perennial rhizomatous herb	2.2	S2	G5
Cypripedium fasciculatum	clustered lady's-slipper	Orchidaceae	perennial rhizomatous herb	4.2	S3.2	G4
Epilobium septentrionale	Humboldt County fuchsia	Onagraceae	perennial herb	4.3	S3.3	G3
Erigeron biolettii	streamside daisy	Asteraceae	perennial herb	3	S3?	G3?
Erythronium revolutum	coast fawn lily	Liliaceae	perennial bulbiferous herb	2.2	S2S3	G4
Fissidens pauperculus	minute pocket moss	Fissidentaceae	moss	1B.2	S1	G3?
Kopsiopsis hookeri	small groundcone	Orobanchaceae	perennial rhizomatous herb (parasitic)	2.3	S1S2	G5
Lathyrus palustris	marsh pea	Fabaceae	perennial herb	2.2	S2S3	G5
Lilium maritimum	coast lily	Liliaceae	perennial bulbiferous herb	1B.1	S2	G2
Lilium rubescens	redwood lily	Liliaceae	perennial bulbiferous herb	4.2	S3.2	G3
Listera cordata	heart-leaved twayblade	Orchidaceae	perennial herb	4.2	S3.2	G5
Lotus formosissimus	harlequin lotus	Fabaceae	perennial rhizomatous herb	4.2	S3.2	G4
Lycopodium clavatum	running-pine	Lycopodiaceae	perennial rhizomatous herb	4.1	S4.1	G5
Mitellastra caulescens	leafy-stemmed mitrewort	Saxifragaceae	perennial rhizomatous herb	4.2	S4.2	G5

Packera bolanderi var. bolanderi	seacoast ragwort	Asteraceae	perennial rhizomatous herb	2.2	S3	G4T4
Piperia candida	white-flowered rein orchid	Orchidaceae	perennial herb	1B.2	S2	G3?
Pityopus californica	California pinefoot	Ericaceae	perennial herb (achlorophyllous)	4.2	S3.2	G4G5
Pleuropogon hooverianus	North Coast semaphore grass	Poaceae	perennial rhizomatous herb	1B.1	S2	G2
Pleuropogon refractus	nodding semaphore grass	Poaceae	perennial rhizomatous herb	4.2	S3.2?	G4
Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb	4.2	S3.2	G4
Sanguisorba officinalis	great burnet	Rosaceae	perennial rhizomatous herb	2.2	S2.2	G5?
Sidalcea malachroides	maple-leaved checkerbloom	Malvaceae	perennial herb	4.2	S3S4.2	G3G4
Sidalcea malviflora ssp. patula	Siskiyou checkerbloom	Malvaceae	perennial rhizomatous herb	1B.2	S2	G5T2
Veratrum fimbriatum	fringed false-hellebore	Melanthiaceae	perennial herb	4.3	S3.3	G3

Suggested Citation

California Native Plant Society (CNPS). 2013. Inventory of Rare and Endangered Plants (online edition, v8-01a). California Native Plant Society. Sacramento, CA. Accessed on Monday, March 25, 2013.

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TRC

BOTANICAL SURVEY OF THE NEWMAN GULCH TIMBER HARVEST PLAN, MENDOCINO COUNTY, CA

Prepared for:

The City of Fort Bragg
416 N. Franklin Street
Fort Bragg, CA 95437

Prepared by:

Matt Richmond
Redwood Coast Associates
PO Box1635
Willits CA, 95490
mrichmond@rcaconsulting.net
August 13, 2008

REDWOOD
COAST
ASSOCIATES

1.0 INTRODUCTION AND OBJECTIVES

A botanical survey was conducted for the Newman Gulch Timber Harvest Plan in order to determine if any rare and endangered plant species and/or rare plant communities were present within the project area. Survey findings are useful in assessing the potential for significant negative impacts on botanical resources and critical in mitigating those impacts to a level less than significant. The following report is based on the methodologies and guidelines set forth in *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Plant Communities* (CDFG, 2000). Sensitive plants are rare, threatened or endangered species as defined by the Federal or California Endangered Species Acts, or the California Environmental Quality Act (CEQA). Plants on the California Native Plant Society's (CNPS) Lists 1A, 1B and 2 are considered sensitive species under CEQA (14 Cal. Code Reg. §15380). In some cases, plants on CNPS Lists 3 and 4 or more common plants may qualify for protection under CEQA if the plant is determined to be regionally significant, such as locally rare species or disjunct populations. The Department of Fish and Game (CDFG) also recognizes certain plant communities as sensitive.

Botanical nomenclature in this report follows *The Jepson Manual/ Higher Plants of California* (Hickman 1993), although common names are borrowed occasionally from other sources in cases where *The Jepson Manual* lists none.

2.0 PROJECT DESCRIPTION AND ECOLOGICAL PROFILE

The Newman Gulch THP is geo-referenced to the Fort Bragg quadrangle, T18N R17W, section 16 (MDBM). The project area is located off of Summers Road, adjacent to the County Animal Control Center in Fort Bragg, CA (Figure 1). The THP consists of an 8-acre harvest unit and subsequent conversion of the area to a reservoir for the City of Fort Bragg water supply. The proposed conversion area (Figure 2) is sloped slightly to the northwest with elevations ranging from approximately 260 to 280 feet above mean sea level. The parcel (APN 190-70-01) is designated as Public Service according to the Fort Bragg General Plan (as it is City owned property) and it is zoned as Timber Preserve according to the Mendocino County zoning code.

A THP for Newman Gulch was prepared by Registered Professional Forester (RPF) Craig Blencowe and approved by CDF in December 1991. Twenty-nine acres were selectively harvested within the Newman Gulch 40-acre parcel.

Vegetation within the THP area is entirely forested, with the exception of openings created by past logging activities, and consists primarily of Redwood-dominated North coast coniferous forest (Holland, 1986). The forest canopy cover is, on average, 50% throughout the conversion area. Primary canopy species include Redwood (*Sequoia sempervirens*) and Douglas fir (*Pseudotsuga menziesii* var. *menziesii*). Additional associated species include Bishop pine (*Pinus muricata*), grand fir (*Abies grandis*), tanbark oak (*Lithocarpus densiflorus* var. *densiflorus*), Western hemlock (*Tsuga heterophylla*), and pygmy cypress (*Cupressus goveniana* ssp. *pigmaea*).

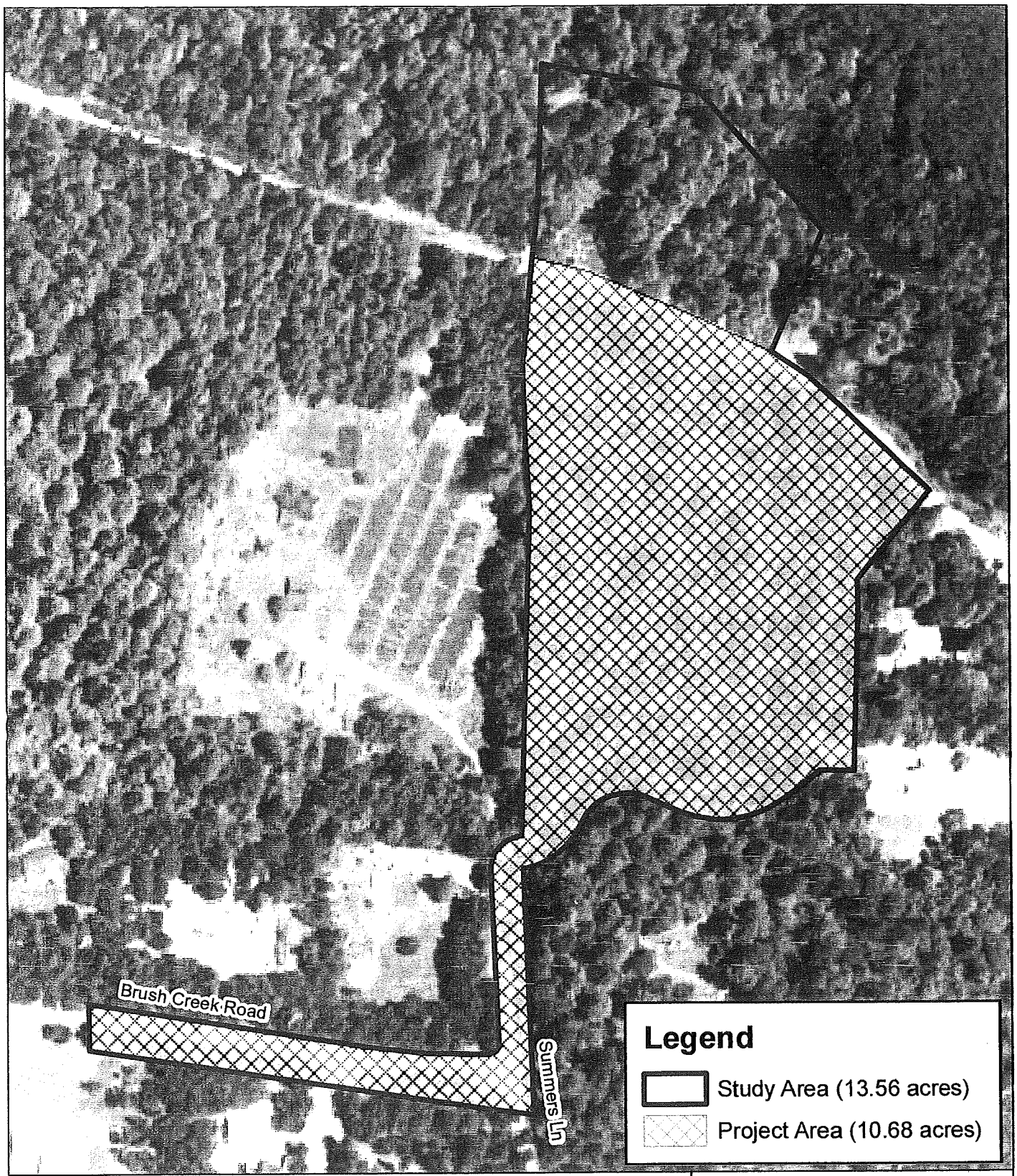

Figure 1. Study Area and Project Area Map

N
W E
S

wra ENVIRONMENTAL CONSULTANTS
REDWOOD COAST ASSOCIATES

Summers Lane Reservoir
Mendocino County, California

0 100 200 Feet

Map By: Derek Chan
Base Source: NAIP, 2005
Filepath:L:\Acad 2000 Files\17000\17017\gis\arcmap\Newman Gulch\Fig2_Aerial_20091116.mxd

Midlevel vegetation is relatively abundant in areas where the canopy cover is less. Characteristic species include; evergreen huckleberry (*Vaccinium ovatum*), salal (*Gaultheria shallon*), tanbark oak (*Lithocarpus densiflorus* var. *densiflorus*), and hairy manzanita (*Arctostaphylos columbiana*).

The understory is sparsely dominated by modesty (*Whipplea modesta*), Pacific star flower (*Trientalis latifolia*), and redwood sorrel (*Oxalis oregana*), with a greater diversity of species occurring where sunlight penetrates to the forest floor beneath occasional over story gaps, along old skid trails/roads/landings and along the edges of the stand and include: evergreen violet (*Viola sempervirens*), bracken fern (*Pteridium aquilinum*), sweet vernal grass (*Anthoxanthum odoratum*), hairy cat's ear (*Hypochaeris radicata*), and little hop clover (*Trifolium dubium*).

3.0 SCOPING AND METHODS

Scoping strategies, survey methods, and impact assessments/mitigations used herein were consistent with the *Guidelines for Assessing the Effects of Proposed Projects on Rare, Threatened, and Endangered Plants and Plant Communities* (DFG, 2000), *Mitigation Guidelines Regarding Impacts to Rare, Threatened, and Endangered Plants* (CNPS, 1998), *California Forest Practice Rules* (CDF, 2006) and the *California Environmental Quality Act* (State of California revised 2001).

The project area was scoped with the current inventories of the California Natural Diversity Database (CNDDB) (CDFG, 2008) and *Rare Plant Inventory* (CNPS, 2008) to determine all List 1-3 plant taxa known from the Fort Bragg quadrangle (wherein the project lies) and adjacent quads. The result was the Target Species List found below. Plant communities were classified using *Preliminary Descriptions of the Terrestrial Plant Communities of California* (Holland 1986), as these are used by CNPS inventory and best describe the communities present. CNPS inventory quadrangle data includes only CNPS list 1-3 plants. Therefore, plant listings considered were CNPS list 1-3, and state and federal rare, threatened, and/or endangered. List 4 plants were also considered (Tables 1 & 2).

Botanists Matt Richmond and Kyle Wear spent a total of 11.5 hours searching for rare plants on April 2, May 8, June 12 and July 8. Surveys were floristic, seasonally appropriate, and intuitively controlled within areas to be impacted by operations. Searches were staged and timed to take place when target taxa[1] were evident and identifiable, and particularly during periods of active blooming (CNPS, 2008). High-intensity (80-100% coverage) surveys were conducted in the area to be impacted by proposed developments. Vascular plants encountered in the field were identified to the lowest taxonomic level necessary for a rare plant determination, and a species list was recorded (Appendix A).

Local reference populations were used in conjunction with blooming windows presented in the CNPS's Electronic Inventory (CNPS, 2008) to confirm the seasonal appropriateness of

[1] Determined by using information in CNPS (2008) and by considering the range of habitat types present in the project area. Primary targets were those taxa for which suitable or marginally suitable habitat was determined to be present within the project area (see Table 1).

surveys. Searches were conducted during periods of active blooming or when target taxa were otherwise determined to be evident and identifiable.

4.0 FINDINGS

Mendocino pygmy cypress (*Cupressus goveniana* ssp. *pigmaea*) trees comprise approximately 10% or 144 ft.^{2} of basal area of tree cover within the 8-acre conversion area. Mendocino pygmy cypress is a CNPS list 1B.2 taxon and is threatened by development, logging, and vehicles (CNPS 2008).

No additional sensitive plants or plant communities were encountered on the THP. A list of plants encountered on the THP is provided in Appendix C. Two populations of Bolander's reed grass (*Calamagostis bolander*) a CNPS List 4.2 species were identified on the THP, consisting of approximately 30 individuals. CNPS List 4 plants are considered to be on a "watch list." The populations of Bolander's reed grass on the THP are not considered to be regionally significant or sensitive.

5.0 POTENIAL IMPACTS

There is potential for direct impacts to approximately 144 ft.^{2} basal area of Mendocino pygmy cypress trees. Mitigation measures are necessary to reduce impacts to a level of insignificance. The California Environmental Quality Act (CEQA), Statutes and Guidelines (Section 15370) lists the following types of mitigation for environmental impacts:

(a) Avoiding the impact altogether by not taking a certain action.

(b) Minimizing impacts by limiting the degree or magnitude of the action.

(c) Rectifying the impact by repairing, rehabilitating or restoring the impacted environment.

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the project.

(e) Compensating for the impact by replacing or providing substitute resources or environments.

POTENIAL IMPACT #1

A permanent loss of approximately 144 ft.^{2} of basal area of Mendocino pygmy Cypress trees.

POTENIAL IMPACT #2

A permanent loss of 30 Bolander's reed grass (*Calamagostis bolander*) plants.

POTENIAL IMPACT #3

A permanent loss of eight acres of native plant habitat and associated vegetation type.

POTENIAL IMPACT #4

Soil erosion and surface water runoff associated with grading and excavating to surrounding natural habitats particularly down slope to the mesic vegetation and water quality of the class I watercourse in Newman Gulch.

POTENIAL IMPACT #5

Colonization of invasive plant species in the disturbed bare soil areas associated with the proposed project.

6.0 ALTERNATIVES

1. No project. This alternative is not feasible as the City has only a three-day supply of water.

2. Multiple ponds. This alternative will create more impacts to greater portion of the 40-acre parcel.

3. Water storage tanks. This alternative was deemed to expensive and would require that numerous storage tanks be placed on the parcel. Currently there is not an area that could support the tanks without a conversion.

7.0 RECOMMENDATIONS

The following mitigation measures are recommended to reduce the impacts to a level less than significant.

RECOMMENDED MITIGATION FOR POTENIAL IMPACT #1

Alternative 1. Replace (minimum 2:1 ratio) the loss of ~ 144 ft.^{2} of basal area of Mendocino pygmy cypress with a 300 ft^2 basal area. Collect seed cones and/or seedlings of Mendocino pygmy Cypress trees from the proposed conversion area prior to impacts and re-plant 300 ft.^{2} of basal area or an equivalent number of seedlings (deemed acceptable by the CDFG) elsewhere on site.

Alternative 2. Conserve the remaining habitat within the parcel, as the remaining area is similar to the habitat being lost. Although no data plots were taken outside of the conversion area, it is likely that the existing basal area of Mendocino pygmy cypress is greater than 1000 ft^2 (personal observation of botanist and RFP).

RECOMMENDED MITIGATION FOR POTENIAL IMPACT #2

Transplant Bolander's reed grass plants to a suitable location outside the conversion area.

RECOMMENDED MITIGATION FOR POTENIAL IMPACT #3

After the completion of the all construction related activities, replant all areas of bare soil around the reservoir with native vegetation, wetland vegetation where appropriate. Plants used for wetland enhancement shall be of stock from within immediate locale and should be planted at the most appropriate time to achieve the highest survival rate as possible, *to the maximum extent feasible.*

RECOMMENDED MITIGATION FOR POTENIAL IMPACT #4

All work involving and/or associated with soil movement and or digging should occur during the dry season. Implement best management practices including silt fencing and straw wattles to control erosion and sediment transport that may flow into surrounding natural habitats particularly along the north end of the unit nearest to Newman Gulch. Existing roads should be utilized to install appropriate BMPs as there location provides an existing cultural buffer to the Newman Gulch area.

RECOMMENDED MITIGATION FOR POTENIAL IMPACT #5

Use native plants and eradicate and control weeds and invasive species in the areas of bare soil.

ADDITIONAL RECOMMENDATION

After the area has been replanted with native vegetation (including the Mendocino pygmy cypress and Bolander's reed grass), monitoring shall be conducted at intervals of 1, 3, and 5 years. Monitor annually to determine the percent of each wetland area that is covered by: a) native and non-native plant species (i.e. total vegetation cover); b) native plant species; and c) non-native species. Annually remove non-native plants that have re-established or colonized, and replant and/or reseed the site until at least 75% of the designated area is covered by native species. If, during the monitoring, survivorship success rates have dropped below the 75% level, the applicant shall replant until the 75% goal has been achieved. Continue this management regime as necessary to maintain native species cover at the 75% level or higher for a period of at least 5 years.

8.0 DISCUSSION

RCA has helped the City of Fort Bragg design the project to be consistent with the typical mitigation hierarchy: avoidance of impacts, reduction of the extent or intensity of impacts, or specific mitigation measures (e.g., habitat enhancements) and monitoring, as appropriate, designed to "compensate for" unavoidable impacts.

No true pygmy forest habitat is present on the parcel. However, an area with hardpan soils and Mendocino pygmy cypress and Bolander's pine is identified in Figure 2. No impacts to this area are proposed. The pygmy cypress trees to be impacted by the proposed project will be replaced on site at a minimum 2:1 ratio.

The current plan RPF infers "there is a high level of defect in the pygmy cypress tress occurring in the THP area. In time, the stand composition, in the absence of fire, will

increasingly exclude the pygmy cypress to favor more shade tolerant species such as grand fir, Western hemlock and tan oak."

The most botanically valuable (true pygmy forest habitat and riparian) areas are excluded from operations with in the remaining City's 40-acre Newman Gulch ownership.

9.0 SURVEYORS QUALIFICATIONS

Kyle S. Wear, M.A., Biology (emphasis in Botany), Humboldt State University. Kyle has over ten years of professional experience in the field of Plant Ecology and has managed a coastal dune restoration project the North Spit of Humboldt Bay since 1998. He has extensive experience in rare plant surveys and endangered species monitoring. He has extensive knowledge of the California flora and taught Plant Taxonomy labs at Humboldt State University for 3 years. He is trained in wetland delineation and is experienced in the use of GPS and GIS.

Matt Richmond. B.S., Biology (emphasis in Botany), Humboldt State University. California. Matt has been studying and keying vascular and nonvascular plants on the North Coast of California for the past seven years. As an undergraduate at Humboldt State University, he worked as a herbarium assistant and a plant collector for the university's taxonomy courses. While working as a biologist in the private sector, Matt has collaborated with the US Fish and Wildlife Service, US Forest Service, Bureau of Land Management, California Department of Fish and Game, and California and Oregon State Parks. Matt is currently working as principal biologist for Redwood Coast Associates where he continues to consult for the private, governmental, and non profit sectors on various types of projects including: ACOE and CCC wetland delineations, and rare and endangered plant and animal surveys.

10.0 REFERENCES

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Table 1. Special-status Plant Species with the Potential to Occur on the Study Area. Include searches from federal, state and CNPS listed species, as well as plants of regional significance.

PLANT NAME (*SCIENTIFIC* & COMMON)	CNPS LIST	FED	STATE	CNDDB ELEMENT RANK		HABITATS/NATURAL COMMUNITIES	BLOOMS	HABITAT PRESENT WITHIN STUDY AREA?
				G RANK	S RANK			
Arctostaphylos mendocinoensis pygmy manzanita	1B.2	-	-	G1	S1?	Closed-cone coniferous forest (CCFrs) / acidic sandy clay	Jan	Marginal
Astragalus agnicidus Humboldt milk-vetch	1B.1	-	-	G1	S1.1	Broadleafed upland forest (BUFrs) | North Coast coniferous forest (NCFrs)/disturbed areas	Apr-Sep	Marginal
Calamagrostis bolanderi Bolander's reed grass	4.2	-	-	G3	S3.2	Bogs & fens (BgFns)/Broadleaf upland forests (BUFrs)/Closed cone coniferous forest (CCFrs)/Coastal scrub (CoScr)/Meadows & seeps (Medws) | /Marshes & Swamps (MshSw) (freshwater)/North Coast coniferous forests (NCFrs) (mesic)	May-Aug	Yes
Calamagrostis foliosa Leafy reed grass	4.2	-	CR	G3	S3.2	Coastal bluff scrub (CBScr) | North Coast coniferous forest (NCFrs)(rocky)(Most occurrences from King Range)	May-Sep	Marginal
Calystegia purpurata ssp. *saxicola* Coastal bluff morning glory	1B.2	-	-	G4T2	S2.2	Coastal dunes (CoDns) | Coastal scrub (CoScr) | North Coast coniferous forest (NCFrs)	May-Sep	Marginal
Campanula californica swamp harebell	1B.2	-	-	G3	S3.2	Bogs and fens (BgFns) | Closed-cone coniferous forest (CCFrs) | Coastal prairie (CoPrr) | Meadows and seeps (Medws) | Marshes and swamps (MshSw) (freshwater) | North Coast coniferous forest (NCFrs) / mesic	June-Oct	No
Carex arcta Northern clustered sedge	2.2	-	-	G5	S1S2	Bogs and fens (BgFns)/North Coast coniferous forest (NCFrs) (mesic)	Jun-Sep	No
Carex californica California sedge	2.3	-	-	G5	S2?	Bogs and fens (BgFns) | Closed-cone coniferous forest (CCFrs) | Coastal prairie (CoPrr) | Meadows and seeps (Medws) | Marshes and swamps (MshSw) (margins)	May-Aug	Marginal
Carex lenticularis var. *limnophia* Lakeshore sedge	2.2	-	-	G5T5	S1S2.2	Bogs and fens (BgFns) | Marshes and swamps (MshSw) | North Coast coniferous forest (NCFrs)/shores, beaches; often gravelly	Jun-Aug	No
Carex viridula var. *viridula* green sedge	2.3	-	-	G5T5	S1.3	Bogs and fens (BgFns)) | Marshes and swamps (MshSw) (freshwater) | North Coast coniferous forest (NCFrs) / mesic	June-Sept	No
Castilleja mendocinensis Mendocino coast Indian paintbrush	1B.2	-	-	G2	S2.2	Coastal bluff scrub (CBScr) | Closed-cone coniferous forest (CCFrs) | Coastal dunes (CoDns) | Coastal prairie (CoPrr) | Coastal scrub (CoScr)	Apr-Aug	No
Ceanothus gloriosus var. *gloriosus* Point Reyes ceanothus	4.3	-	-	G3G4T3	S3.3	Coastal bluff scrub (CBScr)/Closed cone coniferous forest (CCFrs)/Coastal dunes (CoDns)/Coastal scrub (CoScr)/sandy	Mar-May	Marginal
Coptis laciniata Oregon goldthread	2.2	-	-	G4G5	S3.2	Meadows and seeps (Medws) | North Coast coniferous forest (NCFrs)streambanks/mesic	Mar-Apr	No
Cupressus goveniana ssp. *pigmaea* pygmy cypress	1B.2	-	-	G2T2	S2.2	Closed-cone coniferous forest (CCFrs) / usually podzol-like soil	May-July	Yes
Erythronium revolutum Coast fawn lily	2.2	-	-	G4	S2.2	Bogs and fens (BgFns) | Broadleafed upland forest (BUFrs) | North Coast coniferous forest (NCFrs)(mesic)	Mar-Jul(Aug)	Marginal
Lasthenia conjugens Contra Costa goldfields	1B.1	FE	-	G1	S1.1	Cismontane woodland (CmWld) | Playas (Plyas)(alkaline) | Valley and foothill grassland (VFGrs) | Vernal pools (VnPls)/mesic	Mar-Jun	No
Lasthenia californica ssp. *bakeri* Baker's goldfields	1B.2	-	-	G3TH	SH	Closed-cone coniferous forest (CCFrs) (openings) | Coastal scrub (CoScr) | Meadows and seeps (Medws) | Marshes and swamps (MshSw)	Apr-Oct	No

PLANT NAME (*SCIENTIFIC* & COMMON)	CNPS LIST	FED	STATE	CNDDB ELEMENT RANK		HABITATS/NATURAL COMMUNITIES	BLOOMS	HABITAT PRESENT WITHIN STUDY AREA?
				G RANK	S RANK			
Lilium maritimum coast lily	1B.1	-	-	G2	S2.1	Broadleafed upland forest (BUFrs) | Closed-cone coniferous forest (CCFrs) | Coastal prairie (CoPrr) | Coastal scrub (CoScr) | Marshes and swamps (MshSw) (freshwater) | North Coast coniferous forest (NCFrs)	May-Aug	Yes
Lotus formosissimus Coastal lotus	4.2	-	-	G4	S3.2	Broadleafed upland forest (BUFrs) | Coastal bluff scrub (CBScr) | Closed-cone coniferous forest (CCFrs) | Cismontane woodland (CmWld) | Coastal prairie (CoPrr) | Coastal scrub (CoScr) | Meadows and seeps (Medws) | Marshes and swamps (MshSw) | North Coast coniferous forest (NCFrs) | Valley and foothill grassland (VFGrs)/wetlands, roadsides	Mar-Jul	Yes
Lycopodium clavatum running-pine	2.3	-	-	G5	S2S3	Marshes and Swamps (MshSw) | North Coast coniferous forest (NCFrs) / mesic	N/A	Marginal
Microseris borealis northern microseris	2.1	-	-	G4?	S1.1	Bogs and fens (BgFns) | Lower montane coniferous forest (LCFrs) | Meadows and seeps (Medws) / mesic	June-Sept	No
Microseris paludosa Microseris	1B.2	-	-	G2	S2.2	Closed-cone coniferous forest (CCFrs) | Cismontane woodland (CmWld) | Coastal scrub (CoScr) | Valley and foothill grassland (VFGrs)	Apr-Jun(Jul)	Marginal
Packera bolanderi var. *bolanderi* seacoast ragwort	2.2	-	-	G4T4	S1.2	Coastal scrub (CoScr) | North Coast coniferous forest (NCFrs)/sometimes roadsides	(Apr)May-Jul	Marginal
Pinus contorta ssp. *bolanderi* Bolander's pine	1B.2	-	-	G5T3	S3.2	Closed-cone coniferous forest (CCFrs) (podzol-like soil)	N/A	Yes
Pleuropogon hooverianus North Coast semaphore grass	1B.1	-	CT	G1	S1.1	Broadleafed upland forest (BUFrs) | Meadows and seeps (Medws) | North Coast coniferous forest (NCFrs) / open areas, mesic	Apr-Jun	Marginal
Pleuropogon refractus Nodding semaphore grass	4.2	-	-	G4	S3.2?	Lower montane coniferous forest (LCFrs) | Meadows and seeps (Medws) | North Coast coniferous forest (NCFrs) | Riparian forest (RpFrs)/mesic	Apr-Aug	No
Potentilla hickmanii Hickman's cinquefoil	1B.1	FE	CE	G1	S1.1	Coastal bluff scrub (CBScr) | Closed cone coniferous forest (CCFrs) | Meadows and seeps (Medws) (vernally mesic) | Marshes and swamps (MshSw)(freshwater)	Apr-Aug	Marginal
Sanguisorba officinalis great burnet	2.2	-	-	G5?	S2.2	Bogs and fens (BgFns) | Broadleafed upland forest (BUFrs) | Meadows and seeps (Medws) | Marshes and swamps (MshSw) | North Coast coniferous forest (NCFrs) | Riparian forest (RpFrs) / often serpentinite	July-Oct	No
Sidalcea malachroides Maple-leaved checkerbloom	4.2	-	-	G3	S3.2	Broadleaf upland forest (BUFrs)/Coastal prairie (CoPrr)/Coastal Scrub (CoScr)/North Coast coniferous forest (NCFrs)(often disturbed areas)	Apr-Aug	Yes
Sidalcea malviflora ssp. *patula* Siskiyou checkerbloom	1B.2	-	-	G5T1	S1.1	Coastal bluff scrub (CBScr)/Coastal prairie (CoPrr)/North Coast coniferous forest (NCFrs) (often roadcuts)/One collection 2 miles south of Albion in roadside ditch	May-Aug	Marginal
Sidalcea malviflora ssp. *purpurea* purple stemmed checkerbloom	1B.2	-	-	G5T2	S2.2	Broadleafed upland forest (BUFrs) | Coastal prairie (CoPrr)	May-Jun	No
Veratrum fimbriatum Fringed false-hellebore	4.3	-	-	G3	S3.3	Bogs and fens (BgFns)/Coastal scrub (CoScr)/Meadows and seeps (Medws)/North Coast coniferous forests (NCFrs)	Jul-Sep	Marginal
Viola adunca Dog violet	-	-	-	-	-	Coastal prairie (CoPrr)		Marginal

Table 2. Scoping List of Special Status Plant Communities with Potential to Occur within the Study Area.

Special-Status Plant Community	Global Ranking	State Ranking	Present on Site
Active Coastal Dunes	G3	S2.2	No
Beach Pine Forest	G4	S2.1	No
Coastal Brackish Marsh	G2	S2.1	No
Coastal Chinook Salmon Stream	G2	S2.1	No
Coastal Coho Salmon Stream	G2	S2.1	No
Coastal Douglas Fir Western Hemlock Forest	G4	S2.1	No
Coastal Terrace Prairie	G2	S2.1	No
Fen	G2	S1.2	No
Freshwater Swamp	G2	S2.2	No
Grand Fir Forest	G1	S1.1	No
Ledum Swamp	G2	S2.1	No
Mendocino Pygmy Cypress Forest	G2	S2.1	No (not within THP)
North Coast Alluvial Redwood Forest	G2	S2.2	No
North Coast Black Cottonwood Riparian Forest	G1	S1.1	No
North Cobble Intertidal	G2	S2.2	No
North Cobble Shore	G2	S2.2	No
North Embayment	G1	S1.2	No
North Eusaline Lagoon	G1	S1.2	No
North Mesosaline Estuary	G2	S2.1	No
North Mixosaline Estuary	G2	S2.1	No
North Mixosaline Lagoon	G1	S1.2	No
North Oligosaline Estuary	G2	S2.1	No
North Rock Intertidal	G2	S2.2	No
North Seasgrass Bed	G1	S1.1	No
Northern Bishop Pine Forest	G2	S2.2	No
Northern Claypan Vernal Pool	G1	S1.1	No
Northern Coastal Bluff Scrub	G2	S2.2	No
North Coast Riparian Scrub	G3	S3.2	No
Northern Dune Scrub	G2	S1.2	No
Northern Foredune Grassland	G1	S1.1	No
Northern Foredunes	G2	S2.1	No
Northern Silk Tassel Scrub	G3	S2.3	No
Red Alder Riparian Forest	G3	S2.2	No
Sitka Spruce Forest	G1	S1.1	No
Sitka Spruce Grand Fir Forest	G4	S1.1	No
Sphagnum Bog	G3	S1.2	No
Wildflower Field	G2	S2.2	No

Sensitivity Ranking Explanations for Tables 1 and 2:

Federal: includes federally rare (FR), threatened (FT), or endangered (FE)

State: State of California status includes rare (CR), threatened (CT), or endangered (CE)

California Native Plant Society (CNPS)

1A. Presumed extinct in California

1B. Rare or Endangered in California and elsewhere

2. Rare or Endangered in California, more common elsewhere

3. Plants for which we need more information - Review list

4. Plants of limited distribution - Watch list

List 1A: Plants Presumed Extinct in California

The plants of List 1A are presumed extinct because they have not been seen or collected in the wild in California for many years. Although most of them are restricted to California, a few are found in other states as well. In many cases, repeated attempts have been made to rediscover these plants by visiting known historical locations. Even after such diligent searching, we are constrained against saying that they are extinct, since for most of them rediscovery remains a distinct possibility. Note that care should be taken to distinguish between "extinct" and "extirpated." A plant is extirpated if it has been locally eliminated, but it may be doing well elsewhere in its range.

List 1B: Plants Rare, Threatened, or Endangered in California and Elsewhere.

The plants of List 1B are rare throughout their range. All but a few are endemic to California. All of them are judged to be vulnerable under present circumstances or to have a high potential for becoming so because of their limited or vulnerable habitat, their low numbers of individuals per population (even though they may be wide ranging), or their limited number of populations. Most of the plants of List 1B have declined significantly over the last century.

List 2: Plants Rare, Threatened, or Endangered in California, but More Common Elsewhere

Except for being common beyond the boundaries of California, the plants of List 2 would have appeared on List 1B. From the federal perspective, plants common in other states or countries are not eligible for consideration under the provisions of the Endangered Species Act. Until 1979, a similar policy was followed in California. However, after the passage of the Native Plant Protection Act, plants were considered for protection without regard to their distribution outside the state.

List 3: Plants About Which We Need More Information - A Review list

The plants that comprise List 3 are united by one common theme--we lack the necessary information to assign them to one of the other lists or to reject them. Nearly all of the plants remaining on List 3 are taxonomically problematic.

List 4: Plants of Limited Distribution - A Watch list

The plants in this category are of limited distribution or infrequent throughout a broader area in California, and their vulnerability or susceptibility to threat appears low at this time. While we cannot call these plants "rare" from a statewide perspective, they are uncommon enough that their status should be monitored regularly. Should the degree of endangerment or rarity of a List 4 plant change, we will transfer it to a more appropriate list or deleted from consideration.

Threat ranks:

Recently, CNPS added a decimal threat rank to the List ranks to parallel that used by the CNDDB. This extension replaces the E (Endangerment) value from the R-E-D Code. CNPS ranks therefore read like this: 1B.1, 1B.2, etc.

CNDDB ELEMENT RANKING

GLOBAL RANKING

The *global rank* (G-rank) is a reflection of the overall condition of an element throughout its global range.

SPECIES OR NATURAL COMMUNITY LEVEL

G1 = Less than 6 viable element occurrences (Eos) OR less than 1,000 individuals OR less than 2,000 acres.
G2 = 6-20 Eos OR 1,000-3,000 individuals OR 2,000-10,000 acres.
G3 = 21-80 Eos OR 3,000-10,000 individuals OR 10,000-50,000 acres.
G4 = Apparently secure; this rank is clearly lower than G3 but factors exist to cause some concern; i.e., there is some threat, or somewhat narrow habitat.
G5 = Population or stand demonstrably secure to ineradicable due to being commonly found in the world.

SUBSPECIES LEVEL

Subspecies receive a **T-rank** attached to the G-rank. With the subspecies, the G-rank reflects the condition of the entire species, whereas the T-rank reflects the global situation of just the subspecies or variety. For example: *Chorizanthe robusta* var. *hartwegii.* This plant is ranked G2T1. The G-rank refers to the whole species range i.e., *Chorizanthe robusta.* The T-rank refers only to the global condition of var. *hartwegii.*

STATE RANKING

The *state rank* (S-rank) is assigned much the same way as the global rank, except state ranks in California often also contain a threat designation attached to the S-rank.

S1 = Less than 6 Eos OR less than 1,000 individuals OR less than 2,000 acres
S1.1 = very threatened
S1.2 = threatened
S1.3 = no current threats known
S2 = 6-20 Eos OR 1,000-3,000 individuals OR 2,000-10,000 acres
S2.1 = very threatened
S2.2 = threatened
S2.3 = no current threats known
S3 = 21-80 Eos or 3,000-10,000 individuals OR 10,000-50,000 acres
S3.1 = very threatened
S3.2 = threatened
S3.3 = no current threats known
S4 = Apparently secure within California; this rank is clearly lower than S3 but factors exist to cause some concern; i.e. there is some threat, or somewhat narrow habitat. NO THREAT RANK.
S5 = Demonstrably secure to ineradicable in California. NO THREAT RANK.

Notes:

1. Other considerations used when ranking a species or natural community include the pattern of distribution of the element on the landscape, fragmentation of the population/stands, and historical extent as compared to its modern range. It is important to take a **bird's eye or aerial view** when ranking sensitive elements rather than simply counting element occurrences.
2. Uncertainty about the rank of an element is expressed in two major ways: By expressing the ranks as a **range** of values: e.g., S2S3 means the rank is somewhere between S2 and S3. By adding a ? to the rank: e.g., S2? This represents more certainty than S2S3, but less certainty than S2.

Other symbols:

GH All sites are **historical**; the element has not been seen for at least 20 years, but suitable habitat still exists (SH = All California sites are historical). GX All sites are **extirpated**; this element is extinct in the wild (SX = All California sites are extirpated). GXC Extinct in the wild; exists in cultivation. G1Q The element is very rare, but there are **taxonomic questions** associated with it.
T Rank applies to a subspecies or variety.

Appendix A

Vascular and Nonvascular Plant Species Observed on the Newman Gulch Timber Harvest Plan

Appendix A. Vascular and Nonvascular Plant Species Observed on the Newman Gulch Timber Harvest Plan.

Scientific Name	Common Name
Trees	
Abies grandis	grand fir
Arbutus menziesii	Pacific madrone
Cupressus goveniana* ssp. *pigmaea	**Mendocino pygmy cypress**
Ilex aquifolium	English holly
Lithocarpus densiflorus var. *densiflorus*	tanbark oak
Pinus muricata	Bishop pine
Pseudotsuga menziesii var. *menziesii*	Douglas-fir
Sequoia sempervirens	coast redwood
Tsuga heterophylla	Western hemlock
Umbellularia californica	California-bay
Shrubs	
Arctostaphylos columbiana	hairy manzanita
Arctostaphylos manzanita	common manzanita
Baccharis pilularis	coyote brush
Berberis aquifolium	tall Oregon-grape
Ceanothus thyrsiflorus	blue blossom
Ceanothus velutinus	snowbrush
Cotoneaster pannosa	cotoneaster
Gaultheria shallon	salal
Genista monspessulana	French broom
Mimulus aurantiacus	orange bush monkey-flower
Myrica californica	wax myrtle
Rhododendron macrophyllum	California rose-bay
Rosa gymnocarpa	wood rose
Rubus discolor	Himalayan blackberry
Rubus leucodermis	white-stemmed raspberry
Rubus parviflorus	thimbleberry
Sambucus racemosa var. *racemosa*	red elderberry
Toxicodendron diversilobum	poison-oak
Vaccinium ovatum	Vine maple
Vaccinium parvifolium	red huckleberry
Herbs	
Achillea millefolium	common yarrow
Achlys californica	California deer foot, vanilla leaf
Adenocaulon bicolor	trail plant
Agrostis hallii	Hall's bent-grass
Agrostis pallens	Bent grass

Agrostis stolonifera	creeping bent-grass
Aira caryophyllea	silver European hairgrass
Aria praecox	hairgrass
Allium sp.	onion
Anagallis arvensis	scarlet pimpernel
Anaphalis margaritacea	pearly everlasting
Anthoxanthum odoratum	sweet vernal grass
Asarum caudatum	wild ginger
Avena barbata	slender wild oat
Avena fatua	wild oat grass
Bellis perennis	English daisy
Blechnum spicant	deer fern
Boykinia occidentalis	coast boykinia
Brassica rapa	field mustard
Briza maxima	large quaking or rattlesnake grass
Briza minor	small quaking or rattlesnake grass
Bromus diandrus	ripgut grass
Bromus hordeaceus	soft chess
Bromus vulgaris	narrow-flowered brome
Calamagrostis bolanderi	**Bolander's reed grass**
Calypso bulbosa	calypso orchid or fairy slipper orchid
Campanula prenanthoides	California harebell
Cardamine californica	California toothwort or milk maids
Cardamine oligosperma	western bittercress
Carduus pycnocephalus	Italian thistle
Carex gynodynama	Olney's hairy sedge
Carex rossii	Ross' sedge
Cerastium arvense	field chickweed
Cerastium glomeratum	mouse ear chickweed
Cirsium arvense	Canada thistle
Cirsium vulgare	bull thistle
Claytonia perfoliata	miner's lettuce
Convolvulus arvensis	field bindweed
Conyza canadensis	horseweed
Cortaderia jubata	weedy pampas grass
Cynodan dactylon	bermuda grass
Cynoglossum grande	hound's-tongue
Cynosurus cristatus	crested dogtail
Cynosurus echinatus	hedgehog dogtail grass
Dactylis glomerata	orchard grass
Danthonia pilosa	hairy oatgrass
Deschampsia elongata	slender hairgrass
Dipsacus sativus	Fuller's teasel
Elymus glaucus ssp. *glaucus*	blue wildrye
Equisetum telmateia ssp. *braunii*	giant horsetail

Erechtites minima	toothed coast fireweed
Eriophyllum lanatum var. *arachnoideum*	woolly sunflower
Erodium botrys	long-beaked storksbill
Erodium moschatum	musk or white-stemmed filaree
Festuca arundinacea	tall fescue
Festuca rubra	red fescue
Foeniculum vulgare	fennel
Fragaria vesca	wood strawberry
Galium aparine	goose grass
Galium muricatum	Humboldt bedstraw
Gastridium ventricosum	nit grass
Geranium dissectum	cut-leaved geranium
Geranium molle	dovefoot geranium
Gnaphalium japonicum	Japanese cudweed
Gnaphalium luteo-album	weedy cudweed
Goodyera oblongifolia	rattlesnake plantain
Hedera helix	English ivy
Hieracium albiflorum	white hawkweed
Hierochloe occidentalis	vanilla grass
Holcus lanatus	common velvet grass
Hordeum jubatum	foxtail barley
Hypochaeris glabra	smooth cat's-ear
Hypochaeris radicata	hairy cat's-ear
Iris douglasiana	Douglas iris
Juncus effusus	common rush
Juncus patens	spreading rush
Lathyrus torreyi	redwood pea or Torrey's pea
Lathyrus vestitus	wood pea
Leontodon taraxacoides	hawkbit
Leucanthemum vulgare	ox-eye daisy
Linum bienne	western blue flax
Lolium perenne	perennial ryegrass
Lolum multiflorum	Italian ryegrass
Lonicera hispidula var. *vacillans*	hairy honeysuckle
Lotus corniculatus	birdfoot trefoil
Lotus micranthus	rose-flowered lotus
Lupinus rivularis	riverbank lupine
Luzula parviflora	small-flowered wood rush
Madia sativa	coast tarweed
Marah oreganus	coast man-root
Medicago arabica	spotted bur clover
Mentha pulegium	pennyroyal
Navarretia squarrosa	skunkweed
Osmorhiza chilensis	mountain sweet-cicely
Oxalis oregana	redwood sorrel

Parentucellia viscosa	yellow parentucellia
Pentagramma triangularis ssp. *triangularis*	goldback fern
Plantago lanceolata	English plantain
Poa annua	annual bluegrass
Poa kelloggii	Kellogg's bluegrass
Polygala californica	California milkwort
Polystichum munitum	sword fern
Prunella vulgaris var. *lanceolata*	self-heal (native, lg. leaves and erect)
Prunella vulgaris var. *vulgaris*	self-heal (exotic, sm. lvs. and prostrate)
Pteridium aquilinum var. *pubescens*	western bracken fern
Ranunculus repens	creeping buttercup
Raphanus sativus	wild radish
Rubus ursinus	Pacific bramble or California blackberry
Rumex crispus	curly dock
Sanicula crassicaulis	Pacific snakeroot
Satureja douglasii	yerba buena
Senecio jacobaea	tansy ragwort
Senecio vulgaris	common butterweed
Smilacina racemosa	branched Solomon's seal
Sonchus asper ssp. *asper*	prickly sow thistle
Sonchus oleraceus	common sow thistle
Stachys ajugoides var. *rigida*	hedge nettle
Stellaria crispa	crisp chickweed
Stellaria media	common chickweed
Synthyris reniformis	snow queen
Taraxacum officinale	dandelion
Torilis arvensis	field hedge-parsley or rattlesnake weed
Trientalis latifolia	Pacific star flower
Trifolium arvense	rabbitfoot clover
Trifolium dubium	little hop clover or shamrock clover
Trifolium repens	white clover
Trifolium subterraneum	subterranean clover
Trifolium variegatum	white-tipped clover
Trillium ovatum	western trillium
Verbascum thapsis	woolly mullein
Vicia hirsuta	hairy vetch
Vicia sativa ssp. *sativa*	common vetch or spring vetch
Viola sempervirens	evergreen violet
Vulpia bromoides	six week fescue
Vulpia myorus	Rat's Tail Fescue
Whipplea modesta	modesty

LICHENS

Alectoria vancouverensis

Bryoria sp.

Cladonia bellidiflora
Cladonia fimbriata
Cladonia macilenta
Fuscopannaria pacifica
Hypogymnia enteromorpha
Hypogymnia imshaugii
Hypogymnia inactiva
Ochrolechia oregana
Parmelia sulcata
Peltigera neopolydactyla
Platismatia herreii
Pseudocyphellaria anthraspis
Pyrrhospora gowardiana
Tuckermannopsis chlorophylla
Usnea flavocardia
Usnea rubicunda

LIVERWORTS
Calypogeia sp.
Cephaloziella sp.
Porella navicularis
Radula bolanderi
Scapania bolanderi

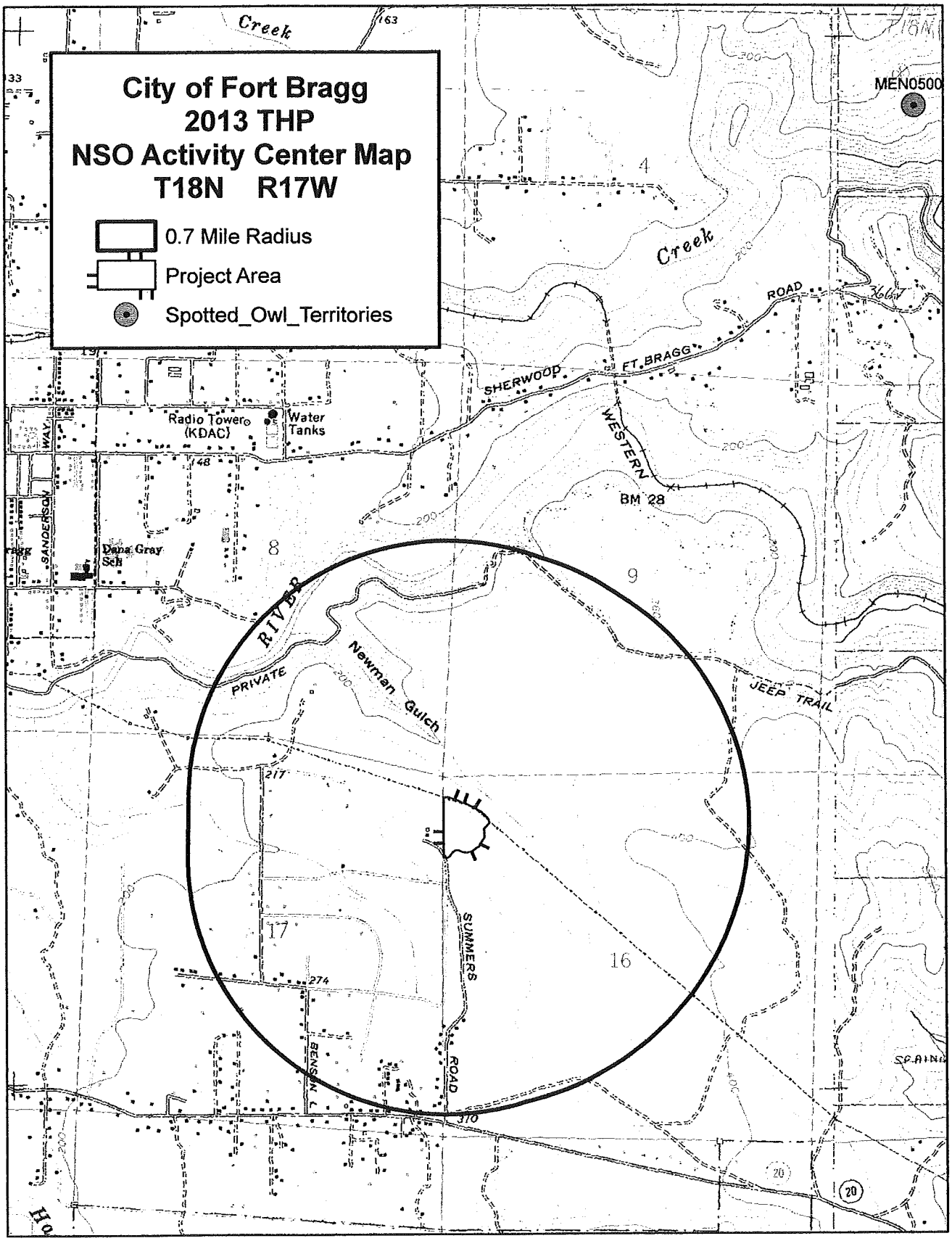
HORNWORTS
Anthoceros sp.

MOSSES
Aulacomnium androgynum
Brachythecium asperrimum
Buxbaumia aphylla
Dendroalsia abietina
Dicranoweisia cirrata
Fissidens bryoides
Funaria hygrometrica
Isothecium cristatum
Isothecium stoloniferum
Kindbergia oregana
Neckera douglasii
Orthotrichum papillosum
Polytrichum juniperinum

APPENDIX

ADDITIONAL INFORMATION CONCERNING THE NORTHERN SPOTTED OWL

City of Fort Bragg
2013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2013 THP
NSO Activity Center Map
T18N R17W
0.7 Mile Radius
Project Area
Spotted_Owl_Territories
MEN0500
Creek
SHERWOOD
FT. BRAGG
ROAD
WESTERN
BM 28
Radio Towers (KDAC)
Water Tanks
SANDERSON WAY
Dana Gray Sch
RIVER
PRIVATE
Newman Gulch
JEEP TRAIL
SUMMERS
ROAD
BENSON L
4
8
9
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194

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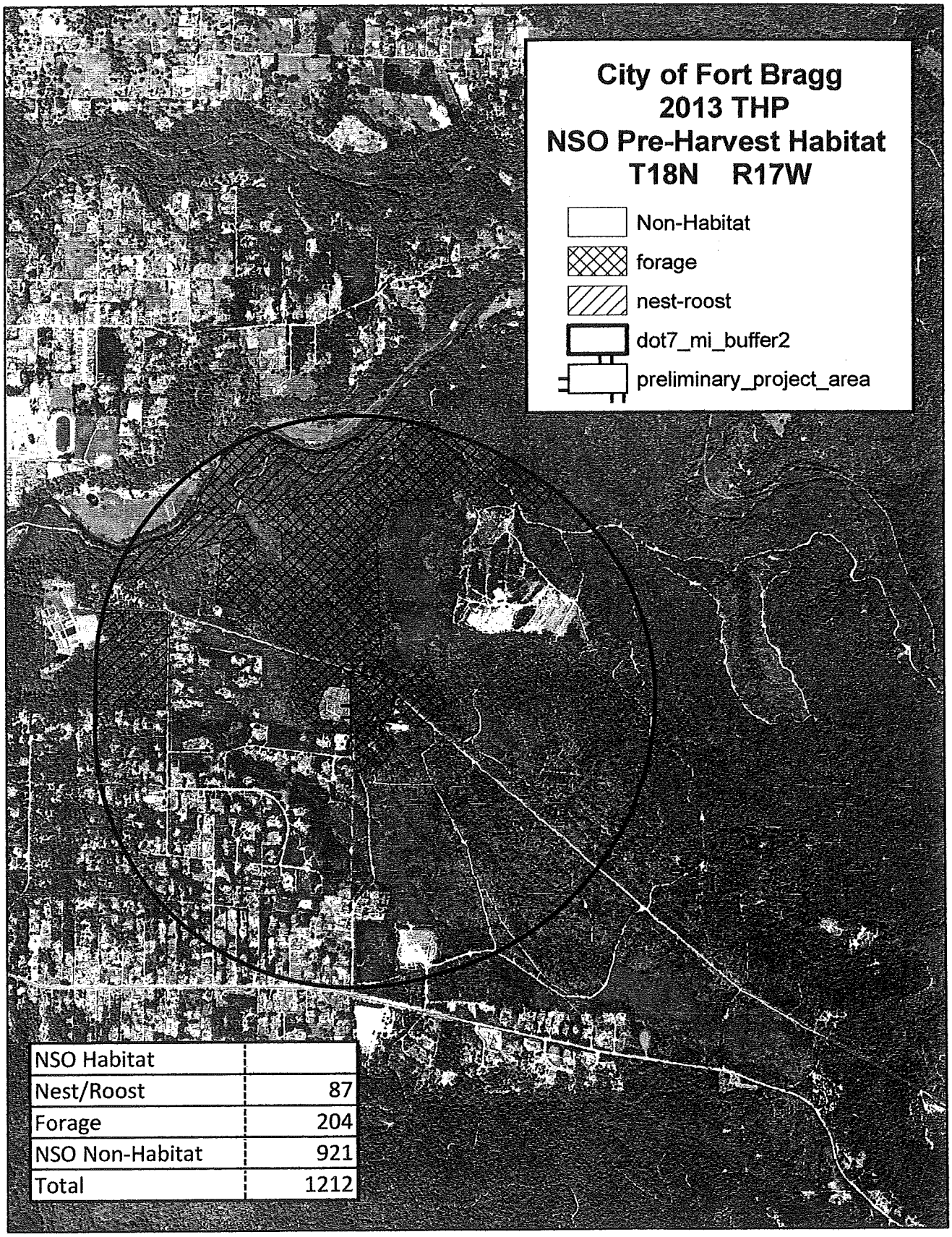

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Nest/Roost	87
Forage	204
NSO Non-Habitat	921
Total	1212

N

195

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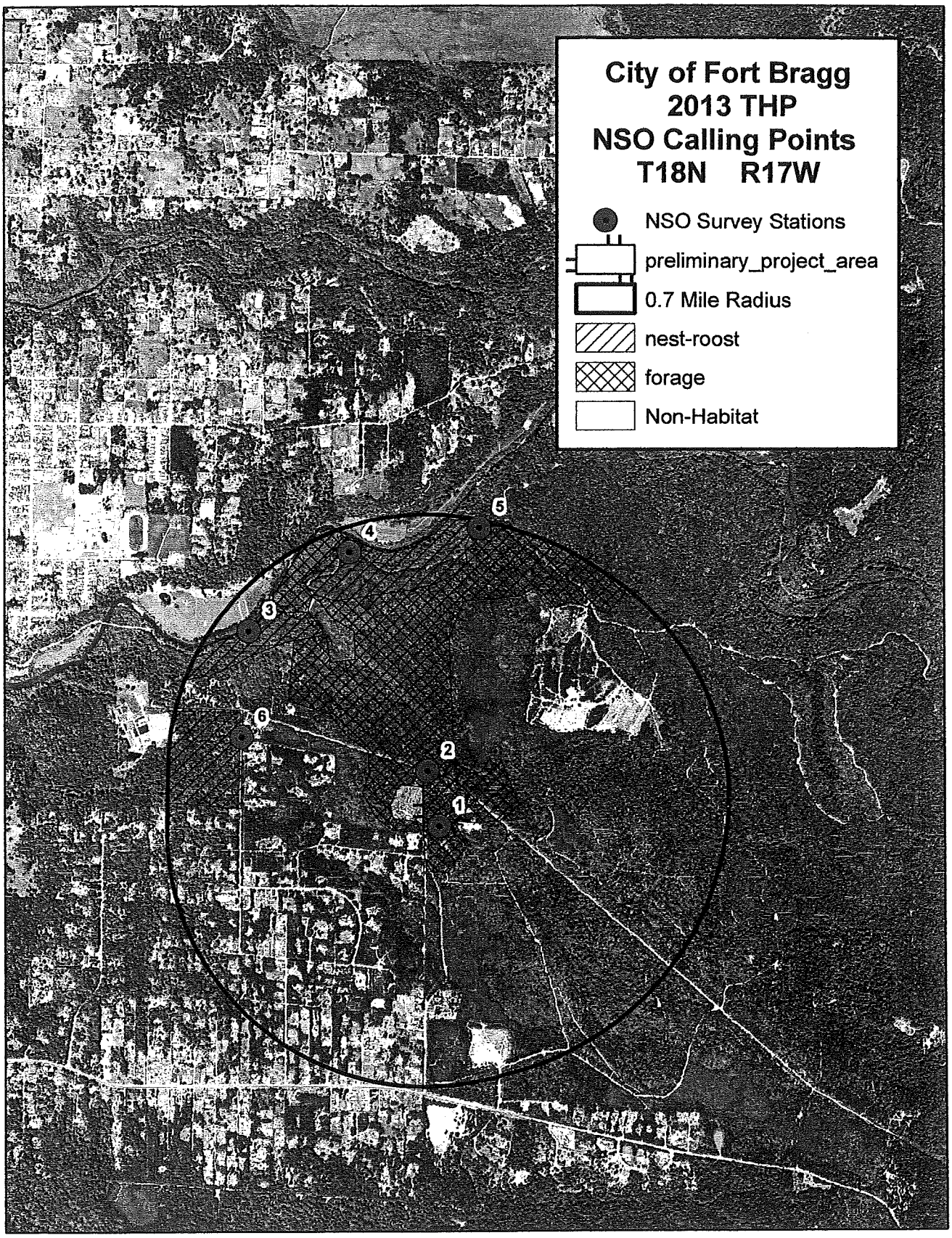

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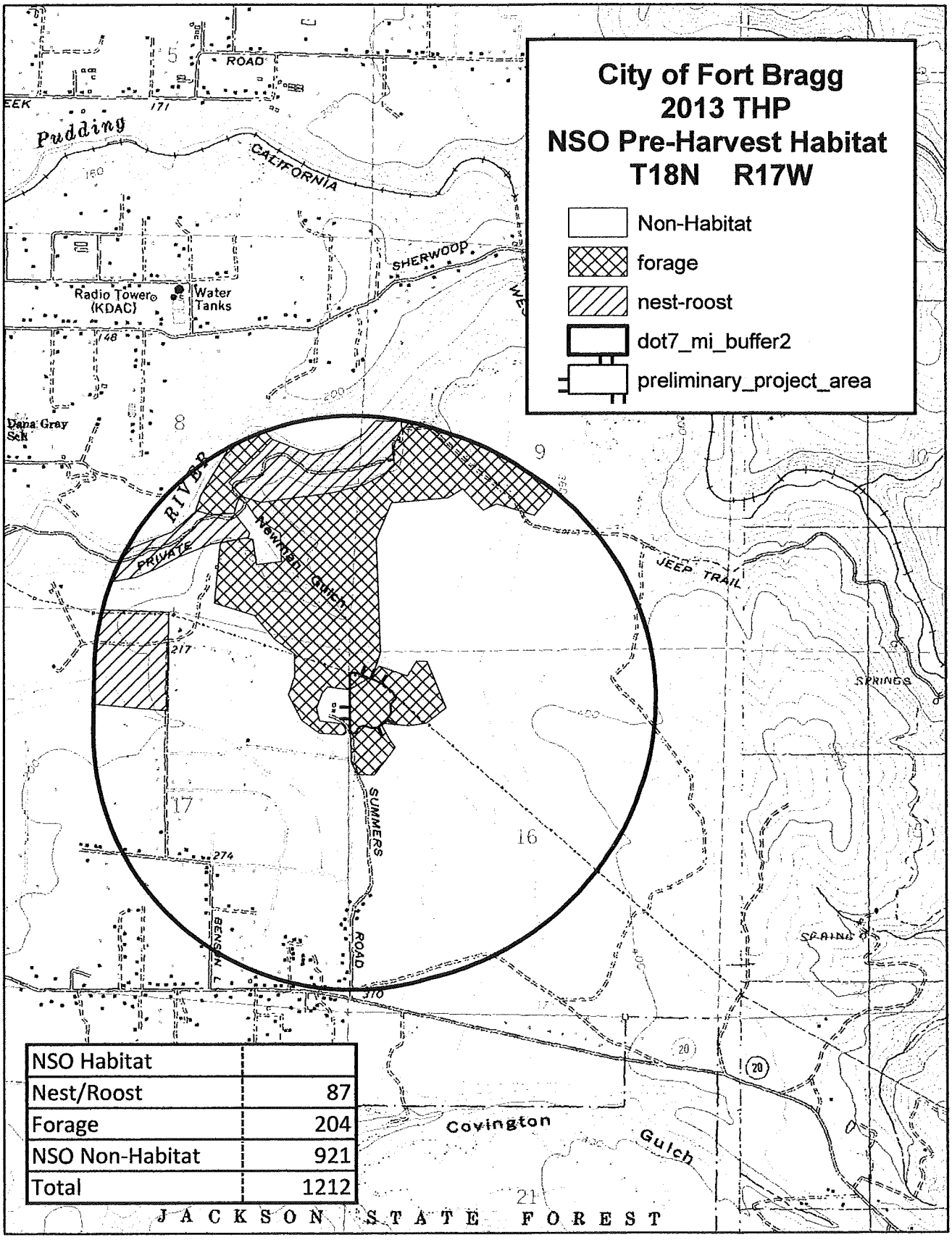

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Nest/Roost	87
Forage	204
NSO Non-Habitat	921
Total	1212

N

196

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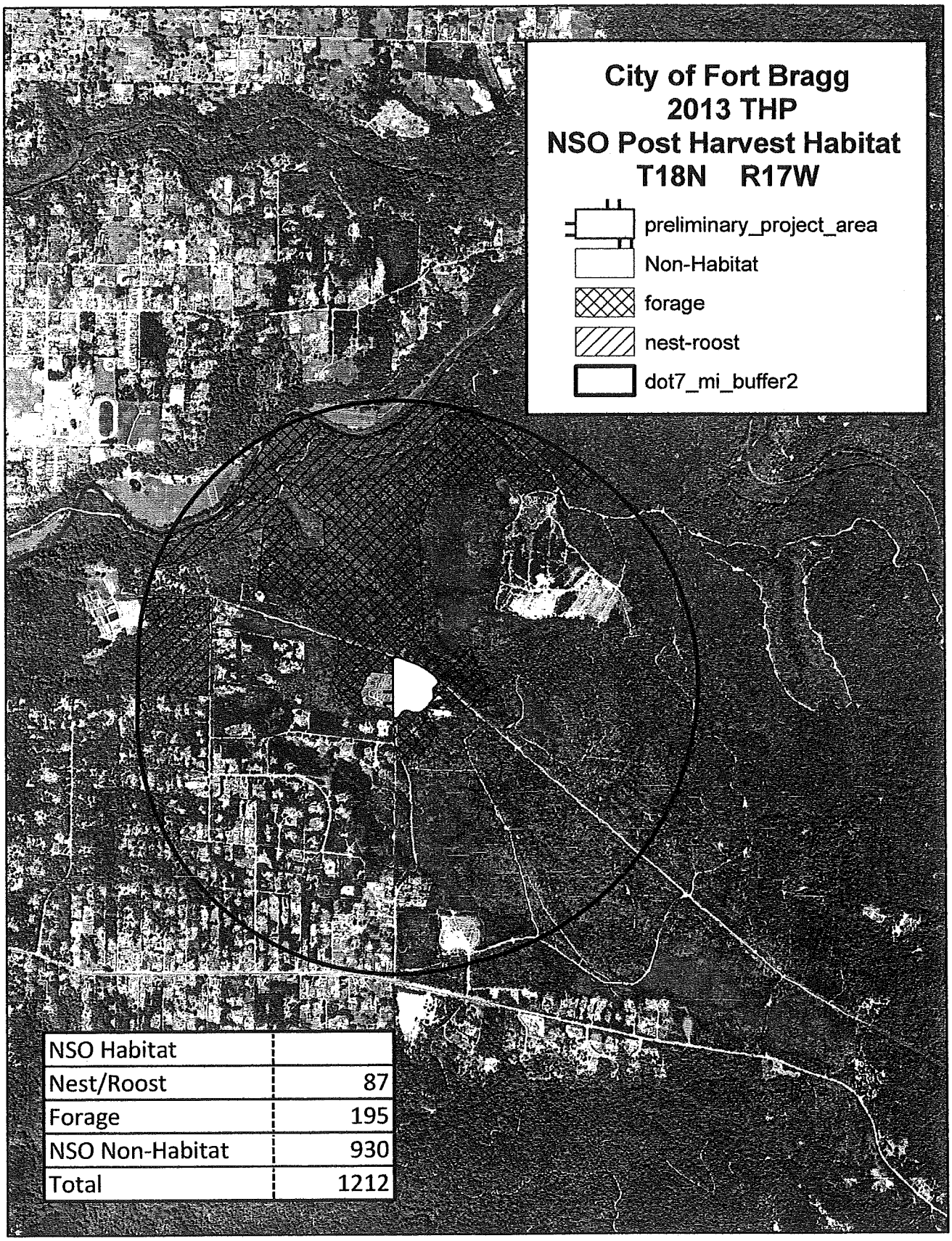
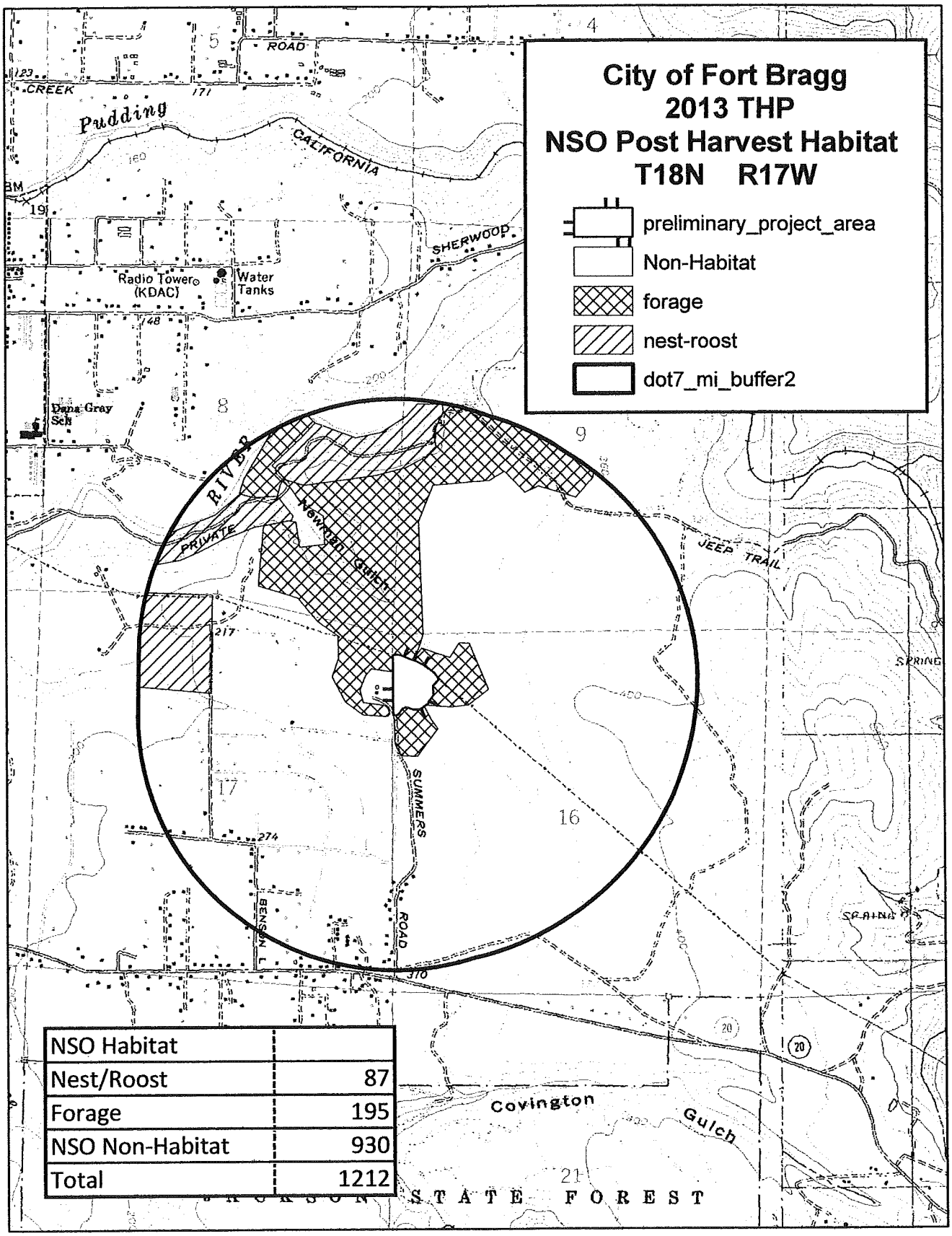

City of Fort Bragg
2013 THP
NSO Post Harvest Habitat
T18N R17W
preliminary_project_area
Non-Habitat
forage
nest-roost
dot7_mi_buffer2
NSO Habitat
Nest/Roost 87
Forage 195
NSO Non-Habitat 930
Total 1212
N
197
1:24,000


City of Fort Bragg
2013 THP
NSO Post Harvest Habitat
T18N R17W
preliminary_project_area
Non-Habitat
forage
nest-roost
dot7_mi_buffer2
Pudding
CREEK
ROAD
CALIFORNIA
SHERWOOD
Radio Tower (KDAC)
Water Tanks
Dana Gray Sch
RIVER
PRIVATE
Newman Gulch
JEEP TRAIL
SUMMERS
ROAD
BENSON L
SPRING
Covington
Gulch
STATE FOREST
NSO Habitat
Nest/Roost 87
Forage 195
NSO Non-Habitat 930
Total 1212
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198
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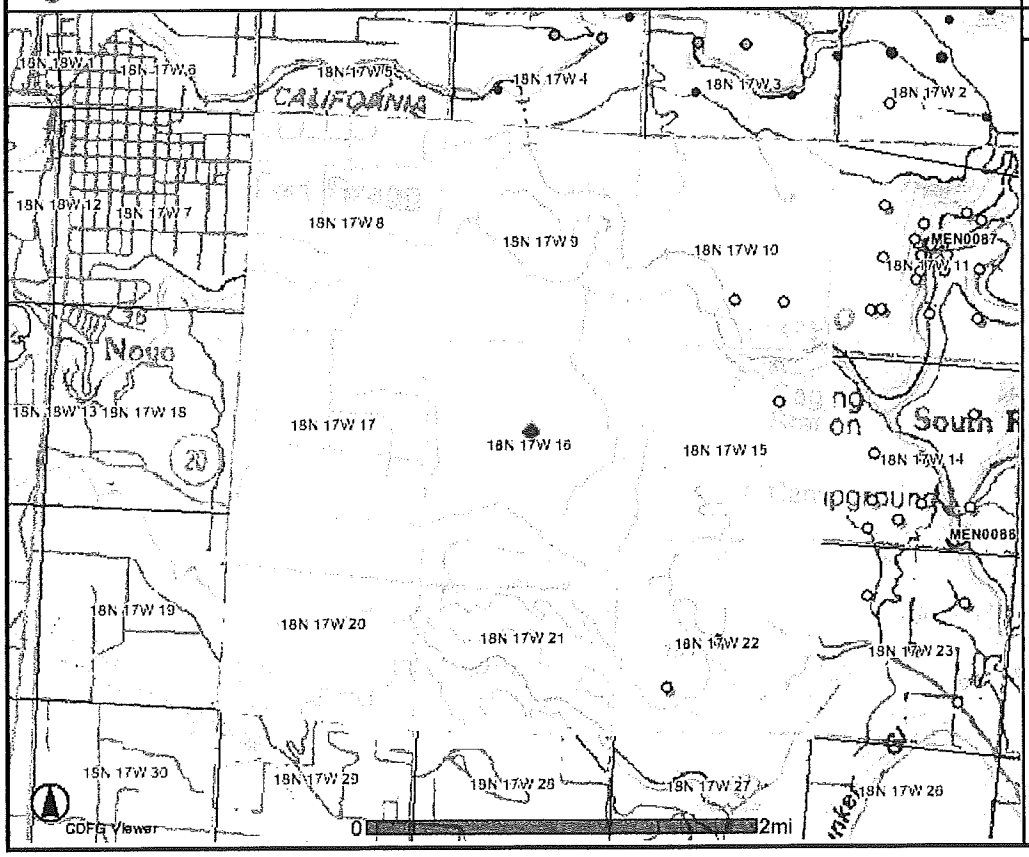
Info: Site available at http://imaps.dfg.ca.gov

Author: Enter Name Here
Date: 4/17/2013 8:33 AM



Map Legend

Spotted Owl Observations [ds704]

- Positive Observation
- Negative Observation
- Activity Center
- Not Valid Activity Center
- Abandoned

PLSS (Protracted)

Western States

Mexico

199

California Department of Fish and Wildlife

Spotted Owl Database Management System

Report # 1 - Spotted Owl Sites Found

Known Spotted Owl sites having observations within the search area.

Meridian, Township, Range, Section (MTRS) searched:

M_18N_17W Sections(08,09,10,17,16,15,20,21,22);

Masterowl	Subspecies	Lat DD N83	Lon DD N83	MTRS	Coordinate Source
MEN0086	NORTHERN	39.41552800	-123.72052600	M 18N 17W 14	Contributor
MEN0087	NORTHERN	39.43747500	-123.72384200	M 18N 17W 11	Contributor

Data Version Date: 4/10/2013

Report Generation Date: 4/17/2013

California Department of Fish and Wildlife

Spotted Owl Database Management System

Report # 2 - Observations Reported

List of observations reported, by site.

Meridian, Township, Range, Section (MTRS) searched.

M_18N_17W Sections(08,09,10,17,16,15,20,21,22);

MasterOwl: MEN0086 **SubSpecies: NORTHERN**

Type	Date Obs	Time	#Adults	Age Sex	Pair	Nest	#Young	Latitude NAD 83	Longitude NAD 83	MTRS	Coordinate Source
AC	**3/9/2007**	**1842**	**1**	**UF**				**39.415528**	**-123.720526**	**M 18N 17W 14**	**Contributor**
POS	8/6/2000	1648	1	UF				39.418042	-123.719134	M 18N 17W 14	Quarter-section centroid
POS	8/6/1993	2034	2	UMUF	Y			39.415623	-123.719830	M 18N 17W 14	Contributor
POS	8/24/2001		0				1	39.418042	-123.719134	M 18N 17W 14	Quarter-section centroid
NE	7/6/2005	2039	0					39.424980	-123.719101	M 18N 17W 14	Quarter-section centroid
POS	7/5/2000	1327	2	UMUF	Y	Y		39.418042	-123.719134	M 18N 17W 14	Quarter-section centroid
NEG	7/29/2004	2103	0					39.407433	-123.724066	M 18N 17W 23	Section centroid
POS	7/28/1995		2	UMUF	Y			39.418042	-123.719134	M 18N 17W 14	Quarter-section centroid
POS	7/27/1991	0531	1	UM				39.410904	-123.719328	M 18N 17W 23	Quarter-section centroid
NEG	7/22/2002	1830	0					39.421635	-123.723783	M 18N 17W 14	Section centroid
POS	7/20/1997		2	UMUF	Y		2	39.418317	-123.728500	M 18N 17W 14	Quarter-section centroid
POS	7/2/1991	1844	2	UMUF	Y			39.410904	-123.719328	M 18N 17W 23	Quarter-section centroid
POS	7/2/1990		1	AF	Y			39.418042	-123.719134	M 18N 17W 14	Quarter-section centroid
POS	7/19/1997	1915	2	UMUF	Y		2	39.418317	-123.728500	M 18N 17W 14	Quarter-section centroid
NEG	7/18/2005	2051	0					39.418042	-123.719134	M 18N 17W 14	Quarter-section centroid

Report # 2 - Observations Reported

List of observations reported, by site.

POS	7/18/1997		2	UUUU	Y		39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	7/17/1997	1745	2	UMUF	Y	2	39.418317	-123.728500	M 18N 17W 14 Quarter-section centroid
NEG	7/16/2002	2040	0				39.421635	-123.723783	M 18N 17W 14 Section centroid
POS	7/16/2000	1904	1	UM			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	7/11/2006	2102	0			0	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	7/10/2003	2110	0				39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	7/10/1997	1740	2	UMUF	Y	2	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
PO.	7/10/1991		1	AF			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	7/10/1991	0536	2	UMUF	Y		39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	7/1/2004	2149	0				39.407433	-123.724066	M 18N 17W 23 Section centroid
POS	6/8/2001		0			1	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	6/8/2001	1901	2	UMUF	Y	2	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	6/7/2001	2145	0				39.403916	-123.747514	M 18N 17W 22 Quarter-section centroid
NEG	6/7/1994	1920	0				39.421635	-123.723783	M 18N 17W 14 Section centroid
POS	6/6/2000	1928	1	UF			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	6/6/1994		0				39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	6/27/2002	1755	0				39.421635	-123.723783	M 18N 17W 14 Section centroid
POS	6/26/2000	1822	1	UM			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	6/24/2004	2205	0				39.407433	-123.724066	M 18N 17W 23 Section centroid

Report # 2 - Observations Reported

List of observations reported, by site.

NEG	6/24/1994	1925	0				39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	6/23/2003	2019	0				39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	6/21/1996	0540	2	UMUF	Y	2	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	6/21/1995		1	UF			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	6/20/1995		2	UMUF	Y		39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	6/19/2005	2303	0				39.407433	-123.724066	M 18N 17W 23 Section centroid
NEG	6/18/2005	2117	0				39.407433	-123.724066	M 18N 17W 23 Section centroid
POS	6/18/2002	1845	1	UF			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NE	6/16/2001	2205	0				39.403916	-123.747514	M 18N 17W 22 Quarter-section centroid
NEG	6/15/2011	2138	0				39.417613	-123.710198	M 18N 17W 13 Quarter-section centroid
NEG	6/15/2011	2138	0				39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
NEG	6/15/2009	2139	0				39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
NEG	6/15/2002	2115	0				39.407550	-123.742721	M 18N 17W 22 Section centroid
POS	6/15/1991	0500	1	UM			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	6/14/1991	2108	1	UM			39.424980	-123.719101	M 18N 17W 14 Quarter-section centroid
NEG	6/13/2003	0525	0				39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	6/13/1996		0				39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	6/12/2007	2041	0				39.421796	-123.728432	M 18N 17W 14 Half-section centroid

Report # 2 - Observations Reported

List of observations reported, by site.

POS	6/12/2000	1912	1	UF				39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	6/12/1998	1947	2	UMUF	Y		0	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	6/12/1996	0545	1	UM				39.410904	-123.719328	M 18N 17W 23 Quarter-section centroid
POS	6/12/1990	1904	2	UMUF	Y	Y	2	39.415623	-123.719830	M 18N 17W 14 Contributor
POS	6/11/2000	1721	1	UF				39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	6/11/1999	1852	1	AF			1	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	6/11/1993	0500	0					39.421635	-123.723783	M 18N 17W 14 Section centroid
POS	6/10/1997	1142	2	UMUF	Y			39.416936	-123.726000	M 18N 17W 14 Contributor
NEG	5/9/2011	2107	0					39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
NEG	5/9/2003	1915	0					39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	5/5/2009	2056	0					39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
NEG	5/5/1995		0					39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	5/4/2001	2100	0					39.403916	-123.747514	M 18N 17W 22 Quarter-section centroid
POS	5/4/2001	1816	2	UMUF	Y			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	5/4/1999	1836	1	UF		Y		39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	5/4/1992	0546	2	UMUF	Y			39.415623	-123.719830	M 18N 17W 14 Contributor
NEG	5/31/2011	2138	0					39.410904	-123.719326	M 18N 17W 23 Quarter-section centroid
NEG	5/31/2011	2138	0					39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
POS	5/31/2000	1152	1	AF				39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid

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List of observations reported, by site.

NEG	5/30/2001	0505	0			39.403916	-123.747514	M 18N 17W 22 Quarter-section centroid
NEG	5/30/1991	1954	0			39.407433	-123.724066	M 18N 17W 23 Section centroid
NEG	5/3/2004	2056	0			39.403514	-123.719682	M 18N 17W 23 Quarter-section centroid
NEG	5/27/2005	2101	0			39.407433	-123.724066	M 18N 17W 23 Section centroid
NEG	5/26/2009	2032	0			39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
NEG	5/26/2004	2040	0			39.410904	-123.719328	M 18N 17W 23 Quarter-section centroid
NEG	5/26/1995		0			39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	5/25/2002	2105	0			39.407550	-123.742721	M 18N 17W 22 Section centroid
PO	5/24/2000	2004	1	UF		39.424476	-123.710115	M 18N 17W 13 Quarter-section centroid
POS	5/24/2000	2004	2	UMUF	Y	39.424980	-123.719101	M 18N 17W 14 Quarter-section centroid
NEG	5/21/2012	2026	0			39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
NEG	5/21/2005	2222	0			39.407433	-123.724066	M 18N 17W 23 Section centroid
NEG	5/20/2010	2051	0			39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
NEG	5/2/2007	1849	0			39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	5/19/1993	0553	0			39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	5/18/2002	0435	0			39.407550	-123.742721	M 18N 17W 22 Section centroid
NEG	5/16/2001	0510	0			39.403916	-123.747514	M 18N 17W 22 Quarter-section centroid
NEG	5/15/2007	2047	0			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	5/14/2008	1930	0			39.418184	-123.723817	M 18N 17W 14 Half-section centroid
POS	5/12/2000	2045	1	UM		39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid

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List of observations reported, by site.

NEG	5/11/2006	2042	0			0	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	5/10/1995		0				39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	4/7/2010	2022	0				39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
NEG	4/7/2004	2054	0				39.407433	-123.724066	M 18N 17W 23 Section centroid
POS	4/7/1998	2045	1	UM			39.410418	-123.710402	M 18N 17W 24 Quarter-section centroid
NEG	4/7/1994	0555	0				39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	4/6/2006	2048	0			0	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	4/6/1993	0618	1	UF			39.410904	-123.719328	M 18N 17W 23 Quarter-section centroid
PO	4/5/1996	1815	2	UMUF	Y		39.410904	-123.719328	M 18N 17W 23 Quarter-section centroid
NEG	4/5/1996		0				39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	4/5/1994		0				39.407433	-123.724066	M 18N 17W 23 Section centroid
POS	4/5/1993		1	UF			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	4/4/2002	1650	2	UMUF	Y	Y	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	4/4/1998	1739	1	UF		N	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	4/30/2000	1110	2	AMUF	Y	Y	39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	4/29/2004	1950	1	UM			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	4/27/1993		2	UMUF	Y		39.424980	-123.719101	M 18N 17W 14 Quarter-section centroid
POS	4/27/1989	0016	2	UMUF			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid

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List of observations reported, by site.

POS	4/26/2001	0524	1	UM			39.418042	-123.719134 M 18N 17W 14	Quarter-section centroid
NEG	4/26/1994	2035	0				39.421635	-123.723783 M 18N 17W 14	Section centroid
POS	4/25/2000	1715	2	UMUF	Y	Y	39.416207	-123.728815 M 18N 17W 14	Contributor
POS	4/23/1997	0842	2	UMUF	Y	Y	39.416936	-123.726000 M 18N 17W 14	Contributor
NEG	4/22/2010	2022	0				39.418046	-123.719140 M 18N 17W 14	Quarter-section centroid
NEG	4/22/2003	1915	0				39.418184	-123.723817 M 18N 17W 14	Half-section centroid
NEG	4/20/1994	2000	0				39.421635	-123.723783 M 18N 17W 14	Section centroid
NEG	4/19/2012	1955	0				39.417613	-123.710198 M 18N 17W 13	Quarter-section centroid
NE	4/19/2012	1955	0				39.418046	-123.719140 M 18N 17W 14	Quarter-section centroid
NEG	4/19/1995		0				39.421635	-123.723783 M 18N 17W 14	Section centroid
NEG	4/18/2011	2043	0				39.418046	-123.719140 M 18N 17W 14	Quarter-section centroid
NEG	4/17/2007	1810	0				39.418042	-123.719134 M 18N 17W 14	Quarter-section centroid
NEG	4/14/2008	1805	0				39.418042	-123.719134 M 18N 17W 14	Quarter-section centroid
POS	4/14/1998	2133	1	UM			39.410904	-123.719328 M 18N 17W 23	Quarter-section centroid
NEG	4/14/1994		0				39.421635	-123.723783 M 18N 17W 14	Section centroid
NEG	4/13/2001	2030	0				39.403916	-123.747514 M 18N 17W 22	Quarter-section centroid
NEG	4/13/1994	1200	0				39.421635	-123.723783 M 18N 17W 14	Section centroid
POS	4/13/1993	1831	2	UMUF	Y		39.418042	-123.719134 M 18N 17W 14	Quarter-section centroid
NEG	4/10/2012	2004	0				39.415528	-123.720526 M 18N 17W 14	Activity center
POS	3/9/2000	1728	2	UMUF	Y		39.418042	-123.719134 M 18N 17W 14	Quarter-section centroid

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POS	3/9/1995		1	UM			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	3/8/2003	2240	0				39.407550	-123.742721	M 18N 17W 22 Section centroid
NEG	3/6/2008	1842	0				39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	3/6/2001	1700	0				39.420736	-123.705872	M 18N 17W 13 Section centroid
NEG	3/4/2009	1849	0				39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
NEG	3/3/1994	1725	0				39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	3/29/1996		0				39.421635	-123.723783	M 18N 17W 14 Section centroid
NEG	3/29/1995		0				39.421635	-123.723783	M 18N 17W 14 Section centroid
POS	3/29/1990	0600	2	UMUF	Y	Y	39.415623	-123.719830	M 18N 17W 14 Contributor
NEG	3/28/2011	2023	0				39.410904	-123.719326	M 18N 17W 23 Quarter-section centroid
NEG	3/28/2011	2023	0				39.418046	-123.719140	M 18N 17W 14 Quarter-section centroid
POS	3/28/1990	1928	1	UM			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
POS	3/27/1992	1740	1	UM			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	3/27/1991	1800	0				39.421635	-123.723783	M 18N 17W 14 Section centroid
POS	3/25/1998	2104	1	UU			39.410904	-123.719328	M 18N 17W 23 Quarter-section centroid
POS	3/25/1997	1635	2	UMUF	Y		39.416936	-123.726000	M 18N 17W 14 Contributor
NEG	3/23/2003	2013	0				39.407550	-123.742721	M 18N 17W 22 Section centroid
POS	3/23/1995		1	UM			39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	3/23/1994		0				39.407433	-123.724066	M 18N 17W 23 Section centroid
POS	3/22/1996	1733	2	UMUF	Y		39.418042	-123.719134	M 18N 17W 14 Quarter-section centroid
NEG	3/20/2012	1920	0				39.415528	-123.720526	M 18N 17W 14 Activity center

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NEG	3/19/2009	2039	0				39.418313	-123.728495 M 18N 17W 14	Quarter-section centroid
POS	3/19/2001	0617	2	UMUF	Y		39.418042	-123.719134 M 18N 17W 14	Quarter-section centroid
POS	3/19/2001	1815	2	UMUF	Y		39.418042	-123.719134 M 18N 17W 14	Quarter-section centroid
NEG	3/19/1993	0615	0				39.421635	-123.723783 M 18N 17W 14	Section centroid
NEG	3/16/2003	2133	0				39.407550	-123.742721 M 18N 17W 22	Section centroid
NEG	3/16/1995		0				39.421635	-123.723783 M 18N 17W 14	Section centroid
POS	3/16/1992	1702	2	UMUF	Y		39.410904	-123.719328 M 18N 17W 23	Quarter-section centroid
POS	3/13/1997	1715	2	UMUF	Y		39.416936	-123.726000 M 18N 17W 14	Contributor
NE'	3/13/1991	1702	0				39.421635	-123.723783 M 18N 17W 14	Section centroid
NE(	3/12/2009	2005	0				39.418046	-123.719140 M 18N 17W 14	Quarter-section centroid
NEG	3/11/2011	1933	0				39.409829	-123.701819 M 18N 17W 24	Quarter-section centroid
NEG	3/11/2011	1933	0				39.418046	-123.719140 M 18N 17W 14	Quarter-section centroid
NEG	3/11/2010	1854	0				39.418046	-123.719140 M 18N 17W 14	Quarter-section centroid
NEG	3/11/2010	1854	0				39.424479	-123.710117 M 18N 17W 13	Quarter-section centroid
POS	3/10/1999	1725	1	UF		N	39.418042	-123.719134 M 18N 17W 14	Quarter-section centroid
POS	2/26/2003	1400	1	UU			39.411216	-123.728624 M 18N 17W 23	Quarter-section centroid
NEG	2/20/2001	0740	0				39.407433	-123.724066 M 18N 17W 23	Section centroid
POS	10/5/2000	2048	2	UMUF	Y	Y	39.418042	-123.719134 M 18N 17W 14	Quarter-section centroid

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MasterOwl: MEN0087 **SubSpecies: NORTHERN**

Type	Date Obs	Time	#Adults	Age Sex	Pair	Nest	#Young	Latitude NAD 83	Longitude NAD 83	MTRS	Coordinate Source
AC	**4/13/2006**	**1805**	**2**	**UMUF**	**Y**	**N**	**0**	**39.437475**	**-123.723842**	**M 18N 17W 11**	**Contributor**
NEG	8/8/1996		0					39.436123	-123.723828	M 18N 17W 11	Section centroid
NEG	8/22/1996		0					39.436123	-123.723828	M 18N 17W 11	Section centroid
NEG	8/15/1996		0					39.436123	-123.723828	M 18N 17W 11	Section centroid
POS	8/14/1997	1925	2	UMUF	Y			39.432599	-123.728335	M 18N 17W 11	Quarter-section centroid
POS	8/1/1997	1858	2	UMUF	Y			39.439450	-123.719098	M 18N 17W 11	Quarter-section centroid
POS	7/8/2010	1412	1	UM			1	39.440274	-123.728359	M 18N 17W 11	Quarter-section centroid
NEG	7/6/2005	2056	0					39.436123	-123.723828	M 18N 17W 11	Section centroid
NEG	7/20/2005	1818	0					39.436123	-123.723828	M 18N 17W 11	Section centroid
NEG	7/20/2005	2400	0					39.436123	-123.723828	M 18N 17W 11	Section centroid
POS	7/2/1990		0				1	39.436123	-123.723828	M 18N 17W 11	Section centroid
POS	7/2/1990		2	AMAF	Y			39.436123	-123.723828	M 18N 17W 11	Section centroid
POS	7/18/2005	2119	1	UM				39.432599	-123.728335	M 18N 17W 11	Quarter-section centroid
POS	7/14/1998	1920	2	UMUF	Y		0	39.432116	-123.719104	M 18N 17W 11	Quarter-section centroid
POS	7/12/1995		1	AF			1	39.440276	-123.728357	M 18N 17W 11	Quarter-section centroid
POS	7/11/1991	0541	1	UF				39.437844	-123.725403	M 18N 17W 11	Contributor
POS	7/10/1997	1855	2	UMUF	Y			39.439450	-123.719098	M 18N 17W 11	Quarter-section centroid
POS	7/10/1997	2000	2	UMUF	Y		0	39.432116	-123.719104	M 18N 17W 11	Quarter-section centroid
POS	7/1/2002		2	AMAF	Y		2	39.440276	-123.728357	M 18N 17W 11	Quarter-section centroid

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List of observations reported, by site.

POS	6/8/2001	9999	1	UU				39.437560	-123.723216	M 18N 17W 11 Contributor
POS	6/8/2001	2030	2	UMUF	Y		2	39.437560	-123.723216	M 18N 17W 11 Contributor
NEG	6/6/2005	1805	0					39.436123	-123.723828	M 18N 17W 11 Section centroid
NEG	6/6/2005	2400	0					39.436123	-123.723828	M 18N 17W 11 Section centroid
POS	6/5/2002	0846	2	UMUF	Y		2	39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	6/5/1991	0724	2	UMUF	Y			39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	6/3/1998	2124	2	UMUF	Y			39.439450	-123.719098	M 18N 17W 11 Quarter-section centroid
POS	6/27/2004	2400	2	UMUF	Y		0	39.435573	-123.722452	M 18N 17W 11 Contributor
POS	6/27/2003	0607	2	UMUF	Y		0	39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
PO	6/22/2011	1802	1	UU				39.439447	-123.719103	M 18N 17W 11 Quarter-section centroid
POS	6/21/1990	0520	2	UMUF	Y	Y	1	39.437844	-123.725403	M 18N 17W 11 Contributor
POS	6/2/1994	0630	1	UU			1	39.440276	-123.728357	M 18N 17W 11 Quarter-section centroid
POS	6/19/2006	1900	1	UU			0	39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	6/19/2006		1	UU		N		39.437475	-123.723842	M 18N 17W 11 Contributor
POS	6/18/2008	2146	1	UU				39.432599	-123.728335	M 18N 17W 11 Quarter-section centroid
POS	6/18/2004		2	AMAF	Y		1	39.440276	-123.728357	M 18N 17W 11 Quarter-section centroid
POS	6/16/2004	1800	2	UMUF	Y		1	39.436676	-123.724740	M 18N 17W 11 Contributor
NEG	6/15/2011	2154	0					39.436436	-123.728349	M 18N 17W 11 Half-section centroid
POS	6/15/1992	1831	1	UF	Y		2	39.437844	-123.725403	M 18N 17W 11 Contributor
POS	6/13/1995		1	UU			1	39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid

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List of observations reported, by site.

POS	6/11/1999	1842	2	UMUF	Y		2	39.439450	-123.719098	M 18N 17W 11 Quarter-section centroid
POS	6/11/1998	1841	2	UMUF	Y			39.440276	-123.728357	M 18N 17W 11 Quarter-section centroid
POS	6/11/1993	2019	2	UMUF	Y	Y	1	39.434872	-123.725140	M 18N 17W 11 Contributor
POS	6/10/2004	2400	1	UM		N		39.439020	-123.724590	M 18N 17W 11 Contributor
POS	6/1/1996	0800	2	UMUF	Y		1	39.439946	-123.720544	M 18N 17W 11 Contributor
POS	5/9/2004	2400	1	UU				39.435460	-123.724774	M 18N 17W 11 Contributor
POS	5/9/2003	2110	1	UU				39.432599	-123.728335	M 18N 17W 11 Quarter-section centroid
POS	5/4/2007	2041	1	UU				39.439450	-123.719098	M 18N 17W 11 Quarter-section centroid
PC	5/4/2001	1830	2	UMUF	Y			39.437560	-123.723216	M 18N 17W 11 Contributor
NE	5/31/2011	2156	0					39.432357	-123.723723	M 18N 17W 11 Half-section centroid
POS	5/26/2009	1841	1	UU		N		39.440274	-123.728359	M 18N 17W 11 Quarter-section centroid
POS	5/26/2000	1912	2	UMUF	Y			39.432485	-123.729298	M 18N 17W 11 Contributor
POS	5/16/2012	1633	2	UMUF	Y	N		39.440274	-123.728359	M 18N 17W 11 Quarter-section centroid
POS	5/16/2007	2250	1	UM				39.439450	-123.719098	M 18N 17W 11 Quarter-section centroid
POS	5/14/1997	1323	2	UMUF	Y			39.432599	-123.728335	M 18N 17W 11 Quarter-section centroid
POS	5/1/1990	0550	2	UMUF	Y	Y		39.437844	-123.725403	M 18N 17W 11 Contributor
POS	4/5/1996	0615	1	UM				39.439946	-123.720544	M 18N 17W 11 Contributor
POS	4/5/1993	1726	2	UMUF	Y	Y		39.434872	-123.725140	M 18N 17W 11 Contributor
POS	4/4/2002	1712	2	UMUF	Y	Y		39.438054	-123.721954	M 18N 17W 11 Contributor
NEG	4/30/1998	0604	0					39.436123	-123.723828	M 18N 17W 11 Section centroid
NEG	4/30/1996	0532	0					39.436123	-123.723828	M 18N 17W 11 Section centroid

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List of observations reported, by site.

POS	4/30/1990	2040	1	UF				39.439450	-123.719098	M 18N 17W 11 Quarter-section centroid
POS	4/30/1990	2040	1	UM				39.432599	-123.728335	M 18N 17W 11 Quarter-section centroid
POS	4/3/1996	1600	2	UMUF	Y			39.439946	-123.720544	M 18N 17W 11 Contributor
POS	4/29/2004	1829	2	UMUF	Y	Y	0	39.436782	-123.722255	M 18N 17W 11 Contributor
POS	4/28/1995		2	UMUF	Y			39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	4/27/1989	0037	1	UM				39.425422	-123.737741	M 18N 17W 15 Quarter-section centroid
POS	4/22/1996	1745	2	UMUF	Y	Y		39.439946	-123.720544	M 18N 17W 11 Contributor
POS	4/2/1999	1646	2	UMUF	Y			39.439450	-123.719098	M 18N 17W 11 Quarter-section centroid
NE	4/2/1990	2240	0					39.432872	-123.742316	M 18N 17W 10 Half-section centroid
POS	4/19/2012	2033	2	UMUF	Y			39.432118	-123.719106	M 18N 17W 11 Quarter-section centroid
POS	4/19/1995		1	UU				39.440276	-123.728357	M 18N 17W 11 Quarter-section centroid
POS	4/18/2011	2058	1	UM				39.432118	-123.719106	M 18N 17W 11 Quarter-section centroid
POS	4/18/2000	1820	2	UMUF	Y			39.432485	-123.729298	M 18N 17W 11 Contributor
POS	4/16/1999	0635	2	UMUF	Y	Y		39.437398	-123.723098	M 18N 17W 11 Contributor
POS	4/16/1997	1800	2	UMUF	Y			39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	4/16/1997	1805	2	UMUF	Y			39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	4/15/1991	1811	1	AF	Y			39.436123	-123.723828	M 18N 17W 11 Section centroid
POS	4/15/1991	1811	2	UMUF	Y	Y		39.437844	-123.725403	M 18N 17W 11 Contributor
POS	4/14/1994	0545	2	UMUF	Y	Y		39.440276	-123.728357	M 18N 17W 11 Quarter-section centroid
POS	4/13/2006		2	UMUF	Y	N		39.437475	-123.723842	M 18N 17W 11 Contributor

Report # 2 - Observations Reported

List of observations reported, by site.

POS	4/13/2001	1845	1	UF			39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	4/1/2000	1724	2	UMUF	Y		39.440276	-123.728357	M 18N 17W 11 Quarter-section centroid
NEG	3/9/2007	1859	0				39.432599	-123.728335	M 18N 17W 11 Quarter-section centroid
NEG	3/6/2008	1901	0				39.435783	-123.719107	M 18N 17W 11 Half-section centroid
POS	3/31/1992		1	UM			39.447845	-123.728273	M 18N 17W 02 Quarter-section centroid
POS	3/3/1997	1948	1	UF			39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	3/28/1992		2	UMUF	Y		39.439450	-123.719098	M 18N 17W 11 Quarter-section centroid
PC	3/27/1992		2	UMUF	Y		39.439450	-123.719098	M 18N 17W 11 Quarter-section centroid
NEG	3/25/2008	1951	0				39.436123	-123.723828	M 18N 17W 11 Section centroid
POS	3/25/1992	1649	2	UMUF	Y	Y	39.436123	-123.723828	M 18N 17W 11 Section centroid
NEG	3/24/1997	1854	0				39.436123	-123.723828	M 18N 17W 11 Section centroid
POS	3/21/1997	1219	1	UM			39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	3/17/1992		1	UU			39.440276	-123.728357	M 18N 17W 11 Quarter-section centroid
POS	3/14/1997	1615	2	UMUF	Y		39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
POS	3/14/1991	1400	2	UMUF			39.439450	-123.719098	M 18N 17W 11 Quarter-section centroid
POS	3/12/2009	2020	1	UU			39.432116	-123.719104	M 18N 17W 11 Quarter-section centroid
NEG	3/11/2011	1952	0				39.439447	-123.719103	M 18N 17W 11 Quarter-section centroid
POS	3/11/2010	1932	1	UU			39.440274	-123.728359	M 18N 17W 11 Quarter-section centroid

Report # 2 - Observations Reported

List of observations reported, by site.

POS	3/10/1999	2200	1	UF				39.432848	-123.737621 M 18N 17W 10	Quarter-section centroid
POS	2/26/1992	1402	2	UMUF				39.432116	-123.719104 M 18N 17W 11	Quarter-section centroid
POS	1/1/2011		1	UM			0	39.437475	-123.723842 M 18N 17W 11	Activity center
POS	1/1/2007		1	AM				39.437627	-123.722624 M 18N 17W 11	Contributor
POS	1/1/2006		2	UMUF	Y	N	0	39.437475	-123.723842 M 18N 17W 11	Contributor
POS	1/1/2002		2	UMUF	Y	Y	2	39.437548	-123.725098 M 18N 17W 11	Contributor
POS	1/1/2001		2	UMUF	Y	Y	2	39.437560	-123.723216 M 18N 17W 11	Contributor

Northern Spotted Owl Take Avoidance Analysis and Guidance For California Coast Forest District

("Attachment A")

March 15, 2011

Through this document, the Fish and Wildlife Service's (Service) Arcata Office (AFWO) establishes guidelines to avoid the incidental take[1] of the federally listed as threatened northern spotted owl (*Strix occidentalis caurina,* NSO), that may result from timber operations occurring within the range of the coast redwood (*Sequoia sempervirens*) ecotype, in the Coast Forest District (Coast District) of the California Department of Forestry and Fire Protection (CAL FIRE). This document will be referred to hereafter as "Attachment A." The eastern portion of the Coast District is outside of the range of the coast redwood. In these eastern areas, the Revised USFWS Attachment B: Take Avoidance Analysis-Interior ("Attachment B") applies to proposed timber operations where no redwoods are present in the timber harvest plan area.

This document (Attachment A) applies to Timber Harvest Plans (THPs) and to Non-industrial Timber Management Plans (NTMPs). This Northern Spotted Owl Take Avoidance Analysis and Guidance (Attachment A), dated March 14, 2011, replaces, in full, all prior versions of this guidance, and remains in effect until replaced or voided.

I. Background

On February 7, 2011, the Service released the *2011 Protocol for Surveying Proposed Management Activities That May Impact Northern Spotted Owls* (hereafter referred to as the 2011 NSO Survey Protocol), its associated transmittal memorandum (2011 transmittal memo) from Region 8 of the Service, and the transition matrix entitled *NSO Protocol Transition Guidance* for surveys initiated in 2009 through 2011. The 2011 transmittal memo and associated transition matrix provide additional details and clarification for surveys conducted within California (a similar memorandum has been prepared for distribution in Oregon and Washington). The transition matrix clarifies how past surveys would be appropriately credited toward meeting current protocol needs. Those documents are included herein by reference; the reader should consult those documents for details regarding survey methods and interpretation of survey data.

This document provides guidance on the application of survey results to evaluation of specific projects that may impact NSO and provides NSO habitat protection measures and operational procedures specifically recommended for the coast redwood ecotype. In addition, this revision of Attachment A crosswalks the pertinent issues addressed in previous AFWO Technical Assistance, previous versions of Attachment A, and the 2011 NSO Survey Protocol.

[1] **incidental take** - take that is incidental to, but not the purpose of, carrying out an otherwise lawful activity.

II. Definitions

This section defines several terms used in the analysis of take avoidance of the NSO within the coast redwood ecotype of the Coast District (additional terms are defined within the protocol guidance documents, referenced above):

Activity Center (AC): Area of concentrated activity of either a pair of NSO or a single territorial NSO, represented by a mapped location (e.g., usually a nest tree) that occurs within, but not necessarily in the exact center of, the "Core Area," defined below.[2]

Core Area: 100 acres of the 200 acres of Nesting/Roosting habitat retained within a 0.7 mile radius contiguous with the Activity Center. If 100 acres of contiguous Nesting/Roosting is not available, then the highest quality habitat available shall be included.

Foraging Habitat: Habitat that contains ≥40% canopy cover of trees that are ≥ 11" DBH (diameter at breast height), and have a basal area ≥75 square feet per acre of trees ≥ 11" DBH. Trees may be conifer or hardwood.

Nesting/Roosting Habitat: Forested habitat that supports successful nesting and associated roosting behavior by NSO. Habitat with ≥60% canopy cover of trees that are ≥ 11" DBH, and have a basal area ≥ 100 square feet per acre of trees ≥ 11" DBH. Trees may be conifer or hardwood.

Nesting/Roosting Polygon: All Nesting/Roosting habitat which is contiguous with an NSO Activity Center.

NSO Breeding Season: Defined as February 1 to July 31 within the coast redwood ecotype found in the Coast District of California.

NSO Home Range: Defined as a 0.7 mile radius circle centered on the Activity Center for the coast redwood ecotype found in the Coast District.

Suitable or Functional Habitat: Habitat that meets either Nesting/Roosting or Foraging definitions, or a combination of Nesting/Roosting and Foraging habitat.

Survey Area: All Suitable/Functional NSO habitat within 0.7 mile from the project boundaries; or for disturbance only activities, a 0.25 mile area outside the edge of the project should be surveyed.

Survey-Start Date: In the coast redwood ecotype, Coast District, NSO Surveys should start on or after March 1.

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[2] NSOs have been characterized as central-place foragers, where individuals forage over a wide area and subsequently return to a nest or roost location that is often centrally-located within the home range (Rosenberg and McKelvey 1999).

Survey-Last Survey Dates: For years 1 and 2 of the 2011 NSO Survey Protocol, the last survey visit should occur on or after May 15. For "Activity Center Searches" and Spot Check Surveys no fixed date is set, but the 2011 NSO Survey Protocols should be followed.

III. Accuracy of NSO Activity Center Location, Status and Mapping

The initial step in determining if the proposed timber operations may avoid take of NSO is to determine if the proposed operations would likely occur within the home range of a NSO (new or historical). A combination of survey data conducted to current protocol and current NSO California Department of Fish and Game (CDFG) database reports, covering all suitable NSO habitat located within the 0.7 mile radius of the proposed harvest operations, will be necessary to support a conclusion that a proposed timber harvest is not within the home range of a NSO.

Accurately mapping the location of the Activity Center is critical to the protection of Core Area habitat. Because NSOs can move from year to year, Activity Center locations are more accurate when plotted as a result of surveys rather than using the locations found in the CDFG NSO Database. Multiple Activity Centers for a NSO pair are possible. If one Core Area does not encompass all known Activity Centers, multiple Core Areas for a NSO pair, or territorial single NSO may need to be mapped and protected to avoid the likelihood of incidental take.

If some, or all, of the habitat in the survey area cannot be surveyed due to lack of access, the most recent update of the CDFG NSO Database should be consulted for Activity Center information within the 0.7 mile survey area. In addition, landowners that are adjacent to the proposed timber operations should be contacted so that all the known current NSO locations can be identified and mapped. All detections reported to the CDFG NSO Database are assigned to a known site or given a new site number. *CDFG NSO Database Report Number 2* identifies the most important detection locations for each site, and those sites should be included as "known" Activity Centers. The guidance contained herein applies to all sites listed in *CDFG NSO Database Report Number 2,* until such detections are determined by the Service not to qualify for protection (e.g., site abandonment or non-site determination). *CDFG NSO Database Report Number 3* may include more than one nest site location for a pair of NSO.

IV. Current 2011 Surveys, Subsequent Years, and Transition from Past Surveys

The 2011 NSO Survey Protocol replaces all prior versions of the NSO survey protocol. Reference to prior protocols should be limited to confirming compliance with earlier protocols during those survey years, for appropriate crediting of earlier, completed surveys, and should not be used as direction for surveys during 2011 and subsequent years. Please refer to the 2011 NSO Survey Protocol and associated NSO Protocol Transition Guidance documents for complete details regarding survey area, timing, design, and documentation of conditions necessitating deviation from the 2011 NSO Survey Protocol, with the exception of the deviation outlined below.

Data and information specific to the coast redwood region show that NSO nest slightly earlier in the year than interior areas within California. Furthermore, additional data from this coast redwood region have shown that the high response rates of NSO begin as early as March 1.

However, the 2011 NSO Survey Protocol states "At least 3 of the complete visits should be conducted before 30 June; this includes at least one visit in April, one in May and one in June."

To accommodate the earlier breeding season for NSOs in the coast redwood region, survey dates should be moved forward 15 days, as follows:

- At least one survey should occur during the period March 15 to April 14.
- At least one survey should occur during the period April 15 to May 14.
- At least one survey should occur during the period May 15 to June 15.

With the exception of this scheduling of survey visits, all other timing, location, and operability requirements (at least 7 days between complete visits, daytime follow-ups, number of complete visits, etc.) remain consistent with the 2011 NSO Protocol.

V. Survey Area

The 2011 NSO Survey Protocol assumes that the entire survey area (0.7 mile) for the redwood portion of the Coast District will be surveyed prior to management activities that may affect suitable NSO habitat. In some cases, access issues related to private property can prevent surveys from being conducted across the entire survey area. At a minimum, surveys should be conducted on the property within which the proposed timber operations will occur, and on any adjacent accessible private or public land and along appurtenant public roads. Current survey data from adjacent landowners may be used to get information about presence/absence of NSO on portions of the survey area not accessible to the project proponent.

Survey documentation for proposed timber operations should include a description, a map of the 0.7 mile survey boundary and, if less than 0.7 mile, a map of the actual surveyed area, and an explanation of any deviation from complete 2011 NSO Survey Protocol. An explanation is especially important when removal or downgrading of suitable NSO habitat is proposed. It should be noted, however, that surveys not covering the entire survey area may require additional Spot Check Surveys to account for incomplete survey area coverage (see 2011 NSO Survey Protocol).

For operations that are anticipated to result only in disturbance to NSO during the breeding season, all suitable NSO habitat within the proposed timber operation plan area should surveyed, plus an additional 0.25 mile radius outside the plan area.

VI. Post-Harvest Habitat Retention and Typing

Accurate habitat typing is required to determine if habitat quantities will be retained above the habitat thresholds described below. Note that CAL FIRE will need habitat typing to verify that pre-harvest typing is correct and post-harvest retention is feasible.

Inventory data provides the best support for accurate habitat typing. When inventory data is not available, habitat typing using available satellite or aerial imagery is acceptable, provided harvest histories showing any habitat alterations since the imagery was generated are incorporated in

the analysis. Imagery alone can provide reasonably accurate canopy closure estimations, but since stand age and diameter class can be difficult to determine in redwood forests from imagery alone, it is important to conduct ground truthing as well. CAL FIRE maintains timber harvest histories by watershed and that information is available on-line and should be used in conjunction with imagery for off-property habitat typing.

Narrow strips of habitat (retention areas between clearcuts, etc.) may contain the characteristics of Nesting/Roosting habitat. However, when these narrow strips of habitat are surrounded by unsuitable or low quality habitats, they function as Foraging habitat at best.

Watercourse and Lake Protection Zones (WLPZs), typically, have the highest canopy closure and the largest trees on the landscape. However, WLPZs are not wide enough by themselves to provide functional Nesting/Roosting habitat (i.e., not at least 600 feet wide); therefore, if a WLPZ is bordered on both sides by unsuitable habitat, then the WLPZ cannot be typed as Nesting/Roosting habitat, and is functionally Foraging habitat at best. If one or both slopes on either side of a WLPZ can be accurately typed as at least Foraging habitat, then the WLPZ can be functional as Nesting/Roosting habitat if a minimum of 60% canopy closure of trees at least 11" DBH are present.

Priority Ranking of Habitat Retention Acres

1) Tree species composition:
   a) Redwood or mixed conifer stands should be selected over hardwood dominated stands.

2) Abiotic considerations to help with priority determinations:
   a) Distance to nest: Nesting/Roosting and Foraging habitat closest to identified nest trees, or roosting trees if no nest trees identified.
   b) Contiguity: Nesting/Roosting habitat within the 0.7 mile radius should be as contiguous as possible; and minimize fragmentation of Foraging habitat as much as possible.
   c) Slope position: Habitats located on the lower 1/3 of slopes provide better microclimate conditions and an increased potential for intermittent or year-round water sources.

If the proposed timber operations retain at least 66% of the pre-harvest basal area and meet the functional definition of Nesting/Roosting or Foraging habitat post-harvest as described above, off-property habitat typing is not necessary, unless needed to display Core Area protections.

Core Area Habitat Protection

Once an Activity Center has been accurately mapped, a 100-acre Core Area polygon must be identified that contains the highest quality habitat (typically Nesting/Roosting) located contiguous with the Activity Center.

When an Activity Center is surrounded by sufficient Nesting/Roosting habitat, the Core Area polygon is typically mapped starting with a 1,000-foot radius circle (72 acres) centered on the

Activity Center, and is connected on one side to a WLPZ and expanded until the Core Area includes 100 acres. Limited timber operations are allowed within the Core Area polygon (see VIII. Timber Operations).

When an Activity Center is closer than 500 feet to the outside edge of the Nesting/Roosting polygon, the acres of non-Nesting/Roosting habitat within 500 feet of the activity center are included, but should be augmented with additional Nesting/Roosting habitat elsewhere in the Core Area polygon to make a total of 100 acres of the highest quality habitat.

When the Activity Center is closer than 1,000 feet to, but not within 500 of, the outside edge of the Nesting/Roosting polygon, the protected Core Area should extend to that most distant edge of the Nesting/Roosting habitat but shall not be less than a 500-foot radius.

Operations conducted outside the Core Area, but within 1,000 feet of an Activity Center should retain the functionality of any NSO habitat present pre-harvest within this area, i.e., operations do not downgrade habitat.

Polygons of Nesting/Roosting habitat contiguous with the Activity Center, which are larger than 100 acres provide the most operational flexibility. If the Nesting/Roosting polygon is 200 acres or greater, and operations in the polygon outside the Core Area have retained functional Nesting/Roosting habitat (i.e., no more than 33% of the basal area removed retaining a minimum of 100 sq. ft. of basal area per acre of trees greater than 11" DBH), then the 100-acre core area can be redrawn in subsequent entries. However, the 500-foot radius should remain unchanged, and the redrawn core area should not include any acres harvested within the previous 5 years.

Within the 0.7 mile radius (985 acres) of each Activity Center please use the following:

1) Retain habitat to maximize attributes desirable for NSO.

2) Retain at least 500 acres of suitable (Nesting/Roosting/Foraging) NSO habitat, post-harvest, as follows:

   a) Retain 200 acres of Nesting/roosting Habitat within a 0.7 mile radius of the Activity Center consisting of:
      i) 100 acres of the 200 acres of Nesting/Roosting habitat retained should be contiguous, or contiguous as possible with the Activity Center.
      ii) An additional 100 acres of Nesting/Roosting with in the 0.7 mile radius:
         (1) If the second 100 acres of Nesting/Roosting habitat is also contiguous with the Activity Center, or within the same drainage, operations should retain a minimum of 66% of the pre-harvest basal area per acre of trees at least 11" DBH.
         (2) If the remaining 100 acres of Nesting/Roosting habitat is not contiguous with the Activity Center, retain at least Nesting/Roosting habitat.
   b) Retain at least 300 acres of Suitable NSO habitat, post-harvest, of at least Foraging quality.

3) Remove no more than 1/3 of the remaining suitable habitat in excess of 500 acres within 0.7 mile of an Activity Center during the life of the timber operations.

VII. Road Use

To avoid take of NSO from noise disturbance (see U.S. Fish and Wildlife Service 2006) road use within 0.25 mile (1,320 feet) of a NSO Activity Center during the breeding season is prohibited until July 10, unless:

1) Non-nesting, or nesting failure at the Activity Center has been determined by a Activity Center Search (2011 NSO Protocol) conducted on or after May 15th, or;

2) The Activity Center is within 165 feet of major highway that typically has continuous traffic year around (Hwy 1, 36, 101,128, 299, etc.) and the appurtenant road is not within 165 feet of the Activity Center.

3) After July 9th until the end of the breeding season road use within the 100-acre core is restricted to existing road use, maintenance and map point work.

VIII. Timber Harvest Operations

A 0.25 mile seasonal restriction on timber operations (except for road use after July 9th) applies to every known NSO Activity Center during the breeding season, unless it is determined via a site monitoring visit, "Activity Center Search" (2011 NSO Protocol), that NSO are not nesting, or nesting failure has occurred. If it cannot be determined whether NSO are nesting, or nesting failure cannot be determined, the 0.25 mile seasonal restriction stays in effect for timber operations until after July 31st.

For all known Activity Centers, timber operations should adhere to the following recommendations:

1) Within the 100-acre Core Area polygon of an NSO Activity Center:

    a) Outside the breeding season, limited timber operations (i.e., road use and maintenance, map point work, tail-hold placements, use of existing skid roads, and loading) may be conducted, provided no trees >11 inches DBH are cut or removed by the operations, and no logs are yarded through the Core Area.
    b) During the NSO breeding season, timber operations (including use of roads before July 9th), are not allowed within the 100-acre Core Area polygon, except as allowed in subsections 4 and 5, below.

2) Timber Operations outside the 100-acre Core Area polygon, but within 0.25 mile of an NSO Activity Center:

    a) Outside the breeding season, timber operations may be conducted.

b) During the breeding season, no timber operations should proceed unless protocol surveys do not detect nesting NSOs.

3) For all NSO Activity Centers, prior to May 15th (until the required May 15 or later survey is completed):

   a) Timber operations (except helicopter yarding or staging) may be conducted only on those THP areas >0.25 mile from the Activity Center.
   b) Helicopter yarding and staging may occur only on those THP areas >0.5 mile from the Activity Center.

4) For NSO Activity Centers where reproductive status has been determined to be non-nesting or failed nesting:

   a) Limited timber operations (road use and maintenance, map point work, use of existing skid roads, tail-hold placements and loading) may be conducted within the 100-acre Core Area polygon of the Activity Center provided no trees >11 inches DBH are cut or removed by the operations, and no logs are yarded through the Core Area.
   b) Full timber operations, including helicopter yarding and staging, may be conducted within 0.25 mile but not within the 100-acre core polygon of the Activity Center. Helicopter fly-overs shall not occur within 1000 ft. of the Activity Center

5) For NSO Activity Centers, where reproductive status has been determined to be nesting:

   a) For Activity Centers where fledging status has not been determined, timber operations may be conducted only on those THP areas that are >0.25 mile from the Activity Center until the end of the breeding season.
   b) Helicopter yarding and staging may occur only on those THP areas >0.5 mile from the Activity Center.

6) For NSO Activity Centers, where fledging status has been determined (either nest failure or fledglings have left the Core Area):

   a) Full timber operations, including helicopter yarding and staging, may be conducted within 0.25 mile but not within the 100-acre core polygon of the Activity Center. Helicopter fly-overs shall not occur within 1000 feet of the Activity Center.
   b) Limited timber operations (road use and maintenance, map point work, use of existing skid roads, tail-hold placements and loading) may be conducted within the 100-acre core polygon of the Activity Center, provided no trees >11 inches DBH are removed by the operations, and no logs are yarded through the Core Area.

7) For any NSO Activity Center, regardless of reproductive status:

   a) If NSO move to a new location (>1000 feet from the historical Activity Center) and reproductive behavior is confirmed at the new site, request technical assistance to evaluate the status of the historical Activity Center.

IX. February Extensions for Timber Operations:

There is no allowance for extending on-going timber operations into the breeding season except, as stipulated in the most current USFWS Survey Protocol Spot Survey procedures.

X. CAL FIRE Review

When reviewing information related to NSO Activity Centers, the following outline should be used to check for adequacy and accuracy:

1) Location
   a) Confirm plotted Activity Center location accuracy.
      i) Review recent surveys.
      ii) Review CDFG Reports 1, 2, 3.
      iii) Review data from adjacent landowners.
   b) Evaluate deviations from CDFG locations.
   c) Determine if habitat maps and tables have been updated.
2) Activity Center and Project Area Habitat Typing.
3) Verify pre-harvest habitat typing of project area, survey area and 0.7 mile radius from each Activity Center using aerial photos, equivalent imagery, or field visits.
4) Determine if any habitat alterations have occurred which should be reflected in current NSO habitat tables and habitat analysis maps.
5) Verify post-harvest habitat typing reflects the silvicultural prescriptions.
6) Determine Activity Center status.
7) Is it a valid site?
   i) Review most current protocol to determine if the location is consistent with definition of a site.
   ii) Report both new sites and non-valid sites (need USFWS approval) to CDFG for next database update.
8) Determine current occupancy status.
9) Determine current reproductive status, if it was determined.
10) Activity Center Habitat and Disturbance Protection Measures.
11) Confirm consistency with Attachment A.

XI. Determination

CAL FIRE should use the following list to help with their take avoidance determinations:

1) If surveys are inadequate or do not meet the intent of the NSO protocol in effect during the year(s) of survey, take avoidance determination may not be possible.

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2) If habitat typing is inadequate, incidental take determination may not be possible.

3) If NSO home range habitat acres are below desired conditions (Section III. 2, 3, and 4), additional loss of suitable habitat can lead to take.

4) If NSO are nesting, use seasonal restriction for all timber operations within 0.25 mile of a nest (February 1 through July 31).

5) If effects are limited to noise disturbance (e.g., no suitable habitat in timber harvest units, but suitable habitat within 0.25 mile of units), a modified seasonal restriction may be used from February 1 through July 9, as follows:
    a. Seasonal restriction applies to unsurveyed suitable habitat within 0.25 mile of unit boundary.
    b. If protocol surveys were conducted and did not detect reproductive NSO, or barred owls seasonal restrictions may not warranted.

6) When multiple THPs are located within a given NSO territory, all habitat conditions should be considered collectively a take avoidance determination may not be possible.

XI. Contents of Technical Assistance Requests

Technical assistance (or "TA") requests need to be submitted to AFWO by CAL FIRE. Open "Habitat Retention Agreements," NTMPs, "Spotted Owl Management Plans," Spotted Owl Recovery Plans," and THPs that have received previous technical assistance from the AFWO (i.e., have an AFWO TA correspondence number) will continue to receive additional technical assistance from AFWO. Technical assistance will be provided on a case-by-case basis to CAL FIRE, by AFWO, on complex determinations or on points of clarification.

Information to be submitted to CAL FIRE should include:

1. Date of written TA request.
2. Date request received.
3. Assigned TA number (only if previous technical assistance has been provided by AFWO in the past for this project).
4. Number of acres within the THP boundary.
5. Maps indicating types and locations of units with silviculture prescriptions.
6. Map of any know NSO sites within the survey area.
7. Location of THP, including County(s); Meridian(s); and, Townships, Ranges, and Sections.
8. Identify NSO Activity Centers returned by CDFG reports.
9. Results of all surveys conducted and Activity Center status for any known Activity Center.
10. Logic behind the take determination.
    a. Habitat considerations:
        i. Acres, quality, and location of suitable habitat pre- and post-harvest,
        ii. Effects of timber operations on suitable habitat;

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1. Degrade: suitable habitat is harvested but still functions in the capacity it did pre-harvest (i.e. Foraging habitat before harvest functions as Foraging habitat post-harvest, Nesting/Roosting habitat pre-harvest functions as Nesting/Roosting habitat post-harvest);
2. Downgrade: pre-harvest Nesting/Roosting habitat becomes Foraging habitat post-harvest;
3. Remove: Nesting/Roosting or Foraging habitat is harvested, such that it no longer functions as habitat post-harvest;

b. Proximity of Activity Center to operations, and;
c. Survey data.

11. Sunset date and seasonal restrictions:
    a. If operations are not complete before February 1, surveys are required to determine location and status of NSO prior to operations during each breeding season that operations are ongoing.
    b. Additional technical assistance may not be required if NSO are not found within 0.7 mile of THP (CDFG reports), if suitable habitat within units are not found within the project area, or if suitable habitat is not identified within 0.25 mile of units.
12. Name of agency person to contact if there questions regarding the technical assistance.

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U.S. Fish & Wildlife Service, July 26, 2006, guidance document "Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California."

NOTE

"Information concerning archaeological sites has been removed from **THP 1-13-096 MEN** pursuant to California Government Code Section 6254.10 which exempts cultural resources site location information from the California Public Records Act and provides authority for widespread state policy (not just within the California Department of Forestry and Fire Protection) to keep archaeological site location information confidential. This exemption to the Public Records Act recognizes that providing site location information to the general public may put such sites at risk from artifact hunting, excavations and/or vandalism."

Copies of the information have been sent to the following locations to facilitate review of the project:

1. CAL FIRE field unit - Willits

2. Reviewing Archeologist, Santa Rosa (Region Office)

The original copy of this material is maintained in a confidential file at CAL FIRE Northern Region Headquarters, 135 Ridgway Avenue, Santa Rosa, CA 95401.

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