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 (02-03)

FOR ADMIN. USE ONLY

THP No.

Dates Rec'd

THP Name: Lower Little Creek THP

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

Date Filed

Date Approved

If this is a Modified THP, check box: [ ]

Date Expires

Extensions 1) [ ] 2) [ ]

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

SECTION I - GENERAL INFORMATION

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

1. TIMBER OWNER(S) OF RECORD: Name: **California Polytechnic State University Foundation**

   Address: **Foundation Administration Building 15**

   City: **San Luis Obispo** State: **CA** Zip: **93407** Phone: **(805) 756-1402**

   Signature Dale Tyler Date 3/15/04

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

2. TIMBERLAND OWNER(S) OF RECORD: Name: **California Polytechnic State University Foundation**

   Address: **Foundation Administration Building 15**

   City: **San Luis Obispo** State: **CA** Zip: **93407** Phone: **(805) 756-1402**

   Signature Dale Tyler Date 3/15/04

3. LICENSED TIMBER OPERATOR(S): Name: **Big Creek Lumber Company** Lic. No.: **A 300**
   (If unknown, so state. You must notify CDF of LTO prior to start of operations)

   Address: **3564 Highway 1**

   City: **Davenport** State: **CA:** Zip: **95017** Phone: **(831) 457-6387**

   Signature Steve Auten Date 3/18/04
   Steven Auten (Company Representative)

4. PLAN SUBMITTER(S): Name: **California Polytechnic State University Foundation**

   Address: **Foundation Administration Building 15**

   City: **San Luis Obispo** State: **CA** Zip: **93407** Phone: **(805) 756-1402**
   (Submitter must be from 1, 2, or 3 above. He/she must sign below. Ref. Title 14 CCR 1032.7 (a))

   Signature Dale Tyler Date 3/15/04

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

Name: **Steven R. Auten**

Address: **3564 Highway 1**

City: **Davenport** State: **CA** Zip: **95017** Phone: **(831) 457-6387**

b. [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?

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

Erosion control maintenance after timber operations have ceased and until certification of the Work Completion Report shall be the responsibility of the LTO. Following certification of the Work Completion Report, the plan submitter shall be responsible for erosion control maintenance.

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

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

b. Expected date of completion of timber operations:

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

7. The timber operation will occur within the:

[X] COAST FOREST DISTRICT
[X] 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
[X] A County with Special Regulations, identify: **Santa Cruz**
[X] Coastal Zone, no Special Treatment Area
[ ] Special Treatment Area(s), type and identify:
[ ] Other

8. Location of the timber operation by legal description:
Base and Meridian: [X] Mount Diablo [ ] Humboldt [ ] San Bernardino

Section	Township	Range	Acreage	County	Assessor's Parcel Number (Optional)
Portions of section:					
8	**T10S**	**R3W**	**1**	**Santa Cruz**	**057-121-07, 057-251-09**
17	**T10S**	**R3W**	**57**	**Santa Cruz**	**057-121-10, 057-121-22, 057-121-14**
(projected)					**057-151-03**
18 (projected)	**T10S**	**R3W**	**26**	**Santa Cruz**	**057-151-03**
20 (projected)	**T10S**	**R3W**	**18**	**Santa Cruz**	**057-151-03**

TOTAL ACREAGE **102** (Logging Area Only)

Planning Watershed: CALWATER Version, Identification Number, and Name: **Calwater v2.2, #3304.110202, Little Creek**

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

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? Number _____Date sub.

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

The Notice of Intent was prepared in conformance with 14 CCR 926.3, which is specific to Santa Cruz County.

13. RPF preparing the THP: Name: **Steven R. Auten** RPF Number: **2734**

Address: **3564 Highway 1** City: **Davenport** State: **CA** Zip: **95017** Phone: **(831) 457-6387**

RPF preparing the THP: Name: **Wally Mark** RPF Number: **1250**

Address: **125 Swanton Road** City: **Davenport** State: **CA** Zip: **95017** Phone: **(831) 427-1718**

RPF preparing the THP: Name: **Douglas Piirto** RPF Number: **2179**

Address: **CalPoly, College of Agriculture** City: **San Luis Obispo** State: **CA** Zip: **95017** Phone: **(805) 756-1402**

a. [X] Yes [ ] No I have notified the plan submitter(s), in writing, of their responsibilities pursuant to 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. [X] Yes [ ] No I will provide the timber operator with a copy of the portions of the approved THP as listed in 14 CCR 1035 (f). If "no", who will provide the LTO a copy of the approved THP?

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 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):

The responsibilities of the RPF include plan preparation, timber marking, plan review and plan implementation. The RPF shall make amendments to the plan, if necessary.

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

No additional required work has been identified at this time.

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

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

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

Signature Steven R. Auten Date 3/2/04
Steven R. Auten, RPF #2734

Signature Douglas D. Piirto Date 3/1/04
Dr. Douglas Piirto, RPF#2179

Signature Walter Mark Date 3/1/04
Dr. Walter Mark, RPF#1250

SECTION II - PLAN OF TIMBER OPERATIONS

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

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

[ ] Clearcutting _____ ac. [ ] Shelterwood Prep. Step _____ ac. [ ] Seed Tree Seed Step _____ ac.
[ ] Shelterwood Seed Step _____ ac. [ ] Seed Tree Removal Step _____ ac.
[ ] Shelterwood Removal Step_____ ac.

[X] Selection 102 ac. [ ] Group Selection _____ ac. [ ] Transition _____ ac.
(per 14 CCR 913.8 (a))

[ ] Commercial Thinning _____ac. [ ] Road Right of Way_____ ac. [ ] Sanitation Salvage _____ ac,

[ ] Special Treatment Area_____ac. [ ] Rehab. of Understocked Area _____ ac. [ ] Fuelbreak _____ ac.

[ ] Alternative _____ac. [ ] Conversion _____ ac. [ ] Non-Timberland Area _____ac.

Total acreage 102 ac.: Explain if total is different from that in 8. MSP option chosen: (a) [ ] (b) [ ] (c) [X]

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

Site Class III, minimum residual basal area of 75 sq. ft./acre using conifers to meet stocking per CCR 913.8 (a). To meet MSP option (c), at least 8 trees 18" in diameter or greater, of full crown, capable of seed production and representative of the best phenotypes, will be left per acre. Each seed tree 24 inches DBH or greater shall be the equivalent to 2 seed trees less than 24 inches DBH.

c. [ ] Yes [ ] No Will evenage regeneration step units be larger than those specified in the rules (20 acres tractor, 30 acres cable)? If yes, provide substantial evidence that the THP contains measures to accomplish any of subsections (A) - (E) of 14 CCR 913 (933, 953) .1 (a) (2) in Section III of the THP. List below any instructions to the LTO necessary to meet (A) - (E) not found elsewhere in the THP. These units must be designated on map and listed by size. **Not Applicable**

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

Marking will emphasize elimination of poorer growing trees while providing for spacing, release potential, aesthetics, and wildlife habitat. Trees to be cut will be marked with a horizontal blue stripe on two sides of the tree with accompanying stump spots at the base of the tree. All operations will be conducted to minimize damage to residual conifers and associated hardwood species.

Wildlife Tree and Snag Recruitment

Trees having one or more of the following characteristics shall be retained for wildlife habitat and snag recruitment:

1. **"Old Growth" characteristic redwood trees (Redwood trees greater than 40 inches at DBH with outward indicators such as platy bark and large branching structures. Limbs shall be at least 8-10 inches in diameter and provide an opportunity for platforms/nesting).**
2. **Redwoods with "goose-pen" boles from fire having at least 50% defect.**
3. **Trees with "goose-pen" boles (basal cavities) extending twelve feet or more above the ground level.**
4. **Stand alone granary trees (acorn storage trees for woodpeckers) or no more than 50% of granary trees in clumps of two or more trees.**
5. **Current snags.**

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

e. Forest products to be harvested: **coast redwood and Douglas-fir sawlogs and incidental hardwoods damaged during operations or marked for release of conifers, and split products including burl and "buckskin" conifers.**

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.

g. Other instructions to LTO concerning felling operations: **Arrows painted on trees indicate the direction to fall the tree. A painted "S" on a tree (meaning "stop") indicates that no more trees are marked past that tree. When falling near watercourses, fallers shall minimize canopy reduction by preserving hardwoods whenever possible.**

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, as per 14 CCR 915.4 (935.4, 955.4).

j. If the rehabilitation method is chosen provide a regeneration plan as required by 14 CCR 913 (933, 953) .4 (b).

PESTS

15. a. [X] Yes [ ] No Is this THP within an area that the Board of Forestry and Fire Protection has declared a Zone of Infestation or Infection, pursuant to PRC 4712 - 4718? If yes, identify feasible measures being taken to mitigate adverse infestation or infection impacts from the timber operation. See 14 CCR 917 (937, 957) .9 (a).

PITCH CANKER: The THP is located in Santa Cruz County within the Coastal Pitch Canker Zone of Infestation. Pitch Canker is caused by the fungus *Fusarium subglutinans,* sp. *pini.* Of the local tree species only Monterey pine (*Pinus radiata*) show susceptibility outside the laboratory. Although not proposed for commercial harvest, some Monterey pines will be displaced during operations. Monterey pine slash shall be treated in the following manner as soon after creation as is practical but not later than one week.

- **Lop all branches from the sides and tops of those portions of main stems which are three inches or more in diameter**
- **Branches shall be scattered so that stems have maximum exposure to solar radiation**
- **Do not pile pine slash**
- **Lopped stems could also be cut into short segments to decrease drying time and further reduce hazard**

SUDDEN OAK DEATH: The California Oak Mortality Task Force monitors the distribution of sudden oak death in Santa Cruz County at (www.suddenoakdeath.org).

The approved THP shall function as the compliance agreement to allow for the removal of hardwood for commercialization from the project area for one year only as incidental hardwood damaged from the timber harvest (refer to 14(f)). If more than one year has passed since THP approval, an amendment to the THP shall be made if more hardwood removal is proposed for commercialization. To function as the compliance agreement, the following information and mitigation is contained in the THP:

1. **Counties regulated for Sudden Oak Death at the time of plan submittal include Alameda, Contra Costa, Humboldt, Marin, Mendocino, Monterey, Napa, San Mateo, Santa Clara, Santa Cruz, Solano, and Sonoma.**

2. **Regulated Hosts:**
   - **Rhododendron (*Rhododendron spp.*)**
   - **huckleberry (*Vaccinium ovatum*)**
   - **madrone (*Arbutus menziesii*)**
   - **bay laurel (*Umbellularia californica*)**
   - **California buckeye (*Aesculus californica*)**
   - **manzanita (*Arctostaphylos manzanita*)**
   - **California coffeberry (*Rhamnus californica*)**
   - **toyon (*Heteromeles arbutifolia*)**

   Associated Plant Species:
   - **grand fir (*Abies grandis*)**
   - **strawberry tree (*Arbutus unedo*)**
   - **camellia (*Camellia sasanqua*)**
   - **mountain laurel (*Kalmia latifolia*)**
   - **forest flame andromeda (*Pieris formosa ssp japonica*)**
   - **cascara (*Rhamnus purshiana*)**
   - **Victorian box (*Pittosporum undulatum*)**

honeysuckle (*Lonicera hispidula)*
redwood (*Sequoia sempervirens*)
Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*)
Western starflower (*Trientalis latifolia*)
coast live oak (*Quercus agrifolia*)
black oak (*Quercus kelloggii*)
bigleaf maple (*Acer macrophyllum*)
canyon live oak (*Quercus chrysolepis*)
Shreve's oak (*Quercus parvula* var. *shrevei*)
camellia (*Camellia japonica*)
tan oak (*Lithocarpus densiflora*)
andromeda (*Pieris formosa*)
Bodnant viburnum (*Viburnum x bodnantense*)
Laurustinus (*Viburnum tinus*)
poison oak (*Toxicodendron diversilobum*)
salmonberry (*Rubus spectabilis*)
California hazelnut (*Corylus cornuta*)
Brouwer's beauty andromeda (*Pieris floribunda x japonica*)
variegated and flaming silver andromeda (*Pieris japonica*)
lilac (*Syringa spp.*)
European yew (*Taxus baccata*)
lingonberry (*Vaccinium vitis-idaea*)
Mariesii – doublefile viburnum (*Viburnum plicatum tomentosum*)
Horse chestnut (*Aesculus hippocastanum*)
Sweet chestnut (*Castanea sativa*)
Beech (*Fagus sylvatica*)
Turkey oak (*Quercus cerris*)
Northern red oak (*Quercus falcata*)
Holm oak (*Quercus ilex*)
Southern red oak (*Quercus rubra*)

Revised March 8, 2004 according to California Oak Mortality Task Force website

3. **Coast live oak, tanoak and madrone will be removed from the THP area either as logs stripped of branches, hardwood rounds, or split firewood. No host foliage will be removed from the project area.**

4. **Hardwood host material will not be moved outside of the regulated area.**

5. **The approved THP will function as the compliance agreement to allow for the movement of hardwood within the regulated area.**
   a. Hardwood produced from the THP area will either be used by the Swanton Pacific Ranch or go to a distributor located in Santa Cruz County.
   b. No material from host plants less than four inches in diameter will be removed from the THP area.
   c. The LTO will visually inspect all vehicles containing host material leaving the project area to insure that the vehicles are free of host plant debris (leaves, twigs, and branches).

6. **This compliance agreement is valid for one year from the THP approval date. If hardwood removal is to occur after the year has expired the RPF shall amend the plan to conform to current regulations.**

***The RPF will be responsible to inform the LTO prior to the start-up of initial operations during any given year regarding current SOD hosts, regulated area, and operational requirements necessary to be in conformance with the compliance agreement.**

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

Douglas-fir trees on the property suffer from *Fomes pini* (a root and butt rot) as indicated by the exhibition of fruiting bodies on the boles of some of the trees. This fungus is a common sight within the Douglas-fir stands in the Southern Sub-district. It is present on the property, but its frequency does not appear to be unusually high.

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. [ ] Feller buncher	f. [ ] Cable, Skyline	i. [ ] Other

* All tractor operations restrictions apply to ground based equipment.

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

[X] Low [X] Moderate [X] High [ ] Extreme

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

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

Per 14 CCR 923.2(m) - Sidecast or fill material extending more that 20 feet (6.1 M) in slope distance from the outside edge of the roadbed which has access to a watercourse or lake which is protected by a WLPZ shall be seeded, planted, mulched, removed, or treated as specified in the THP, to adequately reduce soil erosion.

Per 14 CCR 923.5(f)(4) - Landing Construction; Sidecast or fill 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.

Per 14 CCR 916.9(m) 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% or more, a flash flood warning, or a flash flood watch.

General Rules for Soil Stabilization

1. Unless otherwise noted below, skid trails will be packed with tractor crushed slash and debris where feasible and waterbarred following completion of use or as specified in the plan.
a. In areas where tractor crushing is not feasible due to lack of slash and debris, hand trashing and/or seeding (35lbs. per acre of seed) will be employed. Slash coverage shall exceed 90% of the bared surface.
2. Seed to be used should preferably be sterile, short-lived varieties that are not known to persist or spread in the ecosystem. These varieties include barley (*Hordeum vulgare*), buckwheat (*Fagopyron esculentum*), rye (*Secale cereale*), wheat (*Triticum aestivum*), and crimson clover.
3. All landings will be seeded at a rate of 35 lbs./acre upon completion of operations and prior to the winter period.
4. All temporary crossings will be removed and the approaches straw mulched and seeded (35 lbs/acre) or hand trashed with slash.
5. All bared areas in the WLPZ or ELZ, 100 sq. feet and greater will be straw mulched, seeded (35 lbs. per acre), or hand trashed with slash. Straw coverage shall exceed 90% of the bared surface.
6. Where vegetation is not adequate to act as a sediment filter at waterbar or dip outlet locations, the LTO shall armor the road drainage outlets with slash or chunks of wood that is of adequate size to reduce the erosion potential at the outlets.

General Rules for Soil Stabilization in the WLPZ and ELZ/EEZ with WLPZ

Per 14 CCR 916.9 (n), within the WLPZ, and within any ELZ or EEZ designated for watercourse or lake protection:

1. **For areas disturbed from May 1 through October 15, treatment shall be completed prior to the start of any rain that causes overland flow across or along the disturbed surface.**
2. **For areas disturbed from October 16 through April 30, treatment shall be completed prior to any day for which a chance of rain of 30 percent or greater is forecast by the National Weather Service or within 10 days, whichever is earlier.**
3. **The traveled surface of logging roads shall be treated to prevent waterborne transport of sediment and concentration of runoff that results from timber operations.**
4. **The treatment for other disturbed areas, including: (a) areas exceeding 100 contiguous square feet where timber operations have exposed bare soil, (b) approaches to tractor road watercourse crossings between the drainage facilities closest to the crossing, (c) road cut banks and fills, and (d) any other area of disturbed soil that threatens to discharge sediment into waters in amounts deleterious to the quality and beneficial uses of water, may include, but need not be limited to, mulching, rip-rapping, grass seeding, or chemical soil stabilizers. Where straw, mulch, or slash is used, the minimum coverage shall be 90%, and any treated area that has been subject to reuse or has less than 90% surface cover shall be treated again prior to the end of timber operations. The RPF may propose alternative treatments that will achieve the same level of erosion control and sediment discharge prevention.**
5. **Where the undisturbed natural ground cover cannot effectively protect beneficial uses of water from timber operations, the ground shall be treated by measures including, but not limited to, seeding, mulching, or replanting, in order to retain and improve its natural ability to filter sediment, minimize soil erosion, and stabilize banks of watercourses and lakes.**

916.9(o), Assessment of Active Erosion Sites in the Logging Area

Per 14 CCR 916.9(o) The RPF has addressed potential erosion sites in the logging area through the abundant crossing, road, and skid trail mitigation.

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

20. [ ] Yes [ ] No Will ground based equipment be used within the area(s) designated for cable yarding? If yes, specify the location and for what purpose the equipment will be used. See 14 CCR 914.3 (934.3, 954.3) (e). **Not applicable.**

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

a. [ ] Yes [X] No Unstable soils or slide areas? Only allowed 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 use 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 below. Provide explanation and justification in section III as required per 14 CCR 914 (934, 954) .2 (d). CDF requests the RPF consider flagging tractor road locations if "a." is yes.

If b., c., d. or e. is yes:

1) the location of tractor roads must be flagged on the ground prior to the PHI or start of operations if a PHI is not required, and
2) you must clearly explain the proposed exception and justify why the standard rule is not feasible or would not comply with 14 CCR 914 (934, 954).

The location of heavy equipment operation on unstable areas or any use beyond the limitations of the standard rules must be shown on the map. List specific instructions to the LTO below.

22. [ ] Yes [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 (934, 954) .9 in Section III.

List specific instructions to the LTO below.

WINTER OPERATIONS

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

The proposed THP is located in a watershed with threatened or impaired values. The winter period is from October 15 through May 1. Except as otherwise provided in the rules, all waterbreaks shall be installed no later than the beginning of the winter period of the current year of timber operations.

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? [ ] Yes [X] No, or reconstructed? [ ] Yes [X] No. If yes, check items "h." through "k."

a. [ ] Yes [ ] No Will new or reconstructed roads be wider than single lane with turnouts?
b. [ ] Yes [ ] No Are logging roads proposed in areas of unstable soils or known slide-prone areas?
c. [ ] Yes [ ] No Will new roads exceed a grade of 15% or have pitches of up to 20% for distances greater than 500 feet? Map must identify any new or reconstructed road segments that exceed an average 15% grade for over 200 feet.
d. [ ] Yes [ ] No Are roads to be constructed or reconstructed, other than crossings, within the WLPZ of a watercourse? If yes, completion of THP Item 27 a. will satisfy required documentation.
e. [ ] Yes [ ] No Will roads be located across more than 100 feet of lineal distance on slopes over 65%, or on slopes over 50% which are within 100 feet of the boundary of a WLPZ?
f. [ ] Yes [ ] No Will any roads or watercourse crossings be abandoned?

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

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

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

j. [ ] Yes [ ] No Will any landings be located on slopes over 65% or on slopes over 50% which are within 100 feet of the boundary of a WLPZ?

k. [ ] Yes [ ] No Will any landings be abandoned?

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

A total of ten existing landings are planned for use in the Lower Little Creek THP. The location of each landing can be referenced on the operations map at the end of Section II. Landings may require some minimal brushing/grading to make each site operational. Following operations or prior to the winter period landings shall be seeded at a rate of 35 lbs/acre unless otherwise stated below.

L1 through L5 and L7 through L11 are existing landings. There is no L6.

Landing L5 shall not be seeded. Landing L5 shall be rocked with drain rock.

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

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

See crossing descriptions below.

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. [X] Yes [ ] No Is this THP Review Process to be used to meet Department of Fish and Game CEQA review requirements? If yes, attach the 1602 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".

WLPZ WIDTHS

The following WLPZ or ELZ widths and protection measures shall be adhered to throughout operations.

CLASS I WATERCOURSE

Slopes of:	≤30%	30-50%	>50%
	150 Foot WLPZ	150 Foot WLPZ	150 Foot WLPZ

CLASS II WATERBODIES

Slopes of:	≤30%	30-50%	>50%
	50 Foot WLPZ	75 Foot WLPZ	100 Foot WLPZ

CLASS III WATERCOURSE

Slopes of:	≤30%	>30%
	25 Foot ELZ	50 Foot ELZ

GENERAL PROTECTION MEASURES

Per 14 CCR 916.9(d)(1), the mitigation measures below shall be implemented to offset potential significant adverse watershed effects from the proposed timber operations. The LTO shall be responsible for the implementation of each measure.

CLASS I WATERCOURSES

Lower Little Creek is the only Class I watercourse running through the harvest area, with a 150' WLPZ on either side of the creek. Lower Little Creek contributes to Scotts Creek after leaving the project area, on the opposite side of Swanton Road. The entire plan is in a "Watershed with threatened or impaired values" because it is a location "where populations of anadromous salmonoids that are listed as threatened, endangered, or candidate under the State or Federal Endangered Species Acts with their implementing regulations, are currently present or can be restored," ref. 14 CCR 895.1.

1. The WLPZ shall be clearly identified on the ground by the RPF who prepared the plan, or his designee, with paint, flagging, or other suitable means, prior to the Pre-harvest inspection.

2. To ensure retention of shade canopy filter strip properties and the maintenance of wildlife values described in 14 CCR 916.4(b), trees within the WLPZ shall be marked by the RPF or his supervised designee prior to the Pre-Harvest Inspection.

3. Within the Class I WLPZ at least 85% overstory canopy shall be retained within 75 feet of the watercourse or lake transition line, and at least 65% overstory canopy within the remaining 75 feet of WLPZ. The over story canopy must be composed of at least 25% conifer canopy post-harvest.

4. No trees shall be harvested within 75 feet of the class I watercourse transition line.

5. Recruitment of large woody debris for aquatic habitat in Class I anadromous fish-bearing or restorable waters shall be ensured by retaining the ten largest DBH conifers (live or dead) per 330 feet of the stream channel length that are the most conducive to recruitment to provide for the beneficial functions of riparian zones. The retained conifers shall be selected from within the plan area that lies within 50 feet of the watercourse transition line.

6. No equipment will be operated within the WLPZ unless explained and justified in this THP.

CLASS II WATERBODIES

Four Class II watercourses and three Class II ponds exist on Cal Poly property in the vicinity of the harvest area. One of the Class II watercourses is on the northern end of the project area, where it feeds into Little Creek. This Class II watercourse is crossed by crossing X4. Another Class II watercourse is tributary to Little Creek just downstream of crossing X6. Archibald Creek, in the southern portion of the project area, is a combination Class II/Class III, considered a Class II where it is crossed by a haul road at X1. Winters Creek is also a combination Class II/Class III. The Class II section of Winters Creek begins at the Winters Creek pond and flows downstream until approximately 85 feet upstream of crossing X3, where the flow goes subsurface and the watercourse becomes a Class III. All of the Class II ponds are manmade stock ponds. One is located upstream of crossing X3 on Winters Creek, and the other two are south of landing L3. All Class II features are shown on the Operations Map.

1. The WLPZ shall be clearly identified on the ground by the RPF who prepared the plan, or his designee, with paint, flagging, or other suitable means, prior to the PHI.

2. To ensure retention of shade canopy filter strip properties and the maintenance of wildlife values described in 14 CCR 916.4(b), trees within the WLPZ shall be marked by the RPF or his supervised designee prior to the PHI.

3. To protect water temperature, filter strip properties, upslope stability, and fish and wildlife values, at least 50% of the total canopy covering the ground shall be left in a well-distributed, multistoried stand composed of a diversity of species similar to that found prior to the start of operations. The residual overstory canopy shall be composed of at least 25% of the existing overstory conifers.

4. No equipment will be operated within the WLPZ unless explained and justified in this THP.

CLASS III WATERCOURSES

Class III watercourses found in or around the project area include portions of Winters Creek, portions of Archibald Creek and unnamed tributaries. Winters Creek is a Class III where it is crossed by the haul road at crossing X3. An unnamed Class III tributary to Little Creek is crossed by the haul road at crossing X5. Class IIIs are mapped on the Operations Map.

1. At least 50% of the understory vegetation present before operations shall be left living and well distributed adjoining Class III watercourses to maintain soil stability.

2. No equipment will be operated within Class III watercourse ELZ'S other than at crossings listed or on flagged skid trails shown on the Operations Map. Any soil deposited in a Class III watercourse shall be removed and debris removed or stabilized before the conclusion of operations or before October 15th, whichever comes first.

3. A 25' Equipment Limitation Zone (ELZ) shall be observed when operating near Class III watercourses on slopes under 30%. Where slopes adjacent to Class III's exceed 30%, a 50' ELZ shall be observed. Equipment operations within these ELZ's are allowed at designated crossings, and on flagged and mapped skid trails and tractor roads. It is the LTO's responsibility to familiarize himself and his crew with the location of the Class III's within the THP area to assure compliance with the ELZ requirements.

WATERCOURSE CROSSINGS:
For the locations of crossings refer to the Operations Map at the end of Section II.

X1: This is an existing Class II watercourse truck road crossing, with a 36 inch CMP culvert. This will be used as is. Following operations, a rock lined critical dip shall be installed using 5-10 inch sized gabion rock on the north side of the culvert pipe. Crossing approaches within the WLPZ shall be rocked with ¾" drain rock to a depth of 2 inches.

X2: This is an existing road crossing below a seep. During the winter months the seep contributes to saturated soil conditions in the road for extended periods of time. Beyond the problems usually associated with saturated roads, this one is now beginning to exhibit damage from feral pigs attracted by the soggy soil. A French drain will be installed, parallel to the road, on the uphill side of the road. Water from the seep will be intercepted by this French drain before entering the road prism. The drain will be connected to a pipe under the road and drained on the downhill side of the road. (See Diagram 3 at the end of Section II.)

X3: This is an existing Class III watercourse truck road crossing, with a 30 inch culvert. The crossing will be used as is. Following operations, the road on top of the culvert, and for 50 feet on both approaches, shall be seeded with an appropriate seed variety as described under item #18 at a rate of 35 lbs/acre.

X4: This is an existing Class II watercourse crossing near an intersection that includes two parallel roads and two 24 inch CMP culverts (one under each road). The truck roads found at this crossing will not be used for log hauling, only skidding. The uphill road section will be outsloped from approximately the location of the pipe west back to the intersection, where a berm will be installed. On the lower road, a berm will be built up just east of the location of the pipe. This road will also be dipped out approximately 20 feet west of the pipe, and water will drain away from the culvert fill prism, over a more stable configuration through a clump of redwoods, and then back into the channel of the Class II. The net effect of this mitigation will be to direct drainage off of the top road and down toward the lower road. The lower road will then direct water away from the pipe into the dip so that water will be directed away from the fill prism and back into the original channel. (See Diagrams 1 and 2 at the end of Section II.)

X5: This is an existing Class III watercourse crossing utilizing an 18-inch plastic culvert. The culvert is "shotgunned" out of the side of the road fill prism. The road fill prism at this location includes a historical hand-stacked rock wall built for a railroad grade around the turn of the 20th century. Because of the archaeological protection due the rock wall, the only appropriate mitigation here is to install a downspout from the end of the culvert pipe. A downspout of approximately 40 feet in length will be installed, and it will terminate in the base of the class III watercourse channel below.

X6: This is a crossing of Little Creek (a Class I watercourse) utilizing a railroad car bridge. Until recently, this bridge was used regularly for forest management activities. During the major storms of 1998, the south side bridge abutment was washed out, and the bridge collapsed. This existing infrastructure is to be repaired back to usable condition. One or more logs will be keyed into the top of the bank on each side of the crossing for use as bridge footers. These log footers should be notched out prior to their placement in the ground with notches that the bridge can rest in. On the south side (left bank), the log footer is to be keyed in approximately 15 feet back from the abrupt edge of the channel. A railroad car will be placed on top of both banks for use as a bridge. Construction of abutments will not be necessary, as the railroad car to be used is a 75 foot-long car, substantially longer than the 54 foot-long car that failed. Movement of footer logs across the creek is to be accomplished by tight-lining the logs with two pieces of heavy equipment, one on each side of the creek. The 75 foot-long railcar is to be brought in to the bridge location via the Little Creek Road on the north side of Little Creek. The bridge is to be installed by tight-lining it across the creek with two pieces of heavy equipment, and placing it on top of the log footers (and setting it in the notches). The 54 foot-long bridge that is currently in this location is to be removed and taken out on Little Creek Road to Swanton Road, where it can be loaded for transport. The bridge design has been done by Timothy C. Best, Certified Engineering Geologist. (See section V for Mr. Best's report.) Repair of the bridge at this location will have two primary watershed benefits. As the bridge is currently resting where it fell, it is at great risk of

causing a log jam, which could potentially cause tens of thousands of yards of soil to wash out. Once the bridge is reset, it will have much greater clearance. Also, the existing position of the old railroad car is causing an alteration of flows that has led to accelerated bank erosion. Once that car is removed from Little Creek, this problem will be alleviated. (See Report by Timothy C. Best, CEG, in Section V. Also, see Department of Fish & Game 1602 permit application at the end of Section II.)

EXISTING ROAD IN THE WLPZ:
A native surface road runs for approximately one mile along the northern bank of Little Creek, though only portions of the road are within the WLPZ. This haul road contains periodic waterbar and rolling dip drainage structures. The existing structures are to be improved and enlarged to ensure that they are able to intercept surface flow and move it off of the road. Additionally, sections of road within the WLPZ between Swanton Road and Landing L5 will be provided an additional 2" cap of ¾" drain rock overlaying the existent native mudstone base.

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

a. [X] Yes [ ] No Prohibition of the construction or reconstruction of roads, construction or use of tractor roads or landings in Class I, II, III, or IV watercourses, WLPZs, marshes, wet meadows, and other wet areas except as follows:
   (1) At prepared tractor road crossings.
   (2) Crossings of Class III watercourses which are dry at time of timber operations.
   (3) At existing road crossings.
   (4) At new tractor and road crossings approved by Department of Fish and Game.

b. [ ] Yes [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 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 watercourses unless sideslopes are <30% and EHR is low?

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

i. [ ] Yes [X] No Retention of at least 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 any of items "a." through "j." constitutes an in-lieu practice. If any item is answered yes, refer to 14 CCR 916 (936, 956).1 and address the following for each item checked yes:

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

Landing in the WLPZ (L5):

1. **14 CCR 916.3(c) states "The timber operator shall not construct or reconstruct roads, construct or use tractor roads or landings in Class I, II, III or IV watercourses, in the WLPZ, marshes, wet meadows, and other wet areas unless when explained and justified in the THP by the RPF, and approved by the Director, except as follows:**
   (1) At prepared tractor road crossings as described in 914.8(b).
   (2) Crossings of Class III watercourses which are dry at the time of timber operations.
   (3) At existing road crossings.
   (4) At new tractor and road crossings approved as part of the Fish and Game Code process (F&GC 1600 et seq.)
   Use of existing roads is addressed in 916.4(a)."
2. **A landing is located in the WLPZ approximately 110 feet from the edge of class I watercourse Little Creek and approximately 25 feet from crossing X4, which contains a class II watercourse. This landing is found on an existing flat, wide, cleared area at a fork in the road. Minimal or no grading is required to make this site operational. Prior to the winter period the landing will be rocked with drain rock. This landing will be used for logs skidded from the harvest areas north of Little Creek. Drainage will be directed off of the southeast corner of the landing into a dip which will direct water toward the class II**

watercourse that flows below the landing.

3. The proposed practice differs from the standard practice in that a landing is proposed to be used in the class I and II WLPZ.
4. The location of the proposed in-lieu practice is mapped as "L5" on maps included with this THP.
5. See Section III, Item #27a for more information. Also, see the diagrams of this landing and surrounding features (Diagrams 1 and 2), found at the end of Section II, for more information.

Skid Trail in the WLPZ (East of Landing L5):

1. 14 CCR 916.3(c) states "The timber operator shall not construct or reconstruct roads, construct or use tractor roads or landings in Class I, II, III or IV watercourses, in the WLPZ, marshes, wet meadows, and other wet areas unless when explained and justified in the THP by the RPF, and approved by the Director, except as follows:
   (1) At prepared tractor road crossings as described in 914.8(b).
   (2) Crossings of Class III watercourses which are dry at the time of timber operations.
   (3) At existing road crossings.
   (4) At new tractor and road crossings approved as part of the Fish and Game Code process (F&GC 1600 et seq.)
   Use of existing roads is addressed in 916.4(a)."
2. An existing road is located to the east of landing L5, which is not to be used for hauling but only for skidding. The skid trail is approximately 100 feet from the edge of the Class I at its closest point. (The skid trail also crosses a class II watercourse at crossing X4, which is excepted from explanation and justification based on 14 CCR 916.3(c)(3).) The skid trail will be used "as is." Following operations or prior to the winter period, all sections of this skid trail in the Class I WLPZ that were used for harvest operations shall be rocked. The skid trail will be flagged prior to the PHI.
3. The proposed practice differs from the standard practice in that a skid trail is proposed for use within a class I WLPZ, while the standard practice would dictate that skid trails remain outside of WLPZ areas.
4. The location of the proposed in-lieu practice is shown on the Operations Map as an existing road heading east out of landing L5: Of the three roads shown in that location, the road to be used as a skid trail in the WLPZ is the center road. The skid trail enters the class I WLPZ approximately 200 feet east of crossing X4, and continues within the WLPZ until its terminus.
5. See Section III, Item #27a for more information. Also see Diagram 2 at the end of Section II.

Skid Trail in the WLPZ (South side of Winters Creek):

1. 14 CCR 916.3(c) states "The timber operator shall not construct or reconstruct roads, construct or use tractor roads or landings in Class I, II, III or IV watercourses, in the WLPZ, marshes, wet meadows, and other wet areas unless when explained and justified in the THP by the RPF, and approved by the Director, except as follows:
   (1) At prepared tractor road crossings as described in 914.8(b).
   (2) Crossings of Class III watercourses which are dry at the time of timber operations.
   (3) At existing road crossings.
   (4) At new tractor and road crossings approved as part of the Fish and Game Code process (F&GC 1600 et seq.)
   Use of existing roads is addressed in 916.4(a)."
2. An existing ranch access road is located on the south side of Winters Creek upstream of crossing X3. A portion of this ranch road is to be used as a skid trail, including a subsection of this which is in the Class II WLPZ. No reconstruction (as defined in 14 CCR 895.1) will be required for use, nor will grading be necessary. The skid trail is approximately 60 feet from Winters Creek at its closest point. The trail runs for approximately 200 feet in the WLPZ. Prior to the winter period, portions of the ranch access road in the WLPZ that have been utilized for skidding shall be waterbarred at a spacing for high EHR and seeded.
3. The proposed practice differs from the standard practice in that a skid trail is proposed for use within a class II WLPZ, while the standard practice would dictate that skid trails remain outside of WLPZ areas.
4. The location of the proposed in-lieu practice is shown on the map as an existing skid trail on the south side of Winters Creek.
5. See Section III, Item #27a for more information.

28. a. [X] Yes [ ] No Are there any landowners within 1000 feet downstream of the THP boundary whose ownership adjoins or includes a class I, II, or IV watercourse(s) which receives surface drainage from the proposed timber operations? If yes, the requirements of 14 CCR 1032.10 apply. Proof of notice by letter and newspaper should be included in THP Section V. If No, "28 b." need not be answered.

b. [ ] Yes [X] No Is an exemption requested of the notification requirements of 14 CCR 1032.10? If yes, an

explanation and justification for the exemption must appear in THP Section III. Specify if requesting an exemption from the letter, the newspaper notice or both.

c. [ ] Yes [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.

Two known water uptakes exist in Little Creek, approximately 250 feet and 350 feet northwest of the harvest area, near Swanton Road (refer to Operations Map). The uptakes are used for the personal water supply of neighbors of the property. The following protocol will be adhered to for any and all work within the vicinity of the uptakes and their waterlines:

1. **No trees are to be harvested within approximately 250 feet of the uptake.**
2. **Minimal blade work will occur on the existing haul road to re-establish erosion control structures.**
3. **The LTO will assume any and all responsibility for repair of damaged or broken waterlines resulting from harvest operations.**

A spring-fed water tank can be found on a ridgeline in the vicinity of the harvest area between Winters Creek and Archibald Creek (refer to Operations Map). This tank serves as the water storage facility for the Big Creek CDF Fire Station. Several broken or damaged pipes can currently be found in the vicinity of the tank. The LTO will assume any and all responsibility for repair of damaged or broken waterlines resulting from harvest operations.

During the noticing process, no contacts were made with the RPF of record concerning water uptakes.

Mr. Andrew Strader of the County of Santa Cruz, Environmental Health Department was contacted to assist in the determination of surface water uptakes downstream of the project area. A copy of the letter and map sent to Mr. Strader is included in Section V of the THP. A conversation with Mr. Strader on February 24, 2004 identified two wells off of the project area in the vicinity of lower Scotts Creek but did not identify any additional surface water uptakes.

29. [ ] Yes [X] No Is any part of the THP area within a Sensitive Watershed as designated by the Board of Forestry and Fire Protection? If yes, identify the watershed and list any special rules, operating procedures or mitigation that will be used to protect the resources identified at risk?

HAZARD REDUCTION

30. a. [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.

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

Several structures maintained for human habitation are found on the property proposed for harvest. Per 14 CCR 917.4 (a), slash within 200' of all permanently located structures currently maintained for human habitation shall be treated by lopping to within 12" above the ground not later than April 1 of the year following its creation.

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

BIOLOGICAL AND CULTURAL RESOURCES

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

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

See Section III Plan Addendum, Item # 32 for more information on other species of varying status.

FISH

Coho Salmon (*Oncorhychus kisutch*) Central California Evolutionary Significant Unit
Coho salmon are listed as threatened under the Endangered Species Act (ESA) and endangered under the

California ESA. Coho salmon may occupy the lower reaches of Little Creek, particularly as refugia during winter storm events. One class I (Little Creek) and two class III tributaries (Winter Creek and Archibald Creek) feed Scott Creek from the Swanton Pacific Ranch. The following proposed mitigations shall ensure protection of the downstream coho salmon habitat.

1. Canopy retention standards as discussed under Item #26 of the THP.
2. Limitations on use of heavy equipment in the WLPZ as discussed under Item #26 of the THP.
3. Treatment of roads, skid trails, and landings near watercourses as discussed under Item #27 of the THP.
4. Soil stabilization as discussed under Item #18 of the THP.
5. Winter operating restrictions as discussed under Item #23 of the THP.

Steelhead (*Oncorhychus mykiss irideus*) Central California Evolutionary Significant Unit
Steelhead are listed as threatened under the ESA. Steelhead may currently migrate up Little Creek as far as a fish barrier approximately 500 feet upstream from crossing X6. Upstream of this fish barrier, a resident population of rainbow trout can be found. For purposes of the THP, Little Creek shall be considered current habitat through the upstream edge of the harvest area. Steelhead are present in moderate numbers in Scott Creek downstream from the project area.

The mitigations set forth for coho salmon will protect steelhead habitat as well. Protection measures include canopy retention standards along creeks, no timber operations in the channel zone, trash packing skid trails, and adequate erosion control structures on roads.

AMPHIBIANS

California Red-legged Frog (*Rana aurora draytoni*)
This species has been identified on NDDB maps at many locations in the vicinity of the harvest area. Three stock ponds and one defunct swimming pool in close proximity to the harvest provide breeding and/or summer habitat for this taxon. These locations are shown on the NDDB maps and overlap the harvest area. For the purposes of this harvest, red-legged frogs are considered present. To ensure protection of this species, the following measures shall be adhered to during harvesting operations (measures are in compliance with the interim guidelines established by the USFWS in 1996 for protection of the red-legged frog):

1. All road, skid trail, and landing construction shall occur prior to the start of the wet season (*see below for the definition of the wet season)
2. All ground based yarding and skidding activities shall occur prior to the onset of the wet season
3. During the wet season, hauling and loading of logs shall occur during daylight hours only
4. All segments of skid trail in the WLPZ shall be packed with slash, seeded at a rate of 35 lb. per acre, and/or straw mulched to a depth of 3 inches following operations and prior to the winter period
5. All segments of road in the WLPZ shall be rocked or seeded at a rate of 35 lb. per acre and straw mulched to a depth of 3 inches following operations and prior to the winter period
6. Trees shall be felled away from riparian habitat including springs, seeps, bogs, and other wet areas of saturated ground

(*For purposes of protection of red-legged frogs, the wet season begins with the first frontal system that results in at least ¼ inch of precipitation after October 1 and extends through April 15)

BIRDS

Marbled Murrelet (*Brachyramphus marmoratus*)
Although marbled murrelets were not identified on NDDB maps within five miles of the project area, some suitable structure is present in the Lower Little Creek drainage. The California Department of Fish and Game was consulted, and surveys were conducted by John Bulger, utilizing the Pacific Seabird Group and California Department of Fish and Game Marbled Murrelet Survey Protocol Guidelines. The survey results show no occupied habitat in the Lower Little Creek drainage.

BOARD LISTED BIRD SPECIES: In order to protect these species so they may nest and fledge their young, the following measures shall be implemented if timber operations will occur during the critical breeding period between March 1 and August 15.

1. During marking operations by the RPF, or his designee, each tree shall be surveyed for the presence of bird species and their nests to a minimum nest size of six inches in diameter.
2. If nests are located which have indicators of current nesting activity and if timber operations are active, all timber operations within 300 feet of the nest shall cease immediately.
3. The RPF shall notify CDF and CDF&G and consult with a qualified biologist.
4. Appropriate mitigation measures as specified for identified listed species in the forest practice rules (CCR 919.3), which includes consultation with CDF&G for flagging of a buffer zone, and specified

restrictions or prohibitions of activities within the buffer zone until the young are fledged.

CDF&G BIRD SPECIES OF SPECIAL CONCERN:

1. **If a nest is observed during tree marking or harvest operations, the RPF shall notify CDF and CDF&G and consult with a qualified biologist.**
2. **Upon identification of the species of the nest occupant(s), a buffer zone of the appropriate size shall be flagged around the nest. The following default buffer zones shall be placed around the nest site for the identified nesting species:**
   a. **Coopers Hawk: 300 feet**
   b. **Sharp-shinned Hawk: 300 feet**
   c. **White-tailed Kite: 300 feet**
   d. **Long-eared owl: 300 feet**
   e. **Vaux's Swift: 150 feet**

3. Buffer Zones may be modified upon recommendation of the qualified biologist based on site specific factors such as topography, stand density, and adjacency of operational activity.

4. Identify and retain undamaged the nest tree, screen trees and roost trees as recommended by the qualified biologist.

5. Conduct no timber operations within the buffer zone during the critical period with the exception that limited operations including log hauling may be permitted with approval of the biologist on an individual case basis. The critical period is from March 1 until the nestlings have strongly fledged as monitored by a qualified biologist.

OTHER RAPTORS: Fish and Game Code 3503.5 states that "***It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess, or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto.***"

PLANTS

Dudley's Lousewort (*Pedicularis dudleyi*)

Dudley's lousewort has no federal listing, is listed by the State as rare, and is a species on the CNPS 1B list. The habitat for Dudley's lousewort is chaparral, valley grassland and redwood forest mainly in coastal habitats. A dicot in the family *Scrophulariaceae*, it is an annual herb that is native to California and endemic to California alone. No occurrences have been recorded on NDDB maps within 5 miles of the harvest area. A plant survey to be conducted in the harvest area will help determine if the plant is present in the harvest area.

Prior to the start of operations, a blooming period rare plant survey shall be conducted and a report amended into the THP. Surveys shall be completed and reported according to the Department of Fish and Game's "Guidelines for Assessing Effects of Proposed Projects on Rare, Threatened and Endangered Plants and Natural Communities." At a minimum, the survey report shall include the following information: dates of survey activity, total field time of survey efforts, map of survey routes or transects, names of investigators, and a complete list of all plants identified. Plant surveys shall be floristic (all species encountered are identified to a taxonomic level necessary to determine whether rare or not). The plant survey may be conducted outside of the blooming period of an individual species if the botanist is able to determine that appropriate habitat is not present in the project area for the species.

If any rare, threatened or endangered plants are detected during botanical surveys or during operations, an Equipment Exclusion Zone (EEZ) shall be established around the outside edge of all occurrences prior to any further operations within 100 feet of the detected plants. Timber falling will be done directionally away from listed plants. Following consultation with a qualified botanist, the protection measures may be reduced if the adjustment is deemed appropriate by the botanist in cooperation with the Department of Fish and Game. Within 30 days, the RPF shall amend the following information into the THP:

1. **A map of the location and description of the shape and area(s) of each occurrence area and the EEZ.**
2. **The number of individual plants in each occurrence area. If occurrence is greater than 100 plants, estimate the number of individuals.**
3. **The estimated percent of plants in reproductive condition and percent of seedlings in each occurrence area.**
4. **A description of the associated species, aspect, topography, and soils of each occurrence area.**
5. **The estimated percentage of cover of tree layer, shrub layer, and bare mineral soil of each occurrence area.**
6. **A description of the current conditions controlling the hydrologic regime of each occurrence area.**
7. **A description of the foreseeable activities and post-harvest stand condition within 50 feet of each avoidance area.**
8. **A copy of a CNDDB field form which has been completed and submitted to the California Department of Fish and Game Natural Diversity Database.**

33. [ ] Yes [X] 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.

No snags are proposed for removal as a part of the THP. Coupled with the fact that the retention of "green trees" will be significantly high with respect to silviculture associated with a selective timber harvest should be more than sufficient to meet the recommendations of the Department of Fish and Game.

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 a current archaeological records check been conducted for the THP area?

c. [X] Yes [ ] No — Are there any archaeological or historical sites located in the THP area? Specific site locations and protection measures are contained in the Confidential Archaeological Addendum in Section VI of the THP, which is not available for general public review.

37. [ ] Yes [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 that are not listed elsewhere in Section II.

Hours of Operation:
The operation of chainsaws and other power-driven equipment shall be restricted to the hours between 7:00 am and 7:00 pm, and shall be prohibited on Saturdays, Sundays and nationally designated legal holidays. Within 300 feet of any occupied legal dwelling, the operation of chainsaws and all other power equipment, except licensed highway vehicles, shall be restricted to the hours between 8:00 am and 6:00 pm, and shall be prohibited on Saturdays, Sundays and nationally designated legal holidays.

Contents of Plan per 14 CCR 926.23:
The estimated number of log truckloads to be removed from the project area is 70 over the course of 50 haul days. Log truck staging areas will only be located inside the project area.

Caution Log Truck Signs:
"Caution: Log trucks" signs shall be placed on Swanton Road, one on each side of the driveways that lead to the harvest area. Signs shall also be placed a minimum of ½ mile apart in visible locations on Swanton Road so that motorists can easily see them from both directions. Signs shall extend to within ¼ mile of Highway 1.

Haul Route:
Trucks will leave the project area and turn right onto Swanton Road, heading in a northbound direction. Near the northern end of Swanton Road, trucks will turn off of the county road into the property of Big Creek Lumber Company.

Drafting per 14CCR 916.9(r):
Water drafting from watercourses shall not occur as a part of this THP. Water shall be obtained from a fire hydrant or other reasonable well water source.

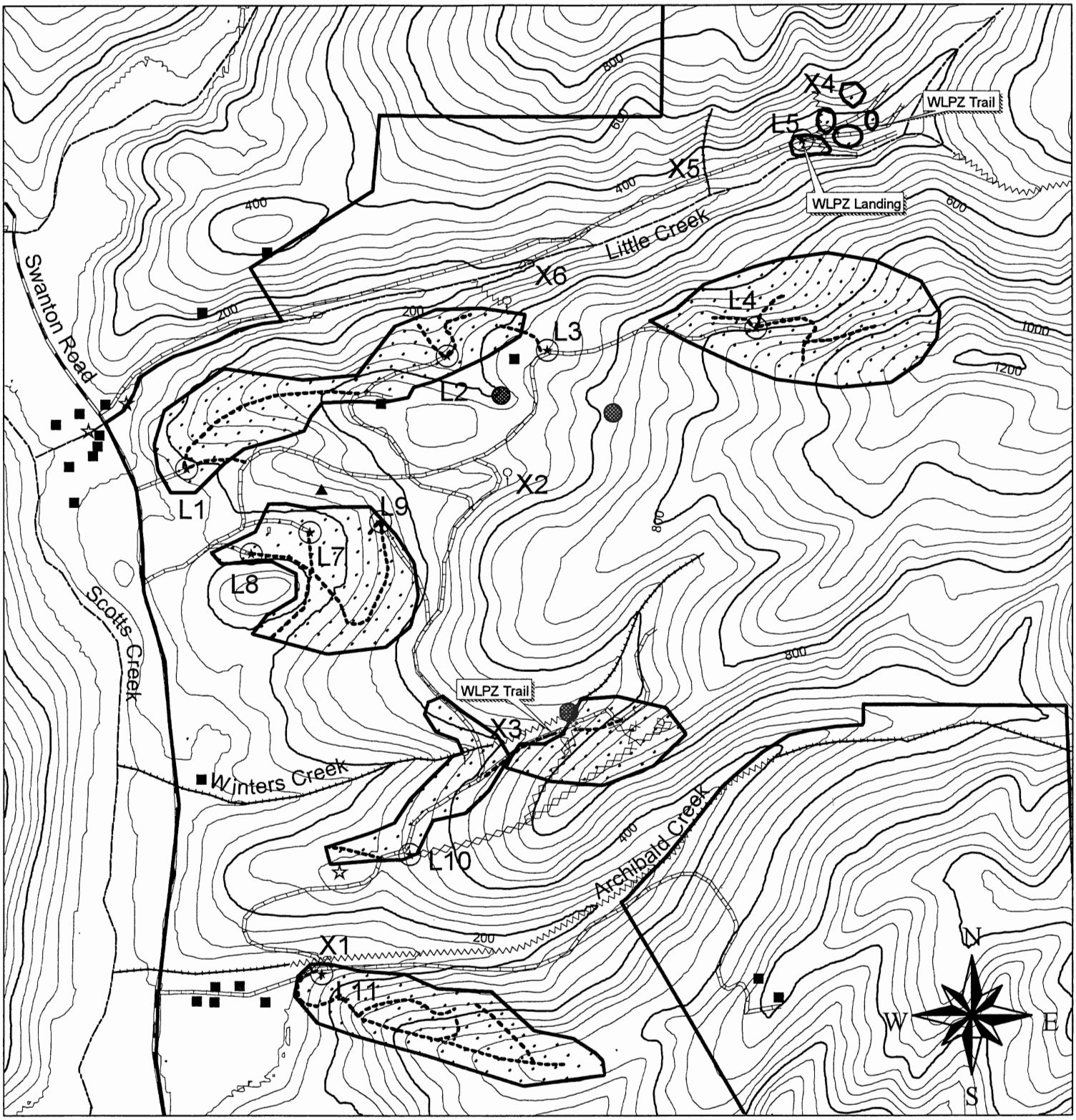
DIRECTOR OF FORESTRY AND FIRE PROTECTION

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

By: _____
(Signature) (Date)

_____
(Printed Name) (Title)

LOWER LITTLE CREEK THP: OPERATIONS MAP
USGS 7.5' QUADRANGLE, DAVENPORT
T10S, R3W, PORTIONS OF SECTIONS 16, 17 AND RANCHO AGUA PUERCA Y LAS TRANCAS

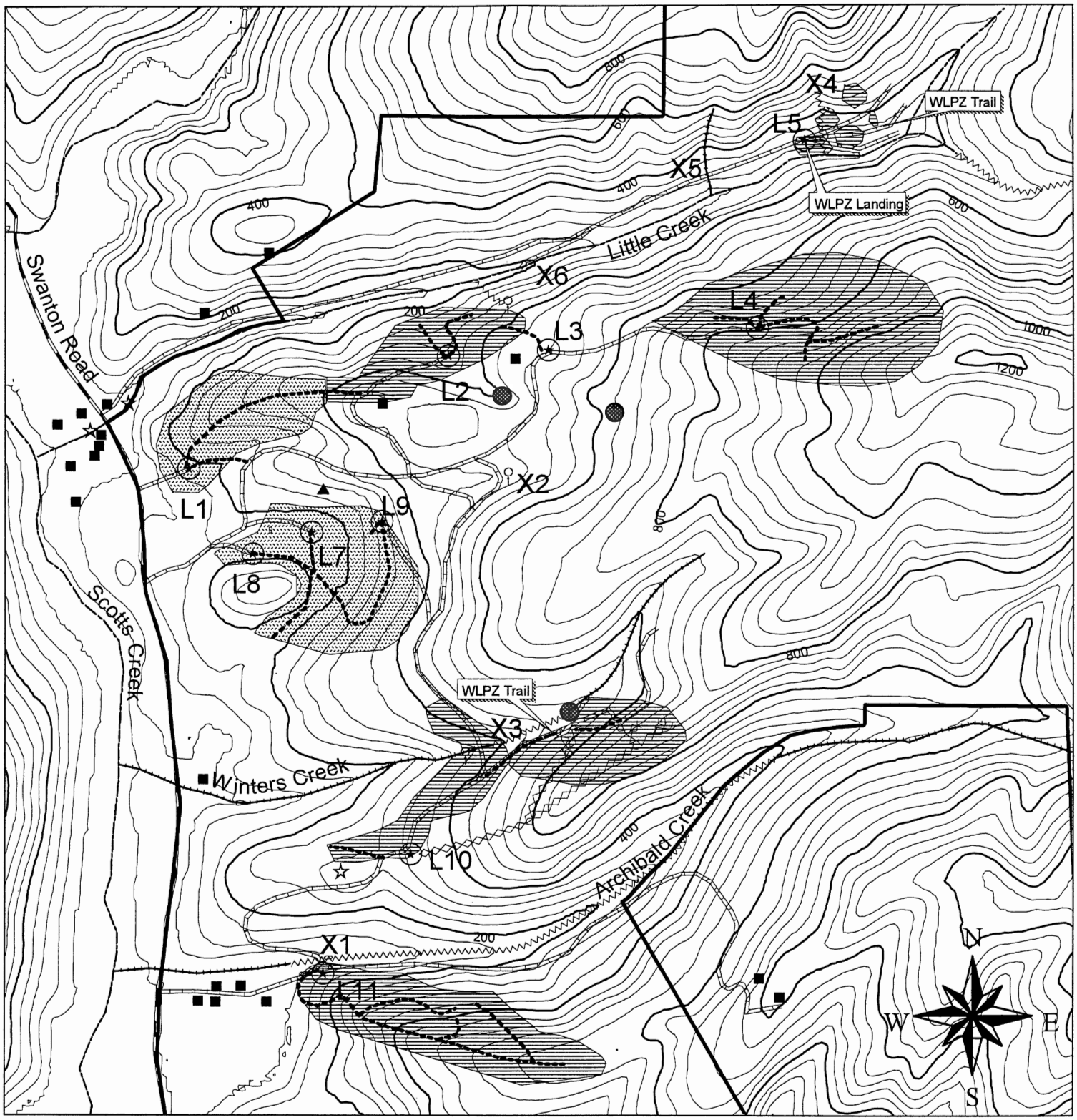


LEGEND

- Property Line
- Harvest Area
- Swanton Road
- Existing Landing
- Existing Haul Road
- Existing Skid Trails
- Class I Watercourse
- Class II Watercourse
- Class III Watercourse
- Pond
- Spring
- Unstable Areas
- Structures
- 40 Foot Contours
- Water Uptake

BIG CREEK
Big Creek Forestry Department
3564 Highway 1
Davenport, CA
andym@big-creek.com

LOWER LITTLE CREEK THP: EROSION HAZARD RATING MAP
USGS 7.5' QUADRANGLE, DAVENPORT
T10S, R3W, PORTIONS OF SECTIONS 16, 17 AND RANCHO AGUA PUERCA Y LAS TRANCAS

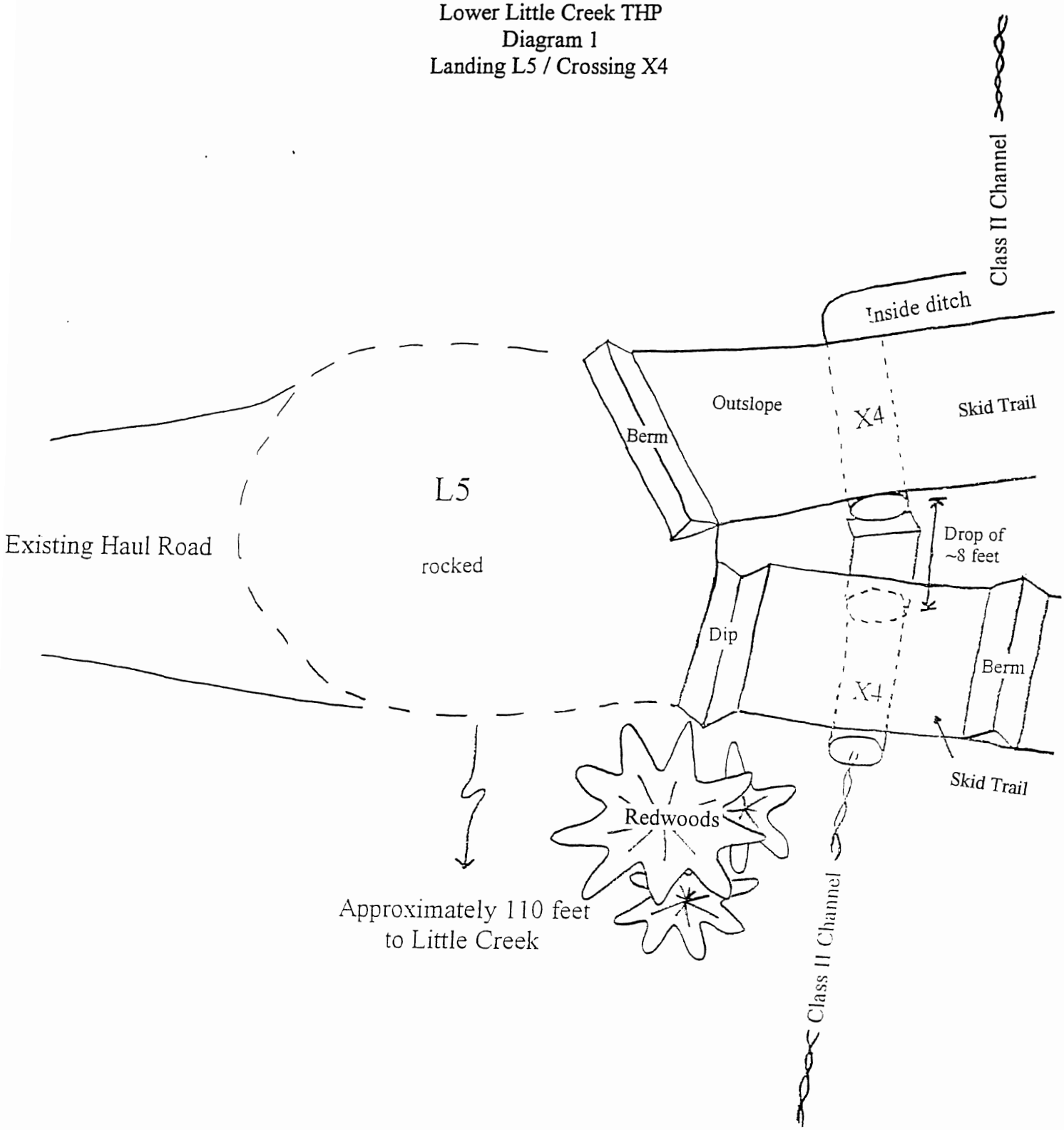


1000 0 1000 2000 3000 4000 5000 Feet

Moderate EHR
High EHR

BIG CREEK
Big Creek Forestry Department
3564 Highway 1
Davenport, CA
andym@big-creek.com

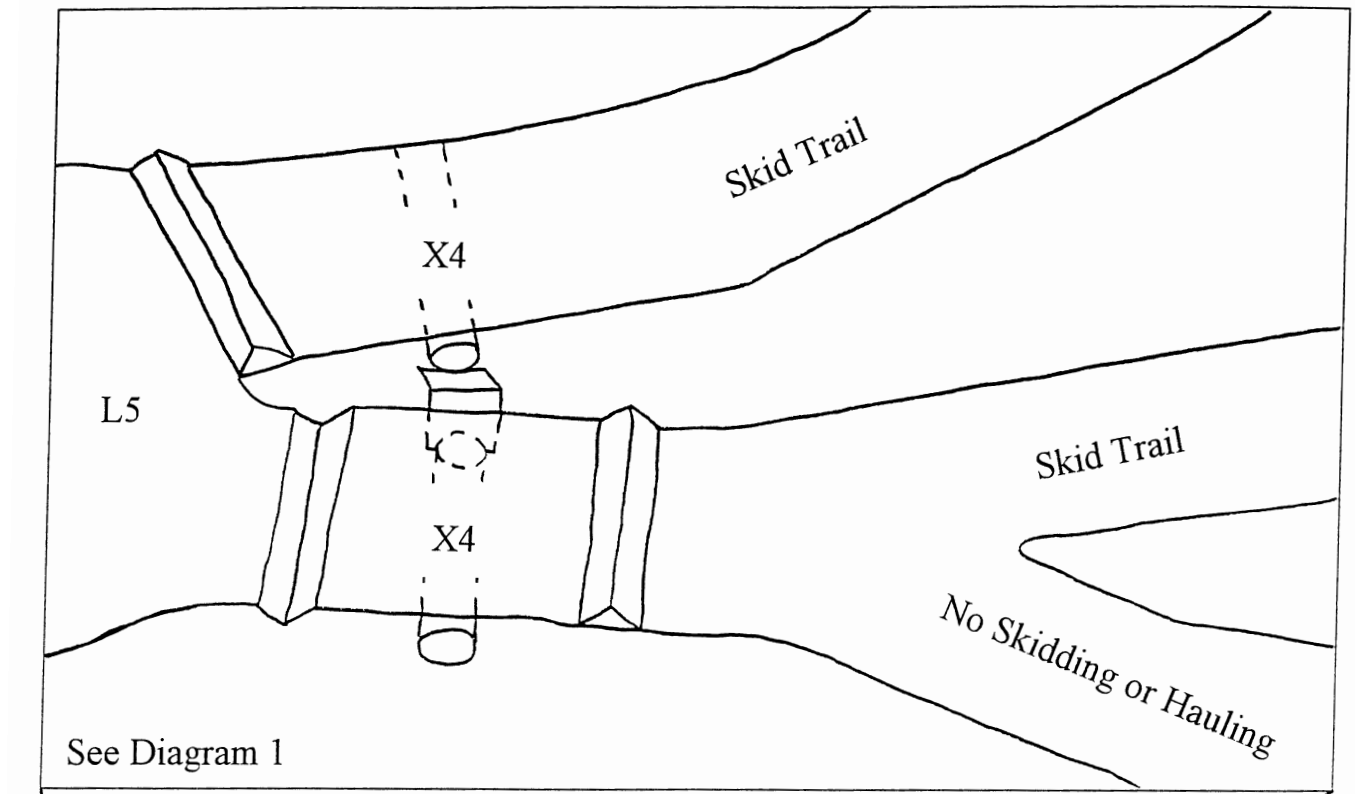
California Polytechnic State University Foundation
Lower Little Creek THP
Diagram 1
Landing L5 / Crossing X4

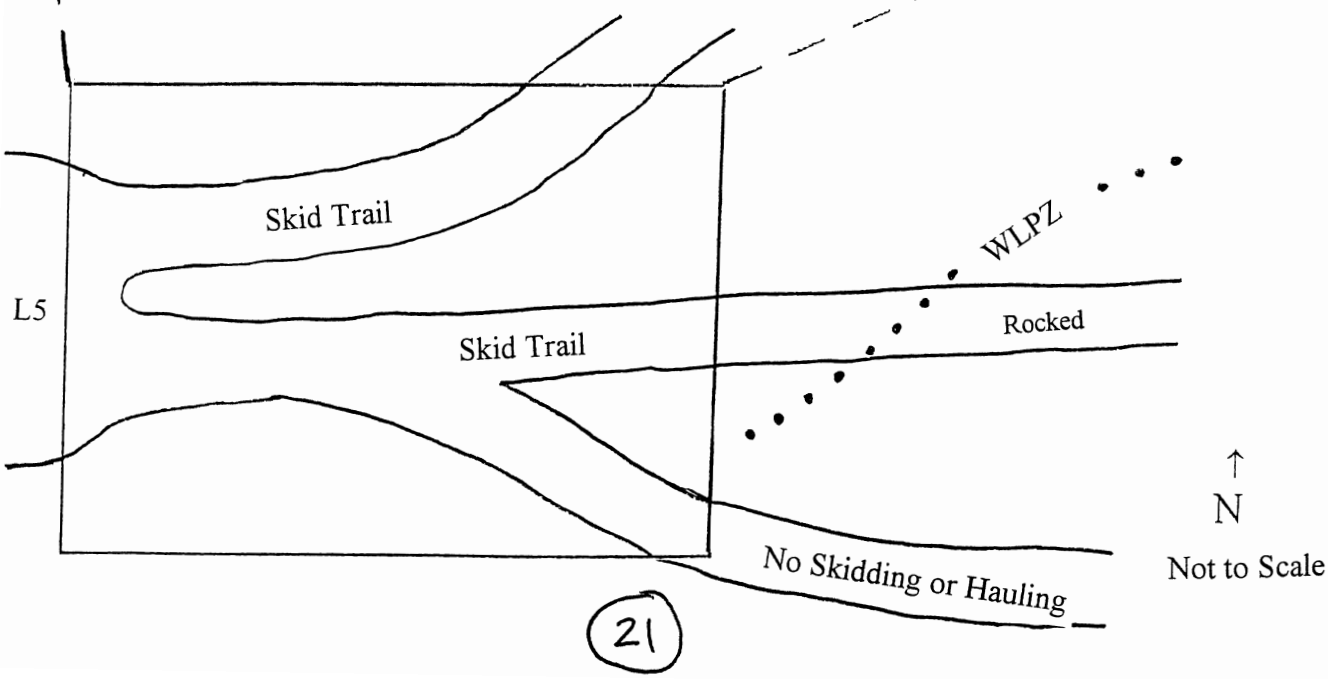


Not to Scale

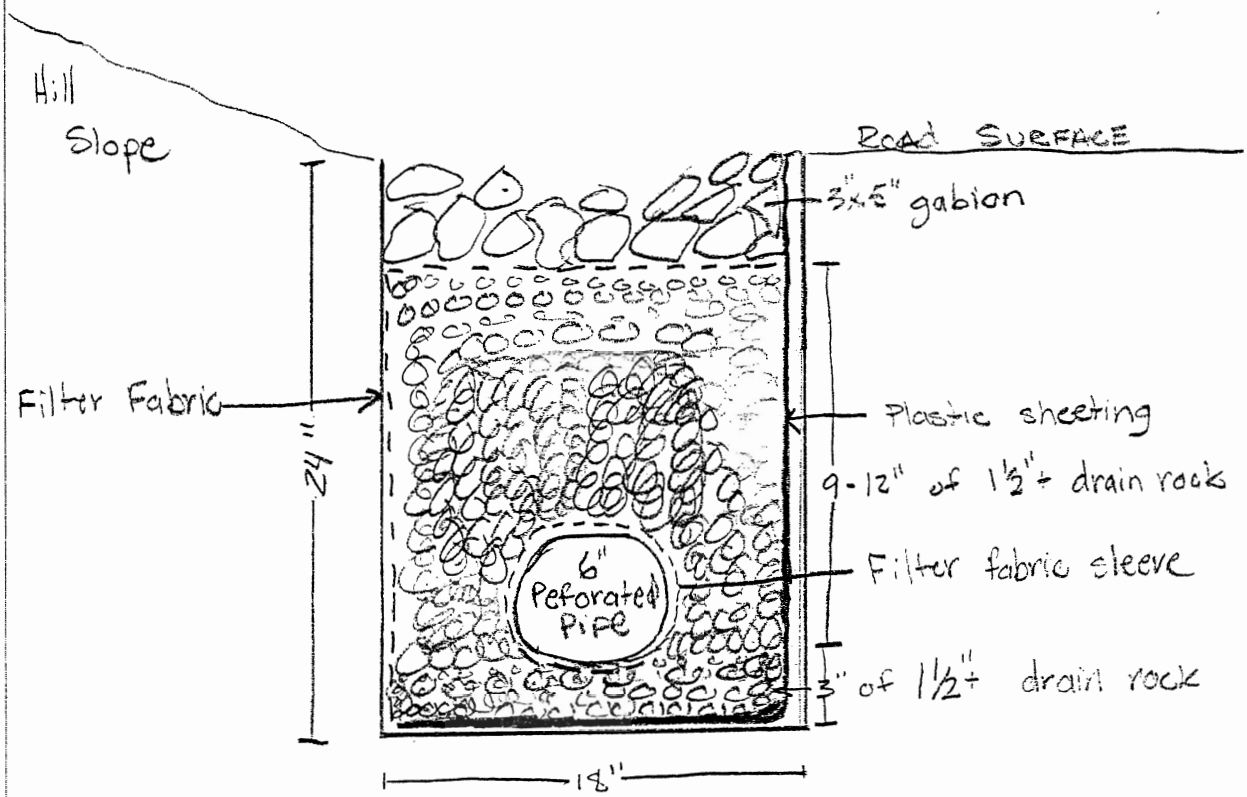
N

California Polytechnic State University Foundation
Lower Little Creek THP
Diagram 2
Skid Trails East of Landing L5





California Polytechnic State University Foundation
Lower Little Creek THP
Diagram 3
French Drain at Crossing X2



French Drain Construction:

- Dig Ditch 18W x 24D
- Line road edge and bottom of ditch with plastic
- Line hillslope side of ditch with filter fabric
- Place 3" of 1½" ± drain rock on top of plastic
- Lay 6" perforated pipe wrapped with filter fabric down length of ditch.
- Cover pipe with 9-12" of 1½"± drain rock.
- Wrap filter fabric over the top.
- Fill remaining ditch with 3"x5" gabion.

REGISTERED PROFESSIONAL FORESTER (RPF) RESPONSIBILITY ACKNOWLEDGEMENT

(As per Section 1035.1 Title 14, CCR)

RPF Certified to Provide Professional Advice:

Name: Steven R. Auten

Street Address/PO Box: 3564 Highway 1 City: Davenport Zip Code: 95017

Telephone Number: (831) 457-6387 RPF Number: 2734

Name: Wally Mark

Street Address/PO Box: 125 Swanton Road City: Davenport Zip Code: 95017

Telephone Number: (831) 427-1718 RPF Number: 1260

Name: Douglas Piirto

Street Address/PO Box: CalPoly, College of Agriculture City: San Luis Obispo Zip Code 2179

Telephone Number: (805) 756-1402 RPF Number 2179

As of January 1, 2001, I have read and understand my responsibility as RPF, as described under 14 CCR 10[illegible].1(a-g). I agree to fulfill my responsibilities as an RPF as they pertain to this plan.

[X] Yes [ ] No I have been retained as the RPF, available to provide professional advice to the li[illegible]nsed timber operator and timberland owner upon request throughout the active timber operations regarding: (1) the plan, (2) the forest practice rules, (3) and other associated regulations pertaining to timber operations.

RPF Signature: Douglas O. Piirto

RPF Signature: Walter R. Mark

RPF Signature: Steve R. Auten

PLAN SUBMITTER RESPONSIBILITY ACKNOWLEDGEMENT

(As per Section 1035 Title 14, CCR)

Plan Submitter

Name California Polytechnic State University Foundation

Street Address/PO Box: Foundation Administration Building 15 City: San Luis Obispo Zip Code: 9[illegible]407

Telephone Number: (805) 756-1402

As of January 1, 2001, I have read and understand my responsibilities as Plan Submitter as described under 14 CCR 1035. I certify that I have fulfilled my legal obligation as stated in the forest practice rules, and agree to fulfill my respon[illegible]bility as the plan submitter as it pertains to this plan.

[X] Yes [ ] No I have retained the services of an RPF to provide professional advice to the LTO ar[illegible] timberland owner upon request throughout active timber operations regarding: (1) the plan, (2) the forest practice rules, (3) and other associated regulations pertaining to timber operations.

[ ] Yes [X] No I have authorized the timberland owner, _____ to perform the services of a professional forester, understanding that the services will be provided personally o[illegible] lands owned by the timberland owner.

Plan Submitter Signature: Walter R. Mark

State of California
Department of Forestry and Fire Protection

(Administrative Use Only-Area _____)
(Plan No._____)
(Date Received_____)
(Amendment Number_____)

LICENSED TIMBER OPERATOR RESPONSIBILITY ACKNOWLEDGEMENT

(As per Section 1035.3 Title 14, CCR)

Harvesting Plan Number:_____

Licensed Timber Operator Information

Name: Big Creek Lumber Company

Street Address/PO Box: 3564 Highway 1 City: Davenport Zip Code: 95017

Telephone Number: (831) 457-5042 LTO Number: A 300

As the LTO listed above I acknowledge responsibility for the following:

1) Inform the responsible RPF or plan submitter orally or in writing of any site conditions which in The LTO's opinion prevent implementation of the approved plan and amendments.
2) Be responsible for the work of his or her employees and familiarize all employees with the intent and details of the operational and protection measures of the plan and amendments that apply to their work.
3) Keep a copy of the applicable approved plan and amendments available for reference at the site of active timber operations.
4) Comply with all provisions of the Act, Board rules and regulations and the applicable approved plan, and amendments.
5) Attend an on-site meeting or discuss archaeological site protection with the RPF or supervised designee familiar with on-site conditions.
6) To inquire of the plan submitter, timberland owner or their authorized agent, RPF who wrote the plan, or the supervised designee, if any mitigation measures or specific operating instructions are contained in the Confidential Archaeological Addendum or any other confidential addendum to the plan.
7) Provide the RPF responsible for professional advice throughout the timber operations, the name, address and phone number of an on-site contact employee authorized by the LTO to receive RPF advice.
8) Keep the RPF responsible for professional advice throughout the timber operations advised of the status of timber operation activity.
9) Within 5 days before, and not later than the startup of timber operations, notify the RPF of the start of timber operations.
10) Within 5 days before, and not later than the shutdown of a timber operation, the LTO shall notify the RPF of the shutdown of timber operations.
11) Cease operations, except for emergencies and operations needed to protect water quality, upon receipt of written notice of an RPF's withdrawal of professional services from the plan. The LTO shall not resume operations until written notice is received from the plan submitter that another RPF has visited the site and accepts responsibility for providing advice regarding the plan as the RPF of record.

In addition to the above, I have specific responsibilities for the following:_____

_____

_____

_____

I have read and understand my responsibilities as the Licensed Timber Operator summarized above and specifically described in 14 CCR 1035.3. I will fulfill my legal obligation as stated in the forest practice rules, and agree to fulfill my responsibilities as described above.

LTO Signature: Steven R. Austin Title: RPF # 2734 FOR BIG CREEK LUMBER LTO

Responsible On-Site Contact (if different)

Name:_____

Printed Name:_____ Date:_____

Street Address/PO Box #:_____City:_____ Zip:_____

Telephone Number:_____

For Department Use Only					
Notification Number:		Date Received		Date Completed	
Fee Enclosed?	☐ Yes $_____		☐ No_____		
Action Taken/Notes					

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME

NOTIFICATION OF LAKE OR STREAMBED ALTERATION

All fields must be completed unless otherwise indicated.
(See enclosures for instructions.)

Notification Type	
☑ Timber Harvesting Plan (No._____)	☐ Water Application (No._____)
☐ Commercial Gravel Extraction (No._____)	☐ Other

Application Information			
	Name	**Address**	**Telephone/FAX**
Applicant:	Big Creek Lumber Company	3564 Highway 1 Davenport, CA 95017	Business: (831) 457-6387 Fax:(831) 425-2872
Operator:	Big Creek Lumber Company	3564 Highway 1 Davenport, CA 95017	Business: (831) 457-6387 Fax: (831) 425-2872
Contractor: **(if known)**	Unknown		Business: Fax:
Contact Person: **(if not applicant)**	Big Creek Lumber Company ATTN: Steve Auten	3564 Highway 1 Davenport, CA 95017	Business: (831) 457-6387 Fax: (831) 425-2872
Property Owner:	California Polytechnic State University Foundation	Foundation Administration Building 15, San Luis Obispo, CA 93407	Business: (805) 756-1402 Fax:

Project Location				
Location Description:	Approximately 3 miles north of Davenport, CA			
County		**Assessor's Parcel Number**		
Santa Cruz County		057-121-07/10/14/22, 057-251-09, 057-151-03		
USGS Map	**Township**	**Range**	**Section**	**Latitude/Longitude**
Davenport, California	10 S	3 W	8,17,18,20	37*03' / 122*13'
Name of River, Stream, or Lake:	Little Creek			
Tributary To?	Scotts Creek			

NOTIFICATION OF LAKE OR STREAMBED ALTERATION
(Continued)

Name of Applicant: California Polytechnic State Univ. Found.

Project Description							
Project Name:	Lower Little Creek THP						
Start Date:	05/01/04	**Completion Date:**	05/01/07	**Project Cost:**	$ 5-500K	**Number of Stream Encroachments: (Timber Harvesting Plans Only)**	1
Describe project below: (Attach separate pages if necessary)							
See attached addendum.							
☑ Continued on separate page (s)							

Attachments/Enclosures		
Attach or enclose the required documents listed below and check the corresponding boxes.		
☑ Project Description	☑ Map showing project location, including distances and/or directions from nearest city or town	☑ Construction plans and drawings pertaining to the project
Completed CEQA documents:	☐ Notice of Exemption ☐ Negative Declaration ☐ Mitigated Negative Declaration ☐ Draft or Final Environmental Impact Report ☐ Notice of Determination	
Copies of applicable local, State, or federal permits, agreements, or other authorizations:	☐ Local. Describe:	
	☐ State. Describe: THP review in progress. CCRWQCB review in progress.	
	☐ Federal. Describe:	

I hereby certify that all information contained in this notification is true and correct and that I am authorized to sign this document. I understand that in the event this information is found to be untrue or incorrect, I may be subject to civil or criminal prosecution and the Department may consider this notification to be incomplete and/or cancel any Lake or Streambed Alteration Agreement issued pursuant to this notification. I understand that this notification is valid only for the project described herein and that I may be subject to civil or criminal prosecution for undertaking a project that differs from the one described herein, unless I have notified the Department of that project in accordance with Fish and Game Code Section 1602.

I understand that a Department representative may need to inspect the property where the project described herein will take place before issuing a Lake or Streambed Alteration Agreement pursuant to this notification. In the event the Department determines that a site inspection is necessary, I hereby authorize the Department to enter the property where the project described herein will take place to inspect the property at any reasonable time and certify that I am authorized to grant the Department permission to access the property.

☑ I request the Department to first contact me at (insert telephone number) (831) 457-6387 to schedule a date and time to enter the property where the project described herein will take place and understand that this may delay the Department's evaluation of the project described herein.

Steve R. Austin — Operator or Operator's Representative

3/12/04 — Date

Lake and Streambed Alteration Program

Project Questionnaire

Complete the following questionnaire and submit it with your notification package. Please attach or enclose any addional information or documents that support or relate to your response.

	Yes	Maybe/ Uncertain	No	Please explain if you responded "yes" or "maybe/uncertain"
1. Will the project or activity involve work on the bank of a river, stream, or lake?	✓			
2. If you answered "yes" to #1, will the project or activity involve any of the following:				
a. Removal of any vegetation?		✓		Insignificant removal of some vegetation may occur around the crossing.
b. Excavation of the bank?			✓	
c. Placement of piers?			✓	
d. Placement of bank protection or stabilization structures or materials (e.g., gabions, rip-rap, concrete slurry/sacks)?			✓	
3. Will the project or activity take place in, adjacent to, or near a river that has been designated as "wild and scenic" under state or federal law?			✓	
4. Will the project or activity involve work in the bed or channel of a river, stream, or lake?			✓	
5. Will the project or activity involve the placement of any permanent or temporary structure in a river, stream, or lake?			✓	

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	Yes	Maybe/ Uncertain	No	Please explain if you responded "yes" or "maybe/uncertain"
6. Will the project involve the use of material from a streambed?			✓	
7. Will the project or activity result in the disposal or deposition of debris, waste, or other material in a river, stream, or lake?			✓	
a. If you answered "yes" to #7, describe the material that will be disposed of or deposited in the river stream, or, lake:				
8. Will any type of equipment be used in a river, stream, or lake?			✓	
a. If you answered "yes" to #8, describe the type of equipment that will be used:				
9. Does the project or activity area flood or periodically become inundated with water?	✓			See attachment.
10. Will water need to be diverted from a river, stream, or lake for the project or activity?			✓	
11. If you answered "yes" to #10, please answer the following:				
a. Will this be a temporary diversion?				
b. Will water quality be affected by the deposition of silt, an increase in water temperature, a change in the pH level, or in some other way?				
c. Will the water be diverted by means of a dam, reservoir, or other water impoundment structure?				
12. Will the project or activity be done pursuant to a water right application or permit?			✓	
13. a. Has a wildlife assessment or study been completed for the area where or near where the project or activity will take place? (If "yes", attach or enclose a copy of the assessment or study.)	✓			See Timber Harvesting Plan.

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	Yes	Maybe/ Uncertain	No	Please explain if you responded "yes" or "maybe/uncertain"
14. Will the project or activity affect fish, amphibians, insects, or other aquatic resources?			✓	
15. Will the project or activity affect terrestrial wildlife?			✓	
16. Are any endangered or rare plant species thought or known to occur in the area where the proposed project or activity will take place?			✓	
17. Are any endangered or threatened fish, bird, or animal species thought or known to occur in the area where the proposed project or activity will take place?	✓			Steelhead, and possibly coho salmon, are thought to occur in Little Creek in the area of the bridge placement.
18. Have you contacted any other local, State, or federal agency regarding the project or activity?	✓			
a. If you answered "yes" to #18, please list the names of the agencies you have contacted:	California Department of Forestry and Fire Protection (CDF), Central Coast Regional Water Quality Control Board (CCRWQCB), Native American Historical Commission.			
19. Have you applied for or obtained any permit, agreement, or other authorization for your project or activity from any government agency?	✓			
a. If you answered "yes" to #19, please list the names or describe the permit, agreement, or authorization you have applied for or obtained:	Timber Harvesting Plan under review by CDF, Waiver of Waste Discharge Requirements applied for from CCRWQCB.			
20. Have any environmental documents pertaining to your project or activity been prepared?	✓			
a. If you answered "yes" to #20, please list the environmental documents that have been prepared:	Timber Harvesting Plan			

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I hereby certify that all information contained in this form is true and correct and that I am authorized to sign this document. I understand that in the event this information is found to be untrue or incorrect, I may be subject to civil or criminal prosecution and the Department may consider my notification to be incomplete and/or cancel any Lake or Streambed Alteration Agreement issued pursuant to my notification.

Steve R. Austin
Operator or Operator's Representative

3/12/04
Date

Lower Little Creek THP
Attachment to Department of Fish and Game 1602 Permit

The stream encroachment referenced in the Fish and Game 1602 permit application is described below.

Crossing X6

Crossing X6 is a truck road crossing of Little Creek using a railroad flatcar bridge. The soil abutment on the south side, or left bank, of the 54-foot rail car currently located at the crossing washed out during the high flow events of 1998. The south end of the bridge dropped several feet, where it came to rest near the water level. The bridge footings on both ends of the bridge are to be improved with redwood logs keyed in to the top of the banks. The new bridge will then rest on these logs. On the left bank, the redwood footer is to be approximately 15 feet back from the abrupt top of the bank. The 54-foot railcar that dropped into Little Creek in 1998 is to be removed and replaced with a 75-foot railcar.

The proposed changes to crossing X6 were developed by the RPFs and the land managers using the Engineering Geologic Review performed by Tim Best for guidance. The report by Mr. Best, Certified Engineering Geologist, is attached to this application.

For the logs to be used for the footer improvements, notches will be cut into one side of each log for the bridge to rest in. Each notched log will be placed and keyed in by a bulldozer. If logs need to be moved across the creek, they will be tight-lined across between two pieces of heavy equipment. The bridge will be brought in to the crossing location via the Little Creek road on the north side of the creek. The 54 foot-long bridge currently located at crossing X6 will be removed and taken out the Little Creek road to Swanton Road, where it can be loaded for transport.

Two bulldozers, one on each side of the creek, will be used to put the bridge into place. No heavy equipment will operate in the creek, nor will either one of the bulldozers walk across the creek without use of a bridge. Once the abutments are ready for use on both sides of the creek, the bridge will be tight-lined over the creek by the bulldozers and placed.

Because the ends of the bridge will be substantially set back from the banks of Little Creek, no bank armoring will be installed at the foot of the banks. While it is expected that flow will be present in Little Creek at the time of bridge improvement operations, no diversions or impoundments will be used, as heavy equipment and bridge materials will be approximately 10 feet above the water level.

TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY

1002 Columbia Street; Santa Cruz, CA 95060
(831) 425-5832 ■ Fax: (831) 425-5830 ■ e-mail: timbest@pacbell.net

March 1, 2004

Mr. Ryan Hilburn
Swanton Pacific Ranch
125 Swanton Road
Davenport, CA 95017

Job: SPR-LITTLE-331

SUBJECT: ENGINEERING GEOLOGIC REVIEW OF BRIDGE CROSSING X6: LOWER LITTLE CREEK THP

INTRODUCTION

As requested, on January 28, 2004, I made a site visit to review erosion and stability concerns at a partially washed out bridge crossing on Little Creek, a narrow steep walled tributary to Scott Creek. The southwest abutment to the bridge was reportedly undercut in 1998 by high stream flows causing the bridge to partially drop in to the channel. The purpose of this field review was to evaluate the geologic feasibility of reconstructing the bridge and to provide appropriate mitigative and erosion control measures.

GEOLOGIC CONDITIONS

The subject bridge site is located on Little Creek, a narrow, steep gradient perennial stream. The area is characterized by steep mountainous terrain that is fairly typical for the region. Little Creek is deeply incised into the landscape with steep (60% to 75+%) inner gorge slopes descending directly to the stream's edge. Regionally the terrain is consistent with shallow and deep-seated landslide processes (Cooper Clark and Associates, 1974). The area is vegetated with advanced second growth redwood, Douglas-fir and a scattered understory of hardwood and brush.

The subject site is underlain by Tertiary age Santa Cruz Mudstone described as medium to thick bedded siliceous mudstone and sandy siltstone that dips moderately (22 degrees) to the south west (Clark, 1981). Bedrock that is exposed in the steep channel bank and road cuts is consistent with this description. Where fresh, the bedrock is competent and able to form steep cuts. Thin alluvial terrace deposits are found intermittently along both sides of the steep walled stream. These deposits are variable and consist mainly of silt, sand, cobles and few boulders.

The subject site is located in a seismically active area of California. The active San Gregorio Fault is located , which is considered capable of generating a Moment Magnitude 7.3 earthquake with a 400-

year return interval (Petersen et al., 1996), is located about 2.5 miles west and off shore. The active San Andreas Fault is located 14 miles to the northeast and is capable of generating a Maximum Moment Magnitude 7.1 to 7.9 earthquake with a recurrence interval of 220 years (Petersen et al., 1996). This fault last ruptured in 1906. Peak ground acceleration with a 10% probability of exceedance in 50 years is reported to be 0.45g (USGS, 1996). High ground accelerations associated with fault rupture along either of these two fault systems is likely a contributing factor if not dominant for movement on many of the deep-seated landslides found in the area.

The regional landslide map by Cooper Clark and Associates (1974) identifies a questionable large-scale deep-seated landslide underlying the southwest side of the hillside at the bridge crossing. I was unable to confirm or negate the existence of this landslide. I did not observe any evidence of recent or active movement at the crossing and Ryan Hilburn (cal Poly) did not report any evidence of upslope slide movement, such as fresh scarps, leaning trees or open ground cracks. The potential risk from deep-seated instability at the bridge is probably low.

OBSERVATIONS

The existing bridge is a 54-foot long, 12 foot wide old railroad flat car that crosses Little Creek obliquely. At this site, Little Creek is a narrow, cobble and boulder bedded stream draining a roughly 1100 acre watershed. The active channel is 16 feet wide a naturally confined between the steep valley walls. Both bridge abutments appear to have been founded on remnants of old fluvial terrace deposits about 14 feet above channel bottom.

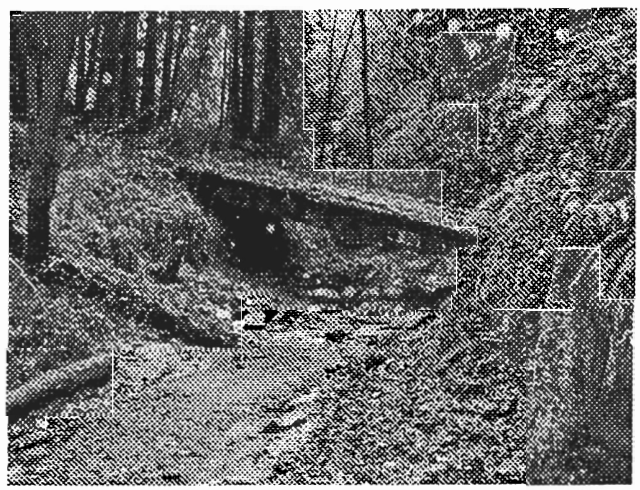


Photo 1: Looking upstream

At the crossing, the stream makes a slight bend to the right resulting in a steep channel bank along the outside edge of the bend. Upstream of the crossing relatively competent bedrock is exposed in the near vertical channel banks. However, at the crossing, the channel bank is comprised of old fluvial terraces deposits that are much more prone to erosion. During the 1998 El Nino storms, the southwest (left bank) abutment was undercut causing this end of the ridge to drop down.

Presently the channel too wide to reinstall the existing 54 long bridge without reconstructing the bridge abutment in the active stream channel, a costly endeavor. Therefore the best alternative will be to replace the 54 long bridge with a longer 75 long bridge that can adequately span the channel without encroaching into the stream. The bottom of the proposed bridge should be located a minimum of 10 feet above the channel, which based on field observations, should be well outside the 100-year flood elevation.

Both abutments are inherently at risk of being undermined by stream bank erosion during a large storm event. This is especially true if a log jam forms in the channel and diverts streamflow into the

banks. The use of a long span bridge will minimize the potential that future erosion will comprise the bridge footings. However, if additional protection is necessary then it should be possible to minimize the amount of erosion by armoring the channel banks with large diameter wood or riprap.

RECOMMENDATIONS

1. Replace the existing bridge with a 75 long rail car as shown on Figure 1.
2. The left bank abutment should be located a minimum of 15 back from the abrupt edge of the stream channel to minimize the potential of it being undercut.
3. Bridge shall utilize suitable footings. It is my understanding that Cal Polly has traditionally used buried wood logs for the bridge footings. Logs are generally adequate for temporary bridges but may suitable for a permanent crossing because they tend to rot out in time. For a permanent crossing a more permanent footing such as reinforced concrete blocks or piers is preferred. The RPF and/or landowner shall provide final design criteria of the bridge footings
4. For an added level of protection against future channel bank erosion that could undermine the bridge footing in time, the channel banks can be armored with rock rip rap or wood logs. Rock rip-rap will provide the greatest level of protection but is the most costly and will have the greatest environmental impact. Alternatively large logs can be placed and anchored against the channel bank. The decision to amour the channel bank is left up to the landowner and depended upon the level of long-term stability that is desired. Typical design criteria for rock rip rap and wood log channel bank protection is found in Appendix A.

Please give me a call if you have any further questions.

Sincerely,

Timothy C. Best
Certified Engineering Geologist #1682

REFERENCES

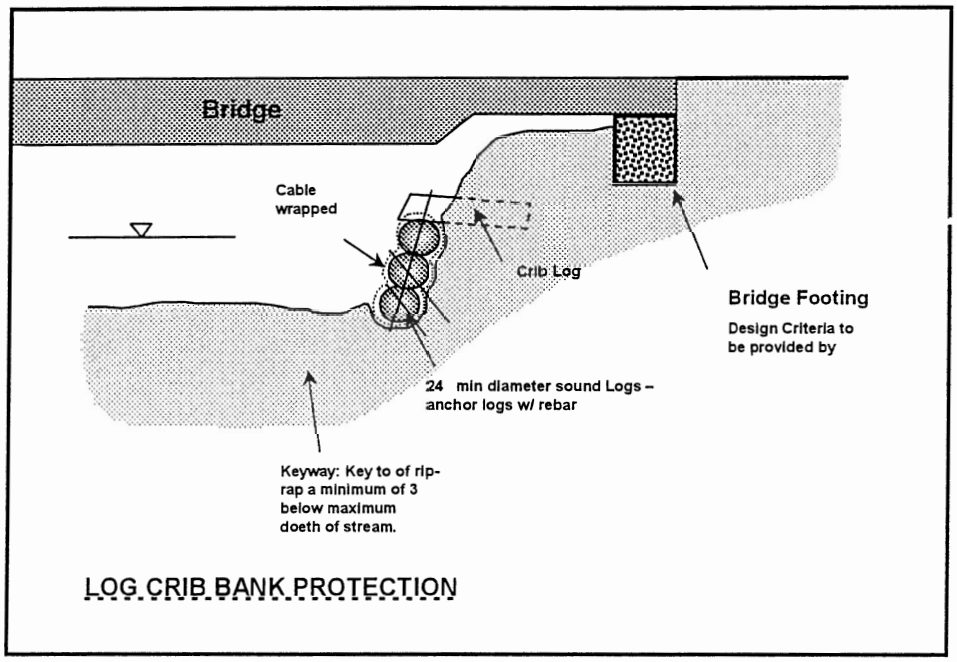
Clark, J.C., 1981, Stratigraphy, Paleontology, and Geology of the Central Santa Cruz Mountains, California Coast Range: USGS Professional Paper 1168, p. 51.

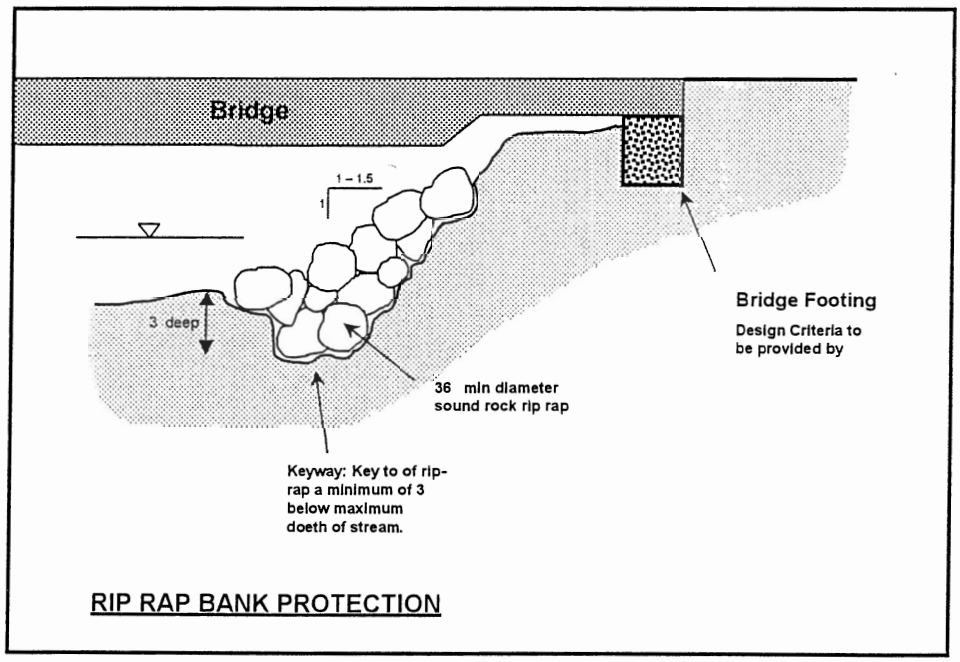
Cooper Clark and Associates, 1974, Preliminary Map of Landslide Deposits in Santa Cruz County, California, Santa Cruz County Planning Department, County Building, 701 Ocean Street, Santa Cruz, California 95060.

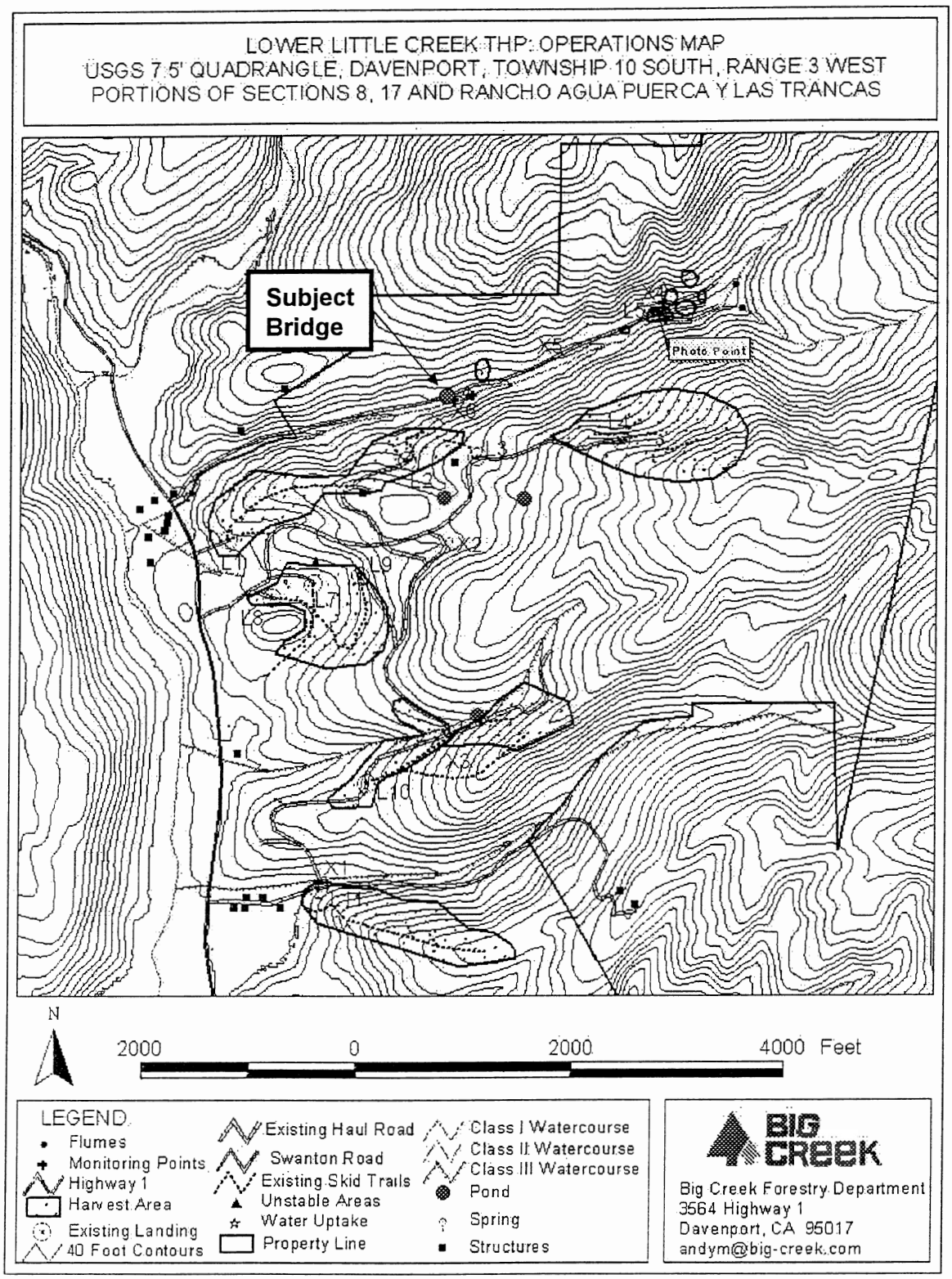
Petersen, M.D., Bryant, W.A., Cramer, C.H., Cao, T., Reichle, M.S., Frankel, A.D., Lienkaemper, J.J., McCrory, P.A., and Schwartz, D.P., 1996, Probabilistic Seismic Hazard Assessment for the State of California: California Department of Conservation, Division of Mines and Geology Open File Report 96-08; U.S. Geological Survey, Open File Report 96-706, p. 31.

USGS, 1996, USGS National Seismic Mapping Project, Web site http://geohazards.cr.usgs.gov/eq/html/genmap.html.

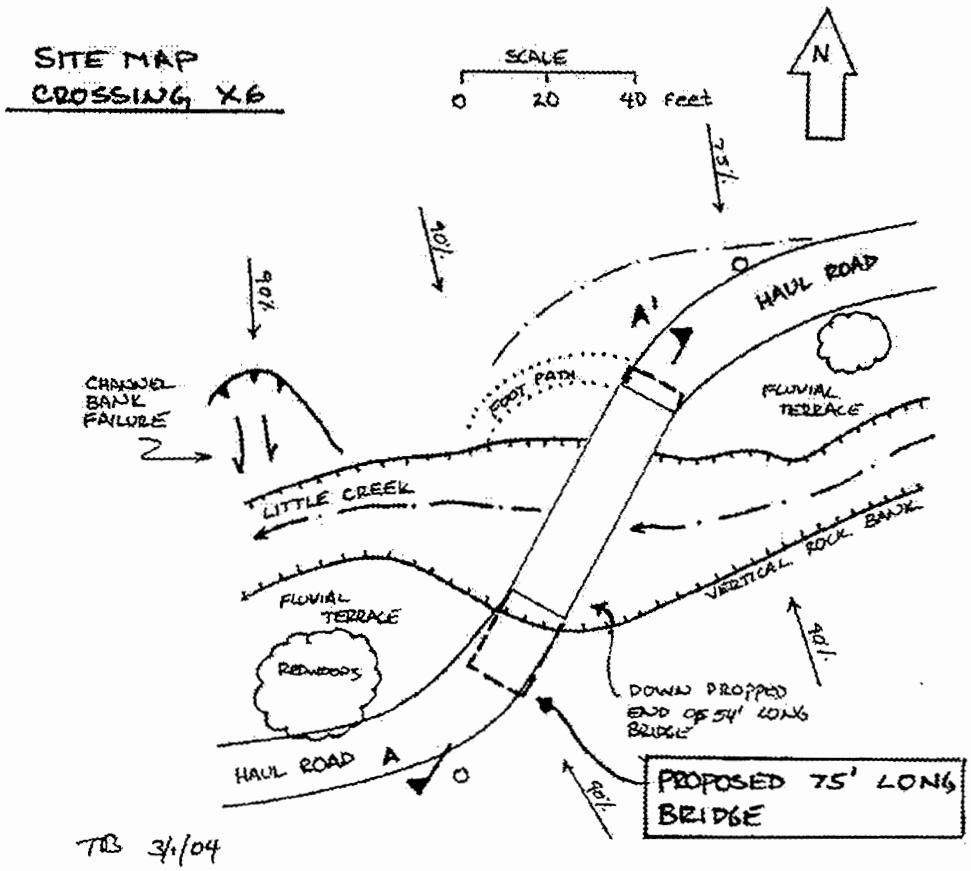
Schematic Bridge abutments and bank protection

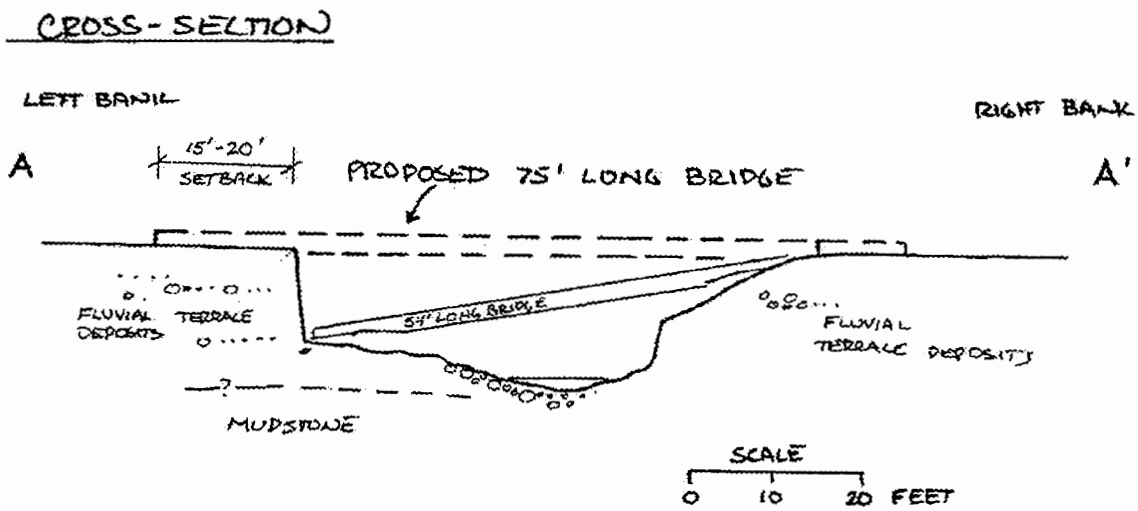




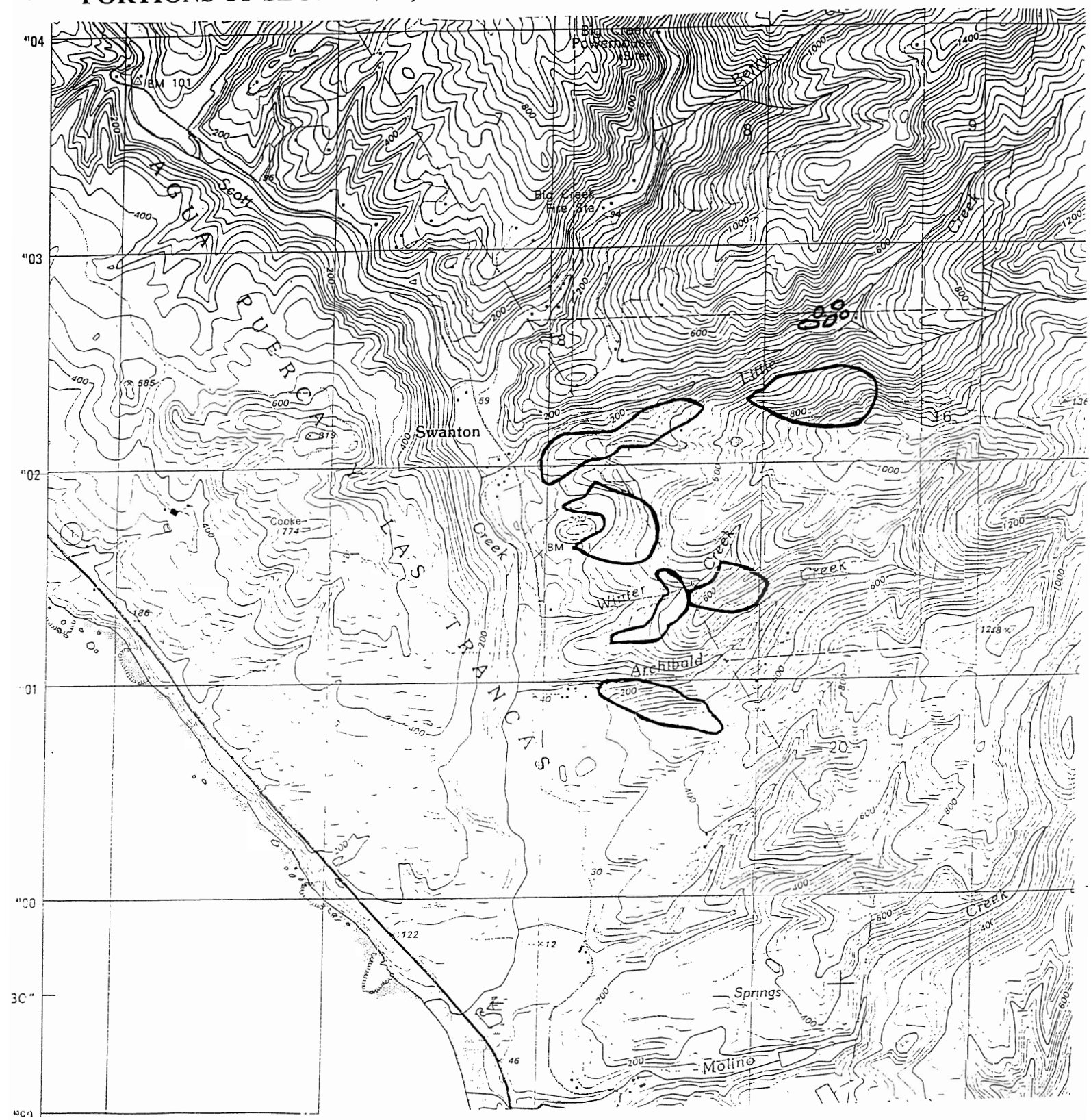


THP map from Swanton Pacific Ranch


SITE MAP
CROSSING X6
SCALE
0 20 40 feet
N
25%
10%
10%
HAUL ROAD
A'
CHANNEL BANK FAILURE
FOOT PATH
FLUVIAL TERRACE
LITTLE CREEK
VERTICAL ROCK BANK
FLUVIAL TERRACE
REDWOODS
40%
DOWN PROPPED END OF 54' LONG BRIDGE
HAUL ROAD A
40%
PROPOSED 75' LONG BRIDGE
TCB 3/1/04


CROSS-SECTION
LEFT BANK
RIGHT BANK
A
15'-20' SETBACK
PROPOSED 75' LONG BRIDGE
A'
FLUVIAL TERRACE DEPOSITS
54' LONG BRIDGE
FLUVIAL TERRACE DEPOSITS
MUDSTONE
SCALE
0 10 20 FEET

LOWER LITTLE CREEK THP: PROJECT LOCATION MAP
SANTA CRUZ COUNTY, TOWNSHIP 10 SOUTH, RANGE 3 WEST
PORTIONS OF SECTIONS 8, 17 AND RANCHO AGUA PUERCA Y LAS TRANCAS



DAVENPORT QUADRANGLE
CALIFORNIA-SANTA CRUZ CO.
7.5-MINUTE SERIES (TOPOGRAPHIC)

SCALE 1:24 000

1997

Harvest Boundary

MN
GN
0°30'
9 MILS
15½°
276 MILS

1 5 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

36.1

SECTION III – PLAN ADDENDUM

1034 jj. Property Description

Soils

Information obtained to determine soil distribution was taken from Santa Cruz County GIS Database. Soil characteristics were adopted from the 1979 USDA Soil Survey of Santa Cruz County, California. The Lower Little Creek THP has five different soil types within the THP area.

Ben Lomond-Catelli-Sur complex, 30-75 % slopes: 57 acres of project area
This soil is usually found on mountain ridegtops and drainageways from 400-3,000 feet, with a mean annual precipitation of 48 inches. It is made up of approximately 30% Ben Lomond sandy loam, 30% Catelli sandy loam, and 20% Sur stony sandy loam. The soil is moderately deep and well drained to excessively drained. It is formed on residuum derived from sandstone, quartz diorite, schist, or granitic rock with base rock at a depth of 35-46 inches. Permeability is moderately rapid and runoff is rapid to very rapid. These soils are used mainly for timber production, recreation, wildlife habitat, and watershed. The Ben Lomond soil is well suited to redwood and Douglas-fir production, the Catelli soil id somewhat well-suited, and the Sur soil is somewhat poorly suited.

Bonnydoon loam, 30-50% slopes: 4 acres of project area
This soil is mostly found on convex, south-facing slopes of hills and mountains. It is formed on residuum derived from sandstone, mudstone, or shale. Elevation ranges from 100-2,100 feet, and the mean annual precipitation is about 30 inches. The base rock, weathered sandstone is at a depth of 11 inches. Permeability is moderate and runoff is rapid. This soil is used mainly for range and home construction is very limited due to the prohibitive slope and depth of rock.

Santa Lucia shaly clay loam, 5-50% slopes: 31 acres of project area
This soil is found on hills and mountains with elevations ranging from 100-1,800 feet. It is formed on material weathered from siliceous shale and is well drained. The permeability is moderate with fractured shale at a depth of 38 inches. The mean annual precipitation is about 30 inches with 1.5 to 4.5 inches of available water capacity. Nearly all areas of this soil are rangeland with a few homesites.

Tierra-Watsonville complex, 15-50% slopes: 7 acres of project area
This soil consists of soils on alluvial and marine terraces with elevations ranging from 20-1,200 feet. The complex is approximately 55% Tierra sandy loam and 30% Watsonville loam. The Tierra soil is very deep and moderately well drained. It is formed on alluvium derived from sedimentary rock and the lower layers are clay and silty clay. Permeability of the Tierra soil is very slow with water perched above the clay at all times. The Watsonville soil is very deep and somewhat poorly drained. It also formed on alluvium derived from sedimentary rock but with lower layers of sandy clay loam. Permeability is very slow and roots can only penetrate below a depth of 10-20 inches

through cracks in the clay. The mean annual precipitation is approximately 28 inches. Runoff is rapid and small areas that periodically have not had vegetative cover are moderately eroded. This complex is used mostly for range; however, population growth has spurred encroaching development.

Maymen-Rock Outcrop Complex, 50-75% slopes: 3 acres of project area
This complex is approximately 45% Maymen stony loam and 25% rock outcrop. It occurs on ridges and steep slopes on mountains from 800 to 3,000 feet elevation. The rock outcrop consists of exposed sandstone, shale and granitic rock. The soil is shaly heavy loam about 8 inches thick and is somewhat excessively drained. It formed on material weathered from shale, sandstone, or granitic rock with unweathered fractured shale at a depth of 14 inches. The mean annual precipitation is approximately 48 inches. Permeability is moderate with very rapid runoff.

Topography

The topography of the project area is generally defined by three west trending drainages leading into Scotts Creek. The northernmost drainage contains Little Creek followed by Winters Creek approximately 2,500 feet to the south, and Archibald Creek another 1,200 feet south. Sideslopes leading into these watercourses are generally steep with average slopes exceeding 50%. Broad ridges exist between the drainages where most of the timber harvesting is proposed.

The published landslide deposit maps (Cooper-Clark and Associates, 1975) show several large landslide deposits through most of the project area. The subdued geomorphic features of these major landscape modifying landslides suggests they are very old, probably hundreds to thousands of years, and would be consistent with dormant young to dormant mature classification.

Vegetation and Stand Conditions

The vegetation on the project area is a typical redwood and Douglas-fir forest type for the Southern Sub-district in Santa Cruz County. The redwoods are generally near the class I, II, and III watercourses throughout the project area. Leaving the watercourses the stand transitions into a hardwood component with associated redwoods and Douglas-fir. Continuing further up the ridges, this mixed forest transitions into a chaparral and knobcone pine community outside of the harvest area. A planted stand of Monterey pine is present along the ridge between Little Creek and Winters Creek. A large amount of poison oak exists as ground cover in this area.

The original growth redwood was essentially clear-cut sometime between 1906 and 1922. The Douglas-fir was later clear-cut in the 1950's for a nearby box factory. Stand health is generally good for the redwood and Douglas-fir, however, pitch canker is present in the Monterey Pine.

Watershed and Stream Condition

Much of the watershed was logged by the San Vincente Lumber Company between 1906 and 1922. Several miles of railroad grade, including a trestle across Little Creek are part of the Little Creek watershed area. The logging technique at that time was clear-cut and burn, leaving the ground relatively un-vegetated. In the last ten years, 360 acres in the watershed have been selectively harvested.

Outside of the forested extent of the watershed, a small portion of the lowlands of the watershed are currently used for agriculture and are tilled and planted in row crops. Rangeland with seasonal cattle grazing covers approximately 1600 acres of the watershed. Ownership in the watershed is primarily made up of large landowners including Big Creek Lumber, RMC Lonestar, and California Polytechnic University (Swanton Pacific Ranch). The predominant land use in the watershed is timber production with simultaneous management for wildlife and watershed values. There is minimal residential development and rural development is primarily in the valley bottom with a few structures in the surrounding hills.

Little Creek has the following stream conditions:

> Small gravels are embedded in the stream channel with a lot of decomposed granite. There is still a lot of free 3-5 inch cobble of mostly mudstone and some granite in the channel. A moderate amount of pool filling is occurring on Little Creek. Pools will aggrade and blow out over a season a couple of times due to all the gravels and fines moving through the system. Aggrading is occurring behind debris jams and migration barriers. Generally, however, little creek is downcutting over time.
>
> Bank mass wasting is moderate to high along Little Creek. This is a function of the stream system having a lot of inner gorge topography There is a moderate to high amount of large woody Debris in the channel. The LWD is mostly comprised of alder and bay, and a little Redwood. There are numerous debris jams composed primarily of LWD. Stream side vegetation is high and comprised primarily of Alder.

Item #27a In-Lieu practices

Landing in the WLPZ (L5):

The in-lieu practice identified in Section II, Item #27a proposes to use a landing, Landing L5, within the boundaries of the class I WLPZ for Little Creek as well as the class II WLPZ for the watercourse crossed by crossing X4.

Protections afforded by the standard rule will be maintained under this proposed in-lieu practice because no impacts will occur to affect water temperature, large woody debris, upslope stability, bank and channel stabilization, and spawning and rearing habitats for salmonids. Further, filtration of organic and inorganic material and vegetation structure

diversity for wildlife habitat will be left intact because the use of this existing landing will avoid the need for construction of another landing. The ground which is proposed for placement of landing L5 is already flat and wide enough for use as a landing, with little vegetation. This ground was cleared and graded originally when the railroad went up Little Creek in the first two decades of the 20th century. Grading will be minimized because of the location of this landing in a flat area. Prior to the winter period in the year of operations, the proposed landing will be rocked as described in Section II Item #27.

This practice will cause no impacts to degrade the quality and beneficial uses of water. No part of this proposed in-lieu practice should create an opportunity for the timber operator to place, discharge, or dispose of, or deposit in such a manner as to permit to pass into the water of this state, any substances or materials, including, but not limited to, soil, silt, bark, slash, sawdust, or petroleum, in quantities deleterious to fish, wildlife, or the quality and beneficial uses of water, because the closest edge of the landing will be approximately 110 feet from Little Creek, across benchy ground. Drainage from the landing headed toward the class II watercourse will be intercepted by a dip to be installed prior to the winter period. This dip will drain onto a stable, vegetated area before water is allowed to find its way back into the class II watercourse. Per 14 CCR 916.3(b), any accidental depositions of soil or other debris in lakes or below the watercourse or lake transition line in water classed I, II, and IV shall be removed immediately after the deposition or as approved by the Director.

The movement of this landing to another location outside of the class I and II WLPZ would necessitate construction of a landing in an area with greater slopes and more complex vegetation development. Grading and ground disturbance would be required, and vegetation would be disturbed that might take a few years to return. Finally, skidding distances might be increased, depending on the landing location. This would surely have a greater potential for ground disturbance than under the current proposal.

In summary, this in-lieu practice provides protection equal to the standard rule while providing for the maintenance of the beneficial uses of water.

Skid Trail in the WLPZ (East of Landing L5):

The in-lieu practice identified in Section II, Item #27a proposes to use a skid trail within the boundaries of the class I WLPZ for Little Creek. An existing road is located here, and it is to be used for skidding. The road is located east of crossing X4, as a continuation of the road found at that crossing. (See Diagram 2 at the end of Section II. The road addressed here is shown on the Operations Map at the end of Section II as the middle road leading east of X4.) The skid trail is approximately 100 feet from the edge of the Class I at its closest point in the segment that is proposed of use as a skid trail. (Beyond the portion of the road proposed for use as a skid trail, the road gets closer to the creek and follows the north fork of Little Creek.) Another road runs roughly parallel to this one on a bench closer to the creek, but it is not proposed for any use associated with this harvest plan. The length of the skid trail within the WLPZ is approximately 300 feet. Currently the skid trail shows no signs of sediment transport to the Class I stream. Prior

to the winter period, all sections of this trail used for skidding logs and located in the WLPZ shall be waterbarred at a spacing for high EHR and drained to stable configurations, and rocked as described in Item #27.

Protections afforded by the standard rule will be maintained under this proposed in-lieu practice because no impacts will occur to affect water temperature, large woody debris, upslope stability, bank and channel stabilization, and spawning and rearing habitats for salmonids. Further, filtration of organic and inorganic material and vegetation structure diversity for wildlife habitat will be left intact because this road/skid trail is existing. A primary objective of the layout for this THP was to use existing infrastructure wherever possible. This ground has been successfully used as a road for decades. The waterbars and dips that will be installed in the road following use will be improvements on those currently present, and surface integrity will be further maintained here by rocking the road surface. U.S. Fish and Wildlife Service (USFWS) guidelines for protection of California red-legged frogs suggest that skid trails in the WLPZ be slash packed or straw mulched and seeded. In the case of this skid trail, however, it will be treated as a road in relation to red-legged frog guidelines, because it has historically been used as a road.

This practice will cause no impacts to degrade the quality and beneficial uses of water. No part of this proposed in-lieu practice should create an opportunity for the timber operator to place, discharge, or dispose of, or deposit in such a manner as to permit to pass into the water of this state, any substances or materials, including, but not limited to, soil, silt, bark, slash, sawdust, or petroleum, in quantities deleterious to fish, wildlife, or the quality and beneficial uses of water, because the skid trail will be waterbarred and rocked, and the downslope bench on which another road is located will intercept drainage. Drainage of this skid trail will not cause water to be concentrated and directed to Little Creek, but instead water will be allowed to percolate into the soil or dissipate into the area surrounding the existing road. Per 14 CCR 916.3(b), any accidental depositions of soil or other debris in lakes or below the watercourse or lake transition line in water classed I, II, and IV shall be removed immediately after the deposition or as approved by the Director.

If this trail were to go unused, consideration would then have to be given to longer, steeper skidding distances and/or the proposal of another landing. This would surely have a greater potential for ground disturbance than under the current proposal.

In summary, this in-lieu practice provides protection equal to the standard rule while providing for the maintenance of the beneficial uses of water.

Skid Trail in the WLPZ (South side of Winters Creek)

The in-lieu practice identified in Section II, Item #27a proposes to use a skid trail within the boundaries of the class II WLPZ for Winters Creek. An existing ranch access road is located on the south side of the creek, and it is to be used for skidding. This skid trail is approximately 60 feet from the watercourse. The length of the skid trail within the WLPZ is approximately 200 feet. Currently the road shows no signs of sediment

transport to the Class II. Prior to the winter period, the trail shall be waterbarred at a spacing for high EHR and drained to stable configurations, and seeded as described in Section II.

Protections afforded by the standard rule will be maintained under this proposed in-lieu practice because no impacts will occur to affect water temperature, large woody debris, upslope stability, bank and channel stabilization, and spawning and rearing habitats for salmonids. Further, filtration of organic and inorganic material and vegetation structure diversity for wildlife habitat will be left intact because this infrastructure is existing. A primary objective of the layout for this THP was to use existing infrastructure wherever possible. This ground has been successfully used as a road (and probably skid trail) by current and previous landowners. Little to no grading or blade work will be necessary to use this road as a skid trail. The waterbars that will be installed in the road following use will be improvements on those currently present, and surface integrity will be further maintained here by seeding the skid trail surface. All segments of this ranch access road in the WLPZ that are used for skidding shall be seeded at a rate of 35 lbs. per acre. Further treatment of this skid trail (as suggested by the U.S. Fish and Wildlife Service California red-legged frog guidelines) would not be appropriate, as slash packing or straw mulching would make the road impassable for management traffic, or for fire suppression equipment using the road for wildland access. The abundance of leaf litter that is currently being deposited on this road will effectively mulch the surface following operations.

This practice will cause no impacts to degrade the quality and beneficial uses of water. No part of this proposed in-lieu practice should create an opportunity for the timber operator to place, discharge, or dispose of, or deposit in such a manner as to permit to pass into the water of this state, any substances or materials, including, but not limited to, soil, silt, bark, slash, sawdust, or petroleum, in quantities deleterious to fish, wildlife, or the quality and beneficial uses of water, because the skid trail will be waterbarred and slash packed, seeded, and/or straw mulched. Per 14 CCR 916.3(b), any accidental depositions of soil or other debris in lakes or below the watercourse or lake transition line in water classed I, II, and IV shall be removed immediately after the deposition or as approved by the Director.

If this trail were to go unused, consideration would then have to be given to longer, steeper skidding distances and/or the construction of an additional, redundant skid trail. This would surely have a greater potential for ground disturbance than under the current proposal.

In summary, this in-lieu practice provides protection equal to the standard rule while providing for the maintenance of the beneficial uses of water.

ITEM #32 Biological Resources

Scoping

The scoping process for the THP involved the identification of species and habitats that

may be impacted by the project. The following sources were used to help identify these species and habitats.

1. CDF&G Natural Diversity Database and related overlay maps, dated April 2001 (listed plants, animals, and terrestrial natural communities).
2. The Cal Flora website was used to identify habitat types where plant species of concern, state listed, or federally listed might be located. The website address is http://www.calflora.org/.
3. The California Native Plant Society website was used to assist in identification of habitat types where plant species of concern, state listed, or federally listed might be located. The website address is http://cnps.org/
4. California's Wildlife Volume I and II Amphibians and Reptiles and Birds. From the Department of Fish and Game.
5. National Audobon Society Field Guide to North American Reptiles and Amphibians. Behler and King. 1996.
6. The Rare and Endangered Plants of San Mateo and Santa Clara County. Toni Corelli and Zoe Chandik. 1995

Natural Diversity Database Maps (NDDB) were reviewed within five miles of the project area. The maps used were dated April 2001 and included all recorded element occurrences of state or federally listed species and any species found on the CNPS list. Although the NDDB is a positive find database only, it is a helpful means of determining the types of habitats and potential species to look for in the project area. The following species were found on the NDDB maps within five miles of the project area.

FISH

Coho Salmon (*Oncorhychus kisutch*) Central California Evolutionary Significant Unit
Coho salmon are listed as threatened under the ESA and endangered under the California ESA. Streams must have cool water with sufficient dissolved oxygen as well as riparian canopy cover to support coho salmon. Spawning habitat must also include pools and beds of loose, silt-free, coarse gravel. Coho are found in the lower 6 miles of Scotts Creek (.15 miles from the harvest area), Waddell Creek (3.5 miles from the harvest area), and the lower reaches of Mill Creek (1.3 miles from the harvest area) and Big Creek (.3 miles from the harvest area).

Scotts Creek is the southernmost drainage with a self-sustaining population of coho salmon. Due to the rigid 3-year lifecycle that coho exhibits, years of hardship (such as drought or flood years) can eliminate an entire age class of fish. Hatchery stock are routinely planted to augment the naturally occurring population. One class I (Little Creek) and two class III tributaries (Winter Creek and Archibald Creek) feed Scotts Creek from the Swanton Pacific Ranch. The following proposed mitigations shall ensure protection of the downstream coho salmon habitat.

1. Canopy retention standards as discussed under Item #27 of the THP.
2. Limitations on use of heavy equipment in the WLPZ as discussed under Item #27 of the THP.

3. Treatment of roads, skid trails, and landings near watercourses as discussed under Item #27 of the THP.
4. Soil stabilization as discussed under Item #18 of the THP.
5. Winter operating restrictions as discussed under Item #23 of the THP.

Steelhead (*Oncorhychus mykiss irideus*) Central California Evolutionary Significant Unit
Steelhead are listed as threatened under the ESA. Steelhead are able to use steeper, faster habitats than coho, and can also use warmer stream habitats if fast-water riffles are present as feeding areas. Summer lagoons and some seasonal on-channel ponds can provide important rearing habitat if water temperatures are not too warm and food is abundant. Poor access and reduced stream flows temporarily reduce abundance during droughts, but populations generally rebound quickly because of flexible freshwater and ocean life history. Steelhead are present in moderate numbers in the lower 6 miles of Scotts Creek, Waddell Creek, and the lower reaches of Mill Creek and Big Creek.

Historically Scotts Creek has had a large steelhead run. One class I (Little Creek) and two class III tributaries (Winter Creek and Archibald Creek) feed Scotts Creek from the Swanton Pacific Ranch. Little Creek receives some use by steelhead, though a barrier to fish migration is found approximately 3000 feet above the confluence of Little Creek and Scotts Creek. Above this barrier, resident populations of rainbow trout can be found.

The mitigations set forth for coho salmon will protect steelhead habitat as well. Protection measures include canopy retention standards along creeks, no timber operations in the channel zone, trash packing many skid trails, and adequate erosion control structures on roads.

Tidewater Goby (*Eucyclogobius newberryi*)
The tidewater goby is a very small fish, (< 2 inches) which occurs in shallow brackish water along Pacific coastal streams and lagoons. This fish avoids strong stream flow and tidal action, and heavily depends on summer sandbar formation to produce calm water conditions for summer breeding. If sandbars fail to form in a given year, the "annual" summertime population explosion does not occur.

Gobies are tolerant of a wide range of salinities (fresh to hypersaline), temperatures and dissolved oxygen conditions, but can be lost from lagoons without backwater habitats to serve as winter high flow refuges. If a populations is lost from a particular stream due to severe flood or drought impacts, it may reestablish from adjacent, more secure populations. The tidewater goby is listed as threatened under the ESA.

Tidewater goby has been identified at the mouth of Waddell Creek (3.5 miles northwest of the harvest area) and Scotts Creek (.1 mile west of the harvest area). Gobies from Scotts Creek were reintroduced to Waddell Creek in 1991, after the species was eliminated in that location by high winter flows. Several tributaries flow either through or adjacent to the harvest area and empty into Scotts Creek. No goby habitat is present in the harvest area. The mitigations set forth for coho salmon will protect tidewater goby habitat as well. Protection measures include canopy retention standards along creeks, no

timber operations in the channel zone, trash packing many skid trails, and adequate erosion control structures on roads.

North Central Coast Stream
Scotts and Waddell Creek possibly have additional native fish species present including: Pacific lamprey (*Lampetra tridentate*), Sacramento sucker (*Catostomus occidentalis*), California roach (*Hesperoleucus symmetricus*), Speckled dace (*Rhinichthys osculus*), Threespine stickleback (*Gasterosteus aculeatus*), and Sculpin spp.(*Cottus spp.*) These small fish, if present, are threatened mainly by exotic fish species and dewatering of the stream due to water diversions. Habitat for these species is not present on the project area and proposed operation will not have a negative impact on downstream habitat.

Fish species coho salmon and steelhead trout are also addressed in Section II, Item #32.

MAMMAL

Townsend's western big-eared bat (Corynorhinus townsendii townsendii)
The big-eared bat is listed as a California species of special concern. It occurs in a variety of communities, including coastal conifer forests, broad-leaf forests and oak woodlands in northern and central California. Roosting sites include caves, tunnels, buildings, and other human-made structures. These bats are highly susceptible to disturbance by humans and a single visit can cause them to abandon a roost. This species is not known to roost in the vicinity of the harvest area and suitable roosting habitat has not been found in the harvest area. Wildlife tree and snag recruitment measures as outlined in Section II, Item #14 may encourage development of suitable habitat for these mammals.

INSECT

Monarch Butterfly (*Danaus plexippus*)
Monarch butterflies migrate in groups to winter ranges south of the freeze line. They require dense tree cover for overwintering and are intolerant to frost. Winter roost sites are located along the coast in wind-protected groves of eucalyptus, Monterey pine, and cypress with nectar and water sources nearby. Autumnal sites are located 1.9 and 2.8 miles south of the harvest area near Davenport. The cluster trees in these locations, as identified on NDDB maps, are Monterey cypress (*Cupressus macrocarpa*) and blue gum eucalyptus (*Eucalyptus globulus*). Habitat is present although there are no confirmed roosts 2.1 miles northwest of the harvest area, just south of Waddell Creek, in a native Monterey pine stand above the Big Creek sawmill. Breeding habitat is greatly dependent upon the presence of milkweeds (*Asclepiad*) flora. Suitable groves do not exist within the harvest area and monarch butterlfy habitat will not be affected by the proposed operations.

AMPHIBIANS

California Red-legged Frog (*Rana aurora draytoni*)

The California red-legged frog is listed as threatened under the ESA. Red-legged frogs require aquatic habitat for breeding but also use a variety of other habitat types including riparian corridors and foothills in or near a permanent water source. Adults utilize ponds, marshes, and low gradient streams with deep pools or backwater for breeding. Riparian areas including vegetated creek banks, and streamside corridors with maples, alders, willows, ferns, and woody debris provide refuge from predators. Some individuals make overland excursions through upland habitat during periods of mild wet weather. These overland movements occur at night, usually during or following rains.

California red-legged frogs are relatively prolific breeders, usually laying egg masses during or shortly following large rainfall events from late December to early April. The larval stage requires 11-20 weeks of permanent water for development. They are usually absent from permanent ponds and streams with predatory fish and bullfrogs. They may migrate more than 1 mile to and from breeding habitats, which appear to limit the abundance of frogs in many coastal watersheds. Artificial (farm) ponds are potentially very valuable habitats, if fish and bullfrogs are absent.

Three stock ponds and one defunct swimming pool in close proximity to the harvest area provide breeding and/or summer habitat for this taxa. These locations are shown on the NDDB maps and overlap the harvest area. For the purposes of this harvest, red-legged frogs are considered present and the guidelines below will be followed to ensure their protection. These mitigations shall ensure protection of the red-legged frog by limiting operations near watercourses, installing erosion control measures that minimize sediment movement into aquatic habitat, and terminating operations following the first winter storm event.

Red-legged frogs are also present in 25 locations within 5 miles of the harvest area. There are 11 locations to the west: 0.5, 0.6, 0.7, 1.0, 1.0, 1.0, 1.2, 1.3, 1.3, 1.6, and 2.3 miles from the harvest area; 8 locations to the south: 0.8, 1.1, 1.1, 1.2, 1.5, 1.7 3.3, and 4.5 miles from the harvest area; and 2 locations to the east: 2.1 and 2.2 miles from the harvest area. These locations include the lower ½ mile of Scotts Creek and Waddell Creek, small pools of perennial streams, stock ponds, or reservoirs used for irrigating nearby crops. Threats to the species at these locations include dewatering during critical periods, agricultural activities, and traffic.

To ensure protection of this species, the following measures shall be adhered to during harvesting operations (measures are adapted from the interim guidelines established by the USFWS in 1996 for protection of the California red-legged frog):

1. All road, skid trail, and landing construction shall occur prior to the start of the wet season (*see below for the definition of the wet season)
2. All ground based yarding and skidding activities shall occur prior to the onset of the wet season
3. During the wet season, hauling and loading of logs shall occur during daylight hours only

4. All segments of skid trail in the WLPZ shall be packed with slash, or seeded at a rate of 35 lbs. per acre and straw mulched to a depth of 3 inches
5. All segments of road in the WLPZ shall be rocked or seeded at a rate of 35 lb. per acre and straw mulched to a depth of 3 inches
6. Trees shall be felled away from riparian habitat including springs, seeps, bogs, and other wet areas of saturated ground
   (*For purposes of protection of red-legged frogs, the wet season begins with the first frontal system that results in at least ¼ inch of precipitation after October 1 and extends through April 15)

California Tiger Salamander (*Ambystoma californiense*)
The California Tiger Salamander is a California species of special concern. The species is proposed for listing as threatened under the ESA for the extent of its range not previously listed as a distinct population segment. The tiger salamander breeds primarily in vernal (seasonal) pools and small, fishless ponds (including farm ponds). The salamanders remain upland in rodent burrows for most of the year and emerge in winter of wetter years to breed (mostly a single breeding attempt). The aquatic larvae complete metamorphosis in 10 weeks and juvenile salamanders migrate to subterranean refugia where they remain until they reach sexual maturity. Tiger salamanders often take 6 years to reach sexual maturity.

Many populations have been eliminated by development and/or by introduction of predatory fish to permanent ponds, resulting in either a lack of breeding or suitable upland habitat. Several ponds are present outside of the harvest area on the Swanton Pacific Ranch. The ponds are possible breeding habitat although no tiger salamanders have been identified. Tiger salamanders are known to occur within the Pajaro River watershed in southern Santa Cruz County. Most existing populations are likely isolated from one another. These salamanders migrate 0.5 miles or more; however, dispersal is limited by physical barriers such as roads, railways, pipelines, and canals. The habitat is fragmented and it is unlikely that the species will occupy the vicinity in future. The proposed harvest will not significantly alter the ponds or upland habitat available.

Santa Cruz Black Salmander (*Aneides flavipunctatus*)
The black salamander is thought to be scarce in the Santa Cruz Mountains and has no official listing status. It is a lungless salamander that lays its eggs in moist habitats on land in summer. They are most often found under rocks and logs in relatively moist habitats (riparian woodlands, mixed evergreen and conifer forests). No large woody debris will be removed as part of the proposed timber harvest and available habitat will remain.

REPTILES

Western Pond Turtle (*Clemmys marmorata*)
The Western pond turtle is a CDF&G species of special concern. Western pond turtle most frequently inhabit streams, rivers, and sloughs. They avoid fast moving shallow

water and prefer concentrated pools and backwater areas. Western pond turtle has been identified on NDDB maps at a "Turtle Pond" on Waddell Creek, 3.5 miles from the harvest area. The nesting season occurs from April-August. Nests may be more than ¼ mile from water in upland locations. There are no known recorded findings of Western pond turtle along Scotts Creek. The stock ponds on Swanton Pacific Ranch could provide suitable habitat for the Western pond turtle. Turtles are uncommon in heavily shaded areas and harvesting operations will not diminish potential turtle habitat.

NOTE: The following threatened species was queried solely based on California Wildlife Habitat Relationships Version 8.0 (CWHR). It should be recognized that this program provides only a general list of species that might be found in the project location as opposed to NDDB, which bases queries specifically on known locations of rare, threatened, or endangered species. Other listed species were queried, but following further analysis, these species were excluded from the final assessment due to specified range or habitat dynamics restrictions. See Section III under Item #32 for further explanation of CWHR method. A list of the initial species queried including habitat importance ratings using the CWHR version 8.0 can be found in Section V.

Rubber Boa (*Charina bottae*)
The rubber boa snake is listed as threatened under the California ESA. Food consists primarily of small mammals and lizards. Found in montane forests habitats including red fir, ponderosa pine, hardwood, hardwood-conifer, Douglas-fir, redwood, mixed conifer and riparian. Also found in montane chaparral and wet meadow habitat. Considered an extremely secretive snake seeking cover in rotting logs, pieces of bark, boards, rocks, and other surface debris. The boa burrows through loose soil or decaying vegetation. Usually found in the vicinity of streams or wet meadows or within or under surface objects with good moisture-relating properties such as rotting logs. The snake's activity is crepuscular and nocturnal. No snags or large woody debris of any kind is proposed for removal as apart of the proposed plan. It is expected that no impact will occur to the Rubber Boa.

BIRDS

Western Snowy Plover (*Charadrius alexandrinus nivosus*)
The Western snowy plover is listed as threatened under the ESA. This shorebird utilizes sandy marine and estuarine shores, not present in project area. The western snowy plover nests in coastal sand dunes, and it is speculated that recreational use of these habitats has contributed to the reduction of these plovers. Nest sites are identified on NDDB maps 0.8 miles southwest of the harvest area, along the coast, and 3.4 miles northwest of the harvest area at the mouth of Waddell Creek. Proposed operations will not affect black rail habitat.

California Black Rail (*Laterallus jamaicensis coturniculus*)
The California black rail is listed as threatened under the California ESA. This bird requires saltwater and freshwater wetland habitat, not present in project area. The black rail is identified on NDDB maps 3.4 miles northwest of the project area in the Waddell

Creek brackish water lagoon and adjacent freshwater pond. No salt or fresh water marsh habitat is present in the project area. Proposed operations will not affect black rail habitat.

Bank Swallow (*Riparia riparia*)
The bank swallow is listed as threatened under the California ESA. This bird requires vertical banks or cliffs with fine textured, sandy soils near streams, ponds or the ocean. Vertical banks are found in the harvest area, along Lower Little Creek; however, the material is not conducive to nest hole digging. Bank swallows have not been located on NDDB maps within 5 miles of the project area. The closest nest colony is in sand dunes at Point Ano Nuevo. Bank swallow habitat will not be disturbed by the proposed operations.

Black Swift (*Cypseloides niger*)
The black swift is not listed federally or by the state of California. This bird arrives in the local area in mid-May for nesting. It breeds in small colonies on cliffs, deep canyons and coastal bluffs above surf. Nest sites are identified on the coast 1.6, 1.7, 2, and 5.5 miles from the project area by NDDB maps. The nests are constructed of entermorpha algae. No coastal habitat is present in the harvest area. Proposed operations will not affect black swift habitat.

Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)
The saltmarsh common yellowthroat occurs in fresh and slat water marshes in the San Francisco Bay Area. Habitat requirements include thick, continuous cover down to the water's edge for foraging, tall grasses, tule patches, and willows for nesting. The yellowthroat is not listed federally or by the state of California. Habitat for these birds exits 0.7 miles for the harvest area in the brackish marsh at the mouth of Scotts Creek. No suitable habitat exists in the harvest area.

Tricolored blackbird (*Agelaius tricolor*)
The tricolored blackbird is not listed federally or by the state of California. These birds congregate in colonies where there is open water, protected nesting substrate, and nearby foraging. There are blackbird nests in the lower Scotts Creek area. The pond habitat present in close proximity to the harvest area is not adequate blackbird habitat. Proposed operation will not affect the tricolored blackbird.

TERRESTRIAL NATURAL COMMUNITIES

Monterey Pine Forest
Monterey Pine Forest is a vegetation type that occurs on the California coastline in San Mateo, Santa Cruz, Monterey, and San Luis Obispo Counties. The Monterey pine forest is present in the fog belt, from the coastline, extending inland to the foothills. This forest type in composed of Monterey Pine (*Pinus radiata*) in association with Douglas-fir (*Pseudotsuga menziesii*) and grassland, with knobcone pine (*Pinus attenuata*) introgression on ridges. Stands of Monterey pine forest are located on NDDB maps approximately 1.5 and 3.8 miles northwest of the harvest area, from north of Ano Nuevo

to north of Waddell Creek and from south of Waddell Creek to Big Creek. These groves are generally more dense and vigorous with less herb understory than similar stands on the Monterey Peninsula. These essentially pure stands will not be affected by the proposed harvesting operations. Scattered individual and planted Monterey pines occur on Swanton Pacific Ranch and are discussed below.

Northern Interior Cypress Forest

1 Northern Interior cypress forest grove is shown on NDDB maps approximately 3.2 miles east of the harvest area in Bonny Doon. This forest type includes Santa Cruz cypress (*Cupressus abramsiana*) in association with knobcone pine (*Pinus attenuata*) and Ben Lomond wallflower (*Erysimum teretifolium*). Habitat exists on pockets of sandy soil on Miocene vaqueros sandstone. The neighboring plant community is northern maritime chaparral. The known groves are threatened by rural residential development. Timber harvesting activities will not affect the existence of Northern Interior Cypress Groves.

Maritime Coast Range Ponderosa Pine Forest

Maritime coast range ponderosa pine forest occurs in Bonny Doon, in two isolated stands approximately 3.5 miles east of the harvest area, according to NDDB maps. The plant community is dominated by dense Ponderosa pine (*Pinus ponderosa*) in association with Santa Cruz manzanita (*Arctostaphylos silvicola*), and Santa Cruz cypress (*Cupressus abramsiana*). The soils are consolidated marine sediments, primarily Zayante coarse sands. The habitat is not listed federally or by the state of California and is threatened by sand quarrying, conversion to vineyard and development. Habitat for this vegetation type does not occur in the harvest area and timber operations will not affect its presence.

Northern Maritime Chaparral

Northern maritime chaparral is a plant community usually including endemic, relict, and locally rare plant species. It is occurs on marine sands and Zayante coarse sand soils in association with Santa Cruz cypress (*Cupressus abramsiana*), Ponderosa pine (*Pinus ponderosa*), Santa Cruz manzanita (*Arctostaphylos silvicola*) and annual grasses and forbs. The habitat is not listed federally or by the state of California and is threatened by sand quarrying. An area of Northern Maritime Chaparral is located approximately 3.5 miles east of the project area in Bonny Doon. Habitat for this vegetation type does not occur in the harvest area and timber operations will not affect its presence.

Coastal Brackish Marsh

Coastal brackish marsh covers approximately 9 acres, slightly southeast of the mouth to Waddell Creek, 3.5 miles northwest of the harvest area. This plant community occurs where fresha nd salt water converge and is dominated by inland saltgrass (*Distichlis spp.*) and bulrushes (*Scirpus spp.*) Harvesting operations will have no effect on the marsh.

Northern Coastal Salt Marsh

Salt marsh covers approximately 15 acres on the lower portion of Scotts Creek. The marsh is approximately .6 miles from the harvest area, downstream of watercourses that flow through the harvest area. The marsh is closed off from the ocean during the dry season by a sandbar at the mouth of Scotts Creek, creating a lagoon. The beach at Scotts

Creek is heavily used for recreation and agricultural cultivation and grazing are the predominant land uses surrounding the marsh. Proposed operations will have no effect on the marsh.

PLANTS

Monterey Pine (*Pinus radiata*)
Monterey pine is classified as a group1B species (rare or endangered in California) by the California Native Plant Society (CNPS). Scattered individuals occur naturally on the Swanton Pacific Ranch, on dry south and west facing slopes and ridges. An area in close proximity to the harvest area is part of a 20 year old plantation. Many of the trees on the Swanton Pacific Ranch are infected with the exotic fungus that causes pitch canker (*Fusarium subglutinans,* sp. *pini).* Several trees from this plantation may be removed to make landing L10 operational. No Monterey pine trees will be commercially harvested under the THP and no pine slash will be removed from the area.

Santa Cruz Microseris (*Stebbinsoseris decipiens*)
This plant is an annual herb with no state or federal listing but is a species on the CNPS 1B list. This species occurs in open areas with loose or disturbed soil, usually derived from sandstone, shale or serpentine, on seaward slopes. Small colonies of this species have been located on NDDB maps north and northwest of the project area. These sightings are located in grassy openings and pastures that are lightly grazed. Habitat for this species may exist on Swanton Pacific Ranch; however, it will not be part of the harvest area.

White-rayed Pentachaeta (*Pentachaeta bellidiflora*)
This plant is an annual herb with a state and federal listing of endangered and is a species on the CNPS 1B list. Habitat for the species includes valley and foothill grassland, often on serpentinite substrate, which is not present in the harvest area. This species has been identified on NDDB maps over 5 miles away from the harvest area.

Santa Cruz Wallflower (*Erysimum teretifolium*)
The plant is a perennial herb with a state and federal listing of endangered and is a species on the CNPS 1B list. Habitat for the species includes chaparral, lower montane coniferous forest and inland marine sands. Santa Cruz Wallflower has been located 2.9 and 4.2 miles east of the project area in Bonny Doon. Development, sand mining, and vandalism seriously threaten this species. No habitat is present in the harvest area and the proposed operations will not affect distribution.

San Francisco Campion (*Silene verecunda* ssp. *verecunda*)
San Francisco is a perennial herb with no state or federal listing and is a species on the CNPS 1B list. Development threatens this species. Habitat for the species includes coastal bluff scrub, chaparral, coastal prairie, valley and foothill grassland. It is most often found on mudstone or shale outcrops. This species has been located in five locations within 5 miles of the harvest area: 1.5, 1.7, 2.3, 2.5, and 2.5 miles north and

northwest. No chaparral habitat is present in the harvest area; therefore, no campion habitat will be altered by the proposed operations.

Santa Cruz Manzanita (*Arctostaphylous andersonii*)
Santa Cruz manzanita is an evergreen shrub with no state or federal listing and is a species on the CNPS 1B list. It is located in broadleaf upland forest, chaparral, and north coast coniferous forest. Within these habitats it can be found in openings and on edges. This species has been located on NDDB maps, 3 miles east and 4.2 miles northeast of the harvest area. Potential habitat for Santa Cruz manzanita is located on Swanton Pacific Ranch, though it is not known to exist in or near the harvest area. Manzanita requires a great deal of sunlight and therefore open canopied habitats. Redwood and Douglas-fir trees proposed for management typically over-shadow manzanitas and THP operations are to occur in forest stands that do not provide enough light for manzanita to succeed.

Schreiber's Manzanita (*Arctostaphylos glutinosa*)
Schreiber's manzanita is an evergreen shrub with no state or federal listing and is a species on the CNPS 1B list. This species is located on NDDB maps 1.5, 1.7, 1.9, 2.7, 3.6, and 4.6 miles from the harvest area. Habitat includes closed-cone coniferous forest and chaparral on a substrate of mudstone or diatomaceous shale, usually in association with other manzanita species. Potential habitat for Schreiber's manzanita is located on Swanton Pacific Ranch, though it is not known to exist in or near the harvest area. Manzanita requires a great deal of sunlight and therefore open canopied habitats. Redwood and Douglas-fir trees proposed for management typically over-shadow manzanitas and THP operations are to occur in forest stands that do not provide enough light for manzanita to succeed. All operations will be conducted on existing roads and skid trails where available. No additional clearing of ground will occur on the project except for areas specified in the THP.

Pajaro Manzanita (*Arctostaphylous pajaroensis*)
Pajaro manzanita is an evergreen shrub with no state or federal listing and is a species on the CNPS 1B list. It is found in chaparral communities occurring on sandy soils. A dicot in the family Ericaceae, it is a shrub that is native to California and is endemic to California alone. This species is located on NDDB maps 3.2 miles east and 3.6 miles northeast of the harvest area in the vicinity of Bonny Doon. Chaparral habitat exists on Swanton Pacific Ranch, but the sandy chaparral habitat that Pajaro manzanita requires is not in the harvest area. All operations will be conducted on existing roads and skid trails where available. No additional clearing of ground will occur on the project except for areas specified in the THP.

Bonny Doon Manzanita (*Arctostaphylos silvicola*)
Bonny Doon manzanita is an evergreen shrub with no state or federal listing and is a species on the CNPS 1B list. Habitat for the species is chaparral, closed-cone coniferous forest, and lower montane coniferous forests. It can be found only in the Zayante sandhills and in Bonny Doon and is endemic to Santa Cruz County. It has been located on NDDB maps 3.4 miles east and 4.2 miles northeast of the project area in the vicinity of Bonny Doon. Suitable habitat for this species does not exist within the THP boundary.

Kellogg's Horkelia (*Horkelia cuneata* ssp. *sericea*)
This plant is a perennial herb with no state or federal listing and is a species on the CNPS 1B list. Development threatens this species. One occurrence is recorded on NDDB maps, 2 miles northwest of the harvest area, on a northwest facing grassland slope. Habitat for the species is in openings of closed-cone coniferous forest, chaparral (maritime), and coastal scrub on old dunes and coastal sandhills. Habitat for this species may exist on the Swanton Pacific Ranch but is not present in the harvest area.

Santa Cruz Clover (*Trifolium buckwestiorum*)
Santa Cruz clover has no state or federal listing and is a species on the CNPS 1B list. This species is an annual herb, endemic to Santa Cruz County, known from about 10 very small occurrences. Habitat is in broadleaf upland forest, coastal prairie, and cismontane woodland. This species has been located on NDDB maps 1.3 miles northwest, 1.5 miles west, and overlapping on the project area. No coastal prairie exists in the project area. Broadleaf upland forest and cismontane woodland does exist on the property but harvest operations will be conducted outside of these areas. A plant survey to be conducted in the harvest area will help determine if the plant is present in the harvest area.

Ben Lomond Spineflower (*Chorizanthe pungens* var. *hartwegiana*)
This annual herb has no state listing, is federally listed as endangered and is a species on the CNPS 1B list. The plant is known only from sandhill parklands in the Santa Cruz Mountains and is threatened by sand mining, development, and non-native plants. This species has been recorded on NDDB maps 3.7, 4, and 4.2 miles east of the project area in Bonny Doon, as well 5 miles north of the project area. Suitable microhabitat includes Zayante coarse sands in maritime ponderosa pine sandhills which does not exist on Swanton Pacific Ranch. Appropriate habitat is not present in the harvest area and distribution will not be affected by proposed harvesting operations.

Santa Cruz Mountains Beardtongue: *(Penstemon rattanii* var. *kleei)*
Santa Cruz Mountain beardtongue is a perennial herb that can be found in chaparral vegetation types, lower montane coniferous forests, and north coast coniferous forests, on sandy shale slopes. The plant has no state or federal listing and is a species on the CNPS 1B list, known only from Santa Cruz and Santa Clara Counties. This species has been recorded on NDDB maps 4.5 miles east, 4.2 miles northeast, and 3.8 miles north of the harvest area. The plant ranges in elevation from 400-1100 meters which is above the highest point in the harvest area.

Dudley's Lousewort (*Pedicularis dudleyi*)
Dudley's lousewort has no federal listing, is listed by the State as rare, and is a species on the CNPS 1B list. The habitat for Dudley's lousewort is chaparral, valley grassland and redwood forest mainly in coastal habitats. A dicot in the family *Scrophulariaceae*, it is an annual herb that is native to California and endemic to California alone. No occurrences have been recorded on NDDB maps within 5 miles of the harvest area. A plant survey to be conducted in the harvest area will help determine if the plant is present in the harvest area.

Santa Cruz Cypress (*Cupressus abramsiana*)
Santa Cruz cypress is state and federally listed as endangered and is a species on the CNPS 1B list. Habitat for this evergreen tree consists of closed-cone coniferous forest, chaparral, and lower montane coniferous forest on sandstone or granitic parent material. This species has been located on NDDB maps 4.9 miles southeast, 3.5 miles northeast, and 3.3 miles east of the harvest area. A plant survey to be conducted in the harvest area will help determine if the plant is present in the harvest area.

Blasdale's bent grass (*Agrostis blasdalei*)
Blasdale's bent grass is not federally or state listed and is a species on the CNPS 1B list. Habitat for this perennial herb consists of coastal bluff scrub, coastal dunes, and coastal prairie on sandy or gravely soil. This species is located on NDDB maps 1.3 and 2 miles west of the harvest area. Appropriate habitat is not present in the project area.

San Francisco Popcorn-Flower (*Plagiobothrys diffuses)*
San Francisco popcorn-flower is not federally listed but is listed as endangered under the CESA and is on the CNPS 1B list. Habitat for this species is coastal prairie and valley and foothill grassland. One occurrence is recorded on NDDB maps 5 miles southeast of the harvest area. Suitable habitat may be present on Swanton Pacific Ranch but is not within the operating area. Appropriate habitat is not present in the project area.

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Section IV
LOWER LITTLE CREEK THP

CUMULATIVE IMPACTS ANALYSIS

Table of Contents

I. Project Alternatives Analysis

The following analysis discusses alternatives to the proposed project other than a selective harvest of commercial conifers. As provided in the California Environmental Quality Act (CEQA), the analysis of alternatives will, "describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project." The analysis will further evaluate the comparative merits of the alternatives.

Although no potentially significant environmental effects have been identified in the project area as proposed, the RPF has analyzed alternatives that could avoid or substantially lessen environmental effects that may be identified in the preparation and review of THP's and amendments in this region. The RPF has used CEQA's EIR-related guidelines as well as CDF's guidance for addressing alternatives in the THP process.

Because the alternative must, to some degree, achieve the objectives of the project, the purpose and need for the project must first be described. The Swanton Pacific Ranch is a research and demonstration property for California Polytechnic University, San Luis Obispo, and in this capacity, serves to provide students, faculty, staff and the general public with a unique interdisciplinary learning opportunity. The commercial timberland is managed specifically for growing and harvesting timber in order to achieve an economic return on the property. This land is zoned TPZ and as such is specifically used for growing and harvesting trees. Faculty members regularly utilize the ranch for course fieldtrips with the premise that the ranch is actively managed. Graduate students conduct research on the ranch as it applies to managed timber land in the Santa Cruz Mountains. The proposed harvest contributes to a base of sustainable resources in support of the local economy.

The following is a list of potential alternatives to the proposed project and an analysis of each in terms of its impact on the ownership, surrounding watershed, and the ability of the alternative to meet the stated project objectives.

A. No Project Alternative

Under this alternative, the land and timber resource would be left in its current condition with no active harvesting of the timber resource occurring. The land use would be primarily rural residential in combination with small-scale cattle operations and recreational activities such as running, hiking, bicycling and horse-back riding. Timber management activities would be limited to firewood harvest by the residents as well as fuels reduction around the various residences, outbuildings and roads.

Under this alternative, the aim of benefactor of the ranch, Al Smith, would not be realized. Students, faculty and staff who teach and conduct research at Swanton Pacific Ranch would lose access to a property managed for sustainable natural resource production. Research goals would go unfulfilled and a land base dedicated to research in a redwood forest in the Santa Cruz Mountains would be unavailable.

The costs of maintaining ownership of the land, both legally and operationally, would have to be funded through some other mechanism. It is unlikely that the scale of cattle operations on the property would provide for the payment of property taxes and land maintenance expenses. Investments into silviculture, roads, buildings, and research would degrade with no financial return. Road upgrades to occur in conjunction with the proposed harvesting operations would not take place. Roads would deteriorate and water control structures would fail with no maintenance activities.

While this alternative would satisfy those who would oppose timber harvesting on this ownership, it does little to improve upon the legacy of land use. The property is zoned "Timber Production" and as such should be utilized to protect and enhance the long-term viability of sustainable forest

products. Land capable of producing a quality resource in perpetuity would be unutilized for the benefit of the local, state and national economy. Local demand for redwood products that would otherwise be provided by local sources would be exported to some other location—in all likelihood, a location comparatively deficient in the stringency of forest practice rules.

B. Open Space/Conservation Easement Alternative

Under this alternative, the entire ownership or portions of it would be sold to a land trust organization or placed under a conservation easement. This action would not necessarily preclude harvesting, though timber harvests would certainly be limited in terms of interval and intensity. Many conservation trust organizations use periodic, light harvests as a means of obtaining revenue for future acquisitions and operating costs. Likewise, the terms of conservation easements can be somewhat flexible in scheme. In the interest of creating a more "park-like" or "old growth" appearance, or for the purpose of fuels reduction, trust organizations might use periodic, light harvests to emphasize the increased growth of larger trees. Similarly, the terms of a conservation easement might be written to allow for a light harvest, whether for fuels reduction, aesthetics or revenue.

Local open space purchases in recent years have been premised on land use for recreational purposes. Mountain bicycling, hiking, equestrian activities and other forms of outdoor recreation seem to be acceptable uses of large tracts of forest as far as the local public is concerned. As illustrated in the purchase of the Gray Whale Ranch in Santa Cruz County, recreationists can be tapped to help pay for the purchase. The effect of intense recreation on a land resource is not benign, however, and must be considered as well. As in any land use, a management plan outlining potential impacts and mitigations including a philosophical discussion of the use would be necessary.

Conservation easements can be a useful tool for deriving some level of economic return on portions of timbered ownerships that are otherwise unavailable for commercial harvest as a result of endangered species concerns or "precautionary principle" evocations. The tax breaks resulting from conservation easements are considerable incentives to landowners burdened with debt. This alternative certainly has merit, but is an unlikely and unnecessary choice given the management goals of the Swanton Pacific Ranch.

C. Park Addition Alternative

This alternative would see the expansion of Santa Cruz County Parks, or (more likely) State Parks, to include all or a portion of the property. The alternative assumes that the landowner is willing to sell and that Santa Cruz County or the State has the financial and/or political wherewithal to both purchase the ownership (or a portion of it) and provide for its continued maintenance. Indeed, the potential of this to be a viable alternative lies in the fervor of the constituency of Santa Cruz County and their willingness to contribute tax of bond money to potential land acquisition. Whether or not there is sufficient recreational interest to warrant the purchase of land to create a park is unknown. The current budgetary outlook for the County of Santa Cruz suggests that the financial means to consider this land purchase will not present itself in the near future.

Under this alternative, at a minimum roads and parking lots would need to be built for recreation and fire suppression access. At the maximum, campgrounds, water supplies and toilets would be constructed to accommodate a specified number of users. The degree of maintenance and improvement would be dependent upon the level of use desired by the park system.

The property was given to the University as a research and demonstration venue for students to "learn by doing" forever. Under this direction, the land managers seek to manage the timberland wood production using exemplary forest stewardship. The land serves as an educational tool of what active timber management can accomplish on the landscape as well as providing an opportunity to conduct research in a managed redwood forest of the Santa Cruz Mountains. These management objectives rule out park acquisition as that would halt active management of the timber resource. Under the direction of the current ownership, the property has the potential

to flourish under an active management scheme in which stewardship of the land is the central and demonstrated theme.

D. Alternative Land Use:

Portions of the property could be developed for agricultural purposes such as orchard, vineyard, hay, or row crop production. Areas where slopes are not prohibitive to this land use conversion would require large-scale clearing of vegetation and excavation of tree stumps with subsequent planting of trees, grapes, or other crops.

The land could be utilized for horse boarding or recreational camping facilities, which would require considerable infrastructure development. The area could be considered for higher scale cattle operations; however, this would not be ideal due to the topography and limited grass available for forage. Provided the application to remove the property from Timber Production Zoning (TPZ) was approved, rural estate subdivision and custom home building might be proposed as well. However, most of the property is on forested slopes best suited for growing timber and, as such the highest and best use for the property lies in maintenance of the forested landscape.

Planned research projects that seek to study actively managed timberland, would not meet their objectives if the land use shifted to discontinue selective harvesting. Faculty, staff, and students would not have the education and demonstration setting available to them that was intended for their use.

Any other intensive land use and particularly those associated with constructed development would result in conversion of this forested landscape to some degree and would undoubtedly result in unmitigated impacts to the entire resource.

E. Alternative Site

This alternative would shift the harvest area to another forested portion of the same ownership, assuming there is other forested area available for harvest. The area included in the proposed harvest boundary has not been harvested since 1955 and is due for a harvest. Conducting a timber harvest on an alternative site would forgo the opportunity to actively manage stands with a periodic harvest cycle. Pressure on the rest of the ownership by utilizing an alternative site would be more intensive, as a fixed land base has limited resources.

Other areas requiring some silvicultural manipulation could be addressed at this time, rather than foregoing the opportunity, however those units have less pressing management needs than the proposed harvest area. Road work and bridge installation planned in conjunction with the proposed harvest would not occur if the harvesting were to shift to another site. Planned research projects that seek to study actively managed timberland, would not meet their objectives where they occur in the proposed harvest area.

Financial returns from timber revenue would still be available. Opportunities as a field classroom would still be available.

F. Alternative Timing of Operations

This alternative would result in the delay of the proposed project until such time as other projects within the watershed are completed. The premise is that perceived risks to watershed attributes could be mitigated through effectively scheduling various projects so as not to have an overlap in the timing of operations. This assumes that all of the landowners within the watershed could be contacted and persuaded to schedule activities regardless of market conditions or personal necessity. Implementation of this alternative would require some level of bureaucracy, existent or constructed, to coordinate between the various landowners and land uses.

The concept here could be considered somewhat "novel", though land use policy practitioners as far back as John Wesley Powell have been advocating watershed level coordination for land use

and resource consumption (particularly water) since the late nineteenth century in the United States. The problem now as in Powell's time is that this alternative does not fit well with capitalism and the belief in the individual's right to prosper. Further, it is complicated by the 5-year life span of a THP and the volatility of the lumber market. It also presumes that all of the landowners in the watershed are willing to work together with a minimum of conflict towards the same end. If there's anything to match the fervor of the capitalist it is surely the intensity of those who consistently prefer conflict and obstructionism. Coordinated Resource Management Planning (CRMP) groups serve as a great illustration both of what could be accomplished in terms of watershed level planning by working together and the dysfunctionality created by the discordant few.

G. THP as Proposed Alternative

The property is zoned "Timber Production" indicating recognition that the resource may be utilized to that end to protect and enhance the long-term viability of a sustainable forest products industry. The property has been harvested in the past and the landowner desires to continue to manage the property as such. This alternative accounts for the protection of water quality, wildlife, soils, and various aesthetic concerns while promoting sustainable forestry and the provision of local wood products for local markets.

The mission of the Swanton Pacific Ranch for research and demonstration would be realized in part by the proposed harvest. The ongoing active management of the forested areas provides an evolving classroom setting for faculty, staff, and students to see, firsthand, the implementation of sound forest management.

This is the only alternative desirable to the landowner and is the reason for the composition of this THP.

H. Alternative Silviculture or Yarding

The optimal silviculture and yarding prescription tailored to the property and available in the Santa Cruz Mountains is proposed in the Lower Little Creek THP.

One silvicultural alternative would be not to harvest - this would not meet the needs of the landowner. Another silvicultural alternative would be to clear-cut the harvest area – this is not legal pursuant to the special harvesting methods of the southern subdistrict as stated in 14CCR 913.8. The silvicultural prescription is written to increase regeneration, reduce defect, and allow redwood to maintain site occupancy.

The yarding method proposed for this harvest is tractor logging. Most of the harvest area can be accessed by traversing existing skid trails and utilizing long-lining to retrieve logs from some areas. Other yarding methods available could include helicopter, balloon, cable, or animal logging. All of these options are more expensive and would increase the costs beyond an acceptable level for the landowners. Furthermore, many portions of the harvest area are not appropriate for the other yarding methods.

Helicopter yarding is most often used on steeper slopes, and is simply not necessary at this location. Cable yarding is not a feasible alternative due to the topography. Adequate yarder settings and cable profiles do no provide access for all of the harvest area. Slopes and slope deflection are not sufficient to facilitate skyline yarding. The terrain is too steep for effective horse or oxen yarding without the use of large teams. Balloon technology leaves much to be desired.

I. Analysis of Alternatives

The THP as proposed alternative is the only alternative that thoroughly satisfies the goals of Swanton Pacific Ranch to provide a working ranch and forest for educational purposes. The faculty, staff, and students of Cal Poly San Luis Obispo rely on the ranch as an outdoor classroom and demonstration tool for active land management. The "no project", conservation easement or

acquisition alternatives would not serve the purpose of the ranch in exposing future land managers to responsible forest management.

This property is part of the base of sustainable resources that support the local economy. The highest and best use of the land remains in the production of timber. The proposed silvicultural method, selection, ensures that the resource will not be squandered and will be available for sustainable harvests in the future. The timing and location of this harvest entry are planned to clean up a stand that was partially harvested at last entry. The proposed harvest will bring the forest closer to the target un-even age structure. The proposed harvesting and yarding methods are the preferred techniques based on many years of logging experience with a strong desire to protect floral and faunal habitats, aesthetic values, and recreational opportunities. No other alternative would satisfy the landowners wish to practice good forest stewardship.

II. Cumulative Impacts Assessment Checklist

A. Watershed Study Area

The Little Creek watershed area was chosen for analysis of potential cumulative impacts resulting from this proposed THP. This watershed encompasses 4,470 acres, the extent of which is shown on the Watershed Assessment Map, included in Section V. In addition to the THP area, the study area includes, among other watercourses: the headwaters of the north fork of Little Creek, the south fork of Little Creek, Winters Creek, Archibald Creek, Queseria Creek, and the mainstem of Scotts Creek from its confluence with Big Creek to the brackish lagoon that is the outlet to the Pacific Ocean.

The planning watershed named Little Creek, Calwater v2.2, #3304.110202 as drawn by CDF is an appropriate assessment area that can be realistically assess for potential impacts related to the proposed harvest. It encompasses the entire length of the streams in close proximity to the harvest area and also the downstream drainage-ways all the way to the ocean. The study area also includes a stretch of rangeland along the coast that does not flow into Scotts Creek but flows toward the ocean.

B. Does the watershed study area contain any past, present, or reasonably foreseeable probable future projects?

Yes. The watershed has a rich history of human activity. Notable projects that have had an impact on the beneficial uses of water include past timber harvesting, livestock grazing, agriculture, road building and residential development.

Much of the watershed was logged by the San Vicente Lumber Company between 1906 and 1922. A Shay engine railroad followed the Little Creek drainage to the headwaters of the north fork, where it branched and continued, north to Big Creek, and south to the headwaters of San Vicente Creek. Several miles of railroad grade, including a trestle across Little Creek are part of the Little Creek watershed area. Several logging camps along the rail line were constructed and used over the course of the logging operation. A mill site was located at Antenelli Pond. The logging technique at that time was clear-cut and burn, leaving the ground relatively un-vegetated. It is estimated that approximately 2000 acres were harvested during this time period between the Little Creek and Big Creek watersheds. The wood was in high demand to rebuild San Francisco following the 1906 earthquake. In 1922 the railroad was dismantled and many of the ties were removed and sold as scrap.

The watershed has been harvested selectively on a small scale by landowners and residents for split products since the late 1800's. In 1955, the lower portion of the watershed around Winters Creek, Archibald Creek, Queseria Creek, and the west side of Scotts Creek were selectively logged using narrow, track-laying tractors. Redwood removed during that harvest was used for split products and the Douglas-fir was sold to a box factory in west Santa Cruz.

In the last ten years, three timber harvest plans have been completed within the watershed study area. The following list includes these THP's which encompass 360 acres in the watershed, 8% of the land area.

THP#	Acres	Location	Status
1-91-088 SCR	20 of 210	T10S, R3W, Sec 4	Completed 6/27/95
1-94-055 SCR	200 of 305	T10S, R3W, Sec 16,20,21,22	Completed 1/4/00
1-94-071 SCR	140 of 150	T10S, R3W, Sec 8,9	Completed 4/1/96

THP 1-91-088 SCR was yarded with tractors. It covered 20 acres of the South Fork of Little Creek. A violation of 14 CCR 1035.3 was issued for a Licensed Timber Operator violation.

THP's 1-94-055 SCR and 1-94-071 SCR utilized tractor and cable yarding methods. These operations covered the area of the North Fork of Little Creek. No violations were issued for either of these plans.

Outside of the forested extent of the watershed, agriculture and livestock grazing have played an important role in landuse since the late 1800's. The lowlands around Scotts Creek and the "panhandle" of the watershed that extends along the coast had up to 5 dairy establishments prior to 1950. Crops including strawberries, flowers, and brussel sprouts were cultivated and irrigated using a water diversion on Scotts Creek, below Mill Creek. Water was pumped from the creek at this location and stored in concrete tanks on the ridge then gravity fed to irrigate crops. This water intake was operational up until the early 1990's. Only a small portion of the lowlands of the watershed are currently used for agriculture and are tilled and planted in row crops. Rangeland with seasonal cattle grazing covers approximately 1600 acres of the watershed.

In 1938 the stretch of Highway 1 that bridges Scotts Creek near the outlet to the Pacific Ocean was constructed. The lower portions of Scotts Creek and Queseria Creek were channeled straight through agricultural fields and all riparian vegetation was removed for this effort. Since that time, up until 1982, the Army Corps of Engineers routinely dredged and maintained the levees that confine Scotts Creek and Queseria Creek. Restoration work on lower Queseria Creek in 2003-2004 modified the channel morphology and replaced an old culvert. A water diversion for agricultural uses was located in the lower reach of Scotts Creek until 1998.

Ownership in the watershed is primarily made up of large landowners including Big Creek Lumber, RMC Lonestar, and California Polytechnic University Foundation (Swanton Pacific Ranch). The predominant land use in the watershed is timber production with simultaneous management for wildlife and watershed values. Selective timber harvests will likely be proposed on a sustainable cycle on forestlands within the watershed. A selective harvesting operation utilizing tractor and cable yarding is scheduled to take place on the North Fork of Little Creek in 2006, covering approximately 140 acres, 3% of the watershed.

There is minimal residential development and rural development is primarily in the valley bottom with a few structures in the surrounding hills. An infrastructure of paved and unpaved access roads receive varying levels of maintenance from the landowners. Other possible future projects could include home construction, permitted through the county planning department. No major developments are expected due to the parcel size and zoning.

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

Yes. A number of legacy roads exist in the watershed from previous logging activities. Legacy roads may contribute sediment to watercourses as they are generally not maintained and they

disrupt the natural drainage of a hillside. These roads have generally healed over through re-vegetation and cut-bank sloughing.

Residential land use and maintenance of related access roads will likely continue to be problematic within the watershed. Many stream crossings in the watershed modify channel morphology and continued road maintenance and construction in the watershed have the potential to impact the beneficial uses of water. The Highway 1 bridge and abutments will continue to restrict flow near the mouth of Scotts Creek. The levees constructed to channelize the lower reaches of Scotts Creek and Queseria Creek will likely unravel without maintenance.

This THP includes plans to reduce the potential for deleterious amounts of sediment to enter Little Creek at mitigation point X6. At this location, a flat-car bridge has fallen into the creek from one bank. The bridge is currently an obstruction to stream flow. It could cause a debris dam which would lead to channel scouring when the dam broke or it could direct water toward the stream bank which would weaken bank stability. The proposed mitigation will reduce the potential for the bridge site to have significant adverse impacts on the watershed in the future.

D. Will the proposed project, as presented, in combination with past, present, and reasonably foreseeable probable future projects identified in Parts B and C 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 reasonable potential significant effects (c)
1. Watershed	[ ]	[X]	[ ]
2. Soil Productivity	[ ]	[X]	[ ]
3. Biological	[ ]	[X]	[ ]
4. Recreation	[ ]	[ ]	[X]
5. Visual	[ ]	[ ]	[X]
6. Traffic	[ ]	[ ]	[X]
7. Noise	[ ]	[ ]	[X]

(a) "Yes after mitigation" means that potential significant adverse impacts are left after application of the forest practice rules and mitigation or alternatives proposed by the plan submitter.
(b) "No after mitigation" means that any potential for the proposed timber operation to cause significant adverse impacts has been substantially reduced or avoided by mitigation measures or alternatives proposed in the THP and/or application of the forest practice rules.
(c) "No reasonable potential significant effects" means that the operations proposed in the THP do not have a reasonable potential to join with the impacts of any other project to cause significant cumulative adverse effects.

E. If column (a) is checked above in Part D, describe why the expected impacts cannot be feasibly mitigated or avoided and what mitigation measures or alternatives were considered to reach this determination.

F. If column (b) is checked above in Part D, describe what mitigation measures have been selected which will substantially reduce or avoid reasonable potential significant cumulative impacts except for those mitigation measures or alternatives mandated by application of the rules of the Board of Forestry.

The Forest Practice Rules for the Southern Subdistrict of the Coast Forest District including the Santa Cruz County Rules shall be adhered to in the mitigation of potential impacts. The specific rule-related mitigations are described in the THP.

G. A brief description of the assessment areas used for each resource subject is contained in the analysis of each resource that follows.

H. The following individuals, organizations, and records were consulted in the assessment of potential cumulative impacts.

1. CDF&G Natural Diversity Database and related overlay maps, dated April 2001 (listed plants, animals, and terrestrial natural communities).
2. The California Native Plant Society website was used to assist in identification of habitat types where plant species of concern, state listed, or federally listed might be located. http://www.cnps.org/.
3. National Audobon Society Field Guide to North American Reptiles and Amphibians. Behler and King. 1996.
4. The Rare and Endangered Plants of San Mateo and Santa Clara County. Toni Corelli and Zoe Chandik. 1995.
5. Guide to Wildlife Habitats of California (October 1988), Volumes I, II and III, CDF 1416 Ninth Street, Sacramento, CA 95814.
6. Interim Guidelines for Determining Protective Measures for Timber Harvest Plans to Avoid Take of the California Red-legged Frog. November 27, 1996. US Fish and Wildlife Service.
7. Soil survey information provided by the Natural Resources Conservation Service, 2337 Technology Parkway, Suite C, Hollister, CA 95023 (408) 636-8029.
8. Northwest Information Center, Archaeological/Historical Records Check Response 2/12/2004. Sonoma State University, 1303 Maurice Avenue, Rohnert Park, CA 94928.
9. California Forest Practice Rules: 2003, 2004.
10. Aerial photography of watershed, flown in 1994 by Air Flight Services. Housed at Big Creek Forestry Department, 3564 Highway 1, Davenport, CA 95017.
11. CDF Planning Watershed Maps and Descriptions, Felton CDF, 6059 Highway 9, Felton, CA 95018 (831) 335-6740.
12. Santa Cruz County GIS data.
13. Cooper Clark Maps, Felton CDF, 6059 Highway 9, Felton, CA 95018 (831) 335-6740.
14. The History of Swanton, as told by Al Smith, July 1990. http://www.spranch.org/SPhistory.html.
15. California Central Coast Railways. Rick Hamman. 1980.
16. Big Creek Lumber and Building Supplies 1981 Catalog & Price Guide, including: A History of the Lumber Industry in the Santa Cruz Mountains. Frank "Lud" McCrary
17. Personal communications, Wally Mark, CalPoly Swanton Pacific Ranch Director.
18. Personal communications, Ryan Hilburn, CalPoly Swanton Pacific Resource Specialist.

19. III. Cumulative Watershed Impacts Assessment

A. Watershed Impacts Assessment Area

The Little Creek watershed area was chosen for analysis of potential cumulative impacts resulting from this proposed THP. This watershed encompasses 4,470 acres, the extent of which is shown on the Watershed Assessment Map, included in Section V. In addition to the THP area, the study area includes, among other watercourses: the headwaters of the north fork of Little Creek, the south fork of Little Creek, Winters Creek, Archibald Creek, an un-named tributary to Scott Creek, and the mainstem of Scotts Creek from its confluence with Big Creek to the brackish lagoon that is the outlet to the Pacific Ocean.

The planning watershed named Little Creek, Calwater v2.2, #3304.110202 as drawn by CDF is an appropriate assessment area that can be realistically assess for potential impacts related to the proposed harvest. It encompasses the entire length of the streams in close proximity to the harvest area and also the downstream drainage-ways all the way to the ocean. The study area also includes a stretch of rangeland along the coast that does not flow into Scotts Creek but flows toward the ocean.

B. Beneficial Uses of Water within Assessment Area

The known on-site and downstream beneficial uses of water that could be affected by the project are domestic use, agriculture, wildlife uses including fish populations, ground water recharge, and recreation.

C. Current Stream Channel Conditions

1. Are there any Class II or larger streams that flow through or adjacent to the project area that will receive runoff from areas disturbed by project activities?

Yes, Class I watercourse Little Creek flows through the project area. Several Class II ponds are also present on the property and one of these has the potential to receive surface runoff from the project area. Portions of Winters Creek and Archibald Creek are considered Class II watercourses, while other sections are considered Class IIIs.

Little Creek has the following stream conditions:

Gravel Embeddedness: Small gravels are fairly embedded in the stream channel with a lot of decomposed granite. The granite has worked down the stream channel from upstream granitic parent material. There is still a lot of free 3-5 inch cobble of mostly mudstone and some granite in the channel.

Pool Filling: A moderate amount of pool filling is occurring on Little Creek. Pools will aggrade and blow out over a season a couple of times due to all the gravels and fines moving through the system. There are not a lot of pools on the stretch of Little Creek. The largest pool is below the main stem flume and measures approximately 10 feet by 10 feet and three feet deep. There are a number of plunge/step pools that generally do not aggrade, most likely due to the steep gradient of the watercourse.

Aggrading: Aggrading is occurring behind debris jams and migration barriers. In general, little creek is downcutting over time.

Bank Cutting: Generally, bank cutting is low. Some bank cutting is present behind aggraded debris jams where fresh downcutting is occurring. In general, there is a higher level of bank cutting after larger storm events.

Bank Mass Wasting: Bank mass wasting is moderate to high along Little Creek. This is a function of the stream system having a lot of inner gorge topography. A higher level of mass wasting occurs after large storm events.

Downcutting: Downcutting is moderate on Little Creek. . The stream channel is downcutting through sediment deposited from historic storm events and also due to regional uplift.

Scouring: There is a low amount of scouring occurring in Little Creek. Recruitment of finer materials from above fill scoured pools and stripped stream materials immediately.

Organic Debris: There is a moderate to high amount of large woody Debris in the channel. The LWD is mostly comprised of alder and bay, and a little Redwood. There are numerous debris jams composed primarily of LWD.

Stream-Side Vegetation: Stream side vegetation is high and comprised primarily of Alder. The big flood event in 1955 stripped the channel of vegetation and the alder came back. The stream-side vegetation generally forms a dense canopy over the stream with some openings.

Recent Flooding: Flooding events are relatively high in the watershed. Several historic events are known to have occurred in the watershed that would have heavily impacted Little Creek. In 1940, a massive debris dam built up in the North Fork of Little Creek, creating a flood when it broke that scoured out the channel downstream. In 1955, a large landslide in the South Fork destroyed a large swath of riparian vegetation and severely scoured the stream channel in the South Fork and mainstem of Little Creek. Recent flooding events include the winters of 1982, 1983, 1996 and 1998. The 1998 event caused debris slides, mud flows, and bank failures on Little Creek, including the collapse of the Lower Little Creek bridge.

2. Are there any current stream channel conditions outside the project area, but within the watershed assessment area, that are contributing to a reduction in the beneficial uses of water?

The effect of residential development (including roaded access) on the stream channel conditions is unknown. It can be speculated that some effect has occurred as a result of inner gorge road reconstruction and maintenance in the watershed. The Basin Plan developed by the Central Coast Regional Water Quality Control Board lists streets and rooftops as sources of pollutants, ranging from heavy metals to large pieces of trash. Most certainly, there has been an effect from the alteration of natural drainage patterns resulting from road construction (including legacy logging roads), road maintenance and residential development.

The construction of the Highway 1 bridge at the mouth of Scotts Creek has constrained the outflow from the brackish water lagoon. This modification has stopped the natural movement of the channel from year to year. The formation and subsequent breakdown of a sandbar on the ocean side of the bridge is a critical event for many species, allowing fresh and salt water mixing and opening the transportation corridor. For example, anadromous salmonids must wait for the berm to be broken to move between fresh and salt water habitats. The channel constriction may have some effect on timing of the surface water connection between Scotts Creek and the ocean.

3. Are there any known current stream channel conditions outside the assessment area that are contributing to a reduction in the beneficial uses of water?

None known.

D. Past Projects

Past projects within the assessment area include road construction, road maintenance, timber harvests, residential development, agriculture, water procurement, and recreation.

Based upon knowledge of watershed conditions on and off the project area, have past projects within the assessment area resulted in any of the following impacts?

1. Increased sediment inputs that have embedded gravels, filled pools, or caused channel aggradation within any portion of the stream system?

Legacy logging has undoubtedly contributed sediment to the stream system. A picture included in California Central Coast Railways (Hamman, 1980) shows a logging railroad trestle on Little Creek in 1918. The surrounding hills are devoid of vegetation and have been burned-over. With no ground cover to hold the soil in place, erosion likely moved sediment downhill until rapid succession re-vegetated the slopes.

A small amount of cattle grazing has taken place on the valley flats and foothill rangeland adjacent to Scotts Creek. Cattle use in the watershed is minimal and has not significantly increased sediment inputs into the stream system.

Within the THP area, at mitigation point X6, a flat-car bridge has fallen into the creek from one bank. The bridge is currently an obstruction to stream flow. It could cause a debris dam which would lead to channel scouring when the dam broke or it could direct water toward the stream bank which would weaken bank stability. Mitigation is proposed in this THP to remove the flat-car from the stream channel and install a longer flat-car bridge over the channel.

2. Increased channel down cutting or bank erosion as a result of increased flows, sediment transport, or other channel modifications?

Some amount of down cutting has occurred within the watershed as a result of sediment transport and improperly installed and maintained road culverts under crossings. The failed bridge at X6 has the potential to cause bank erosion if plans to remove it from the stream channel as part of this THP are not carried out.

3. Increased water temperatures resulting from canopy removal along stream channels?

Historic clear-cut logging in the watershed removed canopy from along stream channels. Channel construction in the Scotts Creek and Queseria Creek drainages removed riparian vegetation in the lower reaches of those streams. No projects in the recent past have resulted in a quantified increase in water temperature in the project area due to canopy removal.

4. Increased inputs of unstable organic debris to streams or lakes?

No known past projects have increased inputs of organic debris to streams in the watershed. Natural landslides within the watershed have added unstable organic debris during historic and recent flood events. Large events occurred in 1940, 1955 and 1998 that inundated the channel with sediment and debris. These events as well as many much smaller ones are natural processes in the Santa Cruz Mountains.

5. Removal of large organic debris leading to loss of pool habitat?

Past harvest operations may have removed some naturally fallen trees from the class I and II watercourses. A landslide in 1998, resulting from a heavy precipitation event under saturated soil conditions, deposited approximately 3 truck loads of logs in the Little Creek drainage. These logs were removed in a salvage logging operation in 1998 so as to not block the stream channel. No pool habitat was lost in this operation, rather, saturated and unstable bank conditions were averted.

No removal of naturally occurring fallen trees is proposed from the class I and II watercourses for this THP.

6. Chemical inputs to a stream or lake?

Levels of chemical contamination likely are quite low. Industry is absent from the basin, and commercial agriculture is currently limited to organically grown row crops on small-scale farming operations near the mouth of Scotts Creek. Big Creek and other timber companies operating within the watershed do not use chemical fertilizers or pesticides in forestry operations.

E. Potential On-site Effects

Based on conditions and knowledge of the impacts of similar past projects, what is the potential for the project to cause the following effects? Use High, Medium or Low.

1. Channel or bank erosion?

Low

2. Streamside or inner gorge mass wasting that could directly enter a stream channel?

Low

3. Debris flows or torrents that could move directly into the stream from side slopes, swales, small channels, roads, landings, or skid trails?

Low

4. Debris flows or torrents caused by debris jams?

Low

5. Side slope mass wasting that directs surface runoff into gullies, swales, or small channels connected to the stream system?

Low

6. Sheet, rill, or gully erosion that could be discharged into the stream from roads, landings, or skid trails (including all disturbed areas from the top of the cut to the bottom of the fill)?

Low

7. Sheet, rill, or gully erosion from harvesting or site preparation that could enter the stream system?

Low

8. Openings created by the project along streams that could result in substantially increased stream temperatures?

Low

9. Increased amounts of small organic debris in streams or lakes as a result of the project?

Low

10. Movement of roadway chemicals, machinery fuels, pesticides, nutrients released by burning, or other chemicals into streams or lakes as a result of the project?

Low

11. Increased peak flows as a result of vegetation removal, snow accumulation in new openings, or more efficient runoff routing created by the project?

Low

12. Inputs of large organic debris in streams or lakes as a result of the project?

Low

13. Extraction of large organic debris from streams or lakes as a result of the project?

Low

14. Loss of future organic debris as a result of streamside timber harvesting?

Low

F. Future Projects

Future projects within the assessment area will likely include timber harvests, continued repair and maintenance of roads, and continued urban interface development. Specifically, a selective harvesting operation is scheduled to take place on the North Fork of Little Creek in 2006, covering approximately 140 acres, 3% of the watershed. This harvest will utilize tractor and cable yarding and will be regulated by the California Department of Forestry and Fire Protection.

Maintenance of roads is an ongoing landowner priority in the watershed. Road work including upkeep of erosion control structures and upgrades to culverts will continue to take place on Cal Poly, Swanton Pacific Ranch as well as other ownerships in the watershed. Due to the large parcel size and zoning in the watershed, major residential development is unlikely; however, individual home construction, permitted through the county planning department may occur.

Based upon the knowledge 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:

1. Increased sediment inputs that will fill pools, embed stream gravels, or cause channel aggradation in some portion of the stream system?

No. Residential development and road building that could cause sediment displacement is likely to proceed very slowly based on the large parcel sizes and zoning in the watershed. The proposed THP incorporates erosion control measures and upgrades to the road infrastructure that render increased sediment inputs insignificant. Future harvest plans utilizing selection silviculture and regulated by the California Department of Forestry and Fire Protection will not likely increase sediment inputs to streams in deleterious amounts.

2. Increased channel down cutting or bank erosion from increased flow, sediment transport, or other stream modifications?

If development increases within the watershed and natural drainage patterns are modified or otherwise damaged, the velocity of flows could increase resulting in some degree of down cutting and bank erosion. Future development is expected to be low in the watershed due to large parcel size.

3. Additional openings along stream channels that could result in unacceptable increases in water temperature?

Additional openings causing increases in water temperature are not likely to occur as a result of the proposed or future THP operations. The canopy retention standards set forth in the proposed THP include no removal of trees within the channel zone, retention of 85% canopy within the first 75 feet of the WLPZ and retention of 65% canopy for the remained of the WLPZ. No increase in water temperature is expected to result following these rigorous standards.

4. New inputs of organic debris to streams or lakes?

No inputs are anticipated from proposed or future projects.

5. Extraction of large organic debris from streams or lakes?

No, given the new awareness surrounding large woody material in streams, future extractions are unlikely.

6. Chemical inputs to streams or lakes?

An increase in such inputs is wholly dependent upon the potential increases in residnetial development within the watershed. Landowner's and resident's awareness of the effects of chemical inputs to the stream system is an important determining factor for what substances are used on the ground or introduced to septic systems in the watershed.

G. Interactions

Considering the combined impacts upon the beneficial uses of water described in the previous sections, what is the potential for developing adverse cumulative watershed effects in the assessment area as a result of: (Use High, Medium or Low)

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

Low

2. The proposed project combined with the effect of past projects and the expected impacts of future projects listed in Part F?

Low

If the answer to both questions is "Low", go to Part H and check the line labeled, "No (after mitigation)" or "No (no reasonable potential significant effects)" as appropriate.

H. Impacts 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)	**[X]**
No (no reasonable potential significant effects)	[ ]

If the answer is, "No" and either or both of the questions in Part G are rated "Medium," describe the reasons for reaching this conclusion. This section may also be used to describe situations in which the proposed project, as described and mitigated, will result in positive effects on watershed conditions and existing cumulative watershed impacts.

The roads and skid trails proposed for use in this THP are predominantly existing. The existing infrastructure will be improved by erosion control measures and mitigations implemented as part of this THP. Improvements made to drainage structures and road surfaces will result in positive effects on watershed conditions.

Roads proposed for use on the property will be upgraded with rolling dips and the surface will be rocked, straw mulched, or seeded where necessary to reduce the transport of surface fines. The rolling dips will reduce sediment movement on roads by getting water off the road surface and onto stable vegetated surfaces. Skid trails and landings will be slashed or seeded.

A flat-car bridge failure on the property will be repaired in accordance with the 1602 permitting process. The flat-car bridge has fallen into the creek from one bank. The bridge is currently an obstruction to stream flow. It could cause a debris dam which would lead to channel scouring when the dam broke or it could direct water toward the stream bank which would weaken bank stability. The proposed mitigation will remove the flat car from the creek and install a new flat-car bridge with a longer span. This mitigation will reduce the potential for the bridge site to have significant adverse impacts on the watershed in the future.

IV. Cumulative Soil Productivity Impacts Assessment

Cumulative soil productivity impacts occur when the combined impacts of a sequence of management activities produce a significant reduction in soil productivity. Those impacts may occur as part of past projects and as the likely impacts of future projects.

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 productive 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.

A. Soil Productivity Impacts Assessment Area

The soil productivity impacts assessment area encompasses the entire proposed project area. It is reasonable to assume that the extent of the potential impacts towards soil productivity is limited to the areas of operations and no further.

B. Soil Productivity Resources Assessment

Site factors to be assessed for cumulative soil productivity impacts include organic matter loss, surface soil loss, soil compaction, and growing space loss. The potential impact of successive management activities must be assessed for each of those factors individually and in combination and the overall impact classed as significant when:

1. The area disturbed by proposed timber operations will exceed that required by the silvicultural and harvest systems approved for use under the proposed THP, including unnecessary duplication of existing skid trails, roads, landings, yarding disturbance, and mechanical site preparation.

14 CCR 923 (a) states that the operation shall use "existing road whenever feasible." Roads, landings, and skid trails proposed for use are predominantly existing.

2. 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.

Organic matter loss and soil displacement will be minimal under the proposed harvest system. Tractor yarding, as proposed, is the most appropriate harvest system for THP area. Further, skid trails will be packed with tractor crushed slash, straw mulched and/or seeded, and waterbarred at the appropriate EHR rating of low to high. Rolling dips shall be installed on all roads to Forest Practice Rules standards.

3. 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 the proposed operations.

Tractor operations will only occur prior to the onset of the wet season. Harvesting will not cause excessive compaction since ground based yarding and skidding will not take place under saturated soil conditions.

4. 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.

The selection silviculture system in combination with tractor yarding is ideally suited for the project area and will work well to prevent soil loss. The erosion control methods employed on all skid trails and roads described in the proposed THP, in association with the silvicultural and harvesting methods, should significantly reduce the potential for loss of soil productivity, soil displacement, and soil compaction.

C. Impacts Evaluation

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

	No after Mitigation	Yes after significant effects	No reasonable potential
1. Organic Matter Loss	[X]	[ ]	[ ]
2. Surface Soil Loss	[X]	[ ]	[ ]
3. Soil Compaction	[X]	[ ]	[ ]
4. Growing Space Loss	[ ]	[ ]	[X]
5. Combination of above	[X]	[ ]	[ ]

V. Cumulative Biological Impacts Assessment

A. Biological Impacts Assessment Area

The biological impacts assessment area for aquatic species such as fish and amphibians is the entire watershed assessment area. The watershed study area chosen for analysis of potential cumulative impacts resulting from this proposed THP encompasses approximately 4470 acres of the Little Creek watershed. In addition to the THP area, the study area includes, among other watercourses: the headwaters of the north fork of Little Creek, the south fork of Little Creek, the main stem of Little Creek, Winters Creek, Archibald Creek, Queseria Creek, and the mainstem of Scotts Creek from its confluence with Big Creek to the brackish lagoon that is the outlet to the Pacific Ocean.

This watershed study area was drawn by the California Department of Forestry, planning watershed #3304.110202, and is recognized as an appropriate area that can be realistically assessed for potential impacts related to this proposed harvest. The study area is appropriate for assessment of aquatic species because it includes the entire length of all streams in and adjacent to the harvest area and also the entire downstream extent and the outlet to the Pacific Ocean

For all other animal and plant species, the assessment area is the project area and the area within one mile of the project boundary. This assessment area accounts for mobile species that may move in and out of the project area. Most plant and animal species found in the plan area will stay within the assessment area. In an attempt to account for all possible species, Natural Diversity Database maps were queried in a 5 mile radius of the project area and all those with positive species presence have been addressed.

B. Biological Resource Inventory

1. Identify any of the following categories of species known or suspected to occur in the biological assessment area for each: rare, threatened or endangered; species of special concern established by the BOF; sensitive species.

Species known or suspected to occur in habitats available in the biological assessment area are discussed in detail in Section III, Additional Information. This species inventory includes rare, threatened or endangered species, plants of the CNPS 1B list, species of special concern established by the BOF, and sensitive species. The resources used in habitat-type determinations, as well as individual species scoping is also included in Section III. For specific species habitat requirements and mitigation measures developed for protection of the species, see the Item #32 in Sections II & III.

FISH
Coho Salmon (*Oncorhychus kisutch*) Central California Evolutionary Significant Unit.
Steelhead (*Oncorhychus mykiss irideus*) Central California Evolutionary Significant Unit
Tidewater Goby (*Eucyclogobius newberryi*)
North Central Coast Stream

MAMMAL
Townsend's western big-eared bat (Corynorhinus townsendii townsendii)

INSECT
Monarch Butterfly (*Danaus plexippus*)

AMPHIBIANS
California Red-legged Frog (*Rana aurora draytoni*)
California Tiger Salamander (Ambystoma californiense)
Santa Cruz Black Salmander (*Aneides flavipunctatus*)

REPTILES
Western Pond Turtle (*Clemmys marmorata*)
Rubber Boa (*Charina bottae*)

BIRDS
Western Snowy Plover (*Charadrius alexandrinus nivosus*)
California Black Rail (*Laterallus jamaicensis coturniculus*)
Bank Swallow (Riparia riparia)
Black Swift (*Cypseloides niger*)
Saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*)
Tricolored blackbird (Agelaius tricolor)

TERRESTRIAL NATURAL COMMUNITIES
Monterey Pine Forest
Northern Interior Cypress Forest
Maritime Coast Range Ponderosa Pine Forest
Northern Maritime Chaparral
Coastal Brackish Marsh
Northern Coastal Salt Marsh

PLANTS
Monterey Pine (*Pinus radiata*)
Santa Cruz Microseris (*Stebbinsoseris decipiens*)
White-rayed Pentachaeta (*Pentachaeta bellidiflora*)
Santa Cruz Wallflower (*Erysimum teretifolium*)
San Francisco Campion (*Silene verecunda* ssp. *verecunda*)
Santa Cruz Manzanita (*Arctostaphylous andersonii*)
Schreiber's Manzanita (*Arctostaphylos glutinosa*)
Pajaro Manzanita (*Arctostaphylous pajaroensis*)
Bonny Doon Manzanita (*Arctostaphylos silvicola*)
Kellogg's Horkelia (*Horkelia cuneata* ssp. *sericea*)
Santa Cruz Clover (*Trifolium buckwestiorum*)
Ben Lomond Spineflower (*Chorizanthe pungens* var. *hartwegiana*)
Santa Cruz Mountains Beardtongue: *(Penstemon rattanii* var. *kleei)*
Dudley's Lousewort (*Pedicularis dudleyi*)
Santa Cruz Cypress (*Cupressus abramsiana*)
Blasdale's bent grass (*Agrostis blasdalei*)
San Francisco Popcorn-Flower (*Plagiobothrys diffuses)*

2. Identify any other wildlife or fisheries resource concerns known or suspected to occur within the biological assessment area.

There are no further wildlife or fisheries resource concerns known or suspected to occur within the biological assessment area.

3. Describe the pre-project condition of the biological resources inventoried within the biological assessment area. Describe the anticipated post-project condition of those biological resources after completion of the proposed project.

The pre-project condition of the biological assessment area is a function of the impact of past land-use activities on the natural environmental conditions. The forested areas were heavily logged between 1906 and 1922, leaving a seed bed and redwood stumps that have grown up into a dense redwood forest with many associate plant species including Douglas-fir, knobcone pine, tanoak, California bay, and nutmeg, to name a few. Most of the THP area was subsequently logged in the early 1990s. Some portions of the assessment area were planted to Monterey Pine approximately 20 years ago and are now pure stands of small diameter pine. Rangeland in the assessment area has been seasonally grazed for many years. Agricultural fields in the assessment area are planted in row crops and are mostly certified organic by California Certified Organic Farmers.

The post-project conditions in the assessment area are anticipated to continue to provide good habitat for plants and animals. The redwood forest habitat shall be selectively harvested and mitigation measures incorporated in the THP strive to ensure continued presence of all species currently present. Mitigations also protect the beneficial uses of water in Little Creek, Winters Creek, Archibald Creek, and downstream in Scotts Creek so as not to harm aquatic species.

C. Evaluation of Watershed Inputs Related to Integrity of Fishery

The following is an evaluation of the 5 watershed inputs (sediment, nutrients, wood, temperature, water quality):

Sediment

Sediment levels in Little Creek are currently low for the regional area. Natural background levels of embeddedness in the Santa Cruz Mountain watercourses is most likely high due to the unstable sandstone parent material of the mountains combined with one of the highest rainfall intensity ratings on the west coast. The stream substrate is primarily cobbles, boulders and decomposed granite. Overall, pool filling is minimal in Little Creek, however it increases downstream which is most likely due to the lessening gradient as Little Creek flows into Scotts Creek. Scotts Creek has a very gentle gradient as it flows into the brackish water lagoon before emptying into the Pacific Ocean.

The mitigation measures incorporated into the THP should reduce sediment delivery below current levels. Roads proposed for use on the property will be upgraded with rolling dips and the surface will be rocked, straw mulched, or seeded where necessary to reduce the transport of surface fines. The rolling dips will reduce any amounts of sediment discharging from the roads into the stream system. Skid trails and landings will be slashed or seeded. A flat-car bridge failure on the property that has the potential to cause bank erosion and scouring will be repaired to reduce significant adverse impacts on the watershed in the future.

Nutrients

The riparian corridor on Little Creek is forested, ensuring abundant deposition of leaf litter to supply nutrients to the stream. Little Creek has some inner gorge characteristics along some stretches and canopy closure over the stream is moderately high. It appears as though leaf drop and the subsequent introduction of nutrients into the system is, at the very least, adequate to support the macroinvertebrates found within the creek.

Harvest intensities within the WLPZ shall comply with 14 CCR 916.9 "Protection and Restoration in Watersheds with Threatened or Impaired Values." Canopy retention within the first 75 feet of the 150 foot WLPZ on Little Creek shall be 85% and retention in the second 75 feet shall be 65%. No tree removal or ground disturbance shall occur within the channel zone of the Class I watercourse, except at designated crossings.

Large Woody Material

Large woody debris (LWD) is present in moderate to high amounts and is the formative agent of many of the pools on Little Creek. The stream profile of Little Creek, included in Section III, diagrams the presence of large woody debris in and directly above the stream channel. No LWD shall be removed from the watercourse as part of the proposed THP. The WLPZ restrictions identified in the operational portion of the THP will be sufficient to ensure that potential recruitment of material is maintained.

Temperature

Stream temperature has been monitored on Little Creek from 1997-2000 and 2003. Hobo data loggers have been placed in Little Creek at various locations within and near the proposed harvest area during the period of peak summer water temperatures. Although the number of data loggers has varied over the years, hobos have consistently been placed upstream from the flume in the north fork, upstream from the flume in the south fork, and upstream from the flume in the main stem of Little Creek. The data from these hobos is summarized in the following tables:

North Fork Flume	Days > = to 64° Fahrenheit	Days > = to 62° Fahrenheit	Mean Daily Temp	Period Max Temp	Begin Record	End Record
1997	0	0	54.4	58.7	10/10/1997	11/14/1997

1998	8	53	57.1	64.9	7/9/1998	10/27/1998
1999	0	0	55.8	60.8	7/8/1999	11/4/1999
2000	15	32	56.2	67	6/23/2000	10/27/2000
2003	0	1	56.7	62.2	8/8/2003	11/8/2003

South Fork Flume	Days > = to 64° Fahrenheit	Days > = to 62° Fahrenheit	Mean Daily Temp	Period Max Temp	Begin Record	End Record
1997	0	0	54.6	60.8	10/10/1997	11/14/1997
1998	0	9	56.6	62.2	7/9/1998	10/27/1998
1999	0	0	55.4	60.1	7/8/1999	11/4/1999
2000	13	24	56	67	6/23/2000	10/27/2000
2003	0	0	56.3	61.5	8/8/2003	11/8/2003

Main Stem Flume	Days > = to 64° Fahrenheit	Days > = to 62° Fahrenheit	Mean Daily Temp	Period Max Temp	Begin Record	End Record
1997	0	0	54	58.7	10/10/1997	11/14/1997
1998	12	76	57.5	65.6	7/9/1998	10/27/1998
1999	0	2	55.9	62.2	7/8/1999	11/4/1999
2000	28	44	57	69.7	6/23/2000	10/27/2000

Note: 2003 Main Stem Flume temperature data is unavailable due to equipment malfunction.

The hobo data shows warmer temperatures in 1997 and 2000 than in the other years. There is no significant warming trend in the downstream direction. The data is more realistically interpreted as a mean weekly average temperature (MWAT) to take into account the cumulative effect of elevated temperatures. Graphs of this data for 2000 are included in Section V. Anadromous salmonids are not likely to face hardship from brief periods of elevated temperature but from extended intervals of increased temperature. The maximum MWAT for 2000 from any sampling station near the THP area were 60.1°F, well within the acceptable range. The thresholds of 62°F and 64°F as shown on the above table and the MWAT graphs were established by the Environmental Protection Agency. It should be noted that these thresholds were determined in a laboratory setting and are somewhat arbitrary.

Canopy retention standards in the WLPZ will minimize the effects of timber harvesting on stream temperatures. Timber harvesting in the WLPZ will focus on thinning out clumps of trees and retaining those trees providing the most shade for the water system.

<u>Water Quality</u>

There are no CWA 303d designated reaches on the mainstem of Little Creek or its tributaries. Levels of chemical contamination likely are quite low. Industry is absent from the basin, and commercial agriculture is currently limited to organically grown row crops on small-scale farming operations near the mouth of the Scotts Creek. Big Creek and other timber companies operating within the watershed do not use chemical fertilizers or pesticides in forestry operations.

D. Habitat Condition

Describe the pre-project condition of the following habitat components within the biological assessment area and in the immediate vicinity outside the assessment area. Rate each: 0-none, 1-well below average, 2-below average, 3-average, 4-above average, 5-well above average. Consider "average" to be the typical forest in the Santa Cruz Mountains.

	Pre-Project		Post-Project
Habitat Components	On-site	Off-site	On-site
Snags	**2**	**3**	**3**
Nest Trees	**3**	**3**	**3**
Down Woody Debris	3	**3**	**4**
Multistoried Canopy	**2**	**3**	**3**
Road Density	**3**	**3**	**3**
Hardwoods	**3**	**3**	**3**
Late Seral Stage	**0**	**0**	**0**
Continuity Late Seral Stage	**0**	**0**	**0**

SNAGS/NEST TREES: Snag density varies in the project area. In the THP area where second growth redwood is the dominant tree type, snag density is low and averages approximately one snag per acre. This low snag density is typical of second growth redwood forests that were originally clear-cut. On the ridges, snag density increases where Douglas-fir and knobcone pine become more prevalent. Based on RPF observation, snag density is higher in these portions of the project area, primarily comprised of larger Douglas-fir. Planted Monterey pine stands on Swanton Pacific Ranch are experiencing some mortality from pitch canker and have a high snag density.

Snag trees will not be harvested as part of this THP. Snag recruitment will occur over time by retaining larger, stand alone Douglas-firs with a "wolfy" branching structure, Douglas-fir trees significantly infected with fomes pini, Douglas-fir and redwood trees with visible top die-back, redwoods with "goose pen" boles from fire having a high defect rate, and stand alone granary trees. Because of these measures, snag density should increase following the THP.

DOWN LARGE WOODY DEBRIS: There is a moderate amount of downed, large woody debris in the THP area. The material that is present shall be retained. No burning or site preparation is proposed that would remove or damage the material present. All cull material and chunks created by the operations will be left in the woods. This will lead to an increase of large woody debris on the site.

MULTISTORIED CANOPY: This habitat feature varies throughout the project area. The majority of the watershed was clearcut between 1906 and 1922. Portions of the harvest area were last logged in 1955 when primarily Douglas-fir was removed and sold to the box factory in Santa Cruz. Much of the stand, particularly in redwood dominated areas, is stocked with a single canopy layer approximately 125 feet above the ground level. The north and south forks of Little Creek, in the assessment area, were selectively logged in 1993 and 1994 and are already closer to a two canopy levels than most of the harvest area. Furthermore, along Little Creek, alders, maples and other riparian vegetation create a multistoried canopy with redwoods. The project will increase the multistoried component of the forest by creating a new age class.

ROAD DENSITY: The road density in the assessment area is average compared to other forestland in the general vicinity of the harvest area. Several roads adjacent to the harvest area are located near the bottom of drainages because of historic logging methods. Road density is higher in the lowlands of the watershed where residential development occurs. Road density decreases trails in the upper reaches of the watershed although there are many trails. No new road will be constructed as part of the proposed THP.

HARDWOODS: Hardwood cover in the project area is typical of coniferous forests in the Santa Cruz mountains and throughout the watershed. Hardwood harvesting will not be a major component of this harvest operation. Hardwoods will only be removed when they are damaged during falling or skidding operations or to provide release for conifers. Hardwood cover in the project area will be similar following the project.

LATE SERAL STAGE: Late seral stage forests do not exist in the project area. The entire project area was clear-cut approximately 100 years ago. Portions of the project area were also harvested approximately 50 years ago. Late seral stage forest is not present within the assessment area.

D. Significant Wildlife Areas

1. Are there any of the following significant wildlife areas located within the biological assessment areas or in the immediate vicinity outside the assessment area?

	On-site	Off-site
Deer Fawning Areas	**Yes**	**Yes**
Deer Migrating Corridors	**Yes**	**Yes**
Deer Winter Range	**Yes**	**Yes**
Deer Summer Range	**Yes**	**Yes**
Wetlands	**Yes**	**Yes**
Riparian Areas	**Yes**	**Yes**

2. Will the project significantly affect the use of those areas by wildlife?

The deer habitat and riparian areas will be completely unaffected, though deer forage may improve as a result of the openings created by the harvests. Upper and lower Staub pond and the in-stream stock pond on Winters Creek are perennial wet areas that may be used as breeding grounds for California red-legged frogs. The harvest operation will not negatively impact these sites.

E. Other Projects

Identify and discuss the effects of the following projects within the biological assessment area that might interact with the effects of the proposed project.

1. Past and future projects in the biological assessment area under the control of the timber owner or timberland owner that did or could cause a significant impact on biological resources.

Periodic selective harvesting under the control of the timber owner is planned and carried out with attention to protection of critical biological resources. Future timber harvests, including the potential tractor/cable operation planned for the North Fork of Little Creek in approximately 2006, will be regulated by the California Department of Forestry and will not have a significant impact on biological resources.

2. Past and future projects planned or expected within the biological assessment area not under the control of the timber owner or timberland owner that did or could cause a significant impact to biological resources

There can be no doubt that the clear-cut and burn harvests between 1906 and 1922 bore significant effects to the biological resources within the assessment area. Current timberland owners within the assessment area will likely continue to manage their timber resource. The biological impacts of these projects are expected to be similar to those anticipated for the Lower Little Creek project – that is, none are expected to be significant to biological resources based on the silviculture proposed, the logging system propose, and the mitigations to be implemented.

Past and future residential development has surely affected biological resources in terms of loss of range, habitat, water, and nutrient sources in addition to fragmentation of habitat, predation by and of domestic pets and the risk of human-caused wildfire. Based on population trends in California, residential development will likely increase over time. The rate of growth in the assessment area will likely be relatively low due to the large parcel size and zoning. Livestock grazing and agriculture in the assessment area also alter the landscape and potentially have an

impact on biological resources. Road construction and culvert installation alter natural drainage patterns and therefore impact the beneficial uses of water and habitat for aquatic biological resources. Grazing and agriculture are expected to continue in the watershed at a similar scale to what is practiced now. Road construction is expected to increase, commensurate with increased residential development.

F. Interactions

In consideration of the biological resources inventoried and their interactions as defined above, is the potential high, medium, or low for developing significant cumulative effects to the biological resources within the assessment area as a result of:

1. The proposed project combined with the future effects of past projects without the impacts of future projects?

Low

2. The proposed project combined with the effects of past projects and the expected impacts from future projects listed in Part D?

Low

G. Impacts Evaluation

Based upon the information presented and all other available resources, is the proposed project likely to produce significant adverse cumulative effects to the biological resources within the biological resources assessment area?

No, the proposed project will not produce significant adverse cumulative effects to the biological resources within the assessment area. The mitigations identified in Section II of this THP in combination with the proposed silvicultural and yarding methods will serve to protect all biological resources within the assessment area. In fact, the harvest will improve the habitat available for plants and animals alike by creating increased growing space and available forage following operations.

Will the proposed project, as presented, have a reasonable potential to cause or add to significant cumulative impacts to biological resources within the biological resources assessment area?

Yes (after mitigation)	[ ]
No (after mitigation)	[X]
No (no reasonable potential significant effects)	[ ]

VI. Cumulative Recreation Impacts Assessment

A. Recreational Impacts Assessment Area

The recreational assessment area designated for the purposes of this THP shall be the project area, and the area within 200 feet of the project boundaries. The recreational assessment area chosen for analysis of potential cumulative impacts represents the area that may be impacted by the proposed project. As most of the surrounding land is private with minimal recreational opportunities to the public, the assessment area was deemed appropriate.

B. Recreational Resources Inventory

1. Identify the recreational activities involving significant numbers of people within the recreational assessment area.

Cal Poly, Swanton Pacific Ranch issues day permits to the general public for hiking and horseback riding on the property. A network of trails is also used by local community members for outdoor recreation.

The facilities are available to the public for scheduled events. The Cal Poly Conclave team has a competition grounds on the property, which they also use to train for the event. Field trips and demonstrations conducted by professors and researchers utilize the property as an outdoor classroom.

2. Identify any recreational Special Treatment Areas as defined by the Board of Forestry rules within the recreational assessment area.

There are no known recreational Special Treatment Areas within the recreational assessment area.

C. Change in Recreational Resources

Discuss whether the project will significantly alter the recreational opportunities within the recreational assessment area.

The project will not significantly alter the recreational opportunities within the recreational assessment area. Trails will be unavailable for use during harvesting operations but will remain scenic places to hike or ride horses after harvesting is complete. For demonstration purposes, the proposed operation will perpetuate the management of the Cal Poly School Forest, making it a more useful place to showcase active management practices.

D. Other Projects

Identify and discuss other projects within the recreational assessment area that might interact with the effects of the proposed project.

1. Any past or future projects within the recreational assessment area that are under the control of the timber owner or timberland owner that will impact recreational opportunities identified above.

No known past or future projects of the timberland owner will impact recreational opportunities.

2. Any known future projects planned or expected in the recreational assessment area that are not under control of the timber owner or timberland owner that will impact recreational opportunities identified above.

No known past or future projects of other landowners in the assessment area will impact recreational opportunities.

E. Impacts Evaluation

Will the proposed project as presented have a reasonable potential to cause or add to significant cumulative impacts to recreational resources?

Yes (after mitigation)	[ ]
No (after mitigation)	[ ]
No (no reasonable potential significant effects)	**[X]**

VII. Cumulative Visual Impacts Assessment

A. Visual Impacts Assessment Area

The visual impacts assessment area is that portion of the proposed project area readily visible to significant numbers of people who are no further than three miles away from the project area (14 CCR 912.9). Outside of this distance the selective harvest method will not be discernable to people viewing the project area.

The majority of the project area is on the side slopes between Little Creek, Winters Creek and Archibald Creek. This area is generally not visible except from a few residential homes in the Scotts Creek valley-bottom and on the ridge south of Scotts Creek. The crest of rangeland between Highway 1 and the project area obscures views of the project area from Highway 1.

B. Visual Resources Inventory

1. Identify any Special Treatment Areas designated by the Board of Forestry for their visual value within the visual assessment area.

Highway 1 is approximately 1.3 miles southwest of the harvest area at the closest point. Highway 1 is a designated Scenic Highway; however, the harvest area is not visible from Highway 1.

2. Describe how far the proposed project is from the nearest point that significant numbers of people can view the project.

Swanton Road is approximately 100 feet from the edge of the harvest area at the closest point. There is a buffer between the road and the harvest area; however, residents driving the road will be able to see a small portion of the harvest area from this location.

3. Identify the manner in which the public identified in Parts A and B will view the proposed project.

The public may view the project area from scattered residential homes on nearby slopes, when recreating on Swanton Pacific Ranch and when driving on Swanton Road.

C. Change in Visual Resources

Discuss the probability of the project changing the visual setting viewed by the public as a result of vegetation removal, creation of slash and debris or soil exposure.

The proposed project (a selective timber harvest) would change a portion of the visual setting afforded the neighbors. Motorists driving by on Swanton Road may have a limited glimpse at the harvested area. Stumps, tractor-packed slash, and generally more sunlight through the trees would be visible to a limited extent upon the completion of proposed operations.

D. Other Projects

Identify and discuss other projects in the visual assessment area that might interact with the effects of the proposed project.

1. Any past and future projects in the visual assessment area that are under the control of the timber owner or the timberland owner that could interact to cause a significant change in any identified visual resource.

Future harvests would render the same change in appearance identified above.

2. Known future projects in the visual assessment area that are not under the control of timber owner or timberland owner that could interact with any identified visual resource.

No known future projects.

E. Impacts Evaluation

Will the proposed project have a reasonable potential to cause or add to significant cumulative impacts to visual resources?

Yes (after mitigation)	[ ]
No (after mitigation)	[ ]
No (no reasonable potential significant effects)	[X]

VIII. Cumulative Traffic Impacts Assessment

A. Traffic Impacts Assessment Area

The traffic impacts assessment area includes all public and private roads necessary for crew travel, log hauling, and equipment transport. The traffic area was chosen as it represents the sum of all private and public roads that will be used in the course of this operation.

1. Identify any public roads to be used for transporting logs.

Trucks will leave the project area and travel either north or south on Swanton Road, then north on Highway 1 to the mill.

2. Identify any public roads that have not been used recently for the transport of logs.

Highway 1 within the haul route is used annually for the transport of logs. Swanton road is used every three to four years for the transport of logs.

3. Identify any public roads to be used to transport logs that have existing traffic or maintenance problems.

No existing traffic or maintenance problems on the haul route.

B. Activity Levels

Discuss how the log trucks used on the project will change the amount of traffic on public roads, especially during heavy traffic conditions.

Approximately 6 loads will be trucked from the proposed project each weekday. There will be no log hauling on the weekends and holidays. The haul route is not subject to heavy traffic. Log trucks will be no more than a minor inconvenience to motorists, at most slowing only the fastest traffic.

C. Other Projects

Identify and discuss other projects in the traffic assessment area that might interact with the effects of the proposed project.

1. Other past or future projects on lands under the control of the timber owner or timberland owner that will add significantly to traffic on public roads during the period the roads are used by log trucks from the proposed project.

No other projects have been identified.

2. Any known future projects not under the control of the timber owner or timberland owner that will impact public road traffic during the period that the roads are being used by log trucks from the proposed project.

It is anticipated that other harvest operations will be using portions of the haul route designated for this THP. Use of Highway 1 is a normal occurrence in any given harvest season and to date has not resulted in quantifiable negative impacts upon roads or commuters.

D. Impacts Evaluation

Will the proposed project as presented have a reasonable potential to cause or add to significant cumulative impacts to traffic on public roads?

Yes (after mitigation)	[ ]
No (after mitigation)	[ ]
No (no reasonable potential significant effects)	[X]

IX. Cumulative Noise Impacts Assessment

A. Noise Impacts Assessment Area

The impacts of chainsaw and heavy equipment noise will be assessed within .5 mile of the harvest area.

1. Identify neighbors and the public interface in the assessment area.

Notices were sent to all landowners within 300 feet of the parcels in which harvesting is to occur. Many of those parcels are do not have residences. The residences within the assessment area are scattered. A portion of Swanton Road is also located in the assessment area.

B. Activity Levels

Discuss how operations will change the amount of noise in the assessment area.

Noise levels in the assessment area will be elevated for the short duration of the harvest. The operation of chainsaws and all other power equipment, except licensed highway vehicles, shall be restricted to the hours between 7:00 am and 7:00 pm, and shall be prohibited on Saturdays, Sundays, and nationally designated legal holidays.

C. Other Projects

Identify and discuss other projects in the noise assessment area that might interact with the effects of the proposed project.

CAMP may occasionally fly over the assessment area in helicopters during the late summer and fall when searching for illegal marijuana plantations. CDF helicopter fly-overs may also occasionally occur throughout the fire season during a response to a fire.

D. Impacts Evaluation

Will the proposed project as presented have a reasonable potential to cause or add to significant cumulative impacts to noise levels in the assessment area?

Yes (after mitigation)	[ ]
No (after mitigation)	[X]
No (no reasonable potential significant effects)	[ ]

X. Determination of Potential for Cumulative Impact

A. Introduction:

The following is a concise summary of the subjects discussed within the context of this assessment. The questions and answers are definitive and intended only to summarize the findings of each specific section of analysis. The answers indicated for each question below account for all mitigations, proposed or required by the forest practice rules.

1. Will the project adversely affect a threatened or endangered species of animal or plant or the habitat of the species?

No.

2. Will the project interfere significantly with the movement of any resident or migratory fish or wildlife?

No.

3. Will the project significantly diminish habitat for fish, wildlife, or plants?

No.

4. Will the project significantly degrade water quality including temperature, chemical composition, pH, and color?

No.

5. Will the project contaminate a domestic water supply?

No.

6. Will the project cause significant flooding, erosion or siltation?

No.

7. Will the project have a significant, demonstrable, negative aesthetic effect as viewed from areas of high public use such as roads and parks?

No.

8. Will the project significantly increase the long-term ambient noise levels for the adjoining areas?

No.

9. Will the project violate ambient air quality standards?

No. Truck roads will be watered to maintain them in a reasonably dust-free condition during use. Dust created in the movement of tractors quickly dissipates within the forest.

10. Will the project create a potential public health hazard or involve the use of, production or disposal of material, which poses a hazard to human, animal or plant populations in the area?

No.

11. Will the project disrupt or adversely affect a prehistoric or historic archaeological site or property of historic or cultural significance to a community, ethnic, or social group?

No.

12. Will the project conflict with established recreational, educational, religious or scientific uses of the area?
No.

13. Will the project disrupt or divide the physical arrangement of an established community?

No.

14. Will the project cause an increase in traffic that is significant in relation to the existing traffic load and capacity of the public road system or as it interferes with the scheduled school bus traffic and commute traffic?

No.

15. Will the project interfere with emergency response or emergency plans?

No.

16. Will the project increase fire hazard significantly?

No. During the harvest operation there is an increase in fuel and risk of ignition. At the same time, the risk of spread is considerably reduced because people and equipment are on-site and available for fire suppression. Following completion of operations, hazardous fuels are crushed with tractors or hand cut (with chainsaws) within 30 inches of the mineral soil layer. In this way, ladder fuels are eliminated thus reducing the potential for large crown fires to a level of insignificance.

B. Cumulative Impacts Assessment

In consideration of the Forest Practice Rules for 2004, mitigation measures proposed in this plan, the discussion above, and the field of review and appraisal of similar harvest operations in the Santa Cruz Mountains which demonstrate that timber harvesting, as proposed here, did not cause any significant adverse environmental impact, I have concluded that the proposed operation will not have a significant adverse impact on the watershed.

MARCH 15, 2004

SECTION V: THP ATTACHMENTS
LOWER LITTLE CREEK THP

THP ATTACHMENTS PAGE

ESTIMATED SURFACE SOIL EROSION HAZARD STATE OF CALIFORNIA
Lower Little Creek THP BOARD OF FORESTRY

I. SOIL FACTORS				FACTOR RATING BY AREA			SOIL TYPES
A. SOIL TEXTURE	Fine	Medium	Coarse	A	B	C	**A= 168 Santa Lucia shaly clay loam 30-50% slope** **B= 174 Tierra Watsonville complex 15-30% slope** **C= 175 Tierra Watsonville complex 30-50% slope**
1. DETACHABILITY	Low	Moderate	High	**8**	**20**	**20**	
Rating	1-9	10-18	19-30				
2. PERMEABILITY	Slow	Moderate	Rapid	**3**	**5**	**5**	
Rating	5-4	3-2	1				

B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK

	Shallow	Moderate	Deep			
	1"-19"	20"-39"	40"-60"	**5**	**11**	**11**
Rating	15-9	8-4	3-1			

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

	Low	Moderate	High				FACTOR RATING BY AREA		
	(-) 10-39%	40-70%	71-100%	**5**	**5**	**5**			
Rating	10-6	5-3	2-1				A	B	C
						SUBTOTAL⇒	**21**	**41**	**41**

II. SLOPE FACTOR

Slope	5-15%	16-30%	31-40%	41-50%	51-70%	71-80%(+)	**15**	**6**	**15**
Rating	1-3	4-6	7-10	11-15	16-25	26-35			

III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE

	Low	Moderate	High			
	0-40%	41-80%	81-100%	**3**	**3**	**3**
Rating	15-8	7-4	3-1			

IV. TWO YEAR, ONE-HOUR RAINFALL INTENSITY (Hundredths Inch)

	Low	Moderate	High	Extreme			
	(-) 30-39	40-59	60-69	70-80(+)	**15**	**15**	**15**
Rating	1-3	4-7	8-11	12-15			
				TOTAL SUM OF FACTORS⇒	**54**	**65**	**74**

EROSION HAZARD RATING

<50	50-65	66-75	>75			
LOW (L)	MODERATE (M)	HIGH (H)	EXTREME (E)	**M**	**M**	**H**

ESTIMATED SURFACE SOIL EROSION HAZARD STATE OF CALIFORNIA
Lower Little Creek THP BOARD OF FORESTRY

I. SOIL FACTORS				FACTOR RATING BY AREA			SOIL TYPES
A. SOIL TEXTURE	Fine	Medium	Coarse	A	B	C	A= 113 Ben Lomond-Catelli Sur complex 30-75% slope B= 117 Bonnydoon loam 30-50% slope C= 167 Santa Lucia shaly clay loam 5-30% slope
1. DETACHABILITY	Low	Moderate	High	23	17	8	
Rating	1-9	10-18	19-30				
2. PERMEABILITY	Slow	Moderate	Rapid	2	3	3	
Rating	5-4	3-2	1				

B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK

	Shallow	Moderate	Deep			
	1"-19"	20"-39"	40"-60"	4	11	5
Rating	15-9	8-4	3-1			

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

	Low	Moderate	High				FACTOR RATING BY AREA		
	(-) 10-39%	40-70%	71-100%	5	9	3			
Rating	10-6	5-3	2-1				A	B	C
						SUBTOTAL⇒	34	40	19

II. SLOPE FACTOR

Slope	5-15%	16-30%	31-40%	41-50%	51-70%	71-80%(+)	18	12	5
Rating	1-3	4-6	7-10	11-15	16-25	26-35			

III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE

	Low	Moderate	High			
	0-40%	41-80%	81-100%	3	3	3
Rating	15-8	7-4	3-1			

IV. TWO YEAR, ONE-HOUR RAINFALL INTENSITY (Hundredths Inch)

	Low	Moderate	High	Extreme			
	(-) 30-39	40-59	60-69	70-80(+)	15	15	15
Rating	1-3	4-7	8-11	12-15			
				TOTAL SUM OF FACTORS⇒	70	70	42

EROSION HAZARD RATING

<50	50-65	66-75	>75	H	H	L
LOW (L)	MODERATE (M)	HIGH (H)	EXTREME (E)			

ESTIMATED SURFACE SOIL EROSION HAZARD STATE OF CALIFORNIA
Lower Little Creek THP BOARD OF FORESTRY

I. SOIL FACTORS				FACTOR RATING BY AREA			SOIL TYPES
A. SOIL TEXTURE	Fine	Medium	Coarse	A	B	C	
1. DETACHABILITY Rating	Low	Moderate	High	**24**			**A= 153 Maymen-Rock Outcrop Complex**
	1-9	10-18	19-30				
2. PERMEABILITY Rating	Slow	Moderate	Rapid	**2**			
	5-4	3-2	1				

B. DEPTH TO RESTRICTIVE LAYER OR BEDROCK

	Shallow	Moderate	Deep			
	1"-19"	20"-39"	40"-60"	**11**		
Rating	15-9	8-4	3-1			

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

	Low	Moderate	High				FACTOR RATING BY AREA		
	(-) 10-39%	40-70%	71-100%	**2**					
Rating	10-6	5-3	2-1				A	B	C
						SUBTOTAL⇒	**39**		

II. SLOPE FACTOR

Slope Rating	5-15%	16-30%	31-40%	41-50%	51-70%	71-80%(+)	**18**		
	1-3	4-6	7-10	11-15	16-25	26-35			

III. PROTECTIVE VEGETATIVE COVER REMAINING AFTER DISTURBANCE

	Low	Moderate	High			
	0-40%	41-80%	81-100%	**3**		
Rating	15-8	7-4	3-1			

IV. TWO YEAR, ONE-HOUR RAINFALL INTENSITY (Hundredths Inch)

	Low	Moderate	High	Extreme			
	(-) 30-39	40-59	60-69	70-80(+)	**15**		
Rating	1-3	4-7	8-11	12-15			
				TOTAL SUM OF FACTORS⇒	**75**		

EROSION HAZARD RATING

<50	50-65	66-75	>75	**H**		
LOW (L)	MODERATE (M)	HIGH (H)	EXTREME (E)			

NOTICE OF INTENT TO HARVEST TIMBER / DOMESTIC WATER SUPPLY INQUIRY

California Polytechnic State University Foundation will submit a Timber Harvest Plan (THP) to the California Department of Forestry and Fire Protection (CDF) on or after March 5, 2004 for timber and timberland owners California Polytechnic State University Foundation. CDF will be reviewing the proposed timber operation for compliance with various laws and rules. This notice with map is being provided prior to the submission of the THP, so that the submitter may be advised of surface water supplies taken from watercourses within 1,000 feet downstream of the proposed harvest. Please send such information to the forester listed below within 10 days of the publication date of this notice of inquiry. The THP has been prepared by Big Creek Lumber Company forester, Steve R. Auten, RPF #2734, 3564 Highway 1, Davenport, CA 95017, (831) 457-6387. The location of the plan is Santa Cruz County, T10S, R3W, Portions of Sections 8, 17 and Rancho Agua Puerca Las Trancas Projected Sections 17, 18 & 20 of the MDB&M. The plan area is approximately 3 miles north of the town of Davenport. The nearest perennial stream, Class I Little Creek, flows 75 feet south of a portion of the plan area and enters Scotts Creek 200 feet west of the plan area.

The approximate THP size is 102 acres. Regeneration shall be accomplished through a selective harvest of redwood sawlogs per 14CCR 913.8(a). There are overhead electric power lines within the project area. The approximate property lines have been flagged for review where truck roads; tractor roads or harvest areas are within 100 feet of the property line. The estimated earliest date that the Director may approve the plan is April 19, 2004. This plan can be reviewed or a copy obtained (for a fee) once submitted to CDF at one of the following locations:

California Department of Forestry
135 Ridgeway Avenue
Santa Rosa, CA 95401
(707) 576-2959

California Department of Forestry
P.O. Drawer F-2
Felton, CA 95018
(831) 335-6740

SantaRosaPublicComment@fire.ca.gov

Questions or comments regarding the THP should be directed to CDF for public input incorporation into an Official Response Document.

If you have a domestic surface water uptake on Little Creek within the plan area or within 1,000 feet downstream of the plan area please contact Steve R. Auten within ten days of this publication.

2/25 (1268705)

SPACE FOR COUNTY CLERK'S FILING STAMP

Proof of Publication

(2015.5 C.C.P.)

Public Notice

I, THE UNDERSIGNED, DECLARE:

That I am over the age of eighteen and not interested in the herein-referenced matter; that I am now, and at all times embraced in the publication herein mentioned was, a principal employee of the printer of the Santa Cruz Sentinel, a daily newspaper printed, published and circulated in the said county and adjudged a newspaper of general circulation by the Superior Court of California in and for the County of Santa Cruz, under Proceeding No. 25794; that the advertisement (of which the annexed is a true printed copy) was published in the above-named newspaper on the following dates, to wit:

FEBRUARY 25, 2004

I DECLARE under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

This **25th** day of **FEBRUARY 2004**, at Santa Cruz, California.

Linda M Tortice

LINDA M. TORTICE

89

BIG CREEK
3564 HIGHWAY 1
DAVENPORT, CA 95017

FACSIMILE TRANSMITTAL SHEET

TO:	FROM:
Mr. Andrew Strader	Nadia Hamey
COMPANY:	DATE:
County of Santa Cruz	3/2/2004
FAX NUMBER:	TOTAL NO. OF PAGES INCLUDING COVER:
(831) 454-3128	2
PHONE NUMBER:	CC::
(831) 454-2741	
RE:	FAX NUMBER (CC):
Water uptakes within or below Little Creek planning area.	

☐ URGENT ☑ FOR REVIEW ☐ PLEASE COMMENT ☐ PLEASE REPLY ☐ PLEASE RECYCLE

NOTES/COMMENTS:

Mr. Strader,

I have attached a map that is an enlarged portion of the Davenport USGS 7.5' quadrangle. I am interested in any information you can provide regarding surface water uptakes in the water uptake assessment area. The assessment area encompasses portions of Lower Little Creek, Winter Creek, Archibald Creek, and Scotts Creek downstream from the confluence with Little Creek. I would also like to know about any local publicly-owned water districts or community water systems which maintain any water production or storage facilities in this area. If you have any information please call me at your earliest convenience (831)457-6382. Thank you for your time and assistance looking into this matter.

Sincerely,

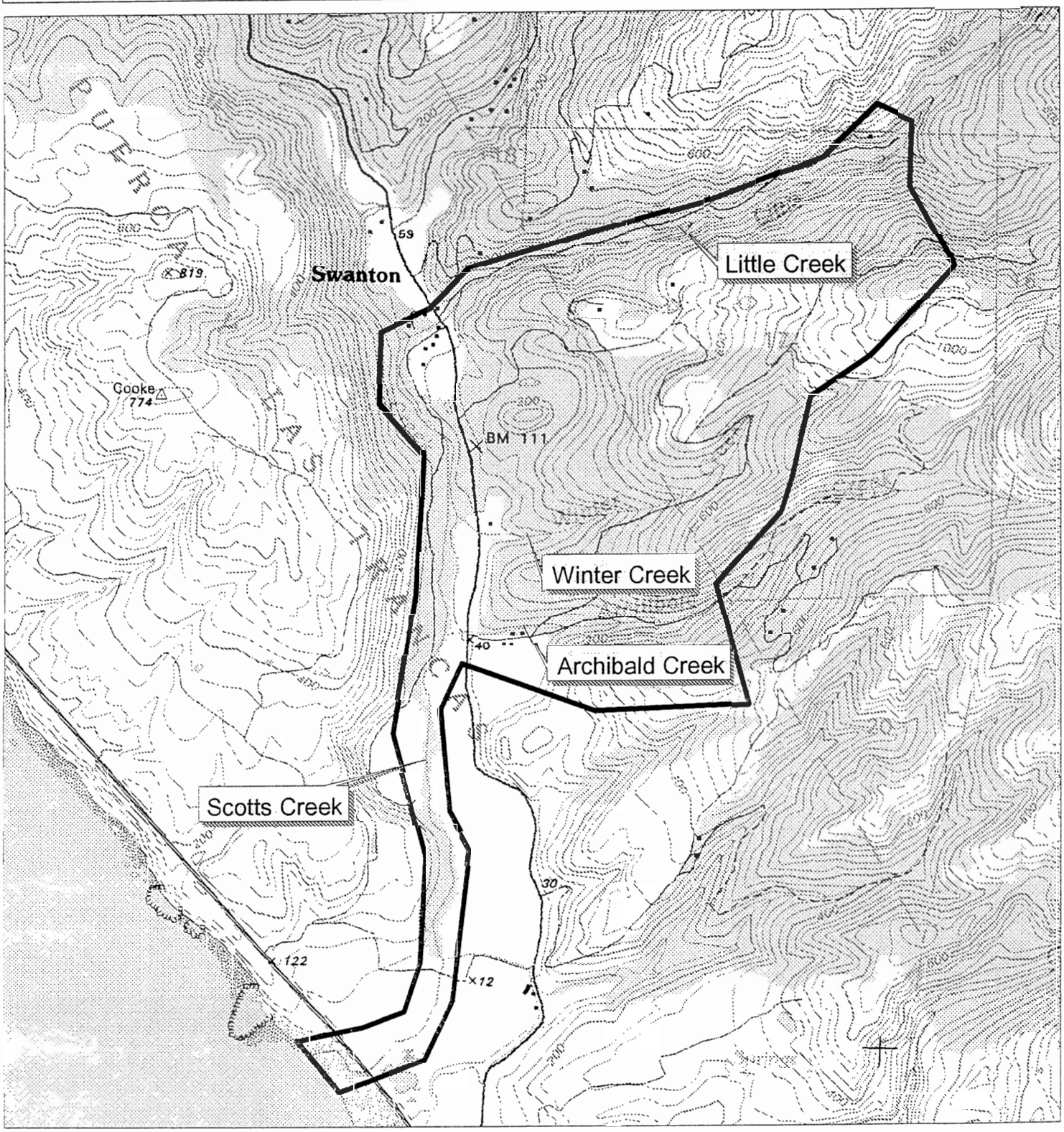
Nadia Hamey

Nadia Hamey

Forester
(831)457-6382
nadiah@big-creek.com

2/24/2004
Reply: "Two wells in the vicinity of lower Scotts Creek, no additional surface water uptakes."
(A. Strader)

LOWER LITTLE CREEK THP: WATER UPTAKE ASSESSMENT AREA
USGS 7.5' QUADRANGLE, DAVENPORT, TOWNSHIP 10 SOUTH, RANGE 3 WEST
PORTIONS OF SECTIONS 8,17 AND RANCHO AGUA PUERCA Y LAS TRANCAS



2000 0 2000 4000 Feet

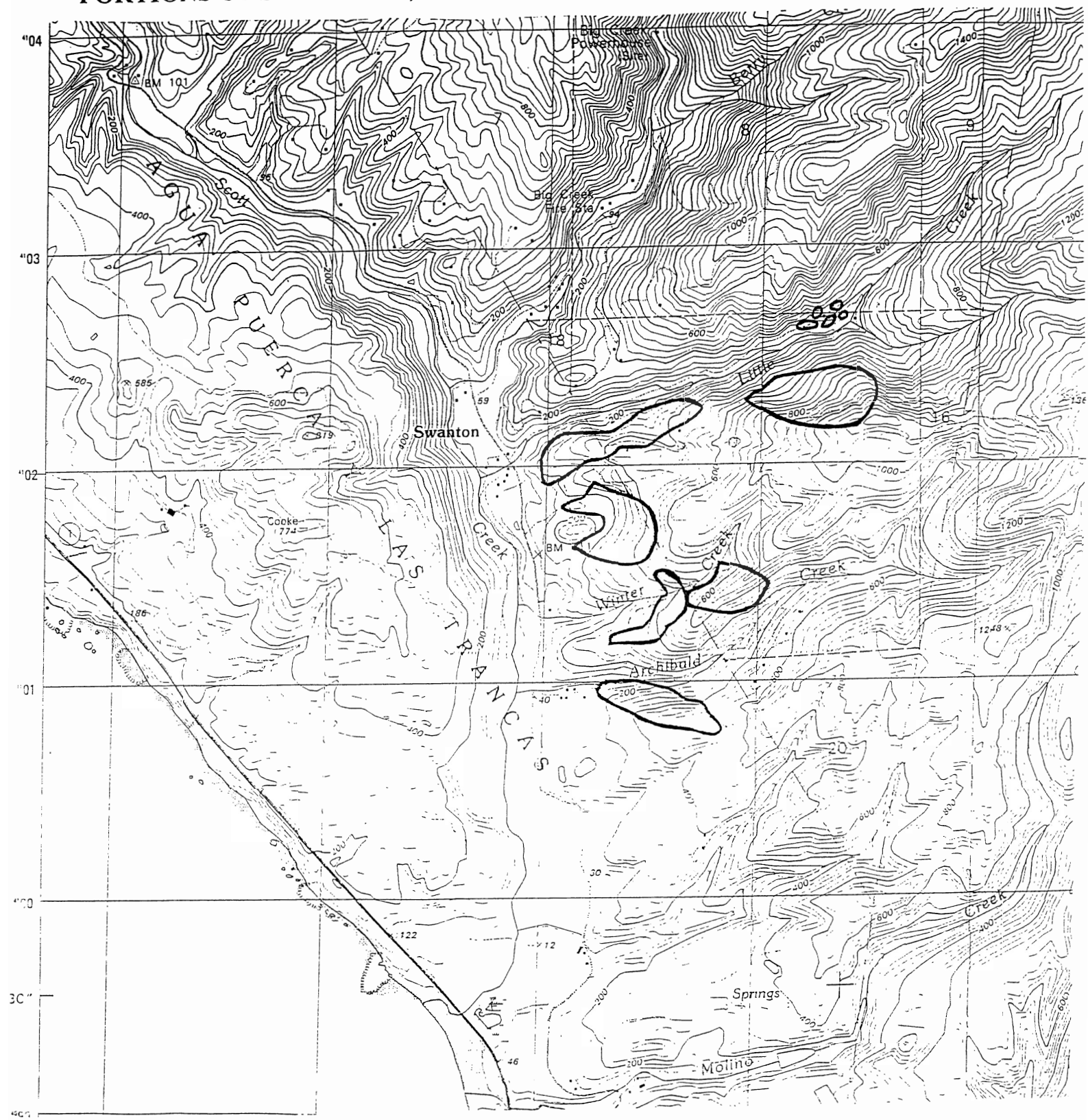
LEGEND

Water Uptake Assessment Area

N

BIG CREEK
Big Creek Forestry Department
3564 Highway 1
Davenport, CA 95017
nadiah@big-creek.com

LOWER LITTLE CREEK THP: PROJECT LOCATION MAP
SANTA CRUZ COUNTY, TOWNSHIP 10 SOUTH, RANGE 3 WEST
PORTIONS OF SECTIONS 8, 17 AND RANCHO AGUA PUERCA Y LAS TRANCAS



DAVENPORT QUADRANGLE
CALIFORNIA-SANTA CRUZ CO.
7.5-MINUTE SERIES (TOPOGRAPHIC)

SCALE 1:24 000

1997

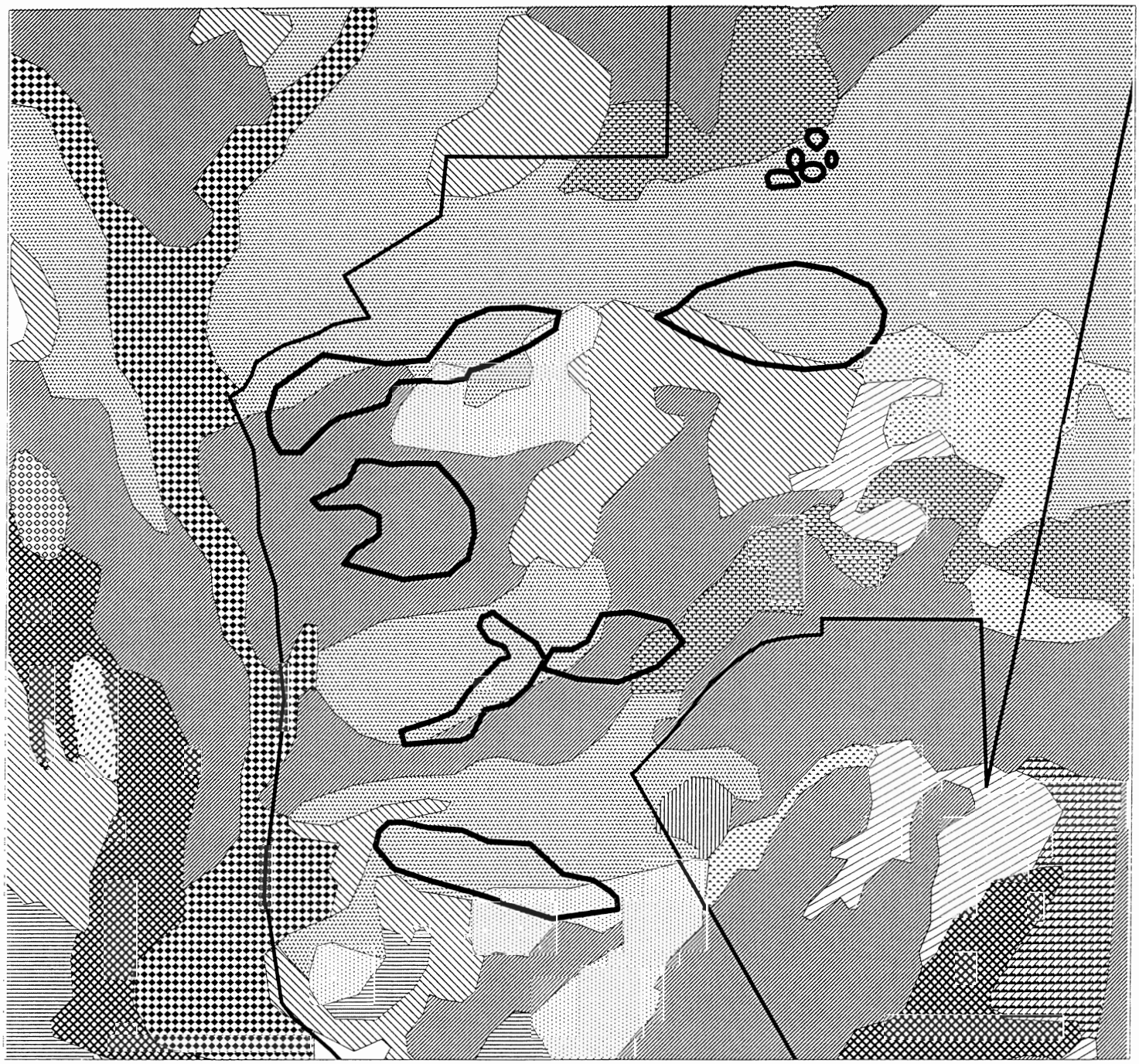
Harvest Boundary

MN
GN
15½°
276 MILS
0°30′
9 MILS

1 0 1
MILES

1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

LOWER LITTLE CREEK THP: SOIL ASSESSMENT AREA MAP
USGS 7.5' QUADRANGLE, DAVENPORT, TOWNSHIP 10 SOUTH, RANGE 3 WEST
PORTIONS OF SECTIONS 8, 17 AND RANCHO AGUA PUERCA Y LAS TRANCAS



N

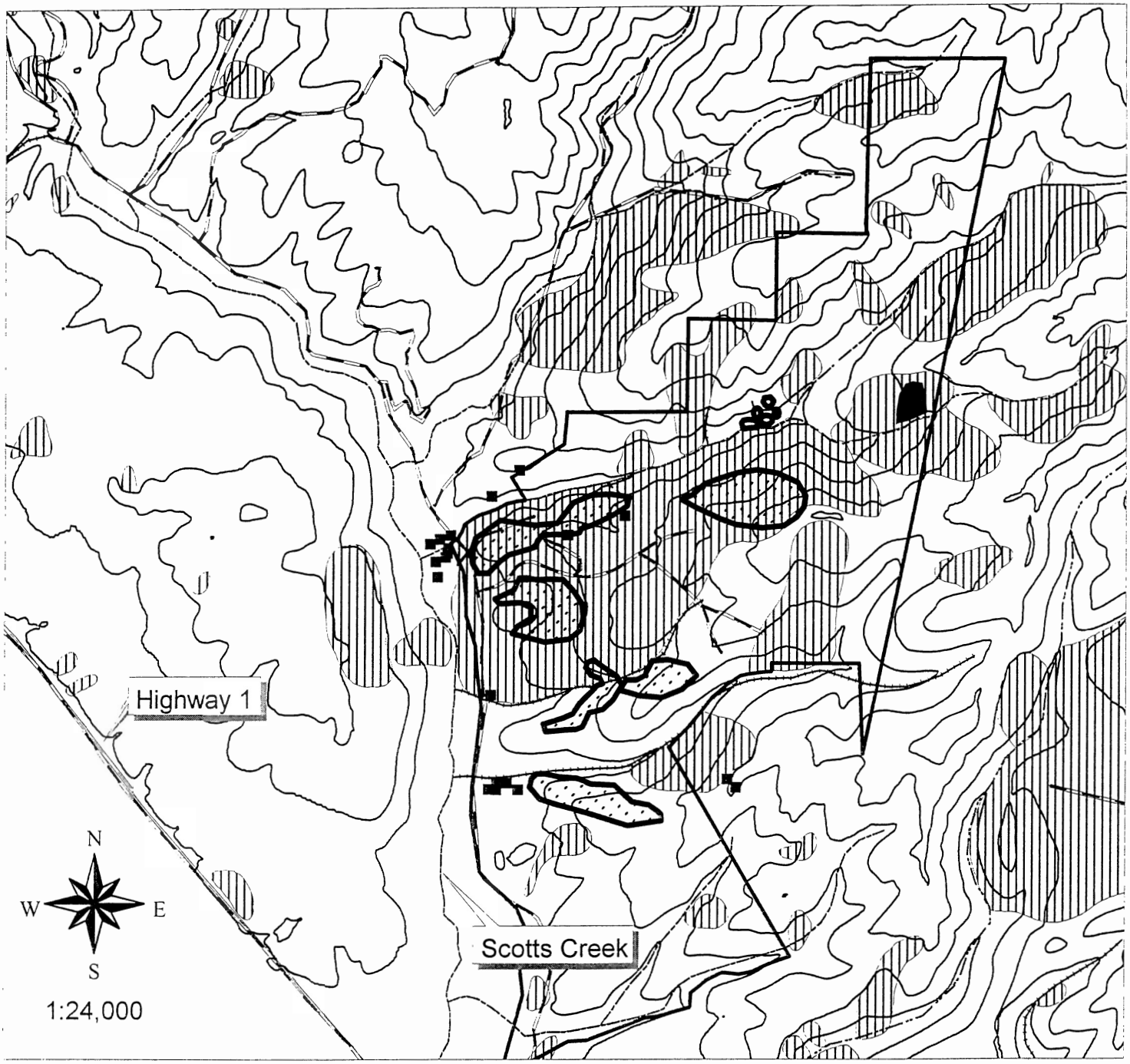
2000 0 2000 4000 Feet

- Soil Assessment Area
- Aptos Loam
- Soquel Loam
- Pfeiffer Gravelly Sandy Loam
- Maymen-Rock Outcrop Complex
- Maymen-Madonna Complex
- Maymen Stony Loam
- Los Osos Loam
- Lompico-Felton Complex
- Bonnydoon-Rock Outcrop Complex
- Bonnydoon Loam
- Ben Lomond-Catelli-Sur Complex
- Santa Lucia shaly clay loam
- Tierra-Watsonville complex

BIG CREEK

Big Creek Forestry Department
3564 Highway 1
Davenport, CA 95017
andym@big-creek.com

LOWER LITTLE CREEK THP: COOPER CLARK MAPPED LANDSLIDES
USGS 7.5' QUADRANGLE, DAVENPORT, TOWNSHIP 10 SOUTH, RANGE 3 WEST
PORTIONS OF SECTIONS 8, 17 AND RANCHO AGUA PUERCA Y LAS TRANCAS



3000 0 3000 6000 9000 12000 Feet

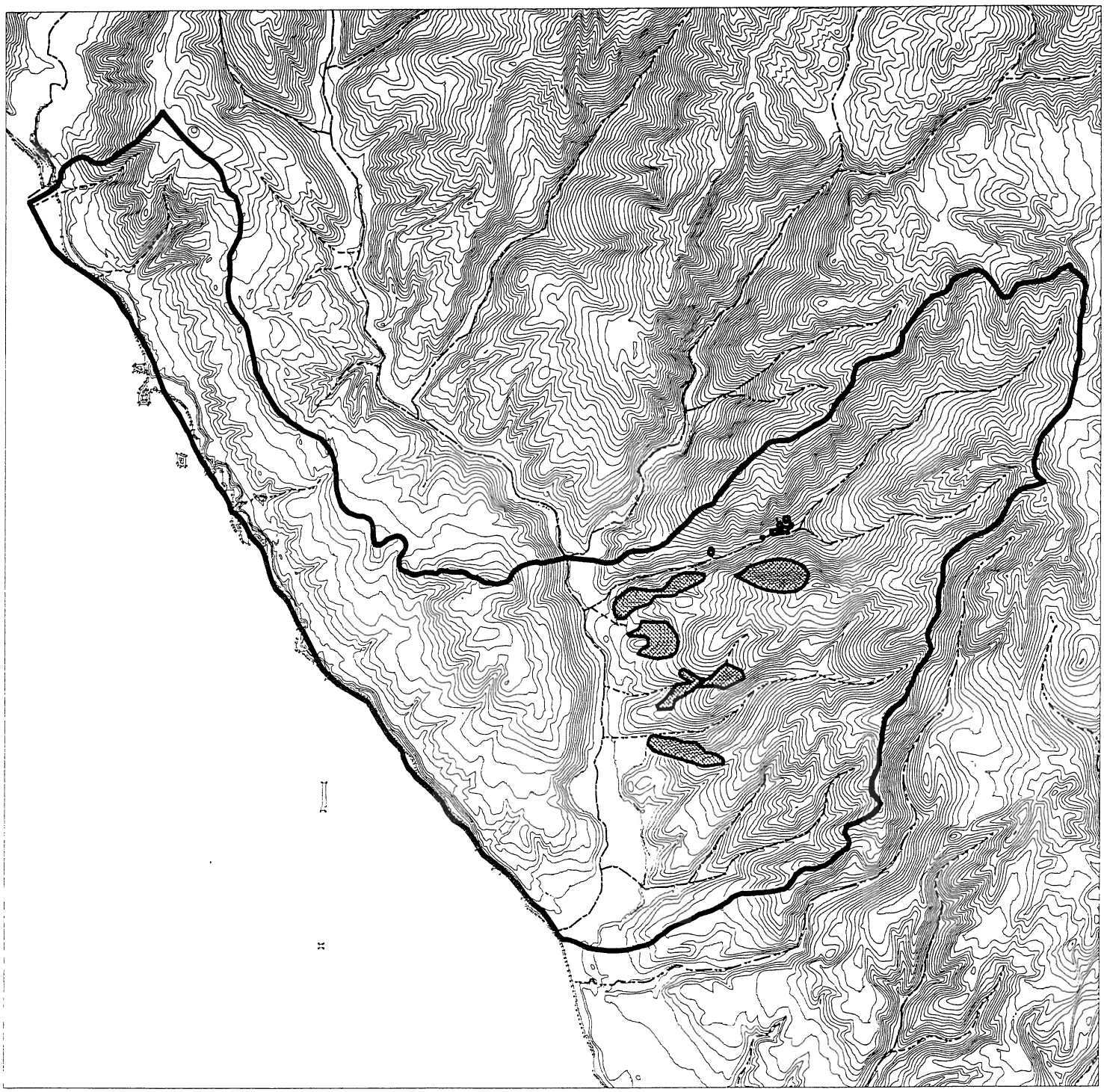
LEGEND

- Cooper Clark Mapped Landslide Deposit
- 1955 Landslide
- Harvest Area
- Property Line
- Roads
- Structures
- 200-foot Contours

BIG CREEK

Big Creek Forestry Department
3564 Highway 1
Davenport, CA 95017
andym@big-creek.com

LOWER LITTLE CREEK THP: WATERSHED ASSESSMENT AREA MAP
USGS 7.5' QUADRANGLE, DAVENPORT, TOWNSHIP 10 SOUTH, RANGE 3 WEST
PORTIONS OF SECTIONS 8, 17 AND RANCHO AGUA PUERCA Y LAS TRANCAS



4000 0 4000 8000 12000 16000 Feet

LEGEND

- Calwater Little Creek # 3304.110202 4470 Acres
- Harvest Area
- 40 Foot Contour Line
- Class I Watercourse
- Class II Watercourse
- Class III Watercourse

N

BIG CREEK

Big Creek Forestry Department
3564 Highway 1
Davenport, CA 95017
andym@big-creek.com

CHECKLIST TO BE USED WITH USFWS DICHOTOMOUS KEY FOR RED-LEGGED FROG (11/27/96)

CIRCLE EACH CHOICE YOU MADE AND APPEND TO THE THP

USE OF THIS CHECKLIST ACKNOWLEDGES THAT THE ENTIRE SANTA CRUZ MOUNTAINS ARE WITHIN RANGE OF THE RED-LEGGED FROG (HEREINAFTER REFERRED TO AS "FROG")

	YES	NO
I. Have the frogs been observed in the river basin in which the THP area is found?	(Go to III)	End of Assessment
II. What is status of each frog observation in the river basin? (Fill out table, then go to IV)		
PROXIMITY TO THE THP: In and adjacent to the harvest area		
DATE OF OBSERVATION: January - July 1997		
AGE OF INDIVIDUAL OBSERVED (Egg, Tadpole, Juvenile, Adult): Adults and Juveniles		
OTHER NOTES		
IV. Have frogs been observed in the THP area or in the area immediately downstream of the THP?	(Go to VII)	Go to V
V. Has at least one (1) frog been observed within reasonable movement distance of the THP area via riparian corridors?	Go to VII	Go to VI
VI. Has at least one (1) frog been observed within reasonable movement distance of the THP area via upland habitats?	Go to VII	End of Assessment
VII. Evaluate the THP area and areas in the vicinity of the THP for the presence of habitat types (Fill out table, then go to VIII.)		
AQUATIC HABITATS (creeks, streams, ponds, marshes, and deep pools and backwaters): Pods in class I Little Creek, stock ponds (in-stream + out), Defunct swimming pool		
RIPARIAN HABITAT (seeps, springs, bogs, and areas if saturated ground; includes ferns, horsetails, sedges and moisture loving trees - maples, alders, willows, etc.): Stream riparian corridors containing maples, alders, willows, and ferns		
UPLAND HABITAT: Grazed grassland scrubland, Monterey Pine Forest, Redwood/Douglas-fir Forest		
SUITABLE BREEDING HABITAT: Stock ponds of sufficient size to retain water, Deep pools in Little Creek		
OTHER		
VIII. Are there aquatic habitats within or immediately downstream of the THP area that may be affected by the THP activities? Mitigation at X6 will remove a potential sediment source to Little Creek. Erosion control will minimize sediment transport.	Identify Mitigations from VIII A' then go to IX	Go to IX.
IX. Are there any riparian habitats within the THP area that may be affected by timber harvest activities? Equipment will not enter the WLPZ except at designated crossings. 85% canopy shall be retained within the first 75 feet of the WLPZ on Little Creek.	Identify Mitigations from IX A' in THP Then go to X.	Go to X.
X. Are there any upland habitats within the THP area that may be affected by timber harvest activities? All ground based skidding shall occur prior to the wet season before red-legged frogs are mobile in upland habitats	Identify Mitigations from X. A' in THP	End of Assessment

APPENDIX B

Appendix B consists of lists of plants and animals (and their habitats) which are described in section 5.1 of the General Plan and Local Coastal Program Land Use Plan. This appendix contains a series of lists which collectively address all the plant and animal species and their associated habitats which are to be protected in Santa Cruz county. As state and federal lists change, this catalogue will be amended to reflect the most current information. Updates can be made without General Plan/LCP amendments or certification by the California Coastal Commission.

THREATENED, ENDANGERED OR ANIMALS OF SPECIAL CONCERN IN SANTA CRUZ COUNTY
Updated 3/1/94

SPECIES	STATE/FEDERAL LISTING	SPECIES OF SPECIAL CONCERN
SPIDERS AND RELATIVES		
Dollof Cave Spider	C2	
Santa Cruz Teleman Spider	C2	
Empire Cave Pseudoscorpion	C2	
GASTROPODS		
California Brackish Water Snail	C2	
INSECTS		
Barbate (Mt. Herman) June Beetle	C2	
Opler's Longhorn Moth	2R	
Monarch Butterfly (wintering sites)	†	
FISHES		
Coho (Silver Salmon)		
Tidewater Goby	C2	Yes
AMPHIBIANS AND REPTILES		
Santa Cruz Long-toed Salamander	SE/FE	
California Red-legged Frog	C2	Yes
Western Pond Turtle		Yes
San Francisco Garter Snake	SE/FE	
Horned Lizard		Yes
BIRDS		
Bank Swallow	ST	
Black-crowned Night Heron		Yes
Black-shinned Hawk		Yes
Black Swift		Yes
Brown Pelican	SE/FE	
Burrowing Owl		Yes
California Least Tern	SE/FE	
Cooper's Hawk		Yes
Double Crested Cormorant		Yes
Golden Eagle		Yes
Ferruginous Hawk		Yes
Marbled Murrelet	SCT/FPT	
Merlin		Yes
Osprey		Yes
Peregrine Falcon	SE/FE	
Purple Martin		Yes
Sharp-shinned Hawk		Yes
Spotted Owl		Yes
Tricolored Blackbird	C2	Yes
Western Snowy Plover	FT	Yes
Western Yellow Billed Cuckoo	SE	
Willow Flycatcher	SCE	
Yellow Breasted Chat		Yes
Yellow Warbler		Yes
MAMMALS		
American Badger		Yes
Monterey Ornate Shrew	C2	Yes
Northern (Steller) Sea Lion	FT	
Santa Cruz Harvest Mouse	C2	Yes
Souther Sea Otter	FT	

KEY

STATE

- **SE** State listed Endangered
- **ST** State listed Threatened
- **SCE** State candidate Endagered
- **SCT** State candidate Threatened

FEDERAL

- **FE** Federally listed Endangered
- **FT** Federally listed Threatened
- **FPE** Federally proposed Endagered
- **FPT** Federally proposed Threatened

- **C1** Sufficient data to support Federal listing
- **C2** Listing May be warranted, but data insufficient to support Federal listing.
- **1R** Recommended for C1 status by U.S. Fish and Wildlife Service (USFWS)
- **2R** Recommended for C2 status by USFWS

† Species fall into one or more categories:

- Biologically rare, very restricted in distrib-ution or declining throughout their range.
- Species closely associated with a habi-tat that is rapidly declining in California.
- California population(s) are threatened with extirpation.

CALIFORNIA STATE PLANT SPECIES OF CONCERN FOUND IN SANTA CRUZ COUNTY - RARE AND/OR ENDANGERED
Updated 3/1/94

	Scientific Name	Common Name	State/ Federal Status	Location	Threat
	Agrostis agristiglumis	Awned bentgrass	C1	Small colony on bluff near Greyhound Rock	
	Agrostis blasdalei	Blasdale's bentgrass	C2	Few colonies in coastal grasslands, mostly Swanton/Greyhound Rock areas.	Threatened in part by agricultural conversion
	Amsinckia lunaris	Bent-flowered fiddleneck		Small colonies on slopes in Swanton area	No immediate threat?
	Arabis blepharophylia	Coast rock cress	C3c	One colony near Eagle Rock, purchased by Sempervirons Fund.	No immediate threat.
	Arctostaphylos glutinosa	Schreiber's manzanita	C2	Chalk ridges NE of Swanton, most of habitat owned by Lockheed.	Up to 1/3 population removed for fire suppression. Possible long-term threat from fire suppression.
	Arctostaphylos hookeri ssp. Hookeri	Hooker's manzanita		Maritime chaparral in San Andreas/Calabasas area.	Threatened by residential development and competing exotics, especially Eucalyptus
X?	Arctostaphylos pajaroensis	Pajaro manzanita		Collected in same area as A. hookeri probably always rare in Santa Cruz Co.	Threats same as A. hookeri if not already extirpated in Santa Cruz County
E	Arctostaphylos silvicola	Silver leaved manzanita	CE/C2	Zayante sandhills and Bonny Doon	Residential Development and sand quarrying. Large population in Bonny Doon protected.
X	Arenaria paludicola	Marsh sandwort	CE/C1	Only colony at Camp Evers marsh in Scotts Valley habitat destroyed for golf course and trailer park.	Habitat destroyed.
	Calyptridlum parryl var. hesseae	Santa Cruz Mtns pussypaws		Rare, few locations in sandy chaparral north of Watsonville, reported in Ben Lomond Mtn and Zayante sandhills.	More information needed on occurrences and threats
X	Campanula californica	Swamp harebell	C2	Only colony at Camp Evers marsh in Scotts Valley habitat destroyed for golf course and trailer park	Habitat destroyed.
	Campanula exigua	Chaparral harebell		Two small colonies in Zayante sandhills.	No immediate threat?
	Castilleja latifola	Monterey Indian paintbrush		Coastal dunes at Sunset Beach State Park and Pajaro Dunes.	Most of population removed by residential development. Threatened by invasive exotics European beachgrass and Iceplant.
	Ceanothus rigidus	Monterey ceanothus	C2	Few plants in maritime chaparral in Calabasas area.	Threatened by residential development, competing exotics and fire suppression.
	Chlorizanthe pungens var. hartwegiana	Ben Lomond Spineflower	FE	Zayante sandhills and Bonny Doon	Mining
	Chorizanthe pungens var. pungens	Monterey Spineflower	C1	Sunset Beach and probably a few other sandy areas in south County but no recent collections.	More information needed on occurrences
	Chorizanthe robusta var. robusta	Robust spineflower	FE	Found in a few sandy places in midcounty and Sunset Beach areas.	No immediate threat?
E	Chorizanthe robusta var. hartwegli	Hartweg's spineflower	C1	Restricted to a few flower fields in Scotts Valley	Threatened by proposed housing and gold course development.

KEY
E = Endemic to Santa Cruz County
X = Extirpated in Santa Cruz County
† = Presumed extict

STATE/ FEDERAL STATUS:
CE = State listed as Endangered
CR = State listed as Rare
CC = Canidate for State listing
PE = Proposed as Endangered
FE = Federally listed as Endangered
C1 = Sufficient data to support federal listing
C2 = Threat and/or distribution data insufficient to support federal listing
C3c = Determined too widespread and/or not threatened for federal listing

CALIFORNIA STATE PLANT SPECIES OF CONCERN FOUND IN SANTA CRUZ COUNTY - RARE AND/OR ENDANGERED
Updated 3/1/94

	Scientific Name	Common Name	State/ Federal Status	Location	Threat
	Collinsia franciscana	San Francisco collinsia		A fee colonies on slopes in Greyhound Rock and Swanton areas.	No immediate threat.
	Cupressus abramsiana	Santa Cruz cypress	CE/FE	Isolated groves in chaparral at Bonny Doon, Eagle Rock, Bracken Brae and above Smith Grade.	Some loss due to residential and vineyard development. Two colonies are publically owned.
X?	Cypripedium fasciculatum	Clustered lady's slipper	C3c	Formerly reported near Glenwood and Boulder Creek. No recent records.	Presumed extirpated in Santa Cruz County, possibly due to collecting.
	Elymus californicus	California bottlebrush grass	C3c	Isolated colonies in openings in woodlands in Swanton area and a few mid county areas.	Most colonies not threatened at this time.
E	Erigonum nudum decurrens	Zayante buckwheat		Zayante sandhills and a few sandy areas in south county.	Reduced by mining and residential development, but common in remaining habitat.
	Erysimum ammophilum	Coast wallflower	C2	Secondary coastal dunes at Sunset Beach and south to Monterey Co.	Threatened by iceplant.
	Elrysimum franciscanum	San Francisco wallflower	C2	Few small colonies on sandy bluffs in Greyhound Rock area; population is at the southern limit of its range.	Threatened by competition from iceplant.
E	Erysimum teretifollum	Santa Cruz wallflower	CE/C1	Zayante sandhills and a small colony in Bonny Doon	Significantly reduced by quarrying. 2-3 populations protected, but largest population threatened by quarrying.
X?	Fritillaria agrestis	Stinkbells	C3c	Reported between Santa Cruz and Soquel, no recent records.	Probably lost long ago to agricultural and urban development
	Grindella latifolia latifollia	Coastal gumplant		Common in saltmarsh at Pajaro estuary and other places along the coast.	More common than originally considered; may be candidate for delisting.
E	Gnaphallum zayateense	Zayante everlasting		Zayante sandhills	Probably much reduced by quarrying
	Holocarpha macradenia	Santa Cruz tarplant	CE/C1	A few colonies remaining in Watsonville area, Soquel/Live Oak area and at Graham Hill Rd.	Possibly all are currently or potentially threatened by various developments.
	Horkella cuneata ssp sericea	Wedge leaved horkelia	C2	Coastal grasslands in Greyhound Rock area and at Graham Hill Rd.	Possibly much reduced by quarrying
	Horkella marinensis	Pt. Reyes horkelia	C2	Native grasslands along Empire Grade	No immediate threat?
X?	Lilliun rubescens	Redwood lily		Reported to occur south to Santa Cruz County. No recent records.	
	Lomatium parvifollum	Small leaved lomatium		A few found in maritime chaparral NW of Watsonville	Still extant? Possible threat from residential development.
	Malacothamnus arcuatus	Arcuate bushmallow		Few in chaparral near Big Basin	No immediate threats?
	Microseris decipiens	Santa Cruz microseris	C2	Few colonies in Greyhound Rock/Swanton area.	No immediate threats?

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CALIFORNIA STATE PLANT SPECIES OF CONCERN FOUND IN SANTA CRUZ COUNTY - RARE AND/OR ENDANGERED
Updated 3/1/94

	Scientific Name	Common Name	State/ Federal Status	Location	Threat
E?	Mimulus rattanii ssp decurtatus	Santa Cruz County monkeyflower		Chaparral borders in Zayante sandhills	Probably reduced by mining and residential development.
	Monardella undulata var undulata	Curly leaved coyote mint		Zayante sandhills	Much reduced by mining and residential development.
X?	Pedicularis dudleyi	Dudley's lousewort	CR/C3c	Reported from redwood forest at San Lorenzo River and Aptos, but no recent records.	
	Penstemon rattanii ssp kleei	Santa Cruz Mountains beardtongue		Few small populations in Nisene Marks State Park and Ben Lomond Mountain.	No immediate threats?
	Pentachaeta bellidiflora	White rayed pentachaeta	CC/C2	Big Basin Quadrangle	
	Perideridia gairdneri ssp gairdneri	Gairdner's yampeh	C2	Colonies on native terrace grasslands, mostly midcounty area, some in Swanton area	Much reduced by agriculture and urban development; remaining colonies threatened
	Pinus radiata	Monterey pine		Only native groves in Swanton area.	Possible threats due to disease and genetic pollution by artificially planted hybrids
	Piperia elongata ssp michaelii	Michael's rein orchid		Few colonies along north coast.	Some reduction due to trampling, otherwise numbers mysteriously decreasing
	Plagiobothrys chorisianus var chorisianus	Chorist's popcornflower		Scattered colonies in wet places, north coast grasslands, etc.	
†	Plagiobothrys diffusus	San Francisco popcornflower	CE/C2	Presumed extinct, since rediscovered in grassland near Swanton and other places near Santa Cruz and Scotts Valley	Most colonies threatened by housing development.
	Quercus lobata	Valley oak		Best grove near corner of Zayante and Quail Hollow Rds, small groves and individual trees scattered throughout San Lorenzo Valley and other areas	Future of grove in uncertain
X?	Ranunculus lobbii	Lobb's aquatic buttercup		Reportedly found in ponds and marshes south to central Santa Cruz County. No recent records.	
	Ribes divaricatum var publiforum	Straggly goosberry		Fairly common in moist, brushy areas	No significant threats
	Sanicula hoffmannii	Hoffmann's sanicle	C3c	Several colonies in Last Chance Rd area	No immediate threats?
	Silene verecunda ssp verecunda	San Francisco champion	C2	Mudstone outcrops in Greyhound Rock area.	No immediate threats?
	Stylocline amphibola	Mt Diablo cottonweed		Scattered colonies on mudstone outcrops mostly in Greyhound Rock area, some in Scotts Valley area.	Scotts Valley colonies threatened by housing and golf course development.
	Trifolium grayi	West's clover		Colonies at isolated grasslands at Scotts Valley and a few other inland areas.	Threatened by housing and golf course development.

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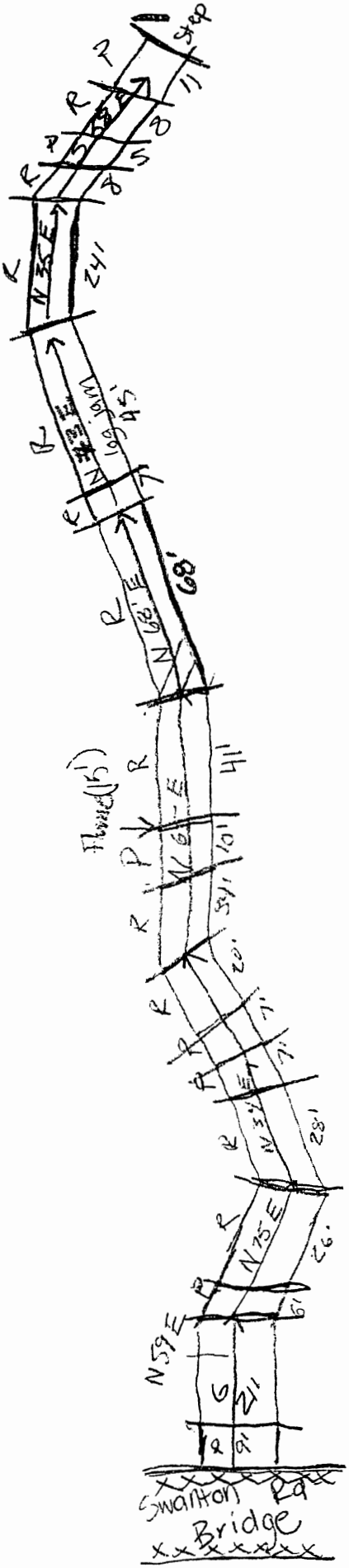
Upstream

HABITAT TYPING OF LITTLE CREEK



undercut bank

Cut bank

Bridge

Boulder

landslide

P = Pool
R = Riffle
G = Glide

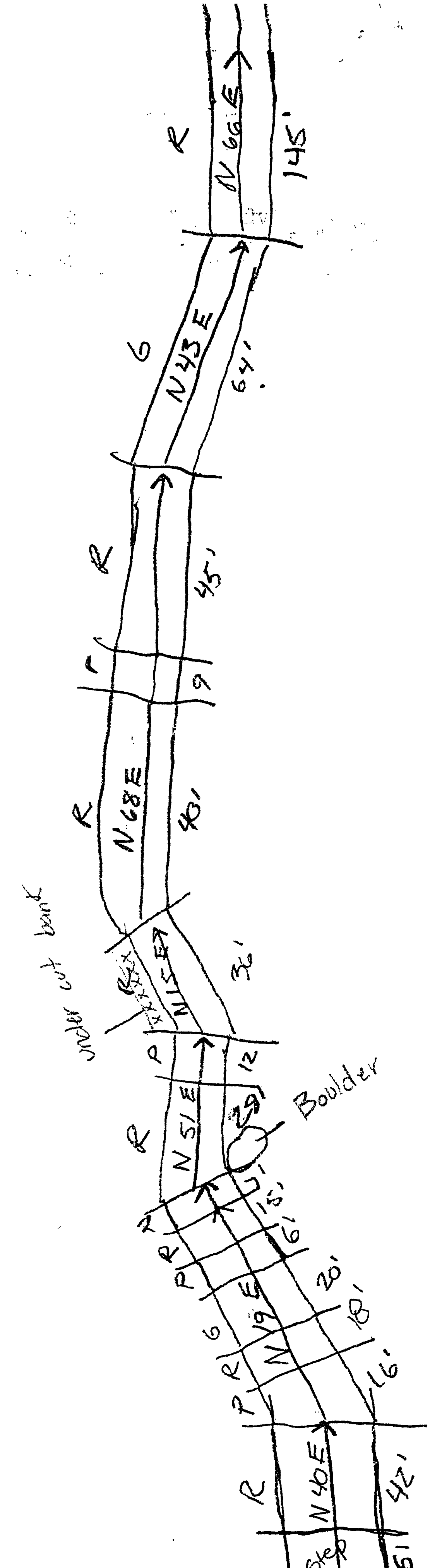
log jam

2/19/02

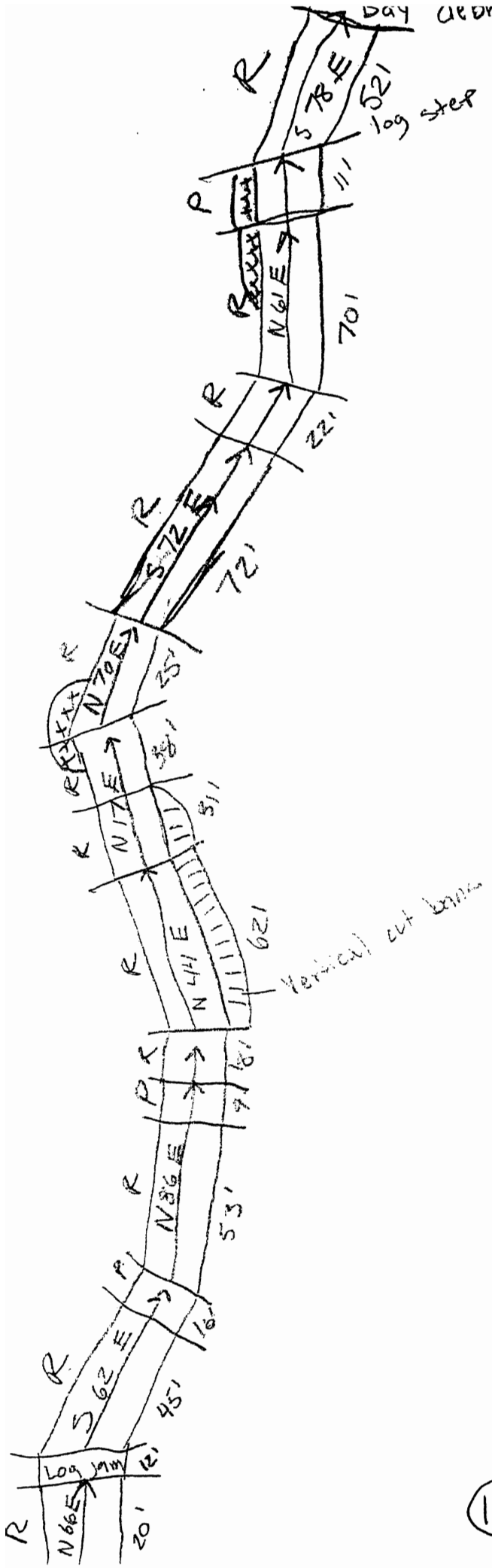
102

LITTLE CREEK

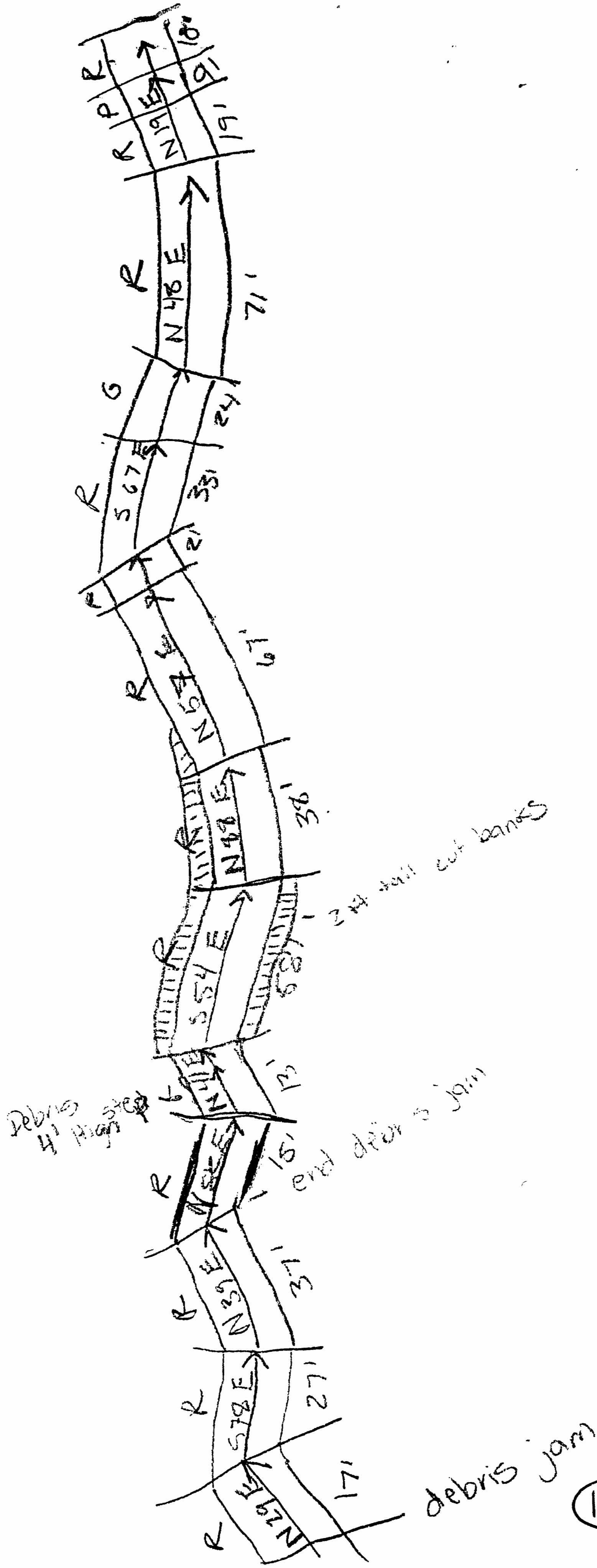
Downstream


R
N 66 E
145'
G
N43E
64'
R
45'
r
9
R
N68E
40'
under cut bank
N15E
36'
P
12
R
N51E
29'
Boulder
15'
6'
20'
18'
N19E
G
16'
R
N40E
42'
step
61

2/19/04

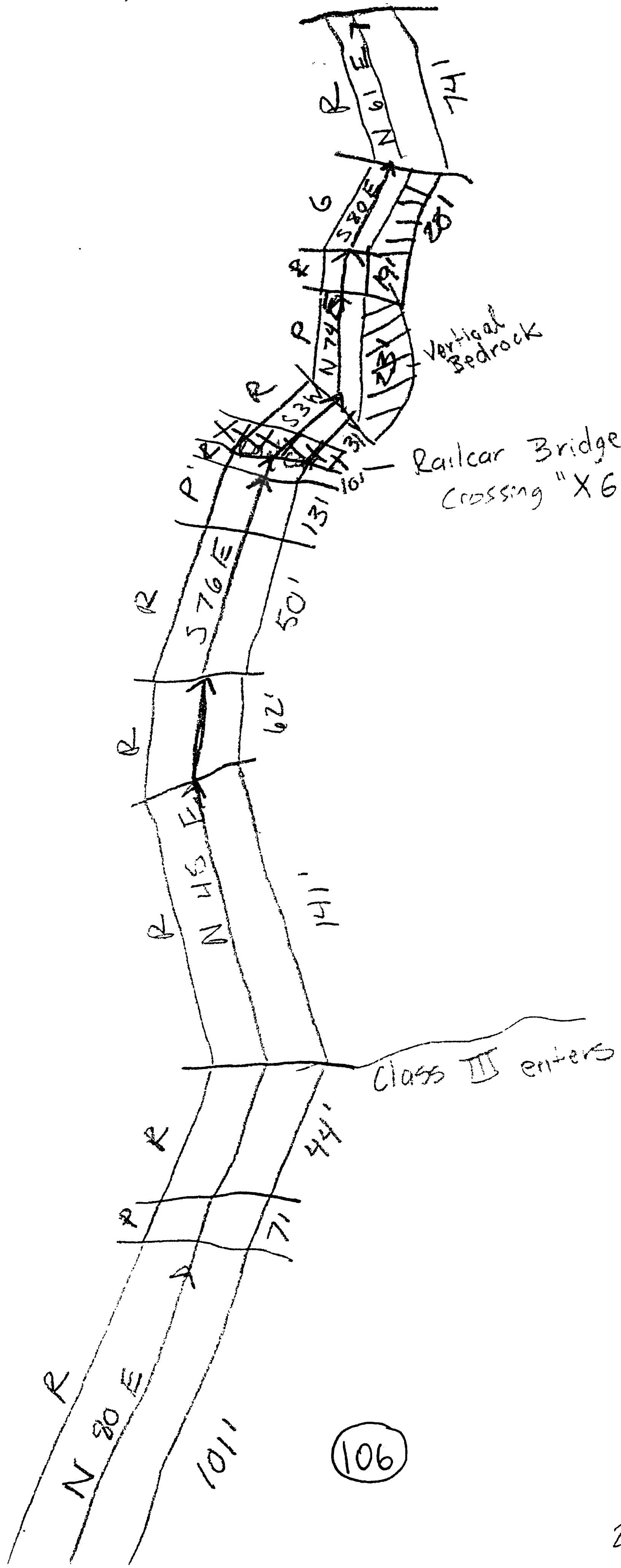

Day debris jam
R
S 78 E
521
log step
P
111
R
N 61 E
701
R
22'
R
S 72 E
72'
R
N 70 E
25'
R
36'
N 17 E
51'
R
N 41 E
621
Vertical cut bank
R
P
16'
R
N 36 E
53'
P
16'
R
S 62 E
45'
Log jam
12'
R
N 66 E
20'

2/19/04

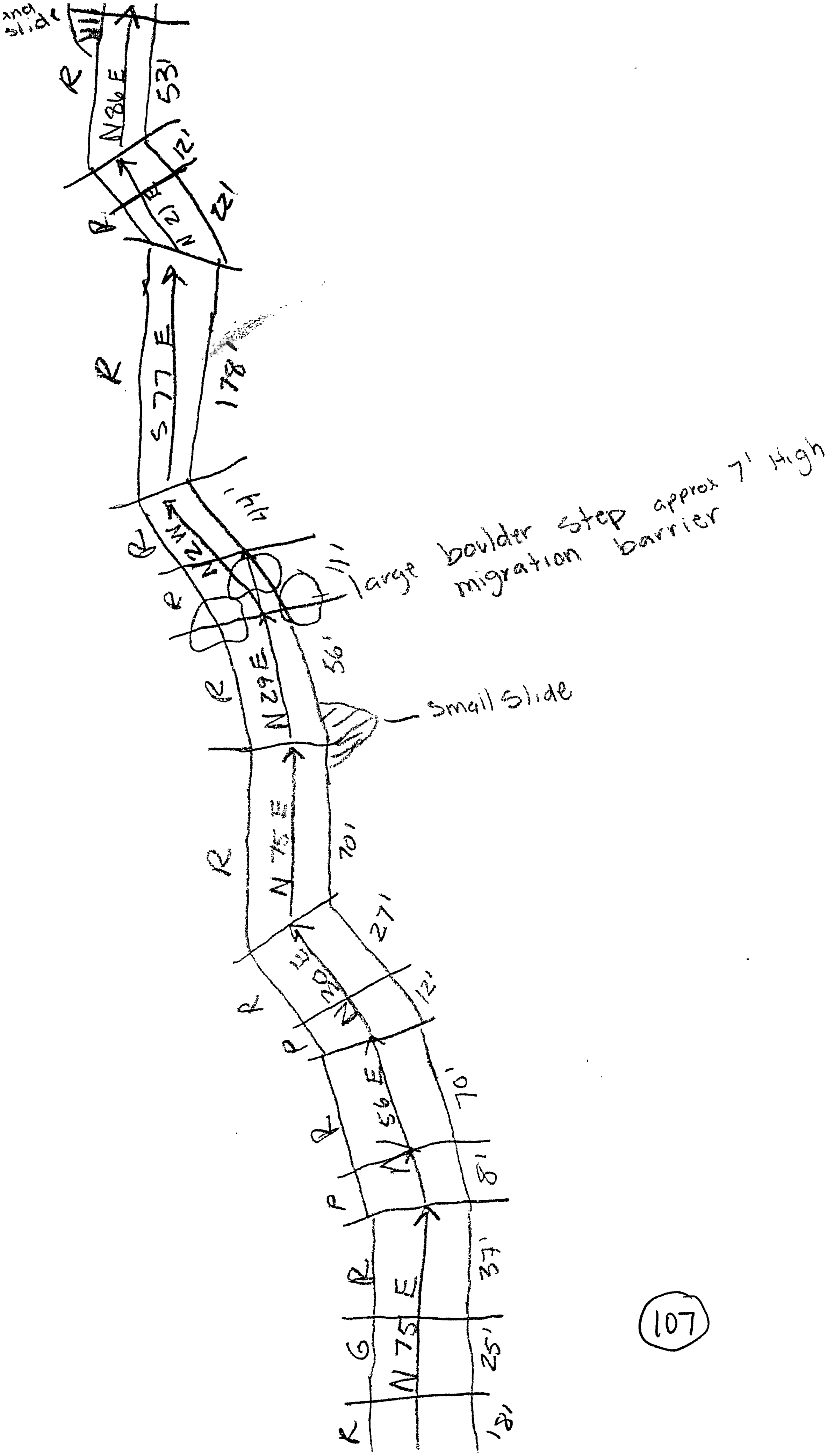

N19E
18'
16'
19'
N48E
71'
G
24'
S67E
33'
R
21'
N57E
67'
N42E
38'
S54E
68'
2 ft tall cut banks
N41E
13'
Debris 4' High step
15'
end debris jam
N39E
37'
S78E
27'
N29E
17'
debris jam

105

2/19/04

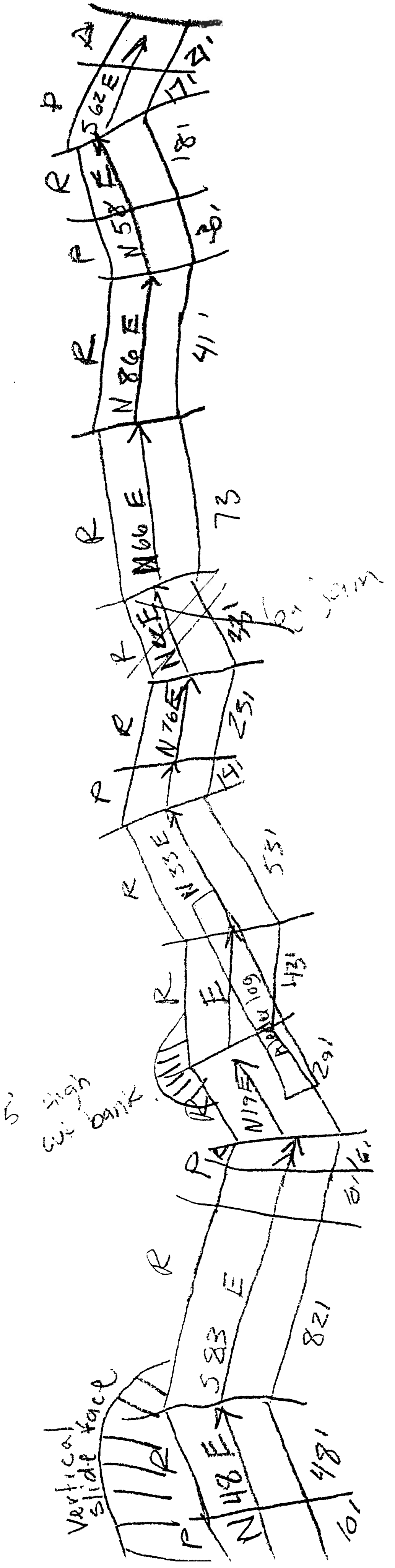

N 61 E
47'
R
G
S 80 E
18'
R
19'
P
N 74
Vertical Bedrock
R
S 3
3'
10'
Railcar Bridge Crossing "X 6"
P
13'
R
S 76 E
50'
R
62'
N 45 E
R
141'
Class III enters
R
44'
R
7'
R
N 80 E
101'

2/19/04


and slide
R
N86E
53'
12'
N21E
22'
S77E
178'
N2W
14'
11'
large boulder step approx 7' High
migration barrier
N29E
56'
Small slide
N75E
70'
N20E
27'
12'
P
N56E
70'
8'
N75E
37'
G
25'
18'

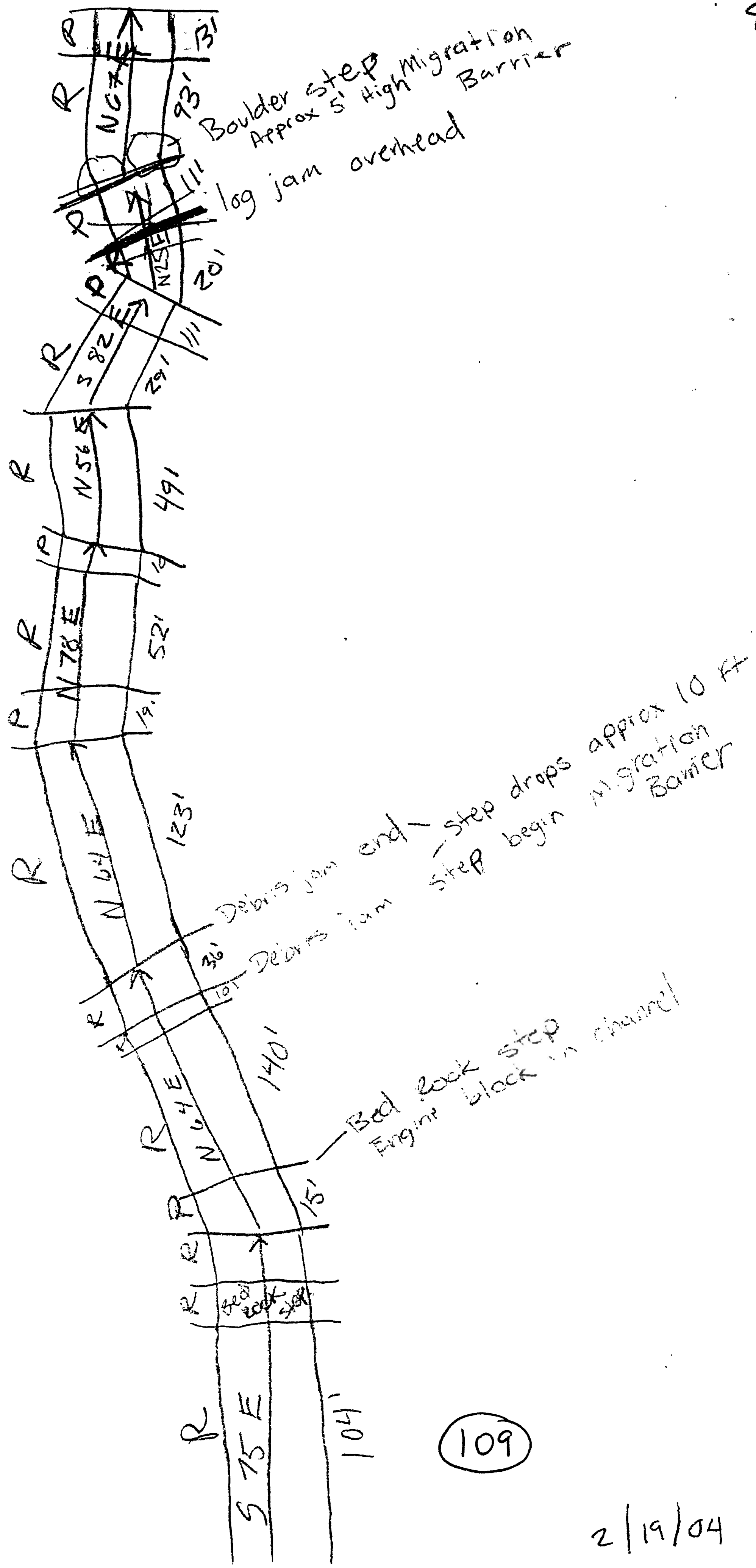
107

2/19/04


N 48 E
48'
10'
S 83 E
82'
10'
16'
N 19 E
29'
43'
E
55'
N 33 E
14'
N 76 E
25'
33'
73
N 66 E
N 86 E
41'
N 58 E
20'
18'
17'
21'
5' high cut bank
Vertical slide face

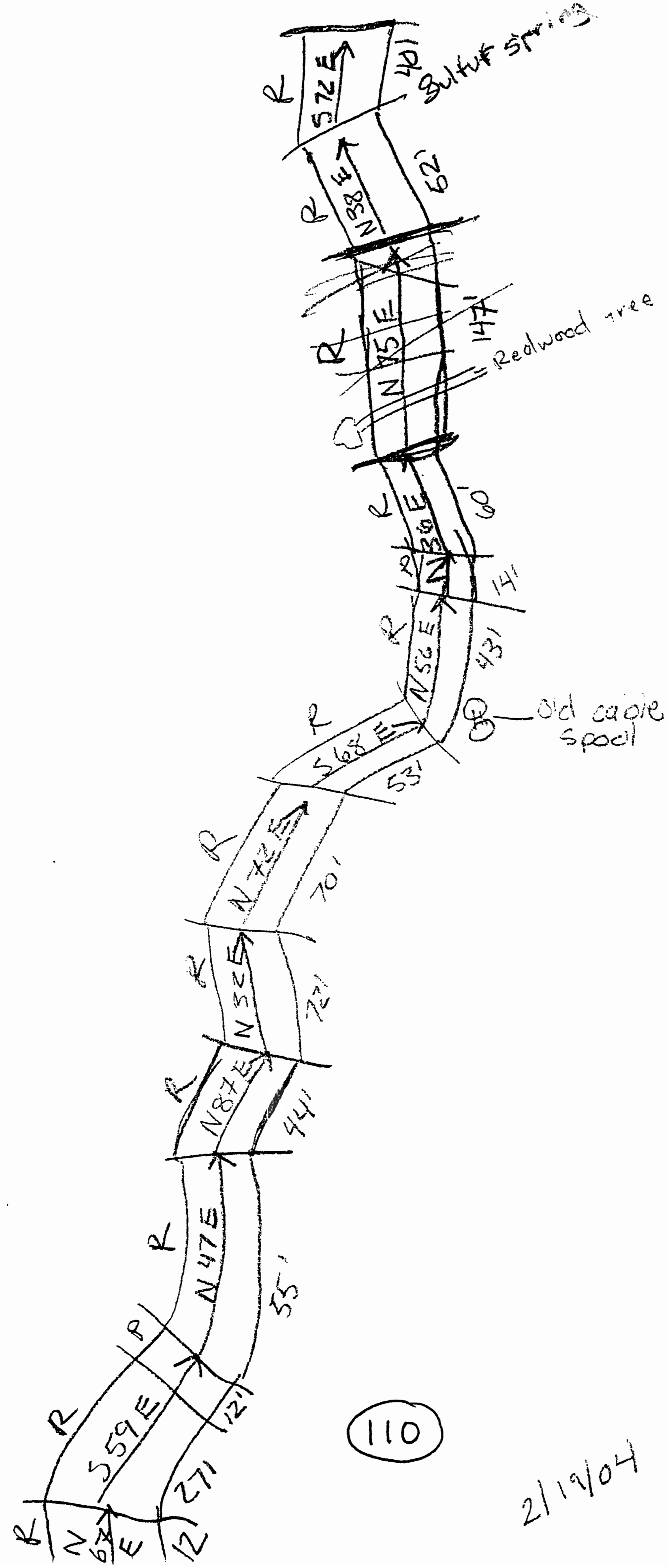
(108)

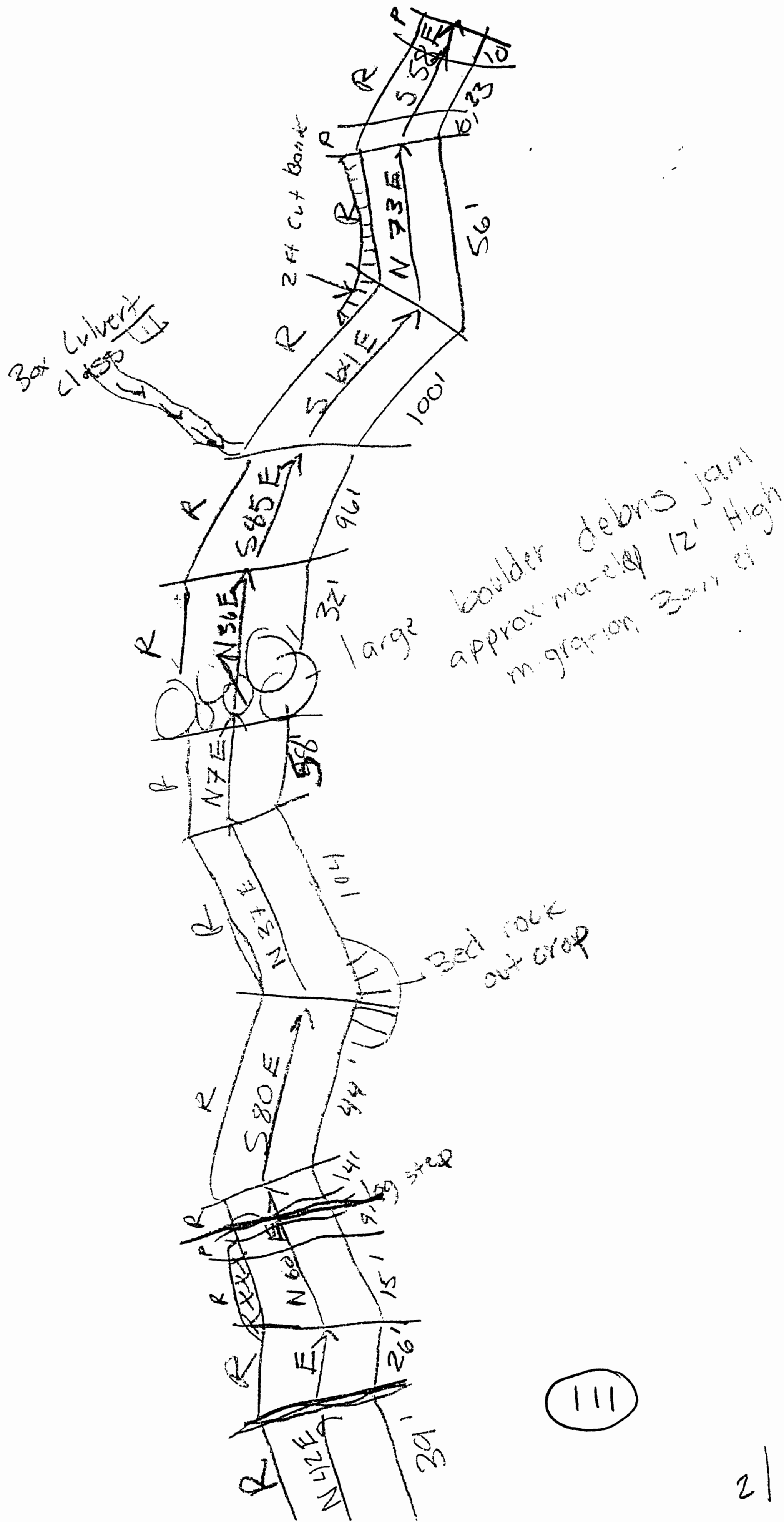
2/19/04


P
R
N67E
13'
93'
Boulder step
Approx 5' High Migration Barrier
11'
log jam overhead
P
N25E
20'
P
11'
R
S 82 E
29'
R
N56E
49'
P
10'
R
N78E
52'
P
19'
R
N64E
123'
Debris jam end — step drops approx 10 ft
Debris jam step begin Migration Barrier
36'
10'
R
N64E
140'
Bed rock step
Engine block in channel
R
15'
R
R
Bed rock step
R
S75E
104'

109

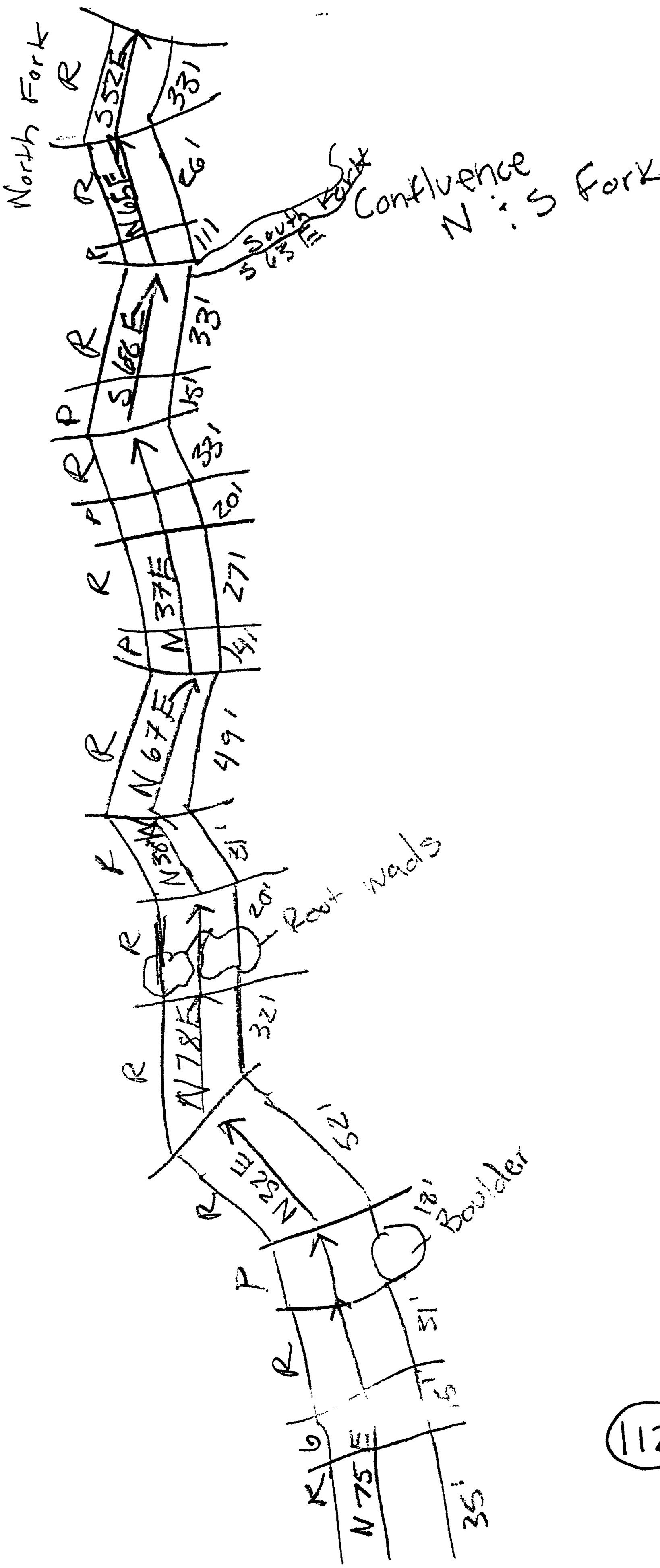
2/19/04


R
S72E
40'
Sulfur spring
R
N38E
62'
R
N35E
147'
Redwood tree
R
N30E
60'
R
14'
R
N56E
43'
Old cable spool
R
S68E
53'
R
N72E
70'
R
N32E
72'
R
N87E
44'
R
N47E
35'
R
R
S59E
12'
27'
R
N67E
12
110
2/19/04



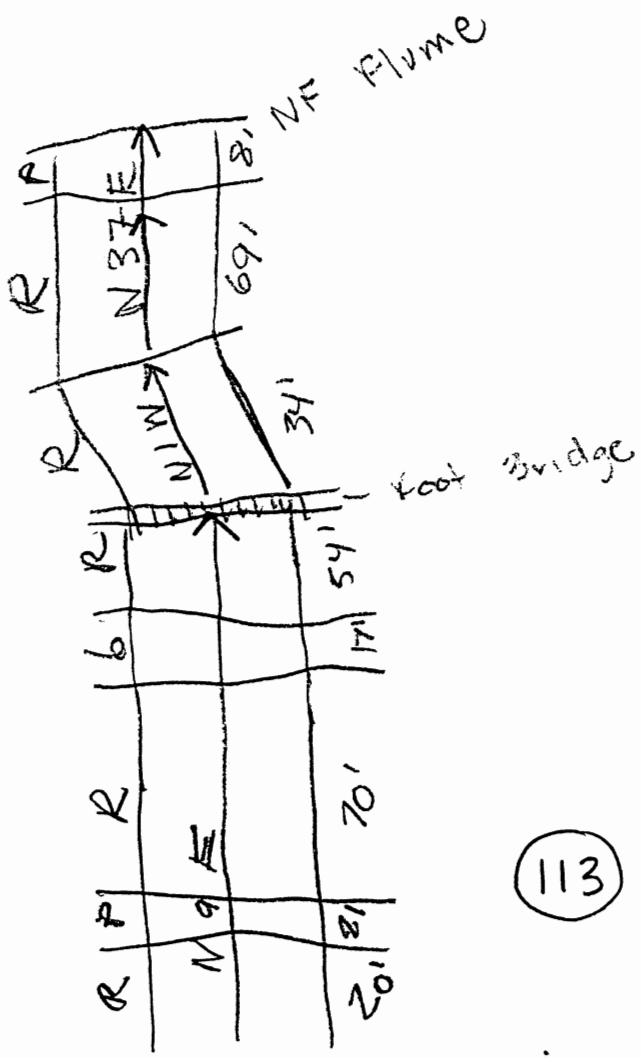
S58E
10'
61.23
2 ft Cut Bank
N73E
56'
Box Culvert
S61E
100'
S85E
96'
N36E
32'
large boulder debris jam
approx ma-ely 12' High
migration Barrier
N7E
58'
N37E
104'
Bed rock
out crop
S80E
44'
14'
9'
step
N60E
15'
E
26'
N42E
30'
R
111

2/19/04


North Fork
Confluence
N : S Fork
South Fork
S 63 E
N 35 E
33'
N 65 E
19'
11'
S 66 E
33'
15'
33'
20'
N 37 E
27'
14'
N 67 E
49'
N 30 W
31'
20'
Root wads
N 78 E
32'
N 28 E
52'
18'
Boulder
31'
5'
N 75 E
35'
R
P

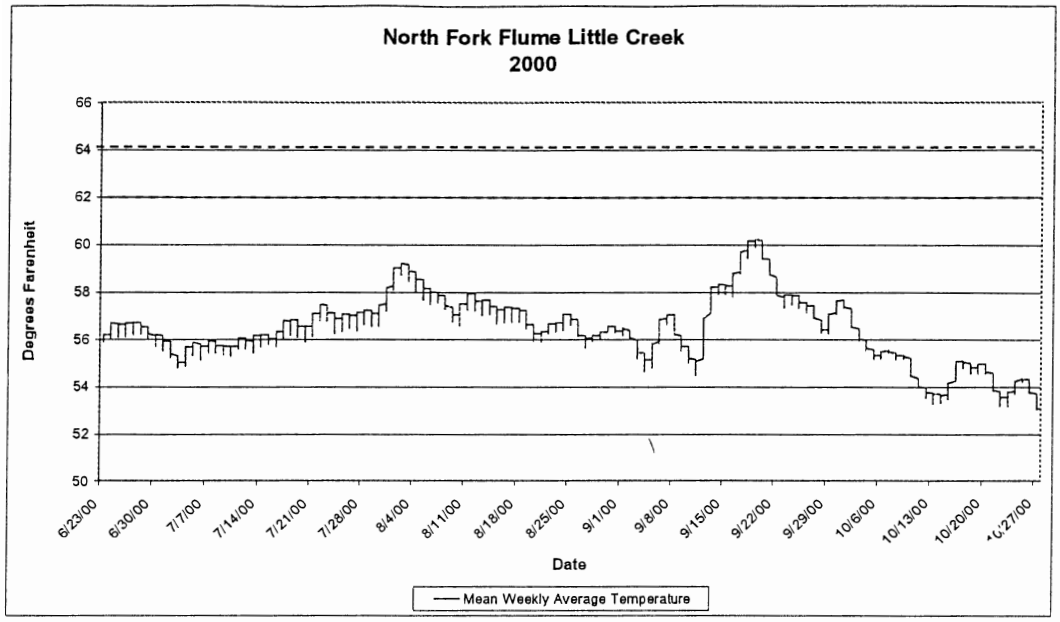
(112)

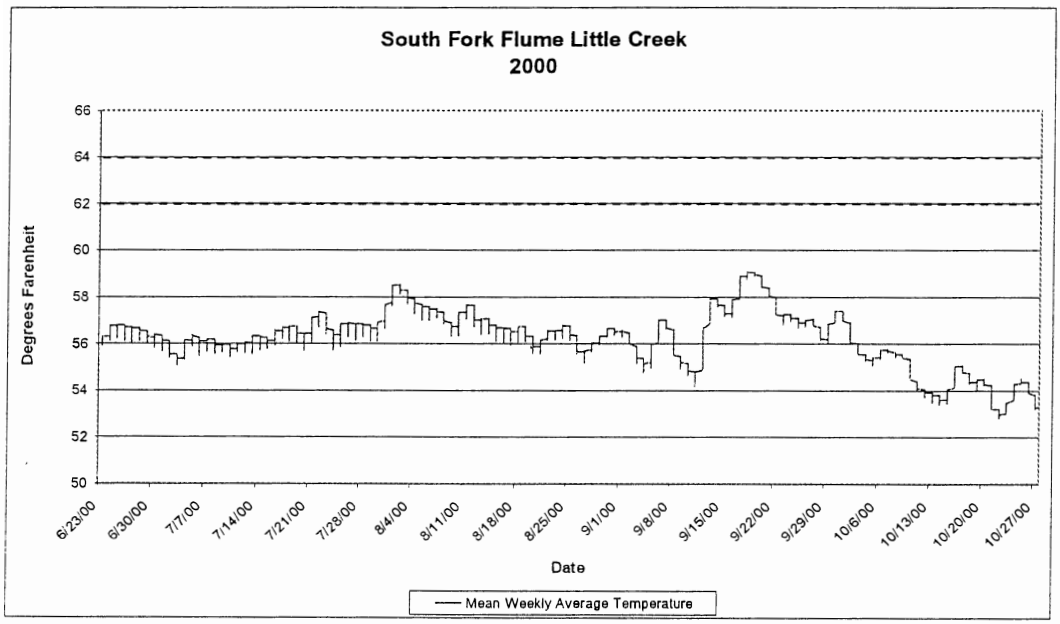
2/19/04

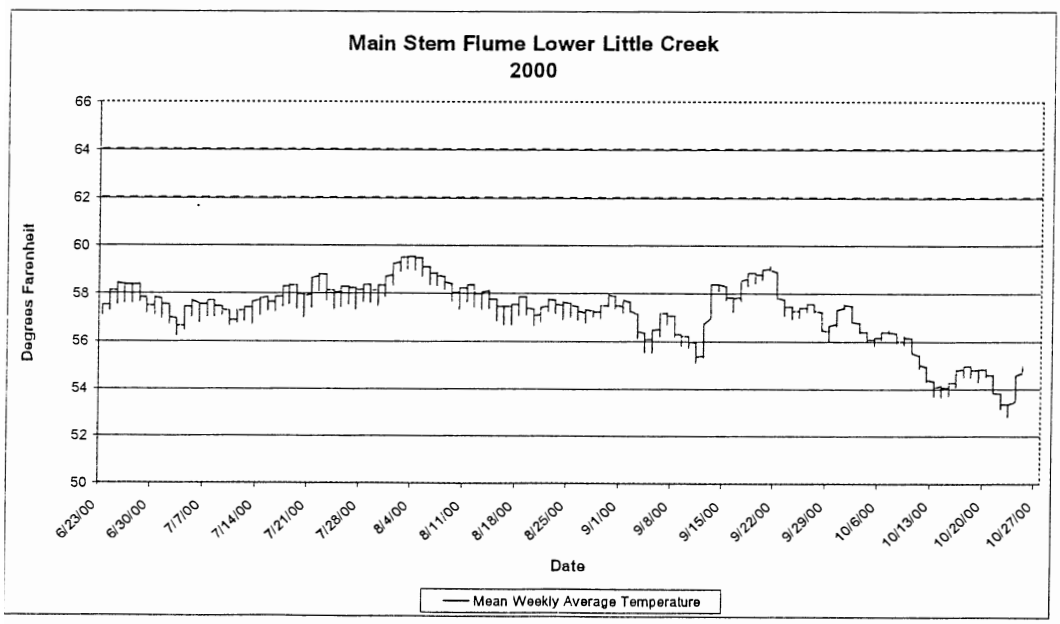


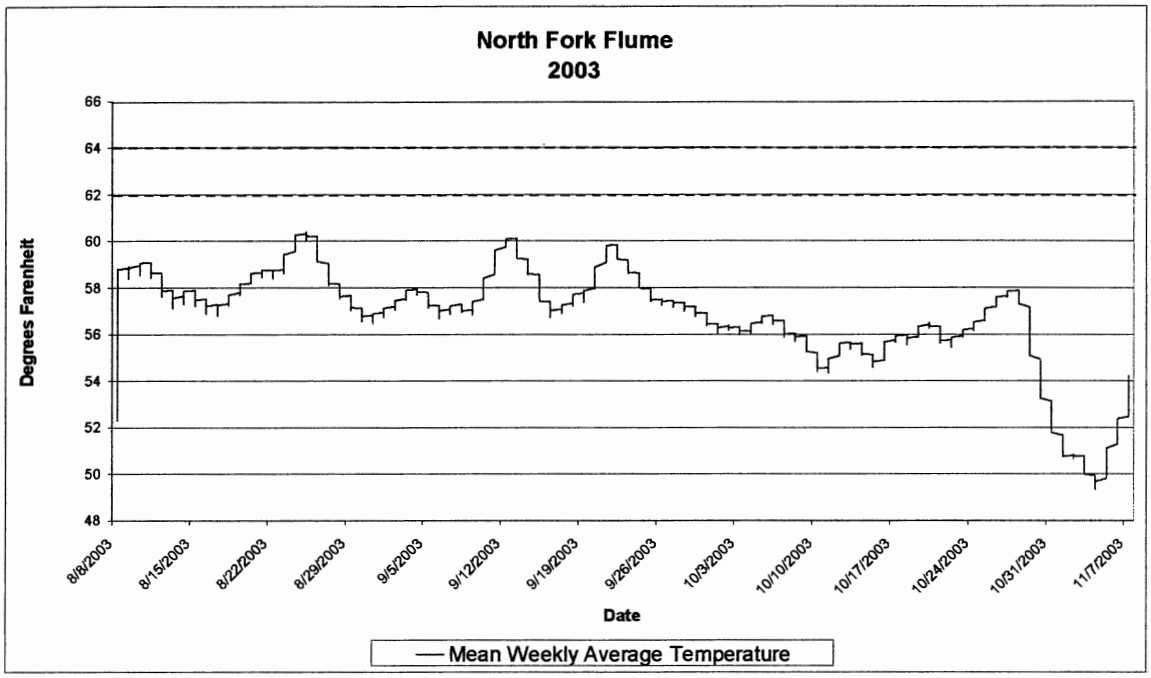
(113)

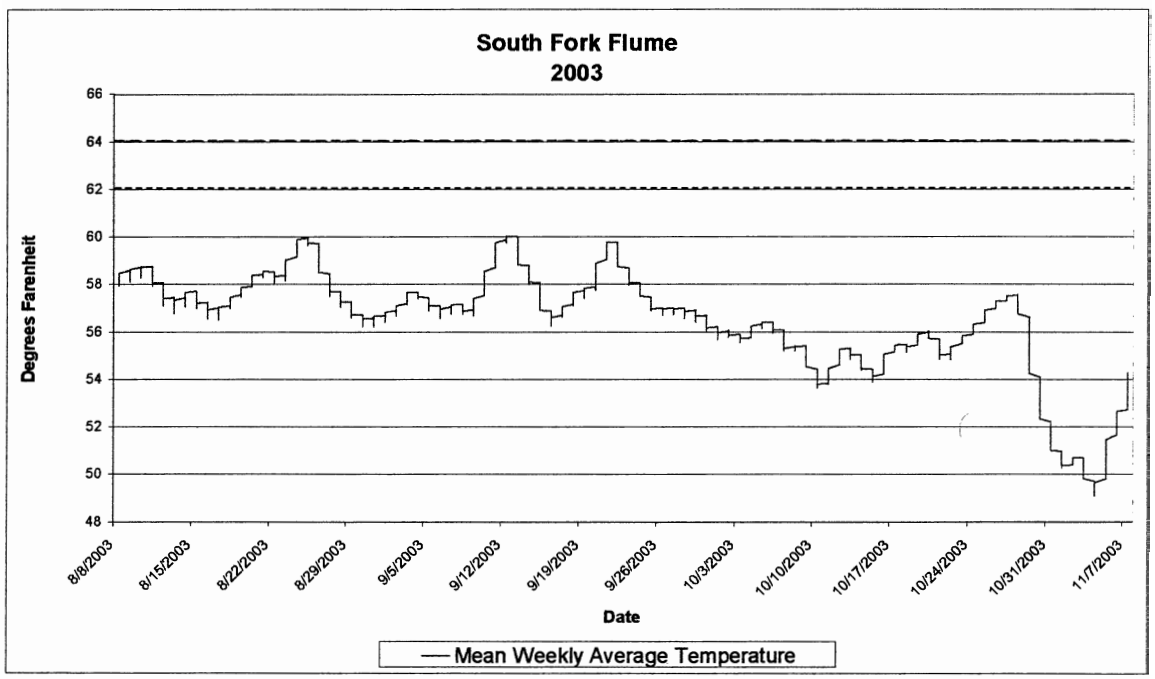
2/19/04


North Fork Flume Little Creek
2000
Degrees Farenheit
66
64
62
60
58
56
54
52
50
6/23/00
6/30/00
7/7/00
7/14/00
7/21/00
7/28/00
8/4/00
8/11/00
8/18/00
8/25/00
9/1/00
9/8/00
9/15/00
9/22/00
9/29/00
10/6/00
10/13/00
10/20/00
Date
Mean Weekly Average Temperature

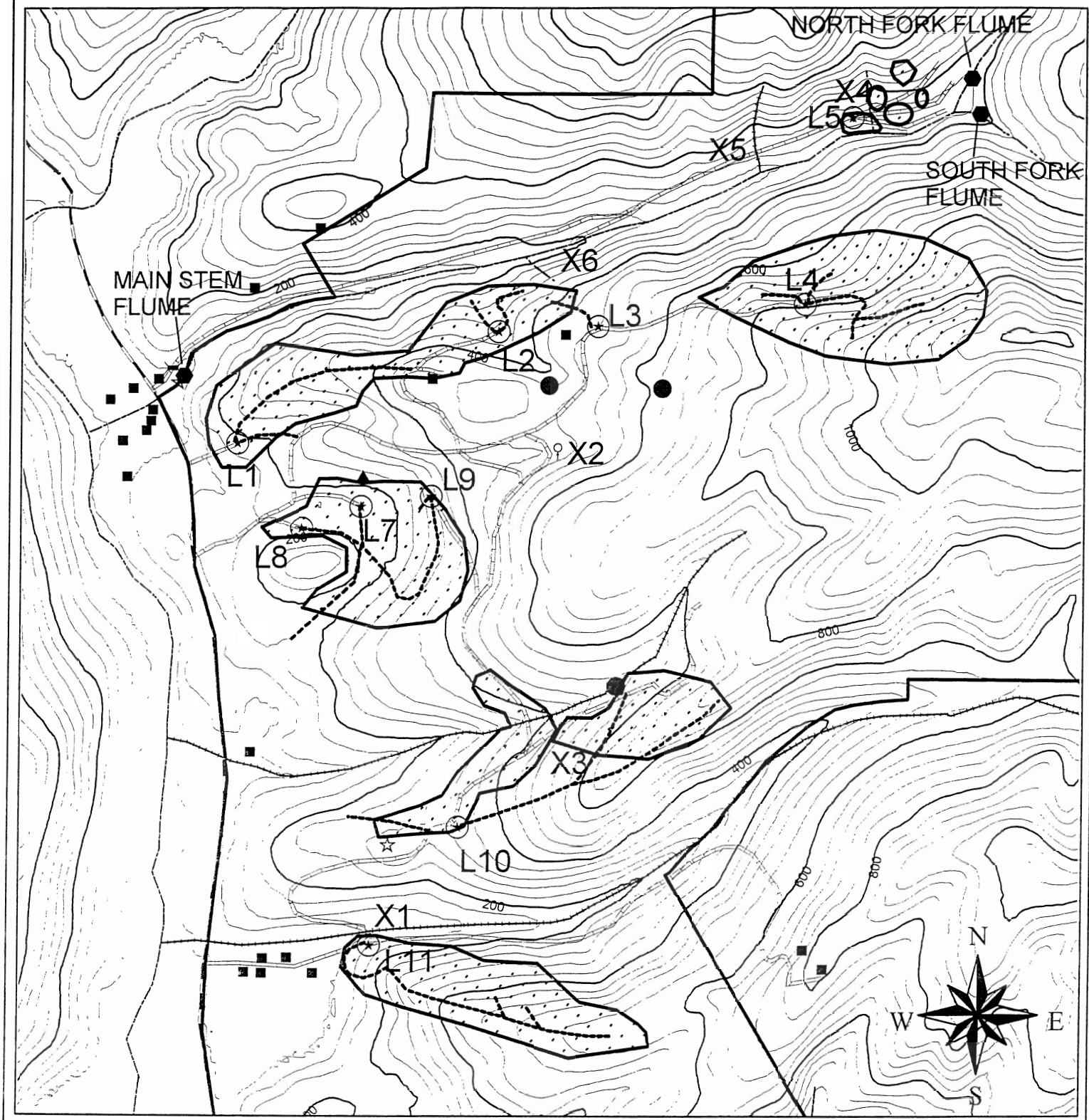

South Fork Flume Little Creek
2000
Degrees Farenheit
66
64
62
60
58
56
54
52
50
6/23/00
6/30/00
7/7/00
7/14/00
7/21/00
7/28/00
8/4/00
8/11/00
8/18/00
8/25/00
9/1/00
9/8/00
9/15/00
9/22/00
9/29/00
10/6/00
10/13/00
10/20/00
10/27/00
Date
Mean Weekly Average Temperature


Main Stem Flume Lower Little Creek
2000
Degrees Farenheit
66
64
62
60
58
56
54
52
50
6/23/00
6/30/00
7/7/00
7/14/00
7/21/00
7/28/00
8/4/00
8/11/00
8/18/00
8/25/00
9/1/00
9/8/00
9/15/00
9/22/00
9/29/00
10/6/00
10/13/00
10/20/00
10/27/00
Date
Mean Weekly Average Temperature


North Fork Flume
2003
Degrees Farenheit
66
64
62
60
58
56
54
52
50
48
8/8/2003
8/15/2003
8/22/2003
8/29/2003
9/5/2003
9/12/2003
9/19/2003
9/26/2003
10/3/2003
10/10/2003
10/17/2003
10/24/2003
10/31/2003
11/7/2003
Date
Mean Weekly Average Temperature


South Fork Flume
2003
Degrees Farenheit
66
64
62
60
58
56
54
52
50
48
8/8/2003
8/15/2003
8/22/2003
8/29/2003
9/5/2003
9/12/2003
9/19/2003
9/26/2003
10/3/2003
10/10/2003
10/17/2003
10/24/2003
10/31/2003
11/7/2003
Date
Mean Weekly Average Temperature

LOWER LITTLE CREEK THP: FLUME LOCATIONS
USGS 7.5' QUADRANGLE, DAVENPORT, T10S, R3W, PORTIONS OF SECTIONS 16, 17 AND RANCHO AGUA PUERCA Y LAS TRANCAS



LEGEND

- Property Line
- Harvest Area
- Swanton Road
- Existing Landing
- Existing Haul Road
- Existing Skid Trails
- Class I Watercourse
- Class II Watercourse
- Class III Watercourse
- Pond
- Spring
- Unstable Areas
- Structures
- 40 Foot Contours
- Water Uptake

BIG CREEK
Big Creek Forestry Department
3564 Highway 1
Davenport, CA
andym@big-creek.com

BIG CREEK

"Growing Redwoods for the Future"

March 4, 2004

California Polytechnic State University Foundation
Attn: Dr. Wally Mark
Foundation Administration Building 15
San Luis Obispo, CA 93407

Re: Notice of Responsibilities for Timberland Owner and Plan Submitter with regards to the Lower Little Creek THP

Dear Dr. Mark:

As the Registered Professional Forester (RPF) preparing the THP for the Lower Little Creek THP in Santa Cruz County, I am required to notify you of your responsibilities as Timberland Owner and Plan Submitter for the proposed harvest.

Your responsibilities as Timberland Owner include compliance with the requirements of the Forest Practices Act, and compliance with the Forest Practice Rules regarding site preparation, stocking, and maintenance of roads, landings, and erosion control facilities. I recommend that you obtain and review a copy of the current Forest Practice Rules (by Contacting the California Department of Forestry and Fire Protection).

Your responsibilities as Plan Submitter include retaining an RPF to conduct all matters that require an RPF. I have included a copy of the Forest Practice Rules describing these responsibilities.

If you have any questions regarding your responsibilities, or any other matter pertaining to the proposed NTMP, please contact me at (831) 457-6387.

Sincerely,

Steven R. Auten

Steven R. Auten
RPF #2734

Enc. 14 CCR 1035 (Plan Submitter Responsibilities)

(117)

THP.

(hh) Where roads, watercourse crossings, and associated landings in the logging area will be abandoned, the methods for abandonment shall be described.

(ii) On a map complying with subsection 1034(x), the locations and classifications of roads, watercourse crossings, and landings to be abandoned shall be shown.

(jj) A general description of physical conditions at the plan site, including general soils and topography information, vegetation and stand conditions, and watershed and stream conditions.

1034.2 Professional Judgment

Where the rules or these regulations provide for the exercise of professional judgment by the forester (RPF) or the Director, the parties, at the request of either party shall confer on the plan area during the initial pre-harvest inspection provided for by law to reach agreement if possible on the conditions and standards to be included in the plan.

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.

1035.1 Registered Professional Forester Responsibility

(a) Upon submission of a THP, the RPF who prepares and signs a plan is responsible for the accuracy and completeness of its contents.

(1) The RPF preparing the plan shall state in the THP the work which will be performed by the RPF plan preparer (beyond preparation of the THP and attending the pre-harvest inspection if requested by the Director), and any additional work requiring an RPF which the plan preparer does not intend to perform. This may include, but is not limited to, field work in identifying watercourse and lake protection zones or special treatment areas, marking trees, or other activities. The RPF is only responsible for the activities set forth in the plan when employed for that purpose, or required by the rules of the Board. The RPF shall state whether or not he or she has been retained to provide professional advice throughout the timber operations.

(2) The RPF preparing the plan shall in writing, inform the plan submitter(s) of their responsibility pursuant to Section 1035 of this Article, and the timberland owner(s) of their responsibility for compliance with the requirements of the Act and where applicable, Board rules regarding site preparation, stocking, and maintenance of roads, landings, and erosion control facilities.

(b) Upon entering into an agreement to accept responsibility for any part of the preparation or implementation of a plan or any work beyond the preparation of a plan, including providing professional advice; all responsible RPFs shall disclose to the real party of interest for whom the RPF is providing professional forestry services any known current or potential conflict of interest the RPFs have with regard to the timber or land that is subject to operations under the plan. All responsible RPFs shall disclose to the timberland owner and plan submitter whether they are the real party of interest for whom the RPF is providing professional forestry services.

(c) Disclosure of newly discovered conflicts of interest an RPF has with regard to the plan submitter, timberland owner, timber owner, the LTO and timber purchaser, pertaining to the timber or land that is

TIMOTHY C. BEST, CEG
ENGINEERING GEOLOGY AND HYDROLOGY

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March 1, 2004

Mr. Ryan Hilburn
Swanton Pacific Ranch
125 Swanton Road
Davenport, CA 95017

Job: SPR-LITTLE-331

SUBJECT: ENGINEERING GEOLOGIC REVIEW OF BRIDGE CROSSING X6: LOWER LITTLE CREEK THP

INTRODUCTION

As requested, on January 28, 2004, I made a site visit to review erosion and stability concerns at a partially washed out bridge crossing on Little Creek, a narrow steep walled tributary to Scott Creek. The southwest abutment to the bridge was reportedly undercut in 1998 by high stream flows causing the bridge to partially drop in to the channel. The purpose of this field review was to evaluate the geologic feasibility of reconstructing the bridge and to provide appropriate mitigative and erosion control measures.

GEOLOGIC CONDITIONS

The subject bridge site is located on Little Creek, a narrow, steep gradient perennial stream. The area is characterized by steep mountainous terrain that is fairly typical for the region. Little Creek is deeply incised into the landscape with steep (60% to 75+%) inner gorge slopes descending directly to the stream's edge. Regionally the terrain is consistent with shallow and deep-seated landslide processes (Cooper Clark and Associates, 1974). The area is vegetated with advanced second growth redwood, Douglas-fir and a scattered understory of hardwood and brush.

The subject site is underlain by Tertiary age Santa Cruz Mudstone described as medium to thick bedded siliceous mudstone and sandy siltstone that dips moderately (22 degrees) to the south west (Clark, 1981). Bedrock that is exposed in the steep channel bank and road cuts is consistent with this description. Where fresh, the bedrock is competent and able to form steep cuts. Thin alluvial terrace deposits are found intermittently along both sides of the steep walled stream. These deposits are variable and consist mainly of silt, sand, cobles and few boulders.

The subject site is located in a seismically active area of California. The active San Gregorio Fault is located , which is considered capable of generating a Moment Magnitude 7.3 earthquake with a 400-

year return interval (Petersen et al., 1996), is located about 2.5 miles west and off shore. The active San Andreas Fault is located 14 miles to the northeast and is capable of generating a Maximum Moment Magnitude 7.1 to 7.9 earthquake with a recurrence interval of 220 years (Petersen et al., 1996). This fault last ruptured in 1906. Peak ground acceleration with a 10% probability of exceedance in 50 years is reported to be 0.45g (USGS, 1996). High ground accelerations associated with fault rupture along either of these two fault systems is likely a contributing factor if not dominant for movement on many of the deep-seated landslides found in the area.

The regional landslide map by Cooper Clark and Associates (1974) identifies a questionable large-scale deep-seated landslide underlying the southwest side of the hillside at the bridge crossing. I was unable to confirm or negate the existence of this landslide. I did not observe any evidence of recent or active movement at the crossing and Ryan Hilburn (cal Poly) did not report any evidence of upslope slide movement, such as fresh scarps, leaning trees or open ground cracks. The potential risk from deep-seated instability at the bridge is probably low.

OBSERVATIONS

The existing bridge is a 54-foot long, 12 foot wide old railroad flat car that crosses Little Creek obliquely. At this site, Little Creek is a narrow, cobble and boulder bedded stream draining a roughly 1100 acre watershed. The active channel is 16 feet wide a naturally confined between the steep valley walls. Both bridge abutments appear to have been founded on remnants of old fluvial terrace deposits about 14 feet above channel bottom.

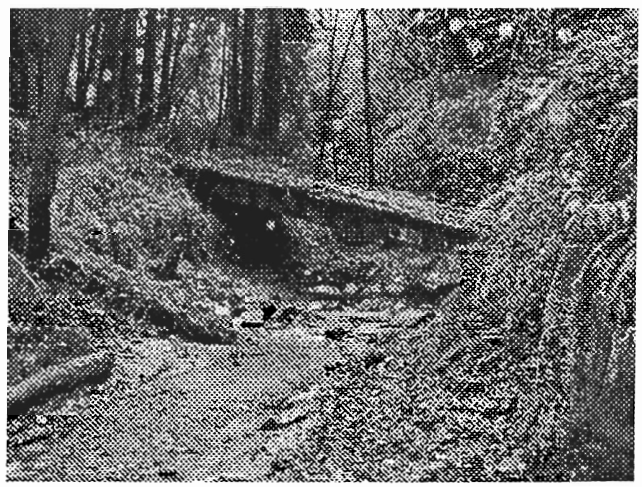


Photo 1: Looking upstream

At the crossing, the stream makes a slight bend to the right resulting in a steep channel bank along the outside edge of the bend. Upstream of the crossing relatively competent bedrock is exposed in the near vertical channel banks. However, at the crossing, the channel bank is comprised of old fluvial terraces deposits that are much more prone to erosion. During the 1998 El Nino storms, the southwest (left bank) abutment was undercut causing this end of the ridge to drop down.

Presently the channel too wide to reinstall the existing 54 long bridge without reconstructing the bridge abutment in the active stream channel, a costly endeavor. Therefore the best alternative will be to replace the 54 long bridge with a longer 75 long bridge that can adequately span the channel without encroaching into the stream. The bottom of the proposed bridge should be located a minimum of 10 feet above the channel, which based on field observations, should be well outside the 100-year flood elevation.

Both abutments are inherently at risk of being undermined by stream bank erosion during a large storm event. This is especially true if a log jam forms in the channel and diverts streamflow into the

banks. The use of a long span bridge will minimize the potential that future erosion will comprise the bridge footings. However, if additional protection is necessary then it should be possible to minimize the amount of erosion by armoring the channel banks with large diameter wood or riprap.

RECOMMENDATIONS

1. Replace the existing bridge with a 75 long rail car as shown on Figure 1.
2. The left bank abutment should be located a minimum of 15 back from the abrupt edge of the stream channel to minimize the potential of it being undercut.
3. Bridge shall utilize suitable footings. It is my understanding that Cal Polly has traditionally used buried wood logs for the bridge footings. Logs are generally adequate for temporary bridges but may suitable for a permanent crossing because they tend to rot out in time. For a permanent crossing a more permanent footing such as reinforced concrete blocks or piers is preferred. The RPF and/or landowner shall provide final design criteria of the bridge footings
4. For an added level of protection against future channel bank erosion that could undermine the bridge footing in time, the channel banks can be armored with rock rip rap or wood logs. Rock rip-rap will provide the greatest level of protection but is the most costly and will have the greatest environmental impact. Alternatively large logs can be placed and anchored against the channel bank. The decision to amour the channel bank is left up to the landowner and depended upon the level of long-term stability that is desired. Typical design criteria for rock rip rap and wood log channel bank protection is found in Appendix A.

Please give me a call if you have any further questions.

Sincerely,

Timothy C. Best
Certified Engineering Geologist #1682

REFERENCES

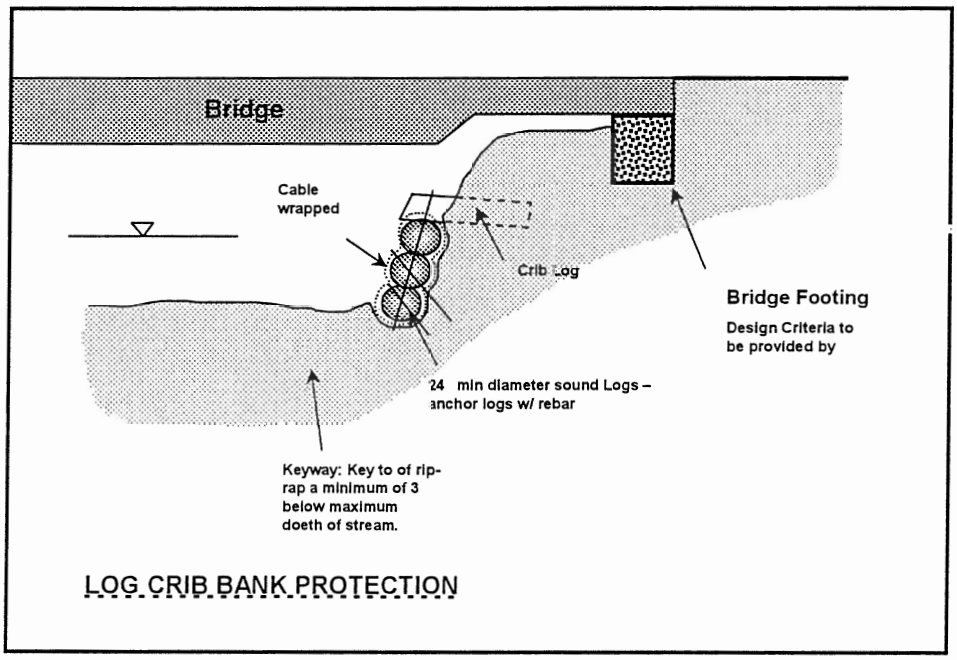
Clark, J.C., 1981, Stratigraphy, Paleontology, and Geology of the Central Santa Cruz Mountains, California Coast Range: USGS Professional Paper 1168, p. 51.

Cooper Clark and Associates, 1974, Preliminary Map of Landslide Deposits in Santa Cruz County, California, Santa Cruz County Planning Department, County Building, 701 Ocean Street, Santa Cruz, California 95060.

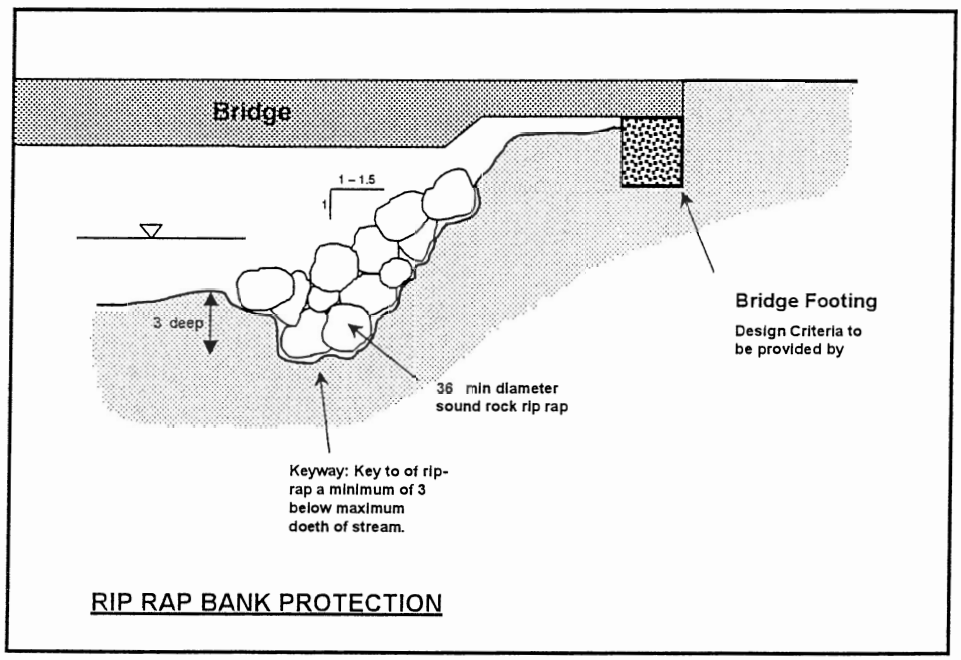
Petersen, M.D., Bryant, W.A., Cramer, C.H., Cao, T., Reichle, M.S., Frankel, A.D., Lienkaemper, J.J., McCrory, P.A., and Schwartz, D.P., 1996, Probabilistic Seismic Hazard Assessment for the State of California: California Department of Conservation, Division of Mines and Geology Open File Report 96-08; U.S. Geological Survey, Open File Report 96-706, p. 31.

USGS, 1996, USGS National Seismic Mapping Project, Web site http://geohazards.cr.usgs.gov/eq/html/gemmap.html.

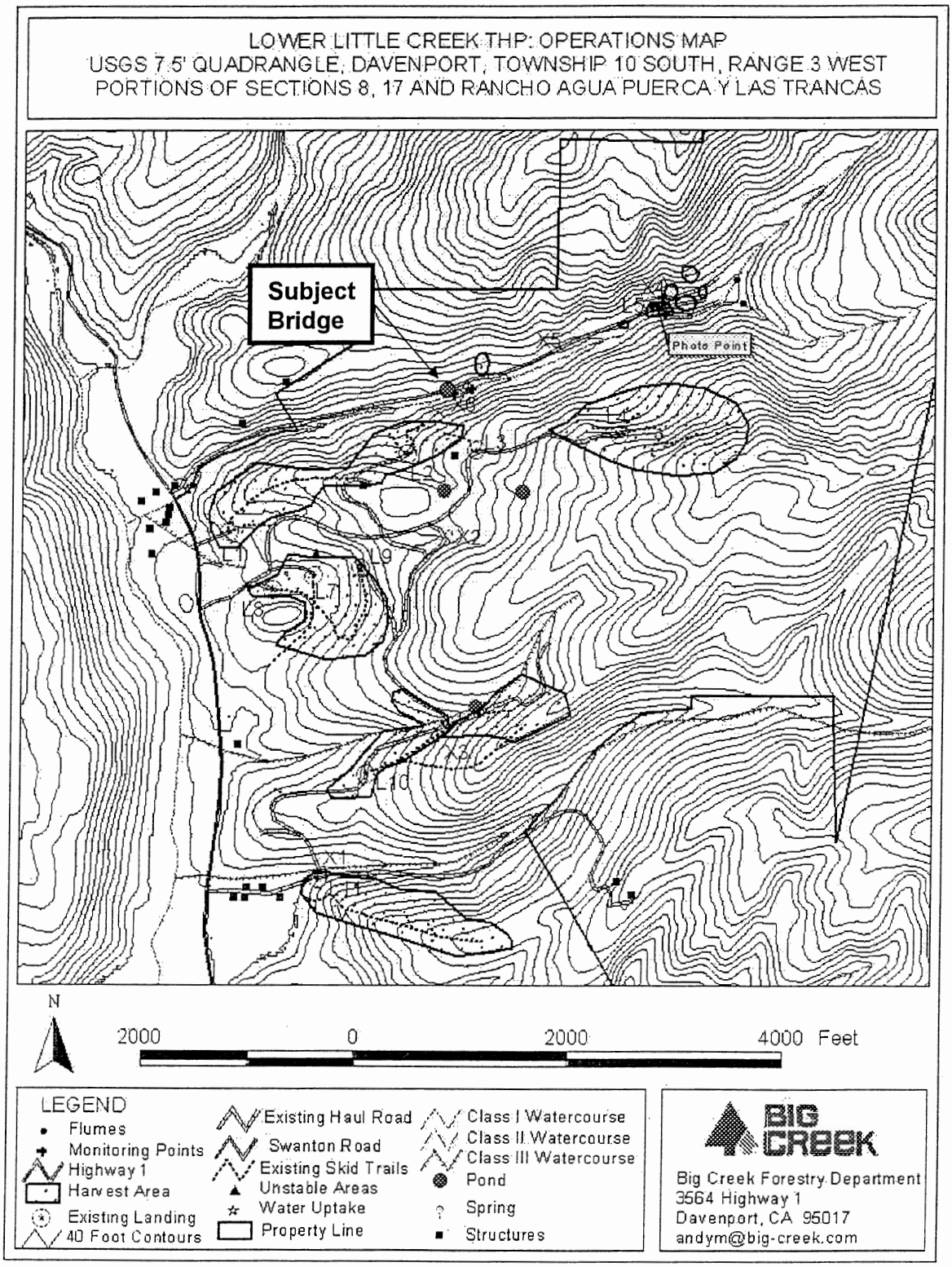
Schematic Bridge abutments and bank protection



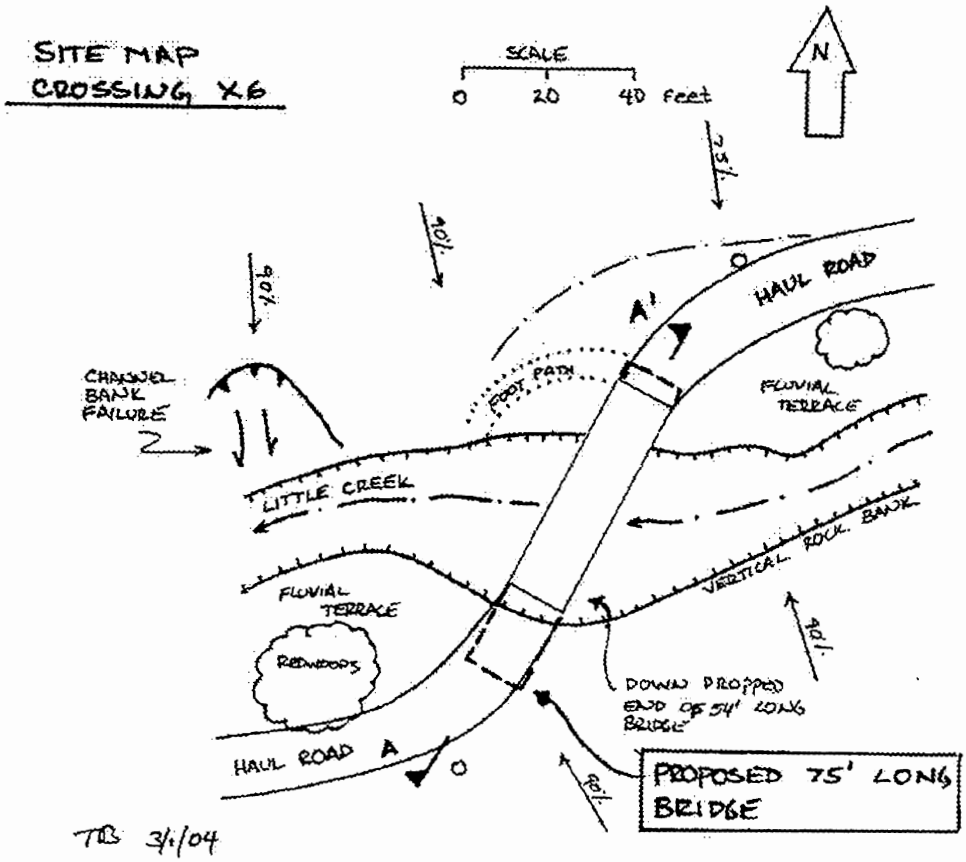
LOG CRIB BANK PROTECTION

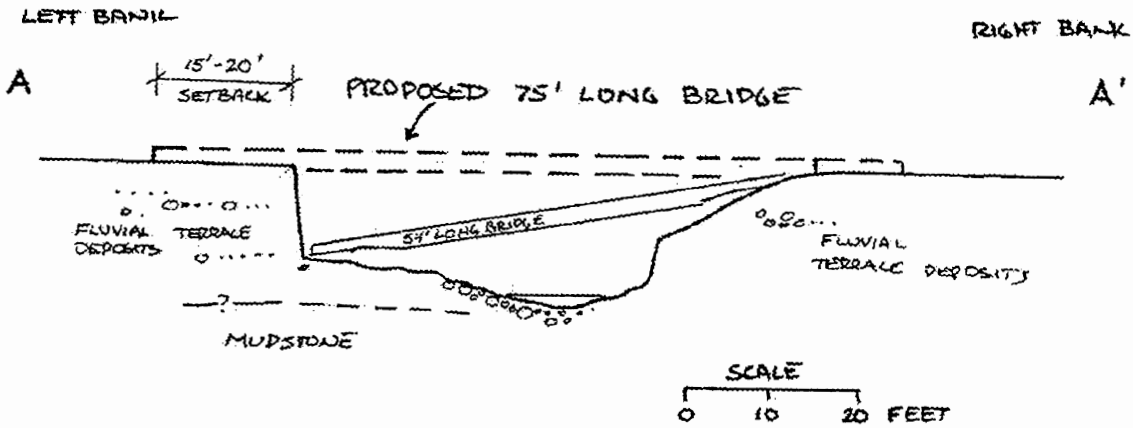


RIP RAP BANK PROTECTION



THP map from Swanton Pacific Ranch


SITE MAP
CROSSING X6
SCALE
0 20 40 Feet
N
25%
10%
10%
HAUL ROAD
A'
FOOT PATH
CHANNEL BANK FAILURE
FLUVIAL TERRACE
LITTLE CREEK
VERTICAL ROCK BANK
FLUVIAL TERRACE
REDWOODS
DOWN PROPPED END OF 54' LONG BRIDGE
HAUL ROAD
A
PROPOSED 75' LONG BRIDGE
TB 3/1/04


CROSS-SECTION
LEFT BANK
RIGHT BANK
A
15'-20' SETBACK
PROPOSED 75' LONG BRIDGE
A'
54' LONG BRIDGE
FLUVIAL TERRACE DEPOSITS
FLUVIAL TERRACE DEPOSITS
MUDSTONE
SCALE
0 10 20 FEET

DBH CLASS
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DBH Class	RW TPA	DF TPA
1	2.09	1.46
2	6.58	3.48
3	5.44	2.53
4	5.76	2.72
5	3.86	1.84
6	3.04	1.84
7	2.53	1.14
8	2.59	1.46
9	2.34	1.14
10	2.15	0.76
11	2.97	0.89
12	1.58	0.82
13	1.71	0.89
14	2.09	0.70
15	1.27	0.82
16	1.14	0.70
17	2.03	0.32
18	1.33	0.51
19	1.27	0.57
20	1.46	0.57
21	1.01	0.63
22	0.76	0.57
23	1.01	0.51
24	1.01	0.63
25	0.70	0.25
26	0.82	0.32
27	0.63	0.51
28	0.76	0.82
29	0.63	0.82
30	0.57	0.32
31	0.44	0.44
32	0.25	0.38
33	0.32	0.44
34	0.38	0.32
35	0.51	0.19
36	0.32	0.06
37	0.06	0.32
38	0.06	0.13
39	0.13	0.06
40	0.00	0.13
41	0.13	0.00
42	0.06	0.00
43	0.06	0.19
44	0.13	0.00
45	0.06	0.13
46	0.06	0.06
47	0.06	0.00
48	0.13	0.06
49	0.13	0.06
50	0.00	0.06
51	0.06	0.00
52	0.00	0.00
53	0.00	0.06
54	0.00	0.00
55	0.00	0.00
56	0.00	0.00
57	0.00	0.06
58	0.00	0.00
59	0.00	0.00
60	0.00	0.00
61	0.00	0.00
62	0.00	0.00
63	0.00	0.06
Total	64.49	33.73

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DBH class	RW Vol BF	DF Vol BF
1	0.40	0.39
2	3.94	3.49
3	8.05	7.68
4	19.55	17.34
5	22.18	18.96
6	25.83	31.25
7	33.10	28.15
8	53.02	54.99
9	67.98	50.84
10	87.47	51.72
11	145.07	0.39
12	110.17	79.76
13	140.72	103.90
14	208.75	97.59
15	156.65	156.38
16	192.65	121.44
17	381.23	75.99
18	310.51	118.03
19	320.87	160.33
20	425.19	210.69
21	320.48	216.74
22	295.11	275.02
23	449.46	247.87
24	499.48	348.12
25	337.40	159.14
26	397.81	214.67
27	404.11	368.73
28	490.21	684.36
29	454.70	691.77
30	510.66	307.70
31	380.84	414.13
32	248.98	415.69
33	341.54	494.42
34	372.52	378.37
35	603.83	265.27
36	425.41	91.56
37	70.37	475.63
38	91.10	199.20
39	195.65	83.13
40	0.00	179.07
41	222.53	0.00
42	36.58	0.00
43	111.94	388.15
44	168.34	0.00
45	166.08	316.25
46	159.42	135.78
47	57.07	0.00
48	228.26	212.47
49	392.18	124.17
50	0.00	189.52
51	145.79	0.00
52	0	0.00
53	0	187.41
54	0	0.00
55	0	0.00
56	0	0.00
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61	0	0.00
62	0	0.00
63	0	304.75
total	11291.17	9266.23
merch	10824.60	9001.[illegible]