

SUMMARY REPORT

EROSION CONTROL WORK PERFORMED ON
THE M-4 & M-4-1 ROADS, BRIDGE CREEK

UNIT 88-3

By

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February, 1989

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INTRODUCTION

Rehabilitation Unit 88-3 is located approximately 11 miles upstream from Orick in the Bridge Creek watershed (map A). This unit includes 190 acres of mostly old growth and the M-4 (1.8 miles) and the M-4-1 (0.4 mile) roads. The heavy equipment work was performed under fixed-price contract and was confined to haul road corridors. Hillslope work above the M-4 Road was performed by rental agreement in 1987 and is summarized in the report for unit 87-5; M-3 and M-4-1 Roads and Slopes, Johnson, 1988.

The total rehabilitation cost including all preparatory work was \$169,304. Of this total, heavy equipment and labor intensive erosion control work accounted for \$151,934, or 90% of the total project cost. A total of 2.2 miles of haul roads were removed with 46,130 yds³ of fill excavated from various worksites. W.K. Construction performed the heavy equipment work under the fixed-price contract IFB 8480-88-05 which totalled \$144,915. Surveys, design, and contract preparation required 449 person-hours to complete (Table 1).

Description of Unit

Unit 88-3 occupies the lower third of the hillslope. Total relief is 900 ft. with elevations ranging from 1000 ft. at the valley bottom to 1900 ft. at the M-Line (Map B). Hillslope gradients average 45%, but easily exceed 50% within the drainage. The M-4 Road is located on the final break-in-slope into the west fork of Bridge Creek. The M-4-1 Road drops into the valley bottom.

Two perennial and five intermittent streams drain this unit. The intermittent streams drain from 12 acres to 54 acres while the perennial streams drain 206 acres to 820 acres. As this unit occupies a low hillslope position, streams are fairly steep (35% - 40%) and well incised. Bedrock is the primary channel armor for the larger streams.

Typical of west-side tributary basins, this rehabilitation unit lies within the Redwood Creek Schist. Where exposed, bedrock varies in competence and in degree of weathering. Likewise, the soils vary from the deep, well drained Trailhead soils to the poorly drained Devils Creek soils. The interested reader is referred to the soils report by Popenoe, 1985, "Soils of the M-2-1-1, M-3-1-2, M-4-1 and M-4 Roads."

TIMBER HARVEST AND EROSION HISTORY

The M-4 Road was constructed around 1957. It was one of the earliest roads constructed in the Bridge Creek watershed and, in its youth, penetrated into the valley bottom of the main stream. Timber harvest was concurrent with road construction. Hillslopes above the M-4 were tractor yarded, while the hillslopes below the M-4 were cable yarded (Map C). The M-4-1 Road was constructed by 1972 to gain access to isolated timber units along the valley bottom.

MAP A. LOCATION

M-4 & M-4-I ROADS

UNIT 88-3

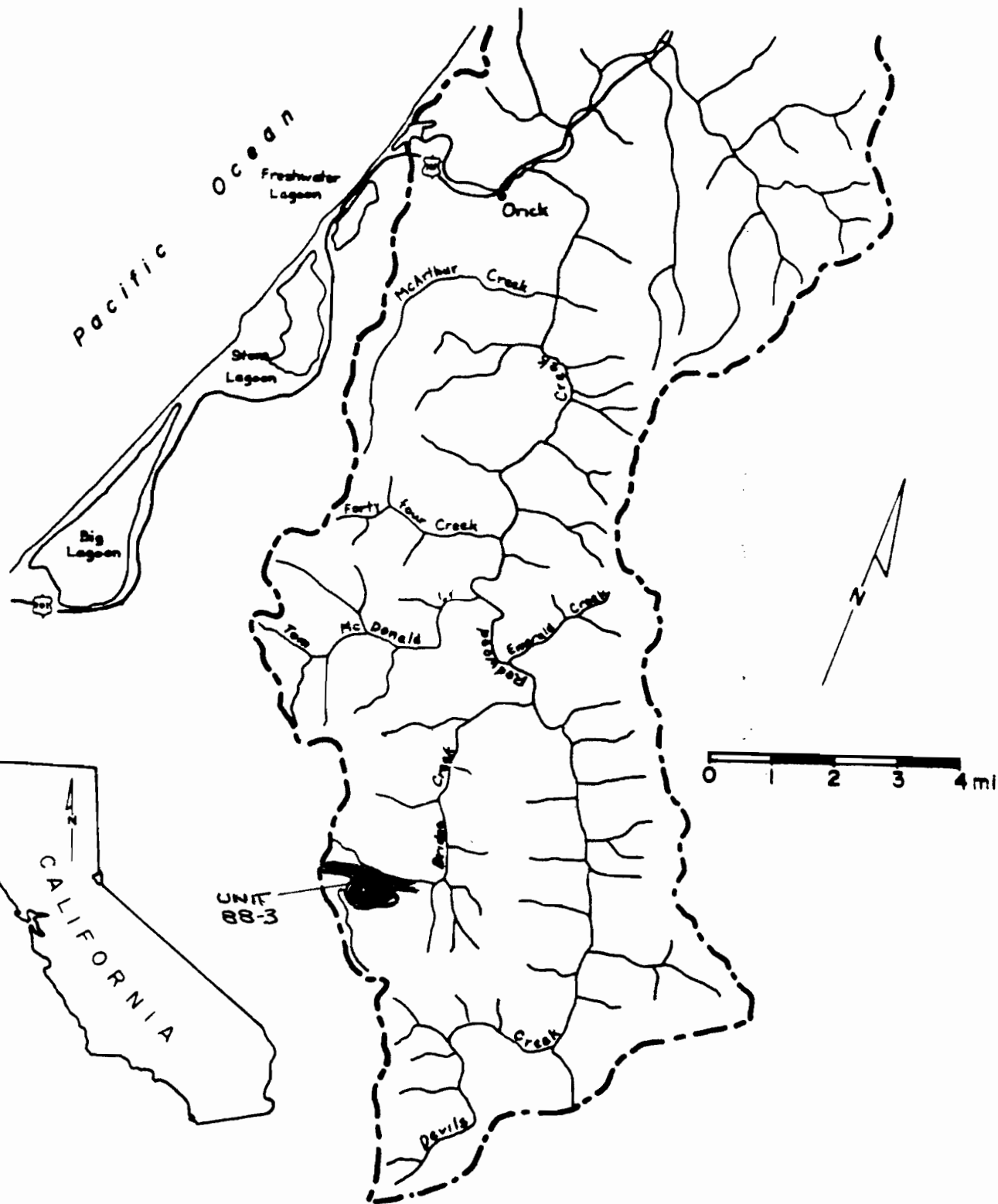


Table 1
REHABILITATION WORK COST SUMMARY
Unit 88-3; M-4 & M-4-1 Roads

Treatment	Total Quantity	Total Cost	Average Unit Cost
HEAVY EQUIPMENT WORK¹			
<u>Primary Treatments</u>			
Haul road crossings	18,015 yd ³	\$56,030	\$3.29/yd ³
Exported outslope	22,490 yd ³	68,749	\$3.06/yd ³
Deep drains	2,045 yd ³	4,076	\$1.99/yd ³
Outslope	3,900 yd ³	7,503	\$1.92/yd ³
Ripping	1.6 mi.	1,238	\$773/mi.
<u>Secondary Treatments</u>	-none		
<u>Miscellaneous Costs</u>			
Culvert removal	3 ea.	300	\$100/ea.
Misc. Costs ²	-. -	6,975	-. -
TOTAL HEAVY EQUIPMENT COST =		<u>\$144,915</u>	
LABOR INTENSIVE WORK:			
<u>Primary Treatments</u>	none		
<u>Secondary Treatments</u>			
Straw mulch ³	290/bales	\$ 4,160	\$14.34/bale
<u>MISCELLANEOUS</u>			
Brush survey lines	55 p.h.	691	-. -
Brush worksite	8 sites	2,168	\$271/site
TOTAL LABOR INTENSIVE COST =		<u>\$7,019</u>	

Table 1 (cont'd)
 REHABILITATION WORK COST SUMMARY
 Unit 88-3; M-4 & M-4-1 Roads

Treatment	Total Quantity	Total Cost	Average Unit Cost
TECHNICAL WORK:			
<u>Evaluation of Rehab. Unit</u>			
Map Unit ⁴	35 p.h.	\$ 521	-.-
Prescribe treatments	160 p.h.	2,360	-.-
Survey & design	304 p.h.	3,900	-.-
Contract prep.	145 p.h.	2,077	-.-
<u>Supervision of Work</u>			
Heavy equipment (C.O.R.)	400 p.h.	5,956	-.-
<u>Documentation</u>			
Photo points	75 p.h.	1,236	-.-
Summary report	88 p.h.	1,320	-.-
TOTAL TECHNICAL WORK =		<u>\$17,370</u>	

TOTAL PROJECT COST = \$169,304

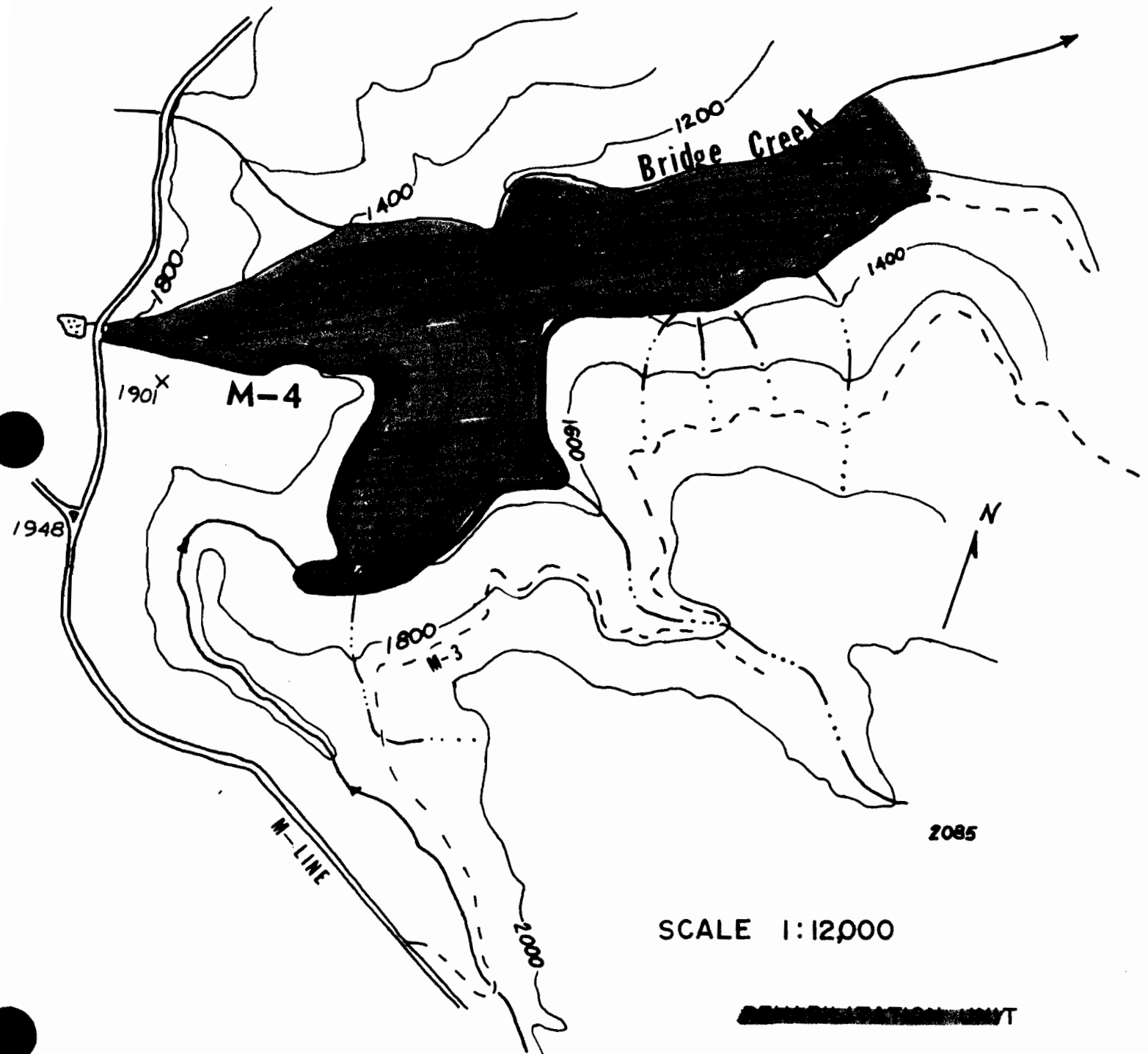
¹Heavy equipment work was performed by fixed price contract IFB-8480-88-05. This table reflects the contract costs to perform this work. Table 2 compares these costs with actual production costs (time). Appendix A contains the Abstract of Bid Data for this rehabilitation unit.

²Miscellaneous costs include lowboy charges and bid item #4 (misc.).

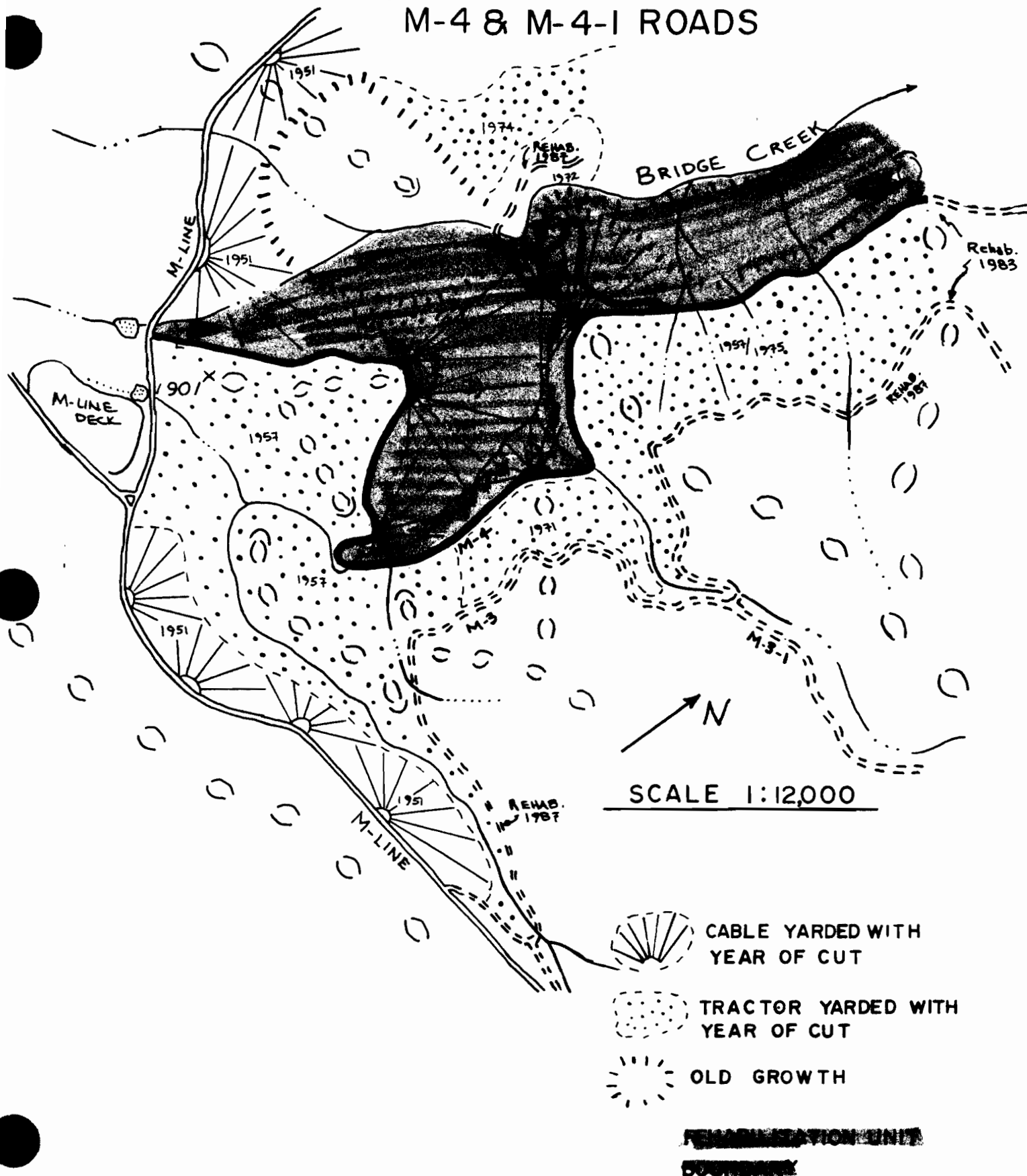
³Straw mulch includes the cost of the bales, delivery and placement, and spreading of straw. Straw was purchased at \$3.13 / bale.

⁴This unit was mapped between 1983-1985. Roughly 35 p.h. was spent field checking existing mapping.

MAP B. TOPOGRAPHY
M-4 & M-4-I ROADS
UNIT 88-3



MAP C. LOGGING HISTORY M-4 & M-4-I ROADS



Because of several flood producing storm events and disturbance to naturally unstable terrain caused by timber harvest activities, the M-4 Road was essentially abandoned until 1975 when it was reopened to access the last unit to be cut along this road. Mass movement and fluvial erosion processes buried many sections of this road; streams either eroded fill from their road crossings or diverted down the road, initiating mass movement processes to adjacent hillslopes. Without question, these areas produced significant quantities of sediment during major storm events.

Poorly constructed road crossings and several unstable road benches represented the potential sediment sources on this unit. Although all road crossings were intact at the time of treatment, three intermittent streams had no culverts at the road and had been diverted into neighboring drainages or drained onto hillslopes. A 206 acre perennial stream contained a very high diversion potential because of a 5% road grade through the crossing. Several segments of the M-4 and M-4-1 roads were either failing into old growth forests or directly into streams, or had a high potential of doing so.

EROSION CONTROL REHABILITATION WORK

Preparatory Work

This unit was mapped between 1983 and 1985 in conjunction with Unit 83-3, M-3 and M-4 roads. It is not possible to ascertain what portion of the original mapping costs should be assigned to this unit. During 1988, an estimated 35 person-hours were spent field checking existing mapping. Other costs associated with treatment prescriptions, surveys and design, and contract preparation are summarized in Table 1. The heavy equipment contract was submitted on March 12, and awarded on May 24, 1988. The "Abstract of Bid Data" is contained in Appendix A. Greg Bundros was the project supervisor for this unit.

Heavy Equipment Work

Heavy equipment work was performed and supervised by Whitey Brown of W.K. Construction. Work began on June 27, and was completed by August 23, 1988. The contractor's primary equipment included a D8 ripper dozer, a Case 1450 winch dozer, and a Case 980 B (1yd³) hydraulic excavator. This equipment was operated by Bill Campbell, Whitey Brown, and Rob French, respectively. All three were experienced, capable operators who were very familiar with this type of work. Whitey Brown sub-contracted, dump truck and loader work to Greg Brownlow and Dennis Wallen. Utilizing the actual hours worked to complete each task, Table 2 compares contract bid costs with heavy equipment costs had this work been performed by rental agreement. Map D shows all of the heavy equipment treatments.

Table 2
A COMPARISON OF CONTRACT
VS. HERE HEAVY EQUIPMENT COSTS
Unit 88-3; M-4 & M-4-1 Roads

Treatment	Number of Worksites	Total Quantity	Total Costs		Government Savings(+) or Losses(-)	Average Unit Costs	
			Contract	HERE ¹		Contract	HERE
Road Crossing (T) ²	2	9,230 yd ³	\$37,241	\$30,125	-\$7,116	\$4.03/yd ³	\$3.26/yd ³
Road Crossing (P)	4	8,465 yd ³	18,789	14,368	- 4,421	\$2.22/yd ³	\$1.70/yd ³
Deep Drain (T)	1	160 yd ³	683	1,534	+ 851	\$4.27/yd ³	\$9.59/yd ³
Deep Drain (P)	5	1,885 yd ³	3,393	3,961	+ 568	\$1.80/yd ³	\$2.10/yd ³
Exported Outslope (T)	5	11,190 yd ³	44,273	27,498	-16,775	\$3.96/yd ³	\$2.46/yd ³
Exported Outslope (P)	6	11,300 yd ³	24,520	18,720	- 5,800	\$2.17/yd ³	\$1.66/yd ³
Outslope	5	3,900 yd ³	7,530	4,067	- 3,436	\$1.92/yd ³	\$1.04/yd ³
Move In/out	-.-	-.-	6,600	2,000	- 4,600	-.-	-.-
Misc. Treatments ³	-.-	-.-	300	66	- 234	-.-	-.-
Misc. Costs ⁴	-.-	-.-	375	10,975	+10,582	-.-	-.-
Ripping	-.-	1.6 mi.	1,238	1,120	- 118	\$773/mi.	\$700/mi.
TOTALS			\$144,915	\$114,416	-\$30,499		

¹Heavy Equipment Rental Equivalent (HERE) is the cost to perform each task based upon the actual hours worked and prevailing equipment rental rates.

²(T) fill is truck endhaunched; (P) fill is push endhaunched.

³Includes the removal of three culverts.

⁴Includes paid breaks, opening roads, travel & disscussion time. Dose not include down time or standbye cost which for this unit totalled \$18,000.

Heavy equipment work began from the end of the M-4 Road and progressed to the M-4-1 intersection. Once there, equipment relocated to the end of the M-4-1 and completed this road in its entirety. Work resumed on the M-4 and progressed through completion to the M-Line. Of the total yardage excavated from various worksites, a total of 20,580 yds³ (45% of total contract volume) were endhauled by dump trucks. Based upon rental equivalents, the volume-weighted, average unit cost for all truck endhauled work equalled \$2.87/yd³. The volume-weighted unit cost for all push endhauled work averaged \$1.61/yd³. Tables 3 through 7 summarize and detail specific costs for individual worksites.

The contractor utilized customary techniques to complete this work. Overall, he sequenced and scheduled equipment very efficiently. In most cases, the D8R performed the dual function of excavating material while, at the same time, pushed the hydraulic excavator's spoil to a fillsite or pile which would be loaded into trucks by a loader. The D8R excavated roughly 50%-60% of total volume from each worksite. Though undersized for this type of work, the 1450 was well utilized to assist the D8R with long pushes and finish all fillsites. It was especially useful during the truck endhauling. It graded the fill piles as the dump trucks produced them, and always maintained a good driving surface for the trucks. When necessary, the 1450 would elevate the driving surface by smoothing the piles, thereby enabling the trucks to dump another lift. Utilizing this method, road benches were filled to the tops of cutbanks by the trucks.

Labor Intensive Work

Labor intensive work was performed by Redwood National Park and Redwoods United labor crews. During the winter months, Redwood National Park labor crews brushed survey lines to assist with contract development. Concurrent with equipment work, both labor groups spread straw onto completed worksites. The total labor costs for this rehabilitation unit was \$7019 or 4% of the total project cost. Their work and associated costs are summarized in Table 8.

SUMMARY

With the exception of a few breakdowns, the heavy equipment work and contract progressed smoothly. The crew from W.K. Construction is well versed in Redwood National Park's rehabilitation techniques and, as usual, was a pleasure to work with. There were no change orders issued for this contract.

The 1450 was extremely valuable during the truck endhauling phases of this work. Although it was not operating 100% of the time, it worked the fillsites whenever necessary to maintain optimum hauling conditions for the trucks. Its constant availability was crucial since all fillsites were nothing more than a standard width (25ft.-30ft.) road bench. In this type of situation, a fillsite dozer can be very cost-effective.

Based upon actual equipment hours, roughly \$30,500 might have been saved had this work been performed by rental agreement instead of by fixed-price contract. In addition, roughly one-half of the survey and design cost (\$1,950)

and all of the contract preparation cost (\$2,077) could have been saved for a total saving of \$34,527. Of course, this assumes at least comparable production rates to that of the contractors. The "savings" of having contracted this work was not having to orchestrate such a complicated heavy equipment schedule, or having to deal with the timing and delivery of the dump trucks and loader. Thank you W.K. Construction!

HAUL ROAD STREAM CROSSING (RX) EXCAVATION COSTS
Unit 88-3: M-4 & M-4-1 Roads

Worksite ²	Actual Equipment Hours			LDR	DTRK	HERE ¹ TOTAL COST	Volume (yd ³)	Unit Cost (\$/yd ³)	Excavation Rate (yd ³ /pc-hr.)	Average Distance to Fillside
	D8H	980	1450							
<u>M-4-1 Road:</u>										
RX-1 (3+70)	43.00	47.25	55.00	49.75	159.25	\$22,587	6300	3.59	18	0.7 mi.
<u>M-4 Road:</u>										
RX-2 (8+11)	8.75	7.00	8.75	-.-	-.-	2,018	1350	1.50	55	289 ft.
RX-3 (15+60)	9.50	9.75	4.25	-.-	-.-	2,040	1380	1.48	55	170 ft.
RX-6 (39+12)	28.25	23.75	25.75	-.-	-.-	6,455	3485	1.85	44	550 ft.
RX-7 (57+00)	20.50	15.25	-.-	20.50	61.50	7,538	3100	2.43	25	0.5 mi.
RX-8 (60+75)	15.50	15.75	15.25	-.-	-.-	3,855	2400	1.61	52	250 ft.

Average Unit Cost for Truck Endhaule Crossings = \$3.20/yd³

Average Unit Cost for Push Endhaule Crossings = \$1.67/yd³

Contract Bids for Haul Road Crossing Totalled = \$56,030

¹HERE rates are: Cat D8H \$95.00/hr; Case 980 Excavator \$88.33/hr; Case 1450 dozer \$65.00/hr; Michigan 125 Loader (LDR) \$70.50/hr; Dump Trucks (DTRK) \$45.50/hr.

²There were no unusual circumstances (materials, moisture, etc.) at any of the road crossing excavations.

DEEP DRAIN (T) XCAVATION COSTS
Unit 88-3: & M-4-1 Roads

Worksite	Actual Equipment Hours			LDR	DTRK	HERE ¹ TOTAL COST	Volume (yd ³)	Unit Cost (\$/yd ³)	Excavation Rate (yd ³ /pc-hr.)	Average Distance to Fillsite
	D8H	980	1450							
<u>M-4-1 Road:</u>										
DD 7+30	3.50	2.75	0.50	-.-	-.-	\$ 608	235	2.59	35	120 ft.
<u>M-4 Road:</u>										
DD 0+13	1.75	2.00	-.-	-.-	-.-	343	245	1.40	65	90 ft.
DD 20+28	0.50	1.50	1.50	-.-	-.-	277	120	2.31	34	130 ft.
DD 23+54	7.00	8.25	2.00	-.-	-.-	1,524	680	2.24	39	90 ft.
DD 43+20	5.00	5.00	4.50	-.-	-.-	1,209	605	2.00	42	150 ft.
DD 51+05	3.00	4.25	1.75	4.00	10.50	1,534	160	9.59	7	0.3 mi.

TOTALS	20.75	23.75	10.25	4.00	10.50	\$5,495	2045yd³	-.-	-.-	-.-
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Average Unit Cost for Truck Endhauled Drains = \$9.59/yd³

Average Unit Cost for Push Endhauled Drains = \$2.10/yd³

Contract Bids Items for Deep Drains Totalled = \$4,076

HERE rates are: D8H: \$95.00/hr; 980 excavator \$120.00/hr; 1450 dozer \$65.00/hr; Loader (LDR) \$70.50/hr; Dumptrucks (DTRK) \$45.50/hr.

EXPORTED (BLADE ENDHAULED) OPE (EOS) ROAD EXCAVATION COSTS
Unit 88-3: M-4 & M-4-1 Roads

Worksite	Actual Equipment Hours			HERE ¹ Total Cost	Quantity (yd ³)	Unit Cost (\$/yd ³)	Excavation Rate/ (yd ³ /pc-hr)	Ave. Push Distance to Fillsite (ft.)	Excav./ ft of rd. (yd ³ /ft.)
	D8H	980	1450						
M-4 Road ² :									
EOS 1+90	22.75	15.25	15.75	\$4,532	2490	1.82	46	300	9.6
EOS 12+74	6.75	6.75	7.50	1,725	1300	1.33	62	170	11.7
EOS 18+40	16.25	15.50	16.50	3,985	1435	2.78	30	370	8.5
EOS 30+20	11.00	12.25	4.50	2,420	1795	1.35	65	400	4.5
EOS 40+00	25.00	16.00	21.25	5,170	3330	1.55	53	450	13.1
EOS 60+85	4.00	5.75	--	888	950	0.93	97	200	5.9

TOTALS 85.75 71.50 65.50 **\$18,720** 11,300yd³ **\$1.66/yd³** 51yd³/pc-hr.

Contract Bid Items for Blade Endhauled EOS Totalled \$24,521 and Averaged \$2.17/yd³.

¹HERE rates are: D8H dozer \$95.00/hr; 980 excavator \$120.00/hr; 1450 dozer \$65.00/hr; Loader \$70.50/hr; Dumptrucks (DTRK) \$45.50/hr.

²Road bench widths range from 25 ft. to 30 ft.

EXPORTED (TRUCK ENDHAULED) OUTSIDE (EOS) ROAD EXCAVATION COSTS
Unit 88-3: M-4 & M-4-1 Roads

Worksite	Actual Equipment Hours			DTRK	LDR	HERE ¹ TOTAL COST	Quantity (yd ³)	Unit Cost (\$/yd ³)	Excavation Rate (yd ³ /pc-hr.)	Average Distance to Fillsite	Excav./ ft.of Rd (yd ³ /ft)
	D8H	980	1450								
<u>M-4-1 Road:</u> ²											
EOS 1+16	15.25	10.00	9.75	28.25	11.50	\$5,062	2190	2.31	29	0.9mi.	11.7
<u>M-4 Road:</u> ³											
EOS 47+82	23.00	19.00	12.00	40.00	14.50	7,486	2185	3.43	20	0.6mi.	7.5
EOS 51+68	5.50	5.00	4.00	13.25	7.50	2,356	540	4.36	15	0.5mi.	4.6
EOS 53+16	16.25	18.75	--	55.75	20.25	7,164	2675	2.68	24	0.5mi.	9.4
EOS 57+60	14.25	12.75	--	42.75	14.25	5,430	3600	1.51	56	0.5mi.	15.6

TOTALS 74.25 65.50 25.75 68.00 180.00 \$27,498 11190yd³ \$2.46/yd³ 27yd³/pc-hr.

Contract Bid Items For Truck Endhauled EOS Totalled \$44,273 and Averaged \$3.96/yd³.

¹HERE rates are: D8H \$95.00/hr; 980 excavator \$88.33/hr; 1450 dozer \$65.00/hr; Loader (LDR) \$70.50/hr; DumpTrucks (DTRK) \$45.50/hr.

²Road bench widths range from 20 ft. to 25 ft.

³Road bench widths range from 25 ft. to 30 ft.

OUTSLOPE (OS) ROAD EXCAVATION COSTS

Unit 88-3: M-4 & M-4-1 Roads

Worksite	Actual Equipment Hours		HERE ¹ Total Cost	Quantity (yd ³)	Unit Cost (\$/yd ³)	Rate (yd ³ /pc-hr.)	Excav/ ft of Rd. (yd ³ /ft)
	D8H	980					
<u>M-4 Road</u>							
OS 7+12	2.25	4.75	2.50	796	570	1.40	84
OS 37+44	0.50	3.25	3.25	546	695	0.79	99
OS 46+00	4.50	4.00	-.-	781	555	1.41	58
<u>M-4-1 Road</u>							
OS 0+28	1.00	4.25	4.00	730	740	0.99	80
OS 4+42	6.50	6.75	-.-	1,214	1340	0.91	101

TOTALS	14.75	23.00	9.75	\$4,067	3,900yd³	\$1.04/yd³	82yd³ pc-hr.	-.-
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Contract Bid Items for Outslopes Totalled \$7503 and Averaged \$1.92/yd³

HERE rates are: D8H \$95.00/hr; 980 excavator \$88.33/hr; 1450 dozer \$ 65.00/hr; Loader (LDR) \$70.50/hr; Dumptrucks (DTRK) \$45.50/hr.

SUMMARY OF AVERAGE LABOR COSTS
Unit 87-3; M-4; M-4-1 Roads

Treatments	Type of Labor	Total Person Hours	Avg. Cost Per Hour	Total Cost	Quantity	Avg. Unit Cost
<u>Primary Treatments - none</u>						
<u>Secondary Treatments</u>						
Materials	--	--	--	\$908	290 bales	\$3.13/bale
Distribute straw	RNP	60	12.42	\$745	290 bales	\$2.57/bale
Spread straw	RNP	157	11.43	1,747	290 bales	\$8.64/bale
	RU	94	8.08	760		
<u>Miscellaneous</u>						
Brush survey lines	RNP	55	12.56	691	--	--
Brush worksites	RNP	196	11.06	2,168	8 sites	\$271/site
Total Labor Cost =				<u>\$7019</u>		

RNP - Redwood National Park employees
RU - Redwood United, Inc. employees

APPENDIX A

ABSTRACT OF OFFERS - CONSTRUCTION		I. SOLICITATION NUMBER IFB 8480-88-05		2. DATE ISSUED April 21, 1988		3. DATE OPENED May 24, 1988		4. ISSUING OFFICE National Park Service Redwood National Park 1111 Second Street Crescent City, California 95531		5. PROJECT TITLE Watershed rehabilitation and Erosion Control on M-4 Road	
6. NUMBER OF ADDENDA ISSUED _____										7. DATE OPENED May 24, 1988	
8. GOVERNMENT ESTIMATE (Check A, B or C and complete D, E and F.)										9. OFFERS	
A. HIRED LABOR										OFFEROR W.K. Construction P.O. Box 187 Miranda, CA95553	
B. REASONABLE CONTRACT (Without Profit)										OFFEROR ROY D. Garren 2722 N. E. Stephens Roseburg, OR 97470	
C. REASONABLE CONTRACT (Including Profit)										B. BID SECURITY (Type and Amount) Cashier's Check \$28,880.00 Bond 20%	
D. UNIT PRICE										C. ADDENDA ACKNOWLEDGED	

7A. ITEM NO.	7B. DESCRIPTION OF OFFERED ITEM	7C. EST. QUANTITY	D. UNIT	E. UNIT PRICE	F. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	E. ESTIMATED AMOUNT
Bid Schedule No. I								
1.	Move In		LS	\$	900.00		4,200.00	\$10,000.00
2.	Move Out		LS		900.00		2,400.00	10,000.00
3.	Ripping (1.65 miles)		LS		1,400.00		1,238.00	2,500.00
4.	Miscellaneous Costs		LS		20,300.00		375.00	20,000.00
5.	00+28 - 01+16	OS 740cy	LS		814.00		1,440.00	1,850.00
6.	01+16 - 03+03	EOS 2190cy	LS		12,045.00		8,645.00	8,760.00
7.	03+70	RX-1 6300cy	LS		27,405.00		24,934.00	25,200.00
8.	04+42 - 06+09	OS 1340cy	LS		1,474.00		2,633.00	3,350.00
9.	07+30	DD 235cy	LS		376.00		400.00	587.50
10.	07+56	CULV/FILL 40ft	LS		55.00		100.00	400.00
11.	14+20	CULV/FILL 40ft.	LS		55.00		100.00	400.00
12.	00+13	DD 245cy	LS		436.00		420.00	735.00
13.	01+90 - 04+50	EOS 2490cy	LS		2,988.00		6,225.00	9,960.00

ABSTRACT OF OFFERS - CONSTRUCTION

4. ISSUING OFFICE

National Park Service
Redwood National Park
1111 Second Street
Crescent City, California 95531

3. SOLICITATION NUMBER
IFB 8480-88-05

2. DATE ISSUED
April 21, 1988

3. DATE OPENED
May 24, 1988

PAGE OF
2 | 3 PAGE

I CERTIFY that I have opened, read, and recorded on this abstract all offers received in response to this solicitation.

DATE SIGNED

5. PROJECT TITLE

Watershed rehabilitation and Erosion
Control on M-4 Road

9. OFFERS

NO. 1
A. OFFEROR
W. K. Construction
P. O. Box 187 95553
Miranda, CA
B. BID SECURITY (Type and amount)
Cashier's Check \$28,800.00
C. ADDENDA ACKNOWLEDGED
YES

NO. 2
A. OFFEROR
Roy D. Garren
2722 NE Stephens
Roseburg, OR 97470
B. BID SECURITY (Type and Amount)
Bond 20%
C. ADDENDA ACKNOWLEDGED
YES

8. GOVERNMENT ESTIMATE

(Check A, B or C and complete D, E and F.)

A. HIRED LABOR

B. REASONABLE CONTRACT (Without Profit)

C. REASONABLE CONTRACT (Including Profit)

6. NUMBER OF ADDENDA ISSUED

7A. ITEM NO.	7B. DESCRIPTION OF OFFERED ITEM	7C. EST. QUANTITY	D. UNIT	E. UNIT PRICE	F. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT
14.	07+12 - 07+78	OS	570cy	LS	627.00		\$ 1,000.00		\$ 1,425.00
15.	08+11	RX-2	1350cy	LS	2,477.00		2,633.00		5,400.00
16.	12+24 - 13+85	EOS	1300cy	LS	1,625.00		2,543.00		5,200.00
17.	15+60	RX-3 132.	1300cy	UP	2,860.00	\$ 2.20	2,548.00	\$ 3.00	3,900.00
18.	18+40 - 20+08	EOS	1435cy	LS	2,655.00		3,125.00		5,740.00
19.	20+28	DD	120cy	LS	216.00		200.00		360.00
20.	23+54	DD	680cy	LS	1,156.00		1,180.00		2,040.00
21.	30+20 - 34+20	EOS	1795cy	LS	2,513.00		3,510.00		7,180.00
22.	36+90	CULV/FILL	60ft	LS	60.00		100.00		500.00
23.	37+44 - 38+37	OS	695cy	LS	938.00		1,350.00		1,737.50
24.	39+12	RX-6	3415cy	UP	6,830.00	2.51	8,572.00	\$ 3.00	10,245.00
25.	40+00 - 42+55	EOS	3330cy	LS	5,328.00		7,250.00		13,320.50
26.	43+20	DD	605cy	LS	968.00		1,193.00		1,815.00
27.	46+00	OS	555cy	LS	610.00		1,080.00		1,387.50

9. OFFER (Continued)

NO. 3			NO. 4			NO. 5			NO. 6			NO. 7		
A. OFFEROR			A. OFFEROR			A. OFFEROR			A. OFFEROR			A. OFFEROR		
Gary Hegler P. O. Box 1049 Ashland, OR 97520			Carl M. Kjer & Sons P. O. Drawer 1091 Arcata, CA 95521			B. BID SECURITY (Type and Amount)			B. BID SECURITY (Type and Amount)			B. BID SECURITY (Type and Amount)		
Bond \$35,000.00			Bond \$38,617.72			C. ADDENDA ACKNOWLEDGED			C. ADDENDA ACKNOWLEDGED			C. ADDENDA ACKNOWLEDGED		
YES			YES			D. UNIT PRICE			D. UNIT PRICE			D. UNIT PRICE		
E. ESTIMATED AMOUNT			E. ESTIMATED AMOUNT			E. ESTIMATED AMOUNT			E. ESTIMATED AMOUNT			E. ESTIMATED AMOUNT		
14.		\$ 4,354.32			\$ 826.50									
15.		5,154.32			2,281.50									
16.		9,857.20			2,197.00									
17.	2.48	3,224.00			2,197.00									
18.		5,219.12			2,425.15									
19.		2,565.04			202.80									
20.		1,102.40			1,149.20									
21.		7,188.64			3,033.55									
22.		600.00			148.23									
23.		2,177.16			1,174.55									
24.	2.59	8,844.85			8,435.05									
25.		10,411.52			8,225.10									
26.		2,205.04			1,022.45									
27.		3,373.28			937.95									
Sub-Total Schedule I			\$104,308.58											

ABSTRACT OF OFFERS - CONSTRUCTION				1. SOURCE INFORMATION		2. DATE ISSUED		3. DATE OPENED		PAGE OF	
4. ISSUING OFFICE				IFB 8480-88-05		April 21, 1988		May 24, 1988		3 3	
5. PROJECT TITLE				National Park Service Redwood National Park 1111 Second Street Crescent City, California 95531		SIGNATURE		DATE SIGNED		June 1, 1988	
6. NUMBER OF ADDENDA ISSUED				B. GOVERNMENT ESTIMATE (Check A, B or C and complete D, E and F.)		NO. 1		9. OFFERS		NO. 2	
7A. ITEM NO.	7B. DESCRIPTION OF OFFERED ITEM	7C. EST. QUANTITY	D. UNIT	E. UNIT PRICE	F. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	A. OFFEROR W.K. Construction P.O. Box 187 Miranda, CA 95553	
				A. HIRED LABOR						B. BID SECURITY (Type and Amount)	
				B. REASONABLE CONTRACT (Without Profit)						C. ADDENDA ACKNOWLEDGED	
				C. REASONABLE CONTRACT (Including Profit)						BOND 20%	
BID SCHEDULE #2											
28.	47+82 - 50+73	EOS 2185cy	LS		5,068.00		8,645.00		\$ 8,740.00		
29.	51+05	DD 160cy	LS		808.00		683.00		480.00		
30.	51+68 - 52+85	EOS 540cy	LS		2,430.00		2,139.00		2,160.00		
31.	53+16 - 56+00	EOS 2675cy	LS		11,235.00		10,602.00		10,700.00		
32.	57+00	RX7 2930cy	UP	4.50	13,185.00	\$ 3.97	11,632.00	4.25	12,452.50		
33.	57+60 - 59+90	EOS 3600cy	LS		14,760.00		14,242.00		14,400.00		
34.	60+75	RX8 2400cy	LS		4,320.00		4,703.00		9,600.00		
35.	60+85 - 62+46	EOS 950cy	LS		1,805.00		1,868.00		3,800.00		
SUBTOTAL BIDSCHEDULE #2					\$ 57,611.00		\$ 54,514.00		\$ 62,332.50		
GRAND TOTAL					\$155,642.00		\$143,908.00		\$216,325.00		

NO. 3			NO. 4			NO. 5			NO. 6			NO. 7		
A. OFFEROR			A. OFFEROR			A. OFFEROR			A. OFFEROR			A. OFFEROR		
Gary Hegler P.O. Box 1049 Ashland, CA 97520			Cal M. Kjer & Sons P.O. Drawer 1091 Arcata, CA 95521											
B. BID SECURITY (Type and Amount) Bid Bond \$35,000.00			B. BID SECURITY (Type and Amount) Bond \$38,617.72			B. BID SECURITY (Type and Amount)			B. BID SECURITY (Type and Amount)			B. BID SECURITY (Type and Amount)		
C. ADDENDA ACKNOWLEDGED			C. ADDENDA ACKNOWLEDGED			C. ADDENDA ACKNOWLEDGED			C. ADDENDA ACKNOWLEDGED			C. ADDENDA ACKNOWLEDGED		
YES			YES											
D. UNIT PRICE	E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	D. UNIT PRICE	E. ESTIMATED AMOUNT	
	3,265.74		\$ 12,563.75											
	1,174.56		920.00											
	2,177.16		3,105.00											
	8,823.84		15,381.25											
2.68	7,852.40	5.75	16,847.50											
	6,799.92		20,700.00											
	4,978.14		13,800.00											
	2,169.00		5,462.50											
Sub-Total Schedule#II	37,232.10		88,780.00											
GRAND TOTAL	\$173,862.55		\$193,088.58											
				</										



PP1 Upsta EOS 6-15-88 STA 1+16 MH and KG



PP1 12-14-88 GB 35mm



PP1 Across RX1 6-15-88 STA 4+42 MH and KG 35mm



PP1 12-14-88 GB 35mm



PP1 DwnSta to FOS Sta 7+00 6-15-88 MH 35mm



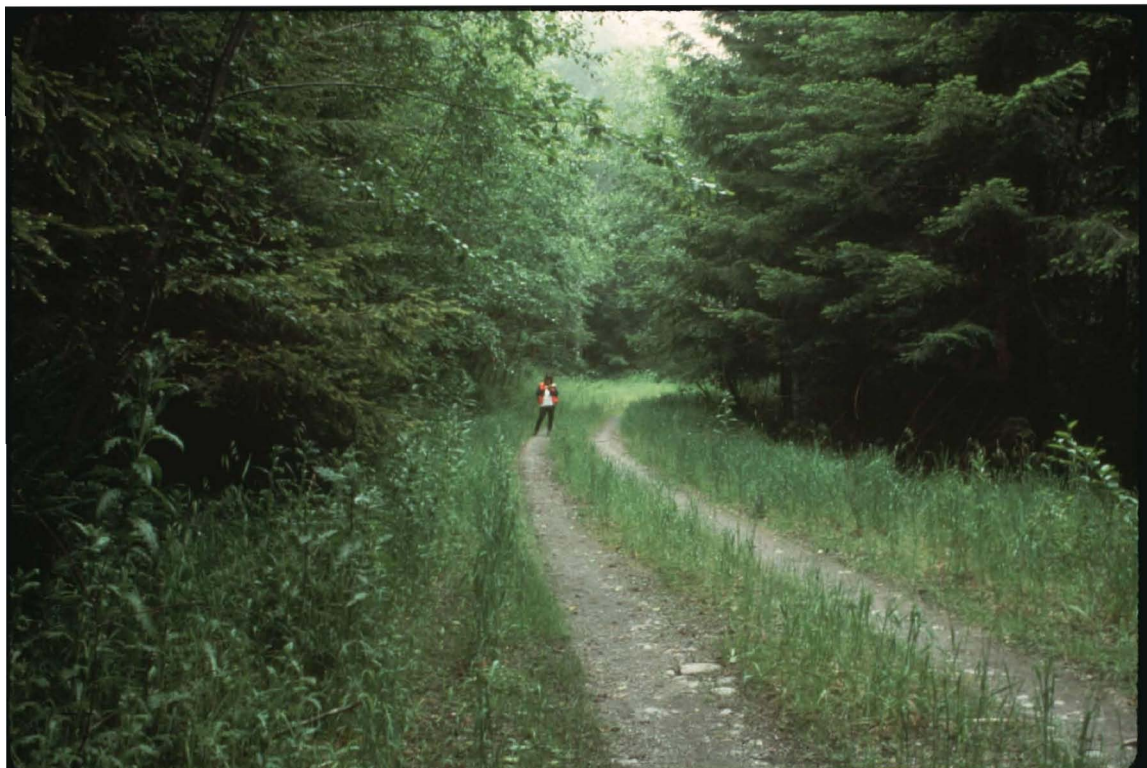
PP1 12-14-88 GB 35mm



PP1 Pre HE DwnStr Rx-6 6-16-88 DAS 35mm



PP1 12-14-88 35mm GB



PP1 Up Sta EOS 53+03 6-16-88 DAS 35mm



PP1 12-14-88 35mm GB