

Watershed Restoration Project 09-02: Removal of a portion of the A400 road – 09-02A; Removal of portions of the A140 and A141 roads – 09-02B

Watershed Restoration project 09-02 was comprised of two different work units located within the Lost Man Creek watershed (see Figure 1). Under contract #C8482060010, Task Order #8485090006 was issued to remove the remainder of the A400 road (unit A), and the remainder of the A140 road and a portion of the A141 road (unit B). All work was performed by Z Logging, LLC of Orick, CA. between June 16th and October 2nd, 2009.

The Redwood National and State Parks geologist for this project was G. Gibbs. It was the project geologist's responsibility to perform all formulation and evaluation of rehabilitation prescriptions, complete the surveying and photo-documentation, generate the plansheets and technical specifications for contracting, oversee the heavy equipment operations as the COTR, and complete the final documentation. The project geologist/Contracting Officer's Technical Representative (COTR) was not onsite for all heavy equipment operations, but did inspect and accept each work item as the project progressed.

Approximately 64,000 cubic yards of road fill were relocated at a total cost of \$417,283, restoring 132 acres as a result of this project. Heavy equipment used consisted of (1) D8K CAT, (1) D6H CAT (with a grapple), (1) 330 CAT excavator, and (1) D8L high-track CAT (utilized for “big pushes”).

Table 1 provides a compilation of total project volumes and costs for the 09-02 project. Excavation volumes and costs for each project unit (A and B) are presented independently later in this section. For compiled statistics of the Lost Man Creek Watershed Restoration Projects accomplishments during 2006-2009, please see the tables in the introduction chapter of this report.

TABLE 1 WATERSHED RESTORATION COSTS SUMMARY FOR PROJECT 09-02: REMOVAL OF A PORTION OF THE A400, A100, AND A140 ROADS					
TREATMENT	QUANTITY	# of JOBS	TOTAL COSTS	% OF GRAND TOTAL	AVERAGE UNIT COSTS
CONTRACT COSTS - HEAVY EQUIPMENT					
STREAM CROSSINGS	6,958 yds ³	4	\$76,046.45	18%	\$10.93
EXPORT OUTSLOPING	31,277 yds ³	8	\$205,421.69	49%	\$6.57
OUTSLOPING	23,184 yds ³	13	\$96,086.30	23%	\$4.14
MISC. BID ITEMS	---	---	\$39,728.70	10%	---
GRAND TOTAL:	61,419 yds ³		\$417,283.14	100%	\$6.79

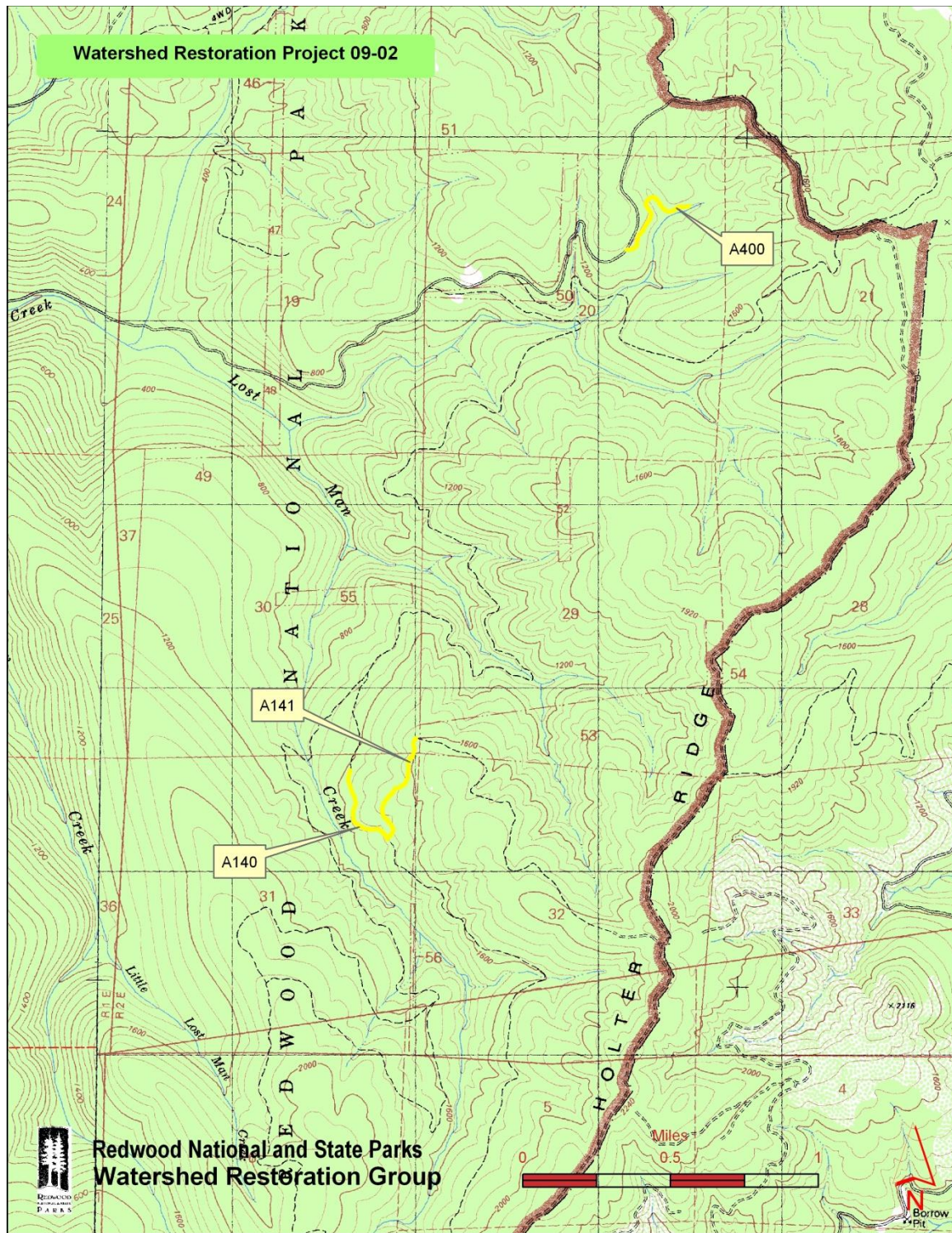


Figure 1. Location map for A400 and A140/A141 roads, Lost Man Creek.

Past reports (prior to 2007) have included tables showing production rates for each work item (e.g. Appendix 1; Project 06-02; Tables 2-4). Organized by prescription type, these data were generated based on the actual equipment hours required for each site. Due to budgetary / management goals, park representation on the project sites was reduced in 2007. Documentation

of equipment hours on specific work items was limited to the time when the COTR was onsite, resulting in incomplete / inconsistent “hours” data. Because the accuracy of production rate data (at the work item resolution) was compromised it is not presented in report tables for this project.

A400 ROAD (UNIT 09-02A)

Watershed Restoration Unit 09-02A was designed to remove the remaining length of the A400 road, as well as some associated skid roads. The A400 road was located near the headwaters of a tributary to the Middle Fork Lost Man Creek (MFLMC).

On June 16th heavy equipment was moved in and work item excavation began under Task Order Number T8485090006. Unit 09-02A relocated a total of 26,346 cubic yards of road fill along the A400 road at a total cost of \$210,994, restoring 37 acres. The restoration addressed erosion problems along 2,900 feet of main haul road and approximately 1,775 feet of skid road (work items 8, 10, and 11) associated with the A400 road (Fig. 2). Project unit 09-02A work items were completed on August 13th and heavy equipment was walked to Unit 09-02B. No move out was paid for the A400 road; equipment walking time was added to move in cost for the A140/A141 roads (Unit 09-02B).

TABLE 1 WATERSHED RESTORATION COSTS SUMMARY FOR UNIT 09-02A: REMOVAL OF A PORTION OF THE A400 ROAD					
TREATMENT	QUANTITY	# of JOBS	TOTAL COSTS	% OF GRAND TOTAL	AVERAGE UNIT COSTS
CONTRACT COSTS - HEAVY EQUIPMENT					
STREAM CROSSINGS	4,481 yds ³	2	\$62,042.79	29%	\$13.85
EXPORT OUTSLOPING	7,122 yds ³	3	\$72,797.20	35%	\$10.22
OUTSLOPING	14,743 yds ³	6	\$62,469.59	30%	\$4.23
MISC. BID ITEMS	---	---	\$13,684.71	6%	---
GRAND TOTAL:	26,346 yds ³		\$210,994.29	100%	\$8.01

Project unit 09-02A moved approximately 26,000 cubic yards of material over 8 weeks, which equates to a gross scale production rate of 3,250 cubic yards per week: or an average of (very) roughly 24 cubic yards per equipment hour for the entire project unit. Undoubtedly, this production rate is lower than the actual rate because it does not accurately represent the hours worked. For example: days off, time spent dealing with trash pump, wrenching, and equipment down time. Project unit 09-02A costs are summarized in Table 1.

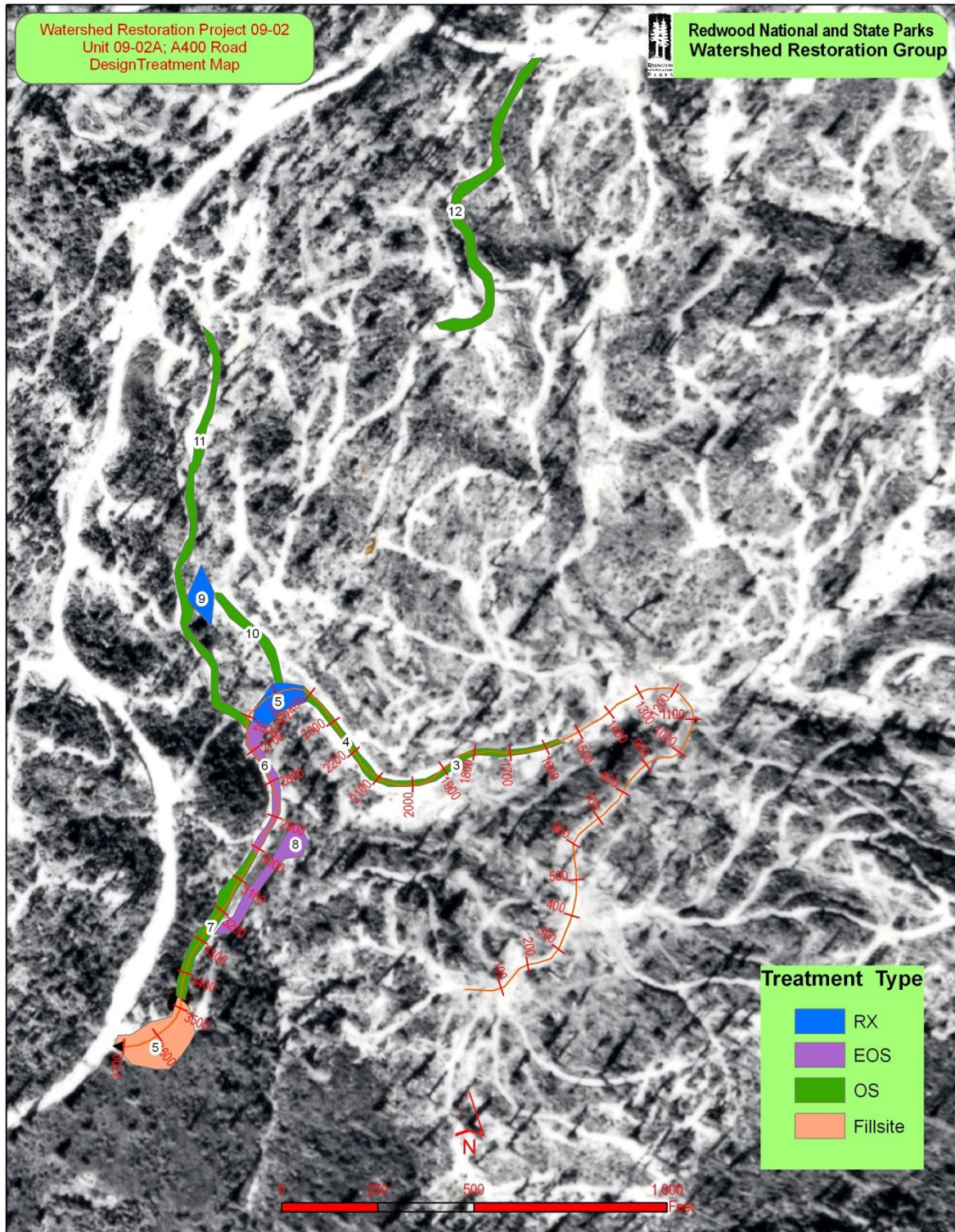


Figure 2. Design plan map for the A400 road: project unit 09-02A. White dots are work item numbers.

Prescriptions and Treatments

Restoration focused on the removal of the stream crossings and unstable side cast fill, and restoring natural drainage patterns interrupted by the A400 road. This road is situated in the Prairie Creek Formation (QTc), very near the contact with the Franciscan Assemblage (KJfl).

Excavated fill was used to mimic the surrounding natural topography as much as possible. Many cutbanks were not matched, however, due to the extensive amount of spring flow present in this porous bedrock. Organic and nutrient rich side cast was sparse, but, when found, it was returned to the surface in order to help speed recovery of native vegetation. Vegetation removed during excavation was stockpiled and dispersed along the finished surface, according to RNSP Post-excavation erosion control guidelines, in order to inhibit surface erosion and provide habitat. In some cases, if the erosion control guidelines would still be met, the larger boles were left stockpiled due to the cumbersome nature of their size and length.

The project accomplished 11 work items, which included the excavation of 2 haul road-stream crossings (RX), 805 ft. of road export outslowing (EOS), and 3,710 ft. of road outslowing (OS) (Figure 2). Miscellaneous bid item costs are summarized in Table 5.

Stream Crossings (RX)

RX-1

Work item #5 (RX-1) was partially excavated during the summer of 2008 as project 08-02 work item#16 (RX-6). This work site was a collapsing log stringer bridge prior to the A400 road removal effort began in 2008. The collapsed logs and fill had caused sediment aggradation immediately upstream of the crossing. In 2008, stream profile and cross sectional surveys estimated that the depth of this aggradation was in excess of eight feet. The designed excavation was to be 2,193 yd³, but only 1,241 yd³ was excavated prior to moving to work unit 08-02C (summer of 2008).

As part of the road opening and improvement to gain access to the first work items in 2008, the log stringers were removed and a temporary culvert was installed. The sideslopes of the crossing were excavated back to a gradient that would be drivable. Due to the need to move to a T&E restricted work unit (08-02C) on September 15th, 2008, no additional excavation outside of the bridge corridor was undertaken on this work item in 2008. Instead, the crossing was winterized by pulling the temporary culvert, cleaning the dirt from on top of the Humboldt logs, excavating the sideslopes back to a 1:1 gradient, and mulching the sideslopes with vegetation disturbed during road opening.



RX-1 prior to excavation. Looking Right Bank. May, 2008.



RX-1 opened for access. Looking Right Bank. June 17, 2008



RX-1 winterized. Looking Right Bank. January, 2009.

In 2009, this crossing excavation was completed. Work item #5 (RX-1) removed 3,909 yd³ of fill and aggraded sediment from this tributary, recovering about 250 feet of stream channel. The excavated material was trucked from the crossing to the fillsite labeled 5 on the design map (Figure 2), at the junction of Geneva Rd. and the A400 road.



RX-1 Looking Up Stream Oblique to Left Bank. July 1, 2009.



RX-1 Looking Up Stream. July 8, 2009.

Snag denoted by red arrows was topped in July of 2009.



Rx-1 Looking Right Bank. July 24, 2009.

Export Outsloping (EOS)

The two Export Outslope treatment work items were straight forward.

Outsloping (OS)

Work Item #3 was designed as an Outslope treatment, but 35 feet of road length (17+50 to 17+85) was paid as an Export Outslope treatment because it was an obscured swale that

contained 1,287 yd³ of fill. Otherwise, the outslope treatments were very uneventful. The cutbank was not matched with fill at every location (full recontour), but all benches were relieved to an angle that would allow free drainage of runoff.

Miscellaneous

The miscellaneous portion of the cost accounting for project unit 09-02A is summarized in Table 5 and includes all payments outside of the excavation treatment categories described above.

Move in is the cost of moving heavy equipment (including highway transport incidentals) to the lowboy drop-off; in this case, the Lost Man Creek picnic area.

Miscellaneous move in is the cost required to walk equipment in from the lowboy drop-off point as well as the cost of bonding (required by the federal government) and administrative expenses incurred during this phase. The A400 road had no move out costs because equipment was walked from the project end location to the staging area of the 09-02B project unit: these miscellaneous costs were included on the move in for the 09-02B project unit.

TABLE 5 MISCELLANEOUS BID ITEM COSTS FOR UNIT 09-02A: REMOVAL OF A PORTION OF THE A400 ROAD				
WORK ITEM #	ITEM TITLE	QUANTITY	UNIT PRICE	TOTAL COSTS
1	MOVE IN	1 JOB	---	\$2,029.46
1A	MISCELLANEOUS MOVE IN	1 JOB	---	\$11,655.25
			Total	\$13,684.71

Threatened and Endangered Species Concerns

Work Items #4-11 were within a 0.25 mile Daily Limited Operating Period “presence” zone with respect to marbled murrelet habitat. Work Item 12 was within a 0.25 mile “occupied” zone with respect to marbled murrelet habitat, but was regarded as a Daily Limited Operating Period zone because of a topographic break (ridge) between the activity center and the work site (work item #12). Consequently, all work items in unit 09-02A were excavated within the period of 2 hours after sunrise till 2 hrs before sunset.

Trash pump and hose were used to divert streams around active excavations for all sites that had live flow. Moreover, straw bales and settling ponds were used at all stream crossing excavations that required diversion because invariably 100% of flow (stream or spring) could not be captured. This technique also provided a back-up in case of pump failure and a settling pond for the “first-flush” of sediment post-excavation.

A140/A141 ROADS (UNIT 09-02B)

Watershed Restoration Unit 09-02B was designed to remove the remainder of the A140 road (2,325 ft.) and approximately 2,000 ft. of the A141 road (Figure 1). The project unit, when completed, actually removed 2,200 ft. of the A141 road because time and budget allowed for an additional 165 ft of road to be added to work item #28: compare Figure 4 and Figure 5.

Unit 09-02B relocated a total of 35,073 cubic yards of road fill and restored 95 acres of landscape at a total cost of \$206,289. The project addressed erosion problems along 4,360 feet of road that included portions of the A140 and A141 haul roads. Heavy equipment was moved in and excavation work began on August 14th under Task Order Number T8485090006. On October 2nd, the final work items were completed and equipment was staged for move out.

The project moved approximately 35,000 cubic yards of material over 7 weeks, which equates to a gross scale production rate of 5,000 cubic yards per week: or an average of roughly 37 cubic yards per hour (per machine) for the entire project. Undoubtedly, this production rate is lower than the actual rate because it does not accurately represent the hours worked. For example: days off, time spent dealing with trash pump, wrenching, and equipment down time. Project costs are summarized in Table 1.

TABLE 1 WATERSHED RESTORATION COSTS SUMMARY FOR UNIT 09-02B: REMOVAL OF A PORTION OF THE A140 AND A141 ROADS					
TREATMENT	QUANTITY	# of JOBS	TOTAL COSTS	% OF GRAND TOTAL	AVERAGE UNIT COSTS
CONTRACT COSTS - HEAVY EQUIPMENT					
STREAM CROSSINGS	2,477 yds ³	2	\$14,003.66	7%	\$5.65
EXPORT OUTSLOPING	24,155 yds ³	5	\$132,624.49	64%	\$5.49
OUTSLOPING	8,441 yds ³	7	\$33,616.71	16%	\$3.98
MISC. BID ITEMS	---	5	\$26,043.99	13%	---
GRAND TOTAL:	35,073 yds ³		\$206,288.85	100.0%	\$5.88

Prescriptions and Treatments

With the exception of work item #14, which was not attempted, all 15 work sites in the project unit design were accomplished prior to the onset of winter weather. The project, as built, included the excavation of 2 road-stream crossings, 1,870 ft. of road export outsloping, and 2,285 ft. of road outsloping (Fig 5). Additionally, 2 miscellaneous treatments were road ripping.

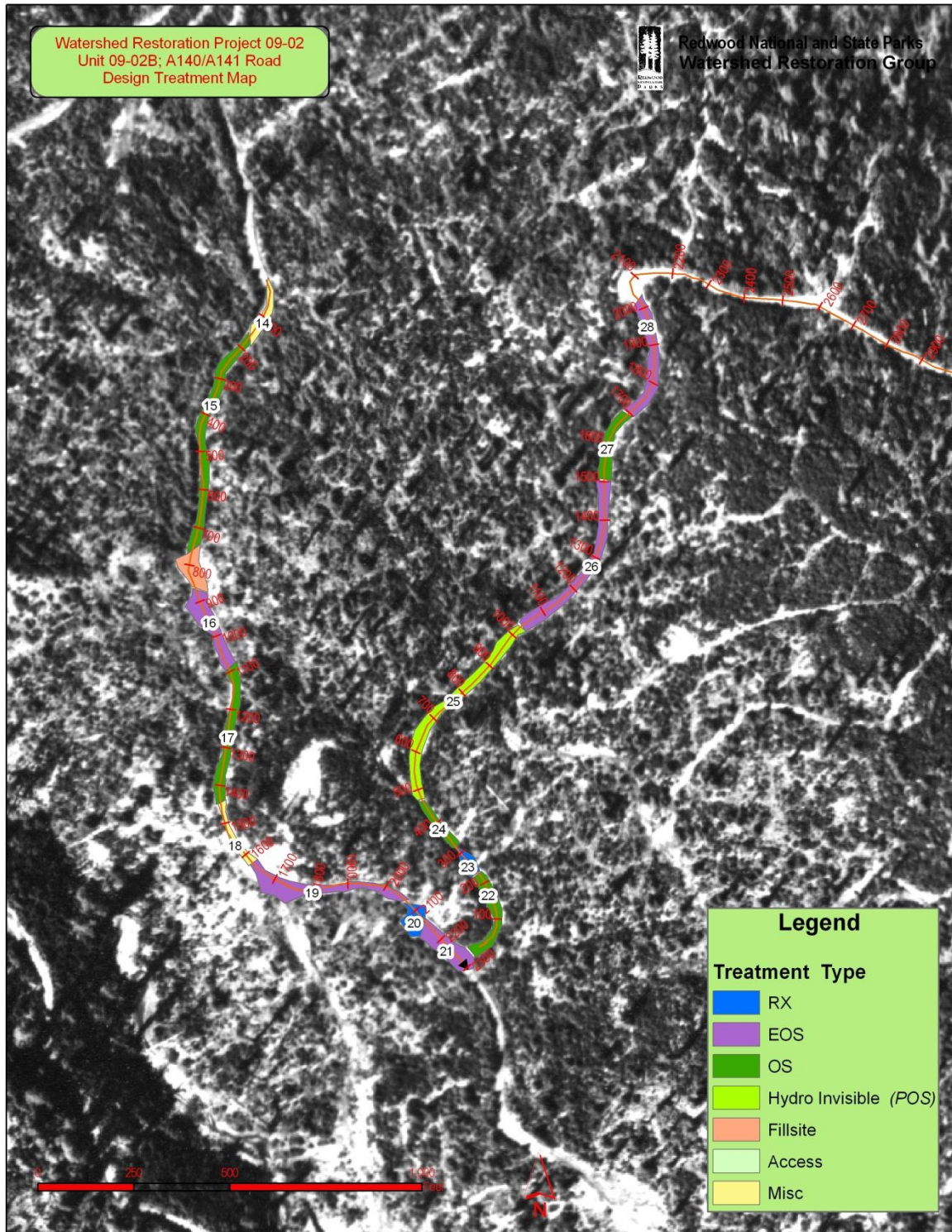


Figure 4. Design map for the 09-02 project unit 09-02B: A140 and A141 roads.

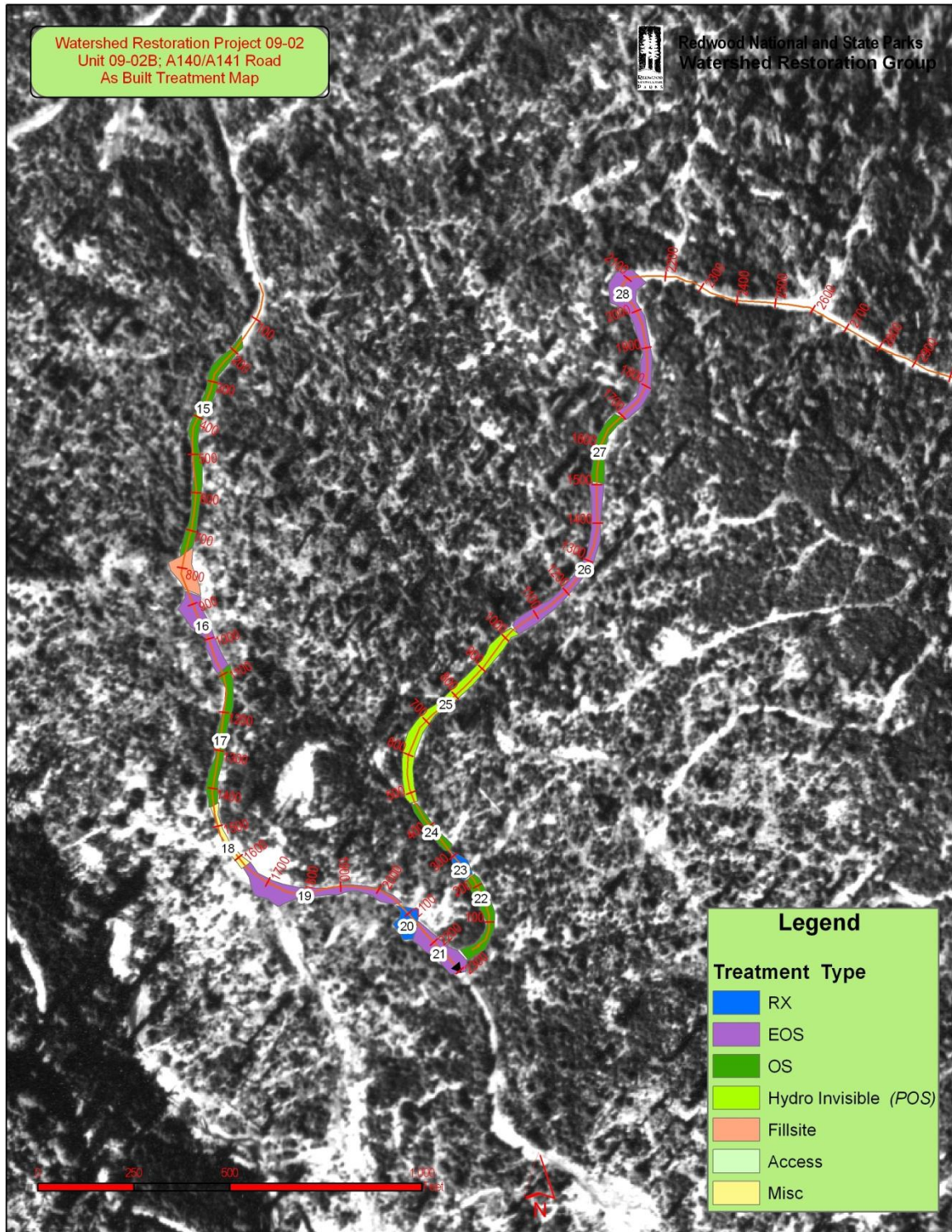


Figure 5. As built plan map for the 09-02 project unit 09-02B: A140 and A141 roads.

Stream Crossings (RX)

The stream crossing excavations on this unit were sites #20 and 23. Work item #20 was moderate in size (2277 yd³), while work item #23 was very small at 200 yd³. They were both void of any drainage structures. The main objective of the road-stream crossing excavations was to make the road hydrologically transparent to concentrated runoff.

Work item #20 did have a critical dip installed, probably in 2000, but it was channeling the seasonal flow to the north of what appeared to be the original flow course. This site was excavated to place flow so that it will correspond with valley downslope, across the removed A142 road. Work item # 23 had both diverted and washed out in the past as evidenced by an enlarged (gullied) inboard ditch down road and a large slug of fill in the draw below the site.

Export Out sloping (EOS)

Export Outslope treatments on this unit were uneventful except for encountering unexpected bedrock in the middle of work item #26, which made for a smaller excavation volume than designed.

Out sloping (OS)

Outslope treatments were straight-forward. Work items #18 and #25 were “Partial Outslope” treatments with very small volumes.

Miscellaneous

The miscellaneous portion of the cost accounting for project unit 09-02B is summarized in Table 5 and includes all payments outside of the excavation treatment categories described above. Move in (work item #13) is the cost of walking equipment to the initial staging area on the A140 road from the A400 road. Miscellaneous move out is the cost required to walk equipment from the end of the project unit to the lowboy pick-up point. Move out is the cost of moving heavy equipment (including highway transport incidentals) from the lowboy pick-up; in this case, Holter Ridge gate at Bald Hills Road to the contractor’s yard. Other miscellaneous costs include road ripping for nearly the entire length of both roads (work items #14A and #29).

TABLE 5 MISCELLANEOUS BID ITEM COSTS FOR UNIT 09-02B: REMOVAL OF A PORTION OF THE A140 AND A141 ROADS				
WORK ITEM #	ITEM TITLE	QUANTITY	UNIT PRICE	TOTAL COSTS
13	MOVE IN	1 JOB	---	\$3,135
14A	ROAD RIP	2,170 ft.	---	\$8,853.60
29	ROAD RIP	2,035 ft	---	\$8,302.80
2	MOVE OUT	1 JOB	---	\$3130.59
2A	MISCELLANEOUS MOVE OUT	1 JOB	---	\$2622.00
			Total	\$26,043.99

Threatened and Endangered Species Concerns

Unit 09-02B was partially within a Daily Limited Operating Period “presence” zone with respect to marbled murrelet habitat. All work was performed during the period of 2 hours after sunrise till 2 hrs before sunset, prior to September 16th, 2009.

Work items #20 and #23 were dry at the time of excavation. Consequently, no flow diversion was necessary.