

REPORT OF THE 1972 SURVEY OF SEDIMENT BELOW STREAM GAGE
SITES 1, 2, AND 3 ON THE H. J. ANDREWS EXPERIMENTAL FOREST

by

Ross Mersereau

Six years have passed since logging and slash burning on watershed 1. On watershed 3, it has been 13 years since roadbuilding, 9 years since logging, 6 years since the slides of December 1964, and 4 years since the slide from the G Road.

MEASUREMENTS AND CALCULATIONS

Measurements and calculations were consistent with those used in previous years.

Lines of sight were checked as every other line was measured. Small differences in "line of sight" measurements were grouped together and averaged.

Accumulated sediment was removed from the sediment basins at gage sites 1 and 3 in August 1971 by a 1-1/2-cubic yard frontend loader. The same week the initial survey for the 1972 report was performed.

Since the basin at gage site 3 was level with the top of the dam again this year, it was assumed that the elevation was the same as the final reading of the 1970 report. Therefore, the data for the final measurement of this report on watershed 3 are the same as that of August 11, 1970.

By January 21, sediment had pretty well filled gage site 1 basin and left a gravel bar which was level across the top. In March 1972, high water washed a large channel through the bar and the material was lost down the creek. When the elevation of the bar was measured, two separate elevations were determined; one for the bar as it finally ended up in the summer and one for a corrected measurement which assumed the elevation of the material before the channel appeared. The latter elevation is the one used in this report.

DISCUSSION

The storm season this past winter was most intense of any year since the 1964-65 winter. There were approximately five or six major storms, one of which involved snowmelt runoff. The basins at gage sites 1 and 3 were full by January 21, 1972; the basin at site 2 had accumulated most of its load. There was evidence throughout the lower areas of the Experimental Forest of massive soil movements especially involving road cutbanks and fill slopes.

There were further slumps in the slide area at the end of the lower watershed 3 road (1502B). The site 3 basin was probably filled with this material along with material from the toe of the middle road slide.

The sediment load from watershed 1, in recent years, appeared to be tapering off. This past winter, however, it filled and overflowed again. Investigation showed that two slides had occurred on a small ridge above the waterfall. The material from these slides ended up in the creek channel. Sediment records show a greater than expected increase in suspended sediment after January 21 from the watershed 1 stream. At the same time, a fine clay sand material appeared in the bedload below the flume. If this is material from the slide area, and it seems to be, it would appear that the slides occurred during the January 21 storm and the material continued to move through the rest of the spring.

The watershed 2 basin did not appear to have an excessive amount of material, so it would seem that there is evidence that watersheds 1 and 3 have still not returned to pretreatment stability.

As has been the case in the past, these measurements still only indicate a fraction of the amount of bedload volume that is moving through the flumes.

Table 1.--Sediment Accumulation 1971-1972

Year	Number of Points	Line of Sight	Average Rod Reading	Average Bottom Elevation	Change of Bottom Elevation	Basin Area in Sq. Feet	Total Accum. in Cubic Feet	Ave. Accum. in Cubic Feet/ Acre	Ratio
<u>WATERSHED 1 (237A)</u>									
1971	250	114.521	9.124	105.397					
1972	64	114.191	5.618	108.573					
	186	114.197	5.691	108.506					
			Wt. Ave.	108.523	3.126	2133	6,667.758	28.134	71.59
<i>Corrected to include bedload lost from basin by last storm of the season</i>									
1972	64	114.191	5.618	108.573					
	186	114.197	5.465	108.732					
			Wt. Ave.	108.691	3.294	2133	7,026.102	29.646	75.44
<u>WATERSHED 2 (149A)</u>									
1971	211	107.954	7.447	100.507					
1972	211	108.080	7.542	100.538	.031	1887	58.497	.393	
<u>WATERSHED 3 (250A)</u>									
1971	3	106.607	11.653	94.954					
	199	106.613	10.804	95.809					
	202		Wt. Ave.	95.796					
1972	202	105.516	7.402	98.114	2.318	890	2,063.020	8.252	21.0

RE - NW -
SOIL STABILIZATION
Watersheds

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Benchmark:

H.I.
Elev.

Experimental Area: HJA
Basin Location: WS #1

Date: 8-20-71
Party: Level Marsden
Rod Leino
Notes Reber

Station*	Transects (Designated in ft. starting at crest of dam)													
	1		2		3		4		5		6		7	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
03														
06		4.76		4.52		4.80		4.82		4.84		4.64		4.58
09		7.40		4.35		8.78		9.02		8.70		8.75		8.02
12		9.86		8.30		11.08		11.41		11.46		12.57		10.17
15		8.83		10.71		11.36		11.50		11.47		11.37		11.27
18		8.85		11.18		11.35		11.44		11.36		11.32		11.46
21		8.84		11.68		11.58		11.68		11.52		11.35		11.47
24		8.40		10.54		11.64		11.67		11.82		11.39		11.52
27		7.24		10.31		11.40		11.66		11.66		11.41		11.40
30		7.94		10.33		11.34		11.46		11.60		11.53		11.29
33		7.63		8.94		10.82		11.30		11.38		11.35		11.25
36				8.60		10.88		11.14		11.29		11.26		11.23
39				7.94		10.39		10.94		10.05		11.05		10.97
42				5.50		10.24		10.68		10.70		10.71		10.96
45				4.56		10.00		9.96		10.40		10.63		10.59
48						8.88		9.73		10.22		10.11		10.03
51						8.61		9.28		10.09		9.86		9.96
54						8.20		9.06		9.44		10.00		10.43
57						5.80		6.90		8.66		9.78		10.26
60						5.15		6.53		8.04		9.04		9.85
63								6.03	Edge	6.18		7.99		9.97
66								5.91		4.80		5.78		8.78
69											Edge	4.91		6.97
72														5.26
75														

Temporary Bm Start 1.881

LINE 2 1.881 1st six LINES 1.881

Temporary Bm End Line

Line 4 1.881

" " 6 1.887

" " "

" " "

" " "

Total NO. Points 250
Total Rod Reading 2286.09
Average Rod Reading 9.124

NO. PTS	(10)	(14)	(19)	(21)	(21)	(22)	(23)
Total	79.75	117.46	182.22	201.95	205.74	215.80	227.75
Average							

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam.

Benchmark:

H.I.

Elev.

Experimental Area: HJA

Basin Location: W. #1

Date: 8-20-71

Party: Level

Rod

Notes

Station*	Transects (Designated in ft. starting at crest of dam)													
	8		9		10		11		12		13		14	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
03														
06		4.65		4.05										
09		5.72	Wt. Edge	5.01		4.80		4.65						
12		10.47	11.5	8.45	Wt. Edge	7.86		5.22		4.53				
15		11.30		11.21		10.94	Wt. Edge	9.65	Wt. 15.00	5.48				
18		11.35		11.33		11.51		10.58		7.44				
21		11.55		11.56		11.53		10.50		7.11				
24		11.66		11.58		11.36		9.96		6.27				
27		11.74		11.55		10.90		9.32	Edge 27	6.03				
30		11.46		11.45		10.50		9.06	L					
33		11.27		11.15	Rock	9.97		8.42	A			4.77	32	6.74
36		11.10		10.80		10.45		7.60	N			7.63		6.90
39		11.10		11.09		10.84	Edge of	6.25	38. Out	6.87		7.24		7.03
42		10.66		10.70		10.09	Out 1st	7.61		8.17		7.39		7.12
45		10.91		10.36		9.62		8.54		8.59		8.06		7.28
48		10.06		9.44		9.44		9.32		8.71		7.79	Wt. Edge	5.60
51		10.16		9.76		9.59		9.57		9.24	Wt. Edge	7.80	4.75	5.13
54		10.15		10.05		10.14		9.41	Wt. Edge	9.03		5.32		
57		9.97		10.30		10.00		10.06	57	6.54				
60		9.94		10.13		9.99		9.35	Wt. Edge	5.79				
63		9.97		10.09		9.99		8.38	57.5	5.40				
66		9.58		9.71		8.61	Wt. Edge	5.80						
69		8.33	Wt. Edge	8.20	Wt. Edge	6.25		55.2						
72	Wt. Edge	5.36	72.7	6.90	68.4	5.73								
75				5.24										

BM end of LINE 8 1.883
" " 10 1.881
" " 12 1.881
" " 14 1.881

Line of sight is Equal to Assumed elevation of 109.00 ft.
+ Plus elevation of Auxiliary spike (12.640) Plus Ave. Rod Reading
on BM at Timing Survey

$$100.000 + 12.640 + 1.881 = 114.521$$

No. Pts	(23)	(24)	(22)	(21)	(15)	(8)	(7)
Total	228.46	230.11	210.11	174.77	105.17	56.00	45.80
Average							

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam.

Benchmarks:

H.I.
Elev.

Experimental Area: HJA.
Basin Location: WS #1

Date: 8-7-72
Party: Level
Rod
Notes

Station#	Transects (Designated in ft. starting at crest of dam)									
	8		9		10		11		12	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00										
03										
06		4.26		4.72						
09		4.45		4.12		4.34		4.20		
12		4.72		8.74		9.00		4.29		4.23
15		9.96		10.21		10.30		8.30		5.59
18		8.11		8.91		9.90		10.00		5.69
21		6.60		7.47		8.48		9.74		8.52
24		5.21		6.08		7.63		9.05		7.45
27		4.78		5.65		6.16		7.56		7.88
30		4.90		5.33		5.63		6.44		
33		4.90		5.03		5.52		6.06		
36		4.19		4.74		5.22		6.07		
39		5.04		5.21		5.43		5.55		
42		5.23		5.41		5.65		5.76		
45		5.51		5.48		5.55		5.55		
48		5.32		5.17		5.10		5.18		
51		5.36		5.31		5.37		5.47		
54		5.28		5.42		5.66		5.73		
57		5.58		5.41		5.24		5.21		
60		4.34		4.51		4.50		4.57		
63		4.33		4.38		4.15		4.53		
66		4.28		4.25		4.15		4.48		
69		4.18		4.26		4.38		4.51		
72		4.28		4.27		4.31				
75				4.26						

Lines 1-4 Line of Sight = $100.000 + 12.640 + 1.551 = 114.191$

Lines 5-14 Line of Sight = $100.000 + 12.640 + 1.557 = 114.197$

(23)	(24)	(22)	(21)	(15)
120.16	129.26	128.49	125.71	83.54
Total No Points 186				
Total Rod Readings 1016.490				
Average Rod Reading 5.465				

No. Pts	(23)	(24)	(22)	(21)	(15)	(8)	(7)
Total	126.61	134.99	132.65	128.52	87.48	44.50	40.75
Average							

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam

Benchmark:

H.I.
Elev.

Experimental Area: HJA
Basin Location: WS #1

Date: 8-7-72
Party: Level RM.
Rod M.W.
Notes S.F.

Station*	Transects (Designated in ft. starting at crest of dam)													
	1		2		3		4		5		6		7	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
03														
06		4.10		4.12		4.33		4.12		4.65		4.26		4.12
09		5.19		8.71		9.45		8.91		9.89		9.83		9.28
12		8.51		10.01		10.55		10.76		10.77		10.76		10.45
15		9.36		9.64		9.49		9.34		9.14		9.44		9.24
18		8.46		8.11		7.62		7.84		7.27		7.54		7.41
21		6.30		6.18		5.96		6.24		5.53		5.71		5.34
24		4.94		4.53		4.72		4.57		4.24		4.36		4.19
27		4.11		4.25		4.20		4.23		4.26		4.30		4.34
30		4.19		4.11		4.06		4.15		4.20		4.19		4.20
33		4.31		4.06		3.92		4.00		3.94		4.02		4.30
36				4.05		3.89		3.84		4.04		4.56		4.59
39				4.05		3.87		3.79		4.63		4.62		4.59
42				3.94		3.84		3.92		4.58		4.50		5.05
45				3.92		3.86		4.37		4.71		5.04	co	5.45
48						4.13		4.47		5.00		5.71		5.35
51						4.51		4.81		5.49		5.74		5.32
54						4.95	age cr	5.07		5.28		5.14		5.13
57						5.29	cr	5.58		5.29		5.18		5.24
60						4.78	cr	5.15		5.04		5.04		4.25
63							cr	5.56		6.03		3.93		4.39
66							cr	5.26		4.27		3.79		4.15
69												3.84		4.20
72														4.08
75														

Between Blue Lines corrected bottom elevation applies

Temporary BM start = 1.551
" " End line # 2 = 1.551
" " " " 4 = 1.551
start " = 5 = 1.557
end of A = 1.557
end of B = 1.557
Temporary BM End at Survey = 1.557

Total NO. Points 64
Total Rod Reading 359.53
Average Rod Reading 5.618

Total NO. Points 186
Total Rod Reading 1058.47
Average Rod Reading 5.691

Collected Data
(21) (22) (23)
109.57 114.92 119.59

NO. Pts	(10)	(14)	(19)	(21)	(21)	(22)	(23)
Total	59.50	79.98	103.41	116.64	117.18	120.85	124.94
Average							

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam

Benchmark:

H. I.

Elev.

Experimental Area:

Basin Location:

Date: 8-7-72

Party: Level

Rod

Notes pm

corrected Figures to include Redlo

A17A

111.5.7

Material Lost During Last Storm of Season

Transects (Designated in ft. ~~starting~~ at crest of dam)

[illegible]

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam.

RI - NW
SOIL STABILIZATION
Watersheds

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Benchmark:

H.I.

Elev.

Experimental Area:

Basin Location:

Date: 8-9-72

Party: Level MW

Rod RM

Notes MW

Station*	Transects (Designated in ft. starting at crest of dam)													
	1		2		3		4		5		6		7	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
03														
06						5.96		6.66		6.76		6.68		6.66
09				6.20		7.16		7.76		7.64		7.77		7.49
12				6.24		7.97		8.48		8.37		8.47		8.47
15				7.40		8.62		8.76		8.78		8.57		8.12
18				8.03		8.84		8.94		8.53		7.84		7.30
21		6.72		8.59		8.98		8.54		8.16		7.48		7.02
24		7.08		8.67		8.66		8.33		7.76		7.54		7.04
27		7.84		8.70		8.22		8.18		7.86		7.51		7.37
30		7.32		8.12		8.01		8.21		7.92		7.48		6.99
33		7.23		8.00		7.96		8.19		7.58		7.48		7.48
36				7.82		7.50		7.83		7.24		7.12		7.33
39				6.96		6.43		6.63		6.28		6.53		6.64
42				6.11		5.74		5.64		5.63		5.84		6.04
45				5.42		5.03		4.90		5.04		5.07		5.74
48				5.00		4.83		4.83		5.04		5.12		5.48
51				4.82		4.83		5.07		5.63		5.52		5.73
54				5.00		5.18		5.66		6.79		5.80		4.99
57														
60														

Total No. Points = 211
Total Rod Reading = 1591.45
Average Rod Reading = 7.542

Line of Sight = 100.000 + Rod Reading each line

100.000 + 8.080 = 108.080

No. Pts

(5)

(10)

(16)

(11)

(17)

(17)

(17)

Total

36.19

111.08

114.76

122.66

121.03

117.82

115.89

Average

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam.

ELEVATIONS OF SEDIMENT ACCUMULATED IN CATCHMENT BASINS

FORM RI-2

Date: 8-9-72
Party: Level MW
Rod RM
Notes MW

Benchmarks:

H.I.	Elev.
1	100
2	100
3	100
4	100
5	100
6	100
7	100
8	100
9	100
10	100
11	100
12	100
13	100
14	100
15	100
16	100
17	100
18	100
19	100
20	100
21	100
22	100
23	100
24	100
25	100
26	100
27	100
28	100
29	100
30	100
31	100
32	100
33	100
34	100
35	100
36	100
37	100
38	100
39	100
40	100
41	100
42	100
43	100
44	100
45	100
46	100
47	100
48	100
49	100
50	100
51	100
52	100
53	100
54	100
55	100
56	100
57	100
58	100
59	100
60	100
61	100
62	100
63	100
64	100
65	100
66	100
67	100
68	100
69	100
70	100
71	100
72	100
73	100
74	100
75	100
76	100
77	100
78	100
79	100
80	100
81	100
82	100
83	100
84	100
85	100
86	100
87	100
88	100
89	100
90	100
91	100
92	100
93	100
94	100
95	100
96	100
97	100
98	100
99	100
100	100

Experimental Area: H-J-A
Basin Location: Unit # 2

[illegible]

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam.

RI - NW
SOIL STABILIZATION
Watersheds

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Benchmark:
H.I.
Elev.

Experimental Area: H.J.A.
Basin Location: W.S. # 2

Date: 8-9-72
Party: Level MW
Rod RM
Notes MW

Station*	Transects (Designated in ft. starting at crest of dam)											
	15		16		17		18					
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00												
03				6.07		6.18						
06		6.06		6.16		5.89						
09		6.20		6.10		6.13						
12		5.96		6.07		5.83		5.66				
15		6.04		6.16								
18		6.39										
21		6.27										
24												
27												
30												
33												
36												
39												
42												
45												
48												
51												
54												
57												
60												
Permanent BM Start = 8.080												
" " End = 8.080												
Auxiliary BM Start = 5.225												
" " End Line # = 5.225												
END LINE # 2 - 5.225												
4 - 5.225												
6 - 5.225												
8 - 5.225												
10 - 5.225												
12 - 5.225												
Center of Spillway - 5.92												
Total p/s = 211												
Total 36.92 24.49 24.02 5.66												
Average												

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam.

Benchmark:

H.I.
Elev.

Experimental Area: HJA
Basin Location: 11.5 #3

Date: 8-19-71
Party: Leveling
Rod M. Leung
Notes Felner

Station*	Transects (Designated in ft. starting at crest of dam)									
	1 B		1 A		1		2		3	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00										
02.5					10.86		11.61		11.59	
04					11.36		11.62		12.26	
06					11.90		12.12		12.44	
08					11.90		12.11		12.35	
10					11.89		12.26		12.19	
12					11.92		12.20		12.26	
14					11.68		11.97		12.11	
16					11.73		11.92		11.90	
18					11.65		11.73		11.86	
20					11.30		11.15		11.75	
22					11.01		10.95		11.50	
24					10.66		11.01		11.30	
26					10.28		10.64		10.92	
28					10.00		10.32		10.55	
30					9.72		9.96		10.21	
32					9.37		9.65		9.81	
34					8.73		9.22		9.43	
36					8.65		8.68		8.98	
38					8.10		8.24		8.47	
40			7.62		7.76		7.83		7.85	
42	6.86		7.10		7.32		7.43		7.31	
44	6.52		6.70		6.96		6.89		7.01	
46	6.25		6.45		6.57		6.64		6.51	
48	6.11		6.16		6.19		6.38		6.00	
	5.87		5.69		5.53		6.04		* EDGE OF DAM	

Bench Mark on Dam start = 6.624
End = 6.630

Start Survey at Line 12

Bench Mark Reading End Line

" " 5 6.630
" " 3 6.629
" " 1 6.630

Total No. Points = 3
Total Rod Reading = 34.96
Average Rod Reading = 11.65

Total No. Points = 199
Total Rod Reading = 2149.99
Average Rod Reading = 10.804

No. of Pts.	(4)	(5)	(24)	(24)	(24)	(24)	(19)
Total	25.74	34.03	237.51	242.53	246.56	247.11	213.26
Average							

*Numbered to right starting with 0 at borderline which extends upstream from left end of dam

Benchmark:

H.I.
Elev.

Experimental Area: HJA
Basin Location: 1415 #3

Date: _____
Party: Level _____
Rod _____
Notes _____

Transects (Designated in ft. starting at crest of dam)														
Station*	6		7		8		9		10		11		12	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
02.5		12.26		12.29		12.26		12.11		11.93		11.55		11.40
04		12.63		12.46		12.33		12.63		11.19		11.68		11.64
06		12.54		12.67		12.79		12.45		12.36		11.91		11.92
08		12.45		12.65		12.63		12.56		12.37		11.98		12.08
10		12.48		12.63		12.47		12.54		12.52		12.14		
12		12.39		12.55		12.48		12.55		12.42		12.24		
14		12.28		12.45		12.37		12.35		12.25		11.88		
16		12.22		12.34		12.30		12.19		12.24		11.81		
18		12.09		12.17		12.29		12.30		12.00		11.52		
20		12.11		12.13		11.91		12.23		11.85				
22		11.69		11.86		11.90		11.92						
24		11.47		11.69		11.71		11.43						
26		11.45		11.26		11.16								
28		10.72		10.94										
30		10.61		10.20										
32		9.94												
34														
36														
38														
40														
42														
44														
46														
48														
Rod on BM start of line 12 6.624														
" End " 11 6.630														
" " 9 6.630														
" " 7 6.630														
" " 5 6.630														
Line #12 Line of Sight 99.983 + 6.624 = 106.607														
All Rest Line of Sight 99.983 + 6.630 = 106.613														