

REPORT OF 1963 SURVEY OF SEDIMENT BASINS
AT STREAM GAUGE SITE 1, 2 AND 3 ON THE
H. J. ANDREWS EXPERIMENTAL FOREST

By Alfred Levno

Sediment basins below stream gauging stations 1, 2, and 3 were measured for the eighth consecutive year on August 13, 14 and 16 (Table 1). A continuation of treatment on Watershed 3 began this year as a follow up to road construction completed 3 years previous. Three units, totaling approximately 65 acres were logged this past year by the high-lead system. About 30% of Watershed 1 has also been logged during this past year. Watershed 1 will be completely cut over and logged by the Wyssen Skyline System. Control Watershed 2 remains undisturbed.

MEASUREMENTS:

The technique used to measure the bottom elevation of the basins was the same as that used in 1961 and 1962. A check with the U. S. Geological Survey Benchmark showed that the elevation of the Watershed 3 reference spike was equal to elevations measured in previous years.

CALCULATIONS:

Sediment accumulation was determined by the procedure outlined in 1959 by Sturgus.

DISCUSSION:

In October 1962, Watershed 2 pond was cleaned and then remeasured. The new area was computed to be 1831 square feet. Addition of new measuring points on the flood plain above the

pond increased the number of elevation points from 223 to 247.

We were particularly interested in determining whether or not we were receiving a significant change in the accumulation of sediment due to the high-lead logging operation, and relating any change to the specific operations of this system. By comparing the sediment ratios of Watershed 3 over Watershed 2 (Table 2) for the 3 pretreatment years we find the upper 95% confidence limit to be 1.14. A ratio in excess of this value can be considered a significant change. For 3 of the 4 post-treatment years sediment accumulation was significantly greater. A marked increase is noted after the first year of road construction but no significant change the second year (1961). A major slide in Watershed 3 during 1962 accounted for the largest sediment increase yet measured. Accumulation of sediment this past year (1963) is probably due to three contributing factors: (1) erosion still occurring from the three year old roads, (2) sediment from the one year old slide, and increased sediment from the newly logged units.

SEDIMENT ACCUMULATION 1962-63

Year	Number of Points	Line of Sight	Average Rod Reading	Average Bottom Elev.	Change of Bottom Elev.	Basin Area in Sq. ft.	Total Accum. in Sq. ft.	Average Accum. cu.ft./ Acre
<u>WATERSHED 1 237 ACRES</u>								
1962	237	113.120	6.981	106.139				
1963	182 55	112.485 112.681	6.739 -5.183	105.746 107.498				
<u>WATERSHED 2 149 ACRES</u>								
1962	247	107.870	6.761	101.109				
1963	21 74 12 140	107.920 107.931 107.921 107.927	6.111 6.857 7.784 6.721	101.070 101.820 100.128 101.206				
<u>WATERSHED 3 250 ACRES</u>								
1962	169	89.610	8.876	89.734				
1963	1969	98.535	8.605	89.921	.195	1647	321.165	1.285

Table 2

SEDIMENT ACCUMULATION SUMMARY SHEET

	Year	Bedload Volume Increase cu. ft./ acre			Ratio 3/2
		Water- shed 2	Water- shed 3	Water- shed 1	
Before Treatment Years	1957	2.56	1.52	2.30	.59
	1958	3.52	2.28	1.40	.65
	1959	.61	.26	-.16	.43
After Treatment					
First year after road construction	1960	.23	.42	.08	1.83*
Second year after road construction	1961	1.82	1.63	.21	.90
Year of slide	1962	.61	10.84	1.23	17.77*
First year after logging	1963	.69	1.28	.13	1.86*

* Significant at 95% level

RI - NW
SOIL STABILIZATION
Watersheds

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Date: 8-14-63
Party: Level Levono
Rod Fredriksen
Notes Levono

Benchmark:
H.I.
Elev.

Experimental Area: H.J. Andrews
Basin Location: #1

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.
1.00													
.03													
.06	2.56 W.E	2.76	3.13	2.98	3.00	2.99	2.96						
.09	4.45 W.E. 8.50	5.10 W.E. 8.0	5.26	5.14 W.E. 8.5	5.30 W.E. 8.25	4.74 W.E. 8.5	4.81 W.E. 8.5						
1.2	5.75 W.E. 1.75	6.58	7.27	7.37	7.00	6.96	6.63						
1.5	5.96 W.E. 2.00	7.81	9.86	8.56	8.81	8.58	8.28						
1.8	6.12 W.E. 2.00	7.74	9.30	9.80	9.65	9.32	9.17						
2.1	6.09 W.E. 1.75	7.98	9.50	9.32	9.09	8.94	9.63						
2.4	5.26 W.E. 2.25	8.05	9.18	8.73	8.06	8.12	7.86						
2.7	5.30 W.E. 1.75	7.69	8.51	8.17	7.90	7.82	7.55						
3.0	4.86 W.E. 1.0	7.26	8.08	7.93	7.84	7.80	7.51						
3.3		6.48 W.E. 2.75	7.61	7.54	7.80	7.69	7.49						
3.6		5.71 W.E. 1.5	6.94	7.25	7.69	8.05	7.71						
3.9		5.04 W.E. 1.00	6.57	6.97	7.75	8.28	8.05						
4.2	(7)	4.74 W.E. 1.5	6.29	6.78	7.13	7.86	8.13						
4.5	38.37	4.64 W.E. 0.0	5.50	6.49	7.25	7.53	7.68						
4.8		4.02 under log	4.72 rock	5.98	6.59	7.00	6.92						
5.1		3.08 W.E. 0.00	5.29	5.48	5.78	6.51	6.74						
5.4			5.37	5.34	5.48	5.95	6.39						
5.7			3.72 W.E. 0.0	4.91	5.11	5.76	6.01						
6.0	(10)	2.92	4.22	4.50 W.E. 1.0	5.39	5.81							
6.3		70.40	9.08	3.95 W.E. 0.0	5.24	5.64							
6.6			3.70	3.25 W.E. -2.5	5.05	5.51							
6.9		(16)	3.68	3.37 W.E. -1.0	4.80	5.25							
7.2		115.25		3.29	4.15	4.11 W.E. 73 1/2							
7.5				3.56	3.52	3.76							
		(19)											
		129.97											
			(22)										
			143.59										
				151.54									
					(22)								

Rod on BM. 12.681 oK

" " 12.485 beginning line 10

" " 12.485 ending line 7

Auxiliary point spike on stump N of creek

Spike Assumed Elevation = 100

line of sight = 112.681 for line 14 to 10

line of sight 112.485 for line 7 to 10

Total
Average

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

RI - NW
SOIL STABILIZATION
Watersheds X 11
Benchmark: 74
H.I.
Elev.

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Date: 8-14-63, 8-16-63
Party: Level Grund
Rod Fzcdrlkscz
Notes Grund

Experimental Area: H.J. Andrews
Basin Location: #1

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.
0.0													
0.3													
0.6	7.90												
0.9	3.80	WE. 9.75	3.98	2.93	3.93								
1.2	6.13		5.35	4.50	WE. 11.75	3.93	2.78						
1.5	7.67		7.06 WE.	6.41	5.79 WE. 13.5	4.18 WE. 16.0							
1.8	8.69		8.55	8.02	7.32	5.69 WE. 1.0							
2.1	8.69		9.01	9.11	7.65	5.47							
2.4	7.91		8.40	8.84	7.28	5.35 WE. 0.0							
2.7	7.43		7.69	8.24	7.22	5.22 WE. 0.0							
3.0	7.32		7.18	7.51	6.87	3.66 dry land							
3.3	7.18		7.05	6.96	6.18	3.76							
3.6	7.54		7.30	6.82	6.38	4.09	3.74						
3.9	7.87		7.51	6.84	6.28	4.41 WE. 0.0	4.96 WE. 38.0	5.05					
4.2	7.99		7.63	6.39	6.05	5.37	5.25						
4.5	7.55		7.25	6.21	5.57	5.26	5.25						
4.8	7.05		6.43	5.80	5.36	5.38	5.05						
5.1	6.66		5.97	5.48	5.44	5.36	4.74	4.49 WE. 5.1					
5.4	6.32		5.97	5.56	5.63	5.17	4.71						
5.7	6.05		5.80	5.47	5.52	5.05	4.53 WE. 5.2	3.70					
6.0	5.91		5.64	5.55	5.05	4.62	4.15						
6.3	5.76		5.65	5.54	5.26	4.40 WE. 1.2	3.43						
6.6	5.66		5.70	5.12	4.73	4.45	3.34						
6.9	5.48		5.13	4.66	4.22 WE. 0.0								
7.2	4.47	WE. 73.5	4.58	11.74 WE. 72	2.96								
7.5	3.17		3.46	3.62			(9)						
							42.07						
								(9)					
								41.51					
(22)	(21)	(21)	(21)	(19)	(18)								
119.07	140.85	133.28	114.79	86.89									

Total: 1511.56 # points: 237 Avg. Rod reading: 6.378

Line 7 to 11 Total: 1,226.50 # points: 182 Avg. Rod reading: 6.739
Line 11 to 14 Total: 285.06 " point: 55 Avg. Rod reading: 5.183

Rod on RM = 12.485, 8/16/63 Line 10 to 7

Total
Average

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

RI - NW
SOIL STABILIZATION
Watersheds

Benchmark:
H.I.
Elev.

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Experimental Area: H.J. Andrews
Basin Location: #2

Date: 8-13-63
Party: Level Fredrikson
Rod Luna
Notes Fredrikson

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.
00													
03		3.77		4.29		4.68		5.29		5.55		5.10	
06		4.86	WE 7.25	5.79	WE 6.70	6.50	WE 4.0	6.55	WE 3.25	6.55	WE 3.25	6.24 WE	
09		5.77	WE 1.50	7.00		7.57		7.55		7.50		7.72	
12		5.85	WE 1.00	7.54		8.02		8.03		8.02		7.97	
15		6.05	WE .25	7.84		8.06		7.93		8.02		8.04	
18		6.33	WE 1.00	7.69		7.80		8.13		8.06		8.10	
21		7.33	WE 2.75	7.70		7.83		8.10		8.00		8.09	
24		7.43	WE 3.25	7.53		8.03		9.02		7.93		7.98	
27	6.14	WE 7.5	7.60	7.61		8.00		7.97		7.91		8.02	
30	6.33	WE 1.0	7.80	7.74		7.96		7.94		7.92		7.92	
33	5.65	WR 0.0	7.75	7.75		7.86		7.83		7.73		7.92	
36		7.65	WE 2.5	7.58		7.78		7.91		7.80		7.81	End
39		6.82	WE 2.0	7.31		6.67		6.94		7.68		7.60	7.92
42		6.70	WE 1.75	6.33		5.77		6.66		7.77		7.27	
45	(3)	5.51	WE 4.7	5.76	WE 4.62	5.59	WE 4.75	5.61	WE 4.75	6.46	WE 4.75	6.44	WE 4.75
48	1812	4.39		5.23		5.34		5.14		5.41		5.33	
51		4.99		5.14		5.14		5.01		4.85		4.78	
54		4.75		5.21		4.91		4.96		4.85		4.21	
57		2.12		4.73		4.90		4.76		4.61		4.12	
60													
	(18)												
	110.21	(18)		(18)		(19)		(19)		(18)		(18)	
		121.48		123.61		130.15		132.15		125.57			

Total line 1+2 = 128.33, # points: 21, Avg. rod reading: 6.111
 Total line 3+07 = 507.39, # points: 74, Avg. rod reading: 6.857
 Total line 7#03 to #42 = 93.41, # points: 12, Avg. rod reading: 7.784
 Total line 7#42 to End = 940.95, # points: 140, Avg. rod reading: 6.721

Total 1610.09 ft, Total 247.0 K

Assumed spike Elv. 100.000

Rod on BM beginning 7.920 Line of sight line 1+2 = 107.920;

" " after line 2# 7.931

" " after line 6 7.921 Line of sight line 3+07 107.931

" #03-29 Line of sight line 7#03 to #42 = 107.921

" " ending 7.927 Line of sight line 7#42 to End = 107.927

Diff = 7.927

Total

Average

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

RI - NW
SOIL STABILIZATION
Watersheds

Benchmark:
H.I.
Elev.

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Date: 8-13-63
Party: Level Foothills
Rod Long
Notes Foothills

Experimental Area: H.T. Andrews
Basin Location: #2

Station*	Transects (Designated in ft. starting at crest of dam)												
	8		0		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	4.59		4.90		4.56		4.91		3.81		3.88		4.04
06	6.08	WF4.50	6.55	WF4.25	6.45	WF4.50	6.77	WF5.00	6.07	WF5.00	5.22	WF7.00	4.66 WF6.75
09	7.66		7.76		7.29		7.56		6.74		5.80		6.27
12	8.06		8.00		7.83		7.92		7.65		6.91		6.41
15	8.10		8.04		8.02		7.99		7.78		7.18		6.88
18	8.11		8.07		8.06		7.94		7.79		7.46		7.17
21	8.07		7.99		8.13		7.97		7.86		7.55		7.01
24	8.05		7.97		8.03		7.94		7.95		7.74		6.91
27	8.00		8.00		8.03		7.94		7.87		7.55		7.00
30	7.94		8.05		8.06		7.95		7.91		7.41		6.63
33	8.01		7.80		7.95		7.83		7.79		7.08		6.48
36	7.92		7.76		7.98		7.64		7.51		6.76		6.08 WF2.96
39	7.57		7.19		7.55		7.29		6.95		6.15		4.79
42	7.16		6.90		7.04		6.75		6.24		5.91		
45	6.49		6.16		6.29		5.84		5.19	WF11.75	4.30	WF13.50	
48	5.63	WF4.80	5.56	WF4.75	5.72	WF4.25	5.42	WF4.75	4.91		3.89		
51	5.08		5.06		5.12		5.07		3.69				
54	4.85		4.89		4.91		4.23						
57	4.47		4.90		4.36		3.79						
60													
(18)		(18)		(18)		(18)		(14)		(13)		(10)	
127.24		126.65		126.80		122.85		101.55		87.80		66.83	
Total													
Average													

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

RI - NW
SOIL STABILIZATION

ELEVATIONS OF SEDIMENT ACCUMULATED IN CATCHMENT BASINS

FORM RI-2

Date: 8-13-63
Party: Level Fredrikson
Rod Luno.
Notes Fredrikson

Benchmark:
H. I.
Elev.

Experimental Area: H.J. Andrews
Basin Location: #?

Station*	Transects (Designated in ft. starting at crest of dam)											
	15		16		17		18		19		20	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
60					6.09							
03	4.97	WE 5.25	5.76	WE 4.75	6.10	WE 2.50						
6	5.99		5.90		6.29	WE 2.00						
9	6.42		6.20		6.14	WE 1.25						
12	6.56		6.38		6.01	WE 1.50	5.66					
15	6.51		6.03		5.85	WE 1.00						
18	6.52		6.16		5.20	WE 16.00						
21	6.53		5.95		4.41							
24	6.20		5.44	WB 23.0	4.24							
27	6.22		1.11									
30	5.95	WE 21.0	4.33									
33	4.19											
	(10)	(8)	(6)		(1)							
	11.19	44.50	35.78		5.61							

07 513117001 5.74

Total = 1,670.09 ± point = 247 Ave rod reading = 6.761

Total
Avera

*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
After pond cleaned
Date: 10-2-62
Party: Level Elevation
Rod Spindle
Notes Elevation

Benchmarks:
H.I. +
Elev.

Experimental Area: H.T. Andrews
Basin Location: W.S. #2

Station*	Transects (Designated in ft. starting at crest of dam)													
	Line 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.	H.I.
00														
03			3.81		4.01		4.64		5.31		5.67		6.03	
06			4.87	WE 7.62	5.60	WE 5.9	6.30	WE 1.0	6.46	WE 3.5	6.48	WE 8.1	6.21	WE 4.0
09			6.72	WE 0.84	6.89		7.18		7.30		7.45		7.62	
12			5.38	WE -0.5	7.50		8.05		8.09		8.06		7.94	
15			5.72	WE +0.6	7.85		8.13		8.08		8.10		8.09	
18			6.46	WE +1.0	7.77		8.02		8.17		8.13		8.15	
21			7.17	WE +7.4	7.96		8.05		8.07		8.06		8.04	
24			7.23	WE +2.8	8.04		8.01		8.03		7.95		7.98	
27	5.75	WE 10.9	7.91		8.11		7.92		7.96		7.91		8.02	
30	6.13	WE +1.0	7.88		8.08		7.95		7.96		7.91		7.99	
33	6.46	WE +1.1	7.66		8.04		7.82		7.84		7.72		7.99	
36			7.13	WE +2.6	7.52		7.79		7.93		7.81		7.75	
39			6.75	WE +2.2	7.57		6.85		6.85		7.64		7.57	
42			6.08	WE +1.6	6.28		5.68		6.71		7.14		7.70	
45			5.43	WE 4.60	6.06	WE 4.56	5.19	WE 1.4	5.84	WE 16.0	6.44	WE 17.5	6.71	
48			4.17		5.23		5.60		5.71		5.54		5.60	WE 8.1
51			5.05		5.00		5.18		5.26		4.25		4.83	
54			5.67		5.08		4.84		4.96		3.92		4.15	
57			3.41		4.69		4.25		4.75		4.66		4.04	
60														
(3)		(19)		(19)		(19)		(19)		(19)		(19)		(19)
18.34		113.89		127.71		128.73		131.02		131.09		130.70		
(3)		(18)		(18)		(18)		(19)		(19)		(18)		
18.12		110.08		123.27		124.09		131.02		132.15		125.83		

Slit Rod on BM - 7.87

0.0 on BM End - 7.87

+ WE ME AND BM is LINE IS ROLL DIAL

- WE " " " " " " BM

Total

Average

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

RI - NW
SOIL STABILIZATION
Watersheds
Benchmark:
H.I.
Elev.

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Experimental Area: H.J. Andrews
Basin Location: 10547

Date: 10-2-62
Party: Level Fredrikson
Rod SPOELSTRA
Notes Fredrikson

Station*	Transects (Designated in ft. starting at crest of dam)												
	1 INF 3		9		10		11		12		13		
H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00													
03	4.52	WE 4.8	4.82	WE 4.8	4.65	WE 4.7	4.81	WE 4.6	3.76	WE 6.3	3.86	WE 6.7	4.02
06	6.00		6.43		6.53		6.19		6.02		5.16		4.79
09	7.69		7.70		7.11		7.59		6.86		5.63		6.19
12	8.16		8.02		7.70		7.88		7.43		6.74		6.40
15	8.13		8.07		8.05		7.96		7.65		7.05		6.71
18	8.08		8.08		8.02		7.89		7.88		7.35		7.13
21	7.98		8.03		8.07		7.84		7.76		7.48		6.94
24	7.99		7.98		8.06		7.87		7.91		7.71		6.85
27	7.99		8.02		7.94		7.90		7.95		7.52		6.93
30	7.96		8.04		7.96		7.96		7.94		7.43		6.56
33	7.99		7.86		7.93		7.91		7.80		7.13		6.48
36	7.97		7.90		7.82		7.63		7.49		6.75		6.16
39	7.53		7.19		7.57		7.25		6.98		6.11		4.33
42	7.22		6.93		7.07		7.71		6.11		5.86		
45	6.45		6.28		6.35		5.76		5.29	WE 4.9	4.30		
48	5.70	WE 4.84	5.53	WE 4.85	5.82	WE 4.85	5.40	WE 4.6	4.85		3.83		
51	5.01		5.12		5.09		5.06		3.63		↑		
54	4.96		5.01		4.79		4.28		↗				
57	4.37		4.42		4.06		3.20			↗	mbnhd		
60													
	(19)	(19)	(19)	(19)	(19)	(19)	(19)	(17)	(16)	(16)	(13)		
Total	131.63	131.44	130.59	128.09	113.41	99.91	80.39						
Average	(08)	(18)	(18)	(18)	(14)	(13)	(10)						
	122.11	126.82	125.94	123.98	101.17	87.06	67.35						

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

Date: 10-2-62
Party: Level Fredrikse
Rod Josephine
Notes: Fredrikse

Benchmark 2

H. I.
Elev.

Experimental Area: H.T. Andrews
Basin Location: 115#2

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

RL - NW
SOIL STABILIZATION
Watersheds

ELEVATIONS OF SEDIMENT ACCUMULATED
IN CATCHMENT BASINS

FORM RI-2

Benchmark:
H.I.
Elev.

Experimental Area: H.J. Andrews
Basin Location: #3

Date: 8-14-63
Party: Level Leveno
Rod Fredrickson
Notes Leveno

Station*	Transects (Designated in ft. starting at crest of dam)											
	8		9		10		11		12		13	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00												
03	8.57		9.69	3.2598	10.00	4.5	on dam		9.45	4-5	on dam	
06	8.83		8.99		9.60		10.07		9.62		9.01	
09	8.92		9.04		9.23		9.24		9.20		9.05	
12	9.11		9.21		9.11		9.27		9.23		9.10	
15	9.26		9.20		9.28		9.29		9.25		9.02	
18	9.34		9.15		9.13		9.19		9.24		9.06	
21	9.26		8.95		8.92		9.19		9.09		8.51	
24	9.13		8.91		9.11		9.04		8.72		7.93	
27	9.00		9.10		9.25		8.90		7.98		7.39	W.F. 280
30	8.83		9.17		8.74		8.12		7.57			
33	X.20		8.59		7.00	on log	7.84		7.06			W.F. 3875
36	7.94	W.F. 37.5	7.40	W.E. 32.5	7.30		7.76		7.07			
39					W.F. 39.0		7.09	W.F. 39.0				
42					W.F. 42.5		7.07					
45					7.07		6.89					
48					6.67	W.						
(11)			(11)		(14)		(14)		(12)		(8)	
99.14			100.00		120.41		118.96		103.48		69.25	
SP. 11 way =			7.05									
			7.05									
			7.07									
			7.04									
			7.03									
Total:	1,454.18	# points:	169	Ave. red reading:	8.605							
Total												
Average												

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