

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 ^ucutover 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. <i>cu.</i>	Average Accum. cu.ft./Acre
<u>WATERSHED 1 237 ACRES</u>								
1962	237	113.120	6.981	106.139				
1963	182	112.485	6.739	105.746				
	55	112.681	5.183	107.498				
			Wt. Ave.	106.153	.014	2133	29.9	.1260
<u>WATERSHED 2 149 ACRES</u>								
1962	247	107.870	6.761	101.109				
1963	21	107.920	6.111	101.070				
	74	107.931	6.857	101.820				
	12	107.921	7.784	100.128				
	140	107.927	6.721	101.206				
			Wt. Ave.	101.165	.056	1831	102.536	.688
<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 Leuno
Rod Fredrikson
Notes Leuno

Benchmark:

H. I.

Elev.

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

[illegible]

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

H.I.
Elev.

ELEVATIONS OF SEDIMENT ACCUMULATED IN CATCHMENT BASINS

FORM RI-2

Date: 8-14-63, 8-16-63

Party: Level *Leuno*

Rod *Fredrickson*

Notes *found*

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

[illegible]

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

Benchmark:

H.I.
Elev.

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

Date: 8-13-63
Party: Level Fredrickson
Rod Leino
Notes Fredrickson

[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.T. Andrews

Basin Location: #2

Date: 8-13-63

Party: Level Frederick

Rod Lev. 2

Notes Frederick

Transects (Designated in ft. starting at crest of dam)														
Station*	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	4.59		4.90		4.56		4.91		3.81		3.88		4.04	
06	6.08	WE4.50	6.55	WE4.25	6.45	WE4.5	6.27	WE5.00	6.02	WE5.00	5.22	WE7.00	4.64	WE6.25
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		8.00		7.95		7.91		7.41		6.62	
33	8.01		7.80		7.85		7.83		7.79		7.08		6.48	
36	7.92		7.76		7.88		7.64		7.51		6.76		6.08	WE3.40
39	7.57		7.19		7.55		7.29		6.95		6.15		4.99	
42	7.16		6.90		7.04		6.75		6.24		5.91			
45	6.48		6.26		6.39		5.84		5.10	WE4.25	4.30	WE4.50		
48	5.63	WE4.80	5.56	WE4.25	5.72	WE4.25	5.46	WE4.50	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		4.80		4.36		3.29							
60														
	(18)		(18)		(18)		(18)		(14)		(13)		(10)	
	127.24		126.65		126.80		122.85		101.55		97.80		116.83	
Total														
Average														

*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. Andrews

Basin Location: #1

Date: 8-13-63
Party: Level Fredrickson
Rod Lump
Notes Fredrickson

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.
00					6.09					
03	4.90	WE 5.25	5.75	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		5.41	WE 2.20	4.24					
27	6.22		4.11							
30	5.95	WE 21.0	4.33							
33	4.29									
	(10)		(9)		(6)		(1)			
	11.19		46.50		35.78		5.61			

on spillway 5.74

Total = 1,670.09 # point = 247 Avg. rod reading = 6.761

Total

Average

*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

Date: 10-2-62
Party: Level
Rod Spool
Notes After pond cleaned

Benchmark:

H.I.
Elev.

Experimental Area: H.T. Andrews
Basin Location: US #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.
00														
03			3.81		4.01		4.04		5.31		5.67		4.03	
06			4.80	WE 7.64	5.60	WE 5.9	6.39	WE 4.0	6.46	WE 3.5	6.48	WE 8.1	6.21	WE 4.0
09			6.72	WE 0.84	6.89		7.48		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			6.45	WE +1.0	7.77		8.02		8.17		8.13		8.15	
21			7.22	WE +2.4	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 +0.9	7.92		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		7.92		7.84		7.72		7.99	
36			7.13	WE +2.6	7.52		7.79		7.93		7.87		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		7.04		7.70	
45			5.13	WE +4.0	6.06	WE 4.58	5.49	WE 4.54	5.84	WE 16.0	6.44	WE 4.75	6.71	
48			4.17		5.23		5.60		5.26		5.54		5.60	WE 8.1
51			5.05		5.06		5.18		5.36		4.25		4.83	
54			5.07		5.08		4.84		4.06		3.92		4.15	
57			3.46		4.69		4.75		4.75		4.66		4.04	
60														

(3)

(19)

(19)

(19)

(19)

(19)

(19)

18.34

113.89

127.71

128.73

131.02

131.09

130.76

(3)

(18)

(18)

(18)

(19)

(19)

(18)

18.12

110.08

123.27

124.09

131.02

132.15

125.83

Shot Rod on BM - 7.87

Rel on BM Ending 7.87

+ WE MEANS 8.00 - LINE IS ONLY 7.87

- WE " " " " " " 7.87

Total

Average

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

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

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

Benchmarks:

H.I.

Elev.

Experimental Area: H.T. Andrews

Basin Location: 10542

Date: 10-2-62
Party: Level Ernst
Rod Spool
Notes: Ernst

Station*	Transects (Designated in ft. starting at crest of dam)											
	Line 15		16		17		18					
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00					6.04							
03	4.64		5.20		6.04	WE12.2						
06	6.06	WE11.9	5.80	WE5.0	6.23	WE12.0						
09	6.34		6.09		6.07	WE11.5						
12	6.51		6.76		5.92		5.63	WE10.7				
15	6.44		5.95	WE17.0	5.78	WE12.3						
18	6.50		6.11		5.38	WE10.7						
21	6.50		5.90		4.33							
24	6.13		5.37		4.18							
27	5.99		4.33	WE12.2								
30	5.85		4.25									
33	4.27	WE32.4	↑									
36	↑											
39												
42												
45												
48												
51												
54												

ON TRAIL ON Spilling = 5.68

* pond surface not determined was

(11) (10) (8) (1)

65.23 55.26 42.93 5.63

(10) (8) (6) (1)
60.59 45.81 35.42 5.63

$$\text{Av. Rd. Elev.} = \frac{\sum \text{rod elevs}}{\# \text{ rods}} = \frac{1767.05}{269} = 6.569 \quad \# 2 \quad \frac{1670.74}{247} = 6.761$$

$$\text{Av. bottom elev.} = \text{Line of sight} - \text{Av. rd. elev.} = 07.87 - 6.57 =$$

Total

Average

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

Benchmarks:
H.I.
Elev.

ELEVATIONS OF SEDIMENT ACCUMULATED IN CATCHMENT BASINS

FORM RI-2

Date: 8-14-63
Party: Level Leino
Rod Andriksa
Notes Leino

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

[illegible]

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

Benchmark:
H.I.
Elev.

FORM RI-2

Date: 8-14-63
Party: Level Levno
Rod Frederickson
Notes Levno

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

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