REPORT OF 1960 SURVEY OF SEDIMENT BASINS AT STREAM GAGE SITES 1, 2, AND 3 ON H. J. ANDREWS EXPERIMENTAL FOREST

by

Loyd Barnett, Jr.

The sediment basins below the stream gages of watersheds 1, 2, and 3 were remeasured on August 9-10, 1960. This marked the first year of measurement after watershed disturbance. Access roads were constructed on watershed 3 in 1959.

Measurement

The measuring technique used was that set up by Graber in 1956. The bottom elevation was determined at three foot intervals along lines spaced three feet apart and perpendicular to the control lines. Measurement was accomplished by means of level and rod. As in previous measurements, 7" x 10" flexible metal base was used with the rod to reduce its tendency to sink in the soft mud.

Permanent stakes marked with aluminum tags and painted yellow were established along primary and secondary control lines of watersheds 1 and 2 in 1959. On watershed 3, stakes were driven along the secondary control line and nails driven into the dam along the primary control line. Consequently there was no difficulty experienced in locating the permanent lines as described in the 1957 and 1958 reports. Two lines which were not staked were measured by offsetting from adjacent lines. As in all earlier measurements, the elevation at each site was taken from the head of a railroad spike driven into a hemlock and assumed 100.00 elevation. A check with a U.S. Geological Survey benchmark at watershed 3 showed no change in elevation from 1959.

Calculations

The altered procedure for calculating sediment accumulations as outlined by Sturges in 1959 was followed. With this method the same points are used in the calculations each year regardless of whether they are above or below the water level in any one particular year. The area of the basin is also assumed to remain constant.

The average rod reading was calculated and subtracted from line of sight to determine average bottom elevation. The difference between average bottom elevation of 1960 and 1959 was multiplied by pond area to obtain sediment accumulation.

Results and Comments

Point 48 on line 11 of watershed 3 was missed in 1960. Deleting this point, the 1959 average bottom elevation was recomputed and used as a basis for 1960 accumulation.

Approximately 1.7 miles of access logging roads were constructed on watershed 3 during the summer of 1959, disturbing 6% of the area. In 1960, the first year of measurement after road construction, watershed 3 showed a sediment accumulation of 0.42 cu. ft. per acre, approximately 30% of its average over 3 years of undisturbed condition. At the same time, watersheds 1 and 2 showed sediment accumulations of 0.08 and 0.23 cu. ft./acre respectively or approximately 7% and 10% of their 3 year averages.

Sediment Accumulation 1959-1960

Year	No. Points	Line of Sight	Av. Rod Reading	Av. Bottom Elev.	Change	Basin area in sq. ft.	Total accum. cu. ft.	Av. accum ft³/acre	Av. annual accum. ft³/acre
Watershed #1 237 acres									
1959	237	113.170	7.201	105.969					
					+.009	2133	19.197	0.08	0.90
1960	76	113.200	6.121	107.079					
	161	112.850	7.432	105.458					
wt. Av.	237			105.978					
Watershed # 2 149 acres									
1959	224	106.920	5.473	101.447					
					+0.017	2016	34.272	0.23	1.73
1960	224	106.780	5.316	101.464					
Watershed # 3 250 acres									
1959	169	98.680	9.377	89.303					
	168	98.680	9.392	89.288					
			8.849	~~89.831~~	~~0.063~~ ~~+0.788~~	1647	103.761	.42	1.35 3/
1960	168	98.200	~~8.124~~	~~90.076~~					

3/ Av WS #3 - [illegible] Period 1957-59

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

ELEVATIONS OF SEDIMENT ACCUMULATED IN CATCHMENT BASINS

FORM RI-2

Date:
Party Level
Rod
Notes

Experimental Area: H.J.A.
Basin Location: Watershed #1

Station*	Transects (Designated in ft. starting at crest of dam)													
	Line 1		Line 2		Line 3		Line 4		Line 5		Line 6		Line 7	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00		from #2												
03	←									8/10/60				
06	3.03		3.45		3.42		3.44		3.47		3.36		3.43	
09	4.74	8.6	5.52	WE 8.3	5.83	WE 7.8	5.73	WE 8.1	5.52	WE 8.1	5.12	WE 8.2	5.14	WE 8.5
12	6.18	5.9	7.20		7.63		7.74		7.37		7.45		7.11	
15	6.74	5.2	8.69		9.12		9.13		9.12		8.93		8.70	
18	6.50	5.1	8.65		10.15		10.55		10.39		9.90		9.86	
21	7.04	6.0	8.69		10.16		10.17		9.86		9.77		9.75	
24	6.96	5.9	8.71		9.65		9.44		8.91		8.78		8.75	
27	6.57	7.8	7.97		8.95		8.71		8.59		8.42		8.13	
30	6.22	5.9	7.64		8.50		8.41		8.38		8.20		7.91	
33		8.2	7.44		8.16		8.07		8.28		8.35		8.03	
36		1.2	6.60		7.73		7.85		8.38		8.65		8.43	
39		1.6	6.31		7.23		7.37		8.39		8.76		8.76	
42		1.6	5.60		7.10		6.96		7.91		8.49		8.61	
45		1.0	5.25		6.47		6.93		7.63		8.21		8.29	
48		2.0	4.95		5.11		6.98		7.43		7.79		7.91	
51		0.9	4.79		5.94		6.50		6.85		7.45		7.38	
54		0.7	4.81	WE 5.46	6.02		6.42		6.41		6.89		7.14	
57					4.60	WE 5.73	5.39		6.02		6.54		6.94	
60					3.34		4.97		5.27		6.15		6.33	
63							4.45		4.74		5.95		6.24	
66							3.93		4.52	67.1	5.81		6.05	
69							3.69		4.03		5.41	WE 7.7	5.82	
72									4.07		4.56		4.84	WE 7[illegible]
75									3.86				3.93	
			[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		22	
Total	[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
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: 8/9/60
Party: Level ______
Rod ______
Notes ______

Experimental Area: [illegible] Hathaws
Basin Location: watershed #1

Station*	Line 8 H.I.	Line 8 Elev.	Line 9 H.I.	Line 9 Elev.	Line 10 H.I.	Line 10 Elev.	Line 11 H.I.	Line 11 Elev.	Line 12 H.I.	Line 12 Elev.	Line 13 H.I.	Line 13 Elev.	Line 14 H.I.	Line 14 Elev.
00														
03		8/10/60							8/9/60					
06	3.25		2.83		3.12									
09	4.77	WE 8.9	2.93		3.62	[illegible]	3.39							
12	6.54		6.06	WE 10.3	5.33		4.47	WE 12.5	3.27					
15	7.96		7.40		7.18		6.24		4.43					
18	9.41		9.15		8.88		7.97		6.12	WE 15.5				
21	9.68		9.77		9.93		8.38		5.84					
24	9.01		9.80		9.66		7.92		5.26					
27	8.24		9.25		9.26		7.92		5.21				3.71	
30	7.84		8.39		8.98		7.68		4.49	WE 29			4.31	
33	7.90		8.09		8.70		7.14		4.23				5.30	31.[illegible]
36	8.12		7.95		8.22		6.77		4.21		4.37	WE 37.5	5.47	
39	8.58		8.08		7.80		6.85		5.00	WE 38.3	5.33		5.49	
42	8.51		8.04		7.50		6.72		5.30		5.72		5.36	
45	8.22		7.61		7.02		5.89		5.72		5.64		5.26	
48	7.81		6.98		6.35		6.00		5.89		5.31		5.21	
51	7.11		6.47		6.53		6.34		5.87		5.27		5.19	
54	6.84		6.45		6.56		6.22		5.63		6.26		5.12	WE 5[illegible]
57	6.74		6.33		6.34		5.95		5.26		5.22		4.31	
60	6.44		6.30		6.38		5.61		5.26		5.06	WE 60.9	3.36	
63	6.36		6.33		6.19		5.51		5.28	64.5 WE	3.99		2.41	
66	6.24		6.13		5.67		5.47		4.15		2.31			
69	5.97		5.46		5.58		4.80	WE 69.3	3.28					
72	4.71	WE 72.5	5.02	WE 71.4	5.12	WE 73.6	3.48							
75	3.45		4.14		4.37									
Total	6												[illegible]	
Average														

22

8/9/60

Rod on BM 13.20 Check 13.20
Assumed Elev. 100
Inst. Sight 113.20

Rod on BM 12.89 check 12.89
100
112.89
8/10/60

*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: 8/10/60
Party: Level Barnett
Rod Wallum
Notes Barnett

Experimental Area: H. J. Andrews
Basin Location: Watershed "2"

Station*	Transects (Designated in ft. starting at crest of dam)													
	Line 1		Line 2		Line 3		Line 4		Line 5		Line 6		Line 7	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00												WE 2.5		
03			2.92		3.30	WE 5.4	4.28	WE 3.0	4.27	WE 3.3	4.66		4.40	WE 3.3
06			3.99	WE 6.8	4.58		5.90		5.32		5.84		5.34	
09			4.78	WE .4	5.69		6.09		6.08		6.07		5.76	
12			4.61	WE .2	5.76		6.18		6.16		6.11		6.07	
15			5.02	WE .8	5.84		5.75		5.48		5.82		5.90	
18		WE 20.1	5.06	WE 1.4	5.90		5.87		5.68		5.88		5.94	
21	4.54	WE .3	5.71		5.85		5.52		5.74		5.86		5.80	
24	5.23	WE .6	5.91		5.53		5.70		5.98		5.73		6.10	
27	5.40	WE .8	5.64		5.60		5.92		6.26		5.76		6.18	
30	5.76	WE 1.6	5.69		5.49		6.33		6.35		5.90		6.18	
33	6.51	WE 23.0	5.82		5.99		6.36		6.39		6.08		6.17	
36			6.06	WE 2.3	6.12		6.46		6.33		6.17		5.96	
39			6.02	WE 1.2	6.14		6.36		6.29		6.07		5.43	
42			5.82	WE 1.2	5.79	WE 43.3	5.29	WE 3.5	6.08		5.49	WE 4.1	4.84	WE 42.8
45			4.49	WE .4	4.22		4.18		4.69	WE 45.4	4.32		3.97	
48			4.17	WE .3	3.96		3.86		4.02		3.70		3.93	
51					4.09		3.36		3.70		3.50		3.68	
54					3.79		3.61		3.44		3.44		3.48	
57					3.54									
	(2)		(10)		(16)		(17)		(13)		(18)		(16)	

Rod on BM 6.78
Assumed Elev. 100.00
Line of sight 106.78
Check on BM 6.78

Total	10.63		56.24		86.04		92.23		98.25		96.40		87.31	
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: WS # 2

Date: 8/10/60
Party: Level Barnett
Rod Wallum
Notes Barnett

Station*	Transects (Designated in ft. starting at crest of dam)													
	Line 8		Line 9		Line 10		Line 11		Line 12		Line 13		Line 14	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00													yellow jacket	
03	3.64	WE 4.2	3.99	WE 3.9	3.93	WE 4.6	3.91	WE 4.3	3.02	WE 5.5	2.93		2.92	
06	5.6		5.53		4.99		5.20		4.70		4.09	WE 6.5	4.12	WE 6.4
09	5.90		6.08		5.88		5.70		5.24		5.26		5.31	
12	5.98		6.10		5.95		5.85		5.35		5.46		5.13	
15	5.84		5.83		5.89		5.70		5.61		5.50		5.66	
18	5.79		5.71		5.79		5.80		5.59		5.52		5.73	
21	5.84		6.02		5.82		5.79		5.57		5.53		5.94	
24	6.20		6.24		6.12		5.90		5.76		5.73		5.29	
27	6.17		6.20		6.18		5.81		5.62		5.63		5.93	
30	6.18		6.26		6.20		5.63		5.75		5.83		5.37	
33	6.18		6.24		6.13		5.52		5.84		5.57		5.27	
36	5.96		5.82		5.53		5.59		5.65		5.38		4.95	WE 3.8
39	5.30	WE 4.2	5.10	WE 4.2	5.15	WE 4.4	5.42		5.50		5.14		3.68	
42	4.24		4.06		4.45		4.62	WE 3.7	5.02		4.82	WE 3.8	3.11	
45	3.61		3.77		3.95		4.30		4.54	WE 4.52	3.21			
48	3.56		3.72		4.11		3.92		3.90		3.72	trail		
51	3.19		3.70		3.44		3.55		2.40					
54	3.52		3.52		3.44		3.19							
57														
	(16)		(15)		(16)		(15)		(14)		(13)		(12)	
	Line 5		Line 16		Line 17				Line 18					
					4.60	sa. flow								
00					4.93	WE W1.3								
03	3.18	WE 8.7	3.97	WE 4.1	4.90	WE W 6.3								
06	4.71		5.07		4.98	WE E .9								
09	5.10		5.31		4.81	WE E 2.0			3.97	WE 10.3				
12	5.41		5.28		4.59				4.58	WE 5				
15	5.35		4.96		4.77	WE 1.6			4.45	WE 15				
18	4.93		4.84		4.42	WE 17.8			3.12					
21	5.07		4.89		3.37									
24	5.06		3.80	WE 22.7	3.10	trail								
27	5.13		3.09	E. Str.										
30	4.86		3.05	trail										
33	3.82	WE 32.5												
36	3.28	trail												
	(11)		(8)		(9)				(7)					
	52.82		37.24		33.40				4.58					
Total	85.40		82.78		82.14		80.75		75.74		68.58		60.39	
Average	Total = 1194.87			23 pts			Ave row = 5.316							

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

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

ELEVATIONS OF SEDIMENT ACCUMULATED IN CATCHMENT BASINS

FORM RI-2

Date: 8/9/60
Party: Level Barnett
Rod Wellum
Notes Barnett

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

Station*	Transects (Designated in ft. starting at crest of dam)													
	Line 1		Line 2		Line 3		Line 4		Line 5		Line 6		Line 7	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
03	7.00	WE 0.5	8.94		9.94		10.29	03.7	10.36	03.9	10.14	04.2	9.95	04.9
06		WE 1.3	9.11		9.89		10.44		10.37		10.14		9.86	
09		WE 0.9	9.18		9.86		10.36		10.72		9.97		9.72	
12		WE 2.4	8.62		9.96		10.60		10.07		9.83		9.54	
15	WE 15.6	WE 3.8	8.53		10.17		9.40		9.76		9.49		9.19	
18		WE -1.6	~~8.59~~	WE 17.7	9.77		9.45		9.46		9.29		9.41	
21		WE -0.8		WE 20.2	9.40		9.32		9.35		9.51		9.59	
24	WE 23.7	WE 0.2	8.59		8.58		9.06		9.60		9.85		9.49	
27		WE 1.6	8.18		8.62		9.20		9.65		9.85		9.72	
30		WE 0.8	8.21		8.52		9.04		9.65		9.65		9.42	
33		WE 1.6	7.88		8.16		8.98		9.21		9.27		9.16	
[illegible]	7.01	WE 2.9	7.24		7.88		8.53		8.64		8.05		8.02	
[illegible]	7.16	WE 3.8	7.21		7.68		7.92		7.63		7.15		6.64	WE 32.0
[illegible]	7.38	WE 4.7	7.43		7.64		7.55		7.09			WE 41.6		
[illegible]	6.92		7.03		7.17		7.0[illegible]			WE 42.8				
48	5.87	WE 50.9	3.64	WE 47.6	6.60			WE 47.3						
51					4.00	WE 48.3								
	(4)		(13)		(16)		(15)		(14)		(13)		(13)	
Scale assumed 100					100.00									
F.S. Scale - Rod					2.17									
Line Sight					102.17									
B.S. Brass Plate					4.77									
Elev. Brass Plate					[illegible]40		- check with 1959							
F.S. Scale Rod					[illegible].55									
[illegible]					10[illegible].55									
F.S. T.P.					6.57									
T.P. Elev.					95.98				Spillway	-	6.66			
B.S. T.P.					2.22					-	6.63			
Line Sight					98.20					-	6.62			
Spillway					6.63					-	6.66			
					91.57					-	6.60			
Total	27.33		103.04		139.86		137.48		130.95		~~[illegible]~~ 3		119.71	
Average														

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

I - [illegible]
[illegible]OIL STABILIZATION
[illegible]atersheds

Benchmark:
H.I.
Elev.

ELEVATIONS OF SEDIMENT ACCUMULATED IN CATCHMENT BASINS

FORM [illegible]

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

Date: 9/19/60
Party: Level Barnett
Rod Wallus
Notes Barnett

Stations*	Transects (Designated in ft. starting at crest of dam)													
	Line 8		Line 9		Line 10		Line 11		Line 12		Line 13		Line 14	
	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.	H.I.	Elev.
00														
03	9.94	04.2	9.70	03.5	9.54	04.1	9.58	04.6	9.29	04.9	8.43	04.2	7.02	WE 0.9
06	9.68		9.58		9.44		9.45		9.28		9.20		7.78	WE 1.6
09	9.49		9.44		9.30		9.41		9.23		9.42		7.64	WE 2.4
12	9.26		9.33		9.39		9.60		9.80		9.57		8.02	WE 2.7
15	9.42		9.33		9.44		9.67		9.78		9.23		7.89	WE 2.9
18	9.48		9.54		9.59		9.85		9.56		8.53		6.78	WE 0.2
21	9.61		9.58		9.74		9.98		9.33		7.93			
24	9.53		9.72		9.24		9.65		[illegible].64		7.21			
27	9.66		9.87		9.53		9.60		8.14		6.93			
30	9.40		9.17		8.51	Es[illegible]	8.41		8.10			WE 6.3		
33	7.93		8.46		7.38	[illegible]	8.40		8.08			[illegible] 28		
36	7.52		7.26		7.5[illegible]	[illegible] WE	8.20		7.25	WE 33.8				
39	6.56		6.75			42.7 WE	7.97		6.89					
[illegible]	6.51	WE 42.6		WE 39.4			7.63			WE 40.5				
[illegible]					7.33		7.02							
[illegible]					6.87		WE 47.[illegible]							
[illegible]						WE 49.[illegible]								
	(14)		(12)		(12)		(15)		(13)		(9)		(6)	
Total	124.99		110.98		107.91		134.37	/	113.37		76.45		38.98	
Average	Total	14[illegible]	No points = 168			Ave =		8.849						

Check on TP 2.22

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