

AQU 4 Appendix 1

*Habitat Data Summary Sheets and Photographs of Reaches
Potentially Accessible to Anadromous Fish Above Merwin Dam*

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Rosgen (1986) Stream Channel Type Descriptions and Delineative Criteria for Broad-level Classification (Level I)

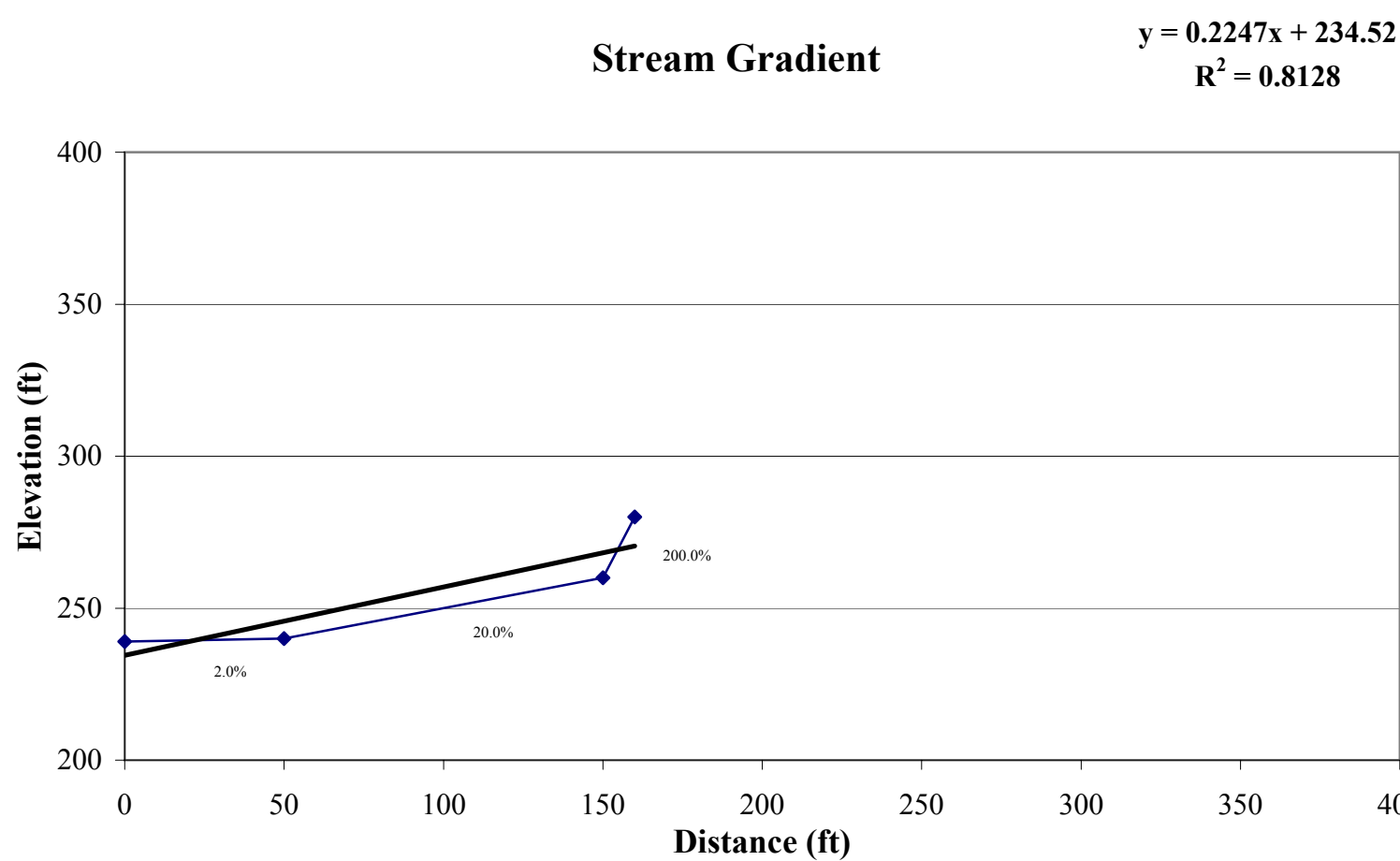
Stream Channel Type	General Description	Entrenchment Ratio	W/D Ratio	Sinuosity	Slop	Landform/ Soils/Features
Aa+	Very Steep, deeply entrenched, debris trans-ports, torrent streams.	<1.4	<12	1.0 to 1.1	>.10	Very high relief. Erosional, bedrock or depositional features; debris flow potential. Deeply entrenched streams. Vertical steps with deep scour pools; waterfalls
A	Steep, entrenched, cascading, step/ pool streams. High energy/debris trans-port associated with depositional soils. Very stable if bedrock or boulder dominated channel	<1.4	<12	1.0 to 1.2	.04 to .10	High relief. Erosional or depositional and bedrock forms. Entrenched and confined streams with cascading reaches. Frequently spaced, deep pools in associated step pool bed morphology.
B	Moderately entrenched, moderate gradient, riffle dominated channel, with infrequently spaced pools. Very stable plan and profile. Stable banks.	1.4 to 2.2	>12	>1.2	.02 to .039	Moderate relief, colluvial deposition, and/or structural. Moderate entrenchment and W/D ratio. Narrow, gently sloping valleys. Rapids predominate w/ scour pools.
C	Low gradient, meandering, point-bar, riffle/pool, alluvial channels with broad, well defined floodplains.	>2.2	>12	>1.4	<.02	Broad valleys w/ terraces, in association with floodplains, alluvial soils. Slightly entrenched with well-defined meandering channels. Riffle/pool bed morphology.
D	Braided channel with longitudinal and transverse bars. Very wide channel with eroding banks.	n/a	>40	n/a	<.04	Broad valleys with alluvium, steeper fans. Glacial debris and depositional features. Active lateral adjustment, w/ abundance of sediment supply, convergence / divergence bed features, aggradational processes, high bedload and bank erosion.
DA	Anastomising (multiple channels) narrow and deep with extensive, well vegetated floodplains and associated wetlands. Very gentle relief with highly variable sinuosities and width/depth ratios. Very stable streambanks.	>2.2	Highly variable	Highly variable	<.005	Broad, low-gradient valleys with fine alluvium and/or lacustrine soils. Anastomosed (multiple channel) geologic control creating fine deposition w/ well-vegetated bars that are laterally stable with broad wetland floodplains. Very low bedload, high wash load sediment.
E	Low gradient, meandering riffle/pool stream with low width/depth ratio and little deposition. Very efficient and stable. High meander width ratio.	>2.2	<12	>1.5	<.02	Entrenched in highly weathered material. Gentle gradients, with a high width/ depth ratio. Meandering, laterally unstable with high bank erosion rates. Riffle/pool morphology.
F	Entrenched meandering riffle/pool channel on low gradients with high width/depth ratio.	<1.4	>12	>1.4	<.02	Entrenched in highly weathered material. Gentle gradients, with a high width/depth ratio. Meandering, laterally unstable with high bank erosion rates. Riffle/pool morphology.
G	Entrenched "gully" step/pool and low width/depth ratio on moderate gradients.	<1.4	<12	>1.2	.02 to .039	Gullies, step/pool morphology w/ moderate slopes and low width/ depth ratio. Narrow valleys, or deeply incised in alluvial or colluvial materials, i.e., fans or deltas. Unstable, with grade control problems and high bank erosion rates.

Stream Name: Marble Creek

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	40
Average bankfull width (ft)	15.2
Average wetted width (ft)	8.2
Total area of accessible habitat (ft²)	328
Estimated flow (cfs)	1.0

Barrier Description:	
Cumulative distance from mouth (ft)	40
Barrier height (ft)	20
Plunge pool depth (ft)	0.8
Horizontal jumping distance (ft)	3.0
Entrance pools depth (ft)	NA
Barrier classification	Single Falls
Barrier type	IIA2



Habitat Description: Marble Creek contains only about 40 feet of accessible habitat downstream from the falls.

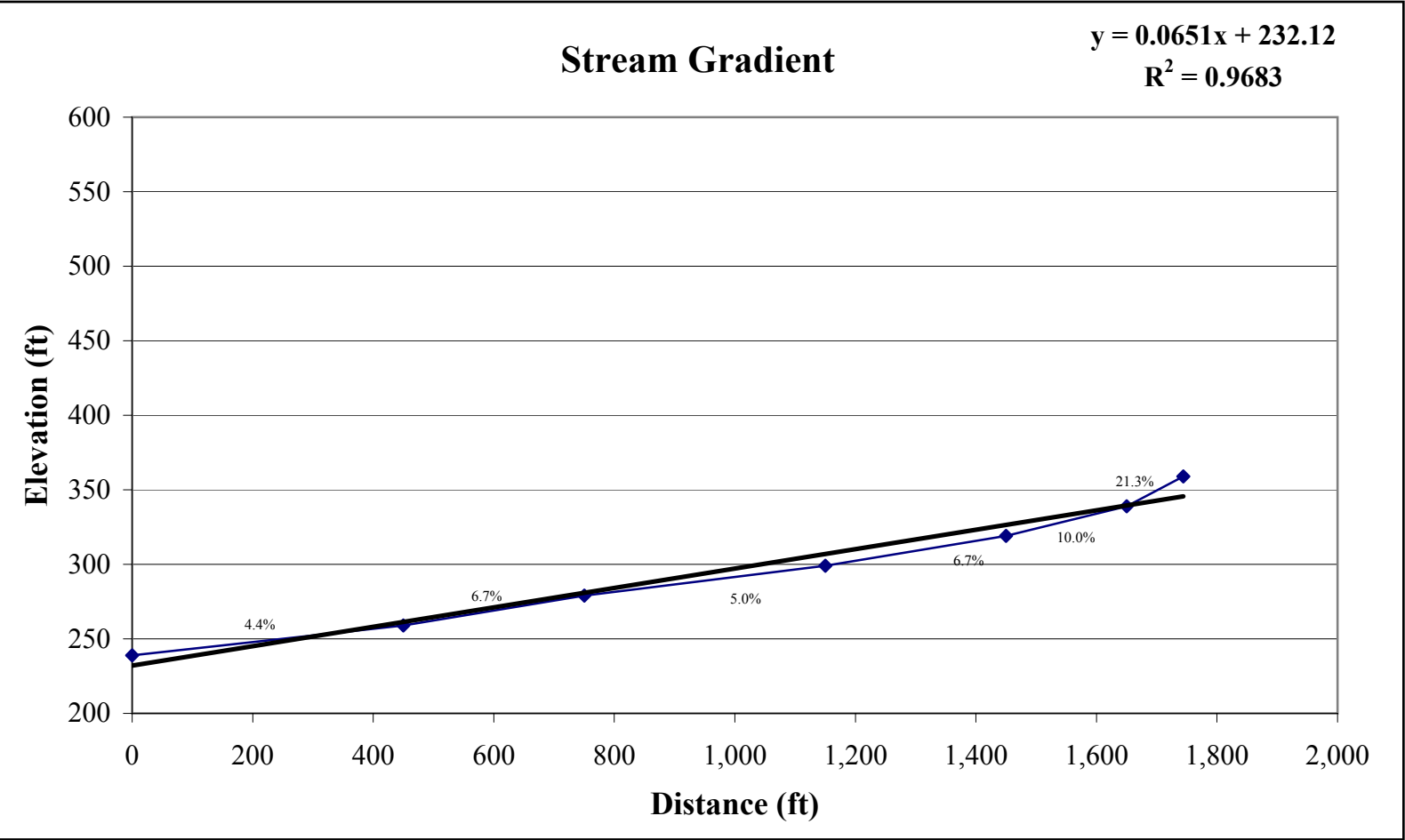
Source: Harza (1999)

Stream Name: Cape Horn Creek

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	1,744
Average bankfull width (ft)	23.3
Average wetted width (ft)	13.1
Total area of accessible habitat (ft²)	22,846
Estimated flow (cfs)	5.0

Barrier Description:	
Cumulative distance from mouth (ft)	1,744
Barrier height (ft)	60.0
Plunge pool depth (ft)	>5.0
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Single Falls
Barrier type	IIA1



Habitat Description: Cape Horn Creek is a high gradient (6.5% slope) 2nd order stream with an "A" Rosgen channel type (Rosgen 1996). The majority of the habitat in the accessible reach is comprised of 10-to 15-foot-wide pools, riffles and pocket water. Gravel is common but not abundant in the tail-crests of larger pools. Instream cover in the form of substrate is abundant. Large, stable riparian vegetation provides very good stream shading. Overall, this relatively short reach (1,744 feet) contains very good salmonid habitat, including potential coho and steelhead habitat.

Source: Harza (1999)

Stream Name: Jim Creek

Reach: Lake Merwin

Habitat Data:

Total length of accessible habitat (ft)	3,140
Average bankfull width (ft)	21.5
Average wetted width (ft)	11.7
Total area of accessible habitat (ft²)	36,738
Estimated flow (cfs)	4.0

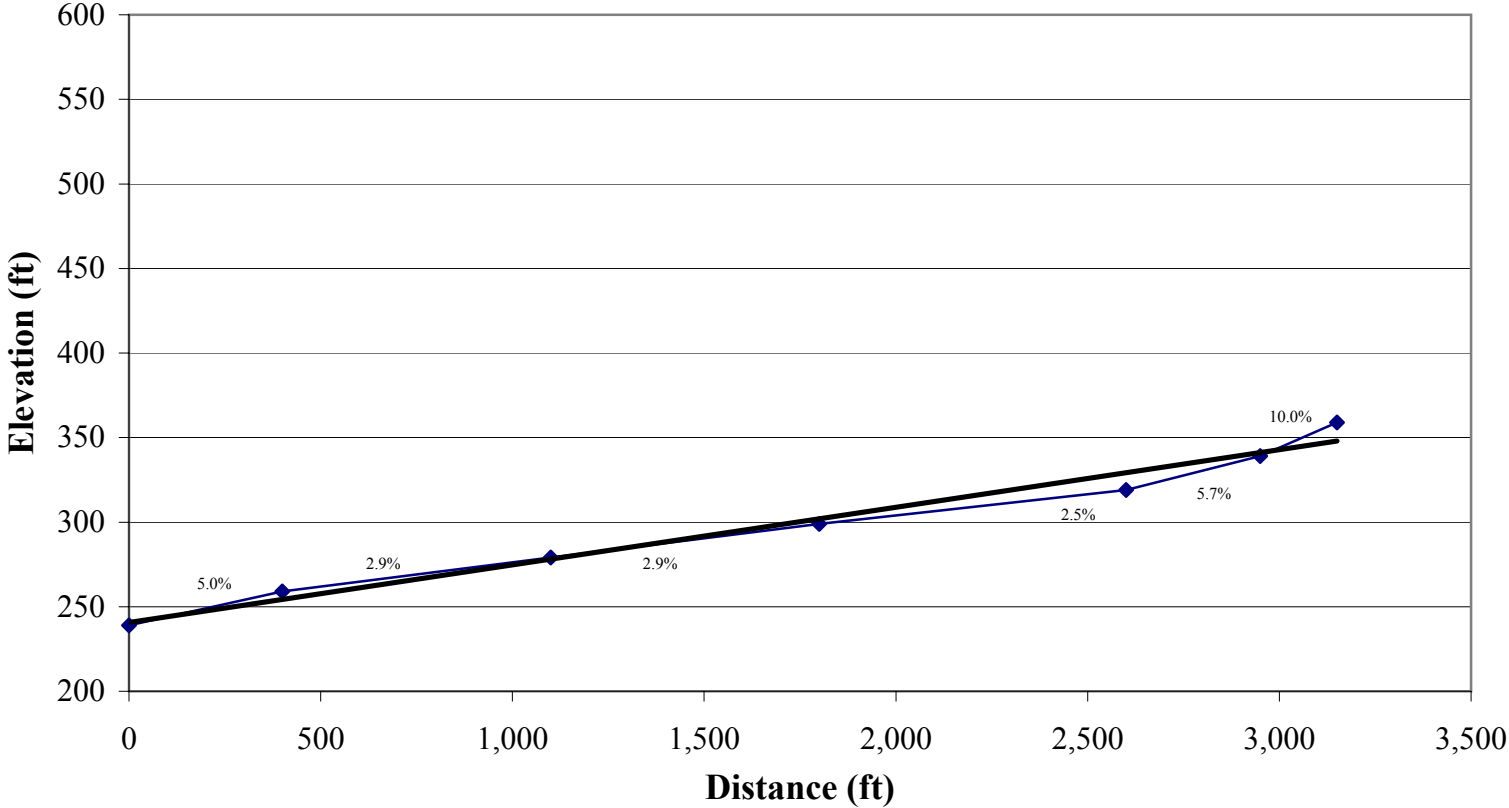
Barrier Description:

Cumulative distance from mouth (ft)	3,140
Barrier height (ft)	25.0
Plunge pool depth (ft)	<5.0
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Single Falls
Barrier type	IIC1



Stream Gradient

$y = 0.0341x + 240.61$
 $R^2 = 0.9763$



Habitat Description: Jim Creek is a moderate gradient (3.4% slope) 2nd order stream with a "B" Rosgen channel type (Rosgen 1996). Fish habitat is comprised of a mixture of 8-to 12-foot-wide cobble dominated riffles with occasional gravel and cobble dominated pools. Portions of the channel are dominated by bedrock substrate. Instream cover is common in the form of substrate and LWD. The riparian area provides excellent stream-shading throughout the reach. The accessible reach appeared to contain potential coho and steelhead habitat.

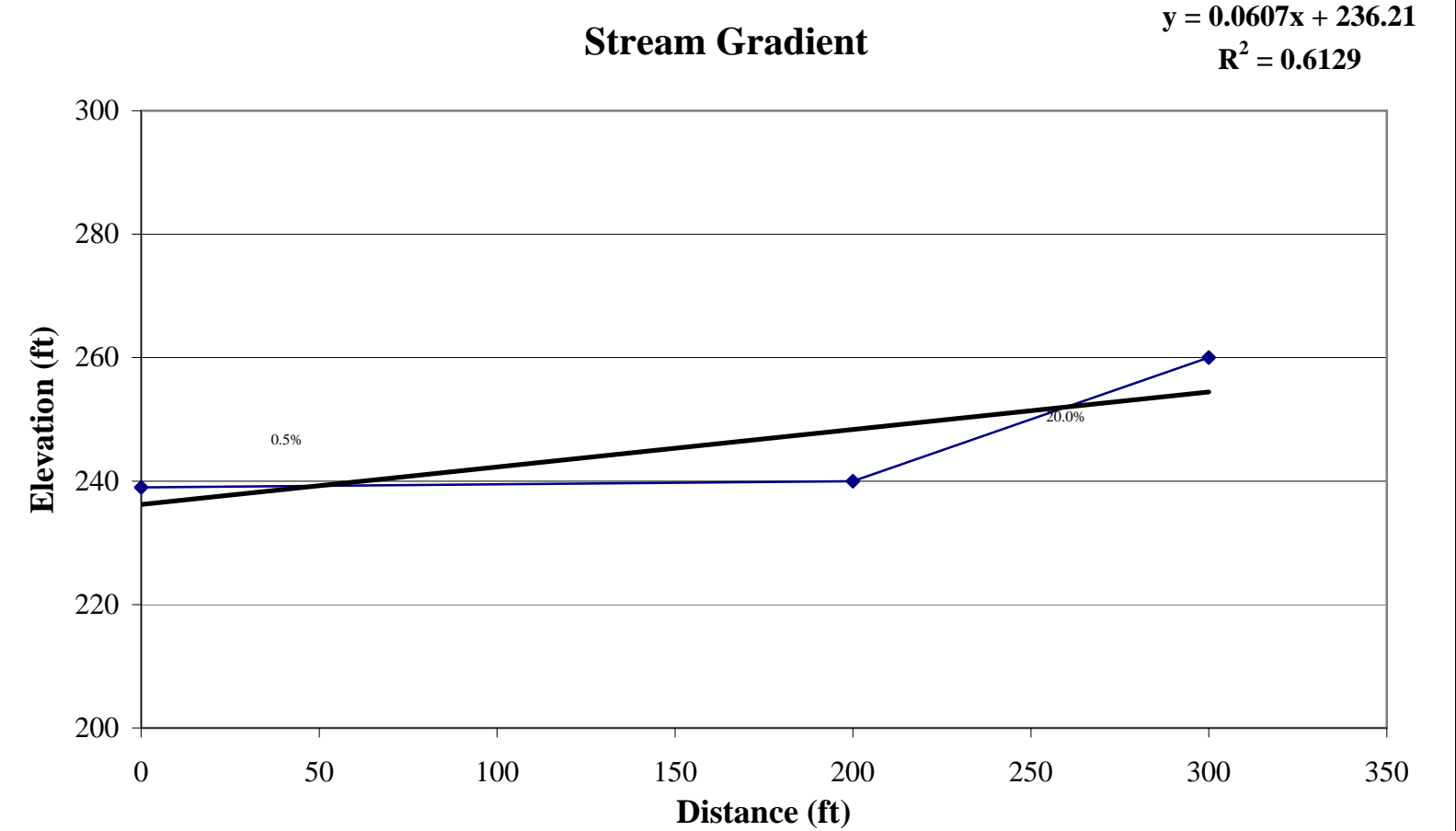
Source: Harza (1999)

Stream Name: Rock Creek

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	320
Average bankfull width (ft)	47.5
Average wetted width (ft)	15
Total area of accessible habitat (ft ²)	4,789
Estimated flow (cfs)	20.0

Barrier Description:	
Cumulative distance from mouth (ft)	320.0
Barrier height (ft)	6.5
Plunge pool depth (ft)	1.0
Horizontal jumping distance (ft)	6.4
Entrance pools depth (ft)	0.9
Barrier classification	Multiple Falls
Barrier type	IIC2



Habitat Description: Rock Creek is a very high gradient 3rd order stream with an "A" Rosgen channel type (Rosgen 1996). Very steep (25 to 35 %) slopes and numerous cascades and falls limit the amount of accessible anadromous fish habitat to the lower 320 feet of stream. A "falls" located at RM 0.5 is also noted on the USGS quad. Very little production would be realized in the accessible portion of this stream. However, kokanee were observed spawning in the reservoir near the mouth of Rock Creek.

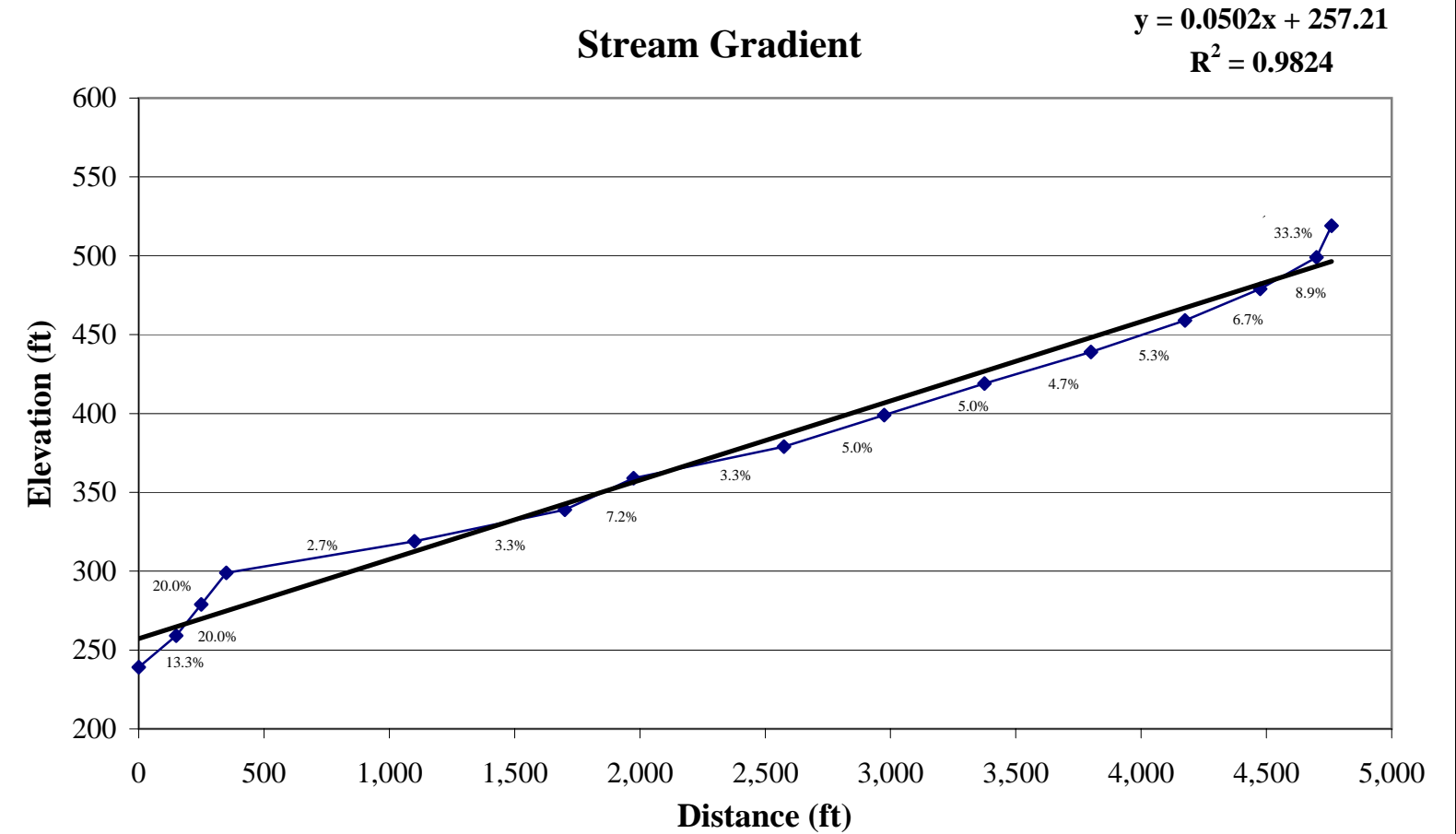
Source: Harza (1999)

Stream Name: Indian George Creek

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	4,760
Average bankfull width (ft)	21.9
Average wetted width (ft)	9.7
Total area of accessible habitat (ft ²)	46,113
Estimated flow (cfs)	2.0

Barrier Description:	
Cumulative distance from mouth (ft)	4,760
Barrier height (ft)	15.4
Plunge pool depth (ft)	2.0
Horizontal jumping distance (ft)	15.0
Entrance pools depth (ft)	0.6
Barrier classification	Compound
Barrier type	IIC2



Habitat Description: Indian George Creek is a high gradient (5% slope) 2nd order stream with an "A" Rosgen channel type (Rosgen 1996). Fish habitat is comprised of a mixture of 8-to 12-foot-wide cobble and small boulder dominated riffles and pocket pools. LWD and small boulder cover are abundant throughout the accessible reach. Spawning habitat appeared to be somewhat limited, due to a lack of spawning gravel. However, juvenile salmonids were observed throughout the surveyed portion of the stream. The riparian area was stable and well developed. Stream shading was excellent. Summer low flows (2.0 cfs) appeared to be a major limiting factor for salmonids.

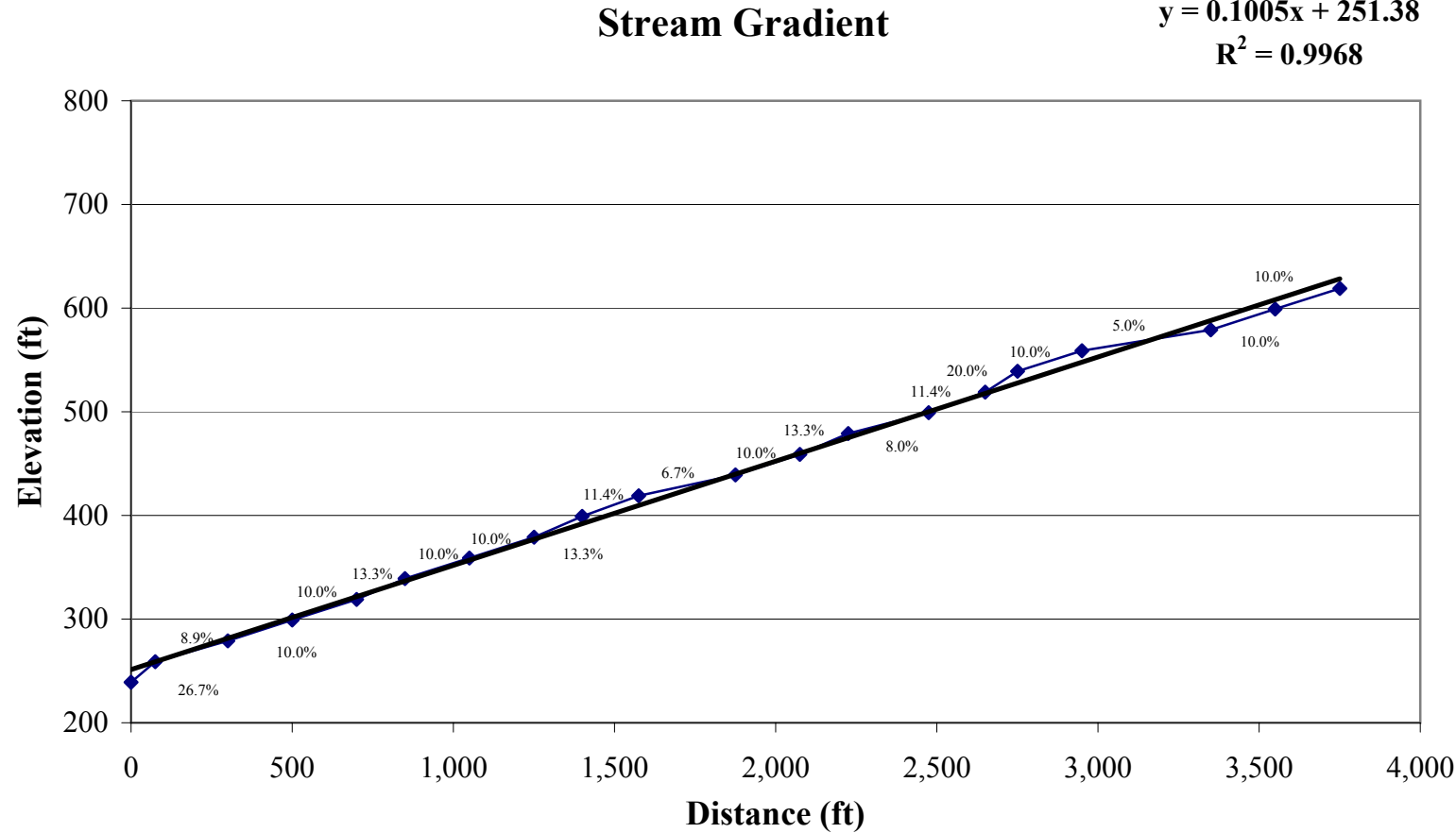
Source: Harza (1999)

Stream Name: M4

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	3,900
Average bankfull width (ft)	11.5
Average wetted width (ft)	6.1
Total area of accessible habitat (ft²)	23,790
Estimated flow (cfs)	0.5

Barrier Description:	
Cumulative distance from mouth (ft)	3,900
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Low Q
Barrier type	NA



Habitat Description: M4 (unnamed) is a high gradient (10.1% slope) 1st order stream with an "A" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible reach is dominated by high gradient, small boulder dominated riffles with pocket water. Low summer flows (<0.5 cfs) and a lack of large pools are major limiting factors. While this stream reach would be accessible at higher flows, low flow related migration obstacles/barriers are common throughout the stream. Overall, the reach contains only a limited amount of accessible salmonid habitat.

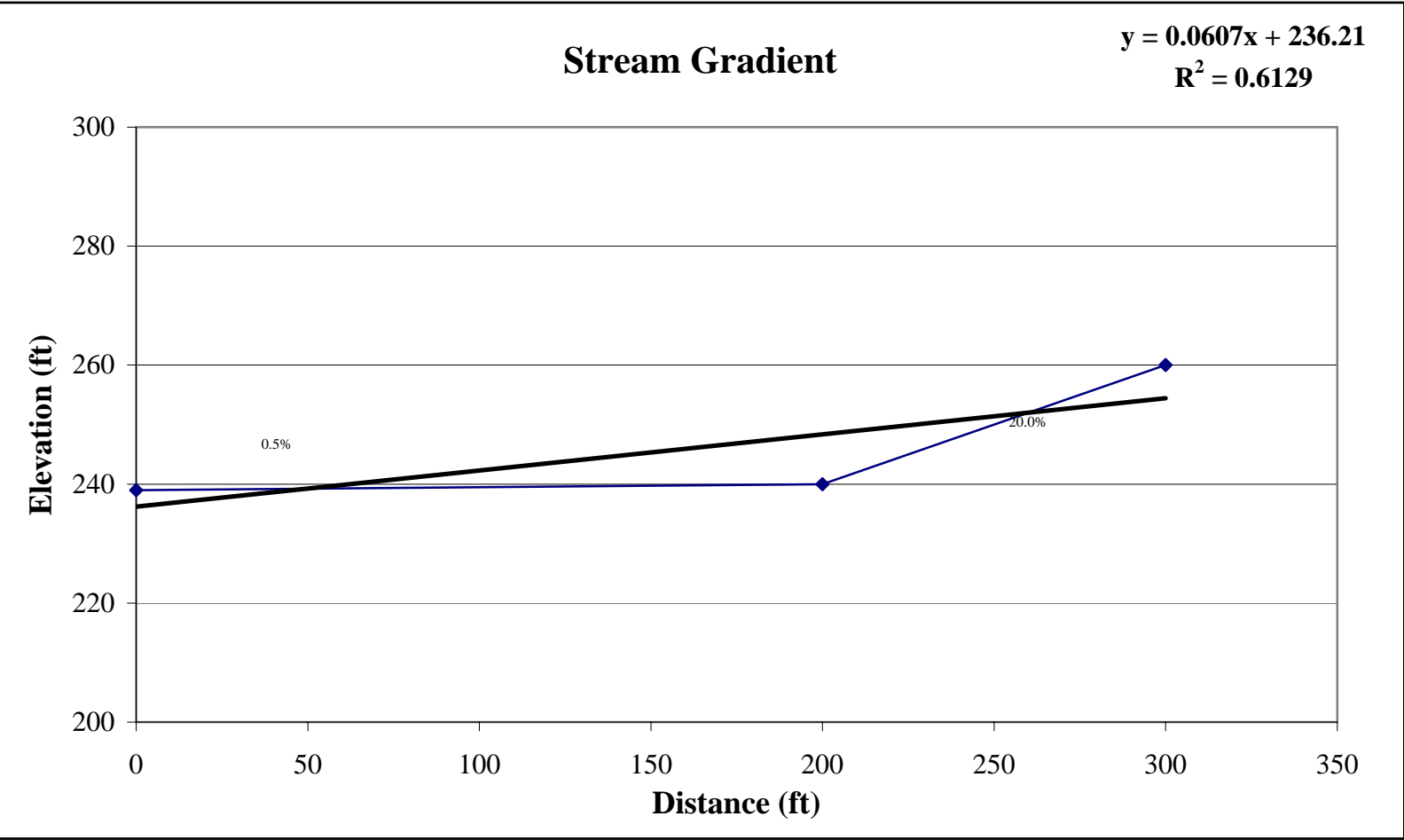
Source: Harza (1999)

Stream Name: Rock Creek

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	320
Average bankfull width (ft)	47.5
Average wetted width (ft)	15
Total area of accessible habitat (ft ²)	4,789
Estimated flow (cfs)	20.0

Barrier Description:	
Cumulative distance from mouth (ft)	320.0
Barrier height (ft)	6.5
Plunge pool depth (ft)	1.0
Horizontal jumping distance (ft)	6.4
Entrance pools depth (ft)	0.9
Barrier classification	Multiple Falls
Barrier type	IIC2



Habitat Description: Rock Creek is a very high gradient 3rd order stream with an "A" Rosgen channel type (Rosgen 1996). Very steep (25 to 35 %) slopes and numerous cascades and falls limit the amount of accessible anadromous fish habitat to the lower 320 feet of stream. A "falls" located at RM 0.5 is also noted on the USGS quad. Very little production would be realized in the accessible portion of this stream. However, kokanee were observed spawning in the reservoir near the mouth of Rock Creek.

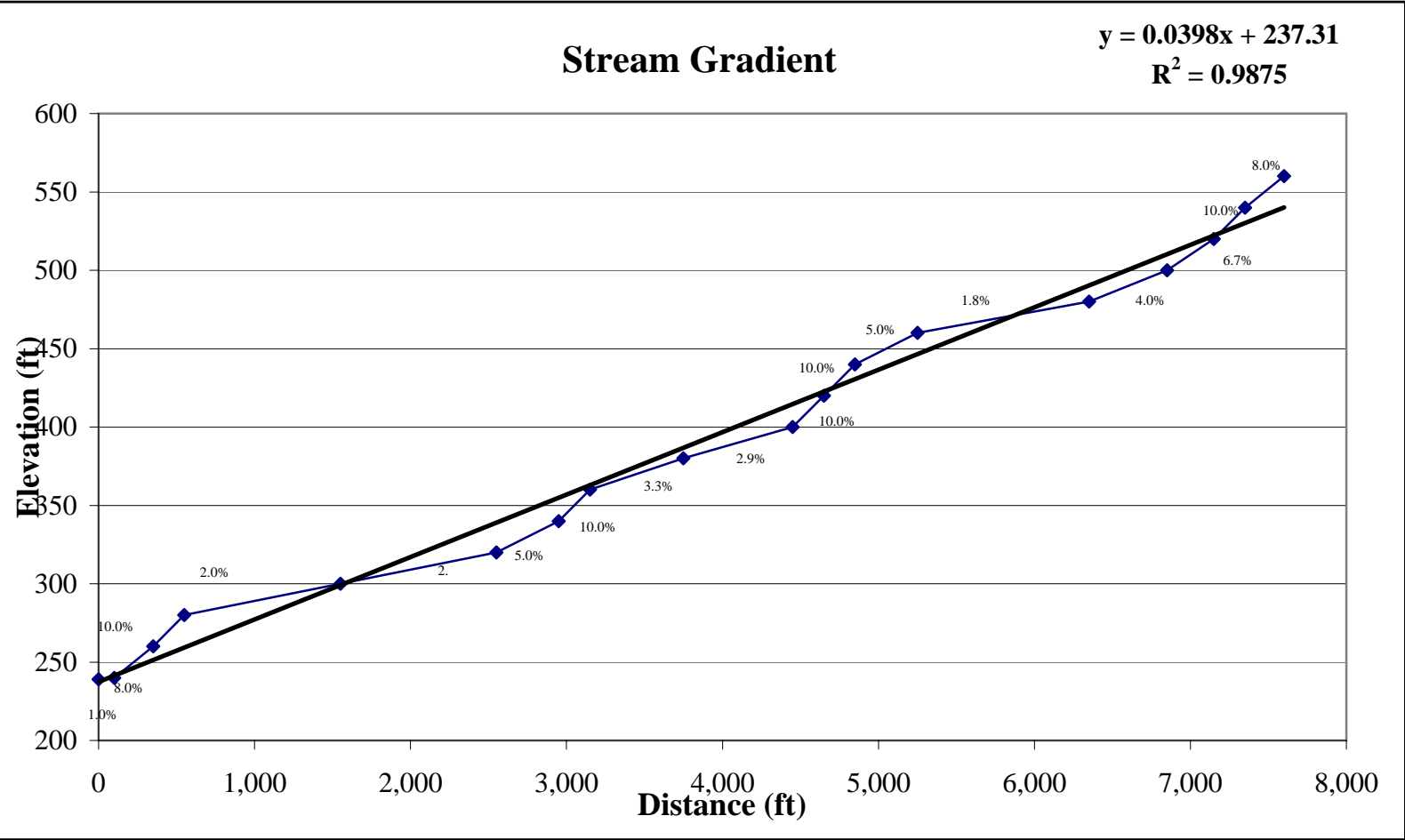
Source: Harza (1999)

Stream Name: Brooks Creek

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	5,714
Average bankfull width (ft)	19.5
Average wetted width (ft)	14.8
Total area of accessible habitat (ft²)	84,662
Estimated flow (cfs)	8.0

Barrier Description:	
Cumulative distance from mouth (ft)	5,714
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Low Q
Barrier type	IID2



Habitat Description: Brooks Creek is a moderate gradient (4.0% slope) 2nd order stream with an "A/B" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of this stream is comprised of 9-to 20-foot-wide cobble and small boulder dominated riffles. Spawning gravel is common throughout the lower portion of the stream. Cover in the form of LWD and overhanging vegetation is abundant. The channel appears stable and the riparian area provides excellent stream shade. Overall, Brooks Creek contains very good salmonid habitat.

Source: Harza (1999)

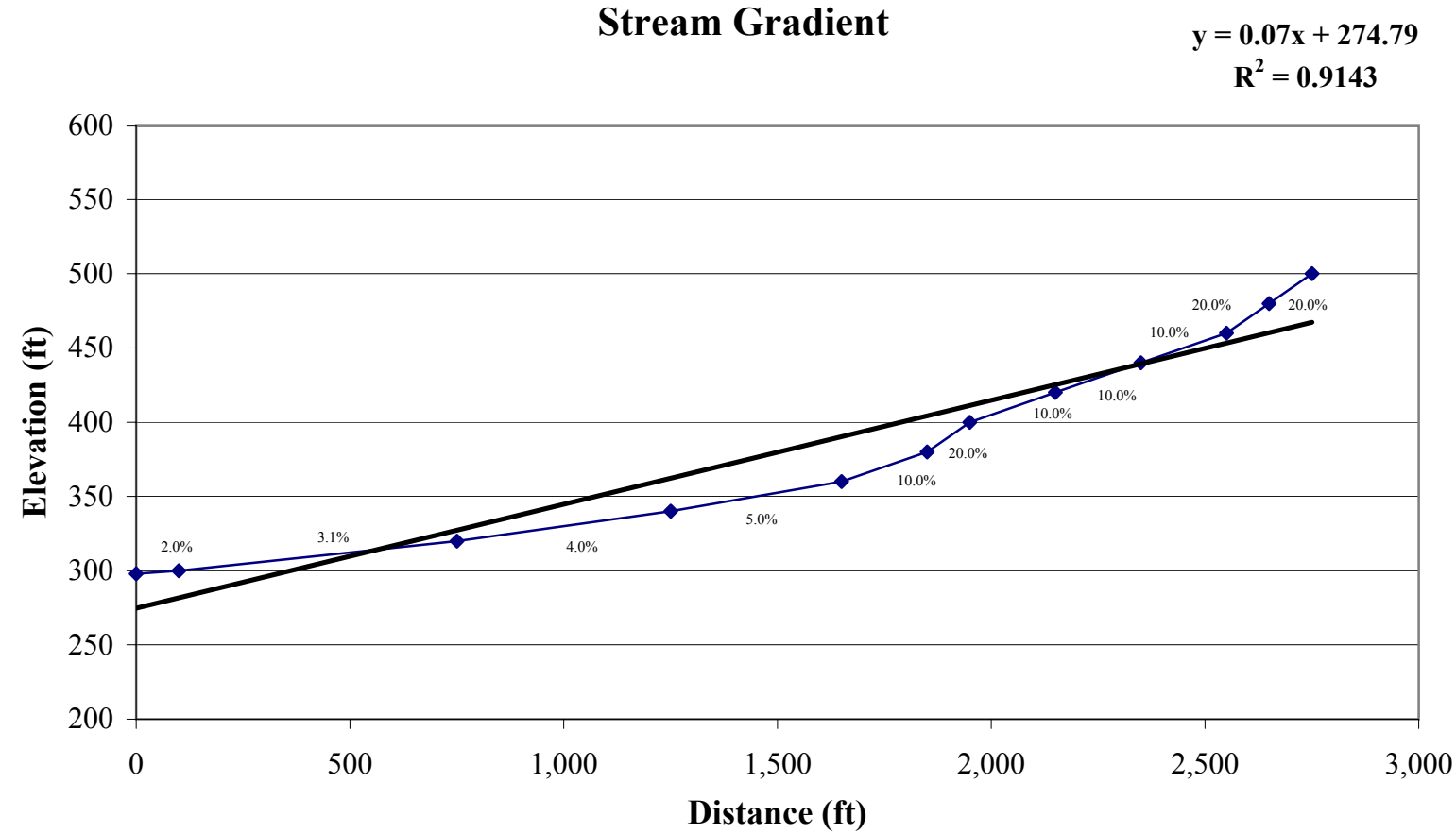


Stream Name: B1

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	2,650
Average bankfull width (ft)	23.4
Average wetted width (ft)	13.8
Total area of accessible habitat (ft²)	36,526
Estimated flow (cfs)	5.0

Barrier Description:	
Cumulative distance from mouth (ft)	2,650
Barrier height (ft)	6.5
Plunge pool depth (ft)	0.8
Horizontal jumping distance (ft)	16.0
Entrance pools depth (ft)	0.9
Barrier classification	Compound
Barrier type	IID2



Habitat Description: B1 (unnamed) is a moderate to high gradient 2nd order tributary to Brooks Creek with an "A" Rosgen channel type (Rosgen 1996). Habitat conditions in the accessible portion of B1 were similar to those found in Brooks Creek. Low summer flows would likely limit the production of anadromous salmonids (coho and steelhead) in this stream.

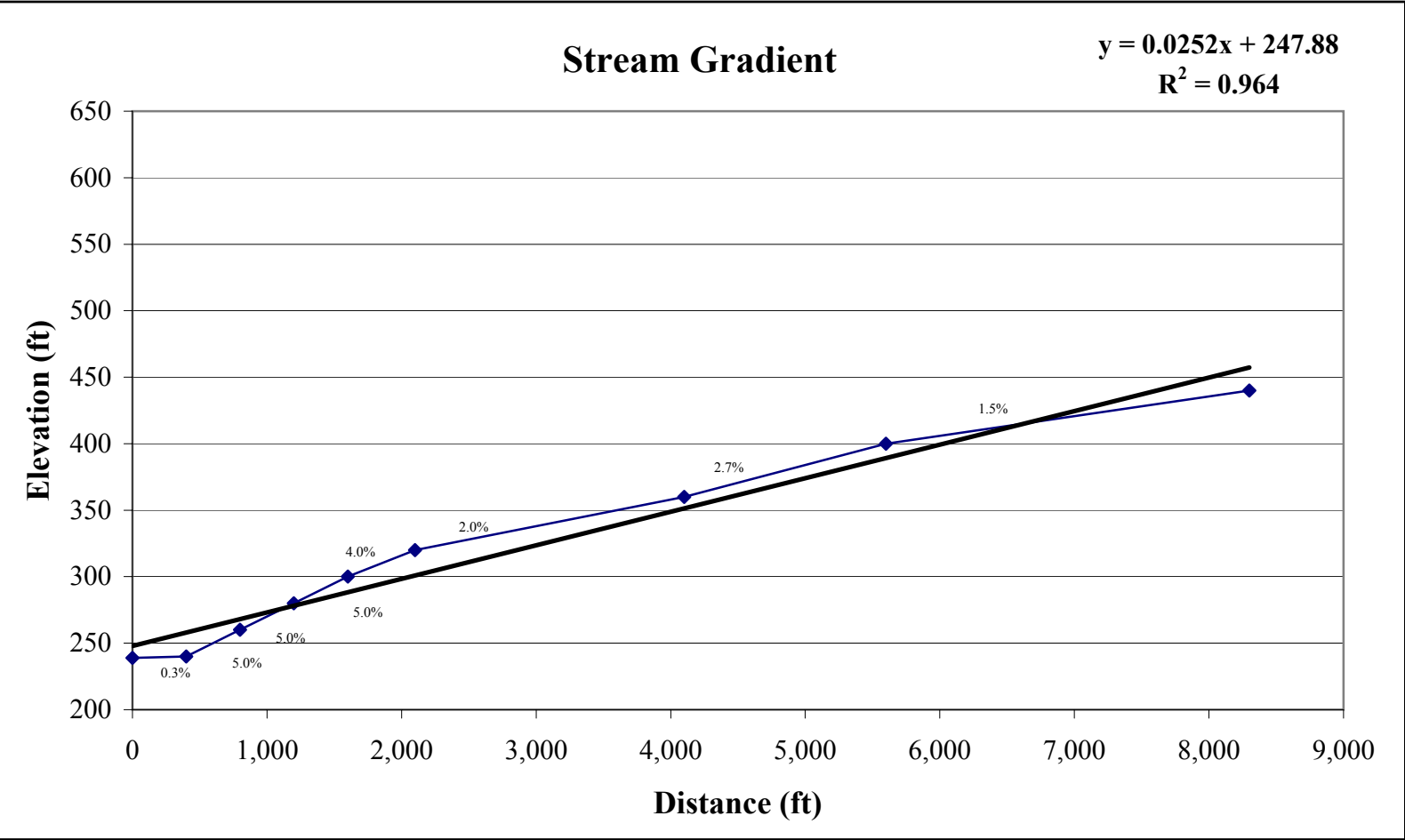
Source: Harza (1999)

Stream Name: M14

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	6,507
Average bankfull width (ft)	35.7
Average wetted width (ft)	12.0
Total area of accessible habitat (ft²)	77,984
Estimated flow (cfs)	0.2

Barrier Description:	
Cumulative distance from mouth (ft)	6,507
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Low Q (wetland)
Barrier type	NA



Habitat Description: M14 (unnamed) is a moderate gradient (2.5% slope) 2nd order stream with a "B" Rosgen channel type (Rosgen 1996). Fish habitat in M14 is comprised of 8-to 15-foot-wide cobble dominated riffles. Spawning gravel is limited (and embedded) and pools are rare in the surveyed reach. The riparian area is stable and well developed. Some actively eroding streambanks were observed in the upper end of the reach. Summer low flows (0.2 cfs) appear to be a major limiting factor for salmonids and overall, the reach contained very little potential anadromous fish habitat.

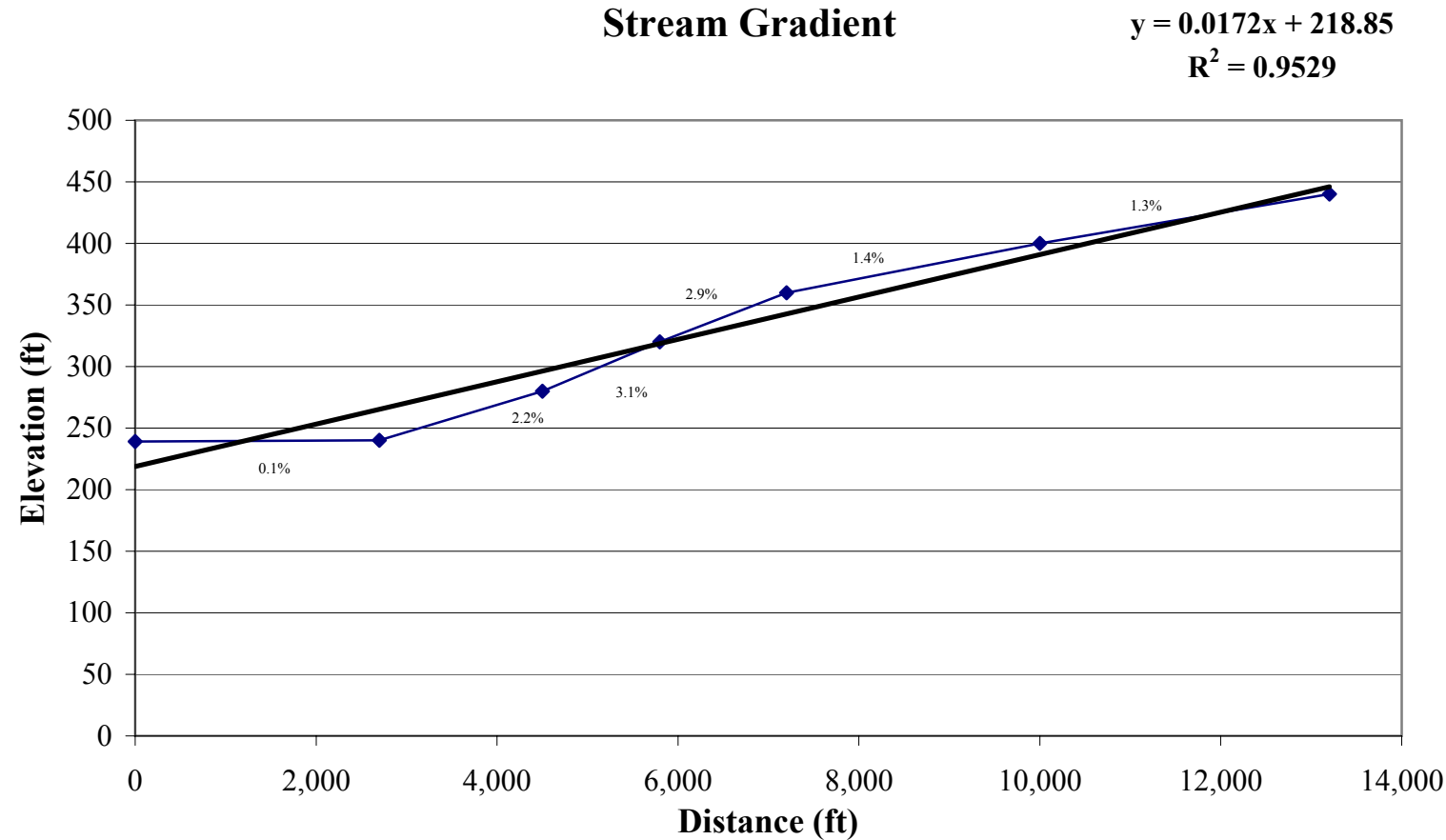
Source: Harza (1999)

Stream Name: Canyon Creek

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	0.0
Average bankfull width (ft)	NS
Average wetted width (ft)	NS
Total area of accessible habitat (ft²)	NS
Estimated flow (cfs)	NS

Barrier Description:	
Cumulative distance from mouth (ft)	NS
Barrier height (ft)	NS
Plunge pool depth (ft)	NS
Horizontal jumping distance (ft)	NS
Entrance pools depth (ft)	NS
Barrier classification	NS
Barrier type	NS



Habitat Description: Numerous waterfalls located throughout the lower 1,000 feet likely block anadromous fish access into Canyon Creek. One of these falls is approximately 18 to 20 feet high. This falls was not field verified in 1999 or 2000 due to difficult and dangerous access.

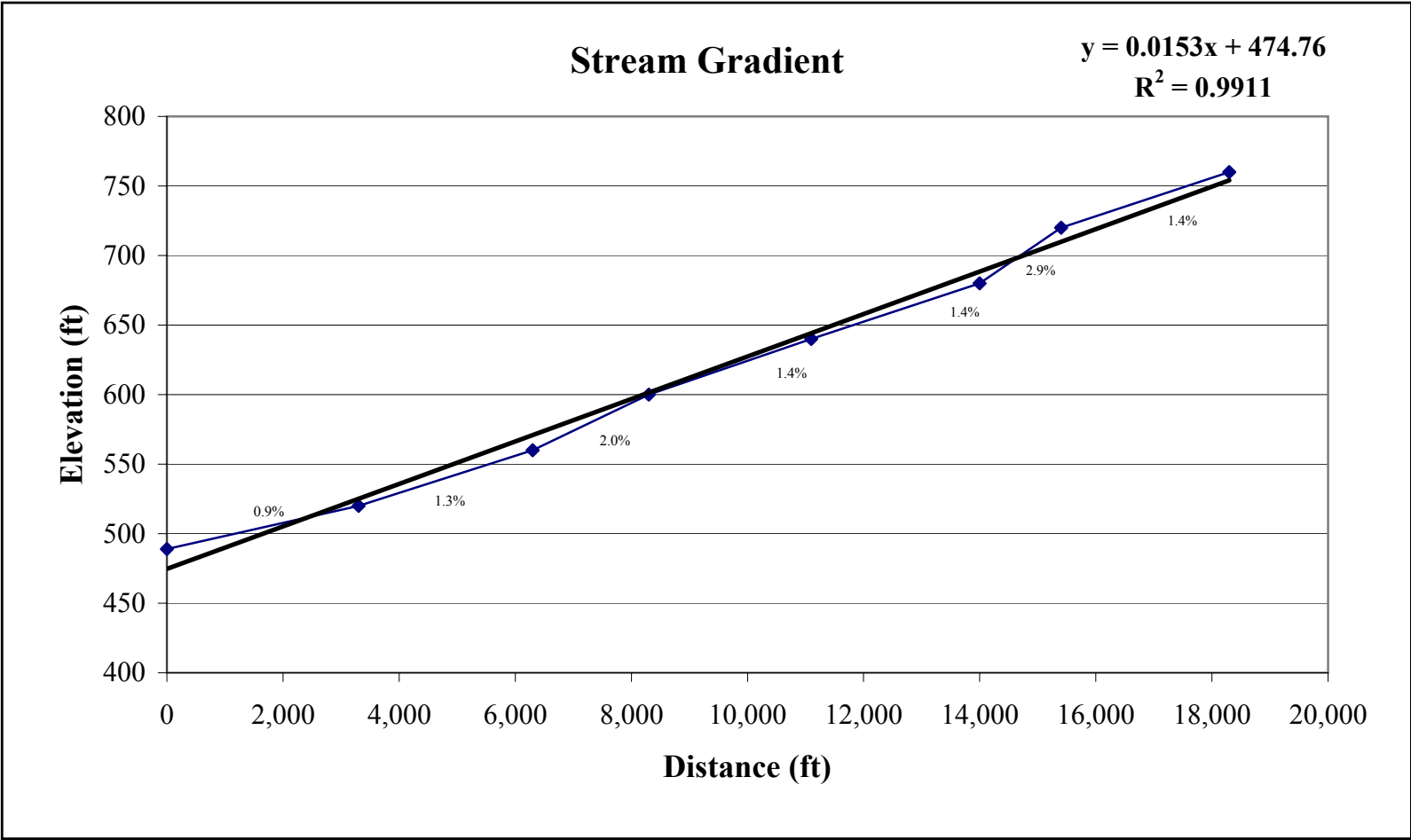
Source: Harza (1999)

Stream Name: Siouxon Creek

Reach: Yale Lake

Habitat Data:	
Total length of accessible habitat (ft)	18,350
Average bankfull width (ft)	81.5
Average wetted width (ft)	55.3
Total area of accessible habitat (ft²)	1,014,143
Estimated flow (cfs)	150.0

Barrier Description:	
Cumulative distance from mouth (ft)	18,350
Barrier height (ft)	14.0
Plunge pool depth (ft)	8.0
Horizontal jumping distance (ft)	16.0
Entrance pools depth (ft)	2.0
Barrier classification	Complex Falls
Barrier type	IIC1



Habitat Description: The potentially accessible portion of Siouxon Creek is relatively low gradient (1.5%) with a "F" Rosgen channel type (Rosgen 1996). Aquatic habitat in this 4th order stream is dominated by long, 25- to 85-foot-long riffles and glides, although occasional pools and cascades were present in the surveyed reach. Portions of the channel are dominated by bedrock substrate. LWD and suitable spawning gravel are present in the reach but not abundant.

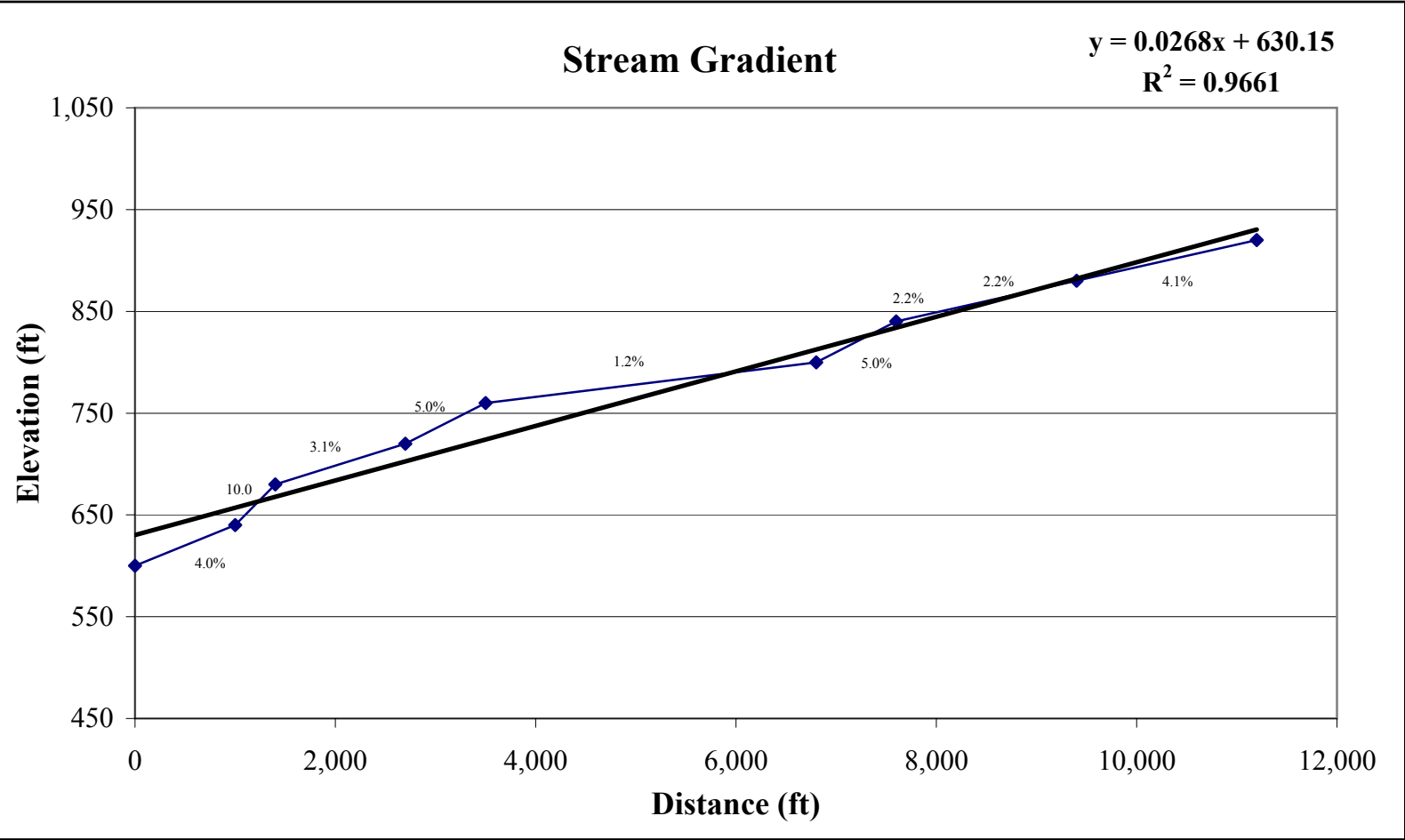
Source: Harza (2000)

Stream Name: North Fork Siouxon Creek

Reach: Yale Lake

Habitat Data:	
Total length of accessible habitat (ft)	10,982
Average bankfull width (ft)	66.9
Average wetted width (ft)	33.6
Total area of accessible habitat (ft²)	369,074
Estimated flow (cfs)	22.0

Barrier Description:	
Cumulative distance from mouth (ft)	10,982
Barrier height (ft)	15 to 20
Plunge pool depth (ft)	8.0
Horizontal jumping distance (ft)	15 to 20
Entrance pools depth (ft)	3.0
Barrier classification	Single Falls
Barrier type	IIA1



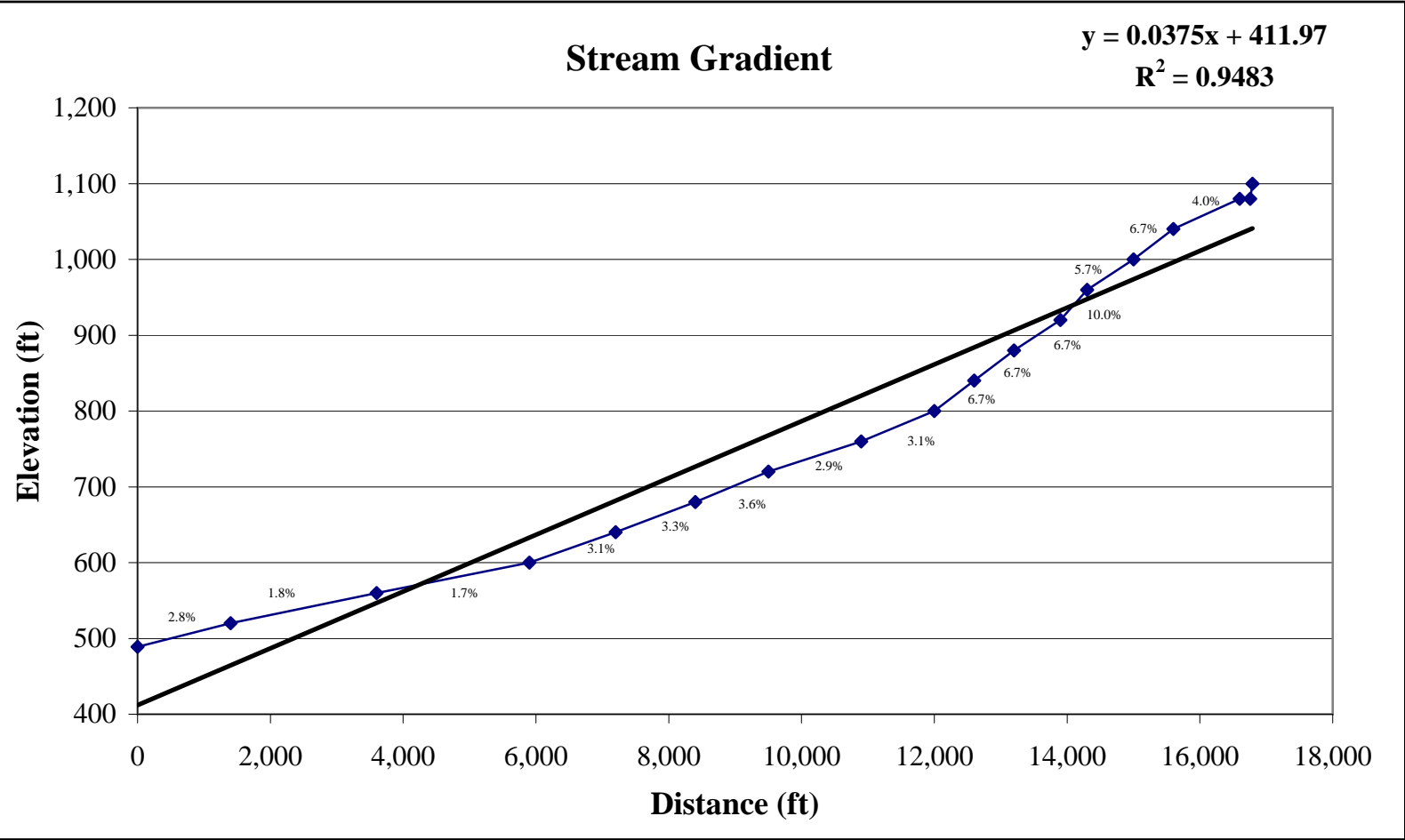
Habitat Description: N. F. Siouxon Creek is a moderate gradient (2.7% slope) 3rd order stream with a "B" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of N. F. Siouxon Creek is comprised of a mixture of 30- to 50-foot-wide boulder and bedrock dominated riffles and occasional pocket and lateral scour pools. Gravel is common but not abundant in larger pools. Cover and LWD appear to be somewhat limited.

Source: Harza (2000)

Stream Name: Speelyai Creek

Reach: Yale Lake

Habitat Data:		Barrier Description:	
Total length of accessible habitat (ft)	16,758	Cumulative distance from mouth (ft)	16,758
Average bankfull width (ft)	48.0	Barrier height (ft)	15.5
Average wetted width (ft)	21.1	Plunge pool depth (ft)	3.1
Total area of accessible habitat (ft²)	353,594	Horizontal jumping distance (ft)	12.0
Estimated flow (cfs)	4.0	Entrance pools depth (ft)	1.5
		Barrier classification	Complex Chute
		Barrier type	IIC1



Habitat Description: Speelyai Creek is a moderate gradient (3.8% slope) 3rd order stream with an "A/B" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of Speelyai Creek is dominated by 20- to 30-foot-wide cobble and small boulder dominated riffles. Pools and glides are common but comprise only about 20 percent of the total wetted habitat area. Boulders and LWD provide a limited amount of instream cover. Gravel is common in larger pools. Bankfull widths average 48 feet. High summer water temperatures are a problem in Speelyai Creek and may limit the production of resident and/or anadromous salmonids (PacifiCorp 1999).

Source: Harza (1999), PacifiCorp (1999)



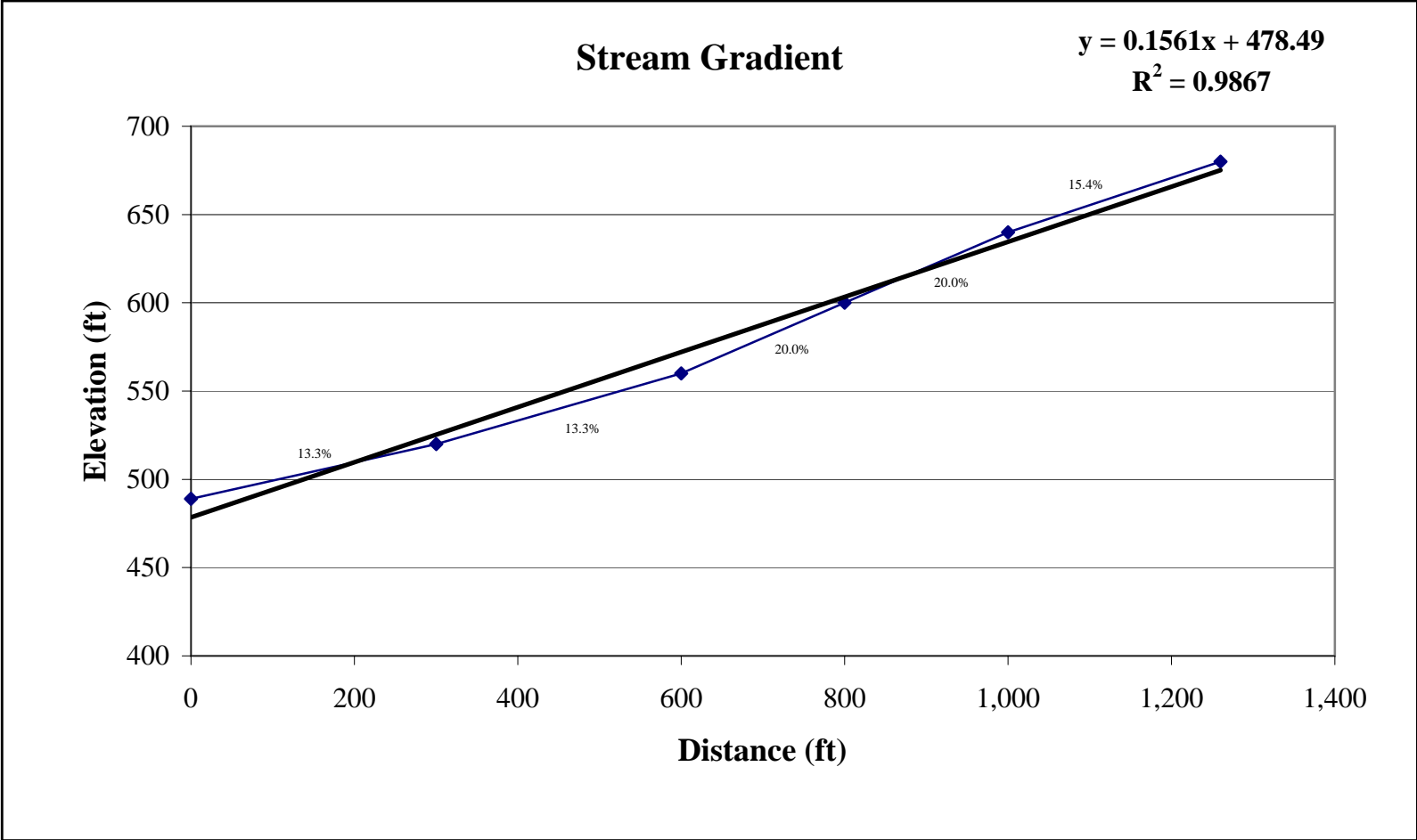
West Fork Speelyai Creek
Not surveyed due to access difficulties and time constraints

Stream Name: Y8

Reach: Yale Lake

Habitat Data:	
Total length of accessible habitat (ft)	1,260
Average bankfull width (ft)	23.4
Average wetted width (ft)	5.7
Total area of accessible habitat (ft²)	7,182
Estimated flow (cfs)	0.5

Barrier Description:	
Cumulative distance from mouth (ft)	1,260
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Gradient and Low Q
Barrier type	NA



Habitat Description: Y8 is a very high gradient (15.6% slope) 2nd order stream with an "A" Rosgen channel type (Rosgen 1996). During low flow periods, the lower 185 feet of Y8 lacks surface flow. Like Dog Creek, this dry channel segment is a total barrier to the upstream and downstream migration of fish. Fish habitat in Y8 is comprised of very high gradient, small boulder and large boulder dominated cascades and riffles. Because of its high gradient and low summer flows, Y8 appears to contain only a limited amount of accessible anadromous fish habitat. At lower reservoir levels the culvert at the mouth of Y8 would be a total barrier to the upstream migration of fish.

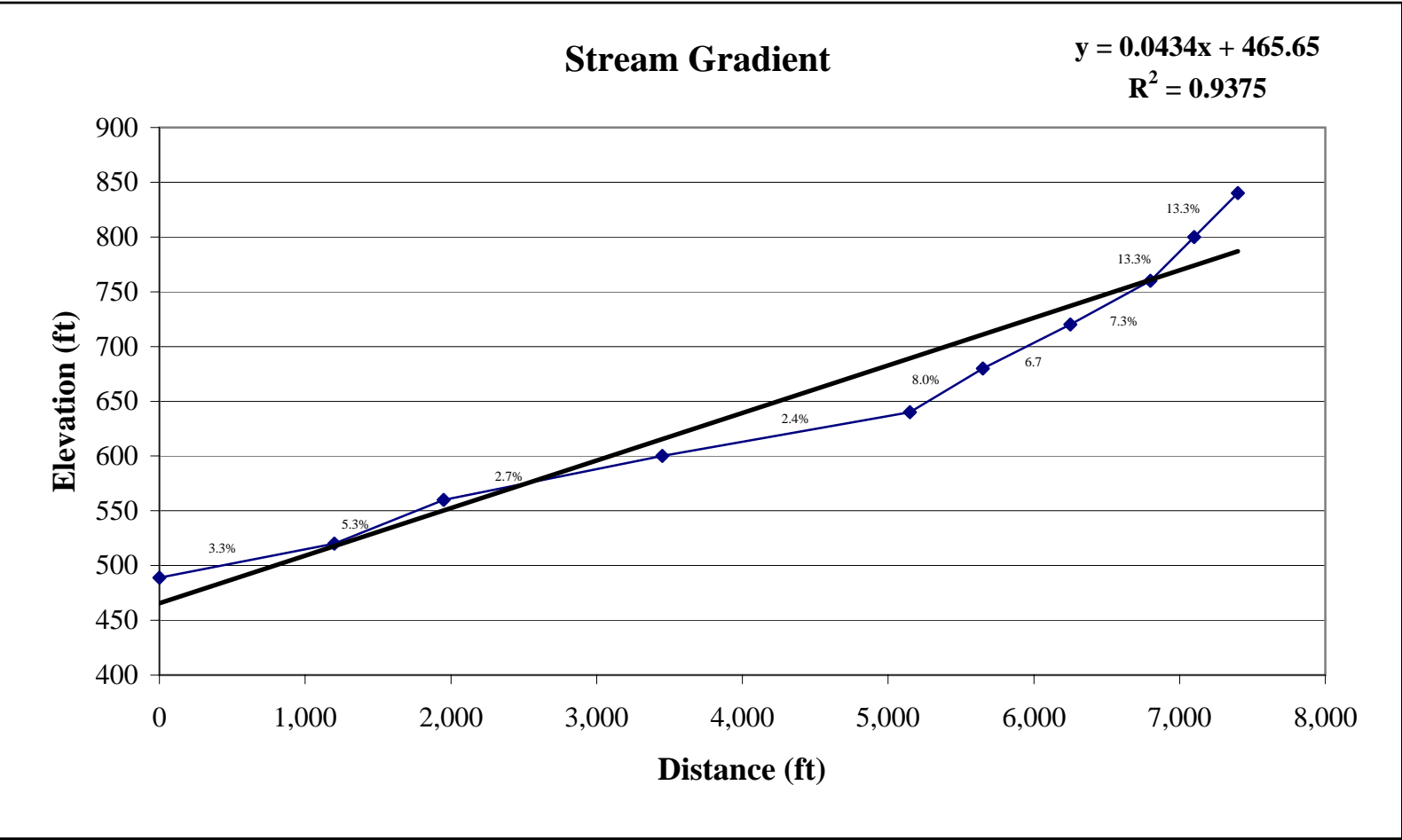
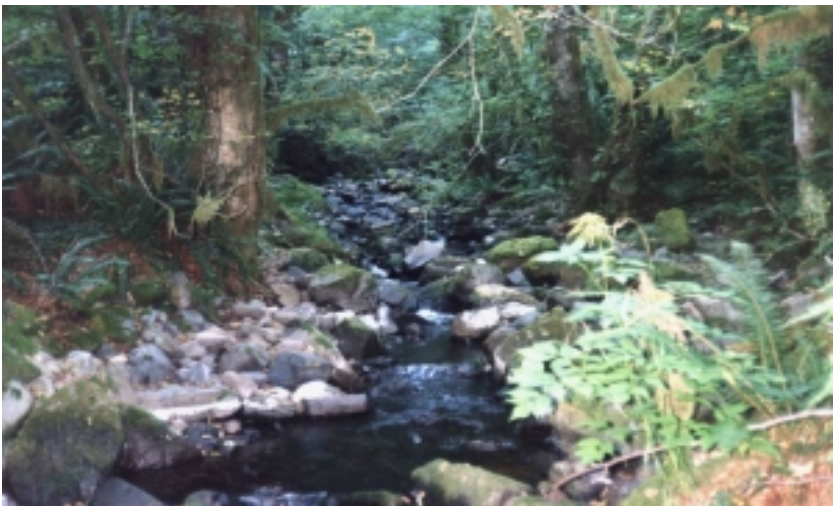
Source: Harza (1999)



Stream Name: Dog Creek

Reach: Yale Lake

Habitat Data:		Barrier Description:	
Total length of accessible habitat (ft)	7,369	Cumulative distance from mouth (ft)	7,369
Average bankfull width (ft)	28.2	Barrier height (ft)	NA
Average wetted width (ft)	3.6	Plunge pool depth (ft)	NA
Total area of accessible habitat (ft²)	26,528	Horizontal jumping distance (ft)	NA
Estimated flow (cfs)	0.0 to 1.0	Entrance pools depth (ft)	NA
		Barrier classification	Gradient & Low Q
		Barrier type	NA



Habitat Description: Dog Creek is a moderate gradient (4.3% slope) 2nd order stream with an "A" Rosgen channel type (Rosgen 1996). The lower 2,000 feet of Dog Creek lacks surface flow in the summer and fall. This dry channel segment is a total barrier to the upstream and downstream migration of fish. A culvert located at Lewis River Road, still within the dry channel segment, is also believed to be an upstream migration barrier even at higher flows. Upstream from the dry channel segment, Dog Creek is more confined and higher gradient (3 to 5 % slope), with a surface flow of approximately 0.5 cfs. Habitat in this segment is comprised of 3- to 5-foot-wide pools and cobble-dominated riffles. Instream cover, spawning gravel, and LWD is abundant in the reach.

Source: Harza (1999)

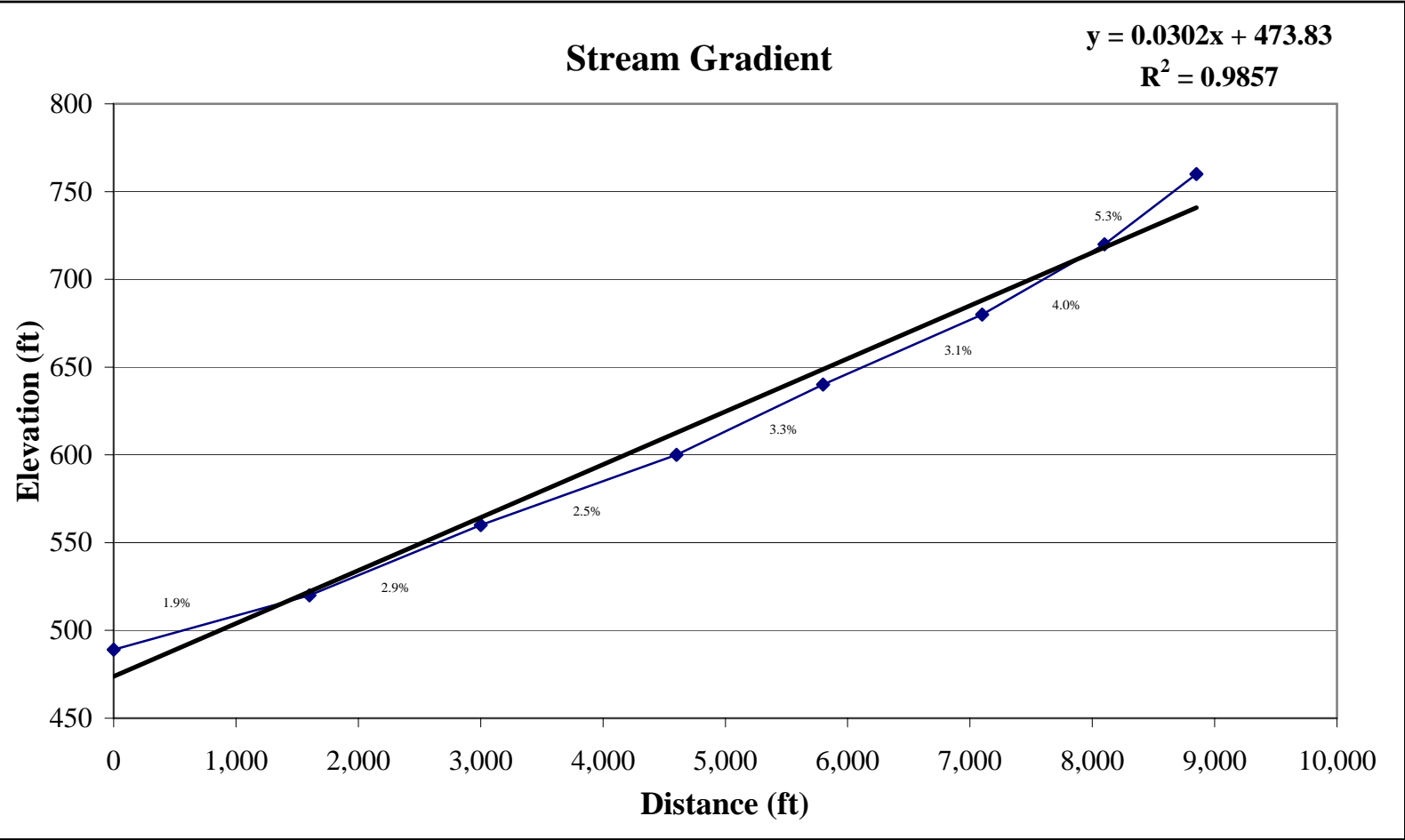
Stream Name: Cougar Creek

Reach: Yale Lake

Habitat Data:	
Total length of accessible habitat (ft)	8,912
Average bankfull width (ft)	40.2
Average wetted width (ft)	32.9
Total area of accessible habitat (ft²)	293,208
Estimated flow (cfs)	75.0

Barrier Description:	
Cumulative distance from mouth (ft)	8,912
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Lava Tube
Barrier type	NA

No Photos Available



Habitat Description: Cougar Creek is a moderate gradient (3.0% slope) 3rd order stream with a "B" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of Cougar Creek is comprised of a mixture of 20-to 40-foot-wide cobble and gravel dominated riffles and pocket pools. Cover in the form of LWD and substrate is abundant throughout the reach. The stream channel is relatively stable and the riparian area provides very good stream shading. Summer water temperatures are very low (44-45 °F) in Cougar Creek, and as a result, it provides critical spawning and rearing habitat for bull trout. Cougar Creek is also the primary spawning stream for Yale Lake kokanee. Overall, this reach contained very good salmonid habitat, including potential coho and steelhead habitat.

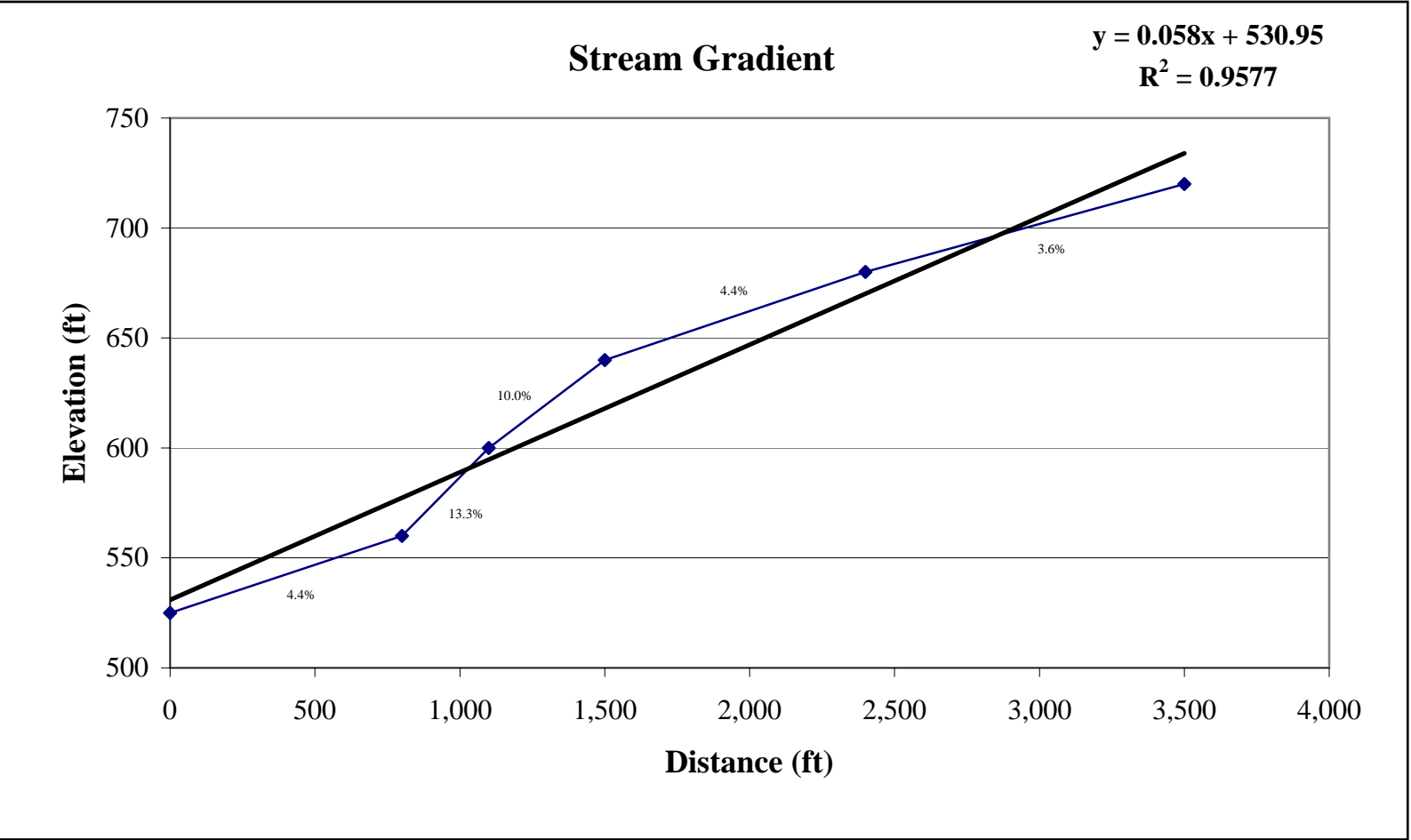
Source: USFS (1995)

Stream Name: Panamaker Creek

Reach: Yale Lake

Habitat Data:	
Total length of accessible habitat (ft)	1,584
Average bankfull width (ft)	40.0
Average wetted width (ft)	5.0
Total area of accessible habitat (ft ²)	7,920
Estimated flow (cfs)	0.5

Barrier Description:	
Cumulative distance from mouth (ft)	1,584
Barrier height (ft)	30.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Single Falls
Barrier type	IIA2

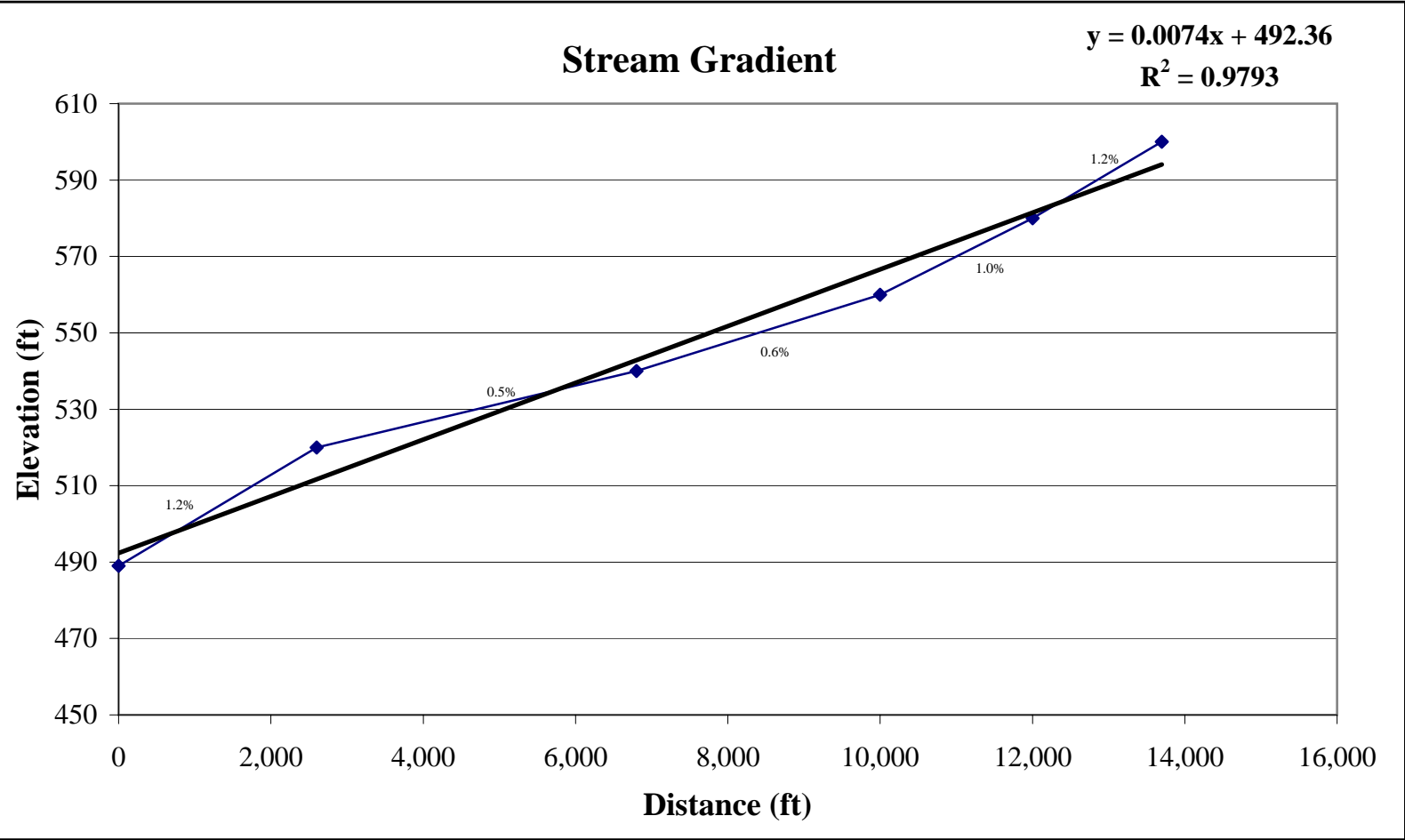


Habitat Description: Panamaker Creek is a high gradient (5.8% slope) 2nd order stream with a "A" Rosgen channel type (Rosgen 1996). The lower 1,000 feet of Panamaker Creek lacks surface flow during low flow periods. Upstream from this dry channel segment, Panamaker Creek contains a mixture of 3- to 8-foot-wide cobble and bedrock-dominated pools, riffles, and cascades. Cover and LWD appear to be somewhat limited. A 30-foot-high waterfall located 1,584 feet upstream from the mouth is a total barrier to the upstream migration of fish at all flows. Overall, this accessible stream reach contains very little anadromous fish habitat.

Source: Harza (1995)

Habitat Data:	
Total length of accessible habitat (ft)	14,048
Average bankfull width (ft)	175.0
Average wetted width (ft)	46.7
Total area of accessible habitat (ft ²)	656,042
Estimated flow (cfs)	10.0

Barrier Description:	
Cumulative distance from mouth (ft)	14,048
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Swift Dam
Barrier type	NA



Habitat Description: The Swift bypass reach (North Fork Lewis River) is dominated by 20- to 60-foot-wide low-gradient riffles and glides, each of which comprise approximately one third of the total wetted habitat area. Seven relatively large pools comprise approximately one-fifth of the remaining habitat. Fish habitat quality is limited by low instream flows (0 to 10 cfs), a lack of LWD and a lack of adequate spawning gravel. High summer water temperatures are a problem in the Swift bypass reach and may limit the production of resident and/or anadromous salmonids (PacifiCorp 1999).

Source: Harza (1995)

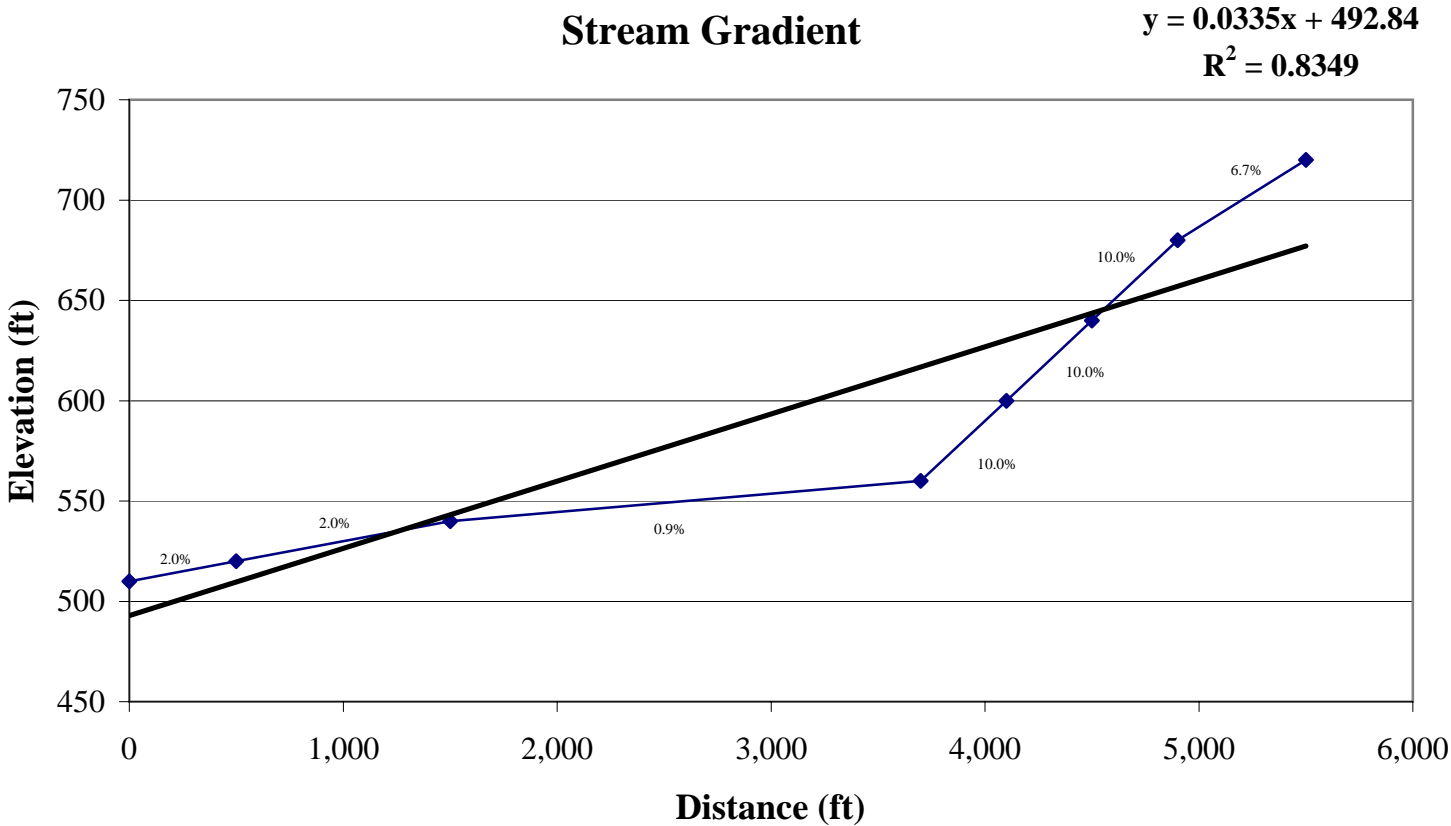


Stream Name: Ole Creek

Reach: Yale Lake

Habitat Data:	
Total length of accessible habitat (ft)	4,224
Average bankfull width (ft)	18.0
Average wetted width (ft)	6.0
Total area of accessible habitat (ft²)	25,344
Estimated flow (cfs)	0.0 to 1.0

Barrier Description:	
Cumulative distance from mouth (ft)	4,224
Barrier height (ft)	30.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Multiple Falls
Barrier type	IIA2



Habitat Description: Ole Creek is a moderate gradient (3.4% slope) 3rd order stream with an "A/B" Rosgen channel type (Rosgen 1996). Streamflow in the lower 2,000 feet of Ole Creek is intermittent during low flow periods. Habitat in this segment is comprised of 4- to 8-foot-wide gravel and sand-dominated pools. This intermittent reach is a low flow migration barrier to all fish. At higher spring and fall flows, this section would be easily passable by salmonids. Upstream from the intermittent segment, Ole Creek is more confined and higher gradient. Habitat is comprised of a mixture of cobble-dominated pools, riffles, and cascades. LWD and boulder cover are abundant throughout the segment. A 30-foot-high debris jam (falls) located 4,224 feet upstream from the mouth of Ole Creek is a total barrier to the upstream migration of fish at all flows.

Source: Harza (1995)

Stream Name: Rain Creek

Reach: Yale Lake

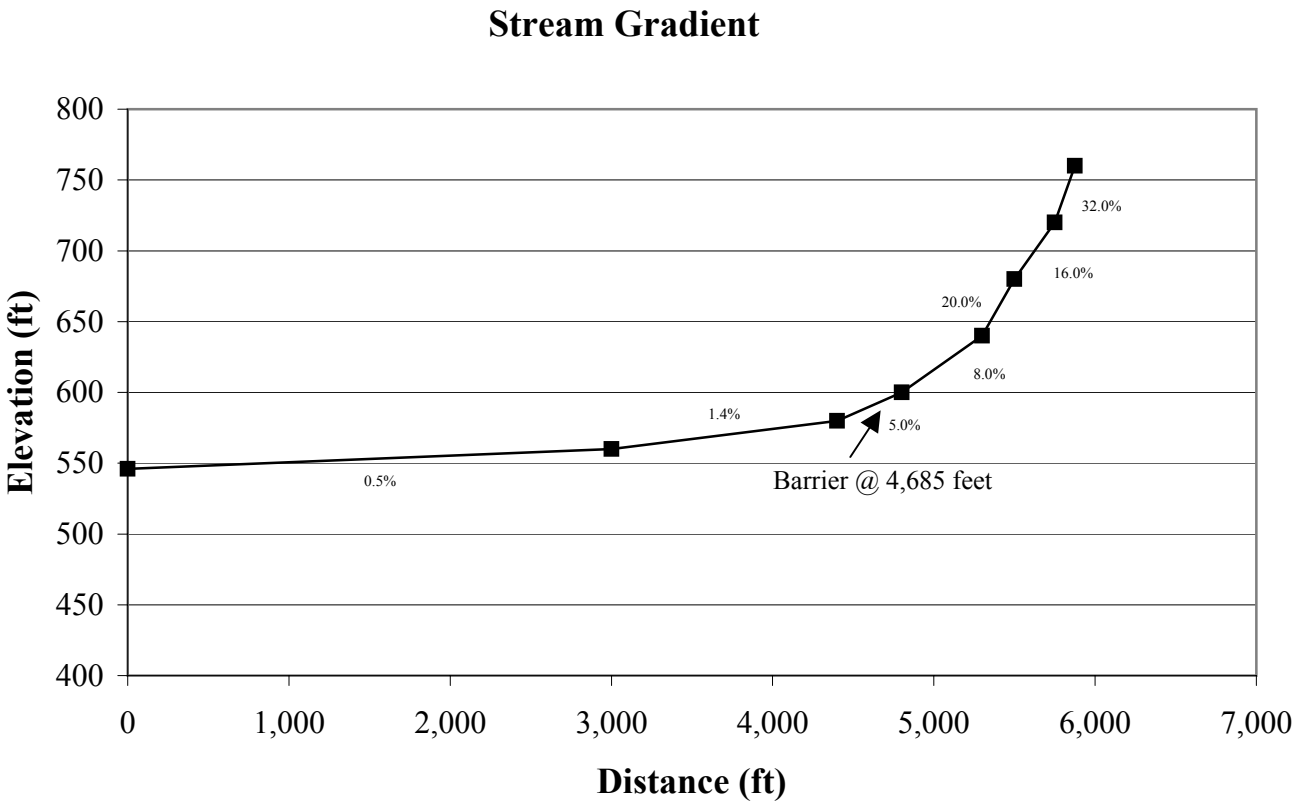
Habitat Data:

* Total length of accessible habitat (ft)	0 (4,685)
Average bankfull width (ft)	29.1
Average wetted width (ft)	0 (19.8)
Total area of accessible habitat (ft²)	0 (92,629)
Estimated flow (cfs)	0 (40 - 50) cfs

* () = Habitat data collected during high flow event.

Barrier Description:

Cumulative distance from mouth (ft)	0 (4,685)
Barrier height (ft)	approx. 40
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Compound
Barrier type	II C2



Habitat Description: Rain Creek is a small, moderate to high gradient 2nd order stream with an "A/B" Rosgen channel type (Rosgen 1996). During the summer and early fall (July through September), the lower 3,000+ feet of Rain Creek lacks surface flow (PacifiCorp 1996). In order to determine if Rain Creek contains potential anadromous fish habitat at higher flows, the lower 4,685 feet of Rain Creek was surveyed on January 1, 2000 during a high flow (rain on snow) event. During the survey, the estimated flow at the mouth of Rain Creek was approximately 40 to 50 cfs. At that flow, the fish habitat in Rain Creek was comprised of a mixture of 13-to 29 foot-wide gravel and cobble dominated riffles with occasional gravel and sand dominated pools. Depths ranged from 0.5 feet to 3.5 feet. Instream cover in the form of substrate and LWD was common throughout most of the reach. Large, deep pools also provided abundant instream cover and holding habitat. Off-channel habitat was somewhat limited. The riparian area provided excellent stream-shading. A total barrier to the upstream migration of all anadromous fish species is located 4,685 feet upstream from the mouth of Rain Creek.

Source: Harza (2000)

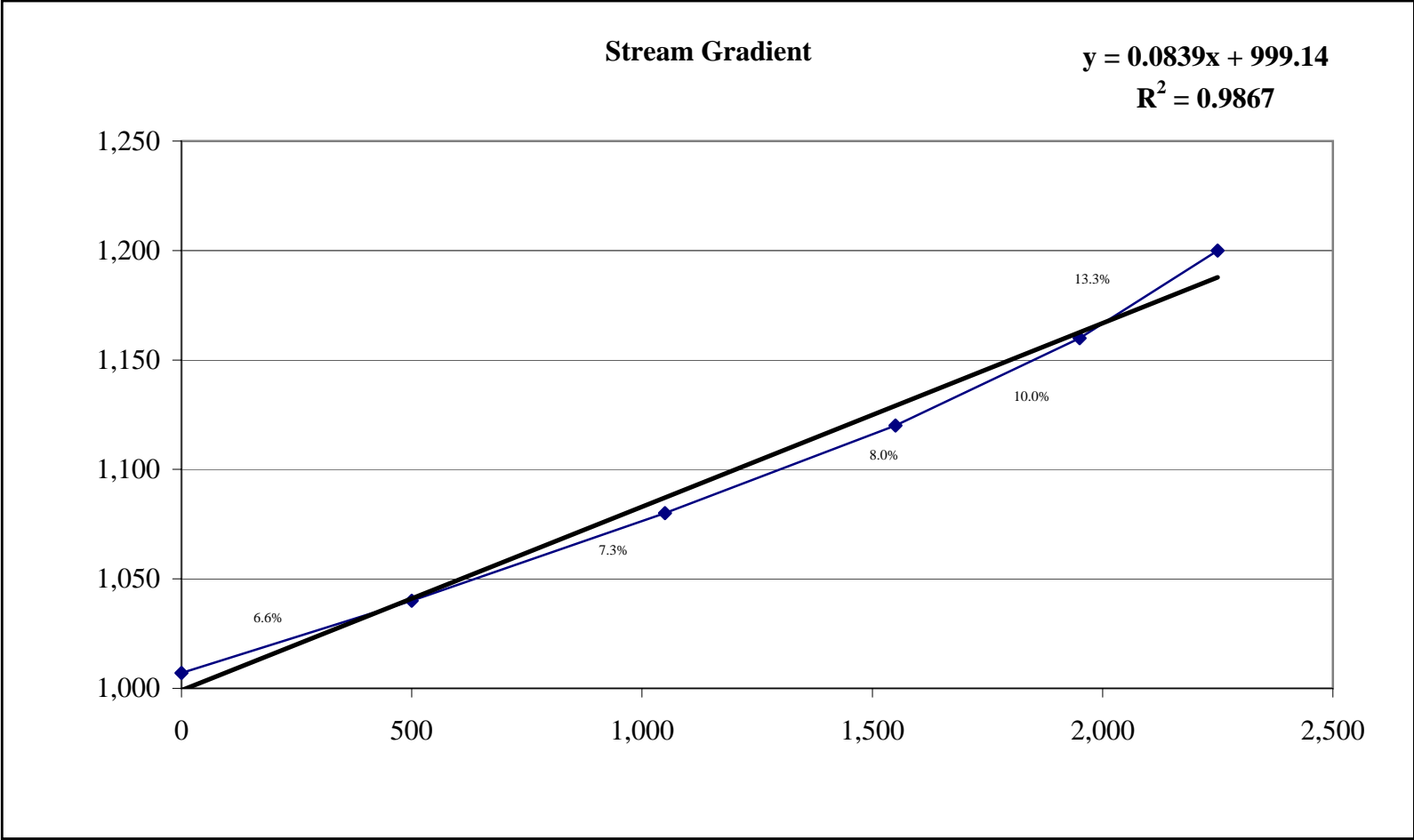
Stream Name: Swift Creek

Reach: Swift Reservoir

Habitat Data:	
Total length of accessible habitat (ft)	1,639
Average bankfull width (ft)	NA
Average wetted width (ft)	29.8
Total area of accessible habitat (ft²)	48,842
Estimated flow (cfs)	128.0

Barrier Description:	
Cumulative distance from mouth (ft)	1,639
Barrier height (ft)	80.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Swift Creek is a high gradient (8.4% slope) 4th order stream with an "A" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of Swift Creek is comprised of a mixture of high gradient riffles (52%) and pools (42%). Cobble and small boulders are the dominant substrate types. Large, stable LWD and spawning gravel is extremely limited. An 80-foot-high waterfall at 1,639 feet blocks the upstream migration of fish into the upper watershed.

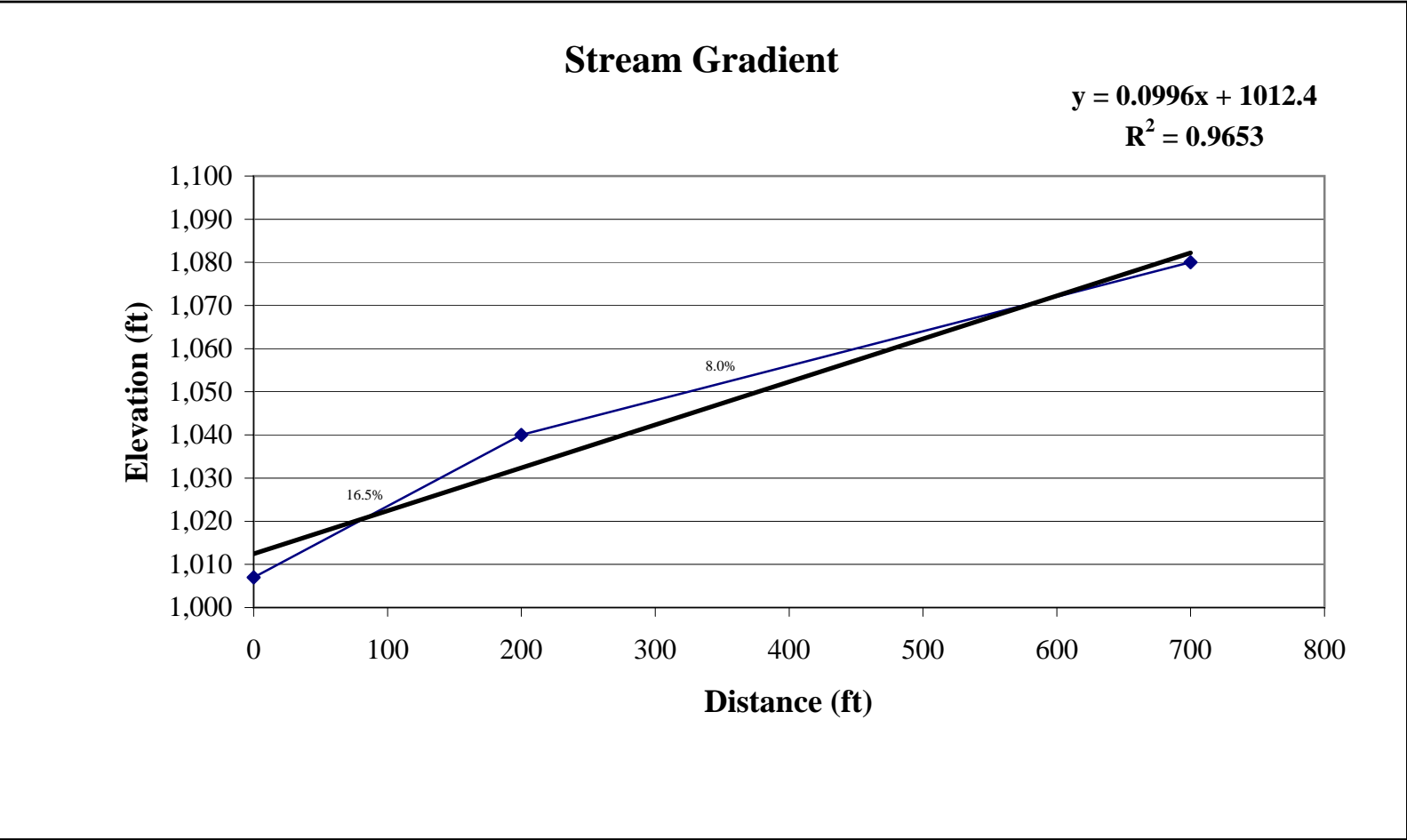
Source: USFS (1995)

Stream Name: Diamond Creek

Reach: Swift Reservoir

Habitat Data:	
Total length of accessible habitat (ft)	655
Average bankfull width (ft)	20.8
Average wetted width (ft)	4.1
Total area of accessible habitat (ft ²)	2,686
Estimated flow (cfs)	0.5

Barrier Description:	
Cumulative distance from mouth (ft)	655
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Gradient & Low Q
Barrier type	NA



Habitat Description: Diamond Creek is a high gradient (10.0% slope) 2nd order stream with an "A" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of Diamond Creek is dominated by shallow, high gradient riffles with occasional pocket pools. Cobble and small boulder are the dominant substrate types. Gravel is extremely limited. Because of its relatively short length, high gradient and low flow (0.5 cfs), Diamond Creek appears to contain only a limited amount of anadromous fish habitat. It is unlikely that a substantial number of anadromous fish would use this stream.

Source: Harza (1999)

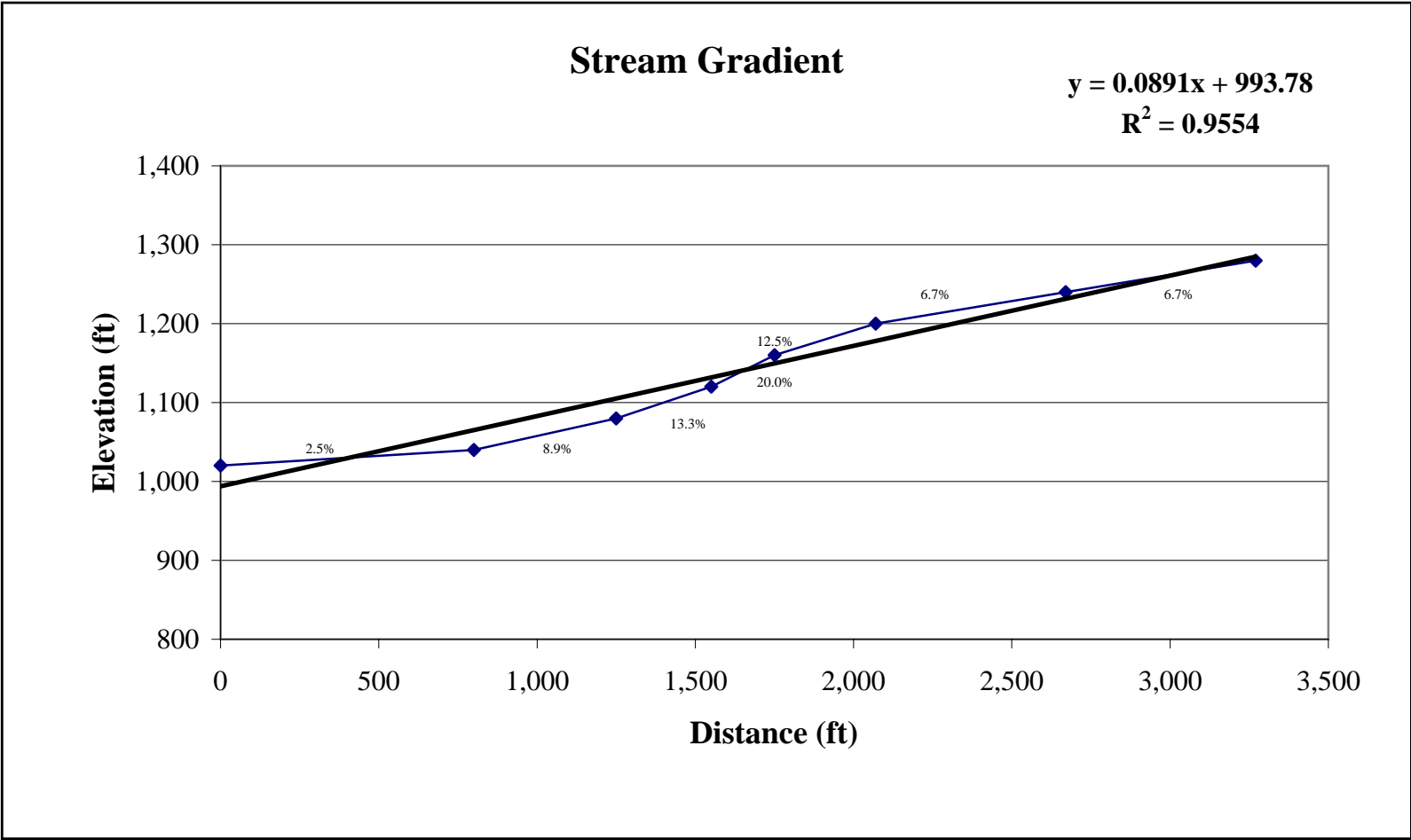
Stream Name: Range Creek

Reach: Swift Reservoir

Habitat Data:	
Total length of accessible habitat (ft)	3,486
Average bankfull width (ft)	45.1
Average wetted width (ft)	19.0
Total area of accessible habitat (ft²)	66,234
Estimated flow (cfs)	3.5

Barrier Description:	
Cumulative distance from mouth (ft)	3,486
Barrier height (ft)	50.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Range Creek is a high gradient (8.9% slope) 3rd order stream with an "A" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of Range Creek is dominated by pools (73%) and riffles (20.7%). Gravel and cobble are the dominant substrate types. The watershed has been heavily impacted by timber harvest activities. Stream shading is poor due to a lack of adequate buffers. Summer water temperatures range from 60 to 66°F.

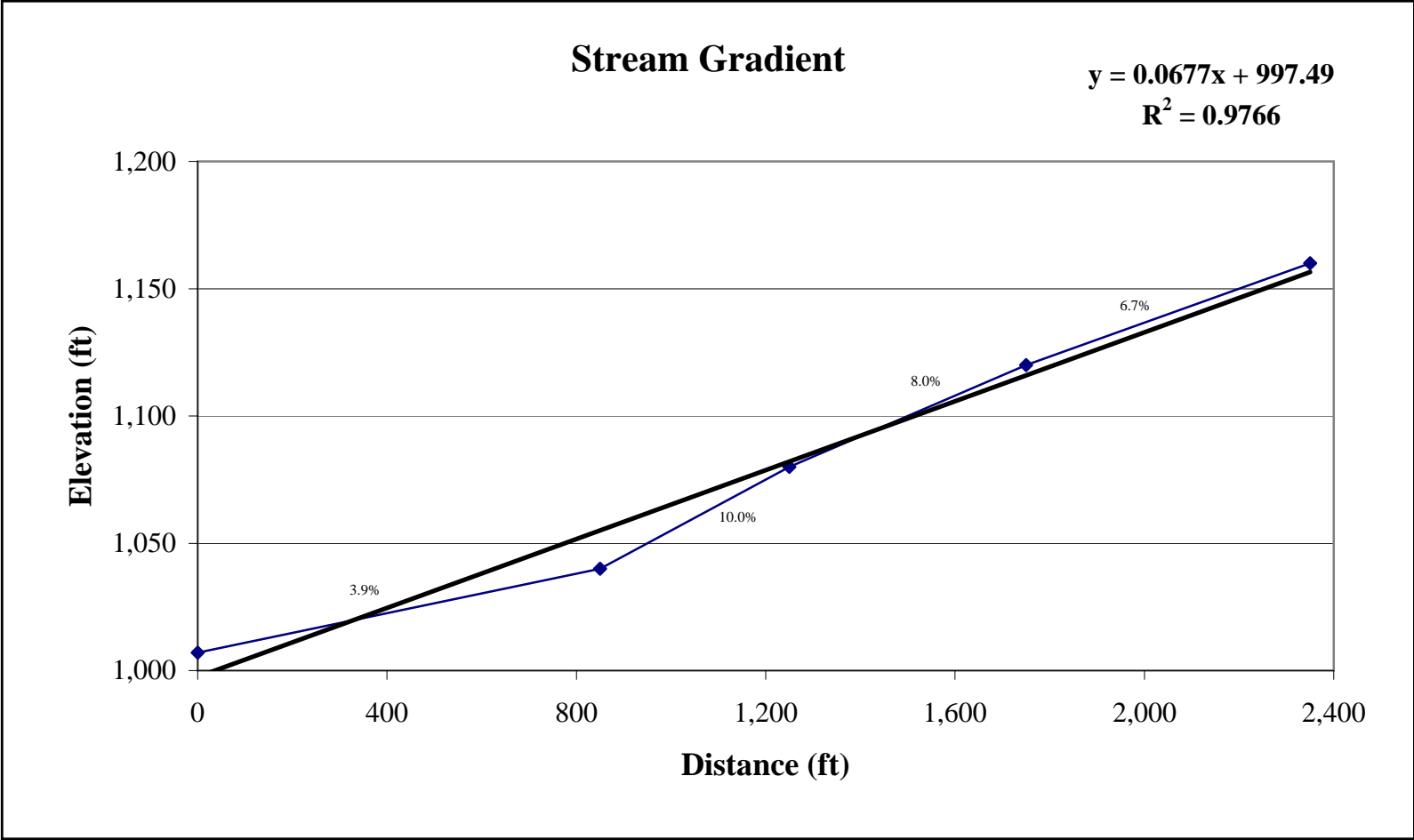
Source: USFS (1995)

Stream Name: S10

Reach: Swift Reservoir

Habitat Data:	
Total length of accessible habitat (ft)	1,855
Average bankfull width (ft)	24.7
Average wetted width (ft)	5.3
Total area of accessible habitat (ft ²)	9,832
Estimated flow (cfs)	0.5

Barrier Description:	
Cumulative distance from mouth (ft)	1,855
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Low Q
Barrier type	NA



Habitat Description: S10 (unnamed) is a high gradient (6.8% slope) 2nd order stream with an "A" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of S10 is dominated by relatively high gradient riffles with occasional pocket pools. Cobble and small boulders are the dominant substrate type. Numerous low flow migration obstacles were observed throughout the surveyed reach. These low flow obstacles would be passable at higher flows. However, summer low flows (0.5 cfs) appear to be a major limiting factor for salmonids. Overall, this stream contained very poor anadromous fish habitat.

Source: Harza (1999)

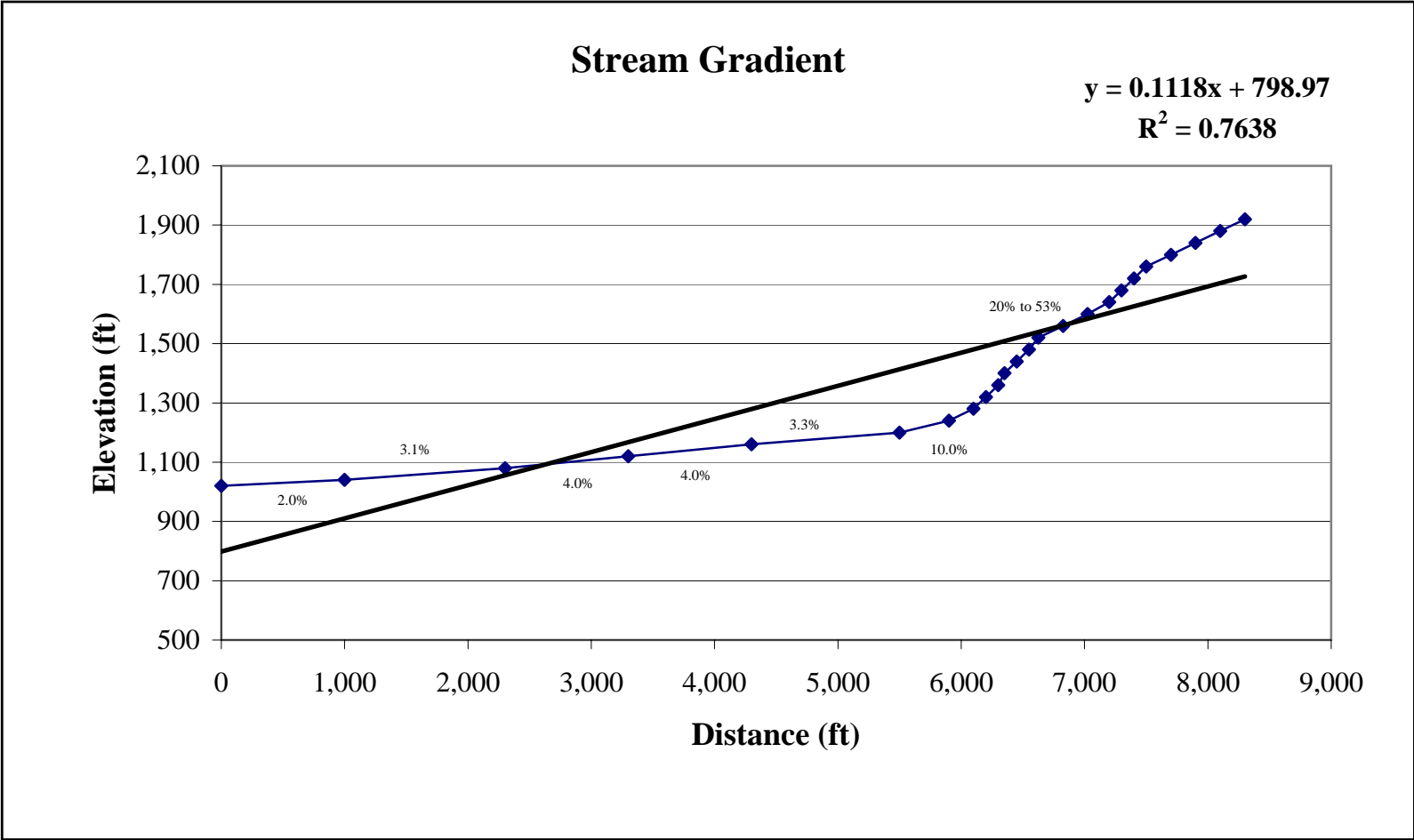
Stream Name: Drift Creek

Reach: Swift Reservoir

Habitat Data:	
Total length of accessible habitat (ft)	8,506
Average bankfull width (ft)	48.1
Average wetted width (ft)	26.7
Total area of accessible habitat (ft²)	227,110
Estimated flow (cfs)	24.6

Barrier Description:	
Cumulative distance from mouth (ft)	8,506
Barrier height (ft)	10.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



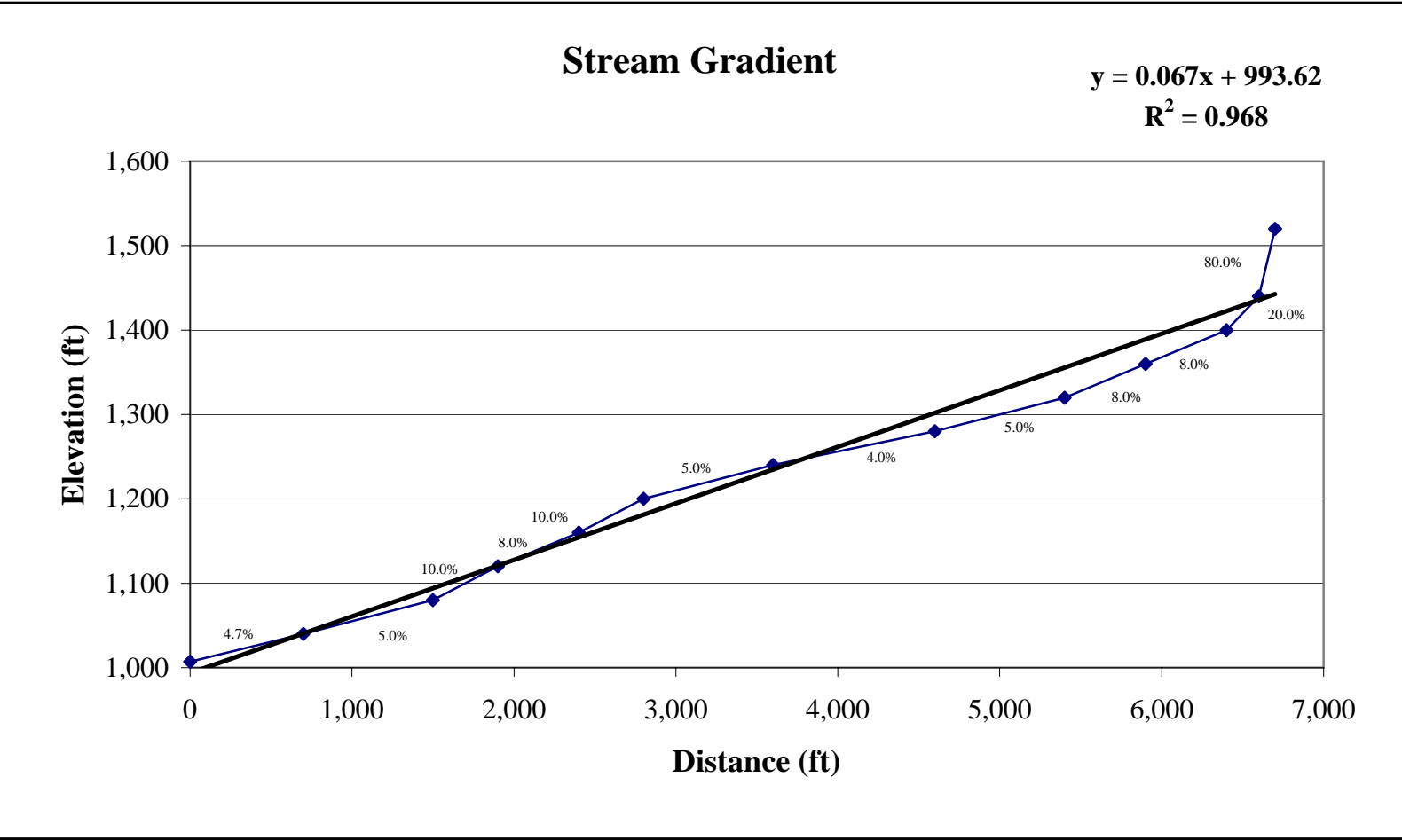
Habitat Description: Drift Creek is a moderate to high gradient (11.2% slope) 3rd order stream with an "A/B" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of Drift Creek contains an estimated 41.6 pools/mile, well above USFS Regional Standards. The streambed substrate is dominated by gravel and cobble. LWD is extremely limited. The riparian area adjacent to Drift Creek has been impacted by past timber harvest activities. Stream shading is poor; however, summer water temperatures are well within the State standard.

Source: USFS (1995)

Stream Name: S15

Reach: Swift Reservoir

Habitat Data:		Barrier Description:	
Total length of accessible habitat (ft)	6,680	Cumulative distance from mouth (ft)	6,680
Average bankfull width (ft)	29.7	Barrier height (ft)	75
Average wetted width (ft)	13.4	Plunge pool depth (ft)	NA
Total area of accessible habitat (ft²)	89,512	Horizontal jumping distance (ft)	NA
Estimated flow (cfs)	4.0	Entrance pools depth (ft)	NA
		Barrier classification	Single Falls
		Barrier type	IIA1



Habitat Description: S15 (unnamed) is a moderate gradient (6.7% slope), relatively large, 2nd order stream with an "A" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of S15 is dominated by 6- to 20-foot-wide riffles with occasional pools. Large boulders and small boulders are the dominant substrate types. However, several sections of stream channel are dominated by bedrock. Gravel is somewhat limited in S15 but does occur in the lower velocity areas of the stream. The riparian area has been heavily impacted by timber harvest activities. Consequently, summer water temperatures may be high. Overall, S15 appears to contain very good salmonid habitat, including potential coho and steelhead habitat spawning and rearing habitat.

Source: Harza (1999)



Stream Name: North Fork Lewis River

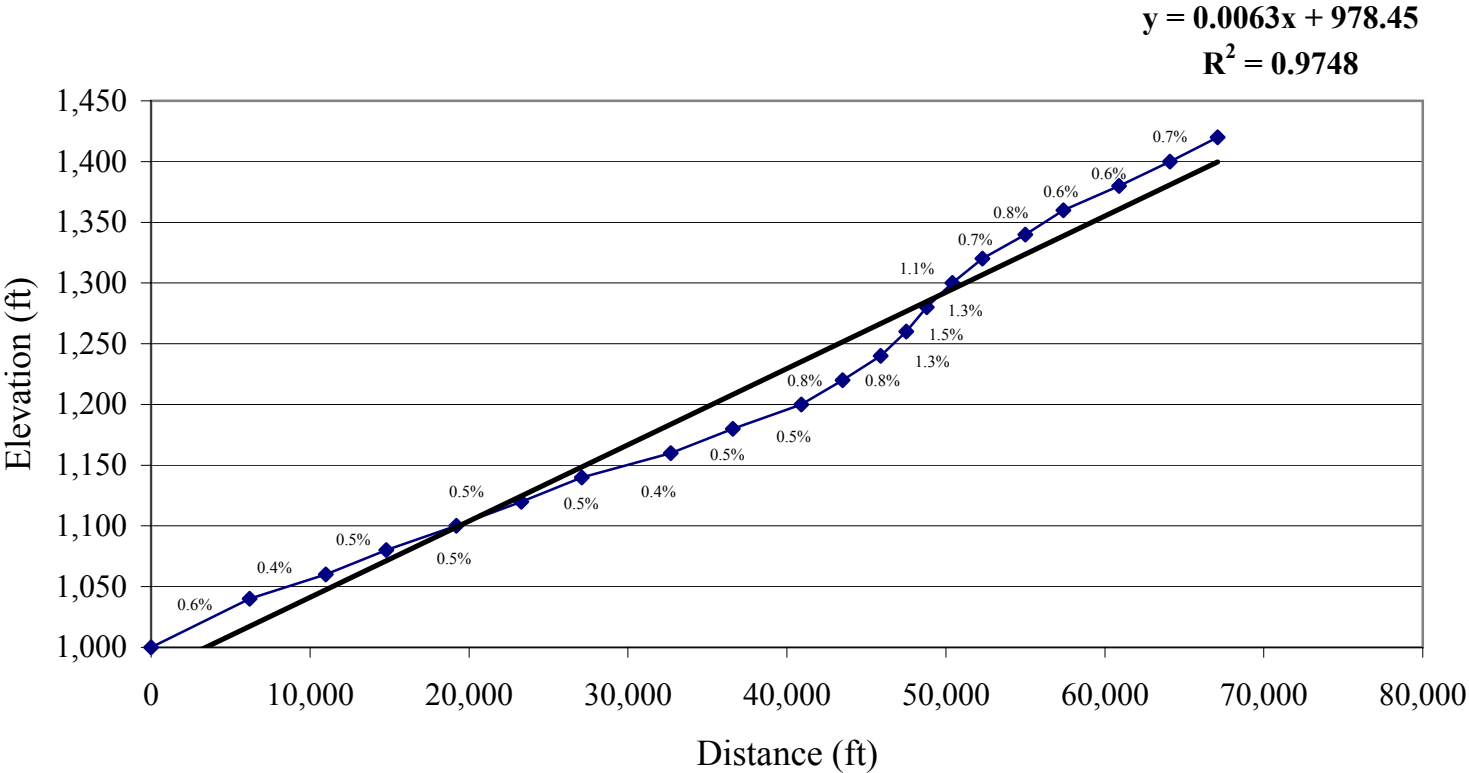
Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	69,350
Average bankfull width (ft)	187.1
Average wetted width (ft)	103.9
Total area of accessible habitat (ft ²)	7,203,509
Estimated flow (cfs)	500.0

Barrier Description:	
Cumulative distance from mouth (ft)	69,350
Barrier height (ft)	40.0
Plunge pool depth (ft)	10.0+
Horizontal jumping distance (ft)	NS
Entrance pools depth (ft)	NS
Barrier classification	Multiple Falls
Barrier type	IIA1



Stream Gradient



Habitat Description: The North Fork Lewis River upstream from Swift Reservoir contains a complex mixture of cobble and small boulder dominated riffles, deep pools and glides. High quality spawning gravel was common throughout the accessible reach. Overall, the North Fork Lewis River upstream from Swift Reservoir provides very good spring chinook, coho and steelhead spawning and rearing habitat. The Rosgen classification for the N. Fork Lewis River is predominantly "B" with some reaches classified as "G"

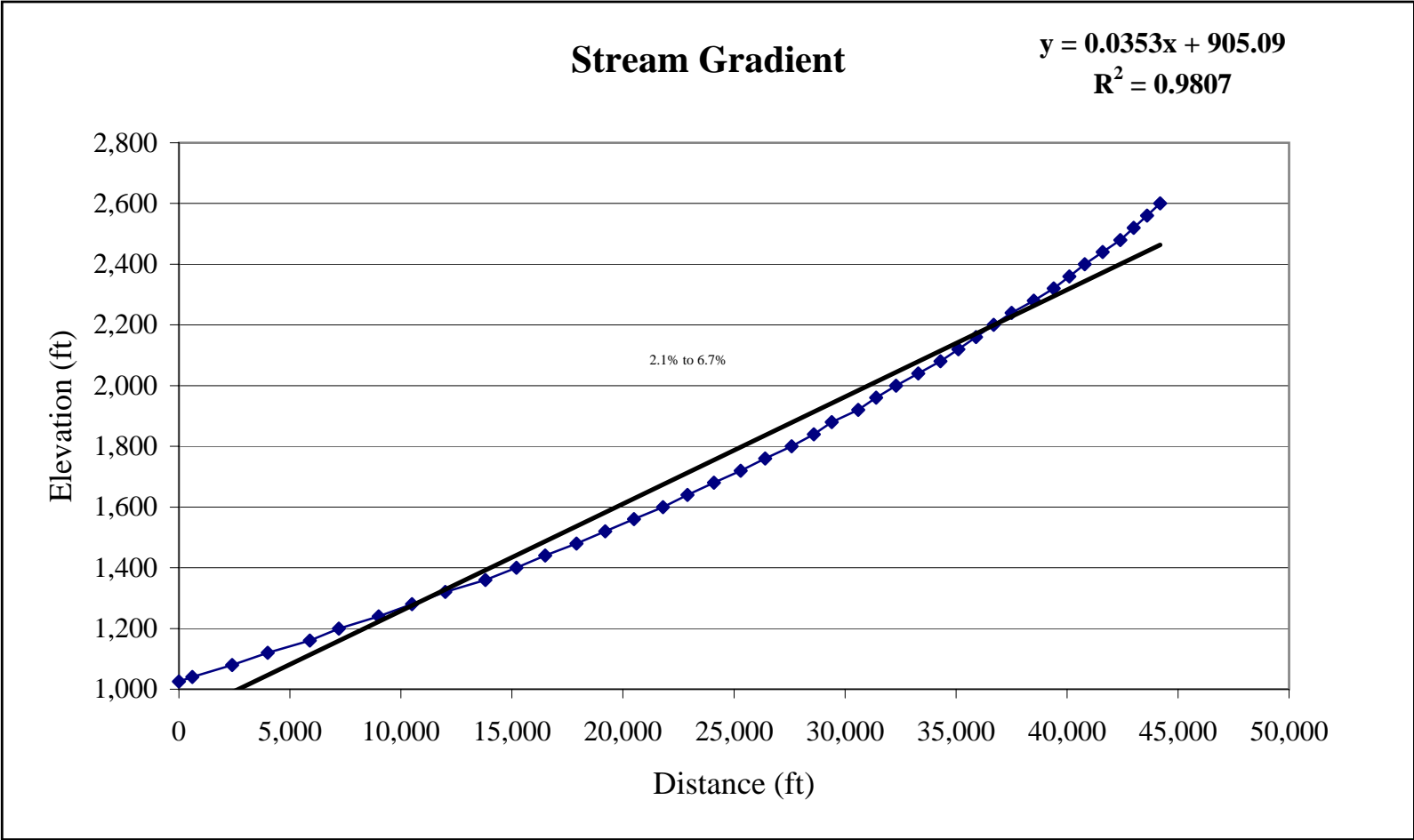
Source: Harza (1999)

Stream Name: Pine Creek (mainstem)

Reach: Pine Creek

Habitat Data:		Barrier Description:	
Total length of accessible habitat (ft)	42,240	Cumulative distance from mouth (ft)	42,240
Average bankfull width (ft)	37.5	Barrier height (ft)	NA
Average wetted width (ft)	27.5	Plunge pool depth (ft)	NA
Total area of accessible habitat (ft²)	1,161,600	Horizontal jumping distance (ft)	NA
Estimated flow (cfs)	127.8	Entrance pools depth (ft)	NA
		Barrier classification	Source
		Barrier type	NA

No Photos Available



Habitat Description: Pine Creek is a moderate gradient (3.5% slope), 3rd order stream with an "A/B" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of Pine Creek is comprised of small boulder and cobble dominated riffles. Water velocities are very fast and few pools are found in the system. LWD is also limited. The Pine Creek stream channel was heavily influenced by the 1980 eruption of Mount St. Helen's. During the eruption, a mud flow surged down Pine Creek and into the North Fork Lewis River. This catastrophic event destroyed a great deal of riparian vegetation adjacent to Pine Creek and scoured much of the channel bottom. The streambank remains relatively unstable. Today, Pine Creek is a major spawning stream for bull trout. Pine Creek also contains potential coho and steelhead habitat.

Source: USFS (1994)

Stream Name: P1

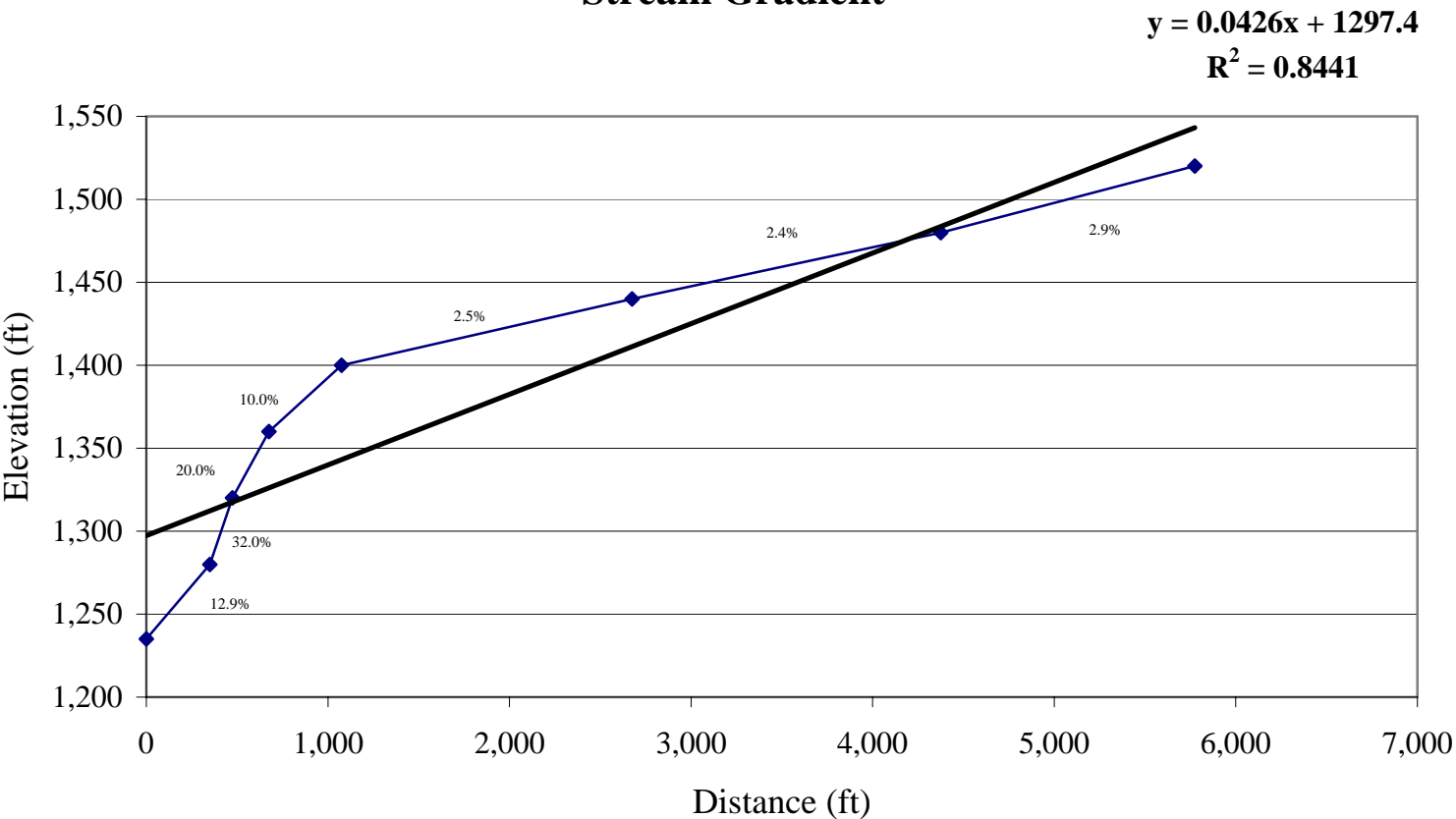
Reach: Pine Creek

Habitat Data:	
Total length of accessible habitat (ft)	4,500
Average bankfull width (ft)	10.1
Average wetted width (ft)	5.9
Total area of accessible habitat (ft ²)	26,719
Estimated flow (cfs)	1.0

Barrier Description:	
Cumulative distance from mouth (ft)	4,500
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Low Q
Barrier type	NA



Stream Gradient



Habitat Description: P1 (unnamed) is a moderate to high gradient (4.3% slope), 1st order tributary to Pine Creek with an "A/B" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of P1 is comprised of 2- to 6-foot-wide high gradient riffles with occasional pocket pools. Substrate in the higher gradient segments is dominated by cobble and small boulders. Lower gradient segments are dominated by silt and occasional gravel. Because of its high gradient and low summer flows (1.0 cfs), P1 appears to contain only a limited amount of anadromous fish habitat.

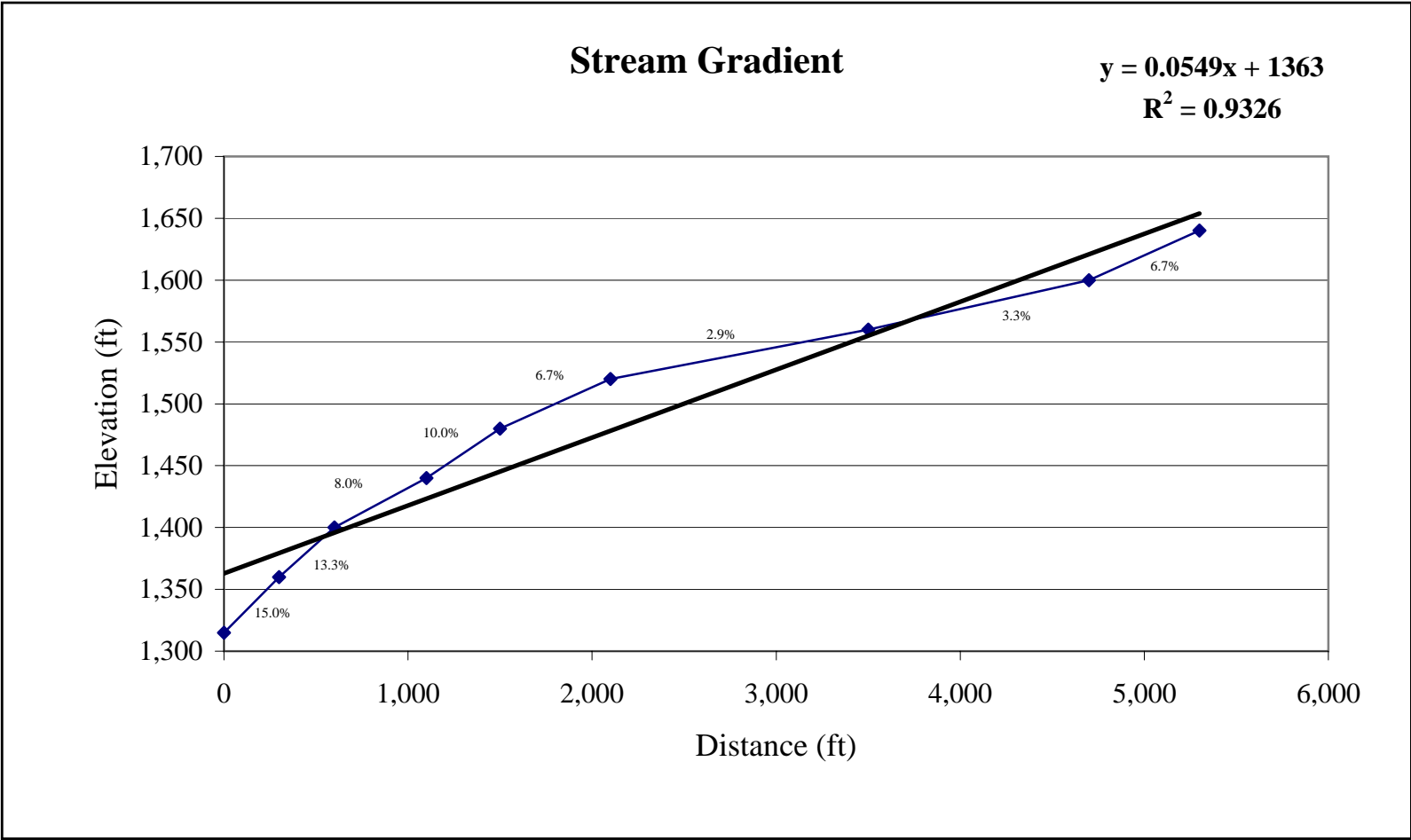
Source: Harza (1999)

Stream Name: P3

Reach: Pine Creek

Habitat Data:	
Total length of accessible habitat (ft)	5,245
Average bankfull width (ft)	10.2
Average wetted width (ft)	6.6
Total area of accessible habitat (ft²)	34,617
Estimated flow (cfs)	0.5

Barrier Description:	
Cumulative distance from mouth (ft)	5,245
Barrier height (ft)	3.5
Plunge pool depth (ft)	3.0
Horizontal jumping distance (ft)	1.0
Entrance pools depth (ft)	0.2
Barrier classification	Culvert
Barrier type	NA



Habitat Description: P3 (unnamed) is a high gradient (5.6% slope), 2nd order tributary to Pine Creek with an "A" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of P3 is comprised of 4- to 12 -foot-wide cobble and gravel dominated riffles. Low summer flows (0.5 cfs) likely limit the anadromous fish production potential of this stream. Overall, P3 contains very little anadromous fish habitat. A culvert barrier and low flows define the upper limit of accessible habitat in this small stream.

Source: Harza (1999)

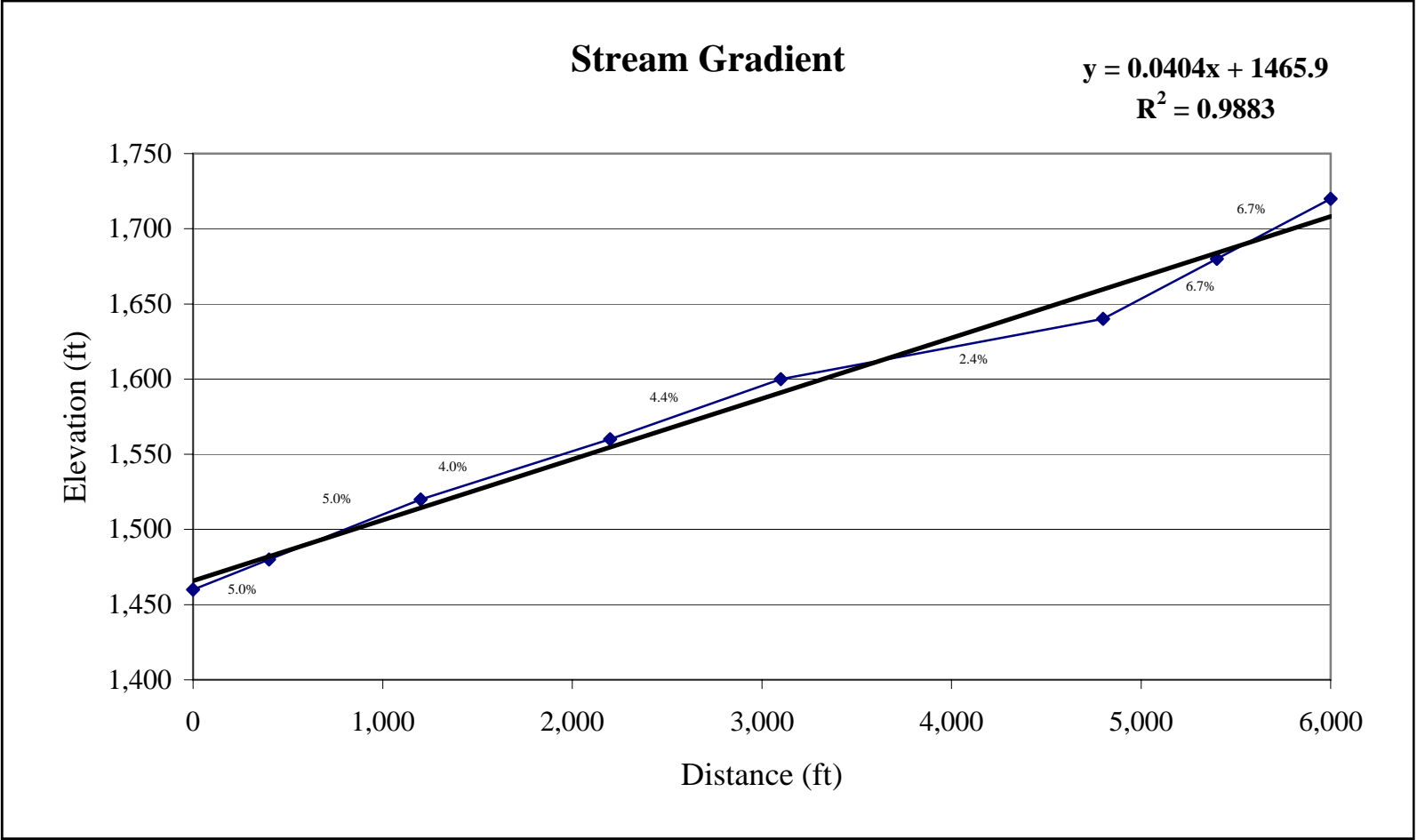


Stream Name: P7

Reach: Pine Creek

Habitat Data:	
Total length of accessible habitat (ft)	5,750
Average bankfull width (ft)	31.0
Average wetted width (ft)	12.7
Total area of accessible habitat (ft ²)	72,833
Estimated flow (cfs)	6.0

Barrier Description:	
Cumulative distance from mouth (ft)	5,750
Barrier height (ft)	6.5
Plunge pool depth (ft)	2.5
Horizontal jumping distance (ft)	5.0
Entrance pools depth (ft)	1.0
Barrier classification	Single Falls
Barrier type	IIA1



Single Falls

IIA1



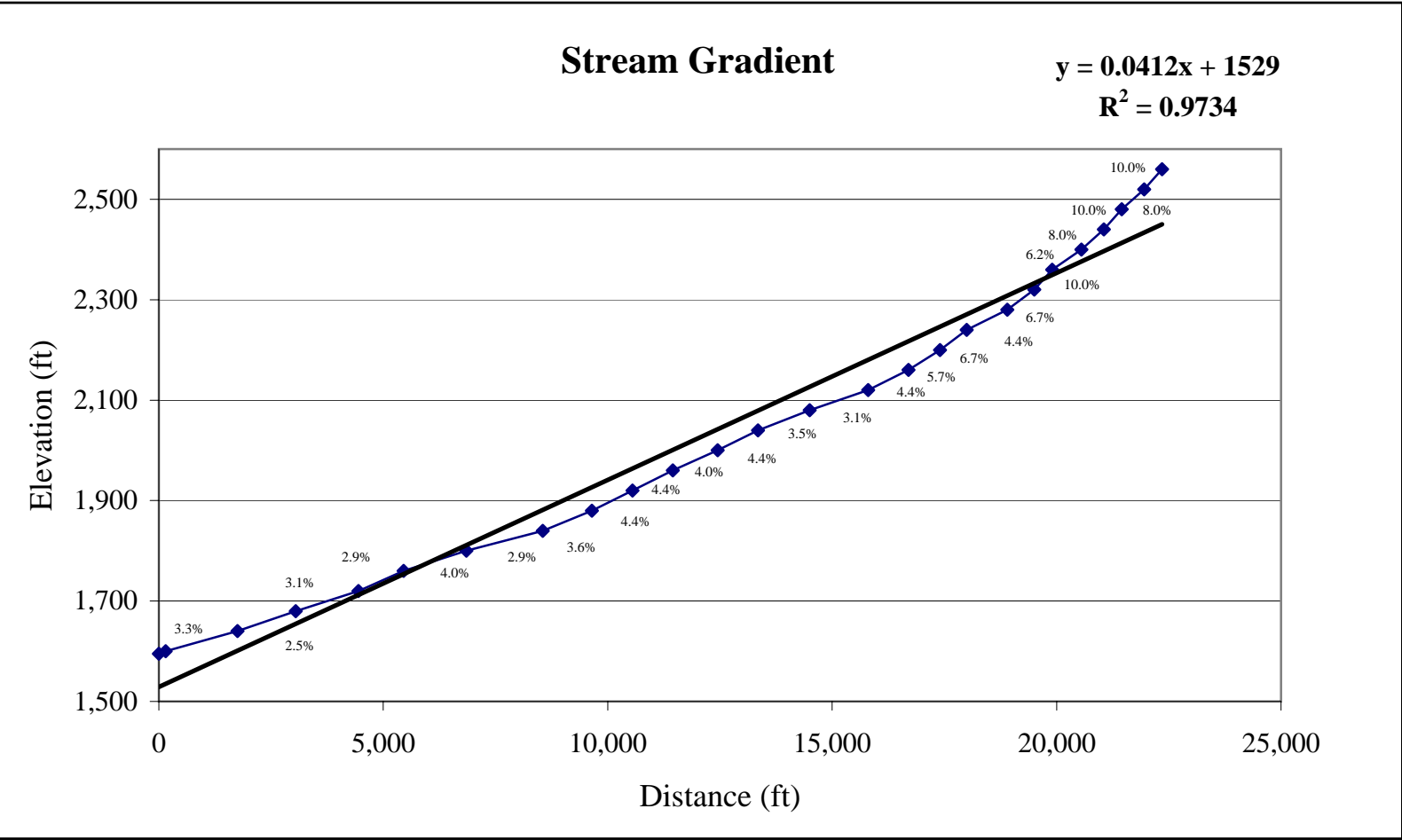
Habitat Description: P7 (unnamed) is a moderate to high gradient (4.0% slope), 2nd order tributary to Pine Creek with an "A" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of P7 is comprised of 10- to 16 -foot-wide cobble and small boulder dominated riffles and plunge pools. Gravel is also common throughout the surveyed reach. Cover in the form of substrate and depth is abundant. The stream channel appears relatively stable and stream shading is excellent. The upstream limit of anadromous fish habitat is blocked by an old logging road bridge that creates an impassable waterfall. This structure has likely been in place for 30+ years. Overall, the surveyed portion of P7 contains very good salmonid habitat, including potential coho and steelhead habitat.

Source: Harza (1999)

Stream Name: P8

Reach: Pine Creek

Habitat Data:		Barrier Description:	
Total length of accessible habitat (ft)	22,070	Cumulative distance from mouth (ft)	22,070
Average bankfull width (ft)	17.3	Barrier height (ft)	NA
Average wetted width (ft)	11.6	Plunge pool depth (ft)	NA
Total area of accessible habitat (ft²)	255,571	Horizontal jumping distance (ft)	NA
Estimated flow (cfs)	10.0	Entrance pools depth (ft)	NA
		Barrier classification	Low Q
		Barrier type	NA



Habitat Description: P8 (unnamed) is a moderate to high gradient (4.1% slope), 2nd order tributary to Pine Creek with an "A/B" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of P8 is comprised of a complex mixture of cobble and gravel dominated riffles and plunge pools. Cover in the form of LWD and overhanging vegetation is abundant. The channel appears to be relatively stable, although actively eroding streambanks were observed through the surveyed portion of the stream. The upstream limit of fish distribution is limited by low flows and high gradient. Overall, P8 contains very good anadromous fish habitat, including potential coho and steelhead habitat. Based on field observations, P8 may also support a population of bull trout.

Source: Harza (1999)

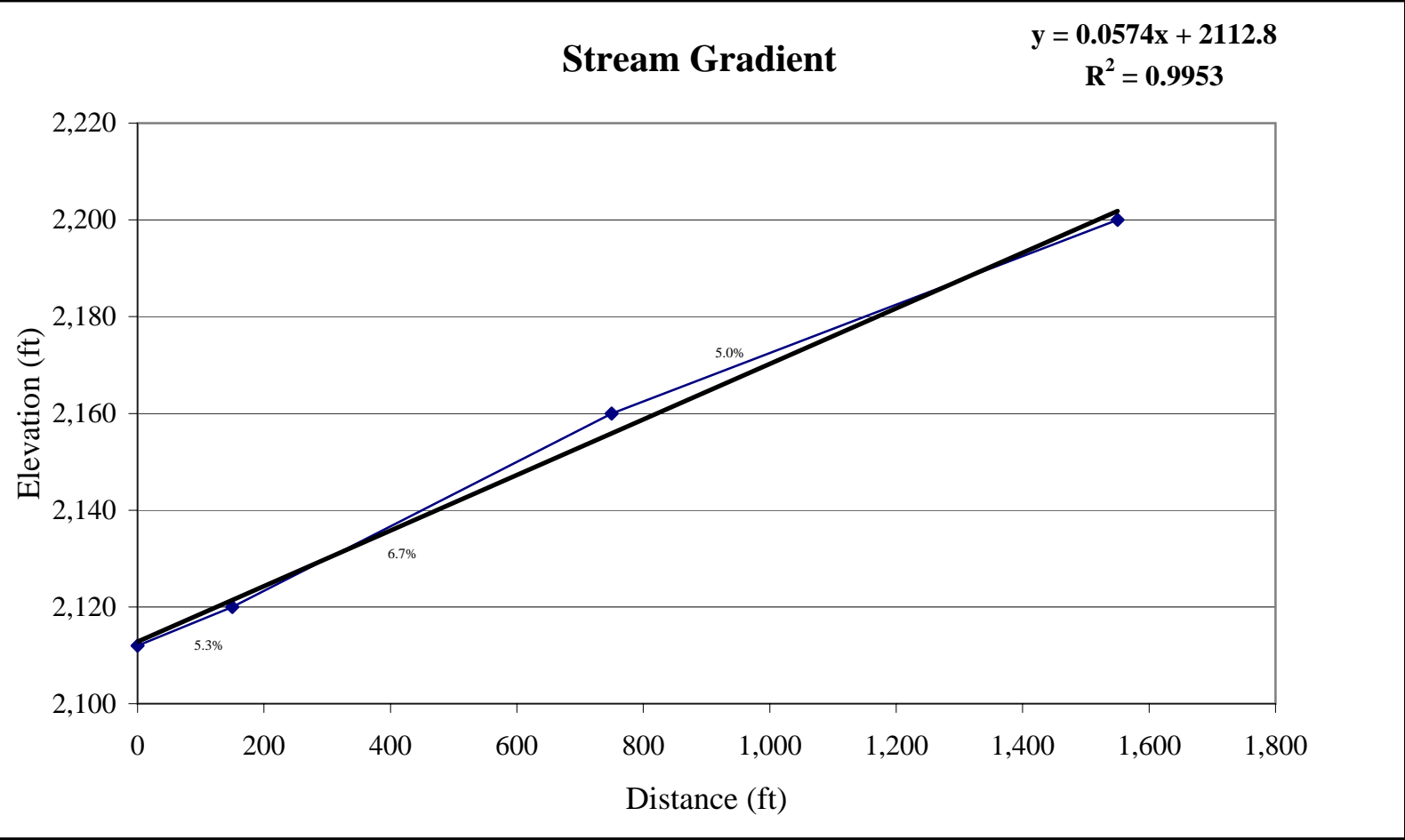
Stream Name: P10

Reach: Pine Creek

Habitat Data:	
Total length of accessible habitat (ft)	1,355
Average bankfull width (ft)	29.1
Average wetted width (ft)	20.8
Total area of accessible habitat (ft²)	28,229
Estimated flow (cfs)	12.0

Barrier Description:	
Cumulative distance from mouth (ft)	1,355
Barrier height (ft)	20
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	10
Entrance pools depth (ft)	0.1
Barrier classification	Single Falls
Barrier type	IIC2

No Photos Available



Habitat Description: P10 (unnamed) is a high gradient (5.7% slope), 2nd order tributary to Pine Creek with an "A" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of P10 is comprised of a complex mixture of 8- to 30-foot-wide cobble and small boulder dominated riffles and plunge pools. LWD is abundant throughout the reach. The stream channel appears to be relatively stable and the riparian area provides very good stream shading. Overall, this relatively short accessible reach (1,355 feet) contains very good salmonid habitat, including potential coho and steelhead habitat.

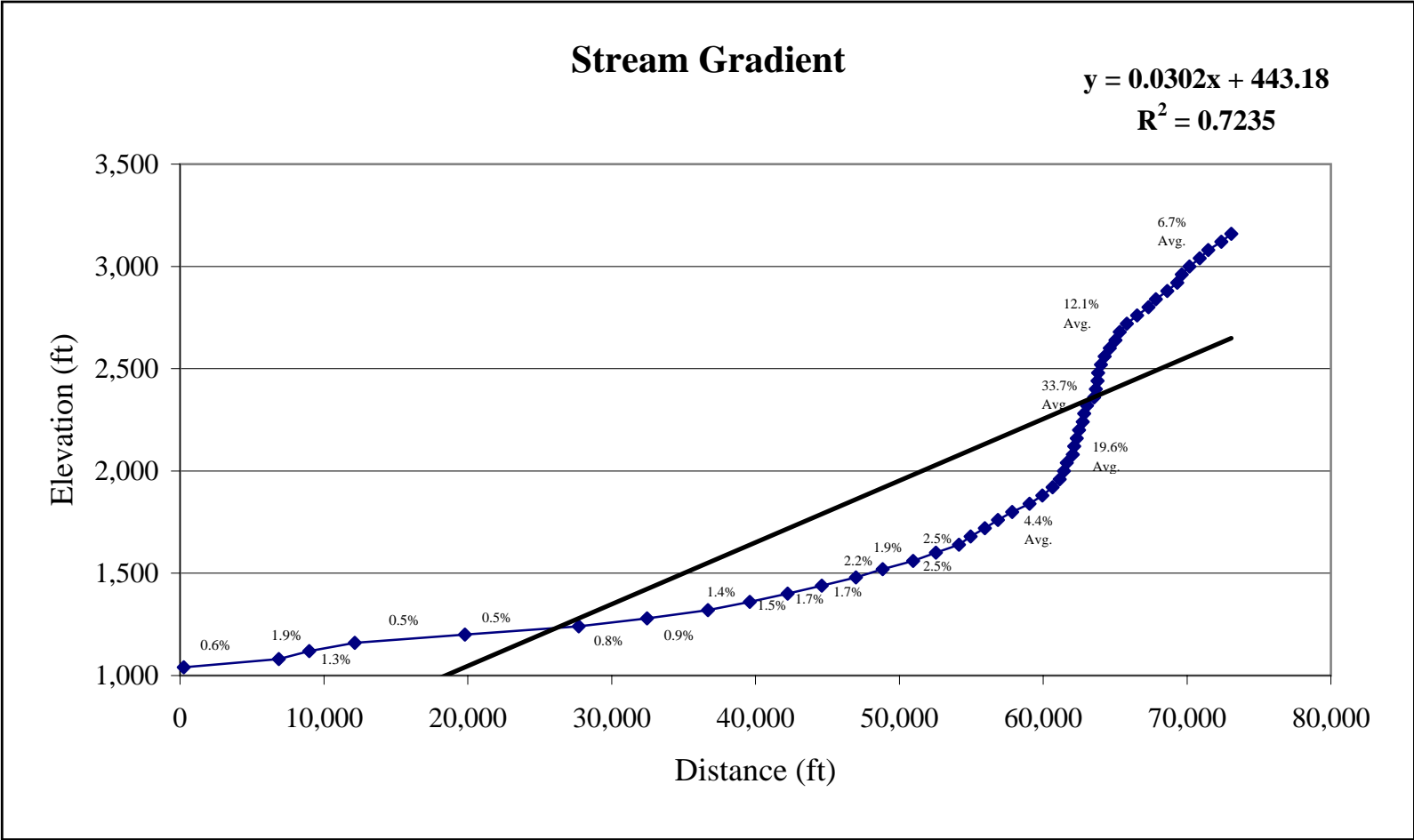
Source: Harza (1999)

Stream Name: Muddy River

Reach: North Fork Lewis River

Habitat Data:		Barrier Description:	
Total length of accessible habitat (ft)	72,864	Cumulative distance from mouth (ft)	72,864
Average bankfull width (ft)	116.3	Barrier height (ft)	20.0
Average wetted width (ft)	48.3	Plunge pool depth (ft)	NA
Total area of accessible habitat (ft²)	3,519,687	Horizontal jumping distance (ft)	NA
Estimated flow (cfs)	263.9	Entrance pools depth (ft)	NA
		Barrier classification	NA
		Barrier type	NA

No Photos Available



Habitat Description: Muddy River is a 5th order, Class II tributary to the North Fork Lewis River located approximately 1 mile upstream from Swift Reservoir. Streambed substrate is dominated by cobble and small boulder, with large amounts of fine sediment. The Muddy River is one of the drainages that channeled mudflow from the 1980 Mt. St. Helens eruption, resulting in high sediment levels and destruction of riparian vegetation. Continual sediment input from upper reaches, and a lack of spawning gravel make for poor fish habitat.

Source: USFS (1995)

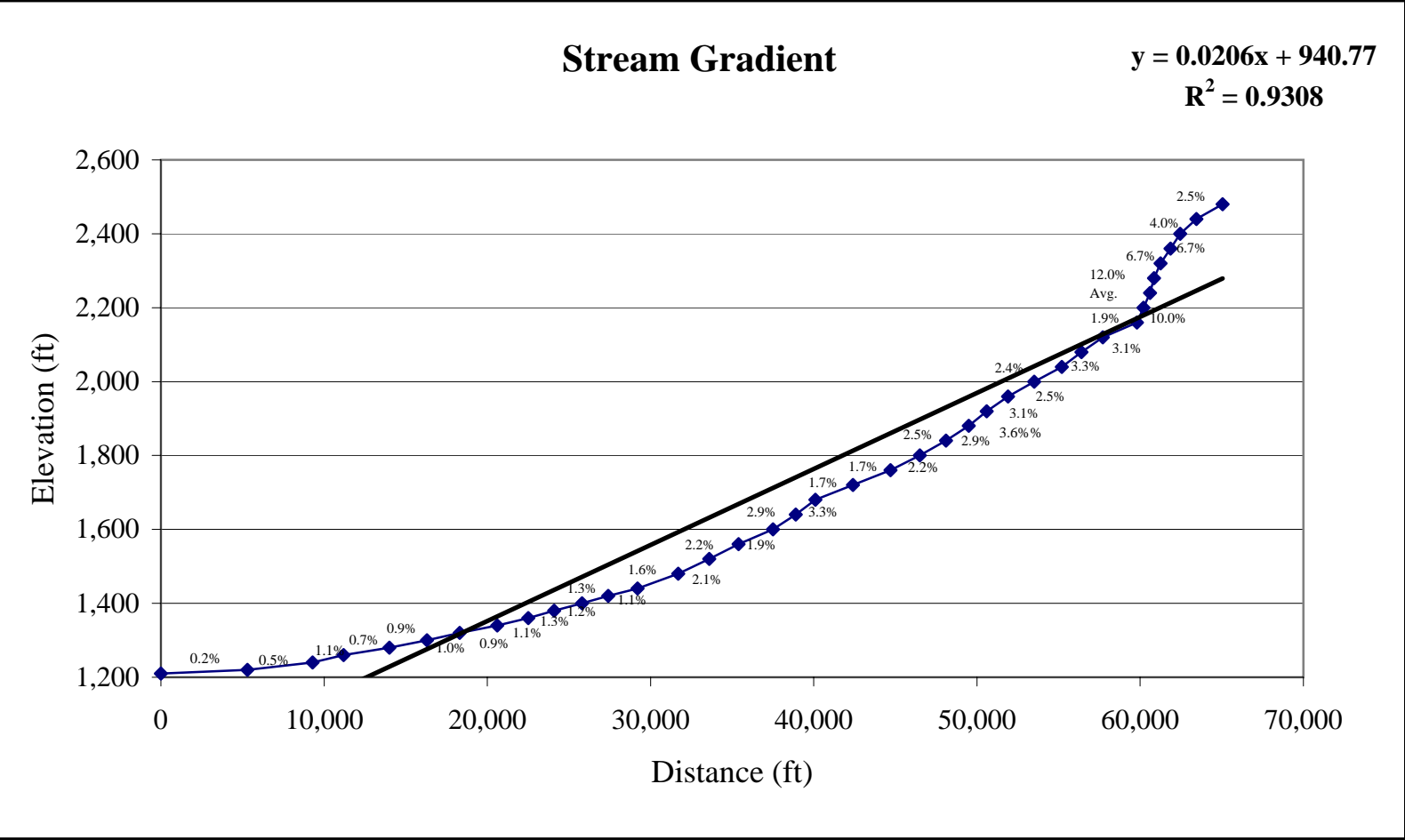
Stream Name: Clear Creek

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	65,050
Average bankfull width (ft)	NA
Average wetted width (ft)	35.9
Total area of accessible habitat (ft²)	2,335,050
Estimated flow (cfs)	54.6

Barrier Description:	
Cumulative distance from mouth (ft)	65,050
Barrier height (ft)	12.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Clear Creek is a 3rd order, Class II tributary to the Muddy River. Streambed substrate is dominated by gravel and cobble. Riparian vegetation is predominantly Alder and Douglas Fir with limited understory due to lack of channel stability. Spawning habitat is limited due to high flow events and a lack of stream structure to hold gravel. Previous efforts (USFS 1989) to enhance fish habitat have failed due to installed structures failing to remain anchored. The 12' high falls at RM 11 was the upstream limit of fish distribution in Clear Creek (USFS 1997).

Source: USFS (1997)

Stream Name: Clearwater Creek

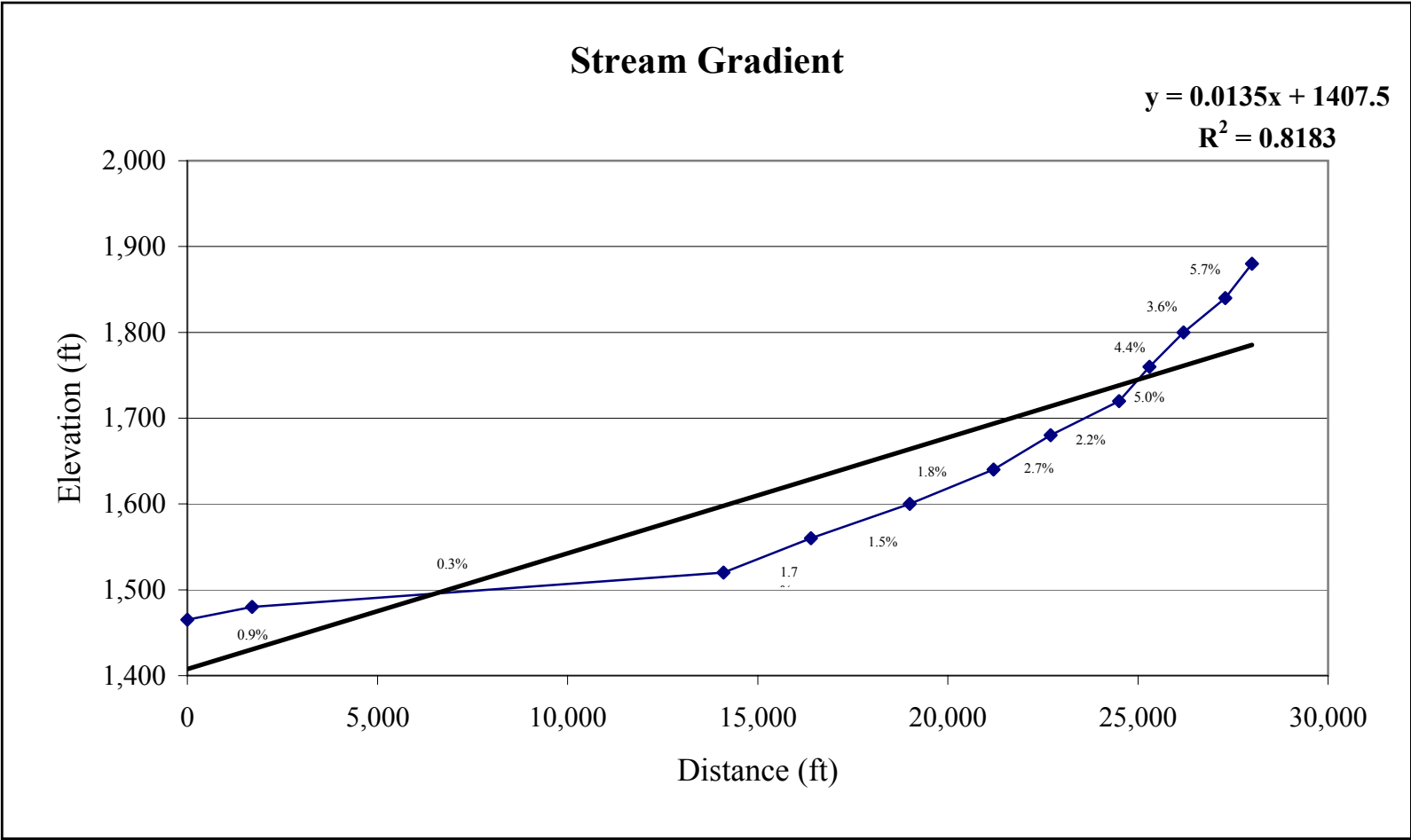
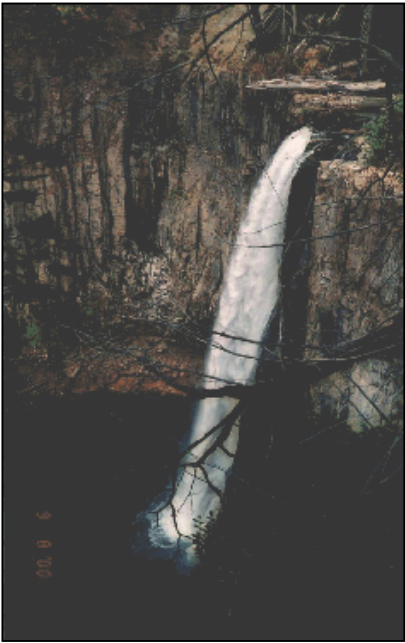
Reach: North Fork Lewis River

Habitat Data:

Total length of accessible habitat (ft)	27,456
Average bankfull width (ft)	155.7
Average wetted width (ft)	53.1
Total area of accessible habitat (ft²)	1,459,090
Estimated flow (cfs)	25

Barrier Description:

Cumulative distance from mouth (ft)	27,456
Barrier height (ft)	80 Paradise Falls
Plunge pool depth (ft)	10+
Horizontal jumping distance (ft)	20.0
Entrance pools depth (ft)	2.0
Barrier classification	Single Falls
Barrier type	IIA1



Habitat Description: Clearwater Creek is a relatively low gradient (1.4%) 4th order tributary to the Muddy River with an C/B Rosgen channel type (Rosgen 1996). Fish habitat in the accessible portion of Clearwater Creek is comprised of 20- to 70-foot-wide low gradient riffles, pools, and glides. The substrate is dominated by sand, gravel and cobble. The channel appears to be heavily impacted by the 1980 eruption of Mt. Saint Helens. LWD (from the eruption) is abundant downstream from the confluence of Bean Creek providing very good cover and deep pools. The riparian area consists of mainly young alder. Stream shading is relatively poor. High quality spawning gravel is abundant throughout the surveyed portion of the stream.

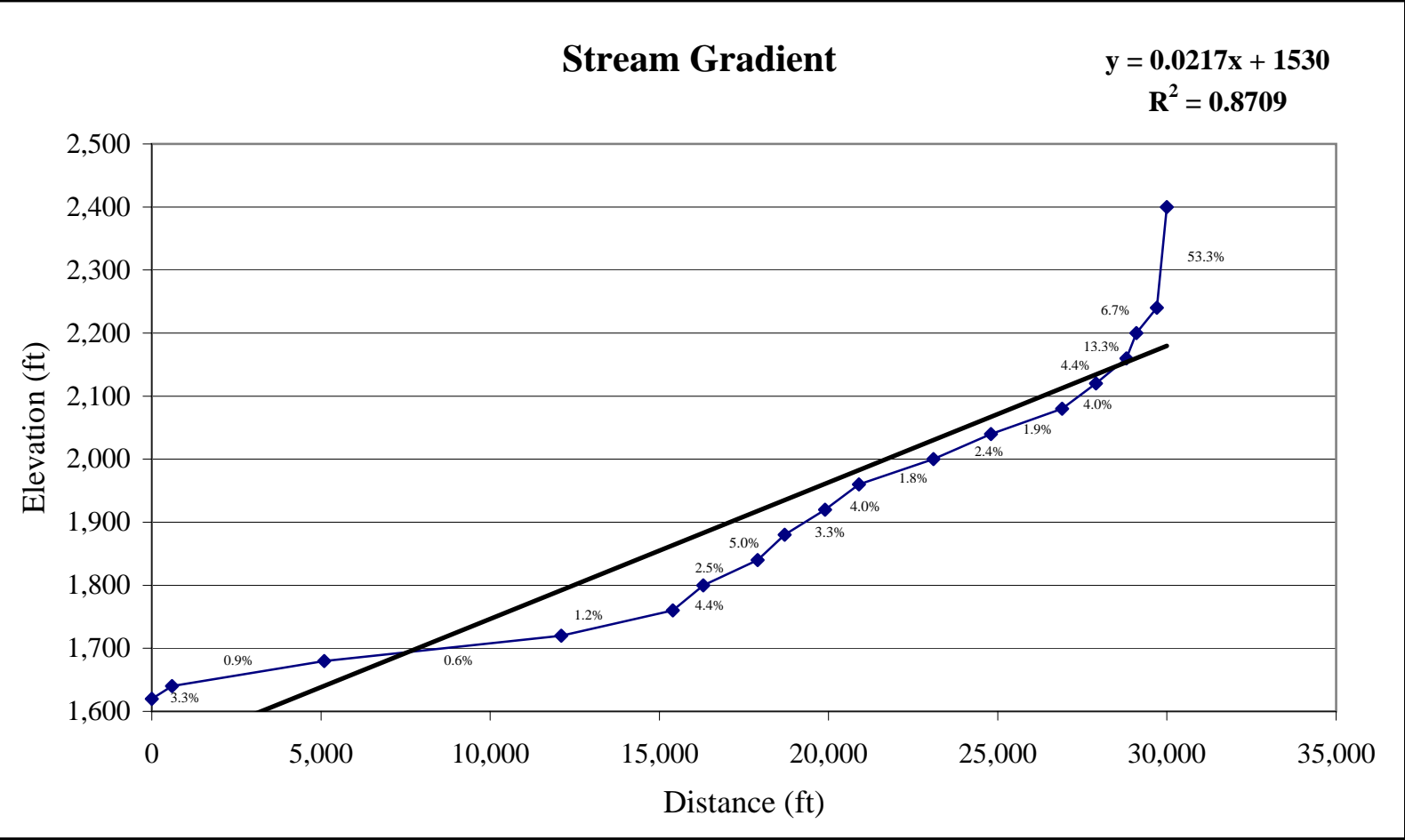
Stream Name: Smith Creek

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	30,269
Average bankfull width (ft)	NA
Average wetted width (ft)	17.8
Total area of accessible habitat (ft²)	537,477
Estimated flow (cfs)	20.2

Barrier Description:	
Cumulative distance from mouth (ft)	30,269.0
Barrier height (ft)	40.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Smith Creek is a 4th order, Class II tributary to the Muddy River. Streambed substrate is gravel/cobble/fines. The 1980 Mt. St. Helens eruption played major havoc with this system, degrading vegetation and bank/channel stability. This system remains unstable with continued sediment input from upstream. Riparian vegetation is limited with Alder and Douglas Fir dominating what exists. Habitat surveyors found a lack of suitable habitat for all stages of bull trout.

Source USFS (1998)

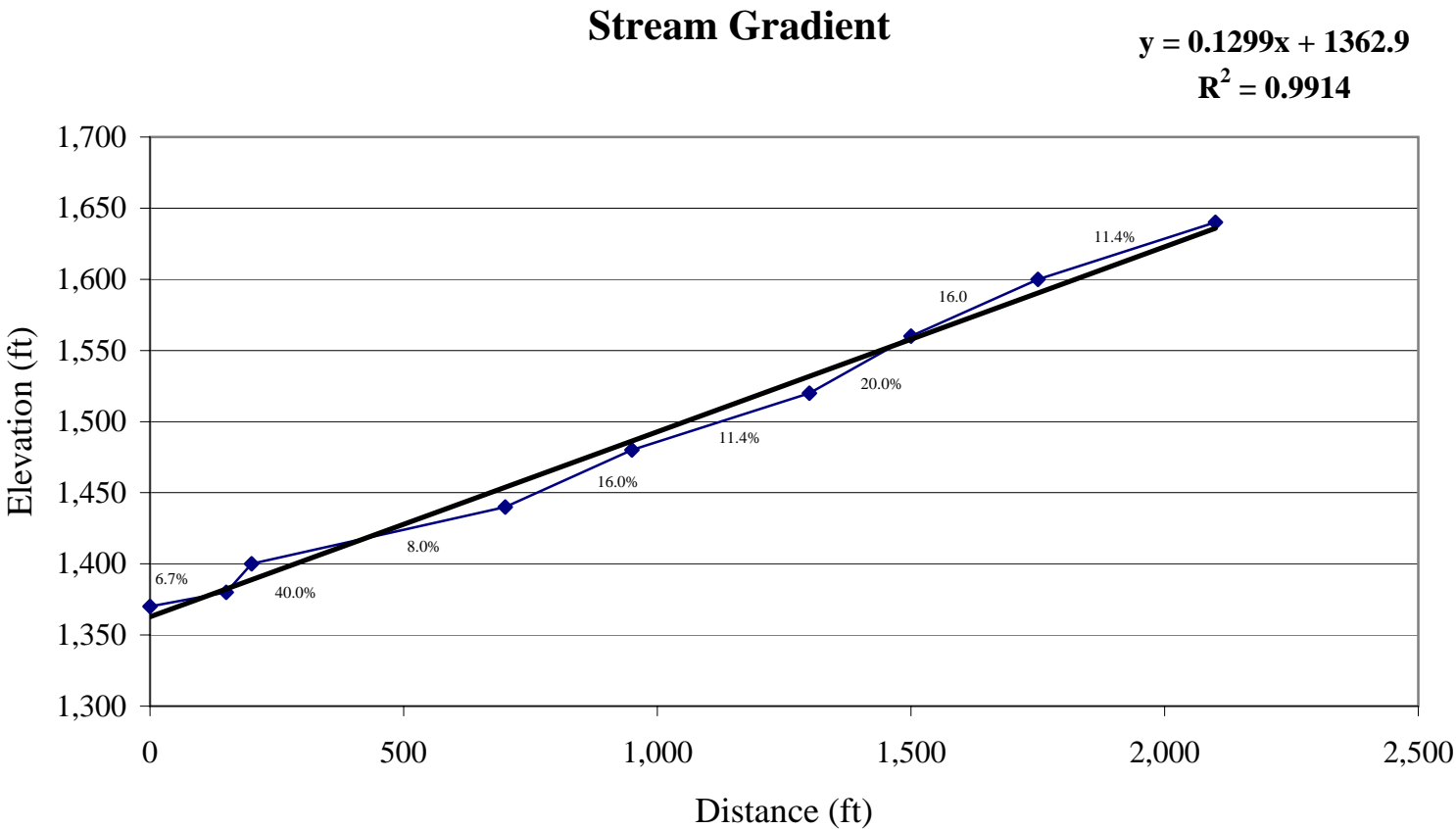
Stream Name: U8

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	1,819
Average bankfull width (ft)	15.7
Average wetted width (ft)	2.7
Total area of accessible habitat (ft²)	4,911
Estimated flow (cfs)	0.2

Barrier Description:	
Cumulative distance from mouth (ft)	1,819
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Low Q
Barrier type	NA

No Photos Available



Habitat Description: U8 is a small, unnamed tributary to the North Fork Lewis River that has very low flow, and goes sub-surface approximately 850 feet upstream from its confluence. Streambed substrate is small boulder/cobble. Riparian vegetation is well established and shades the creek effectively. The lower 800 feet of creek has some potential as useable habitat at correct flows (narrow range).

Source: Harza (1999)

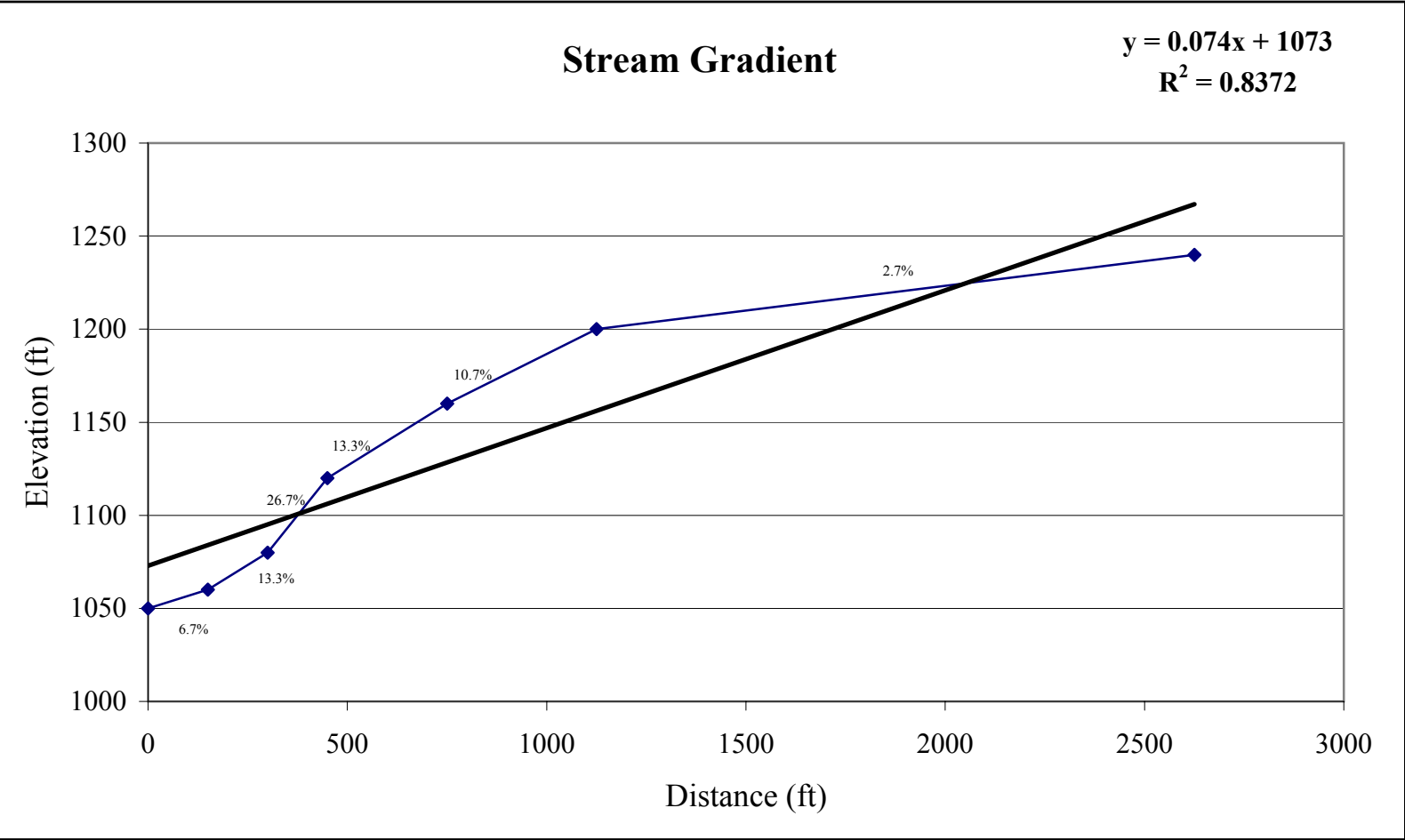
Stream Name: Pepper Creek

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	2,112
Average bankfull width (ft)	27.5
Average wetted width (ft)	10.1
Total area of accessible habitat (ft²)	21,331
Estimated flow (cfs)	1.5

Barrier Description:	
Cumulative distance from mouth (ft)	2,112.0
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Pepper Creek is a low gradient, low flow tributary to the Lewis River. This combination provides a very stable stream environment. Habitat is predominantly riffle, with frequent pocket pools. Riparian vegetation is well established with a heavy canopy and understory. Spawning gravel is found frequently throughout the creek. Dominant streambed substrate is cobble/boulder. Due to low discharge Pepper Creek will probably never support large fish, but is a good source of cutthroat trout for the Lewis River.

Source USFS (1989)

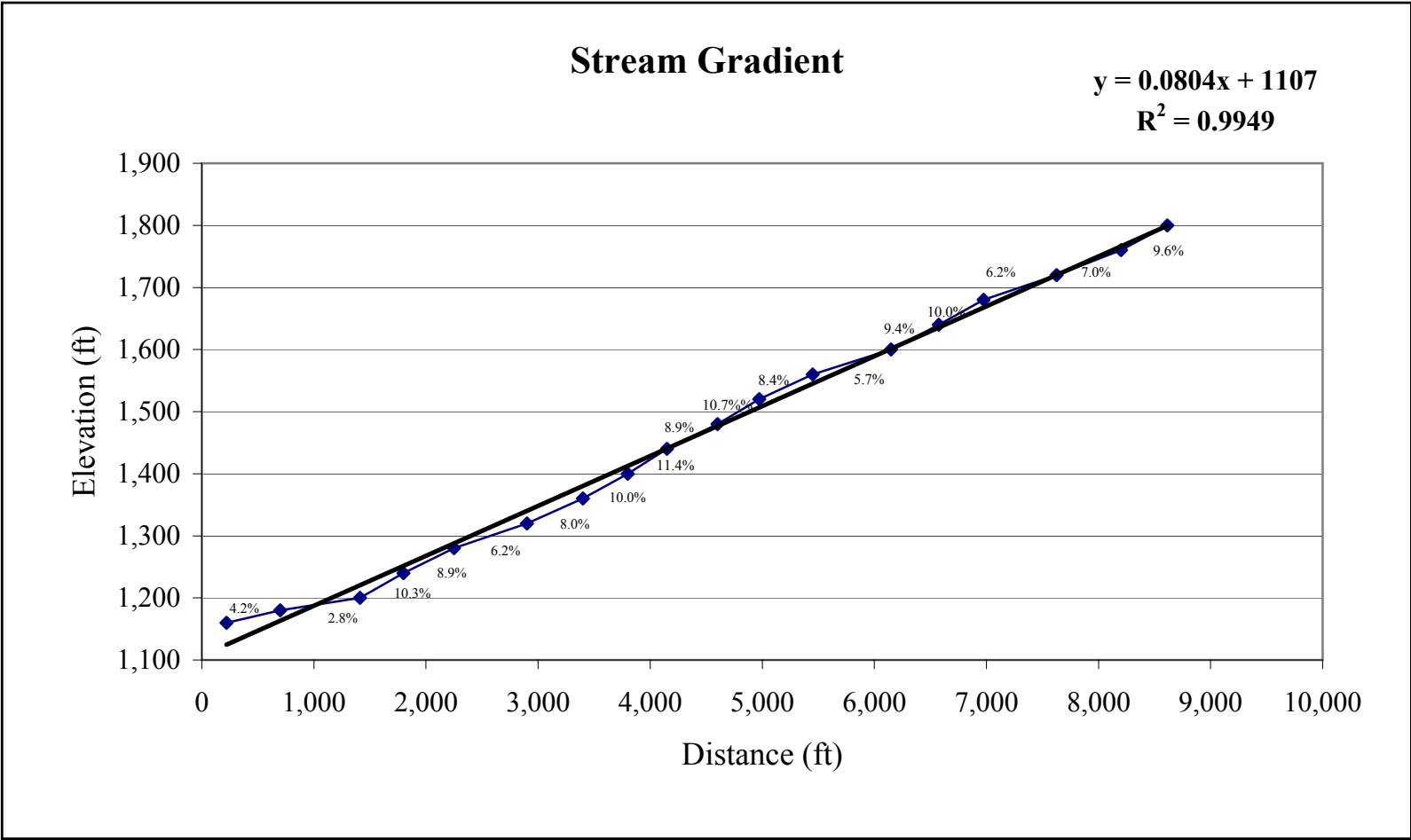
Stream Name: Rush Creek

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	8,976
Average bankfull width (ft)	54.3
Average wetted width (ft)	25.9
Total area of accessible habitat (ft²)	232,168
Estimated flow (cfs)	100.0

Barrier Description:	
Cumulative distance from mouth (ft)	8,976.0
Barrier height (ft)	70.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Rush Creek is a 4th order tributary to the North Fork Lewis River. Streambed substrate is dominated by small boulder and cobble. Riparian vegetation is well established with old growth conifer forests and sapling/pole alder. Pool frequency is high. Rush Creek supports populations of bull, brook and cutthroat trout, and also whitefish. Woody debris is plentiful and fairly stable. Spawning habitat appears to be limited due to high velocity.

Source: USFS (1994)

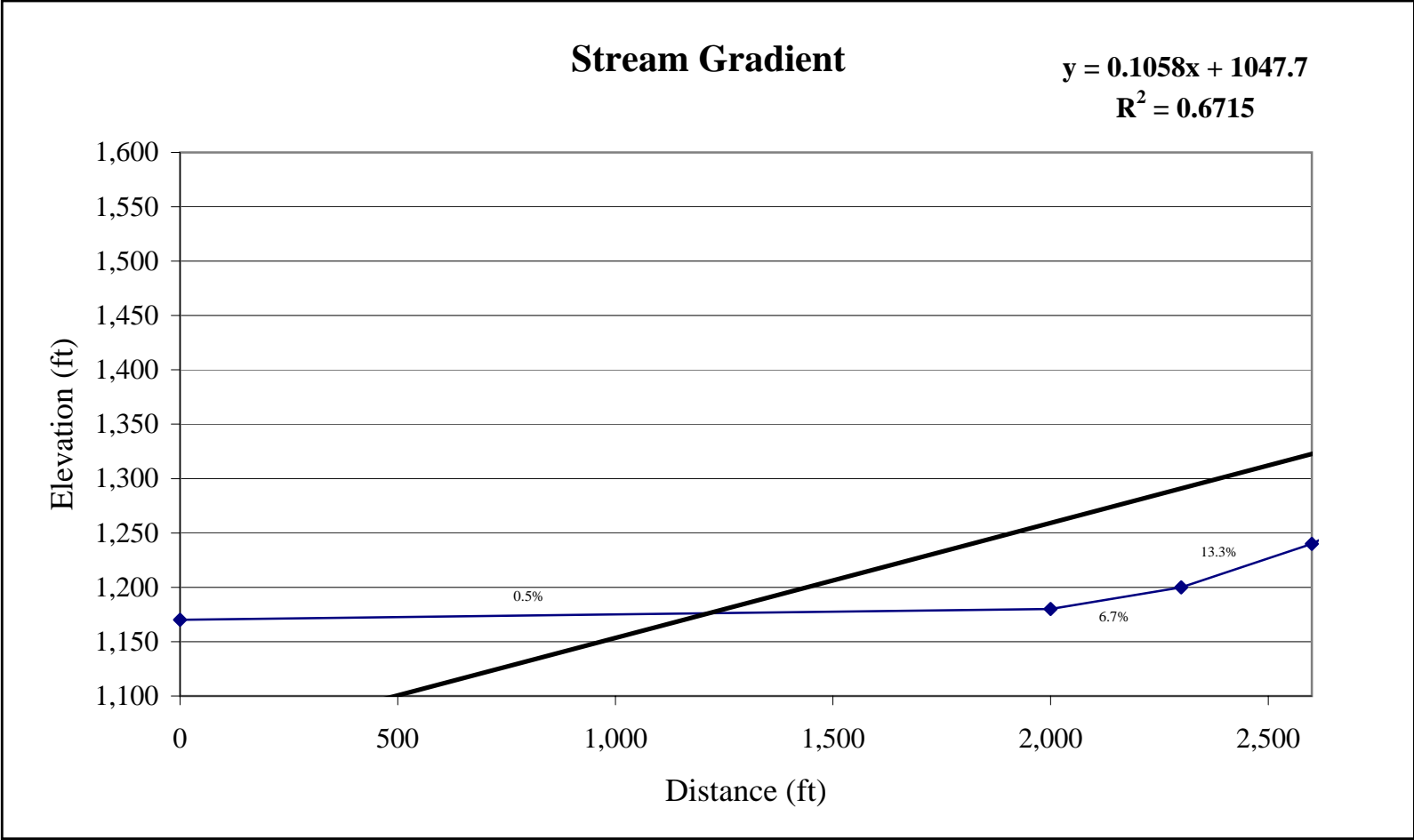
Stream Name: Little Creek

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	1,600
Average bankfull width (ft)	NA
Average wetted width (ft)	10.1
Total area of accessible habitat (ft²)	16,160
Estimated flow (cfs)	20.3

Barrier Description:	Habitat
Cumulative distance from mouth (ft)	NA
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Little Creek is a 3rd order tributary to the North Fork Lewis River. Streambed substrate is dominated by sand and silt. Riparian vegetation is predominantly grasses and sedges in this pool dominated creek. The surveyed reach could be classified as a wetland meadow with no spawning habitat and limited fish habitat in the pools. USFS survey ended before encountering a migration barrier.

Source USFS (1990)

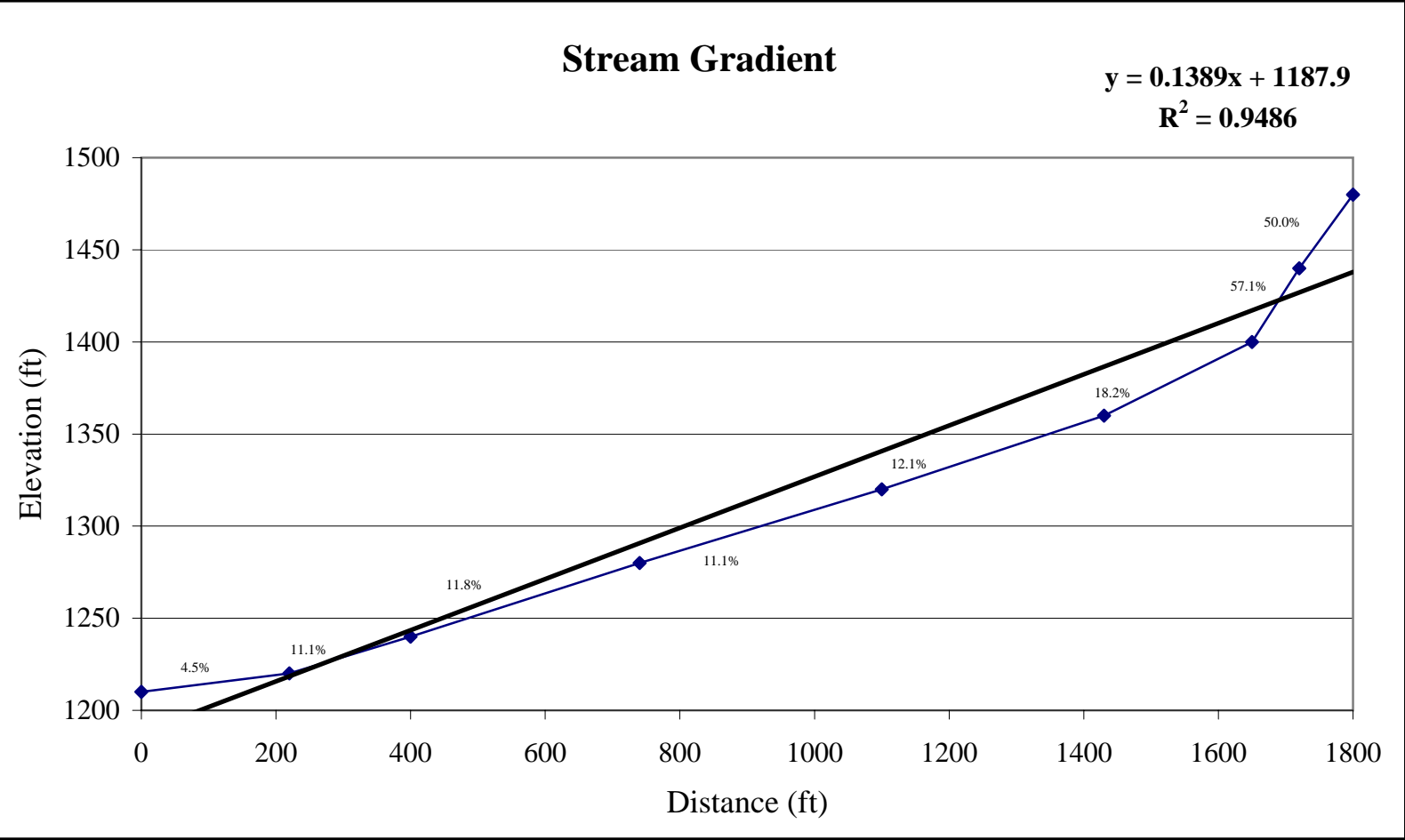
Stream Name: Big Creek

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	1,742
Average bankfull width (ft)	45.0
Average wetted width (ft)	22.5
Total area of accessible habitat (ft²)	39,195
Estimated flow (cfs)	23.0

Barrier Description:	
Cumulative distance from mouth (ft)	1,742.0
Barrier height (ft)	100.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Big Creek is 90% riffle habitat. Dominant substrate is cobble, followed by small boulder. The riparian vegetation is well established. Spawning gravel is severely limited. Rearing habitat is available. Fish migration is a major problem due to numerous waterfalls.

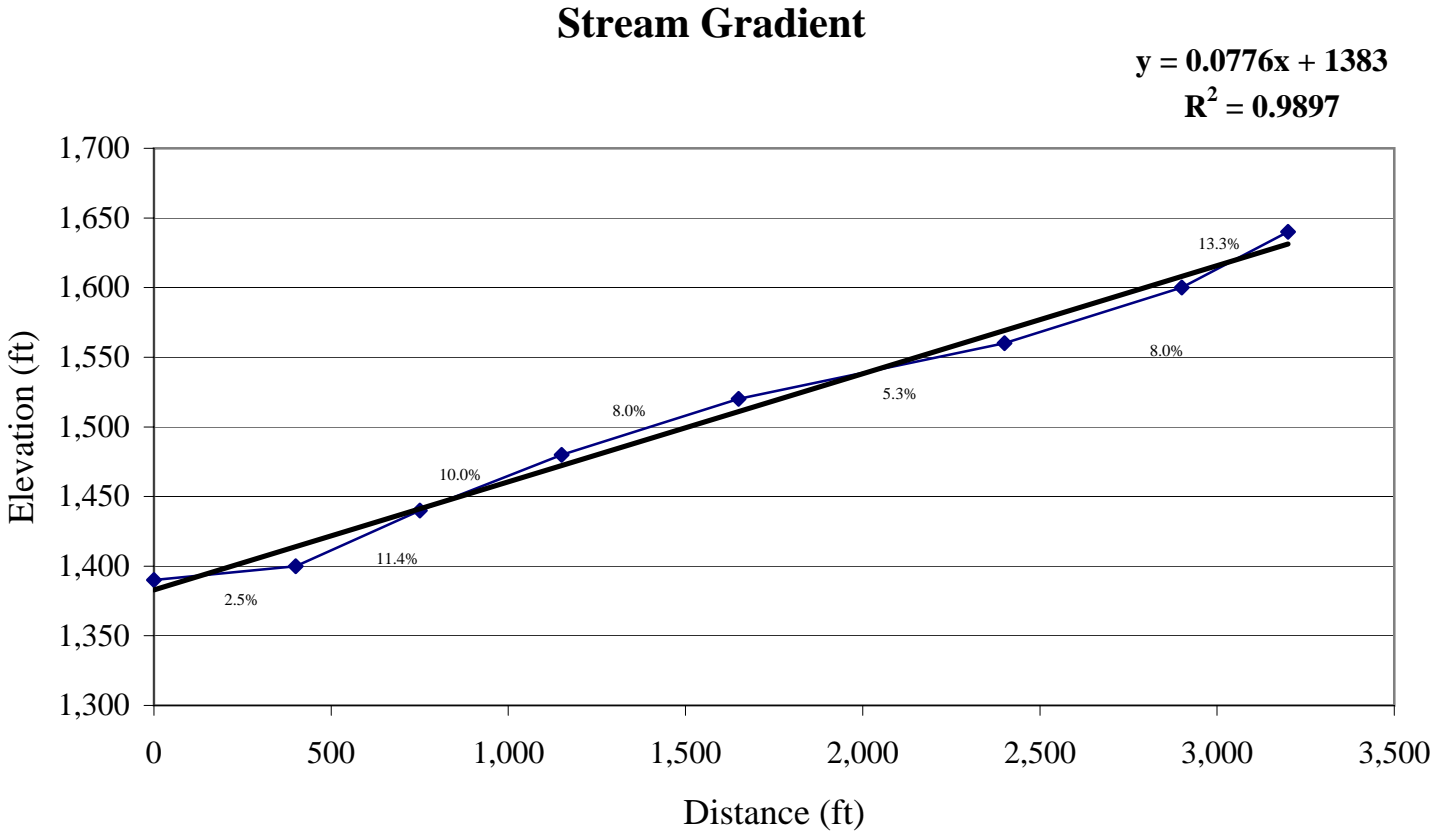
Source USFS (1991)

Stream Name: Spencer Creek

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	3,116
Average bankfull width (ft)	30.5
Average wetted width (ft)	10.8
Total area of accessible habitat (ft ²)	33,549
Estimated flow (cfs)	0.2

Barrier Description:	
Cumulative distance from mouth (ft)	3,116.0
Barrier height (ft)	14.0
Plunge pool depth (ft)	0.5
Horizontal jumping distance (ft)	12.0
Entrance pools depth (ft)	None
Barrier classification	Single Falls
Barrier type	IIA2



Habitat Description: Spencer Creek is a cobble dominated, well shaded stream that supports an established fish population throughout the surveyed length. Potential salmon habitat exists only in the lower 300 feet at which point gradient increases and spawning gravel becomes infrequent.

Source: Harza (1999)

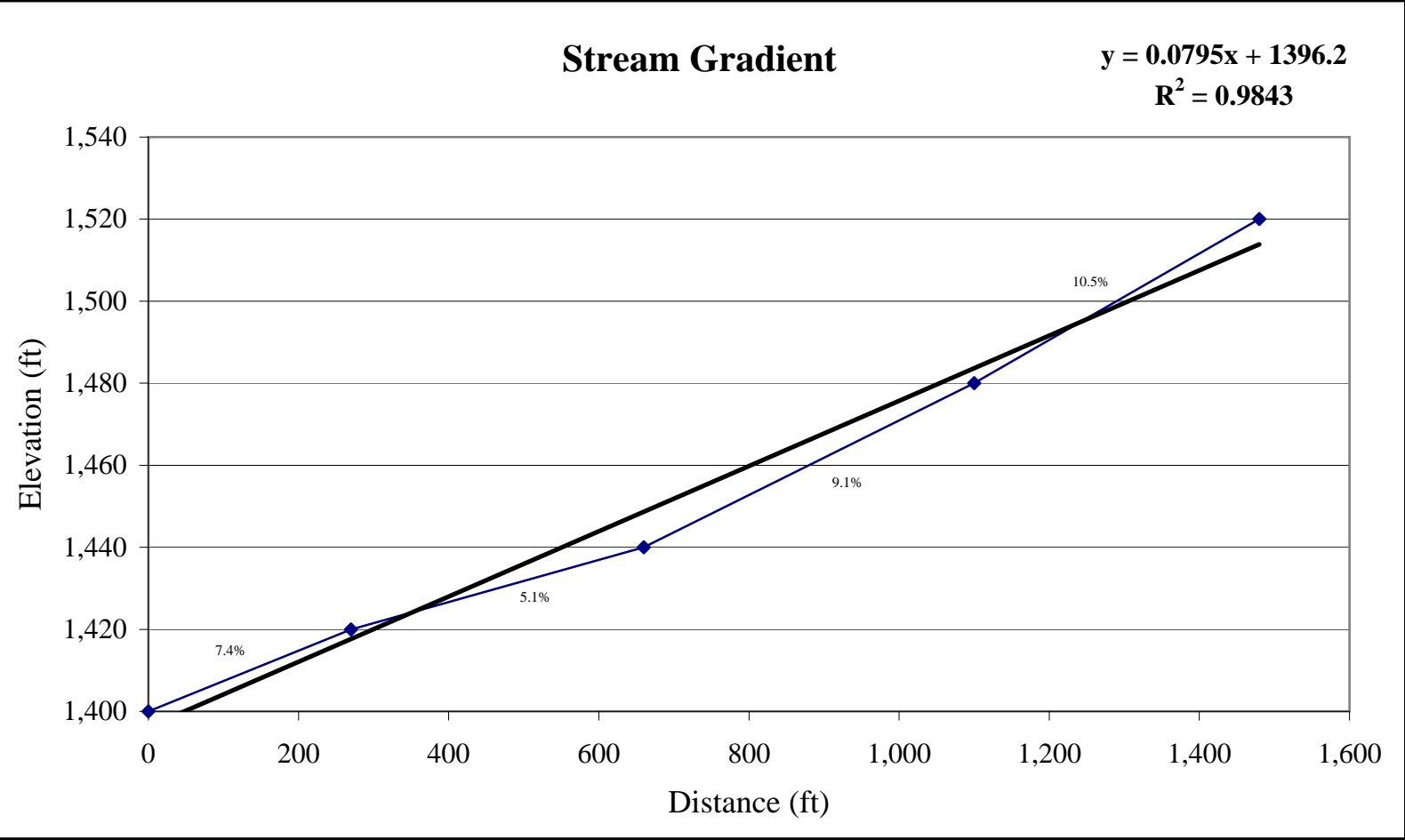
Stream Name: Cussed Hollow Creek

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	1,320
Average bankfull width (ft)	30.5
Average wetted width (ft)	17.4
Total area of accessible habitat (ft²)	22,990
Estimated flow (cfs)	9.2

Barrier Description:	
Cumulative distance from mouth (ft)	1,320.0
Barrier height (ft)	20.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Cussed Hollow is a 2nd order, Class III tributary to the Lewis River. Substrate is dominated by boulders. Riparian vegetation is well established with mixed species. Fish habitat consists of occasional pockets of spawning gravel, marginal habitat for adults and fair habitat for juveniles.

Source: USFS (1989)

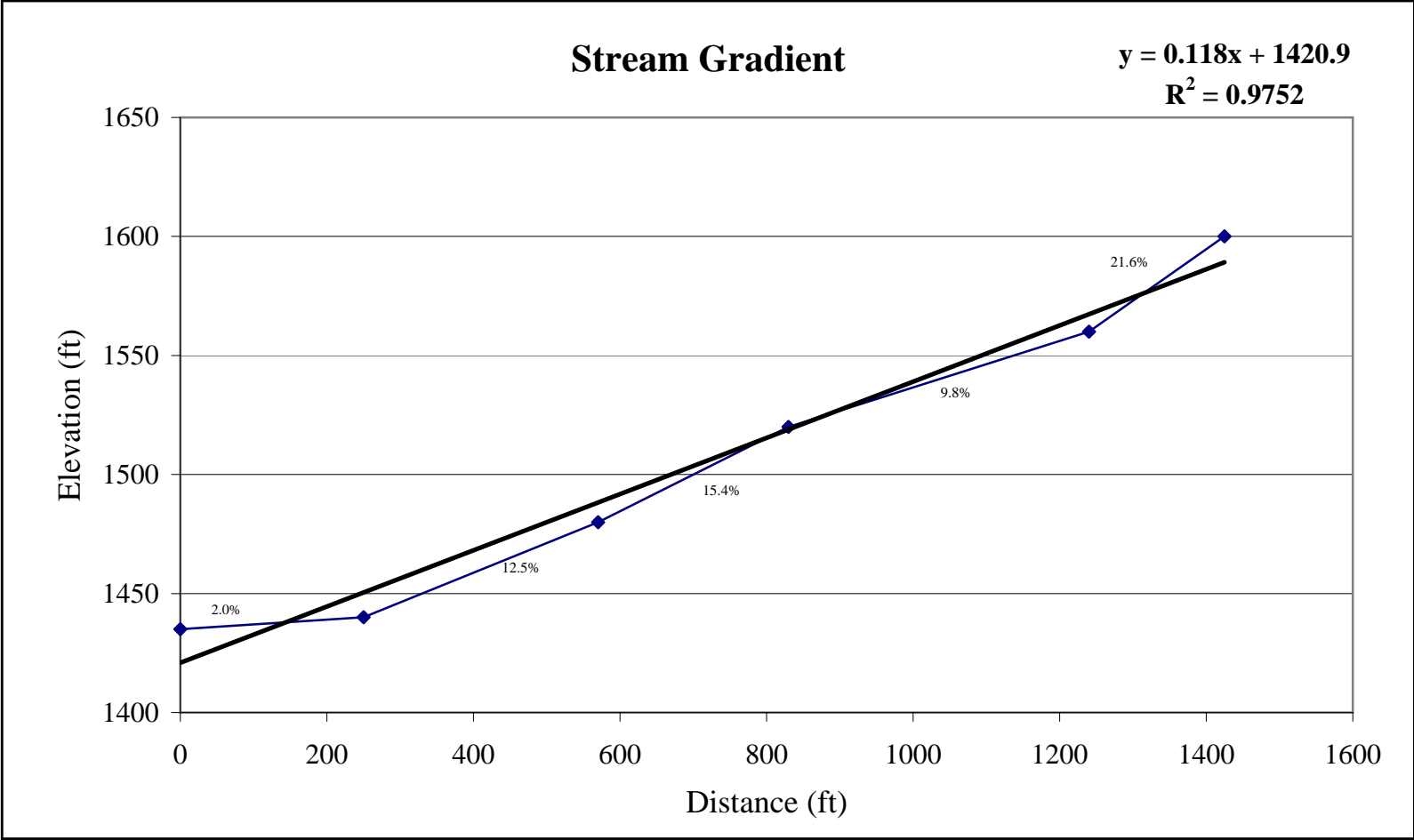
Stream Name: Chickoon Creek

Reach: North Fork Lewis River

Habitat Data:	
Total length of accessible habitat (ft)	1,584
Average bankfull width (ft)	33.0
Average wetted width (ft)	12.3
Total area of accessible habitat (ft²)	19,536
Estimated flow (cfs)	6.8

Barrier Description:	
Cumulative distance from mouth (ft)	1,584.0
Barrier height (ft)	60.0
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	NA
Barrier type	NA

No Photos Available



Habitat Description: Chickoon Creek is a 3rd order, Class III tributary to the Lewis River. Streambed substrate is cobble/small boulder in lower half and then bedrock/cobble. The riparian area is well vegetated with both canopy and shrub layers. Spawning gravel is found in isolated pockets.

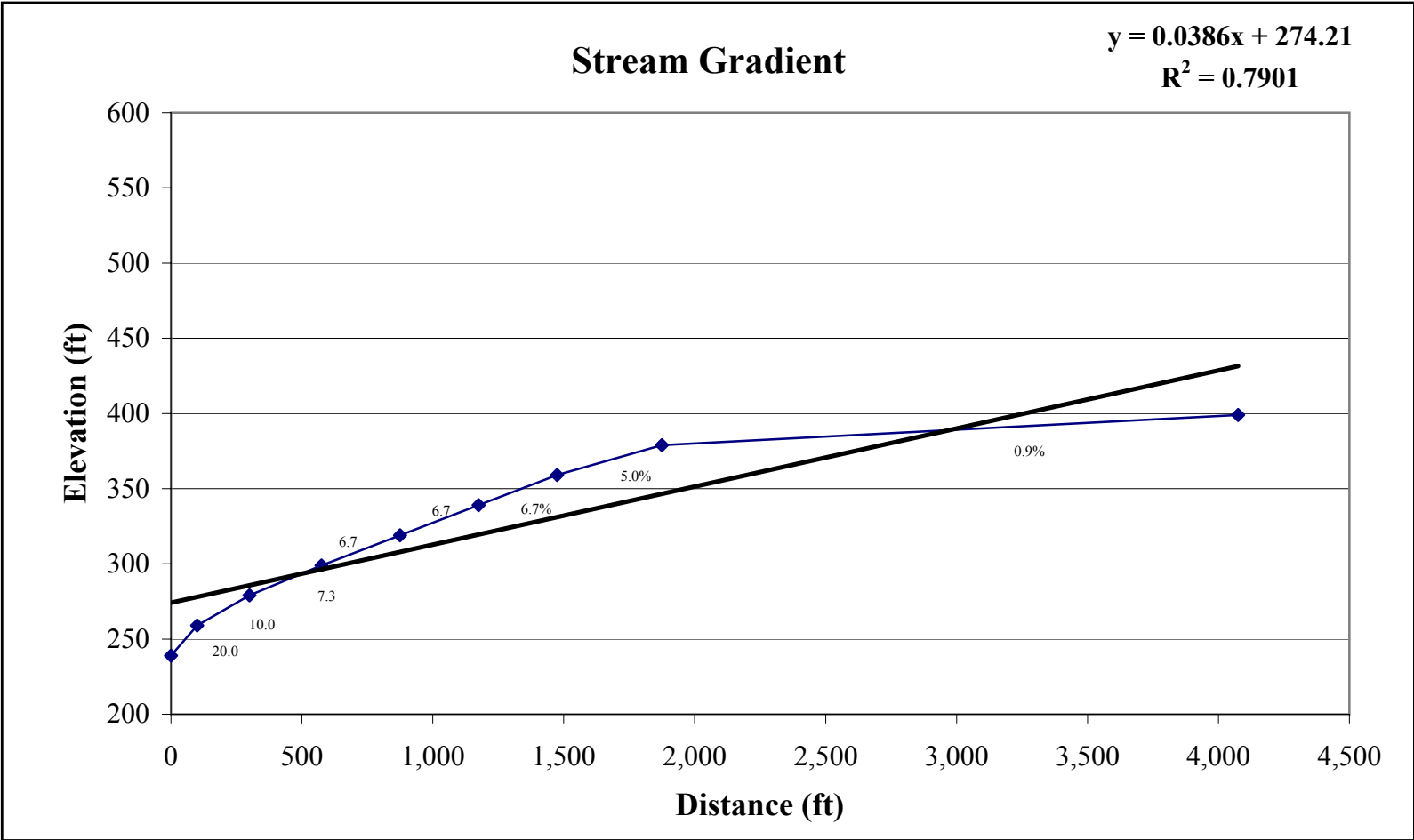
Source USFS (1989)

Stream Name: Buncombe Hollow Creek

Reach: Lake Merwin

Habitat Data:	
Total length of accessible habitat (ft)	4,168
Average bankfull width (ft)	10.9
Average wetted width (ft)	6.7
Total area of accessible habitat (ft ²)	27,926
Estimated flow (cfs)	1.5

Barrier Description:	
Cumulative distance from mouth (ft)	4,168
Barrier height (ft)	NA
Plunge pool depth (ft)	NA
Horizontal jumping distance (ft)	NA
Entrance pools depth (ft)	NA
Barrier classification	Low Q
Barrier type	NA



Habitat Description: Buncombe Hollow Creek is a moderate gradient (3.9% slope) 2nd order stream with an "A/B" Rosgen channel type (Rosgen 1996). Fish habitat in the accessible stream reach is comprised of a mixture of cobble and large gravel dominated riffles with occasional plunge pools (LWD related). A lack of instream cover and low summer flows (1.5 cfs) appear to be major limiting factors. Low flow related migration obstacles are also common throughout the reach. However, these would likely be passable at higher flows. Accessible habitat ends at a large wetland complex with no defined channel and silt substrate.

Source: Harza (1999)