STILLAGUAMISH BASIN

Water Resource Inventory Area 05

The Stillaguamish River system consists of two main streams; the North and South forks, each with numerous tributaries and a relatively long section of mainstem river flowing to Puget Sound. Both forks have their origins in heavily forested foothill slopes of the Cascade Range. This drainage basin contains over 975 linear miles of mainstem river and tributaries, plus independent streams. The North Fork heads in the Finney Peak area of the Mount Baker National Forest. Flowing south through some 12 miles of steep sloped, densely forested terrain, the upper stream reaches velocities that are quite rapid with numerous cascades and few pool and riffle areas. Emerging from a shallow canyon section about 2 miles northwest of Darrington, the North Fork turns west and flows some 35 miles over a broad, gently sloping floor to its confluence with the South Fork at Arlington. Considerable pool and riffle sections exist throughout this stretch. The associated valley floor contains intermittent sections of moderately dense deciduous and coniferous thickets with increased cleared farm land areas progressing downstream.

The South Fork Stillaguamish heads in the vicinity of Barlow Pass, also within the Mount Baker National Forest. From here the stream flows approximately 52 miles west and northwest to its confluence with the North Fork. The upper 37 miles of stream pass through a relatively narrow valley with steep, densely forested slopes on either side of the valley floor. Through this section, the stream is quite rapid with only a few scattered pool and riffle sections. A considerable portion of this stretch of river is encased in a relatively deep, narrow, steep-walled canyon containing numerous cascades. The South Fork's lower 33 miles, below Granite Falls, is characteristically pool- and riffle-type stream flowing over a somewhat broader valley floor. Adjacent to the river along this lower stretch exists occasional thickets of deciduous and coniferous growth with increasing amounts of cleared farm land.

Below the North and South fork confluence, the mainstem Stillaguamish meanders 18 miles west across a broad, gently sloping valley floor to its confluence with Puget Sound at the northern end of Port Susan. Between river miles 6 and 11 the mainstem's channel is split, with Cook Slough flowing along the south valley floor and the smaller "Old Stillaguamish Channel" winding along the north valley perimeter. Cook Slough is predominantly a moderate flowing riffle section containing few pools while the main Stillaguamish is mainly a pool- and riffle-type stream. At

PHOTO 05-1. Mouth of Stillaguamish River and Port Susan with Camano and Whidbey islands in the background.

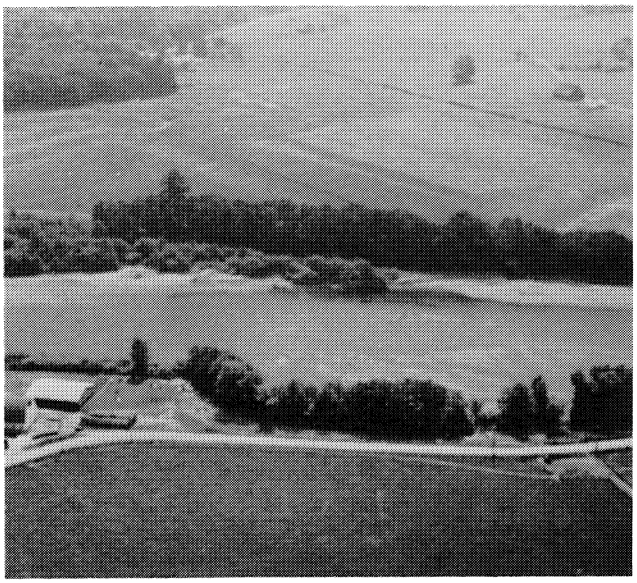


PHOTO 05-2. The lower Stillaguamish River is primarily a transportation zone for fish.

river mile 3 another channel split occurs with the smaller "Old Stillaguamish Channel", traveling approximately 8 miles northwest to its confluence with the northern end of Port Susan near Stanwood. Below these forks, the main body of Stillaguamish water flows west down Hat Slough for some 3 miles to its meeting with Port Susan. Each of these lower stream sections is subject to tidal influence and represents the extremely important brackish water conversion area for the anadromous fishes. The "old" channel is almost entirely a sluggish, extensively channelized stream course receiving mainly overflow during the high water periods. Hat Slough, when not under tidal influence, is characteristically a slow- to moderate-flowing river having numerous pool and riffle areas. There are 457 streams in the Stillaguamish basin providing over 977 linear miles of mainstem river, tributaries, and independent streams.

PHOTO 05-3. Confluence of South and North forks (looking downstream) forming the mainstem Stillaguamish near Arlington.

Fish Inventory and Distribution

Four Pacific salmon species populate the Stillaguamish River system. They are chinook, coho, pink, and chum. These fish migrate, spawn, and rear in over 61 miles of mainstem and South Fork Stillaguamish River with 65 miles of tributaries, and 36 miles of North Fork Stillaguamish with 93 miles of tributaries.

Chinook Salmon — Chinook salmon populating the Stillaguamish system are generally separated into three groups of races; spring, summer, and falls, with the latter two considerably more abundant. Since the springs exhibit different adult migration timing and choose somewhat different spawning areas, the adults are usually regarded separately while the summers and falls are considered a single combined population.

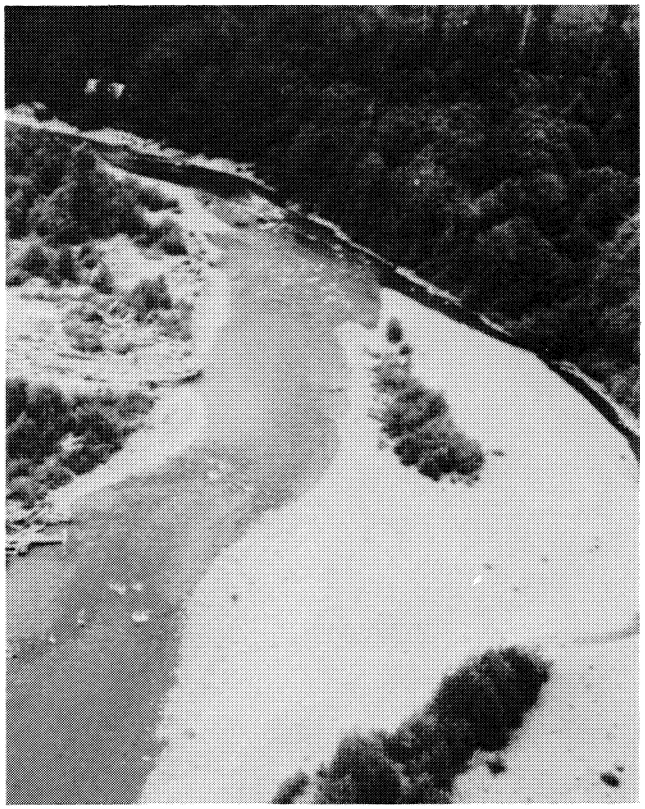


PHOTO 05-4. Typical chinook spawning area in South Fork Stillaguamish River above Boardman Creek.

Stream sections throughout the accessible length of the North and South forks, plus portions of the mainstem Stillaguamish below Arlington, receive chinook spawners. In the North Fork the riffles between river mile 22 and 24, near the Hazel claybank slide, receive moderate to heavy numbers of adult fall chinook, while below the slide area, relatively limited spawning occurs at this time. The South Fork receives spring and fall chinook spawners in moderate numbers in the area between river mile 62 near Silverton and river mile 44 near Robe. Very limited chinook spawning occurs in the canyon area from river mile 40 downstream to river mile 35 near Granite Falls. Below Granite Falls, the extensive riffle sections are utilized by moderate numbers of fall chinook. Portions of the mainstem Stillaguamish below the North Fork and South Fork confluence also serve the adult spawners.

Stillaguamish River tributaries known to support chinook populations include Squire, Boulder, and Deer creeks on the North Fork; Canyon and Jim creeks on the South Fork; and Pilchuck Creek on the lower mainstem river. Most other tributaries experience moderate to severe low flows during the usual chinook migration and spawning period.

Juvenile chinook rear throughout the total accessible length of the Stillaguamish River system including both forks and those tributaries utilized by spawning adults. Considerable rearing also takes place in the basin's estuary waters.

Adult spring chinook salmon enter the Stillaguamish River beginning in mid-April with spawning commencing in mid-August (Table 05-1). Following incubation, the juvenile spring chinook emerge from the gravel and characteristically remain within the river system for one year before migrating to sea. These fish begin emigrating in March of the second spring following emergence. The major portion of this migration coincides with the normal high spring runoff flows; however, some juveniles can be found moving downstream nearly year-round.

The summer-fall segment of the chinook run enters the Stillaguamish River about mid-July with spawning commencing in mid-September. Spawning is usually completed by the end of October. Following egg incubation and subsequent emergence of the fry from the gravel, the fall chinook juveniles rear approximately 3 months in the stream before migrating to salt water. Although little is presently known regarding summer chinook early life history, these juveniles are expected to exhibit a rearing pattern somewhat between that of the springs and falls. In general, out-migration for both races occurs from mid-March through the end of June, again corresponding to the higher river flows present at that time.

Based on extensive spawning ground data, it is estimated that the spring chinook escapement to the Stillaguamish spawning grounds has ranged from 50 to 300 fish from 1966 to 1971, averaging about 100 annually. The same type of spawning ground information indicates that the summer-fall chinook escapement to the Stillaguamish River has ranged from 4,000 to 9,700 for the same period, averaging about 7,000 fish.

The combined spring and fall chinook salmon escapement to the Stillaguamish River has in recent years exceeded 10,000 fish. Based primarily on catch to escapement ratios, it has been calculated that a seasonal escapement of this magnitude reflects a commercial and sport fishery catch of up to 30,000 salmon.

Coho Salmon — Nearly every accessible tributary within this basin receives coho spawners. In addition, coho spawning also occurs throughout sections of the mainstem North and South forks and in a few areas of the lower mainstem river. Some of the more important spawning tributaries include Squire, French, Boulder, and Deer creeks on the North Fork; Boardman, Canyon, and Jim creeks on the South Fork; and Portage and Pilchuck creeks on the lower mainstem river. A number of these tributaries are quite extensive in total accessible length providing considerable spawning area.

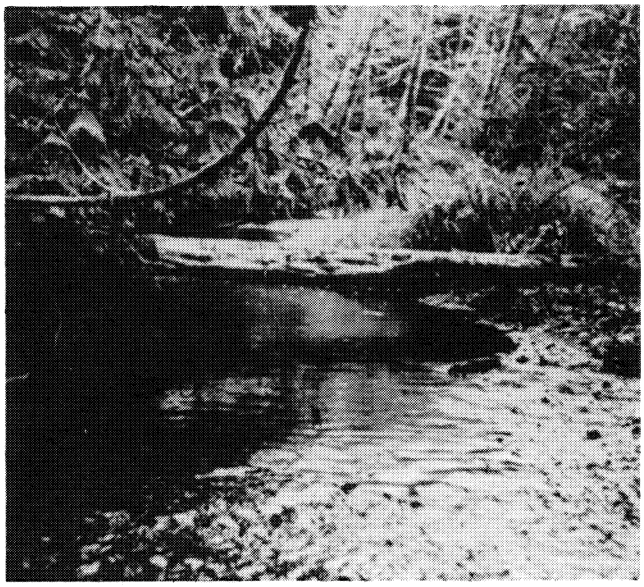


PHOTO 05-5. Coho salmon inhabit most small streams in the Stillaguamish basin, (Browns Creek).

Juvenile coho rear throughout the accessible length of both the North and South forks of the Stillaguamish, as well as in the tributaries receiving adult spawners. The relatively deep pools and long, slow glides common to the lower North and South forks and throughout much of the mainstem river below Arlington, serve as excellent rearing areas for these fish, as do the estuary waters of Port Susan.

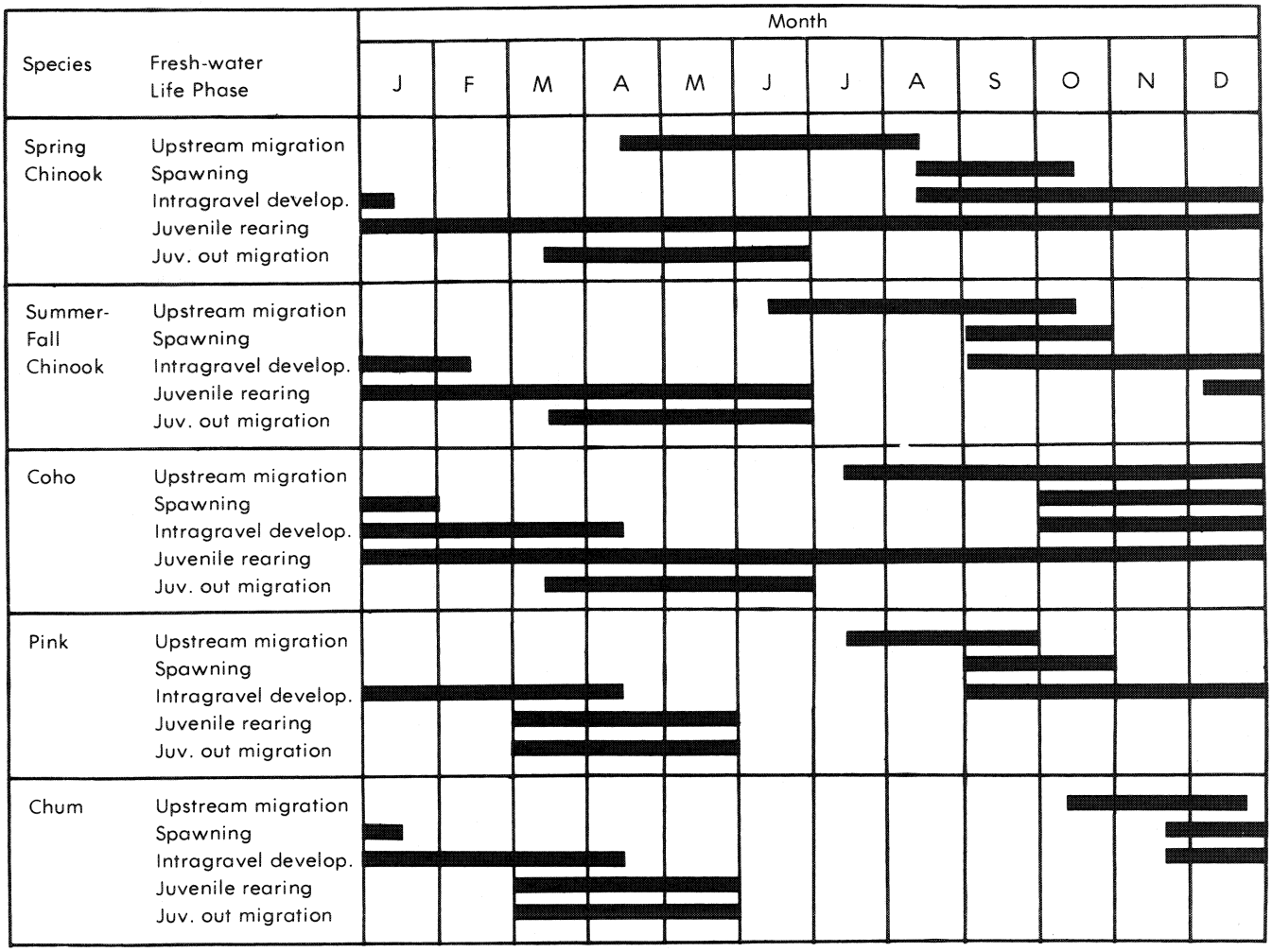
Adult coho begin entering the Stillaguamish River in mid-July with spawning activity observed as early as late September. However, as in most areas populated by this species, the majority of spawning occurs in November and December. Following incubation and subsequent emergence from the gravel, the juvenile coho remain in the system for more than a year, migrating to sea early in their second year of life. Although the bulk of this migration occurs during the spring months, coinciding with the high river flows, some migrant coho have been observed throughout the year.

Based mainly on extensive spawning ground surveys, it is estimated that annual coho escapements to the Stillaguamish River system have ranged from 2,600 to 11,400 fish over the period 1966 to 1971, averaging about 7,500 per year.

Calculations based principally on catch to escapement ratios indicate that an adult coho escapement of approximately 10,000 relates directly to a commercial and sport fisheries catch of nearly 40,000 salmon.

Pink Salmon — Adult pink salmon present in odd-numbered years have been recorded spawning in virtually every tributary to the Stillaguamish River system. These fish also spawn in the riffles and in the side channels of the accessible length of mainstem North Fork and in the extensive riffle areas of the lower South Fork upstream to Granite Falls. Some pinks spawn in the upper South Fork above Granite Falls; however, this species does not readily use the laddering system. Pink salmon have also been recorded spawning in the riffles below the confluence of the forks downstream to within about 1.5 miles of the mouth.

Timing of salmon fresh-water life phases in Stillaguamish Basin WRIA 05



Since the juvenile pink salmon begin their seaward migration soon after emerging from the gravel, much of their early fresh-water life takes place in each of the forks and in the lower mainstem river. These stream sections are extremely important in providing the young pink salmon with the necessary environmental characteristics for successful migration to salt water. Early rearing also occurs in the estuarine waters of Port Susan.

Adult pink salmon begin entering the Stillaguamish System about mid-July with spawning beginning in some areas from early to mid-September. Spawning is usually completed by late October. Soon after the pink fry emerge from the gravel, their seaward migration begins with outmigration completed by the end of May.

Based on extensive tagging and recovery programs and on routine stream survey information, it is estimated that the pink salmon runs to the Stillaguamish system have ranged from 125,000 to 640,000 fish since 1959, averaging about 268,750 per odd-year escapement. Calculations based on catch to escapement ratios indicate a spawning escapement of 200,000 fish reflect a commercial and sport fishery catch of up to 400,000 pink salmon.

Chum Salmon — Most tributary streams to the North Fork, South Fork, and to the mainstem Stillaguamish River receive spawning chum salmon. Also, considerable spawning occurs in the mainstem North Fork throughout the river and the South Fork upstream to Granite Falls. Few chum salmon have ever been recorded above Granite Falls. Chum salmon have also been observed spawning in the lower mainstem Stillaguamish downstream to within 1.5 miles of the mouth.

Like the pink salmon, the young chum begin their seaward migration soon after emerging from the gravel, making the mainstem portions of the North Fork, South Fork, and the lower mainstem river exceedingly important in the fish's early fresh-water rearing period. Also extremely important to this species' early life history are the estuary waters of Port Susan.

Adult chum salmon have been reported in the Stillaguamish River system as early as mid-September. Spawning usually commences from mid to late November and continues until early January. Soon after emergence from the gravel, the juvenile chum begin their seaward migration, generally completing their early fresh-water life phase by mid-May.

Based on limited spawning ground surveys, it is estimated that chum salmon spawning escapements to the Stillaguamish River system have ranged from about 2,400 to 25,000 fish for the period 1966 to 1971, averaging about 10,700 per year.

Calculations based on catch to escapement ratios indicate that a spawning escapement of 25,000 to the Stillaguamish system reflects a commercial fishery catch of nearly 25,000 chum salmon.

PHOTO 05-6. The Granite Falls fishway opened the opper South Fork Stillaguamish to all anadromous fish.

Salmon Production

A six-year base period, 1966 through 1971, has been selected for the presentation of all salmon production figures. This span of years is used for both naturally and artifically produced fish, as well as escapement and harvest figures.

Natural production of salmon in the Stillaguamish River system provides over 311,000 salmon annually to various sport and commercial fisheries in Washington. In an average year over 150,000 chinook, coho, pink, and chum salmon adults return to spawn naturally (Table 05-2).

Although the Washington Department of Fisheries has no hatcheries or artificial propagation facilities located within the Stillaguamish basin, natural salmon production is supplemented by the planting of stock obtained at hatcheries located in nearby basins. Both chinook and coho juveniles are planted with these originating mainly from hatcheries located in the Skagit and Snohomish basins. Between 1966 and 1971, approximately 7,257,000 chinook and 2,-148,000 coho juveniles were introduced into the Stillaguamish system. The average annual plants for this period are 1,210,000 chinook and 358,000 coho.

Preliminary information from commercial and sport catch statistics indicate that the present salmon planting program contributes approximately 3,480 chinook and 3,350 coho to these fisheries annually.

TABLE 05-2. Salmon Escapement Level for the Stillaguamish Basin WRIA 05.

	1966-1971 Escapements [1]	
Species	*Range*	*Average*
Chinook	4,000— 9,700	7,000
Coho	2,600— 11,400	7,500
Pink	75,000—200,000	125,000
Chum	2,400— 25,000	10,700

	Natural Escapement Potential
Chinook	7,500
Coho	16,000
Pink	200,000
Chum	25,000

[1] *Includes natural plus artificial combined escapements.*

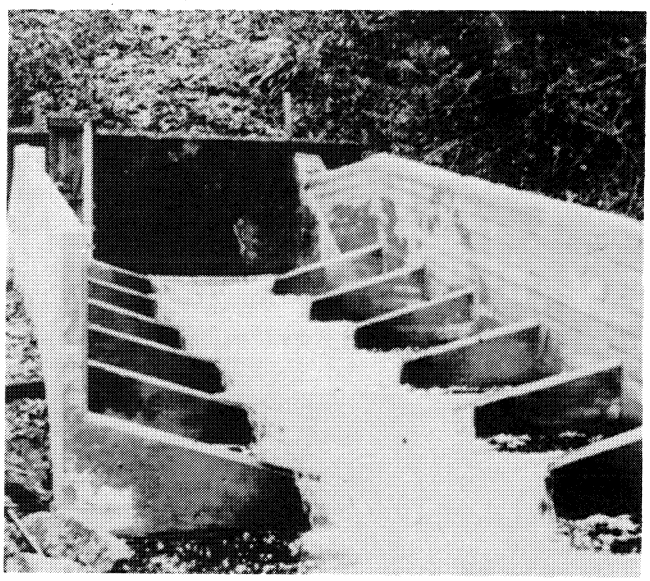


PHOTO 05-7. Modified pool and weir fishway provides access through a culvert on Harvey Creek.

Harvest

Salmon reared in the Stillaguamish River system contribute to U.S. and Canadian, Pacific Ocean sport and commercial fisheries. It is estimated that total contribution (all species) to these fisheries in recent years ranged from 174,800 to 499,700 salmon annually. The Stillaguamish contributes good numbers of chinook and pink salmon to the Tulalip Indian beach seine fishery in Port Susan. Records indicate this fishery has taken between 3,897 and 49,517 fish in a single season during the 1966-1971 period with the majority being pink salmon.

The question of Indian fishing rights has been contested for many years and adjudication now in progress may cause significant alterations in both fishing patterns and distribution of catch.

Freshwater sport angling is limited to the main river from its mouth to the confluence of the North and South forks, a distance of 17 miles, where both adult and jack salmon may be taken from July through January.[2] The major portion of the catch is pink salmon. The estimated odd year pink catches by sportsmen averaged 3,500 to 4,500 since 1967 with 16,500 harvested during the 1963 record return.

Limiting Factors

Limiting factors are conditions that lead to a reduction of an environment's fish producing potential, excluding harvest. In the Stillaguamish drainage major limiting factors include excessive siltation, very low summer flows with borderline high temperatures for fish life in the lower drainages, and extensive logging activities in the upper watersheds.

Stream flow — Extensive clear-cut logging over vast sections of both the upper North and South fork watersheds influences run-off patterns which result in accelerated fall and spring flooding and reduced summer flows. Increased velocities associated with the rapid flooding hinders spawning activities for extended periods of time and may force salmon to utilize less desirable fringe areas where redds could become stranded when the water recedes.

Physical barriers — Few physical barriers exist in this system that block fish access to suitable habitat. Some blockages occur on the upper North Fork, Canyon Creek, and Pilchuck CReek. Other blockages may result from low summer flows at beaver dams, cascades, and intermittent debris jams on Deer Creek and some of the smaller tributaries such as Grant and Fortson creeks.

[2] *Not less than 10 inches nor more than 20 inches in length.*

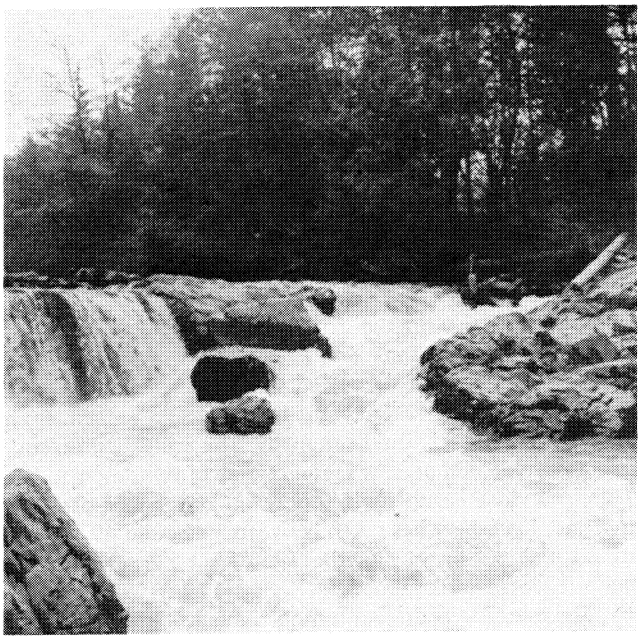


PHOTO 05-8. Canyon Creek falls causes migratory delays under certain flow conditions.

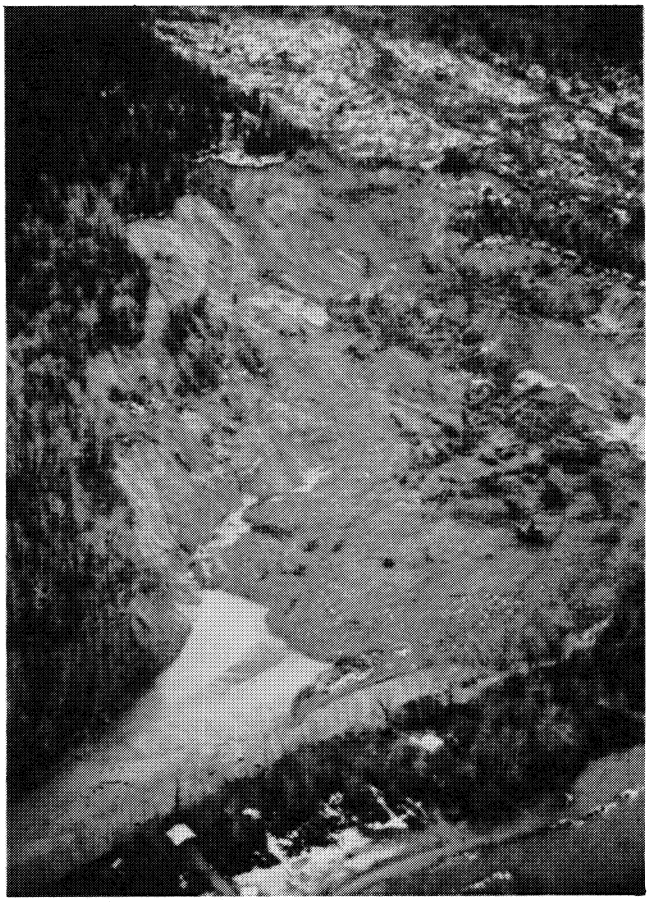


PHOTO 05-9. The North Fork Stillaguamish slide near Hazel in January 1967. This slide area causes continuing siltation problems to the river below.

Water quality — Excessive siltation caused by mud and clay slides on the North Fork near the community of Hazel and on the South Fork above the settlement of Robe contribute to poor water quality. Conditions in the downstream environment created by these slides include excessive discoloration of the water, heavy silt deposits which cause over-compaction of the streambed gravel normally suitable for spawning, and smothering of aquatic vegetation and food organisms. This heavy siltation also adversely affects sport fishing downstream. Elimination of these slides could double the total natural fish production of this river system.

Sewage and industrial waste discharges are not serious problems in the river, although they must be monitored below Arlington. There are problems, however, with sewage at waterfront home developments, particularly at lakes.

High temperatures, sometimes exceeding 70°F, occur during summer low flows in the lower river. Such conditions severely limit fish production in this area.

Limited spawning and rearing — The major factor limiting spawning area is the siltation and compaction of gravel below the mud slides mentioned above. Alteration of natural streambed conditions and removal of gravel bars also reduce suitable spawning area. In the steeper gradient areas of this system's streams, large boulders and rubble limit the spawning area.

PHOTO 05-10. A major slide area impacts the lower South Fork Stillaguamish River.

Watershed development — Proposed flood channeling and diking along the lower mainstem below the State Highway 5 bridge could cause severe curtailment and limitations on anadromous fish production and destroy the good sport fishing areas within this section. The development of river front property for summer or permanent homes is just beginning in this basin.

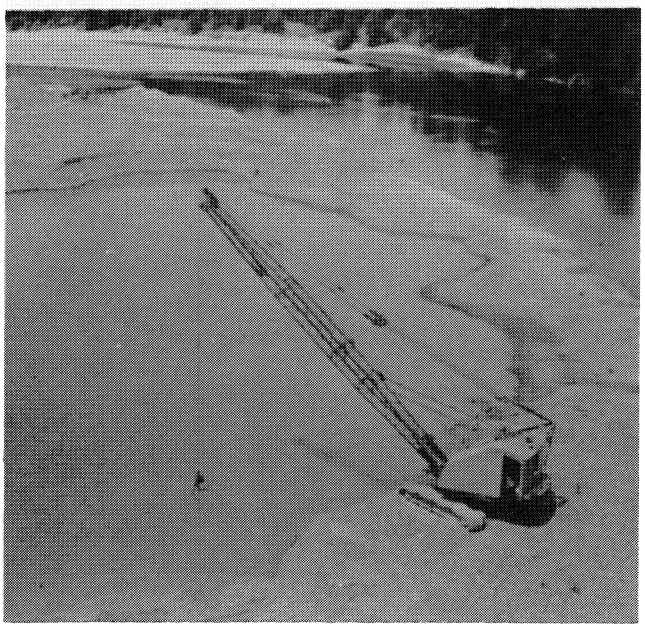
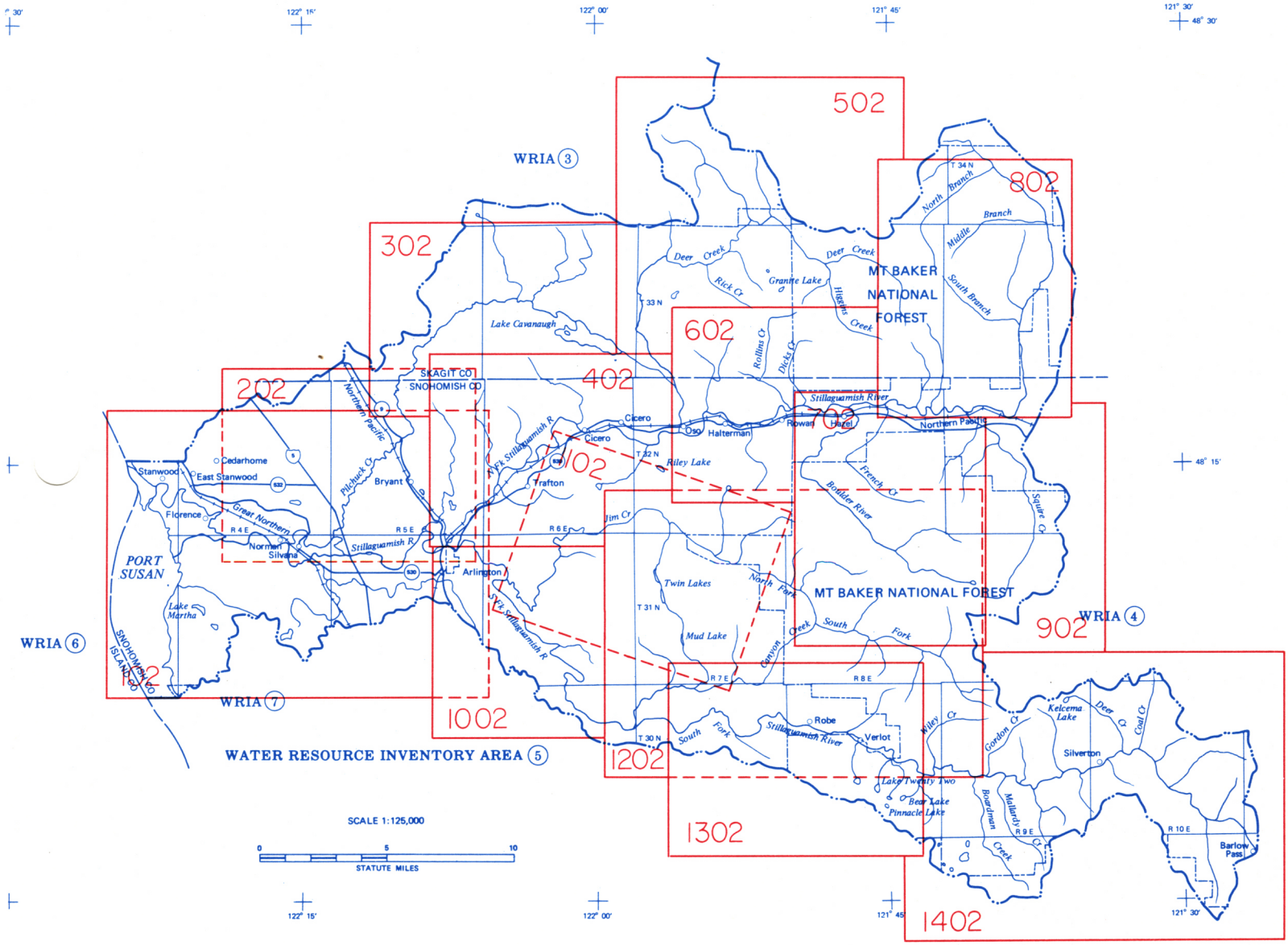


PHOTO 05-11. Gravel mining on river bars creates serious siltation, water quality problems and fish mortalities.

STILLAGUAMISH BASIN WRIA 05
Index to Key Map

STILLAGUAMISH RIVER BASIN

WRIA - 05



STILLAGUAMISH RIVER
Lower Mainstem

This section includes 18 miles of mainstem, plus 12 miles of side channels and is located south and east of Stanwood. The 13 tributaries, excluding Pilchuck Creek (Stillaguamish 201 and 301) add more than 68 stream miles.

Stream Description

From the confluence of the North and South forks (mile 17.8 near Arlington), the mainstem flows west 7 miles. At R.M. 10.8, South (Cook) Slough diverts from the left bank and courses westerly past Silvana for about 3.5 miles, converging with the mainstem at R.M. 6.1. The river continues west another 3.3 miles to the right bank divergence of the old Stillaguamish channel which meanders slowly northwest for 8.3 miles, entering Port Susan near Stanwood. The mainstem flows west some 2.8 miles as Hat Slough, entering Port Susan 3.0 miles south of Stanwood.

Principal tributaries described in this section include Armstrong Creek; Portage Bay, entering South Slough; and Church Creek, entering the old Stillaguamish channel.

The mainstem and side channels wind through a broad, gently sloping valley as does the major portion of most tributaries with their upper reaches being steeper. The river skirts the valley's northern edge through cleared agricultural land. Some urban and commercial development exists near Arlington, Silvana, and Stanwood and the area is heavily farmed.

This section has a moderate to gentle gradient, maintaining a good pool-riffle balance with numerous long, deep holes. South Slough has a moderate gradient with long, deep runs and a few shallow riffles and pools. Bottom composition from Arlington to South Slough is mainly rubble-gravel with moderate-sized gravel below the divergence, while South Slough contains larger-sized gravel. Below the convergence, the river bottom is mostly sand, with gravel areas showing considerable sedimentation. Hat Slough and the old channel have sand and silt bottoms with an occasional gravel section. Mainstem widths range from about 75 feet to over 150 feet. Below, the divergence widths range from 25 to 100 feet. Stream banks are stable, composed of broad, gently sloping gravel and rubble beaches and steep, earth-cut banks along the upper 12 miles with a few riprapped sections. South Slough and the remainder of the lower Stillaguamish have contoured and riprapped banks, leaving a broad river channel to Port Susan. Stream cover is sparse along the lower mainstem with small stands of deciduous trees and brush separated by lengthy sections of cleared farmland.

Tributaries in this section exhibit moderate gradients and good pool-riffle characters. Bottom composition consists of sand and small gravel in the lower areas, and larger gravel and rubble in the upper reaches. The streambeds and banks are stable, although several streams are channelized in their lower reaches.

Salmon Utilization

Hat Slough, the mainstem, and South Slough are the transportation reaches for salmon using the system. Spawning and rearing area is fair to good with the quality increasing above mile 6.0. Chinook, pink, chum, and a few coho spawn within this stretch. All juvenile salmon utilize the lower 4 miles for rearing as they acclimate to the marine environment. Each of the accessible tributaries offers fair to good spawning and rearing habitat for coho, chum, and pinks.

Limiting Factors

Salmon production is limited by low summer flows, warm water temperatures, and occasional heavy sedimentation. High summer temperatures are a particular problem in the slow-moving old Stillaguamish channel. Other water quality problems include spraying of chemicals on agricultural land and gravel removal operations.

Beneficial Development

No facilities or programs have been undertaken to benefit salmon production, except fish passage facilities on Armstrong Creek.

Habitat Needs

Major requirements to maintain fish production potential in this section include preserving or increasing stream bank cover and restricting gravel removal.

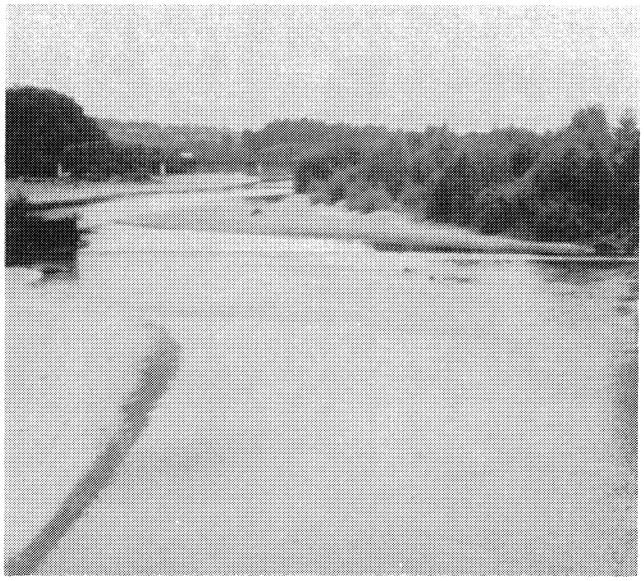
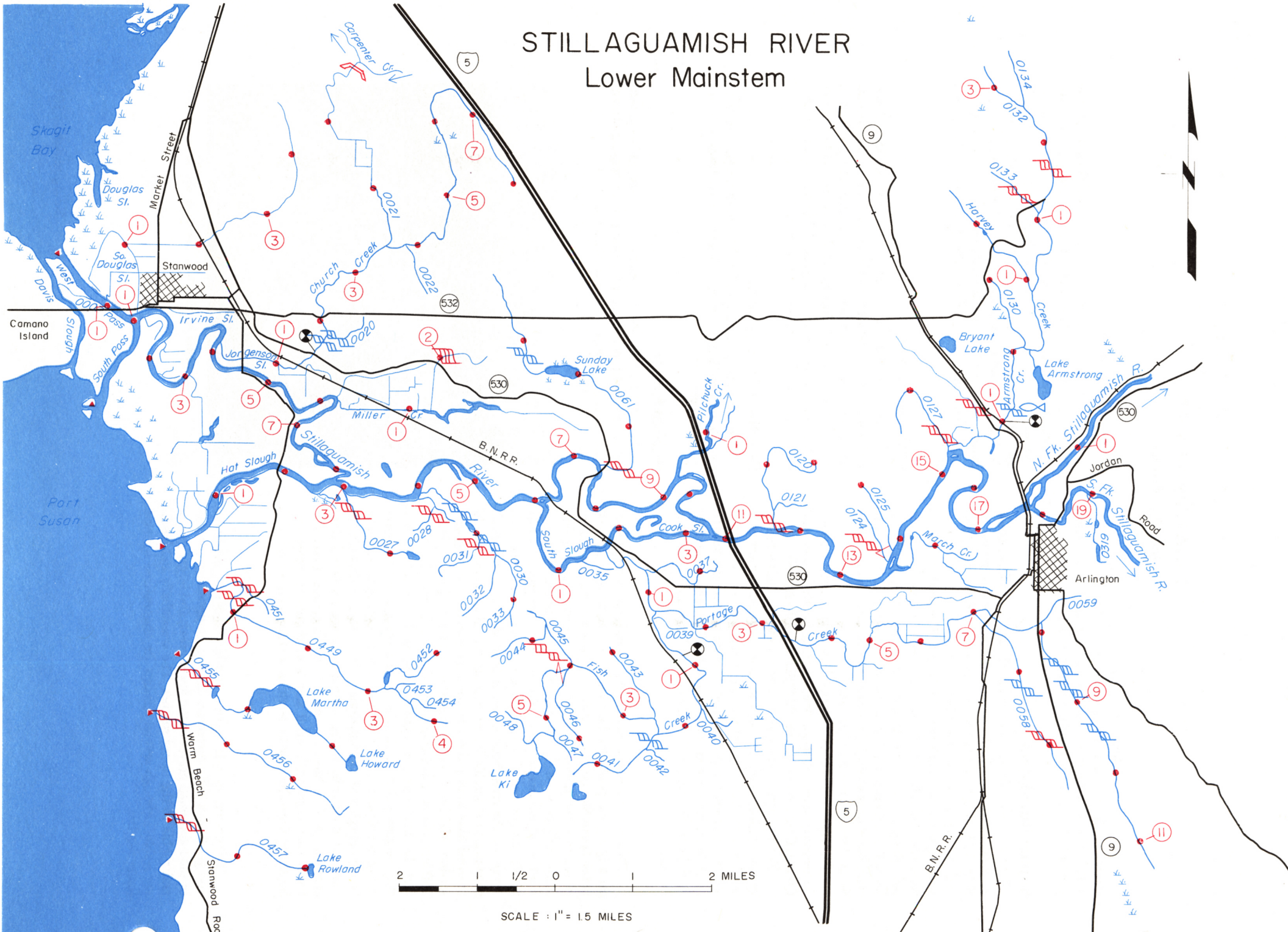


PHOTO 05-12. Lower mainstem at diversion sill on upper Cook Slough.


STILLAGUAMISH RIVER
Lower Mainstem
Skagit Bay
Port Susan
Camano Island
Douglas Sl.
So. Douglas Sl.
West Pass
South Pass
Davis Slough
Market Street
Stanwood
Irvine Sl.
Jorgenson Sl.
Carpenter Cr.
Church Creek
Sunday Lake
Miller Cr.
Pilchuck Cr.
B.N.R.R.
Hat Slough
Stillaguamish River
South Slough
Cook Sl.
Portage Creek
Fish Creek
Lake Martha
Lake Howard
Lake Ki
Lake Rowland
Warm Beach
Stanwood Road
Harvey Creek
Bryant Lake
Armstrong Cr.
Lake Armstrong
March Cr.
N. Fk. Stillaguamish R.
S. Fk. Stillaguamish R.
Jordan Road
Arlington
0021
0022
0020
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530
532
2 1 1/2 0 1 2 MILES
SCALE : 1" = 1.5 MILES

STILLAGUAMISH RIVER — LOWER MAINSTEM
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River	Sec12,T31N,R3E	70.2	684.0	Chin., Coho, Pink, Chum
0002	Drainage Ditch	RB-0.3	~ 3.1	—	None
0003	Drainage Ditch	LB-0.7	~ 3.1	—	None
0005	Old Stillaguamish R.	Sec35,T32N,R3E	8.3	—	Coho, Chum
0006	West Pass	Sec23,T32N,R3E	1.3	—	Coho, Chum
0009	S. Douglas Slough	RB-1.1	4.7	—	Unknown
0010	Drainage Ditch	LB-0.55	~ 1.0	—	Unknown
0012	Drainage Ditch	RB-1.0	~ 1.4	—	Unknown
	S. Douglas Sl. cont. as unnamed	@ mi. 1.01	—	—	
0014	Irvine Slough	RB-1.4	~ 1.0	—	Unknown
0015	Drainage Ditch	RB-1.8	~ 1.0	—	None
0017	Drainage Ditch	LB-3.1	~ 3.4	—	None
0018	Jorgenson Slough	RB-3.8	8.0	—	Coho, Chum
0019	Drainage Ditch	LB-1.0	~ 1.1	—	Unknown
	Jorgen. Sl. cont. as Church Cr.	@ mi. 1.01	—	—	Unknown
0021	Unnamed	RB-3.55	2.7	—	Unknown
0023	Drainage Ditch	RB-6.15	~ 3.1	—	Unknown
0024	Miller Creek	RB-6.2	2.7	—	Unknown
0026	Drainage Ditch	LB-1.2	~ 2.2	—	Unknown
0027	Unnamed	LB-2.9	1.2	—	Unknown
	Unnamed Lake	Outlet-1.2	—	—	
0030	Unnamed	LB-3.9	2.3	—	Unknown
	Unnamed Lake	Outlet-0.8	—	—	
0034	South Slough	LB-6.1	3.4	—	Chin., Coho, Pink, Chum
0036	Portage Creek	LB-1.7	11.3	21.4	Coho, Pink, Chum
0038	Fish Creek	LB-1.3	5.8	—	Coho, (Chum)
0041	Unnamed	RB-2.4	1.4	—	Unknown
0043	Unnamed	LB-2.6	1.0	—	Unknown
0044	Unnamed	LB-4.0	1.8	—	Unknown
0046	Unnamed	RB-4.2	1.1	—	Unknown
	Lake Ki	Outlet-5.8	—	—	
0049	Drainage Ditch	LB-1.85	~ 2.2	—	Unknown
0050	Drainage Ditch	RB-1.86	~ 2.4	—	Unknown
0052	Drainage Ditch	RB-3.1	~ 1.0	—	Unknown
0053	Drainage Ditch	LB-3.6	~ 1.1	—	Unknown

STILLAGUAMISH RIVER — LOWER MAINSTEM
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0056	Drainage Ditch	RB-5.2	~ 1.8	—	Unknown
0057	Drainage Ditch	RB-5.5	~ 1.5	—	Unknown
0058	Unnamed	LB-7.0	2.5	—	Unknown
	South Slough cont. as Cook Slough	@ mi. 1.9	—	—	
0061	Unnamed	RB-7.45	3.8	—	Unknown
	Sunday Lake	Outlet-1.9	—	—	
0062	Pilchuck Creek	RB-9.4	22.4	76.2	Chin., Coho, Pink, Chum
	(See Stillaguam. 203)				
0120	Unnamed	RB-11.7	2.0	—	Unknown
0122	March Creek	LB-13.7	1.5	—	Unknown
0123	Drainage Ditch	LB-1.1	~ 1.8	—	Unknown
0125	Unnamed	RB-13.9	1.0	—	Unknown
0126	Armstrong Creek	RB-15.3	2.5	—	Chin., Coho, Pink, Chum
0127	Unnamed	RB-0.1	1.7	—	Coho, Chum
0129	Drainage Ditch	RB-0.6	~ 2.2	—	Unknown
0130	Unnamed	RB-2.2	1.0	—	Unknown
0131	Harvey Creek	RB-2.3	2.7	—	Coho
0132	Unnamed	LB-0.9	3.3	—	Coho
	Lake Armstrong	Outlet-2.5	—	—	
0135	N. Fk. Stillaguam. R.	RB-17.8	48.5	284.0	Chin., Coho, Pink, Chum
	(See Stillaguam. 403)				
	Stillaguamish R. cont. as S.F. Stillaguam. R.	@ mi. 17.81	—	255.0	
	(Cont. Stillaguam. 1003)				
0449	Unnamed	Sec7,T31N,R4E	4.2	—	Unknown
0450	Drainage Ditch	RB-0.05	~ 1.2	—	Unknown
0452	Unnamed	RB-3.2	1.1	—	None
	Unnamed Pond	Outlet-0.15	—	—	
0455	Unnamed	Sec13,T31N,R3E	2.3	—	Unknown
	Unnamed Pond	Outlet-0.5	—	—	
	Lake Martha	Outlet-1.0	—	—	
	Lake Howard	Outlet-2.3	—	—	
0456	Unnamed	Sec24,T31N,R3E	2.9	—	Unknown
0457	Unnamed	Sec25,T31N,R3E	2.0	—	Unknown
	Lake Rowland	Outlet-2.0	—	—	

NORTH FORK STILLAGUAMISH
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
0135	N. F. Stillaguamish R.				Chin., Coho, Pink, Chum
0212	Unnamed	RB-15.0	2.8	—	Coho, Pink
	Unnamed Pond	Outlet-2.8	—	—	
0213	Unnamed	LB-15.2	2.3	2.04	Coho
0215	Brooks Creek	RB-16.1	3.4	—	Coho
0216	Unnamed	LB-1.5	2.8	—	Unknown
0217	Montague Creek	LB-18.0	3.6	—	Coho, Pink
0218	Unnamed	RB-1.0	2.3	—	Unknown
0219	Unnamed	LB-1.7	1.0	—	Unknown
0221	Rollins Creek	RB-20.8	5.1	—	Coho
0222	Unnamed	RB-1.3	1.4	—	Unknown
0223	Dicks Creek	RB-21.4	4.0	—	Coho, Pink, Chum
0224	Unnamed	LB-0.1	2.2	—	Unknown
0226	Unnamed	RB-22.3	2.3	—	Coho, Pink, Chum
0227	Unnamed	LB-0.3	1.8	—	Unknown
0229	Boulder River	LB-24.3	13.3	—	Chin., Coho, Pink, Chum
	(See Stillaguam. 703)				
0241	Unnamed	RB-24.6	1.8	—	Coho
0242	Unnamed	RB-25.15	1.7	—	Coho
0243	Unnamed	RB-25.2	2.6	—	Coho, Pink, Chum
0246	French Creek	LB-26.1	6.5	—	Chin., Coho, Pink, Chum
0247	Unnamed	RB-1.4	1.6	—	Unknown
0248	Unnamed	RB-1.8	1.3	—	Unknown
0249	Unnamed	LB-2.1	1.2	—	Unknown
0250	Unnamed	RB-26.5	2.15	—	Coho
0251	Unnamed	LB-26.8	1.2	—	Coho, Chum
0252	Unnamed	RB-27.3	3.6	—	Coho, Pink, Chum
0253	Little French Cr.	LB-27.4	1.2	—	Coho, Chum
	(Cont. Stillaguam. 803)				

LOWER PILCHUCK CREEK

This section includes the lower 9.5 miles of mainstem Pilchuck Creek, plus 10 small tributaries which total more than 32 linear stream miles. This section includes that portion of the drainage from 3 miles above State Highway 9, north of Bryant, in Snohomish County, downstream to its confluence with the Stillaguamish River where it enters from the right bank northeast of Silvana at mile 9.5.

Stream Description

From R.M. 9.5 Pilchuck Creek flows generally south for 3 miles to State Highway 9. From here it courses southwest about 6 miles to the Stillaguamish River. The 10 unnamed tributaries entering below Bryant are small. This section also includes Jackson Gulch Creek which enters the north Stillaguamish River at R.M. 7.3. The majority of the tributaries are intermittent. A few, however, are spring-fed and maintain some flow during normal low water.

The upper 2 miles of this section course through intermittent canyon-like conditions. The valley walls are steep and densely forested with mixed coniferous and deciduous growth. The stream channel is narrow and confined. Approximately a mile above State Highway 9 the steep hillsides change to low rolling hills which are still densely forested. The creek remains confined and flows within a narrow, but shallower valley. Slightly below State Highway 9 the surrounding terrain flattens considerably and remains heavily forested with mixed deciduous and coniferous growth. Three miles above Interstate 5, Pilchuck Creek winds 4 miles across a broad, gently sloping valley to the Stillaguamish River. This lower section has considerable cleared farmland separated by intermittent stands or strips of deciduous trees and brush. Rural development and timber production predominate throughout this entire section, but suburban development is increasing in the area.

The upper 3 miles of Pilchuck Creek exhibit a moderate to moderately steep gradient, with a few cascades and numerous rapids. The next 6 miles of creek has a moderate gradient with a few flat stretches. While the upper 3 miles contain fast riffle conditions and few pools, the lower stream offers good to excellent pool-riffle balance. Boulders, rubble, and occasional patch gravel sections make up most of the stream bottom in the upper three miles, while downstream the bottom is composed mainly of clean gravel and rubble. Most pools are quite shallow and generally have sand-covered bottoms. Stream widths range from approximately 20 to 60 feet in the upper reaches of this section and from 35 to 110 feet in the downstream areas. Below the canyon sections the stream banks are generally quite low with many gently sloping gravel beaches. There are numerous cut banks and a few contoured or riprapped sections. Generally the streambed and stream banks are quite stable. Stream bank cover is moderate to dense, consisting mainly of deciduous trees and brush.

Nearly all tributaries entering the lower Pilchuck offer gentle gradients and good to excellent pool-riffle conditions. They are small with gravel and sand bottoms but a few sections show steeper gradients as they move down through cuts onto the valley floor.

Salmon Utilization

This stretch of the Pilchuck drainage provides transportation, spawning and rearing for anadromous species. The lower 6 to 7 miles is the major spawning habitat within the system which is utilized by chinook, coho, pink, and chum. Each of the accessible tributaries has coho and a few are utilized by pink and chum.

Limiting Factors

The major factor limiting salmon production in this drainage section is the occurrence of low summer flows which often cause extensive stranding in the lower reaches. A serious problem exists with stream bank erosion projects. These are generally associated with road construction or housing developments and often include removal of vegetation and stream channelization or bank protection. The ultimate effect is reduced shade, elimination of natural protection, and increased summer temperatures.

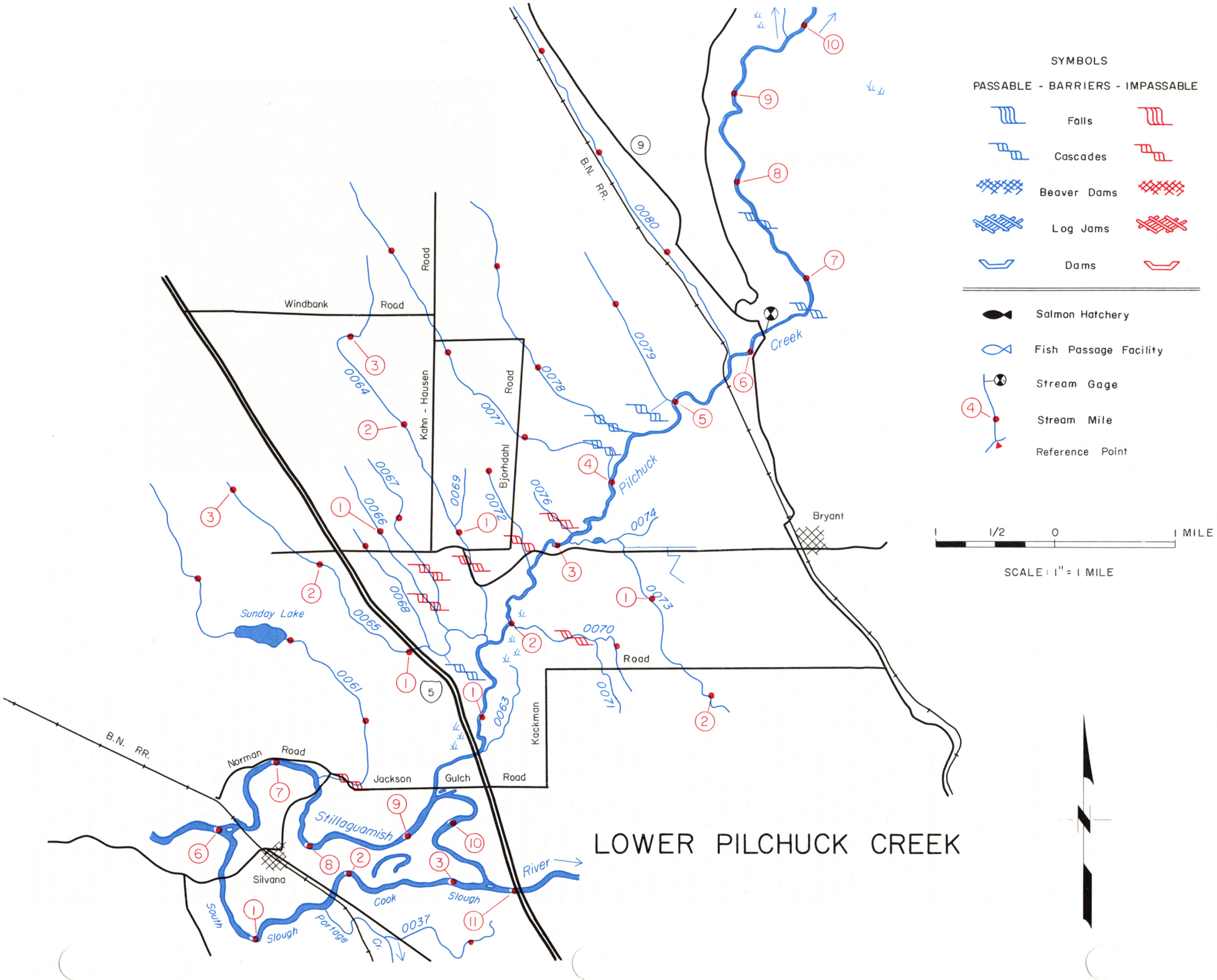
Beneficial Developments

No facility developments or programs have been undertaken within this section to benefit salmon production.

Habitat Needs

The major requirement for maintaining fish production potential within this river system is to preserve existing stream cover and the natural pool-riffle balance. Replacement of adjacent stream bank cover along reaches already cleared is highly desirable.

PHOTO 05-13. Pilchuck Creek falls is a barrier to anadromous fish migrations.


SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage
Stream Mile
Reference Point
1/2
0
1 MILE
SCALE: 1" = 1 MILE
LOWER PILCHUCK CREEK
B.N. RR.
Windbank Road
Kahn - Hausen Road
Bjorndahl Road
Kackman Road
Norman Road
Jackson Gulch Road
Bryant
Silvana
Sunday Lake
Pilchuck Creek
Stillaguamish River
South Slough
Portage Cr.
Cook Slough
0061
0063
0064
0065
0066
0068
0069
0070
0071
0072
0073
0074
0076
0077
0078
0079
0080
0037

LOWER PILCHUCK CREEK
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
0062	Pilchuck Creek	RB-9.4	22.4	76.2	Chin., Coho, Pink, Chum
0064	Unnamed	RB-1.65	3.8	—	Coho
0065	Unnamed	RB-0.01	3.1	—	Coho
0066	Unnamed	LB-0.35	1.5	—	Unknown
0067	Unnamed	LB-0.2	1.4	—	Unknown
0068	Unnamed	LB-0.8	1.2	—	Unknown
0070	Unnamed	LB-2.0	1.4	—	Coho
0072	Unnamed	RB-2.6	1.0	—	Coho
0073	Unnamed	LB-3.1	2.3	—	Coho, Pink, Chum
	Unnamed Pond	Outlet-0.2	—	—	
0075	Drainage Ditch	RB-0.5	~ 1.1	—	Unknown
0077	Unnamed	RB-4.0	3.7	—	Coho, Pink, Chum
0078	Unnamed	RB-4.35	2.6	—	Coho, Pink, Chum
0079	Unnamed	RB-5.0	1.5	—	Coho
0080	Unnamed	RB-5.8	3.4	—	Coho
	(Cont. Stillaguam. 303)				

UPPER PILCHUCK CREEK

This section includes upper Pilchuck Creek above R.M. 9.5, which has 13 miles of mainstem, plus 13 tributaries adding 83 linear stream miles. The headwaters are east of Bald Mountain approximately 4 miles north of Cavanaugh Lake. The stream then courses generally southwest crossing State Highway 9 two miles north of Bryant. Access to the upper watershed is available via the Lake Cavanaugh Road.

Stream Description

From its mountainous headwaters Pilchuck Creek flows generally southwest about 5 miles to the Lake Cavanaugh Road and below it is joined by a major tributary, Lake Creek. Pilchuck Creek continues west, being joined by Bear Creek and a few smaller tributaries, then turns southwest again toward Bryant.

The upper 5 miles flows over steep-sloped, clear-cut terrain. Some dense stands of coniferous timber remain, particularly on the upper, steep-sloped tributaries. Below Bear Creek the stream enters a narrow, steep-sloped valley, intermittently exhibiting ravine- or canyon-like conditions. The slopes are densely forested with coniferous timber, but only a few small patches have been logged. The canyon-like conditions continue throughout the rest of this section where little development has taken place other than some private homes on Cavanaugh Lake. Logging is the principal activity throughout this area with extensive clear-cut sections evident.

Above the Lake Cavanaugh Road the creek exhibits a moderately steep gradient with numerous cascades and rapids, but few pools or riffles. Stream width ranges from 2 to 13 yards, averaging about 7 yards during the fall.

Downstream from Lake Creek, Pilchuck Creek continues its mountain stream character. Throughout the remainder of this section the stream is swift flowing and presents numerous cascades and rapids. It offers only limited pool-riffle areas, but does contain many large, deep pool. Bottom composition is primarily clean boulder and rubble with gravel patches or side beach strips. Stream widths range from 9 to 20 yards, averaging 15 yards in the fall.

The stream banks and streambed throughout the upper creek are quite stable, with only a few cut-bank areas. Except for logged-off portions in the upper reaches, stream cover consists of moderate to dense coniferous timber.

Nearly all tributaries exhibit a steep, swift-flowing character. The one exception is Lake Creek which has a moderate gradient, a good pool-riffle balance, and a stream bottom composed of clean gravel and rubble. The others, including Bear Creek, contain boulder and rubble stream bottoms with numerous cascades and falls.

Salmon Utilization

Present salmon use is restricted to the lower 1.5 miles of the mainstem. Further upstream migration is blocked by a falls at R.M. 11. Chinook, coho, and some pink are known to migrate this far and passage facilities at the falls have been proposed. If adult salmon passage were possible, fish would have easy access through the canyon into the upper watershed. The stability of available spawning areas and the high quality of the rearing habitat indicate potential salmon production from this upstream area. Except for Lake Creek and Bear Creek, upper watershed tributaries would offer little potential.

Limiting Factors

The major factor limiting salmon production is the 12 to 15-foot vertcal falls at R.M. 11. The effects of clear-cut logging and associated road building in the upper watershed are felt mostly on the downstream reaches of Pilchuck Creek.

Beneficial Developments

No projects have been undertaken within this section to benefit salmon production. Engineering and biological evaluations have been performed for determining the feasibility of proposed fish passage facilities at the falls.

Habitat Needs

To realize the production potential from this section, fish passage should be provided over the falls. To maintain a production potential within the upper watershed existing stream cover should be preserved. Logging and road building operations throughout the upper watershed should be coordinated to maintain natural stream habitat.

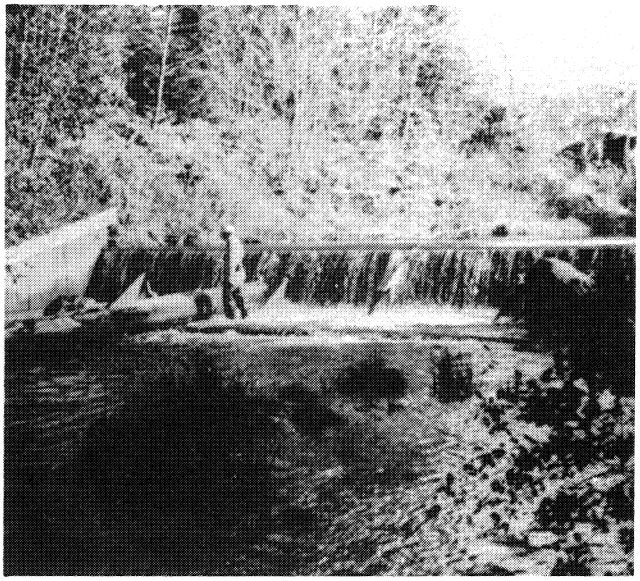
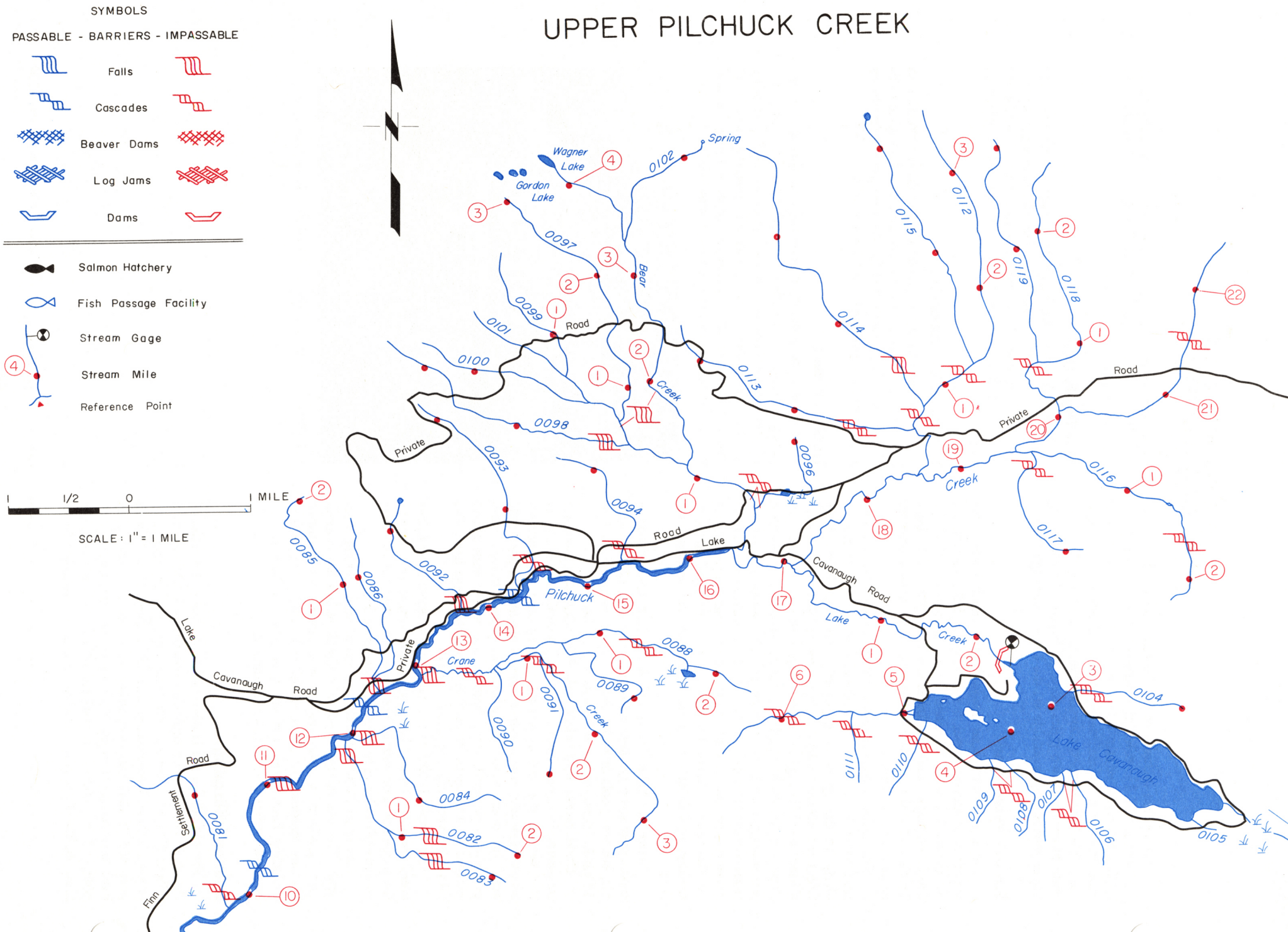


PHOTO 05.14. Dam at outlet of Cavanaugh Lake on Lake Creek.

UPPER PILCHUCK CREEK



UPPER PILCHUCK CREEK
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
0062	Pilchuck Creek				Chin., Coho, Pink, Chum
0081	Unnamed	RB-9.8	1.7	—	Unknown
0082	Unnamed	LB-11.9	2.0	—	None
0083	Unnamed	LB-0.9	1.1	—	None
0084	Unnamed	LB-11.95	1.7	—	None
0085	Unnamed	RB-12.4	2.0	—	None
0086	Unnamed	LB-0.11	1.5	—	None
0087	Crane Creek	LB-12.9	3.4	—	None
0088	Unnamed	RB-0.7	2.4	—	None
0089	Unnamed	LB-0.7	1.2	—	None
0091	Unnamed	LB-1.1	1.0	—	None
0092	Unnamed	RB-13.7	1.2	—	None
0093	Unnamed	RB-14.3	2.2	—	None
0094	Unnamed	RB-15.4	1.3	—	None
0095	Bear Creek	RB-16.4	4.2	—	None
0096	Unnamed	LB-0.4	1.0	—	None
0097	Unnamed	RB-1.2	3.0	—	None
0098	Unnamed	RB-0.5	2.4	—	None
0099	Unnamed	RB-0.7	1.8	—	None
0100	Unnamed	RB-0.3	1.5	—	None
0102	Unnamed	LB-3.3	1.2	—	None
	Wagner Lake	Outlet-4.2	—	—	
0103	Lake Creek	LB-17.1	6.6	—	None
	Lake Cavanaugh	Outlet-2.5	—	—	
0104	Unnamed	NS-3.0	1.0	—	None
	Lake Cr. cont. as Unnamed	@ mi. 4.91	—	—	
0112	Unnamed	RB-18.6	3.6	—	None
0113	Unnamed	RB-0.5	2.3	—	None
0114	Unnamed	RB-0.7	2.9	—	None
	Unnamed	RB-1.3	2.3	—	None
0116	Unnamed	LB-19.5	2.3	—	None
0117	Unnamed	LB-0.1	1.1	—	None
0118	Unnamed	RB-20.05	2.7	—	None
0119	Unnamed	RB-0.6	2.1	—	None

NORTH FORK STILLAGUAMISH
Cicero Area

This portion of the Stillaguamish River drainage includes the North Fork from the vicinity of Oso (R.M. 14.5) downstream to its confluence with the South Fork at Arlington at R.M. 17.8. Sixteen tributaries, excluding Deer Creek, enter the North Fork along this stretch, adding nearly 63 linear stream miles. The Deer Creek drainage is covered in the next section (Stillaguamish — 501).

Stream Description

From R.M. 14.5 the North Fork Stillaguamish meanders generally west for about 6 miles, then southwest a little more than 8 miles to its confluence with the South Fork. The named tributaries along this stretch include Deer Creek, Elk Creek, Grant Creek, and Rock Creek. The remaining 13 smaller tributaries are all unnamed. Grant Creek and Deer Creek are the major fish production tributaries. Most of the other streams provide little access as they move down generally steep hillsides to the Stillaguamish Valley floor.

The valley is quite broad throughout most of this section, bordered by moderately steep, heavily forested hillsides. Land use is predominantly agricultural, with some patch logging on the upper slopes. Intermittent farms and rural residences represent the major habitation, with the communities of Oso, Cicero, Trafton, and Arlington being the population centers. Some summer and recreational developments have located along river-front lands. Heavy recreational and fishing use occurs in this stretch of river.

In the upper 9 miles of this section the river meanders a great deal, offering moderate gradient with good to excellent pool-riffle conditions. Below R.M. 6, just north of Trafton, the gradient shallows considerably and the stream channel contains numerous long, deep pools and relatively shallow, slow-moving glides. Channel widths range from about 45 feet to 100 feet, averaging about 75 feet during the fall months. Numerous riffles are composed mainly of gravel and mixed rubble, with layers of silt deposition in the slower waters and pools. The streambed and banks are considered quite stable with many broad, gently sloping gravel and rubble beaches. A few steep, natural earth-cut banks are also found along this section, particularly in the lower 6 miles. Immediate stream-side cover is considered quite good. It is composed mainly of mixed deciduous and conifer thickets or strips located adjacent to the stream, with only occasional sections of cleared farmland.

Salmon Utilization

This section provides transportation, spawning and rearing for chinook, coho, pink, and chum. Juvenile coho and some juvenile chinook inhabit these waters year-round. The deep pools located in the lower 6 miles of this section offer excellent holding and resting areas for adult salmon, and provide exceptional rearing habitat.

Limiting Factors

A major factor limiting salmon production in this section is the silt deposition over the streambed caused by a large clay and mud slide located a short distance upstream. The heavier concentrations of silt over the streambed are between R.M. 4 and 11, in the vicinity of Cicero. Also, natural low summer flows within the main channel, and in some of the smaller tributaries, restrict salmon production to some degree. Gravel removal operations also impose restriction on production. Poaching becomes an occasional problem in this section.

Beneficial Development

No facilities or programs have been undertaken within this section to specifically benefit salmon production.

Habitat Needs

Major requirements for maintaining the fish production capabilities within this drainage section include preserving the existing stream bank cover and curtailing extensive gravel removal operations. Confinement of the clay bank slide upriver would also be highly beneficial, and would allow for large-scale gravel cleaning operations in the salmon spawning riffles.

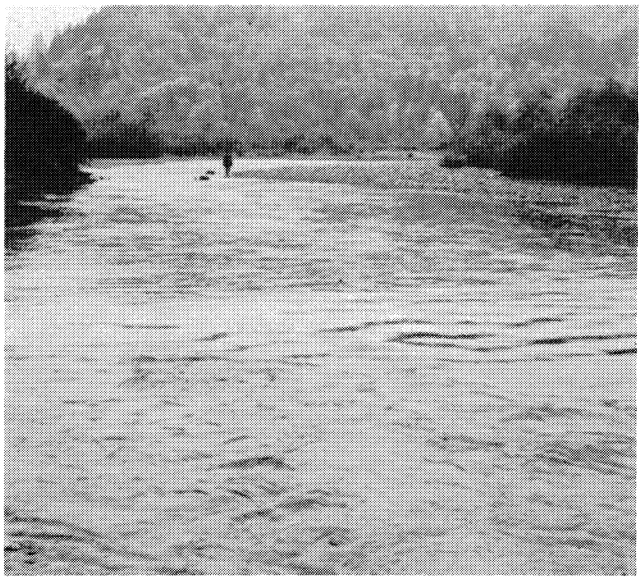
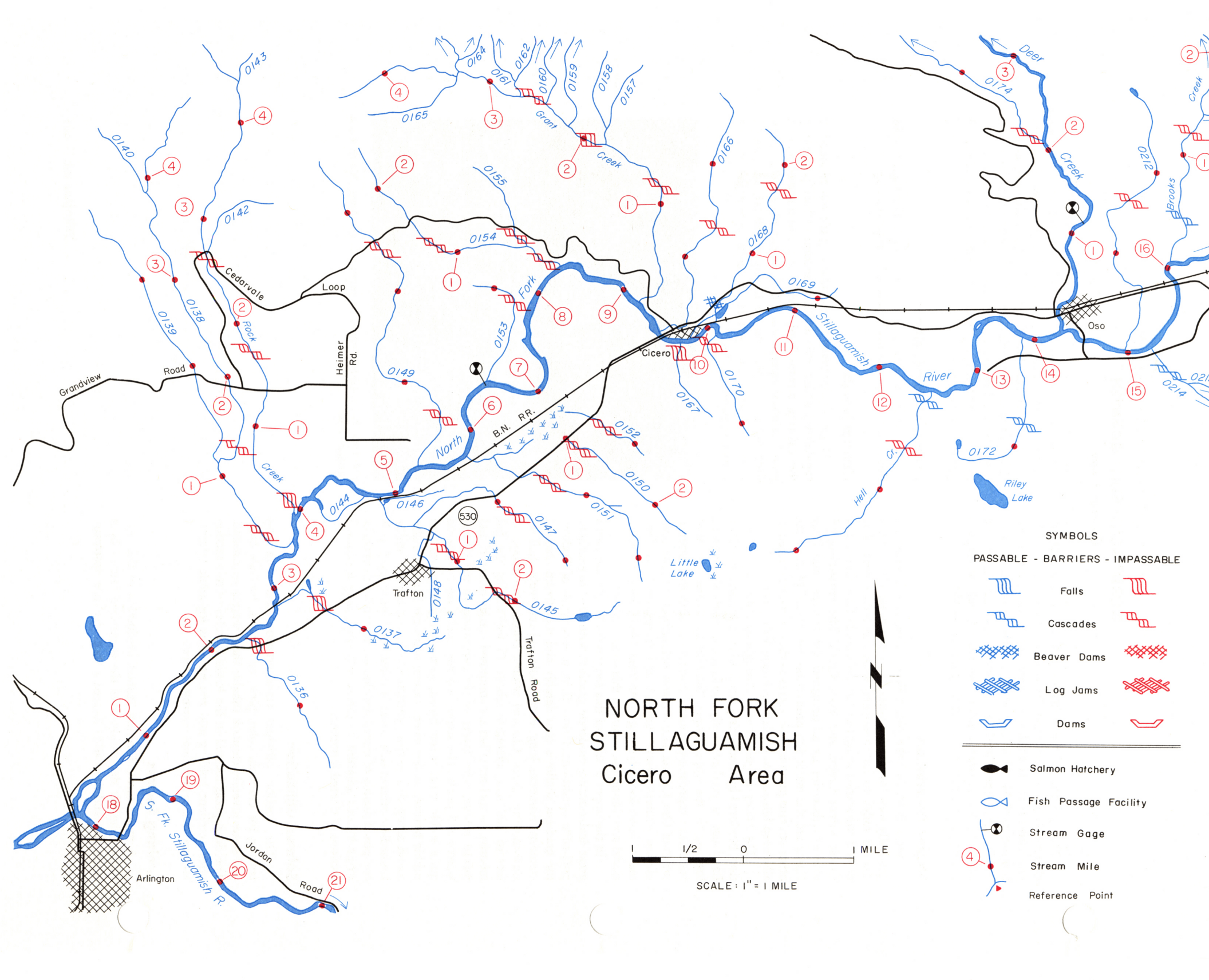


PHOTO 05-15. Gentle gradients prevail in the lower North Fork Stillaguamish.


NORTH FORK
STILLAGUAMISH
Cicero Area
SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage
Stream Mile
Reference Point
1 1/2 0 1 MILE
SCALE: 1" = 1 MILE
Cicero
Oso
Trafton
Arlington
Grandview Road
Cedarvale Loop
Heimer Rd.
Rock Creek
North Fork
Stillaguamish River
B.N. RR.
Grant Creek
Deer Creek
Hell Cr.
Riley Lake
Little Lake
Trafton Road
Jordan Road
S. Fk. Stillaguamish R.
530

NORTH FORK STILLAGUAMISH — CICERO AREA
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish				
0135	N. F. Stillaguamish R.	RB-17.8	48.5	284.0	Chin., Coho, Pink, Chum
0136	Unnamed	LB-2.5	1.7	—	Unknown
0137	Unnamed	LB-2.89	1.9	0.98	Unknown
	Unnamed Pond	Outlet-0.3	—	—	
0138	Unnamed	RB-3.6	4.9	—	Coho
0139	Unnamed	RB-1.1	2.9	—	Unknown
0141	Rock Creek	RB-3.9	4.9	—	Unknown
0145	Unnamed	LB-4.8	2.9	—	Unknown
0147	Unnamed	RB-0.4	2.0	—	Unknown
	Unnamed Pond	Outlet-2.5	—	—	
0149	Unnamed	RB-5.3	3.7	—	Coho
0150	Unnamed	LB-5.7	2.5	—	Unknown
0151	Unnamed	LB-0.2	2.3	—	Unknown
0152	Unnamed	RB-0.9	1.1	—	None
0153	Unnamed	RB-6.51	1.2	—	Unknown
0154	Unnamed	RB-8.3	2.4	—	Unknown
0156	Grant Creek	RB-9.2	4.5	—	Coho, Chum
0159	Unnamed	LB-2.2	1.1	—	None
0161	Unnamed	LB-2.7	1.0	—	None
0163	Unnamed	LB-3.3	1.5	—	None
0166	Unnamed	RB-9.45	2.7	—	Coho, Chum
0168	Unnamed	RB-9.8	2.4	—	Unknown
	Cicero Pond	Outlet-0.35	—	—	
0169	Unnamed	LB-0.51	1.2	—	Unknown
0170	Unnamed	LB-10.1	1.1	—	Unknown
0171	Hell Creek	LB-12.5	2.2	—	Coho
0172	Unnamed	LB-13.9	1.7	—	Unknown
	Unnamed Pond	Outlet-1.7	—	—	
0173	Deer Creek	RB-14.3	23.9	—	Chinook, Coho, Pink

(See Stillaguam. 503)
(Cont. Stillaguam. 603)

DEER CREEK DRAINAGE

This stream section covers the entire Deer Creek drainage from its mountainous headwaters north of the Stillaguamish Valley downstream to its confluence with the North Fork Stillaguamish River at the town of Oso. It includes approximately 24 miles of mainstem stream plus 23 individual tributaries adding a total of nearly 56 additional stream miles.

Stream Description

From its headwaters Deer Creek courses generally west about 16 miles, then south 8 miles to its confluence with the North Fork. Its major tributaries are Higgins Creek and Little Deer Creek. These, along with the majority of smaller tributaries, exhibit steep gradient characteristics common to mountain streams.

Throughout the drainage the valley floor is quite narrow, with only a few intermittent broad sections. Adjacent hillsides rise quickly away from the streambed and, except where logging has occurred, are densely forested. Very narrow, ravine and sometimes canyon-like conditions predominate in the lower 5 miles. The upper watershed is almost entirely undeveloped. The major portion of all tributaries entering above mile 13, plus the remainder of upper Deer Creek drainage above mile 17, are located within Mt. Baker National Forest. Clear-cut logging is evident throughout much of the upper drainage, and is especially heavy in the Little Deer Creek watershed. Logging roads provide the principal access throughout most of the area. There are a few rural residences in the lower reaches, with Oso the only community development. The watershed receives relatively heavy recreation use, especially in the summer and early fall months.

Stream gradient is moderately steep throughout most of the drainage, with some very steep sections in the canyon between mile 1.5 and 5.0. A number of channel sections exhibit flood plain characteristics, particularly where a somewhat broader valley floor exists. In such areas, channel splitting and extensive broad gravel riffles and gently sloped gravel beaches predominate. For most of the stream length, however, bottom composition is mainly boulder-strewn, interspersed with rubble, and only a few riffle and patch gravel sections. In spite of apparent flooding effects, the major portion of the channel appears quite stable. Stream widths throughout most of the upper drainage range from 5 to 12 yards. In the lower 1.5 miles, below the ravine and canyon-like area, widths range from 12-20 yards. Natural, stable stream banks prevail throughout the drainage, most of them relatively low earth cuts or boulder-strewn beaches. Steep slopes with some vertical walls exist in the lower canyon section. Except where logging has approached the immediate stream bank, cover is moderate to dense, composed mainly of conifers and mixed deciduous trees and underbrush.

Salmon Utilization

Deer Creek is accessible to anadromous fish runs nearly to its headwaters. It serves spawning and rearing fall chinook, spring chinook, and coho with some pink and an occasional chum observed. Most tributaries provide relatively short access; however, a number received heavy spawning concentrations of coho. Since most of the tributaries are quite small and provide limited rearing area, most salmon juveniles spend the major portion of their fresh-water life in Deer Creek proper.

Limiting Factors

One of the principal factors limiting salmon production in the Deer Creek drainage is its flash flooding tendency, with consequential heavy silt loading of the stream. This condition is aggravated by extensive clear-cut logging practices in the upper watershed. Steep gradient conditions in the lower canyon, particularly between miles 1.5 and 3, may present at least a partial barrier to salmon migration, probably blocking most pink and chum salmon. The heavy silt deposition existing over riffle areas in the lower 2 miles would affect pink and chum the most. In the upper watershed, stream sections exhibiting considerable channel splitting have a definite lack of adequate shade and cover. Also, during low summer flow periods, water in these stretches tends to spread out, often forming potholes, trapping juvenile fish. Increasing stream gradient above R.M. 17 may present obstacles to migration. Also, considerable logging debris along the stream course could intermittently create barriers at some locations.

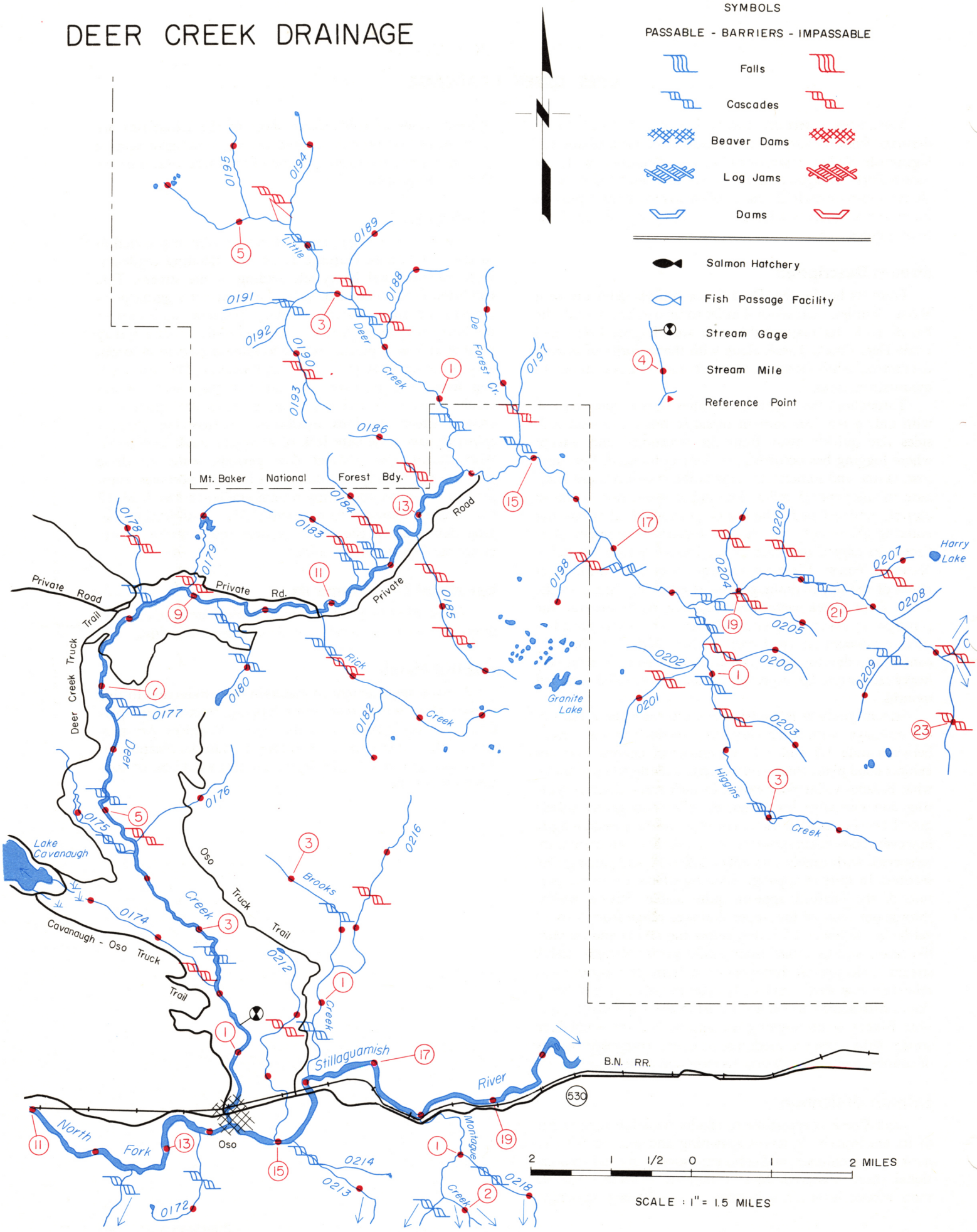
Beneficial Developments

No facilities or programs have been undertaken in this drainage area to specifically benefit salmon production.

Habitat Needs

A major requirement to maintain fish production in this section is to insure that forest logging activities are performed in accordance with the Forest Practices Act protecting the natural stream habitat. In addition, cleaning of streambed gravel over the lower 2 miles would be of considerable benefit.

DEER CREEK DRAINAGE



DEER CREEK DRAINAGE
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
0135	N. F. Stillaguamish R.				Chin., Coho, Pink, Chum
0173	Deer Creek	RB-14.3	23.7	—	Chin., Pink, Coho
0174	Unnamed	RB-2.1	2.6	—	Unknown
0175	Unnamed	RB-4.3	1.8	—	Unknown
0176	Unnamed	LB-4.4	1.9	—	Coho
0178	Unnamed	RB-8.2	1.4	—	Unknown
0179	Unnamed	RB-8.8	1.9	—	Unknown
	Unnamed Pond	Outlet-0.8	—	—	
0180	Unnamed	LB-9.3	1.3	—	Coho
	Unnamed Lake	Outlet-1.3	—	—	
0181	Rick Creek	LB-10.7	3.3	—	Coho
0182	Unnamed	LB-1.4	1.0	—	None
0183	Unnamed	RB-11.4	1.1	—	Unknown
0184	Unnamed	RB-11.8	1.7	—	Unknown
0185	Unnamed	LB-12.8	2.4	—	Coho
0186	Unnamed	RB-13.3	1.3	—	Unknown
0187	Little Deer Cr.	RB-13.9	6.0	—	Coho
0188	Unnamed	LB-2.1	1.4	—	None
0189	Unnamed	LB-2.8	1.2	—	None
0190	Unnamed	RB-3.3	1.9	—	None
0194	Unnamed	LB-4.4	1.5	—	None
0195	Unnamed	LB-4.9	1.2	—	None
0196	DeForest Creek	RB-14.9	2.6	—	Unknown
0198	Unnamed	LB-16.8	1.0	—	Unknown
0199	Higgins Creek	LB-18.4	4.6	—	Coho
0200	Unnamed	RB-0.5	1.5	—	Unknown
0201	Unnamed	LB-0.8	1.6	—	Unknown
0203	Unnamed	RB-1.6	1.2	—	None
0204	Unnamed	RB-19.0	1.1	—	Coho
0205	Unnamed	LB-19.05	1.2	—	Unknown
0207	Unnamed	RB-20.9	1.2	—	Unknown
0209	Unnamed	LB-21.55	1.3	—	Unknown
0210	Unnamed	RB-22.1	1.4	—	Unknown
	Segelsen Lake	Outlet-1.4	—	—	

NORTH FORK STILLAGUAMISH
Hazel Area

This drainage section covers approximately 14 miles of the mainstem North Fork Stillaguamish River plus 18 tributaries, adding more than 86 linear stream miles. The reach encompasses that area from a point near the community of Fortson, downstream to Oso.

Stream Description

From R.M. 28.5, near Fortson, the North Fork meanders west approximately 14 miles to Oso. The principal tributaries entering along this reach include French Creek, Montague Creek, and Boulder River (see Stillaguamish 700 — Boulder River). Other named tributaries include Dicks Creek, Rollins Creek, and Brooks Creek. Most tributaries offer moderate gradients and their upper watersheds are predominantly steep, mountain-type streams. The upper portion of nearly all tributaries above R.M. 21 are within Mt. Baker National Forest.

The valley floor in this section is relatively broad and gently sloping. It contains a number of areas having dense mixed deciduous and coniferous forest, these separated by intermittent cleared farm lands. Side valley terrain rises sharply away from the bottom land and is densely forested with coniferous timber. Some patch- or section-type logging takes place on the valley floor and on the adjacent hillsides. The principal land use is agriculture, with many rural residences, plus a few small communities including Fortson, Tucker, Hazel, Rowan, Halterman, and Oso. This section of mainstem river, as well as a number of its tributaries, receive relatively heavy recreation use.

Stream gradient is moderate throughout this entire reach, with considerable meandering, and numerous channel splits. Pool-riffle balance is good to excellent, the channel offering a mixture of broad riffles and lengthy gravel beaches, with some patch gravel sections. Nearly all gravel areas are highly suitable for spawning. Pools are sufficiently deep and large enough to accommodate the various populations of adult salmon which travel through or utilize this river section. Stream bottom composition is predominantly rubble and gravel, and appears for the most part to be quite stable. Channel widths range from approximately 15-30 yards, averaging nearly 35 yards during the fall spawning period. Stream banks appear generally stable, with a few relatively low natural earth cut sections, otherwise gently sloping gravel and rubble side beaches are formed. Little bank protection work has taken place in this section. The adjacent stream and bank cover is moderately dense, and is composed of mixed deciduous and conifer thickets or intermittent strips.

Salmon Utilization

This section of North Fork Stillaguamish provides transportation, spawning and rearing for chinook, pink, chum, and some coho. These species also spawn in the tributaries to this reach. Juvenile salmon rearing also takes place in the main river and throughout the accessible length of its tributaries.

Limiting Factors

The principal factor limiting salmon production within this section is sedimentation resulting from a major mud and clay slide on the river's right bank, at approximately mile 20.4. Below that point, heavy silt deposits cover most of the gravel riffles, making them unsuitable for successful spawning and egg incubation. This condition also inhibits natural cycles of aquatic insect growth, reducing food production, and consequently lowering the rearing capacity of the stream below. Gravel removal operations also impose serious stream habitat alterations.

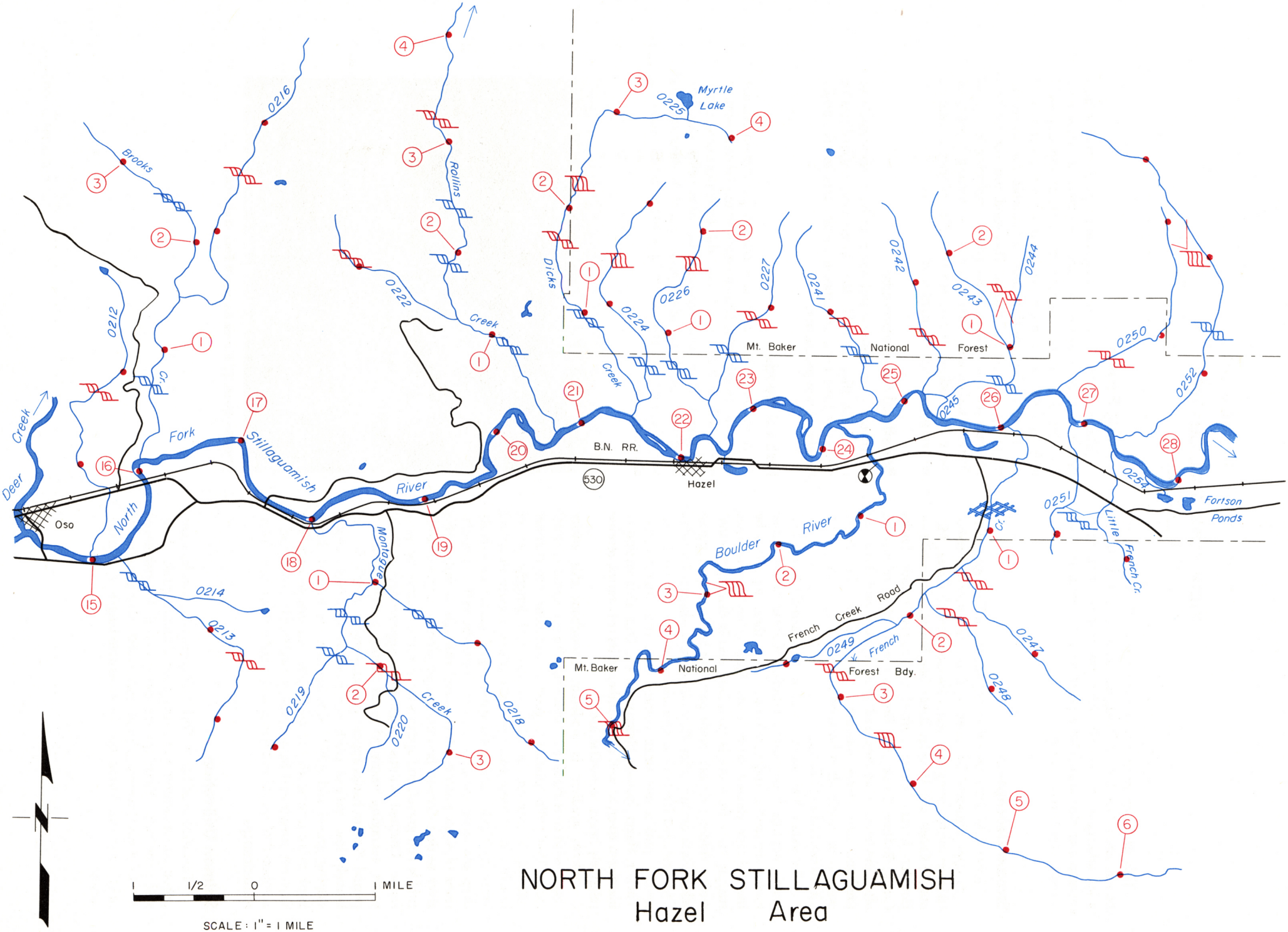
Beneficial Developments

In the past, unsuccessful attempts have been made to control the slide at R.M. 20.4. Otherwise, no facilities or programs have been undertaken in this area to specifically benefit salmon production.

Habitat Needs

A major project to benefit salmon production habitat within the North Fork Stillaguamish would be containment of the slide at R.M. 20.4. Should this be undertaken, extensive gravel cleaning operations in the river below would be beneficial. Curtailment of the gravel removal operations and maintenance of natural stream bank cover in this section is also imperative.

PHOTO 05-16. Slide area on North Fork near Hazel.



NORTH FORK STILLAGUAMISH
Hazel Area

NORTH FORK STILLAGUAMISH
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
0135	N. F. Stillaguamish R.				Chin., Coho, Pink, Chum
0212	Unnamed	RB-15.0	2.8	—	Coho, Pink
	Unnamed Pond	Outlet-2.8	—	—	
0213	Unnamed	LB-15.2	2.3	2.04	Coho
0215	Brooks Creek	RB-16.1	3.4	—	Coho
0216	Unnamed	LB-1.5	2.8	—	Unknown
0217	Montague Creek	LB-18.0	3.6	—	Coho, Pink
0218	Unnamed	RB-1.0	2.3	—	Unknown
0219	Unnamed	LB-1.7	1.0	—	Unknown
0221	Rollins Creek	RB-20.8	5.1	—	Coho
0222	Unnamed	RB-1.3	1.4	—	Unknown
0223	Dicks Creek	RB-21.4	4.0	—	Coho, Pink, Chum
0224	Unnamed	LB-0.1	2.2	—	Unknown
0226	Unnamed	RB-22.3	2.3	—	Coho, Pink, Chum
0227	Unnamed	LB-0.3	1.8	—	Unknown
0229	Boulder River	LB-24.3	13.3	—	Chin., Coho, Pink, Chum
	(See Stillaguam. 703)				
0241	Unnamed	RB-24.6	1.8	—	Coho
0242	Unnamed	RB-25.15	1.7	—	Coho
0243	Unnamed	RB-25.2	2.6	—	Coho, Pink, Chum
0246	French Creek	LB-26.1	6.5	—	Chin., Coho, Pink, Chum
0247	Unnamed	RB-1.4	1.6	—	Unknown
0248	Unnamed	RB-1.8	1.3	—	Unknown
0249	Unnamed	LB-2.1	1.2	—	Unknown
0250	Unnamed	RB-26.5	2.15	—	Coho
0251	Unnamed	LB-26.8	1.2	—	Coho, Chum
0252	Unnamed	RB-27.3	3.6	—	Coho, Pink, Chum
0253	Little French Cr.	LB-27.4	1.2	—	Coho, Chum
	(Cont. Stillaguam. 803)				

BOULDER RIVER DRAINAGE

This section contains the entire Boulder River drainage. It includes nearly 13.5 miles of main stream, with 10 tributaries adding almost 11 linear miles of stream length. The majority of this drainage is located within Mt. Baker National Forest boundaries, south and west of Whitehorse Mountain, a few miles west of Darrington in eastern Snohomish County.

Stream Description

From its headwaters southwest of Whitehorse Mountain, Boulder River flows generally northwest nearly 8 miles, then turns north and slightly east, dropping sharply through a relatively deep, narrow cut for nearly 3 miles. Below the canyon the stream courses northeast more than a mile, then north to the Stillaguamish. This lower 2.5 miles is across more gently sloping terrain. The stream moves under State Highway 530 approximately 0.5 mile above its confluence with the North Fork Stillaguamish at R.M. 24.3. All Boulder River tributaries are above Boulder Falls, and each exhibits steep, swift-flowing mountain stream characteristics.

The upper Boulder River watershed is mountainous and for the most part, densely forested. Adjacent hillsides are quite steep, leaving a relatively narrow valley floor. These conditions continue from the headwaters, downstream about 8 miles, to the vicinity of Boulder Falls (R.M. 5.0). At this point the valley walls narrow and steepen into first, a deep ravine, then canyon-like condition, continuing for 2 miles. Below R.M. 3.0, the valley floor begins to broaden, with adjacent hillsides less steep, but still densely forested. Development of any kind is virtually non-existent throughout the Boulder River drainage. The principal land use is forestry, with only a few small logging operations evident. Considerable recreation activity also takes place within the watershed.

Above Boulder Falls, the river offers mostly a moderate to moderately steep gradient all the way to the headwaters, with only occasional rapids or cascade sections. The stream channel is relatively confined and presents riffle-type stream character. Stream bottom is mainly rubble with a few boulder sections and mostly patch-type gravel areas. Stream widths range generally from 3 to 7 yards. Most of the stream banks are moderately steep with rubble and boulder beaches, and occasional low, sharp earth cuts. The streambed and stream banks throughout the upper section appear quite stable. All tributaries have very steep gradients with numerous cascades and falls and predominantly boulder-strewn streambeds.

The Boulder River canyon section lying between mile 3.0 and 5.0 is very narrow and has steep, often vertical walls. This stretch is composed almost entirely of sharp cascades and falls, separated by occasional deep slow-moving pools. Many of the falls in this section exhibit vertical drops greater than 20 feet, with at least one near the canyon's lower end exceeding 50 feet.

The lower 3 miles of Boulder River offer, for the most part, a moderate stream gradient. The channel remains relatively confined and holds a fair to good pool-riffle balance. The stream bottom is composed principally of clean gravel and rubble. Stream widths range from 5 to 11 yards, averaging near 8 yards during the fall months. Stream banks are mostly gently sloped rubble beaches with a few sharp earth-cut sections. Only in the lower 0.5 mile has any bank protection or stream channelization taken place. Otherwise, the streambed and stream banks appear naturally stable. Stream shading is considered good to excellent throughout this lower stretch, with mostly dense mixed coniferous and deciduous trees and brush.

Salmon Utilization

Boulder River is accessible to anadromous fish runs for nearly 3 miles. This section provides transportation, spawning, and rearing area for fall chinook, coho, pink, and some chum. The heaviest use by pink and chum is within the lower half mile; however, a few are known to migrate nearly to the falls. Early spawning chinook have been observed in the stream which are possibly of the spring chinook race.

Limiting Factors

The principal factor limiting salmon production within this drainage is the series of falls beginning at approximately mile 2.9. These halt anadromous fish migration, and are of such heights and configurations as to preclude use of the upper drainage. Additional limitations are sometimes imposed by periodic gravel removal or channelization work in the lower stream, and by some logging operations which have, in the past, disturbed spawning and rearing habitat in this lower section.

Beneficial Developments

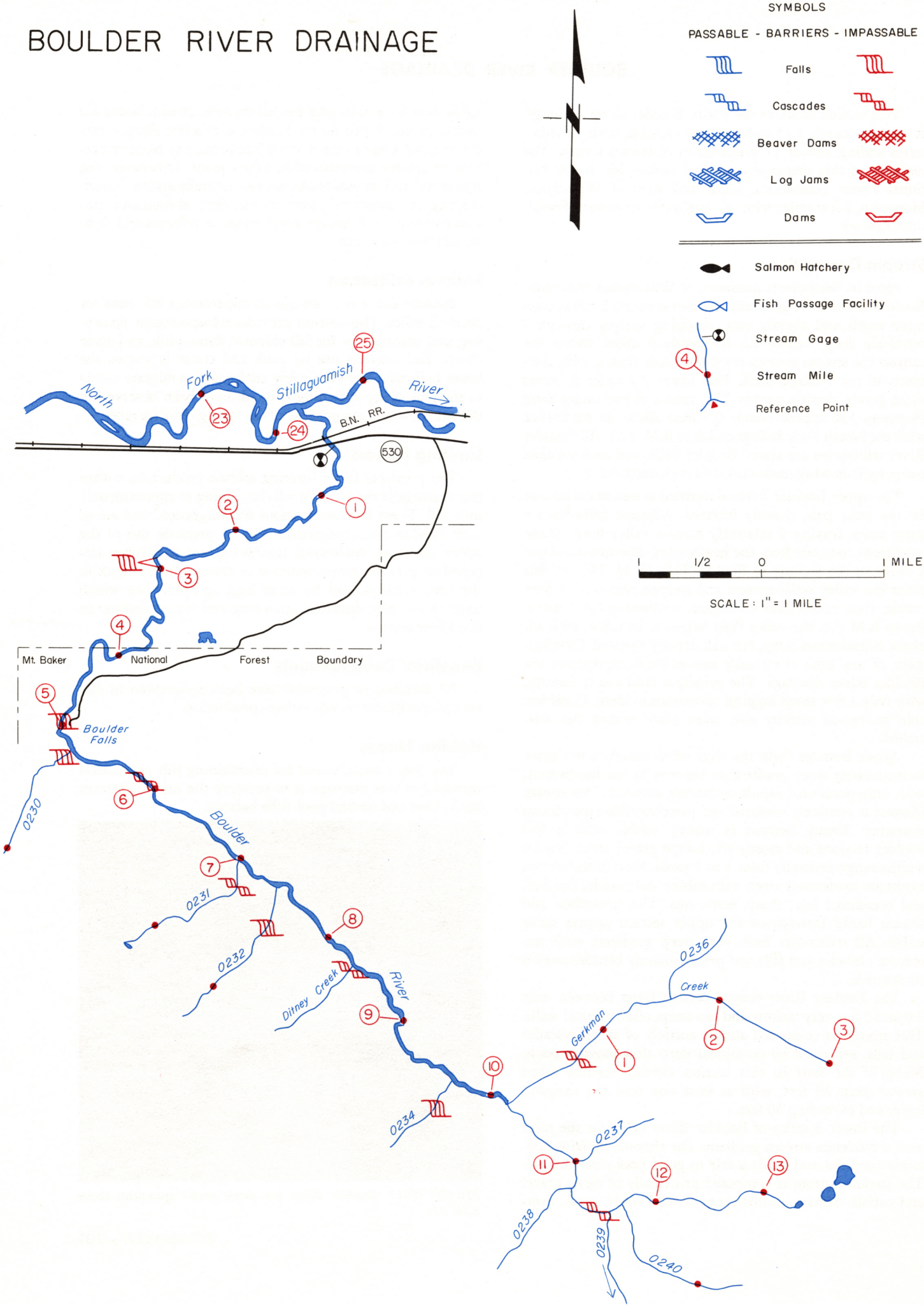
No facilities or programs have been undertaken in this area to specifically benefit salmon production.

Habitat Needs

The major requirement for maintaining fish production potential of this drainage is to preserve the existing stream bank cover and natural pool-riffle balance.

PHOTO 05-17. Boulder River has patch gravel spawning above R.M. 1.0.

BOULDER RIVER DRAINAGE



BOULDER RIVER DRAINAGE
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
0135	N. F. Stillaguamish R.				Chin., Coho, Pink, Chum
0229	Boulder River	LB-24.3	13.3	—	Chin., Coho, Pink, Chum
0230	Unnamed	LB-5.3	1.0	—	None
0231	Unnamed	LB-7.0	1.2	—	None
0232	Unnamed	LB-7.4	1.3	—	None
0235	Gerkman Creek	RB-10.2	3.0	—	None
0240	Unnamed	LB-11.7	1.3	—	None
	Unnamed Lake	Outlet-13.3	—	—	

NORTH FORK STILLAGUAMISH
Headwaters

This section includes the upper 20 miles of North Fork Stillaguamish drainage, from R.M. 28.5, near Fortson, to headwaters high in the mountains northeast of Phinney Peak. There are 29 tributaries, including Squire Creek (see Stillaguamish 901), which provide nearly 90 linear stream miles. A major portion of this drainage area is within Mt. Baker National Forest, a few miles northwest of the Snohomish County town of Darrington.

Stream Description

From headwaters near Phinney Peak, the North Fork travels southeast 5 miles, then south 9 miles to its closest point to Darrington. Here the river turns west and courses some 6 miles to the vicinity of Fortson. Major tributaries include North, Middle, and South branches, plus Crevice, Segelson, and Squire creeks.

The upper 13 miles runs through mostly steep, mountain terrain. Its streambed and those of tributary channels are confined by narrow, steep valley walls, heavily forested with conifers. About 3 miles above Squire Creek (R.M. 34.5) the North Fork emerges from its narrow valley and mountain terrain with the lower 5 to 6 miles flowing across a broad, gently sloping valley floor. Adjacent hillsides remain steep and heavily forested. The valley floor supports relatively dense stands of deciduous trees and underbrush. The upper watershed has experienced little development with few logging roads and limited patch logging. Natural reforestation is evident over some previously logged slopes. The broader valley floor below consists of a number of farms and scattered rural residences, plus the small communities of Whitehorse and Fortson. This upper drainage section offers considerable recreation opportunity with heaviest use presently in the lower 6 to 8 miles.

In this reach the North Fork presents two totally different environmental types; the upper 14 miles of boulder zone character, the lower 6 miles floodway in nature. Above R.M. 34.5, the river is swift flowing over steep gradient, through a relatively deep-cut channel. There are numerous rapid and cascade stretches and a few short falls. Stream bottom is mainly of boulders and rubble, with only occasional patch gravel sections. Stream widths range from 2 to 5 yards, and banks are generally stable, consisting of sharp earth or rock cuts and only a few gently sloping rock beaches. Stream-side cover is mainly of coniferous timber, with occasional patches of mixed deciduous growth. Cover is dense over most upper watershed drainages.

The North Fork's lower 6 miles presents a moderate gradient and winding stream course with numerous relatively broad riffles separated by deeper pool and glide stretches. The channel is well defined, with only a few channel splitting sections. The bottom is quite stable, being predominantly clean rubble and gravel. Banks along this lower stretch are relatively low, naturally stable, earth-cut or gently sloping gravel-rubble beaches. Stream-side cover is mainly dense deciduous trees and underbrush with many stretches having a nearly complete canopy. Except for Moose and Squire creeks, major lengths of the tributaries entering along this lower section are steep gradient, mountain-type streams, with numerous cascades and small falls. All tributaries in this section have dense cover throughout most of their length.

Salmon Utilization

Salmon utilization in this section of the North Fork is restricted to that area below the falls (R.M. 37.3), about 0.75 miles downstream from the South Branch. Except for Moose and Squire creeks, salmon use only the lower reaches of those tributaries entering below the falls. The North Fork's major spawning concentrations occur in the lower 6 to 7 miles of this reach. Large numbers of chinook, pink, and chum spawn in the mainstem while coho mainly use the accessible tributaries. The river's upper accessible 3 miles receive scattered chinook and coho spawning populations. Juvenile salmon rear in the mainstem and in accessible tributary.

Limiting Factors

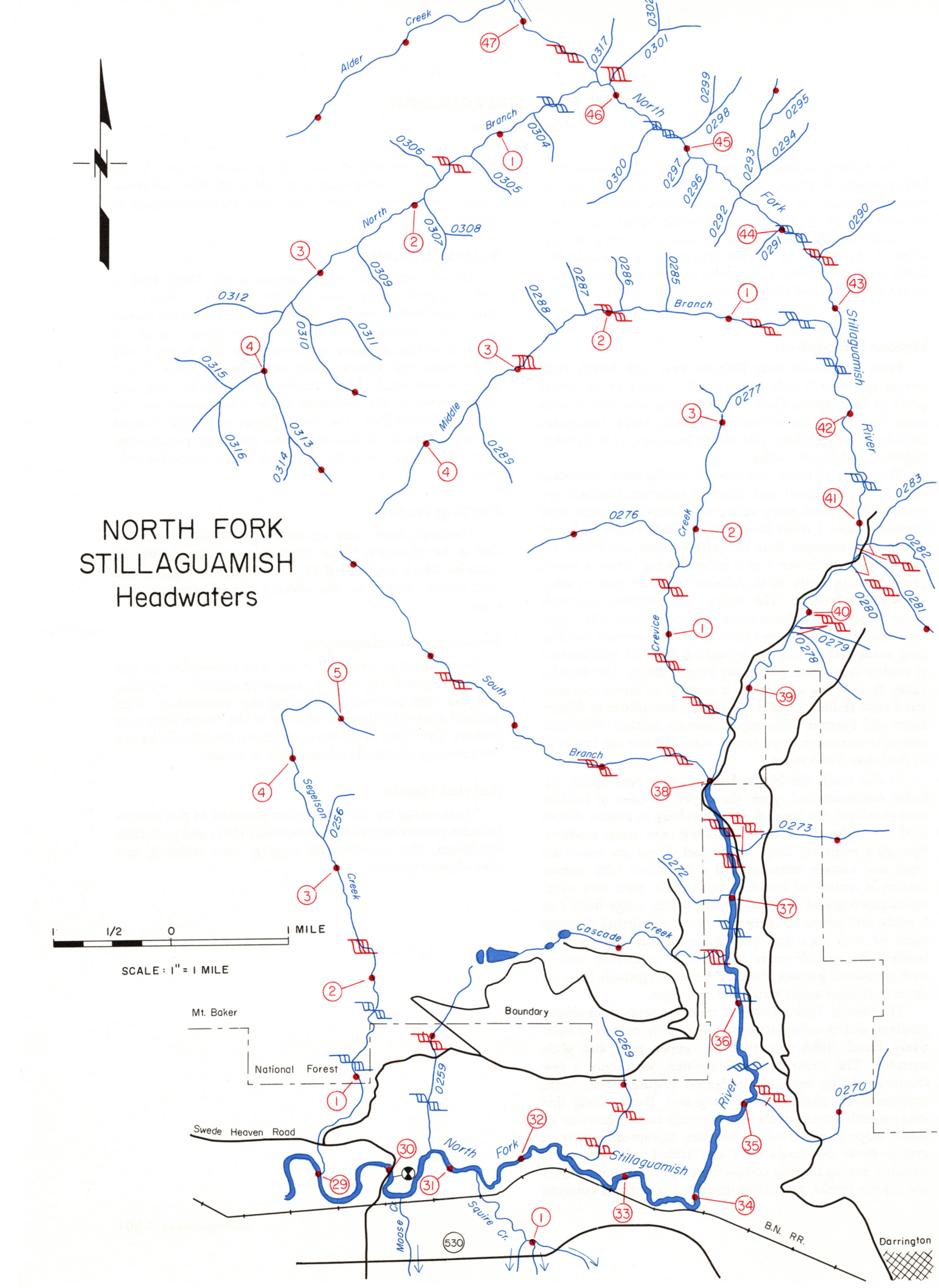
The major factor limiting salmon production in this section is the migration barrier formed by a series of falls and cascades which begin at R.M. 37.3. Clear-cut logging and road construction have also affected natural stream conditions.

Beneficial Developments

No projects or programs have been undertaken in this section to specifically benefit salmon production. Investigation has been completed regarding the construction of an artificial spawning channel adjacent to the North Fork near Fortson. Use of the upper drainage above the falls, for barren -area rearing of juvenile salmon, may be feasible.

Habitat Needs

Maintaining the fish production potential in this section includes preserving existing stream-side cover and pool-riffle conditions, plus coordinating logging, road building, and silvicultural practices.


NORTH FORK
STILLAGUAMISH
Headwaters
Alder Creek
North Branch
North Fork
Middle Branch
South Branch
Crevice Creek
Segelson Creek
Cascade Creek
Stillaguamish River
Boundary
Mt. Baker
National Forest
Swede Heaven Road
Moose Cr.
Squire Cr.
B.N. RR.
Darrington
530
1/2 0 1 MILE
SCALE: 1" = 1 MILE

NORTH FORK STILLAGUAMISH — DARRINGTON AREA
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
0135	N. F. Stillaguamish R.				Chin., Coho, Pink, Chum
0255	Segelsen Creek	RB-29.0	5.3	—	Coho, Pink, Chum
0257	Moose Creek	LB-30.3	2.9	—	Coho, Chum
	(See Stillaguam. 903)				
0259	Unnamed	RB-30.8	1.7	—	Unknown
0260	Squire Creek	LB-31.2	9.6	—	Chin., Coho, Pink, Chum
	(See Stillaguam. 903)				
0269	Unnamed	RB-32.4	1.6	—	Unknown
0270	Unnamed	LB-35.1	1.8	—	Unknown
0271	Cascade Creek	RB-36.5	1.9	—	Unknown
	Unnamed Pond	Outlet-1.4	—	—	
	Unnamed Pond	Outlet-1.6	—	—	
	Unnamed Lake	Outlet-1.9	—	—	
0273	Unnamed	LB-37.5	1.5	—	None
0274	South Branch	RB-38.0	4.2	—	None
0275	Crevice Creek	RB-38.7	3.4	—	None
0276	Unnamed	RB-1.6	1.6	—	None
0281	Unnamed	LB-40.65	1.1	—	None
0284	Middle Branch	RB-42.7	4.8	—	None
0293	Unnamed	LB-44.45	1.1	—	None
0303	North Branch	RB-46.2	4.8	—	None
0310	Unnamed	RB-3.4	1.1	—	None
0313	Unnamed	RB-4.0	1.1	—	None
0318	Alder Creek	RB-47.2	2.3	—	None

SQUIRE CREEK DRAINAGE

This section includes the entire 25 square miles of Squire Creek drainage located west of Darrington and south and east of Whitehorse Mountain in northeast Snohomish County. Squire Creek is about 9.5 miles long, with 7 tributaries adding 16.5 linear stream miles. The upper 4.5 miles, plus tributary headwaters, are within the Mt. Baker National Forest. Upper watershed access is limited to private roads and newly extended logging roads out of Darrington. Lower reaches are accessible via the Arlington-Darrington Road (Highway 530).

Stream Description

From its headwaters southeast of Whitehorse Mountain, Squire Creek flows north about 5.5 miles to Browns Creek, then turns northwest winding another 4 miles to the North Fork Stillaguamish River. Major tributaries include Ashton, Browns, and Furland creeks.

Squire Creek's upper 4.5 miles lie within a narrow, steep -sloped basin. The confined valley floor supports scattered low-growth conifers and deciduous trees and underbrush over the upper one-third of the basin, with increasingly dense growth in the lower drainage. Many side slopes are so steep that timber growth is restricted to a short distance above the basin floor. Squire Creek emerges about 1 mile upstream from Brown Creek, moving onto a relatively broad and moderately sloping valley floor. Relatively dense mixed coniferous and deciduous growth predominates over the remainder of the drainage.

Much of the surrounding land features gently sloped valley and dense vegetative cover. Little development has taken place. Some logging does occur in the upper basin and in some tributary drainages. There are scattered farms in the lower 1.5 miles. The area provides considerable recreation with heaviest use over the lower 2 miles.

The upper mile of Squire Creek is extremely precipitous, having sharp cascades and falls, and a boulder-bedrock stream bottom. The next 0.8 mile courses over a moderately sloped valley floor, offering stable gravel riffles and occasional shallow pools. Below, the creek again drops sharply for 0.2 mile through a series of cascades and short falls. Downstream the gradient decreases with the stream winding across a broader valley to the upper basin's mouth. In this upper reach the channel remains restricted and generally stable, with a bottom composed mainly of rubble, and scattered boulder or gravel patches. Most banks are stable, steep-sloped, earth or rock cuts. Widths in this upper basin range from 1 to 4 yards, averaging 2.5 yards. Cover consists mainly of scattered thickets of mixed deciduous vegetation and low growth conifers.

Below the upper basin Squire Creek's gradient is mostly moderate to its mouth. The channel broadens and in some stretches is much less restricted, forming channel splits. Numerous broad riffles exist along with many glides and moderately large, deep pools. Bottom composition is predominantly clean rubble and gravel. Banks are generally low and naturally stable. Many sharp-faced earth cuts exist; however, more gently sloping gravel-rubble beaches prevail. Some bank protection has occurred along the lower 2 miles, as well as along short sections of lower Ashton and Furland creeks. Stream cover is dense through most of this lower stretch, composed mainly of deciduous trees, underbrush, and some conifers, often forming a nearly complete canopy. Along the lower 2 miles, cover exists mainly as strips or thickets, interrupted by patches of cleared farmland. Stream widths in this section range from about 6 to 14 yards, averaging about 9 yards.

Salmon Utilization

Squire Creek offers about 8 miles of stream for salmon use. Tributaries, principally Brown, Ashton, and Furland creeks, offer about 5.5 additional miles. Chinook spawn mainly in Squire Creek, while pink, chum, and coho utilize the mainstem plus each accessible tributary. Juvenile salmon rear in all accessible stream areas.

Limiting Factors

Principal factors limiting salmon production include occasional flash flooding, and severe low summer flows, the latter especially limiting in the tributaries. Road construction and certain logging practices in the upper basin and tributary headwaters affect the natural stream habitat. Proposed channelization projects on lower Ashton and Furland creeks could prove very damaging.

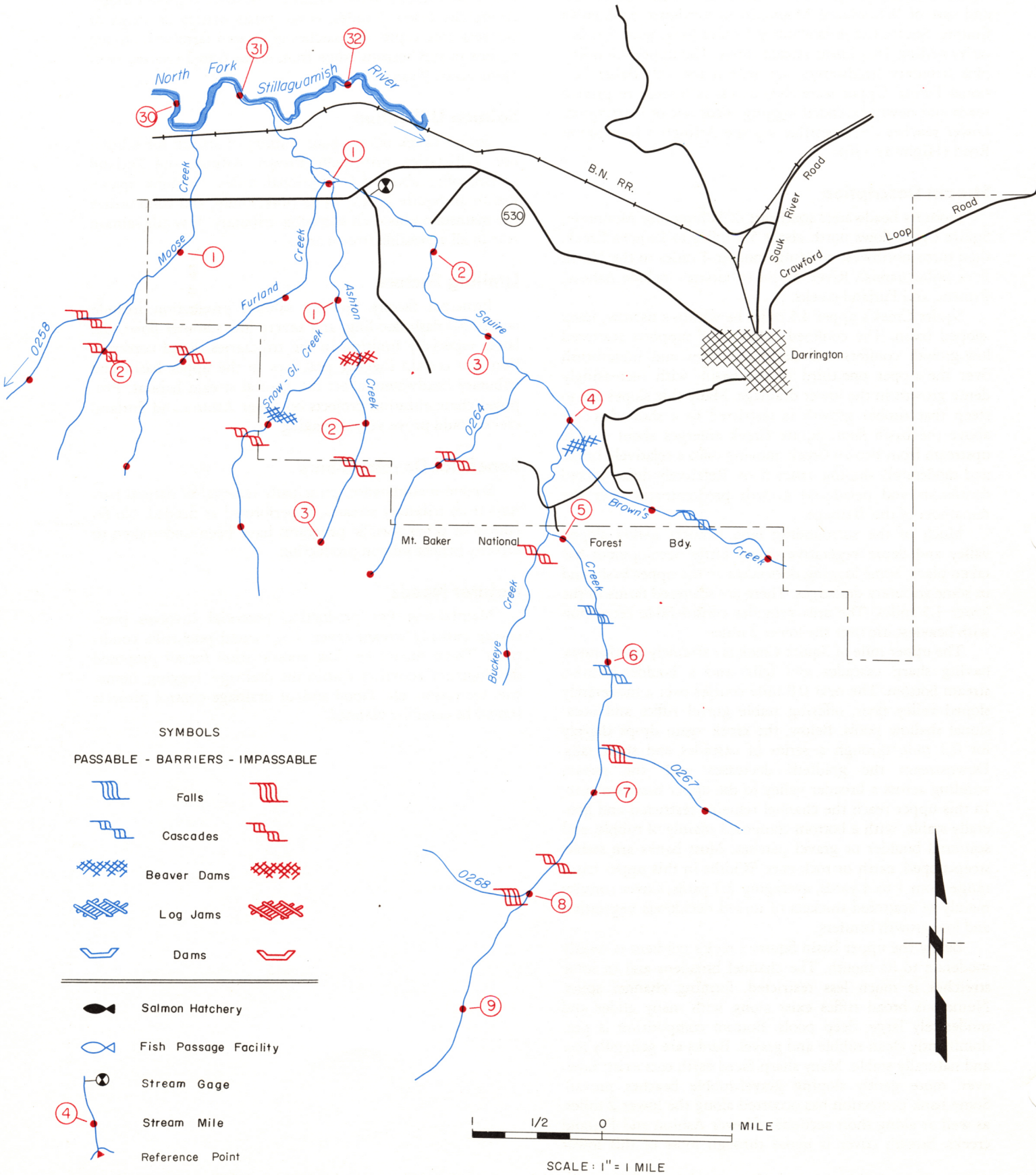
Beneficial Developments

Stream maintenance, principally removal of natural barriers from tributary streams, is performed as needed. No facilities or other specific programs have been undertaken to directly benefit salmon production.

Habitat Needs

Maintaining fish production potential involves preserving existing stream cover, and natural pool-riffle conditions. There should be close coordination for all proposed development activities within the drainage; logging, homesite, recreation, etc. Flood and/or drainage control projects should be carefully planned.

SQUIRE CREEK DRAINAGE



SQUIRE CREEK DRAINAGE
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
0135	N. F. Stillaguamish R.				Chin., Coho, Pink, Chum
0257	Moose Creek	LB-30.3	2.9	—	Coho, Chum
0258	Unnamed	LB-1.4	1.5	—	Unknown
0259	Unnamed	RB-30.8	1.7	—	Unknown
	(See Stillaguam. 803)				
0260	Squire Creek	LB-31.2	9.6	—	Chin., Coho, Pink, Chum
0261	Furland Creek	LB-0.9	3.1	—	Coho, Pink, Chum
0262	Ashton Creek	LB-1.0	3.0	—	Coho, Pink, Chum
0263	Snow Gulch Cr.	LB-1.3	2.5	—	Coho, Chum
0264	Unnamed	LB-3.5	2.0	—	Coho
0265	Brown's Creek	RB-4.0	2.2	—	Coho, Chum
0266	Buckeye Creek	LB-4.9	1.2	—	Coho
0267	Unnamed	RB-6.7	1.3	—	None

SOUTH FORK STILLAGUAMISH
Arlington Area

This section covers nearly 18 miles of the South Fork Stillaguamish River from the confluence with the North Fork at Arlington, upstream to R.M. 35.5 above Granite Falls in Snohomish County. Eleven tributaries enter this stretch, adding more than 145 linear miles in stream length.

Stream Description

From R.M. 35.5, near Granite Falls, the South Fork cuts westerly 4 miles, then winds northwest 14 miles to its confluence with the North Fork at Arlington. The main tributaries are Jim Creek (Stillaguamish 1120) and Canyon Creek (Stillaguamish 1220).

Through the upper 2 miles of this reach the stream falls through a narrow steep-sided canyon with numerous sheer rock faces. Below Canyon Creek the valley widens, containing at first only intermittent river-side flats, then a considerably broader, flat valley floor. Relatively dense stands of deciduous and conifer trees exist, with increasing amounts of cleared farmland toward Arlington. Steep-sloping terrain prevails along most of the river's left bank with the right bank becoming more gently sloped yet thickly forested and conifers giving way to deciduous growth toward the lower valley. Principal settlements include Arlington and Granite Falls, and the smaller communities of Jordan and Riverside. Major land use is forestry, plus some limited agriculture. Good to excellent recreation opportunities exist here.

The South Fork in this reach changes from boulder zone to floodway zone stream types. The upper 2 miles, cutting through the canyon, has a restricted channel, ranging from 16 to 28 yards wide, averaging over 20. It presents numerous rapids and cascades, and one major barrier, Granite Falls. The bottom is mostly boulder-rubble, with some bedrock. Banks are mostly bare, steep-sloped faces, interspersed with patch areas having limited deciduous growth.

Below Canyon Creek the gradient begins to decrease. The channel remains confined for 2 to 3 miles, but exhibits considerable riffle habitat. Winding over the lower 12-13 miles the channel widens, averaging over 25 yards, and containing progressively better pool-riffle-glide habitat. Channel braiding occurs intermittently below R.M. 31, and continues on downstream below Jim Creek (R.M. 21.7), with numerous diverse riffles. Where the channel remains confined it presents a combination of broad riffles, long slow-moving glides and large deep pools. The stream bottom is mainly rubble with numerous boulder-strewn stretches. Increasingly heavy silt deposition occurs, especially over the lowermost reaches. Stream banks are generally stable with a few natural earth cuts and increasing amounts of gently sloped gravel-rubble beaches. Some limited artificial contouring and riprapping has taken place along farmlands in the lower 3-4 miles. Stream-side cover ranges from dense forest near Canyon Creek to intermittent thickets of deciduous trees and underbrush decreasing in quantity near Arlington.

Salmon Utilization

This South Fork reach provides transportation, spawning and rearing for chinook, coho, pink and chum. Fair spawning of chinook, pink, chum and some coho occurs in the mainstem and in accessible tributary reaches.

Limiting Factors

The major limitation on salmon production in the lower South Fork is streambed siltation resulting from a large earth slide in the upper watershed. Many gravel riffles have been rendered unsuitable for successful spawning or egg incubation. This condition also affects the aquatic vegetation and insect production. In the canyon, a steep gradient with cascades plus fluctuations inhibits adult migration, and creates attraction problems at the fish ladder.

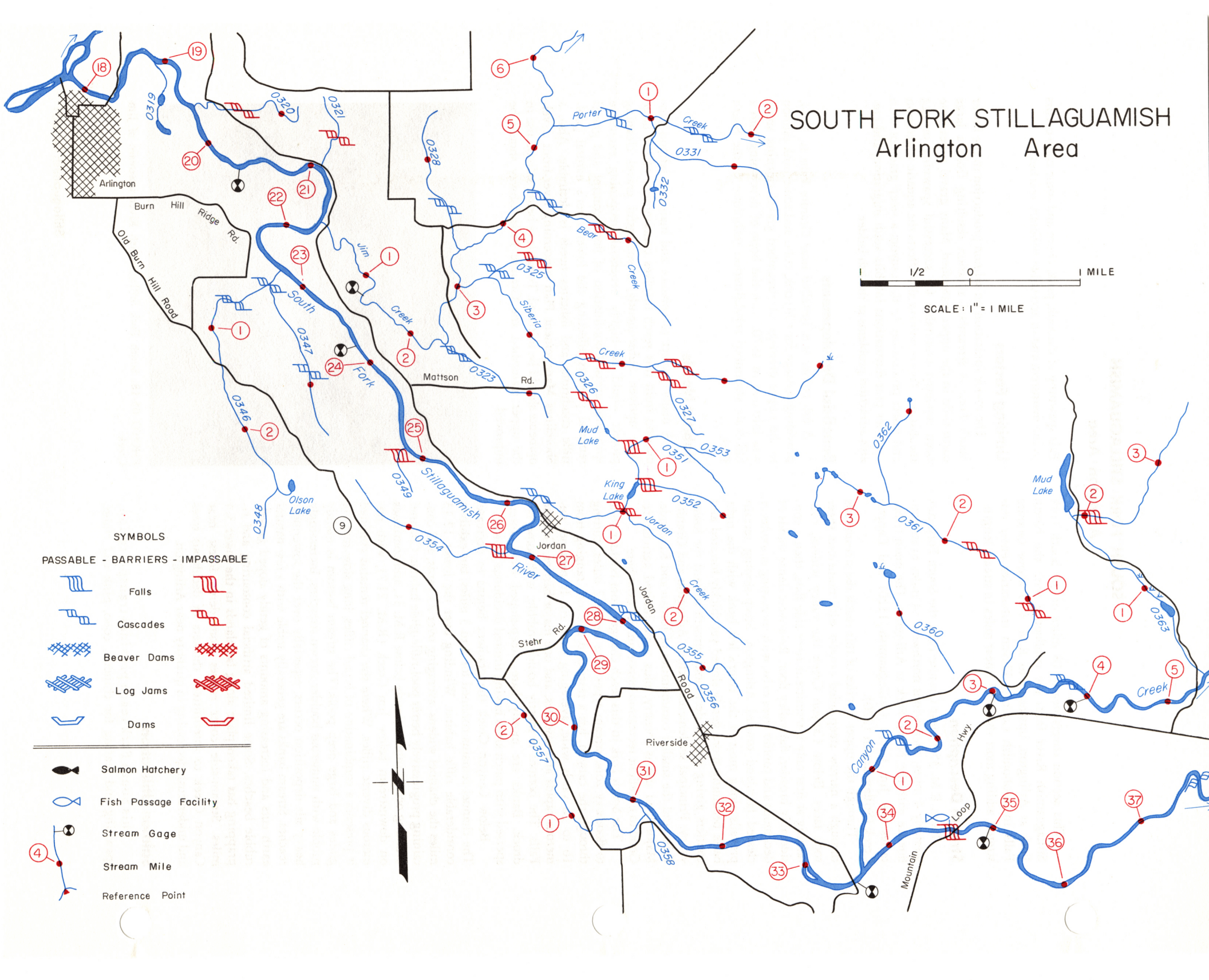
Beneficial Developments

A fish ladder was installed near Granite Falls in 1954, providing passage for Chinook, coho and some pink salmon to the upper drainage. A streambed gravel cleaning study was initiated in 1970, with the hope of developing into a full scale streambed rehabilitation technique in the South Fork.

Habitat Needs

A major project to enhance and maintain salmon production from this reach involves containment of the large slide upriver. Subsequently, a successful gravel cleaning project would be highly beneficial, reopening extensive spawning areas. Coordination of flood control and gravel removal projects affecting the lower river's natural pool-riffle conditions and fisheries needs is desirable. Also, a Shorelines Management Plan concerning river-front developments should be initiated. To achieve better salmon use in the upper watershed, the Granite Falls fishway should be improved.

PHOTO 05-18. South Fork Stillaguamish River upstream of Jim Creek.


SOUTH FORK STILLAGUAMISH
Arlington Area
1/2
0
1 MILE
SCALE: 1" = 1 MILE
SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage
Stream Mile
Reference Point
Arlington
Burn Hill Ridge Rd.
Old Burn Hill Road
Mattson Rd.
Jim Creek
South Fork
Stillaguamish
River
Porter Creek
Bear Creek
Siberia Creek
Mud Lake
King Lake
Olson Lake
Jordan
Jordan Road
Stehr Rd.
Riverside
Canyon Creek
Hwy
Loop
Mountain
0319
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SOUTH FORK STILLAGUAMISH — ARLINGTON AREA
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
	Stillaguamish R. cont. as S.F. Stillaguam. R.	@ mi. 17.81	—	—	Chin., Coho, Pink, Chum
0320	Unnamed	RB-19.6	1.2	—	Unknown
0322	Jim Creek	RB-21.6	19.7	—	Chin., Coho, Pink, Chum
	(See Stillaguam. 1103)				
0346	Unnamed	LB-22.75	2.9	—	Unknown
0347	Unnamed	RB-0.1	1.5	—	Unknown
	Olson Lake	Outlet-2.9	—	—	
0350	Jordan Creek	RB-26.2	2.7	3.44	Coho, Pink
0351	Unnamed	RB-1.0	1.9	—	Unknown
	King Lake	Outlet-0.2	—	—	
0352	Unnamed	LB-0.45	1.0	—	None
	Unnamed Pond	Outlet-1.2	—	—	
0354	Unnamed	LB-26.8	1.7	—	None
0355	Unnamed	RB-27.95	1.6	—	Unknown
0357	Unnamed	LB-31.05	2.8	—	Coho
0359	Canyon Creek	RB-33.7	20.4	62.4	Chin., Coho, Pink
	(See Stillaguam. 1203)				
	(Cont. Stillaguam. 1303)				

JIM CREEK DRAINAGE

This section covers the nearly 20 miles of mainstem Jim Creek, plus 15 tributaries with 37 additional miles. It lies in the low rolling foothills of the Cascades, a few miles east of Arlington in Snohomish County. A portion of the upper drainage is within U.S. Government (Navy) Reservation, with restricted access. Most of the watershed above R.M. 13.5 is within the Mount Baker National Forest. Access is achieved via roads out of Arlington.

Stream Description

From headwaters east of Wheeler Mountain, Jim Creek flows generally west nearly 9 miles to the Lake Riley outlet stream (R.M. 11.2). Two larger tributaries, Little Jim Creek, and Cub Creek, enter above this point. From here the channel winds mostly southwest for 6 miles, picking up a number of tributaries, including Porter, Bear, and Siberia creeks. Near R.M. 2 the creek turns northwest to its confluence with the South Fork at R.M. 21.6.

The upper 7 miles of Jim Creek travel over mountain terrain, the channel cutting through narrow, ravine-like valleys, mostly barren of timber. Similar terrain is found in the Cub Creek drainage where deciduous and mixed conifer cover is more dense. A few sections of the upper slopes still contain timber and are undergoing logging. Stream gradients are steep with numerous cascades and small falls. Channels are mostly confined, presenting rapids with few pools or riffles. Stream bottom is mainly rubble-boulder, with some bedrock and limited patch gravel deposits. Banks are mainly steep, earth or rock-cut with adjacent cover mostly scattered, low-growing deciduous trees and brush.

Below R.M. 12, the valley floor broadens with an increasingly gentle slope. This condition continues for nearly 7 miles downstream. Above Porter Creek (R.M. 5.5), Jim Creek falls quickly to about R.M. 40. For the next 1.5 to 2 miles the valley floor again broadens. The lower 2 miles of stream cuts through shallow ravine-like terrain. Most of the lower valley contains moderate to dense deciduous trees and underbrush with some conifers and a few open patches of farmland. Side valley terrain remains moderately steep and densely forested, primarily with conifers and some deciduous stands. Land use is limited farming, and logging of hardwood in the valley and conifers on the side hills.

Stream gradient is moderate in the broader valley stretches. Widths range from 5-15 yards, averaging near 9. A relatively good pool-riffle balance exists with occasional channel splitting. Stream bottom is composed mainly of gravel and rubble and, except for a few areas, is quite stable. Most banks are naturally stable with some earth cuts and numerous gently sloping gravel beaches. The ravine stretches have steeper gradient and confined channels with numerous rapid areas separated by a few relatively good pool-riffle sections.

Tributaries above R.M. 12 offer mainly steep mountain-type characteristics. The Lake Riley outlet stream and three unnamed tributaries offer moderate gradients, gravel bottoms, and dense cover in their lower reaches. Smaller tributaries between R.M. 6 and 11 are generally steep, with limited access. The lower reaches of Porter, Bear, and Siberia creeks have moderate gradients, gravel-rubble bottoms, and good to excellent cover.

Salmon Utilization

Jim Creek is accessible to salmon runs for approximately 13.5 miles and the tributaries provide an additional 10.5 miles. Jim Creek provides transportation, spawning, and rearing for chinook, coho, pink, and some chum salmon. Spawning is generally concentrated within the lower 4 miles.

Limiting Factors

A partial migration barrier, particularly at low flows, occurs at approximately R.M. 4.3. Extensively cleared slopes over the upper watershed contribute to a rapid runoff and flooding from heavy rainfall or sudden snowmelt causing gravel scouring and heavy siltation.

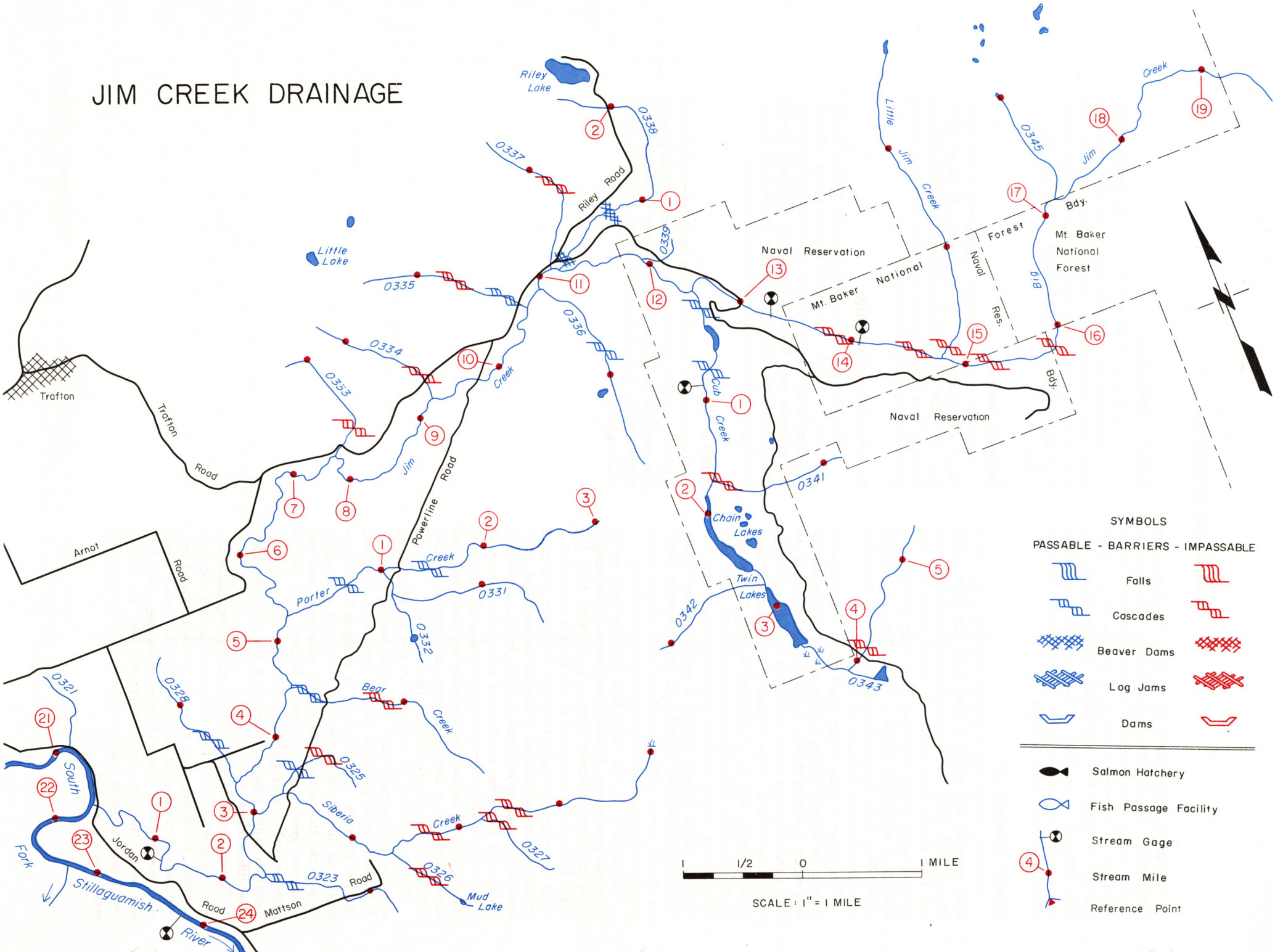
Beneficial Developments

A streambed gravel-cleaning pilot-study has been undertaken on Jim Creek. This could develop into a full-scale streambed rehabilitation program. No other facilities or special programs have been undertaken to specifically benefit salmon production. Occasional stream maintenance is conducted, primarily for removal of log or debris jams.

Habitat Needs

Preservation of existing stream bank cover and natural pool-riffle balance is essential to maintain the fish production potential. Reforestation of the upper watershed would stabilize stream flows and erosion allowing a full scale gravel cleaning program.

JIM CREEK DRAINAGE



JIM CREEK DRAINAGE
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
	Stillaguamish R. cont. as S.F. Stillaguam. R.	@ mi. 17.81	—	255.0	Chin., Coho, Pink, Chum
0322	Jim Creek	RB-21.6	19.7	46.8	Chin., Coho, Pink, Chum
0323	Unnamed	LB-2.35	1.3	—	Coho
0324	Siberia Creek	LB-3.0	4.0	—	Coho, Chum
0328	Unnamed	RB-3.4	1.5	—	Coho
0329	Bear Creek	LB-4.5	1.9	—	Coho
0330	Porter Creek	LB-5.2	3.0	3.83	Coho
0331	Unnamed	LB-1.0	1.7	—	Unknown
0333	Unnamed	RB-7.7	1.2	—	Unknown
0334	Unnamed	RB-9.2	1.3	—	Unknown
0335	Unnamed	RB-10.6	1.4	—	Unknown
0336	Unnamed	LB-10.8	1.8	—	Coho
0337	Unnamed	RB-11.1	1.4	—	Coho, Chum
0338	Unnamed (Lk. Riley local name)	RB-11.2	2.5	—	Coho, Chum
0340	Cub Creek	LB-12.4	5.3	—	Coho
	Unnamed Lake	Outlet-0.3	—	—	
0341	Unnamed	RB-1.7	1.1	—	None
	Lower Twin Lake	Outlet-1.8	—	—	
0342	Unnamed	LB-2.8	1.1	—	None
	Upper Twin Lake	Outlet-2.85	—	—	
0344	Little Jim Creek	RB-14.8	2.9	—	None
	Jim Cr. cont. as Big Jim Creek	@ mi. 14.81	—	—	
0345	Unnamed	RB-17.2	1.0	—	None

CANYON CREEK DRAINAGE

This section includes more than 20 miles of Canyon Creek, plus 18 tributaries adding 47 linear stream miles. The watershed is located northeast of Granite Falls in Snohomish County. Its upper 10 miles are within Mt. Baker National Forest, with access via roads leading north from Granite Falls.

Stream Description

From headwaters north of Green Mountain, east of Granite Falls the Canyon Creek South Fork flows west more than 8 miles to the North Fork, the other major branch. Canyon Creek then courses generally southwest nearly 12 miles to the confluence with the South Fork Stillaguamish (R.M. 33.7). Nearly all tributaries exhibit steep, swift-flowing mountain stream characteristics over most of their lengths.

The upper 8 miles of the South Fork cut through steep terrain with a narrow, often ravine-like valley. Adjacent slopes are for the most part densely forested with conifers. The stream gradient is steep, with a confined channel ranging from 2-6 yards wide. There are numerous cascades and small falls, and only a few relatively short pools or riffles. Stream bottom is primarily rubble and boulders. Banks along this upper section are sharply sloped earth or rock cuts with few gentle-slope beaches. The area contains dense large conifer timber with some deciduous underbrush. Gradient, streambed, and cover conditions on the North Fork are essentially the same as those on the South Fork above R.M. 8.0.

Below the North Fork the valley floor broadens intermittently and is heavily timbered with conifers and mixed deciduous trees. The side valley slopes remain steep, supporting dense stands of conifers. Canyon Creek then winds for 11 miles, with a moderately steep gradient and only a few stretches showing a more gentle stream slope. The channel remains mostly confined, exhibiting fast riffle-type stream with few pools or channel split areas. The stream bottom is primarily of large rubble and gravel with a number of boulder-strewn sections. Gravel is found mostly in patches or along short beach strips. Banks are relatively stable, consisting mainly of sharp-sloped earth or rock cuts, with a number of more gently sloped rubble-gravel beaches in some stretches. Cover ranges from moderate to dense, mostly of conifers with some mixed deciduous trees and undergrowth.

The valley floor narrows considerably about 1.5 miles above the creek's mouth. From here it cuts rapidly through a short canyon having steep side slopes and some virtual sheer rock faces. Gradient is mostly steep and the narrow channel contains numerous rapids and cascades with at least one drop of about 8 feet. The lower 0.5 mile of Canyon Creek then widens to about 8-14 yards with a moderately steep gradient and a few riffles. Otherwise, the lower 2 miles are mainly rapids separated by a few small deep pools. The stream bottom is mainly large rubble and boulder with only a few stretches in patch gravel riffles, in the lower 0.5 mile. Banks are relatively stable, consisting mainly of sharp-sloped earth or rock cut. A few more gently sloping gravel beaches are located along the lowermost reaches. Stream cover remains relatively dense, composed mostly of conifers with some mixed deciduous trees and brush.

Salmon Utilization

Chinook, coho, pink, and a few chum salmon spawn and rear in the mainstem Canyon Creek below the cascade-falls at R.M. 1.2. Given adequate water conditions, only coho and some chinook can ascend the lower falls to use some 13 miles of mainstem plus about 3.5 miles of tributaries. Juvenile salmon rear throughout the accessible drainage area.

Limiting Factors

A series of cascades and low falls near R.M. 1.2 presents at least a partial barrier to most adult salmon, particularly during very low or high flow periods. Two large earth slides between R.M. 6 and 7 contribute to heavy downstream siltation. A potentially serious condition exists with the logging and road building activities in the upper watershed.

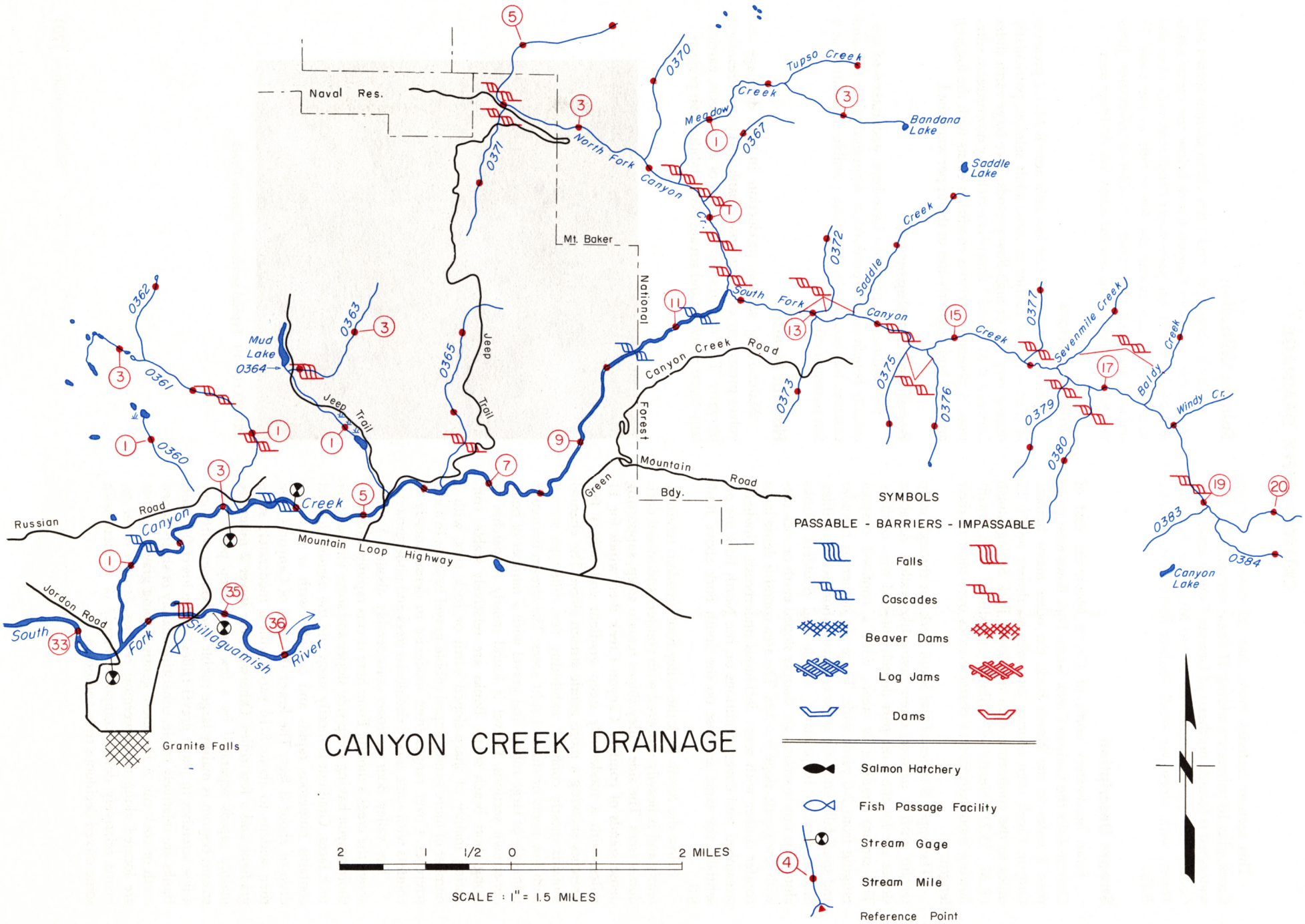
Beneficial Developments

No facilities or programs have been undertaken to specifically benefit salmon production. Appraisal of the falls and cascades has been made, regarding possible installation of a fish passage facility.

Habitat Needs

Maintaining salmon production in this drainage involves preserving existing stream bank cover and streambed integrity. This requires coordination of all projects, particularly forest practices and stream bank stabilization projects.

PHOTO 05-19. Typical section of Canyon Creek.



CANYON CREEK DRAINAGE

CANYON CREEK DRAINAGE
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
	Stillaguamish R. cont. as S.F. Stillaguam. R.	@ mi. 17.81	—	255.0	Chin., Coho, Chum, Pink
0359	Canyon Creek	RB-33.7	20.4	62.4	Chin., Coho, Pink
0360	Unnamed	RB-2.5	1.4	—	None
0361	Unnamed	RB-3.2	3.9	—	Unknown
0362	Unnamed	LB-2.7	1.1	—	None
	Unnamed Lake	Outlet-3.9	—	—	
0363	Unnamed	RB-5.45	3.7	—	Unknown
	Unnamed Pond	Outlet-0.6	—	—	
0365	Unnamed	RB-6.3	2.8	—	Unknown
0366	N. Fk. Canyon Cr.	RB-11.8	6.0	14.7	Chin., Coho
0367	Unnamed	LB-1.2	1.7	—	None
0368	Meadow Creek	LB-1.6	3.7	—	None
0369	Tupso Creek	RB-2.2	1.0	—	None
	Bandana Lake	Outlet-3.7	—	—	
0370	Unnamed	LB-2.1	1.7	—	None
0371	Unnamed	RB-4.0	1.7	—	None
	Canyon Cr. cont. as S.F. Canyon Cr.	@ mi. 11.81	—	23.7	
0372	Unnamed	RB-13.0	1.2	—	None
0373	Unnamed	LB-13.05	1.4	—	None
0374	Saddle Creek	RB-13.5	2.2	—	None
0375	Unnamed	LB-14.4	1.2	—	None
0376	Unnamed	LB-14.6	1.4	—	None
0377	Unnamed	RB-15.9	1.1	—	None
0378	Sevenmile Creek	RB-16.3	1.4	—	None
0379	Unnamed	LB-16.5	1.5	—	None
0380	Unnamed	LB-16.8	1.8	—	None
0381	Baldy Creek	RB-17.5	1.6	—	None
0384	Unnamed	LB-19.3	1.1	—	None

SOUTH FORK STILLAGUAMISH
Verlot Area

This section includes 15.5 miles of mainstem South Fork Stillaguamish River plus 16 tributaries providing an additional 35 linear miles. It includes the South Fork from a point 0.5 mile above Wisconsin Creek, downstream to within 1.0 mile of the Mountain Loop Highway crossing, northeast of Granite Falls in Snohomish County. Most of the river in the upper third of this section is within Mt. Baker National Forest, as are the majority of south bank tributaries and the upper reaches of the north bank tributaries.

Stream Description

From R.M. 51, below Wiley Creek, the South Fork winds in a west-northwest direction toward Granite Falls. Below mile 42, as the river enters a gorge, it begins a zig-zag course, moving generally west about 6 miles to the lower end of the section (R.M. 35.5). Major tributaries include Black, Hemple, Twentytwo, Heather, Triple, and Rotary creeks entering along the south bank, and Benson, Turlo, and Cranberry entering from the north.

In the upper 8 miles of this section, above Cranberry Creek, the valley floor is relatively broad. The right bank slope is gentle at first but increases gradually as it moves toward steeper mountain slopes. Along the left bank the valley floor rises quickly to the steep south bank mountains. Below Cranberry Creek the valley floor begins to narrow, becoming ravine-like at first, then into a narrow 6-mile gorge starting at R.M. 41.5. The upper valley contains some dense stands of conifers with occasional patches of deciduous trees and underbrush. A few relatively small agricultural or cleared lands and community developments, such as Robe and Verlot, occur in this stretch. Above the canyon rim along the lower stretches, dense conifer cover exists. The steeper mountain slopes bordering the valley are also densely forested, with numerous clear-cut areas. Timber harvesting, some farming, and considerable recreation use occurs here.

Over the upper ten miles the South Fork has a moderately steep gradient, and widths range from 15 to 30 yards. The channel is relatively confined and winds considerably, having few channel-split areas. It is a stable, fast flowing, riffle-type stream with numerous boulder-strewn areas, and only a few pools. The stream bottom is predominantly rubble and boulders with some relatively good gravel-rubble riffles between Robe and the Mountain Loop Highway crossing (R.M. 47.2). Banks are mostly stable, relatively steep natural earth or rock cuts, with large rocks predominating. Cover is moderate to dense throughout, with conifers predominating.

The lower 6-mile section of river exhibits a fairly steep gradient, having widths ranging from 6 to 20 yards. The narrow channel presents high velocities, numerous cascades and few pools. Bottom material is mostly boulders and rubble, with occasional hugh (6 to 10 feet) rocks that break up the rapids. Some bedrock outcropping is also evident in the gorge. Stream banks are steep rock faces having little vegetation, but providing extensive shade.

Salmon Utilization

This South Fork section provides transportation, spawning and rearing for chinook, coho and pink. Although somewhat limited, the spawning area is used by spring and fall chinook, and by some coho and pink. Coho and some pink also spawn in the more than 10 accessible miles of tributaries.

Limiting Factors

The major limiting factor in the South Fork Stillaguamish system is the massive earth slide located on the right bank at approximately R.M. 48.7. This causes heavy silt loading on spawning beds during periods of heavy runoff. Also, a series of cascades and rapids in the gorge can impede migration, particularly at high water. A potential for debris buildup occurs within the canyon, posing passage problems. Logging and roadbuilding activities, and the use of herbicides and insecticides in the forests offer potential hazards.

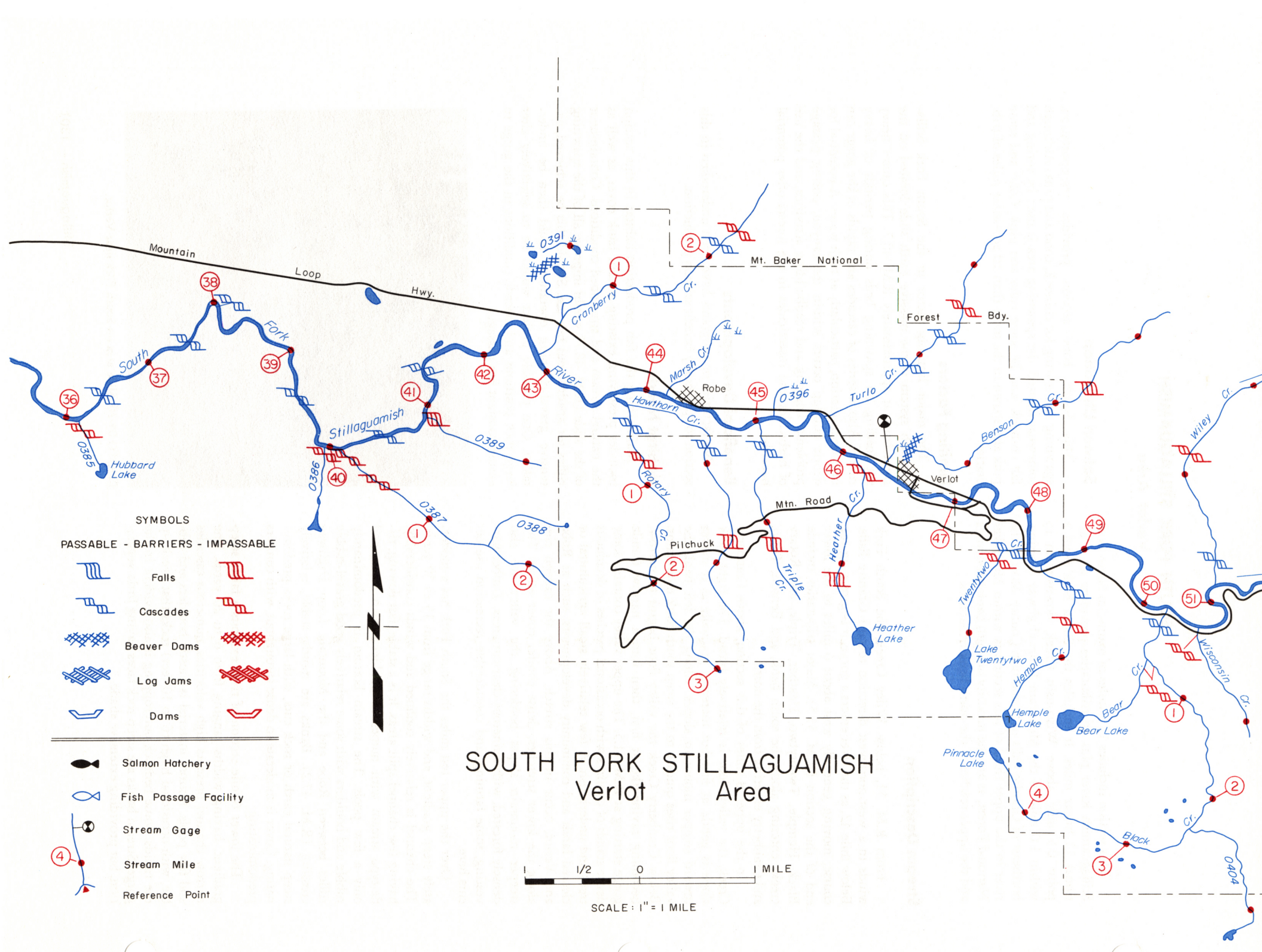
Beneficial Developments

No facilities or programs have been undertaken in this section to specifically benefit salmon production.

Habitat Needs

Maintaining the fish production habitat in this section includes preserving existing stream bank cover, as well as the natural stream and streambed conditions. Containment of the slide (R.M. 48.7) would improve all of the spawning riffles for anadromous fish use. Should this be achieved, extensive gravel-cleaning operations could then be undertaken. One possible project would be to selectively alter large rock positions and cascade conditions in the gorge to ensure constant fish passage.

PHOTO 05-20. Slide area on South Fork near Verlot.



SOUTH FORK STILLAGUAMISH
Verlot Area

SOUTH FORK STILLAGUAMISH — VERLOT AREA
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
	Stillaguamish R. cont. as S.F. Stillaguam. R.	@ mi. 17.81	—	255.0	Chin., Coho, Pink
0387	Unnamed	LB-40.1	2.3	—	None
0389	Unnamed	LB-40.9	1.1	—	None
0390	Cranberry Creek	RB-42.8	2.9	—	Unknown
0391	Unnamed	RB-0.45	1.0	—	Unknown
0392	Rotary Creek	LB-43.7	3.0	—	Coho
0393	Hawthorn Creek	RB-0.2	2.9	—	Coho
0395	Triple Creek	LB-45.0	1.7	—	Unknown
0397	Turlo Creek	RB-45.6	2.5	—	Coho
0398	Heather Creek	LB-46.1	1.6	—	Unknown
	Heather Lake	Outlet-1.6	—	—	
0399	Benson Creek	RB-46.3	3.3	—	Coho
0400	Twentytwo Creek	LB-48.4	1.2	1.12	Unknown
	Lake Twentytwo	Outlet-1.2	—	—	
0401	Hemple Creek	LB-48.6	1.8	—	Unknown
	Hemple Lake	Outlet-1.8	—	—	
0402	Black Creek	LB-50.2	4.5	4.57	Unknown
0404	Unnamed	RB-2.35	1.3	—	None
	Pinnacle Lake	Outlet-4.5	—	—	
0405	Wisconsin Creek	LB-50.5	1.1	—	None
	(Cont. Stillaguam. 1403)				

SOUTH FORK STILLAGUAMISH
Headwaters

This section contains the upper South Fork Stillaguamish River, including 20 miles of mainstem river, plus 24 tributaries adding 72 linear stream miles. It is located about 25 miles east of Granite Falls in Snohomish County, with access available via the Mountain Loop Highway. Virtually the entire area is within Mt. Baker National Forest.

Stream Description

From its mountainous headwaters, south of Barlow Pass, the South Fork flows north about 3 miles to its first major tributary, Buck Creek. Here the river turns northwest nearly 5 miles to Coal Creek then continues generally west for the next 11 miles to R.M. 51.2 at Wiley Creek. Other principal tributaries include Perry, Deer, Marten, Blackjack, Mallardy, Gordon, Boardman and Wiley creeks.

The upper 3 miles of the South Fork headwaters are over steep mountainous terrain with ravines and small canyons. Side slopes rise abruptly and are timbered with moderately dense stands of conifers. Near Buck Creek the valley floor begins to flatten and widen slightly, still covered with mixed conifers and deciduous growth. This relatively narrow valley continues about 5 miles to the vicinity of Coal Creek. Below Coal Creek the valley floor broadens somewhat, but remains fairly confined with moderate sloping hills for about 10 miles. A relatively dense coniferous forest predominates over the valley and adjacent mountain slopes. Principal land use is forestry and recreation. The small community of Silverton represents the only development, with a few rural residences and summer homes mainly below Coal Creek.

The South Fork's gradient over the upper two miles is mostly steep with a narrow channel, numerous cascades, small pools, and a rubble-boulder bottom. Stream cover is moderate, consisting of low-growing conifers and some deciduous underbrush.

In the 2.5 miles from Buck Creek downstream to Perry Creek the gradient decreases considerably. The channel widens and meanders with some braiding. The bottom is predominantly gravel with some rubble. Numerous gravel riffles and many moderate-sized pools occur here with stream widths ranging from 6 to 14 yards. Stream banks are relatively low, stable earth cut or large rock. Cover is low-growing conifers with some deciduous trees and underbrush.

Below Perry Creek (R.M. 64.7), the South Fork gradient increases slightly with few side channels, relatively fast riffles and few pools. The bottom is mainly rubble and large gravel, with numerous boulders. Some good-quality gravel riffles and patch gravel areas are scattered throughout this reach. The streambed appears quite stable, with widths ranging from 10 to 25 yards. Stream banks are stable, containing few steep earth or rock cuts, with mostly gentle-slope, gravel-rubble beaches. Coniferous cover is moderate throughout this stretch.

Over the next 2.5 miles below Boardman Creek, the gradient increases sharply. The confined channel presents a number of low cascades and rapids, with increasing pools. The few existing riffles contain large gravel with numerous large boulders and rubble. The stream width remains the same as above; however, stream banks are mostly sharp-sloped earth or rock cut with few beach-type areas. Conifer stream bank cover remains moderately dense.

Salmon Utilization

This segment of the South Fork Stillaguamish offers good spawning and rearing habitat for chinook, coho, and some pink salmon. Access is possible to about R.M. 69, with tributaries providing an additional 19 miles. These are utilized mainly by spawning and rearing coho. Occasionally, chinook, including springs, make use of the larger streams. Most tributaries are inaccessible except for relatively short segments within their lower reaches.

Limiting Factors

A principal factor limiting salmon production is believed to be a lack of basic nutrients in the water. Also, forest practices involving spray control of insects or undesirable vegetation, large-scale clear cutting and log road building, pose problems.

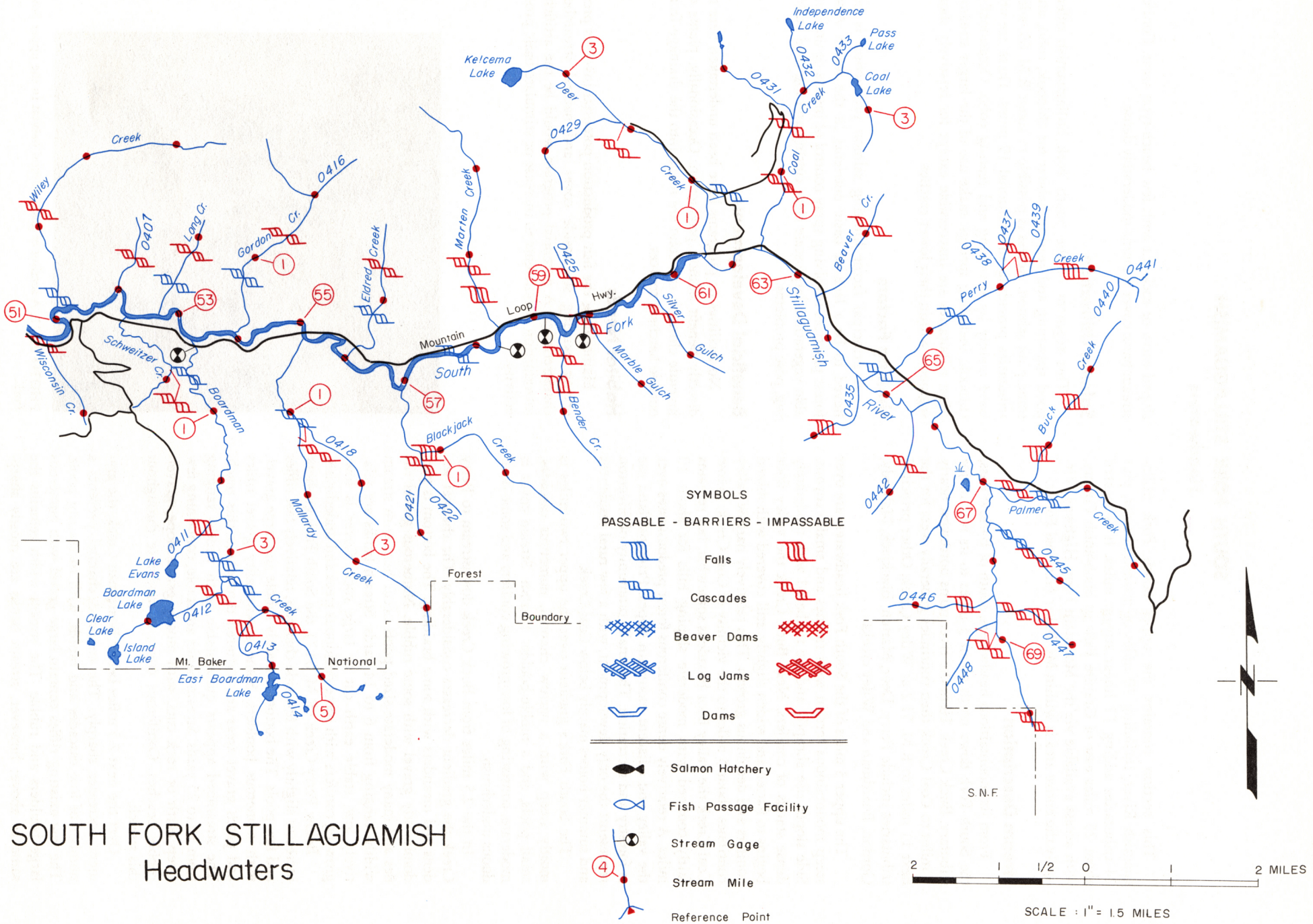
Beneficial Developments

No facilities or programs have been undertaken here to directly benefit salmon production. Occasionally, plants of juvenile chinook and coho are made into the drainage from outside hatchery sources.

Habitat Needs

Maintaining the fish production potential involves preserving existing streamside cover and natural streambed characteristics. A potential program would be the artificial introduction of nutrients to increase or stimulate basic productivity.

PHOTO 05-21. A section of good salmon habitat in the upper South Fork.



SOUTH FORK STILLAGUAMISH
Headwaters

SOUTH FORK STILLAGUAMISH — HEADWATERS
Stillaguamish River Basin — WRIA 05

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Stillaguamish River				
	Stillaguamish R. cont. as S.F. Stillaguam. R.	@ mi. 17.81	—	255.0	Chin., Coho, Pink
0406	Wiley Creek	RB-51.2	3.5	—	Unknown
0408	Schweitzer Creek	LB-52.3	1.6	—	Coho, Pink
0409	Long Creek	RB-52.7	1.2	—	Unknown
0410	Boardman Creek	LB-53.5	5.6	—	Coho, Pink
0412	Unnamed	LB-3.4	1.5	—	None
	Boardman Lake	Outlet-0.7	—	—	
	Island Lake	Outlet-1.5	—	—	
0413	Unnamed	LB-4.0	1.9	—	None
	E. Boardman Lk.	Outlet-1.1	—	—	
	Unnamed Pond	Outlet-1.9	—	—	
	Unnamed Pond	Outlet-5.6	—	—	
0415	Gordon Creek	RB-53.9	2.9	—	Unknown
0417	Mallardy Creek	LB-55.2	4.4	3.64	Coho
0418	Unnamed	RB-1.2	1.5	—	None
0419	Eldred Creek	RB-56.0	1.8	—	Unknown
0420	Blackjack Creek	LB-56.9	2.9	3.28	Coho
0421	Unnamed	LB-0.8	1.2	—	None
0423	Marten Creek	RB-58.6	2.9	—	Coho
0424	Bender Creek	LB-59.5	1.7	—	Unknown
0426	Marble Gulch Creek	LB-60.0	1.1	—	Unknown
0427	Silver Gulch Creek	LB-60.6	1.4	—	Unknown
0428	Deer Creek	RB-61.6	3.5	—	Coho
0429	Unnamed	RB-2.1	1.5	—	None
	Kelcema Lake	Outlet-3.5	—	—	
0430	Coal Creek	RB-62.5	3.5	—	Coho
0431	Unnamed	RB-1.7	1.3	—	None
	Coal Lake	Outlet-2.65	—	—	
0434	Beaver Creek	RB-63.3	1.5	—	Unknown
0435	Unnamed	LB-64.5	1.1	—	Unknown
0436	Perry Creek	RB-64.7	3.8	—	Coho
0442	Unnamed	LB-65.4	1.4	—	Unknown
0443	Buck Creek	RB-67.1	2.6	—	Coho
0444	Palmer Creek	LB-0.05	2.1	—	Unknown
0445	Unnamed	RB-67.6	1.3	—	Unknown
0446	Unnamed	LB-68.5	1.3	—	Unknown
0447	Unnamed	RB-68.7	1.0	—	Unknown