CHEHALIS BASIN

Water Resource Inventory Areas 22 & 23

The Chehalis basin is comprised largely of the Chehalis River watershed with two major and a number of minor, independent drainages. The Humptulips and Hoquiam rivers plus several smaller systems enter Grays Harbor from the north; the Chehalis River from the east; and the Johns and Elks rivers along with a number of smaller drainages from the south.

The Chehalis River forms on the higher slopes of southwestern Washington near the town of Pe Ell. The river flows generally northerly through a gradually broadening valley where a number of larger tributaries enter the river along its route. These include the South Fork Chehalis, Newaukum, Skookumchuck, Black, Satsop, Wynoochee, and Wishkah rivers. Of these, only the Wynoochee and Satsop river watersheds contain steep mountainous terrain in their headwaters. Thei lower reaches and most of the remainder of the Chehalis River watershed is composed of moderately sloped hills and broad valleys.

The Humptulips River is formed by its East and West forks which originate in the southeastern slopes of the Olympic Mountains. Its two major forks flow south through narrow valleys to their confluence from which the mainstem courses southerly through a gradually broadening valley to its entrance into Grays Harbor.

The Hoquiam River and its tributaries head in low, gentle hills north of Grays Harbor. Its stream courses are generally confined to moderately sloped valleys and the other tributaries to the north side of Grays Harbor and all the south side tributaries originate in low hills, meandering through broad valleys in their middle and lower reaches. There are 1,391 rivers and streams containing 3,353 linear stream miles within this basin.

Grays Harbor is an important marine area providing an essential fresh-salt water conversion zone and feeding ground for juvenile salmonids produced in the basin. Salmon from this and other basins enter Grays Harbor periodically to feed on the abundance of smaller marine fishes which occasionally school in the western portion of the harbor.

Fish Inventory and Distribution

Grays Harbor tributaries are inhabitated by chinook, chum, and coho salmon while pink and sockeye salmon are rarely encountered in these streams. Anadromous trout, steelhead, and cutthroat are also common. Salmon migrate, spawn, and rear in over 1,688 miles of tributary streams.

Chinook Salmon — Both spring and fall chinook are present in the Chehalis basin. Spring chinook enter the river in March through June destined for the upper reaches of the Wynoochee, Skookumchuck, Newaukum, South Fork Chehalis, and Chehalis rivers. These runs are presently at a low level of abundance.

Fall chinook are present in all of the larger tributaries and many of the smaller streams. Available chinook spawning area in the Humptulips and Hoquiam rivers and the Chehalis River tributaries downstream from Oakville is more heavily utilized at present than the spawning grounds of the Chehalis watershed upstream from Oakville.

PHOTO 22-1. Removal of Fisk Falls (R.M. 113.5) opened the upper Chehalis River to chinook and coho production.

Chinook spawners are generally abundant on riffles of the West Fork Humptulips and upper mainstem Humptulips River. The East Fork Humptulips River supports these fish at least as far upstream as the falls near Flatbottom Creek. Donkey Creek, below the falls, and the lower half of Stevens Creek are also heavily spawned.

The West Fork Hoquiam from tidewater to above the diversion dam, the lower reaches of the Middle Fork, and the central portion of the East Fork are excellent chinook spawning areas. The Wishkah River upstream from the mouth of the West Fork to the falls below Parker Creek and the lower reaches of the West and East forks also provide suitable chinook spawning riffles.

The Wynoochee River contains spawning riffles suitable for chinook salmon from the mouth of Black Creek upstream to Wynoochee Canyon above Save Creek with the riffles upstream from Carter Creek to near Save Creek appearing to be the most heavily spawned. Significant runs of chinook are known to inhabit the lower miles of Carter and Schafer creeks with some spawning in the lower extremities of several other tributaries.

The Satsop River tributaries provide many miles of chinook spawning area. While some spawning occurs in the main river, the bulk of the activity takes place in the East Fork between its mouth and Bingham Creek, the lower half of the West Fork, the Middle Fork, and Decker Creek. If stream flows are sufficient during the spawning run, Dry Run and Bingham creeks are also occupied.

Several smaller tributaries to the Chehalis River, including Cloquallum, Porter, and Cedar creeks, contain suitable chinook spawning riffles. Significant runs annually enter Cloquallum and Porter creeks.

Certain reaches of the Chehalis River contain quantities of chinook spawning gravel, but are presently used far below their potential. These reaches include the mainstem between Porter and Scatter creeks and upstream from Adna. Other

PHOTO 22-2. Chinook inhabit all the larger tributaries and many of the smaller streams in the Chehalis River basin (riffle on Canyon River).

suitable areas in the upper Chehalis watershed, presently underseeded, include: portions of the Black River, Skookumchuck Dam, Newaukum River, North Fork Newaukum upstream to Mitchell Creek, South Fork Newaukum upstream to the falls above Bernier Creek, the lower and upper reaches of the South Fork Chehalis River and the lower half of Stillman Creek and Elk Creek from the falls to the mouth. The Chehalis River above Fisk Falls, about five miles south of Pe Ell, was not accessible to salmon prior to 1970 when the configuration of the falls was modified.

Adult spring chinook enter the river during March through July (Table 22-1). These fish commence spawning in late August and continue through September. Fry emerge from the gravel late the following winter or early spring and juvenile spring chinook generally remain in the river for more than a year with seaward migration taking place the second spring following hatching.

In late July adult fall chinook begin entering the streams of the Chehalis basin where most of the earliest fish are destined for the Satsop River. The run peaks in September and tapers off rapidly through mid-November. Some of the earliest fish begin spawning in late August with the peak of spawning generally occurring during late October and early November. Fall chinook fry remain in fresh water for 3 to 5 months following emergence from the gravel and the major seaward migration occurs in mid-April through June.

Based on spawning ground inspections and fishery observations, it is estimated that the total combined spring and fall chinook natural spawning escapements to the Chehalis basin ranged from 10,000 to 30,000 chinook annually in the period of 1966 through 1971 with the average annual escapement being approximately 22,400.

In addition to the natural production of chinook in the Chehalis basin, the Department of Fisheries produces this species at Simpson Salmon Hatchery on the Satsop River. Only limited numbers of chinook reach the hatchery racks annually where an average of less than 40 fish per year were enumerated.

Coho Salmon — Coho salmon spawn in virtually all accessible streams containing satisfactory streambed material. These fish characteristically seek out smaller tributary streams, although some spawning does occur in large stream channels, such as the West Fork Humptulips and upper Wynoochee rivers. Coho runs in the Humptulips and Hoquiam watersheds and in the Chehalis River watershed downstream from Adna are generally good. Present populations in the Chehalis watershed upstream from Adna are in relatively poor condition.

The Grays Harbor coho run enters fresh water in September through February. This run consists of two distinct segments — early and late spawners. The early run commences in September and continues through November with spawning spread over the period from October through December. These fish are found throughout Chehalis basin. The late-run coho enter the streams in mid-November through February with spawning activities taking place in late December through March. Late-run coho are not found in significant numbers in the Chehalis River watershed upstream from Delezene Creek near Elma, but excellent runs are present in the Satsop, Wynoochee, Hoquiam, Wishkah, and Humptulips rivers with lesser runs in other tributaries to Grays Harbor and the Chehalis River below Delezene Creek.

Juvenile coho generally remain in fresh water over one year before beginning their seaward migration. They mainly migrate as yearlings during April, May, and June of their second year; however, some fry and fingerlings migrate during flooding and heavy run-off periods in their first year. Estimates of annual coho spawning escapements are based on spawning ground surveys and fishery observations. During 1966 through 1971 the average coho escapement was nearly 120,000 fish and ranged from 50,000 to 200,000. These figures include the average return of 8,200 coho annually to Simpson Hatchery whose escapement ranged from 5,200 to 10,212 coho.

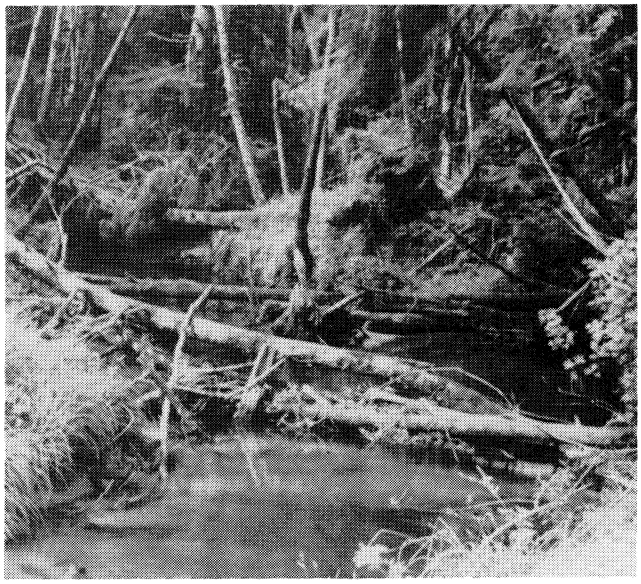
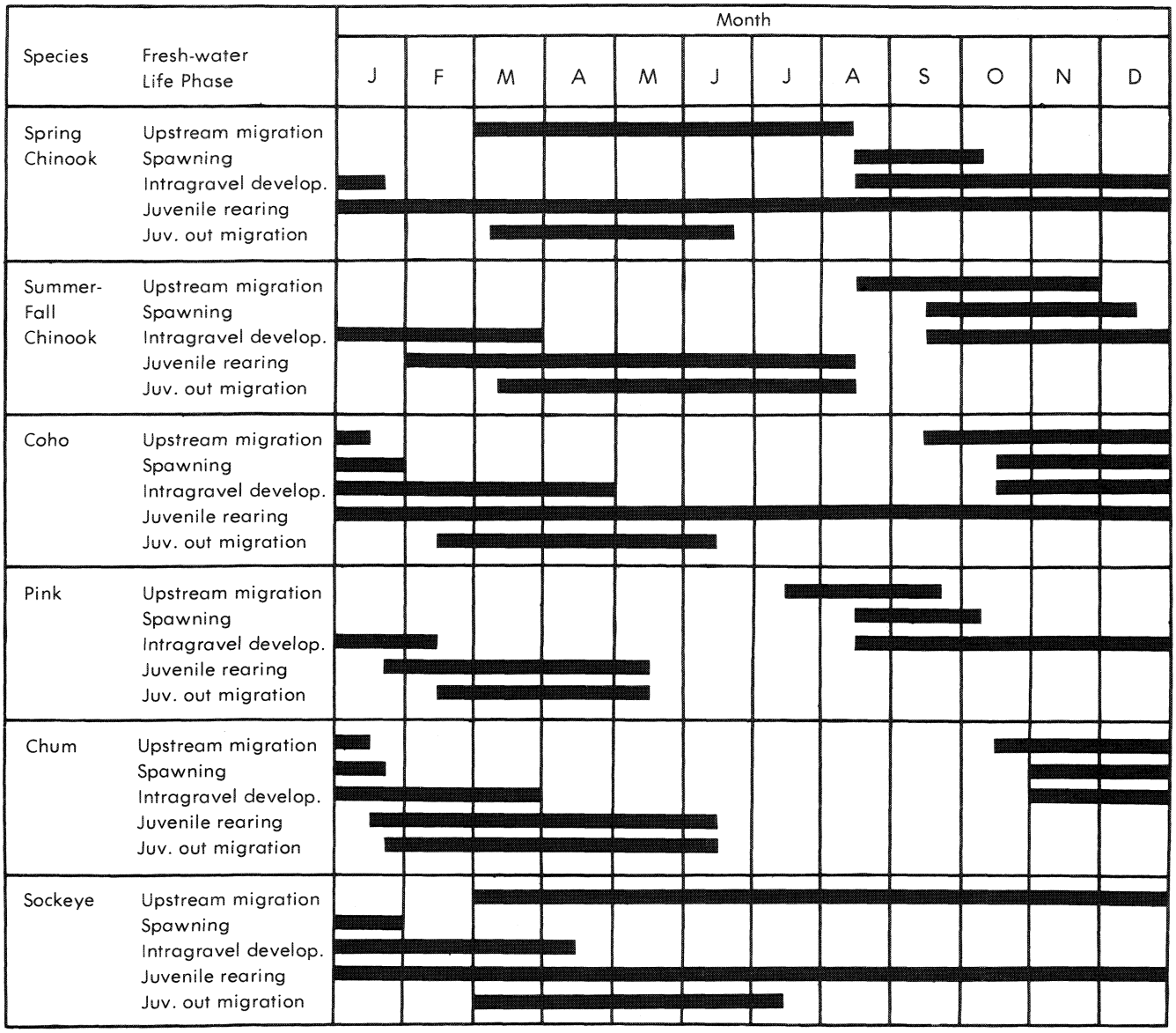


PHOTO 22-3. Many small Chehalis River tributaries provide good habitat for coho spawning and rearing (Andrews Creek).

Table 22 & 23-1. Timing of salmon fresh-water life phases in Chehalis Basin WRIA 22 & 23



Chum Salmon — Major chum spawning areas are found in all the larger tributaries to the north side of Grays Harbor and in the larger streams entering the north side (right bank) of the Chehalis River downstream from Cloquallum Creek. Large numbers of chum frequently spawn in small, spring fed streams.

The Humptulips River and its tributaries, particularly Stevens Creek and the West Fork Humptulips, support significant chum runs. The Hoquiam and Wishkah rivers also are important chum spawning areas. Extensive chum utilization in the Wynoochee extends from approximately two miles above its mouth upstream to the lower end of Wynoochee Canyon near Save Creek. Schafer Creek is probably the most important chum spawning tributary; however, spawning takes place in the lower reaches of most tributaries containing suitable spawning gravel.

The Satsop River and its tributaries annually contain large numbers of chum salmon. Major runs occur in the East Fork, the lower ten miles of the West and Middle forks, and the lower reaches of their tributaries. Decker Creek, several of its tributaries, and the East Fork Satsop are heavily spawned.

Cloquallum Creek is the uppermost tributary to the Chehalis which presently supports an important chum run. Chum salmon runs in areas further upstream have suffered a drastic decline with the majority of production upstream in the Chehalis from Cloquallum Creek now being confined to the area between Porter Creek and Scatter Creek near Rochester.

Chum salmon enter the Grays Harbor tributaries in early October through mid-December and spawning peaks in mid-November. Chum fry begin their seaward migration shortly after emerging from the spawning bed during February, March, and April after a short period of stream residence. An average of 16,000 chum escaped the fisheries to spawn in streams of the Chehalis basin in 1966 through 1971 while the spawning escapement ranged from 12,000 to 35,000 fish. Virtually all of this production is the result of natural

PHOTO 22-4. An excellent chum spawning riffle in lower Cloquallum Creek.

spawning. Average return to Simpson Hatchery was 444 chum and ranged from 25 to 1,158. Success of the eyed-egg incubation channel on the East Fork Satsop River has not been fully documented.

Pink and Sockeye Salmon — These two species have been seen in several streams of the Chehalis basin, but in insignificant numbers. They are assumed to be strays from elsewhere and are not indigenous to this basin.

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 natural and artificially produced fish, as well as escapement and harvest figures.

Natural spawning in the Chehalis basin sustains an average annual catch of over 130,000 salmon to the various sport and commercial fisheries in Washington. An additional 65,000 salmon are harvested by fisheries of Alaska, Canada, Oregon, and California. In an average year approximately 160,000 adult salmon return to spawn in the Grays Harbor drainage of which over 150,000 spawn naturally and nearly 10,000 return from artificial production.

The Washington Department of Fisheries maintains the Simpson State Salmon Hatchery on the East Fork Satsop River. Bingham Creek and the East Fork Satsop provide water for the 44 standard pond equivalent station which has a hatching capacity of 9.0 million fry and a rearing capacity of approximately 2.0 million coho yearling and 4.5 million chinook fingerling salmon. This station handles principally fall chinook and coho. Virtually all juvenile coho are planted in the Grays Harbor drainage while much of the chinook production is transported to Capitol Lake in lower Puget Sound for further rearing.

Additional plantings of chinook and coho fry are often planted in this drainage from stations in the Willapa Harbor area. For the period 1966 to 1971, annual salmon plants in the basin have averaged 1.5 million chinook, 800,000 coho yearlings, and 800,000 coho fry.

Table 22-2. Salmon Spawning Escapement Levels for the Chehalis Basin WRIA 22 & 23.

Species	1966-1971 Escapements Range	Average
Chinook	10,000— 30,000	22,000
Coho	50,000—200,000	119,000
Chum	12,000— 35,000	16,000

During the 1966-1971 period a total 9,152,000 chinook fry and fingerling, 6,283,000 coho fry and fingerling, 9,652,000 yearling coho, and 528,000 chum fry were planted in the Chehalis basin. Some of these fish, particularly chinook and coho fry, were planted out of hatcheries in the Willapa basin. Many of the chinook fry and most of the coho fry and fingerling were planted after only short-term rearing into barren and depleted areas within the Chehalis basin. Actual production of the fisheries and returns to the basin from such plants are unknown.

An experimental egg incubation channel is operated on a spring-fed tributary to the East Fork Satsop River. This facility is 240 feet long by 12 feet wide and has an estimated capacity of 2,000,000 eggs. Eggs are buried in the gravel and allowed to incubate, emerge, and migrate from the channel naturally. Both chum and coho eggs have been planted; however, emphasis has been placed on the production of chum fry. An average of 500,000 chum eggs have been planted annually since its construction.

Harvest

Salmon produced or reared in the Chehalis basin waters are harvested by sport and commercial fisheries of the United States and Canada. These fish are known to be present from northern California to southeastern Alaska, but Washington coastal fisheries and those in the western end of the Strait of Juan de Fuca capture the majority of the total production. The estimated total contribution (all species) to these fisheries ranged from 139,000 to 370,000 salmon for the period 1966-1971.

Grays Harbor supports an intensive gill net fishery which harvests an estimated 35 percent of the chinook, 50 percent of the chum, and 23 percent of the coho entering the bay. An Indian gill net fishery operates on the Chehalis River in the vicinity of Oakville. This fishery has captured an average of 4,050 salmon annually in recent years.

A large sport fishing fleet operates out of Westport and Ocean Shores near the entrance to Grays Harbor. Most of the fleet's effort is expended on the ocean waters between Copalis and Willapa Harbor. The bar at the entrance of Grays Harbor is also a popular sport fishing site.

Freshwater salmon angling is permitted in several of the larger tributaries in the Chehalis basin. The more popular fishing areas include the Humptulips, Wynoochee, Chehalis, and Satsop rivers. The average freshwater catch of salmon in the basin based on sport catch punch card returns is 6,150 annually and has ranged from 2,030 to 8,330. Chinook and coho comprise the bulk of the catch; however, some chum salmon are taken. No data are available to determine species composition or the number of jacks and adults.

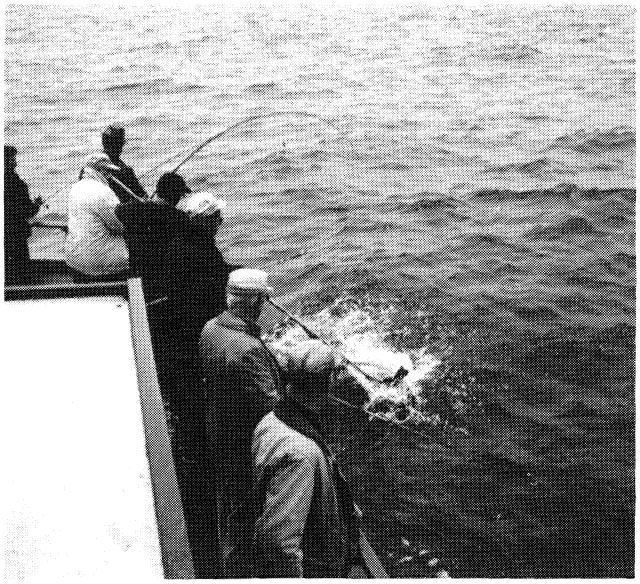


PHOTO 22-5. A scene repeated thousands of times each year on Westport charter boats.

Limiting Factors

Limiting factors refer to conditions that lead to a complete loss or a reduction of an environment's fish producing potential, excluding harvest.

Stream flow — Seasonal flooding occurs in some of the drainage areas. This flooding does not normally result in excessive damage to the fisheries resources of this basin, but it may result in unstable streambeds.

Seasonal low flows occur in virtually all of the streams, but are most detrimental to fish life in the smaller tributaries by limiting the amount of rearing areas available. These low flows generally occur from natural causes, since stream diversions for other water uses are presently limited to a small number of courses. Some smaller streams go dry during extensive rainless periods in the summer.

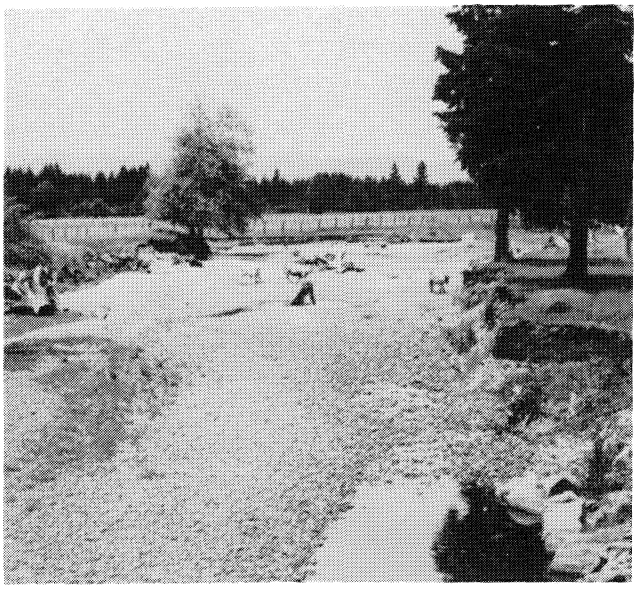


PHOTO 22-6. Intermittent flows create serious mortalities of juvenile coho (Dry Bed Creek).

Physical barriers — A number of streams in this basin have physical barriers which inhibit or delay salmon migration to potential spawning and rearing areas. Most of these barriers are natural features consisting of falls, cascades, and beaver dams. Log jams, composed of both natural and logging debris, are problems in many streams.

Some barriers have resulted from construction activities and include two dams that have been constructed with both of them having fish passage facilities. A number of small tributary streams are blocked by improper culverts on county, state, and private roads. Culverts not properly installed create outfall drops and velocities sufficient to prevent upstream passage of adults.

Natural barriers blocking fish passage to stream reaches with significant salmon production potential are found on the East and West forks Humptulips, East Fork Hoquiam, Wishkah, Wynoochee, Middle and West forks Satsop, Skookumchuck, South Fork Newaukum, and West Fork Chehalis rivers, and Porter Creek. A number of lesser, but important, potential production areas are inaccessible on the smaller streams.

Water Quality — Degraded water quality areas exist in the lower five miles of the Newaukum River. Many of the small drainages and most estuarine areas of Grays Harbor suffer from degraded water quality. Grays Harbor has suffered from water pollution problems since 1937 and has had many studies conducted on the problems in the past years.

Principal causes of inferior water quality result from domestic and agricultural pollutants in the streams, and domestic and industrial effluents in the estuarine and marine water.

Excessive streambank erosion exists upstream of Pe Ell on the mainstem Chehalis River and has created heavy siltation downstream.

Water temperature problems exist, particularly in the Chehalis River below Newaukum River.

Operation of food processing plants in the Centralia area during the summer months overloads existing treatment facilities and raw sewage enters the Chehalis River below the confluence of the Newaukum River. Water samples collected by the Washington Water Pollution Control Commission in 1967 and by the Federal Water Pollution Control Administration in 1966 show low dissolved oxygen, a high 5 -day BOD, and high coliform counts. This pollution problem may have serious effects on salmon and shad.

Limited spawning and rearing — Virtually all of the streams in this basin had sufficient spawning area in their pristine condition. Siltation from logging and road construction has resulted in compaction of the spawning gravel and decreased intragravel flow in many tributaries. This seriously limits the success of natural spawning and rearing.

Streams experiencing very low summer flows have limited rearing area for juvenile coho which is also lost through physical changes in stream length, streambed composition, and pool-riffle characteristics.

Steeper gradient streams do not have a proper balance of pools and riffles, consequently the rearing potential is restricted. Bottom materials in these steeper streams are often too large for successful spawning with only an occasional patch of smaller spawning gravel.

Watershed developments—Development of riverfront property for summer and permanent homes has not been extensive, but can be expected in the future. This will result in demands for diking and channel changes which are not compatible with fish production.

Physical alterations of the stream courses for road construction are found on many streams which results in increased gradient and loss of spawning and rearing area. Logging road construction has resulted in numerous such losses and public roads also have created a number of damaging channel changes.

Gravel removal from the natural streambeds reduces the amount of available spawning area and may result in a reduction in streambed stability. Gravel removal projects on the Satsop, South Fork Chehalis, Humptulips, and Wynoochee rivers have probably reduced the available chinook spawning areas.

Gravel removal operations, particularly adjacent to stream in the Newaukum watershed, have probably contributed greatly to the decline of the chinook and chum runs. These operations have affected, and continue to affect, virtually every spawning reach of the South Fork below the town of Onalaska, the Newaukum River, and the North Fork below the stream gage. Full restoration of the chinook runs is not possible until this situation is corrected.

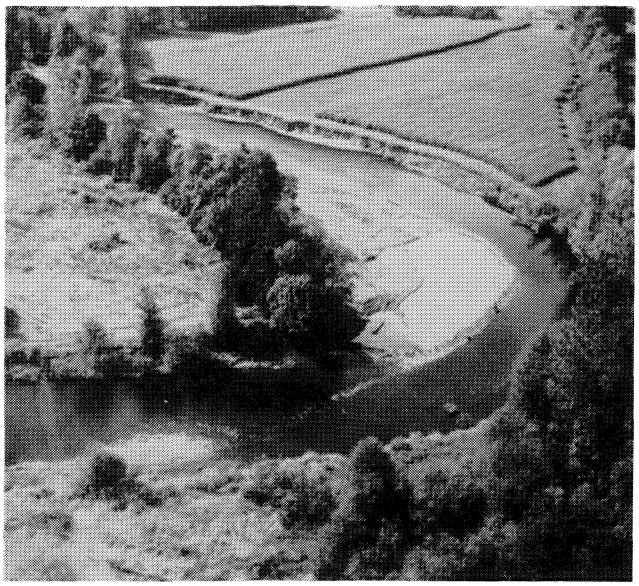
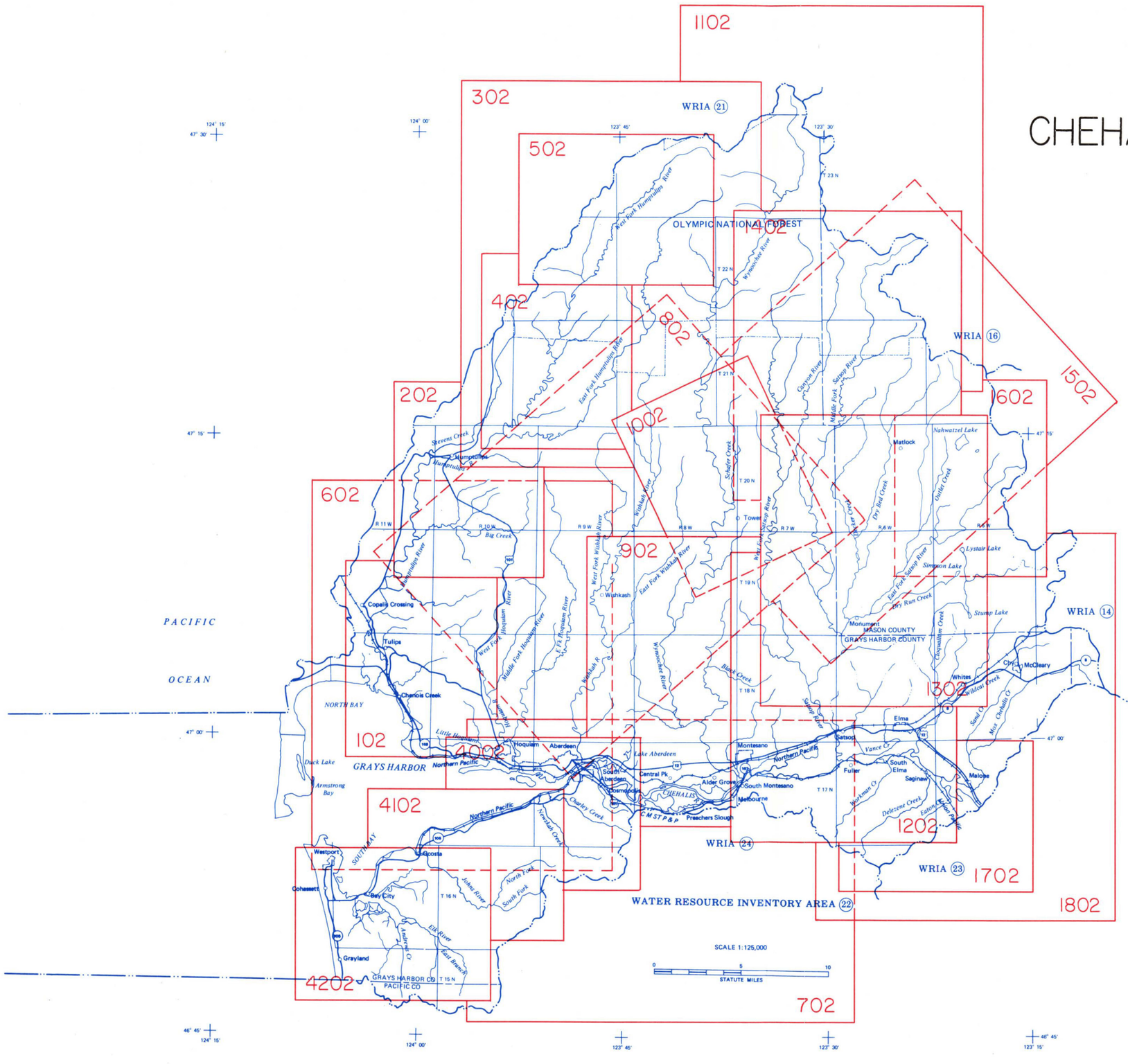


PHOTO 22-7. Improper gravel removal operations impair salmon production (Newaukum River).

CHEHALIS BASIN WRIA 22
Index to Key Maps

UPPER CHEHALIS BASIN CONTINUED Page Chehalis — 12.

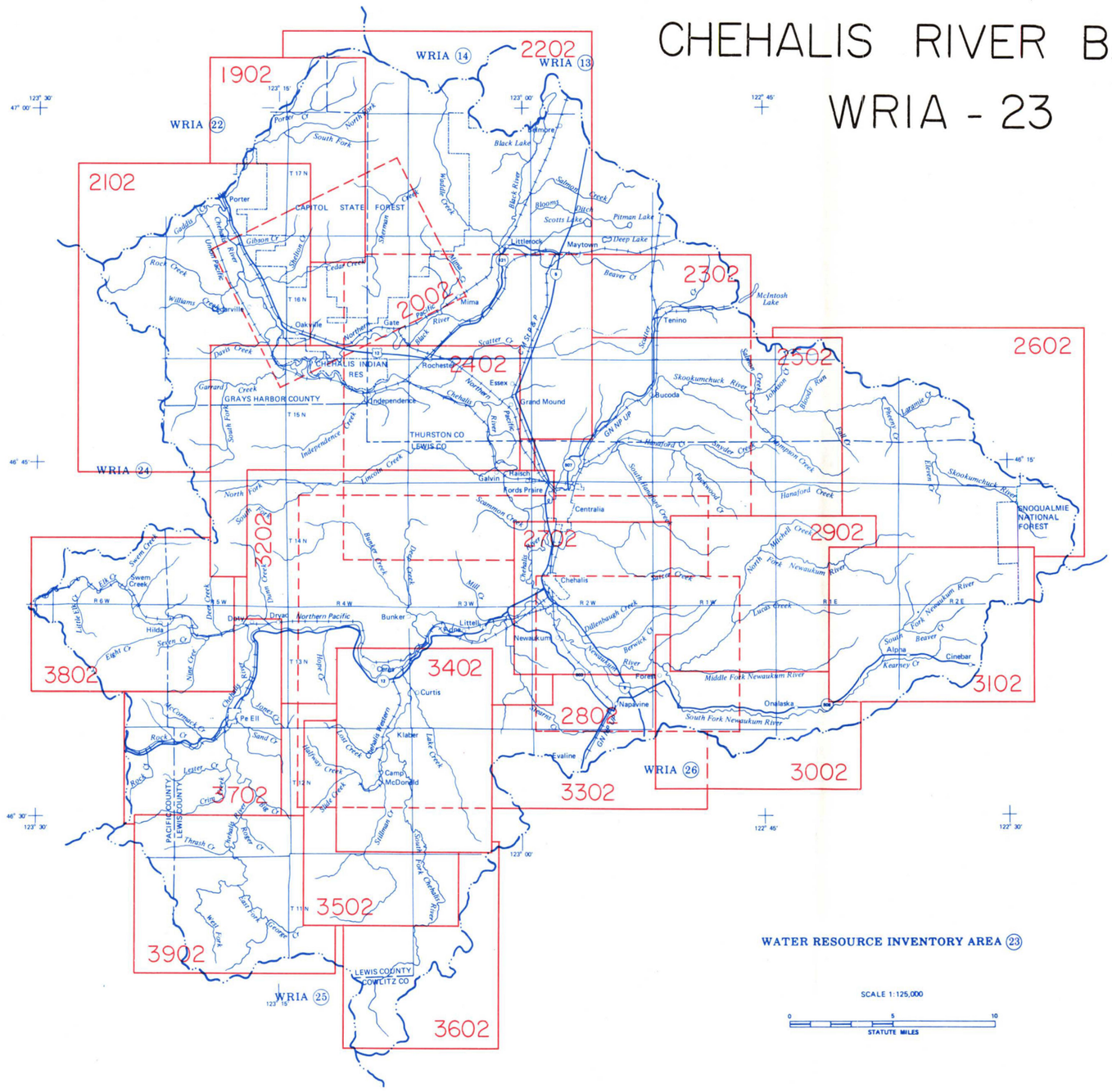
CHEHALIS RIVER BASIN
WRIA - 22



CHEHALIS BASIN WRIA 23
Index to Key Maps

CHEHALIS RIVER BASIN

WRIA - 23



WATER RESOURCE INVENTORY AREA (23)

SCALE 1:125,000

0 5 10

STATUTE MILES

HUMPTULIPS RIVER
Lower Mainstem

This drainage section contains the lower 14.1 miles of the Humptulips River and its tributaries. Two independent Grays Harbor drainages, Grass Creek and Chenois Creek, are also included. This section of the Humptulips includes 14.1 miles of mainstem and 8 tributaries with over 53 miles of stream drainage. The entire Humptulips watershed (245 square miles) contains over 320 miles of stream with more than 160 miles presently in salmon production. The remainder of the watershed is discussed in Chehalis 200-500.

Stream Description

From stream mile 15.0 the Humptulips meanders in a southerly direction to its confluence with Grays Harbor. A number of tributaries enter along the course. The only major tributary is Deep Creek.

The low gradient river channel flows alternately through cleared farm and timberland. Farmland is located adjacent to the river with timberland along the tributaries and gentle valley slopes. Rural residences are scattered through the bottomland. Newton and Copalis Crossing are the principal residential developments. There are several active gravel removal operations.

The Humptulips River ranges from 30 to 50 yards wide in this section. The river is comprised mostly of pool areas with short riffle sections. Rubble and gravel are the predominant bottom materials.

The lower tributaries of the river are classified as sloughs. These sloughs — Gillis, Campbell, Jessie, and Burg — offer minor amounts of spawning area but do provide rearing area for chinook and coho. Only Burg Slough is nontidal and all are almost entirely pool areas ranging from 4 to 30 yards wide.

Deep Creek is the most important tributary to this reach. It lies in a partially cleared watershed. The accessible reach of Deep Creek has an average width of 9 yards during the winter months. The other streams are generally less than 2 yards wide. Bank cover is adequate, consisting mainly of deciduous vegetation.

The two independent drainages head in low hills and flow southerly from gentle valleys into broad, flat land adjacent to Grays Harbor. Most of these two drainages are in second-growth timber with farmland near their mouths.

Salmon Utilization

This reach of the Humptulips River channel serves primarily for transportation of adults destined for upper spawning areas and for rearing of juvenile salmon. A limited number of chum and chinook may spawn in this mainstem section. Coho and chum utilize most of the accessible tributary streams, including Chenois and Grass creeks, for spawning and rearing. Few, if any, chinook spawn in the tributaries. The lower slough areas provide rearing for juvenile salmon and are valuable as refuges for juvenile salmon flushed downstream before they are ready to adapt to salt water. An estimated 19 linear miles of tributary streams are accessible for salmon production in this lower Humptulips River. In addition, approximately 9 miles of accessible stream occurs in Grass and Chenois creeks.

Limiting Factors

Major limitations to fish production in this section are limited spawning facilities and low summer flow. Water quality is occasionally degraded by gravel mining in the stream channel, and from erosion of the defrosted land and from road construction.

A falls on Deep Creek limits salmon production to only 6.5 miles of stream channel in the watershed.

Beneficial Developments

No major beneficial developments have occurred in the section.

Habitat Needs

Major demands for water diversion from the Humptulips River can be expected in the future. Application has been made for 140 cfs in this reach. This will present significant problems in fish screening and passage and in water quality.

Survival of juvenile salmonids is much higher in the Humptulips than in the Chehalis. This can be attributed to the high water quality in the river and estuary. This must be maintained. Its continuance will depend on preserving present flows and application of less damaging road construction and logging practices. The recent practice of transporting smolt coho and chinook from the Simpson State Salmon Hatchery should be continued. The presently unutilized or underseeded rearing areas, particularly upper Deep Creek and Damon Lake, should receive annual plants of coho fry. No gravel removal or channel alterations should be permitted upstream from stream mile 15.0.

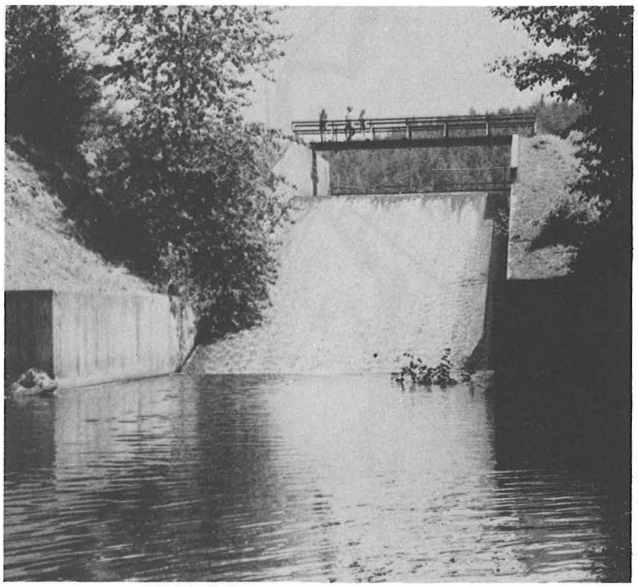
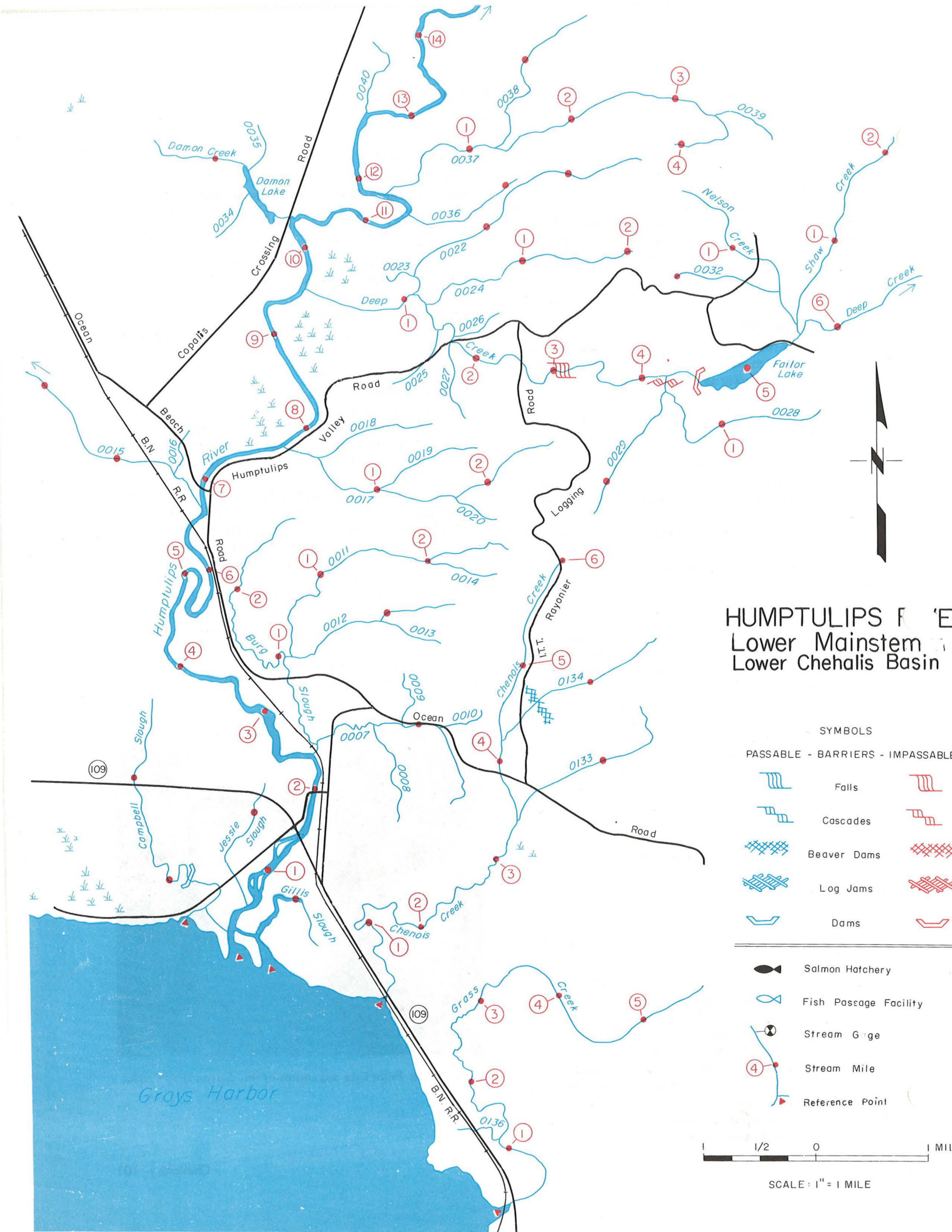


PHOTO 22-8. Failor Lake was created by this dam on Deep Creek.


HUMPTULIPS R 'E
Lower Mainstem
Lower Chehalis Basin
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
Grays Harbor
Ocean
Damon Creek
Damon Lake
Crossing
Copalis
Beach
B.N. R.R.
Humptulips River
Humptulips
Valley Road
Logging Road
Deep Creek
Nelson Creek
Show Creek
Failor Lake
Rayonier
I.T.T.
Chenois Creek
Burg Slough
Campbell Slough
Jessie Slough
Gillis Slough
Gross Creek
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HUMPTULIPS RIVER — LOWER MAINSTEM
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0001	Clover Creek	N½,Sec3, T17N,R12W	1.1	—	Unknown
0002	Kurtz Slough (Drainage Ditch)	N¼,Sec24, T18N,R12W	~ 3.8	—	Unknown
0003	Campbell Slough	NW¼,Sec21, T18N,R11W	2.7	—	Chinook, Coho
0004	Humptulips River	NE¼,Sec21, T18N,R11W	60.8	—	Chin.,Chum,Coho
0005	Jessie Slough	RB-0.5	1.3	—	Coho
0006	Burg Slough	LB-2.3	2.8	3.6	Coho, Chum
0007	Unnamed	LB-0.1	1.9	—	Unknown
0011	Unnamed	LB-0.9	2.6	—	Unknown
0012	Unnamed	LB-0.05	1.6	—	Unknown
0015	Unnamed	RB-6.8	2.4	—	Unknown
0017	Unnamed	LB-7.7	2.7	—	Unknown
0021	Deep Creek	LB-9.7	7.8	12.6	Coho, Chum
0022	Unnamed	RB-1.1	2.6	—	Coho, Chum
0024	Unnamed	RB-1.2	2.1	—	Coho
0028	Unnamed	LB-4.2	1.8	—	None
0029	Unnamed	LB-0.1	1.2	—	None
	Failor Lake	Outlet-4.5	—	—	
0030	Shaw Creek	RB-5.6	2.2	—	None
0031	Nelson Creek	RB-0.1	1.9	—	None
0032	Unnamed	RB-0.35	1.0	—	None
0033	Damon Creek	RB-10.3	1.6	—	Coho
	Damon Lake	Outlet-0.15	—	—	
0036	Unnamed	LB-11.3	1.1	—	Unknown
0037	Unnamed	LB-11.7	4.1	—	Unknown
0038	Unnamed	RB-1.2	1.6	—	Unknown
0131	Gillis Slough	NW¼,Sec22, T18N,R11W	1.5	—	Coho
0132	Chenois Creek	SE¼,Sec22, T18N,R11W	5.95	—	Coho, Chum
0133	Unnamed	LB-3.5	1.75	—	Coho
0134	Unnamed	LB-4.2	1.7	—	Coho
0135	Grass Creek (Cont. Chehalis 203)	E½,Sec35, T18,R11W	5.65	—	Chum, Coho

HUMPTULIPS RIVER
Big Creek Area

This section of the Humptulips River drainage consists of that portion of the watershed downstream from the confluence of the East and West forks to stream mile 14.1. This stretch of river provides 14.0 miles of mainstem channel and 8 tributaries with over 87 miles of stream drainage. East and West forks are presented in Chehalis 300-500.

Stream Description

Below the confluence of the East and West forks the river flows in a westerly and southwesterly direction to near stream mile 22.5. The channel continues south from this point. Principal tributaries to this reach include one unnamed stream (25.65), Stevens Creek, and Big Creek.

The Humptulips River and most of its tributaries meander through a broad, gently sloping valley floor. Most of the watershed is in second-growth timber production with significant stands of old-growth remaining only on the upper reaches of Stevens Creek. Cleared farmland is scattered along the main valley floor adjacent to the Humptulips River. Lesser acreages are farmed in the bottomland along Big Creek. Aside from the small community of Humptulips, most of the remaining development is in the form of scattered rural or farm residences along the river and Big Creek.

The main channel provides a nearly uniform habitat throughout this stretch. Long, gentle pools alternate with generally short riffle sections. The stream width varies from 30 to 40 yards and deep pools are common. The bottom material consists primarily of rubble and gravel.

The tributaries, except in their upper extremities, have moderate to low gradient. Stream banks are quite stable and marginal cover, in the form of mixed vegetation types, is quite adequate. The lower reaches of these tributaries range from 3 to 15 yards wide. The bottom is predominately gravel and sand. These streams have sufficient pool characteristics to provide for resting and maturation of adult salmon.

Salmon Utilization

The Humptulips River channel is a major spawning area for chinook and chum. In addition, it provides transportation water for salmon destined to other spawning areas and excellent habitat foj the rearing of juvenile salmon.

The tributaries serve as good to excellent spawning grounds for coho nearly to their headwaters. Chum utilize the lower reaches of these same streams. Stevens Creek also supports a significant chinook run with lesser numbers in Big Creek. An estimated 56 linear miles of tributary streams are presently utilized by salmon in this section.

Limiting Factors

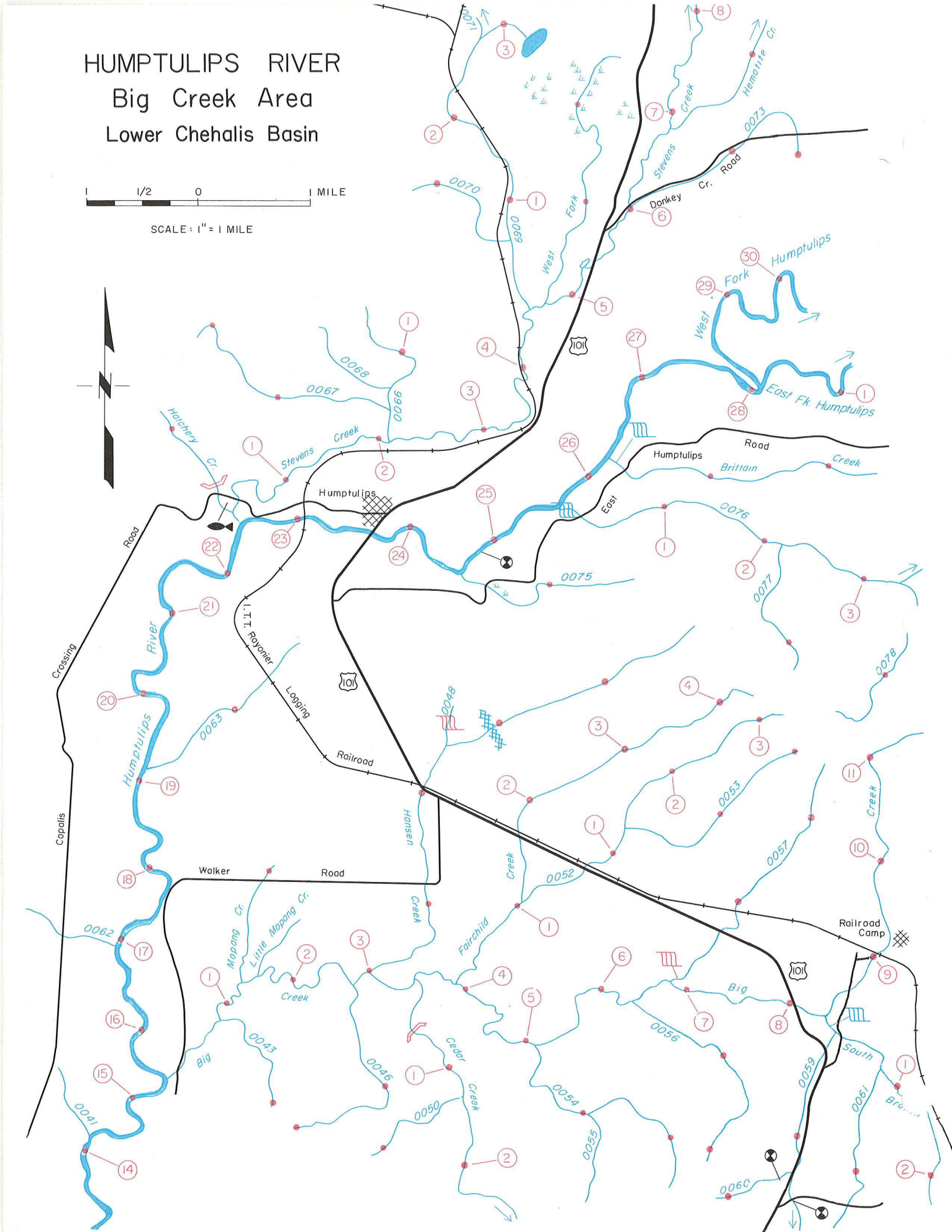
The major limiting factor to salmon production in this watershed section is low flow in the tributaries. Erosion from road construction and defrosted land periodically affects water quality in the main channel. Tributary inflow is usually of good quality except during extremely high flow. No major barriers to salmon migration exist in this section.

Beneficial Developments

No major beneficial developments have taken place in this section. A small salmon hatchery was constructed on a Stevens Creek tributary in 1915. Its operation was discontinued in 1945. A new hatchery planned for the Humptulips River watershed will probably be constructed on lower Stevens Creek. Until this hatchery is in full production, smolt from Simpson Hatchery on the Satsop River should continue to be planted in this watershed.

Habitat Needs

The excellent survival of juvenile salmon produced in this section can be continued only if the water and streambed quality is maintained. This will require application of less damaging road construction and logging practices. Gravel removal operations adjacent to the stream channels should be prohibited. One of the alternative plans for municipal diversion from Humptulips River is to pump from the upper end of this section near the forks. This will be extremely damaging to the spawning and rearing habitat downstream.


HUMPTULIPS RIVER
Big Creek Area
Lower Chehalis Basin
1/2
0
1 MILE
SCALE: 1" = 1 MILE
0071
0070
6900
West Fork
Stevens Creek
Hematite Cr.
0073
Donkey Cr. Road
0068
0067
0066
Hatchery Cr.
Stevens Creek
Humptulips
Humptulips River
Crossing Road
Copalis
I.T.T. Rayonier Logging Railroad
Walker Road
Hansen Creek
Mopang Cr.
Little Mopang Cr.
Big Creek
0062
0043
0041
0046
Cedar Creek
0050
0048
0063
0075
0076
0077
0078
0052
0053
0057
0054
0055
0056
0059
0061
006C
Fairchild Creek
Railroad Camp
South Big Creek
West Fork Humptulips
East Fk. Humptulips
Humptulips Road
East Britain Creek
101

HUMPTULIPS RIVER — BIG CREEK AREA
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0004	Humptulips River			—	Chum,Coho,Chin.
0042	Big Creek	LB-15.4	11.5	31.6	Coho,Chum,Chin.
0043	Unnamed	LB-0.8	1.0	—	None
0044	Mopang Creek	RB-1.4	1.1	—	Coho
0046	Unnamed	LB-2.8	2.0	—	Coho
0047	Hansen Creek	RB-3.0	4.9	—	Coho, Chum
0049	Cedar Creek	LB-3.5	3.8	—	Coho, Chum
0050	Unnamed	LB-1.3	1.1	—	None
0051	Fairchild Creek	RB-3.9	4.4	—	Coho, Chum
0052	Unnamed	LB-1.1	3.2	—	Coho
0053	Unnamed	LB-1.25	2.0	—	Coho
0054	Unnamed	LB-5.1	2.5	—	Coho
0056	Unnamed	LB-6.5	2.1	—	Coho
0057	Unnamed	RB-6.8	2.5	—	Coho
0058	So. Br. Big Creek	LB-8.3	2.2	—	Coho
0059	Unnamed	LB-0.2	2.2	—	Coho
0060	Unnamed	LB-1.3	1.1	0.15	Coho
0061	Unnamed	LB-0.8	1.5	—	Coho
0063	Unnamed	LB-19.1	1.9	—	Unknown
0064	Stevens Creek	RB-22.5	13.7	28.2	Chum,Coho,Chin.
0065	Hatchery Creek	RB-0.1	1.15	—	Coho, Chum
0066	Unnamed	RB-2.1	1.6	—	Chum,Coho,Chin.
0067	Unnamed	RB-0.3	2.2	—	Coho,Chum,Chin.
0069	Unnamed	RB-4.6	3.3	—	Coho,Chum,Chin.
0070	Unnamed	RB-0.7	1.2	—	Unknown
	Unnamed Lake	Outlet-3.3	—	—	
0071	W. F. Stevens Cr.	RB-4.75	2.7	—	Coho,Chum,Chin.
0072	Unnamed	LB-6.05	2.0	—	Coho, Chum
0073	Hematite Creek	LB-6.85	2.1	—	Coho, Chum
0074	Unnamed	LB-10.2	1.0	—	Coho
0075	Unnamed	LB-24.6	1.7	—	Coho
0076	Unnamed	LB-25.65	5.35	—	Coho
0077	Unnamed	LB-2.2	1.3	—	Coho
0078	Unnamed	LB-3.3	1.7	—	Coho
0079	Brittain Creek	LB-26.2	2.4	—	Coho, Chum

HUMPTULIPS RIVER — BIG CREEK AREA
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0080	E. F. Humptulips R.	LB-28.1	30.9	—	Chin.,Chum,Coho
	(See Chehalis 303)				
	(Cont. Chehalis 402)				

EAST FORK HUMPTULIPS RIVER

This section describes the East Fork Humptulips River and all its tributaries. It includes 46.4 square miles of drainage area and 29.9 miles of mainstem. Nineteen tributaries provide over 31.4 linear miles of streams in the East Fork.

Stream Description

The East Fork heads in the steep foothills of the Olympic Mountains and flows southwest between steep hills in a gradually broadening river valley. All tributaries to the East Fork are quite short and steep.

Most of this section is forested with old second-growth or virgin timber. There are no areas of farmland or residential development. Recent logging has been conducted. The upper mainstem East Fork is quite steep with the remaining mainstem East Fork having a moderate gradient. An adequate stream bank cover of deciduous and conifer vegetation exists along its banks. The tributary streams are quite steep except in their lower reaches where they enter the main river valley. Most of these tributaries are in recently logged land or old-growth timberland. Their bank cover consists of conifer timber in their steeper sections and deciduous growth in the bottomlands.

The lower reaches of the East Fork contain a good balance of pools and riffles. The river is relatively stable and ranges from 15 to 30 yards in width. Gravel and rubble are the predominant features of the streambed materials. The tributaries contain numerous cascades, rapids, and waterfalls in their upper reaches. Only their lower extremities contain significant amounts of pool and riffle area. The majority of these streams are less than 3 yards wide in the lower reaches. The streambeds are composed primarily of gravel. Deciduous vegetation and conifer timber provide generally good stream bank cover.

Salmon Utilization

The East Fork Humptulips River supports runs of fall chinook, coho, and chum. The majority of the coho spawning occurs in the middle East Fork and in the lower reaches of its tributaries. Chinook are known to spawn in the main channel as far upstream as stream mile 15.0. They are not known to spawn in any of the tributaries. Chum spawning is probably confined to the lower 9 miles of the East Fork and the lower reaches of several of the tributaries to this reach. The East Fork provides good rearing area for juvenile salmon. Numerous deep, well-shaded pools provide adequate resting and maturation area for adult salmon. Use of tributaries by salmon is generally limited to the lower 0.5 miles or less of those streams accessible. These areas provide good spawning and rearing facilities for coho. The lower reaches of several of the tributaries below mile 0.9 may be utilized by chum salmon. An estimated 26 miles of the mainstem East Fork and only 4 miles of tributary streams are accessible to salmon production.

Limiting Factors

The major limiting factors in this section are the numerous barriers to salmon migration. Until recent years, only the lower 17 miles of the East Fork and its tributaries were accessible to salmon. The falls below Flat Bottom Creek was laddered and the upper reaches of the stream are now accessible for spawning and rearing but have not yet been extensively used for coho. Most of the tributary streams have falls or cascades in their lower reaches which block adult salmon. Splash dams, formerly located on the East Fork, were complete blocks to salmon migration.

Beneficial Developments

The falls on the East Fork Humptulips River at mile 17.1 has been laddered. Several log and debris jams have been removed from the drainage system. No other beneficial developments have taken place on this drainage.

Habitat Needs

Streambed and water quality in this section will be maintained if adequate protection is provided during road contains 17.3 miles of mainstem channel and 11 tributaries with over 30 miles of stream channel. Tis portion of the watershed contains 36 square miles of drainage.

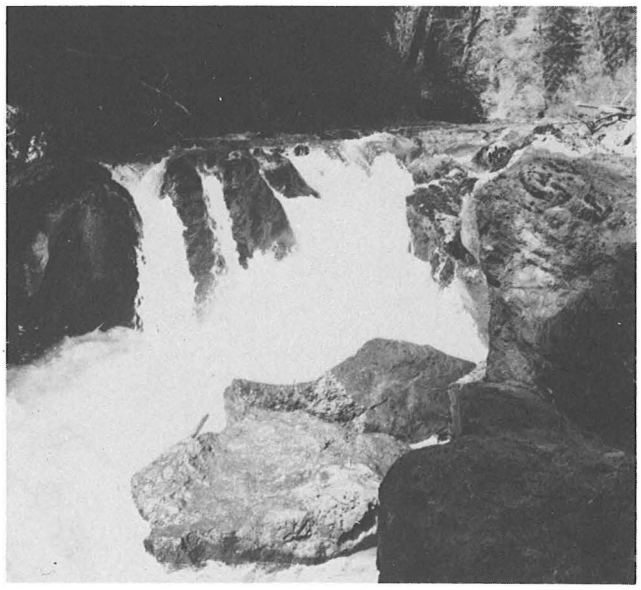
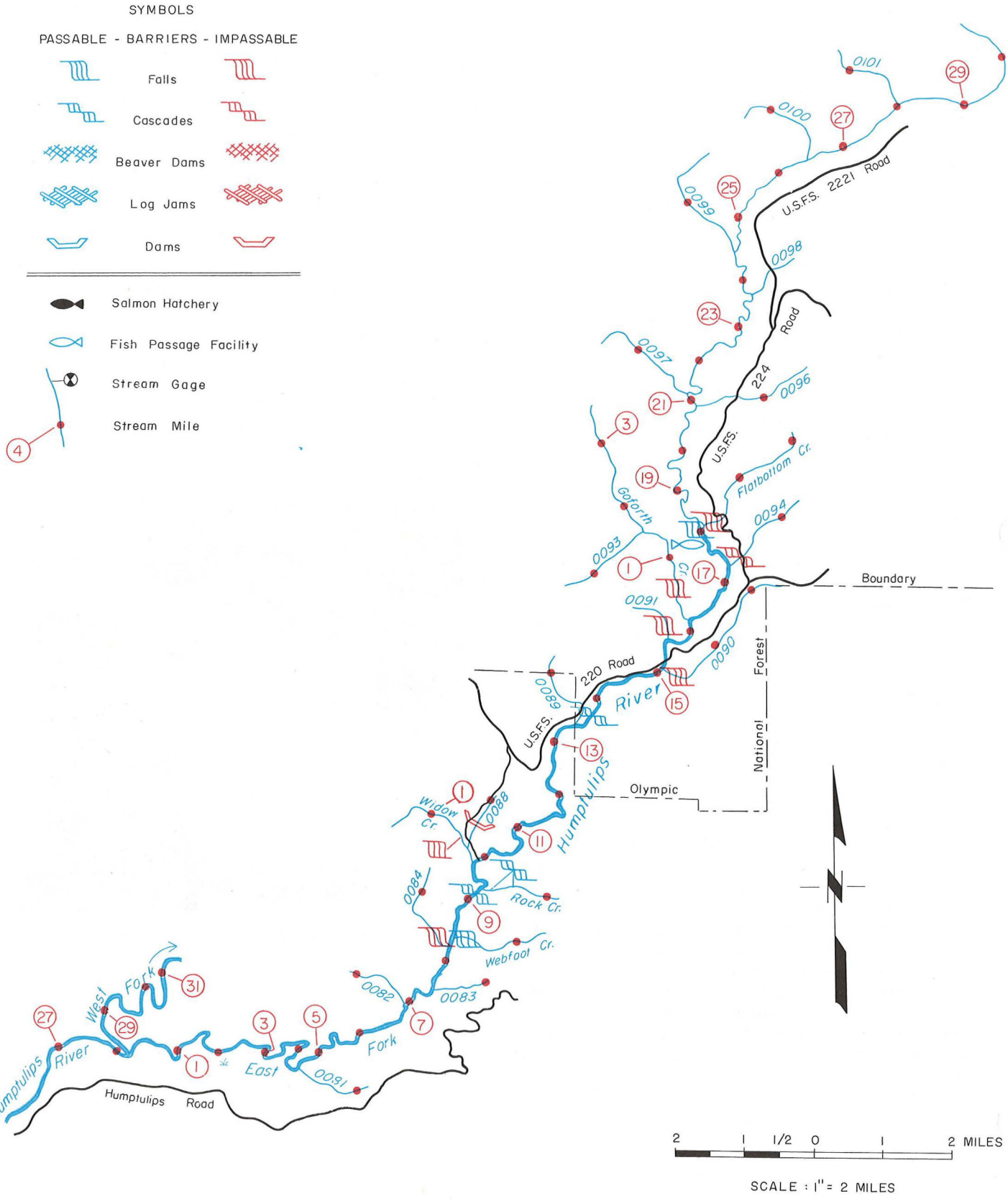


PHOTO 22-9. East Fork falls before fish passage facilities were constructed.

EAST FORK HUMPTULIPS RIVER

Lower Chehalis Basin



EAST FORK HUMPTULIPS RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0004	Humptulips River				Chin.,Chum,Coho
0080	E. F. Humptulips R.	LB-28.1	30.9	46.4	Chin.,Chum,Coho
0081	Unnamed	LB-4.6	1.2	—	None
0082	Unnamed	RB-6.9	1.0	—	None
0083	Unnamed	LB-7.5	1.0	—	Coho
0084	Unnamed	RB-8.2	1.5	—	None
0085	Webfoot Creek	LB-8.3	1.5	—	Coho
0086	Rock Creek	LB-9.3	1.2	—	Coho
0087	Widow Creek	RB-9.75	1.7	—	Coho
0088	Unnamed	LB-0.2	1.0	—	Coho
0089	Unnamed	RB-13.4	1.35	—	Coho
0090	Unnamed	LB-15.1	2.4	—	Coho
0091	Unnamed	RB-15.55	1.3	—	None
0092	Goforth Creek	RB-16.2	3.6	—	Coho
0093	Unnamed	RB-1.5	1.35	—	None
0094	Unnamed	LB-17.15	1.4	—	Coho
0095	Flatbottom Creek	LB-18.0	2.2	—	Coho
0096	Unnamed	LB-20.85	1.7	—	Coho
0097	Unnamed	RB-21.1	1.7	—	Coho
0099	Unnamed	RB-24.55	2.0	—	Coho
0100	Unnamed	RB-26.45	1.5	—	Coho
0101	Unnamed	RB-28.05	1.3	—	Unknown

WEST FORK HUMPTULIPS RIVER

Lower Mainstem

This section of the West Fork Humptulips River extends from the confluence of the East and West forks upstream to the gorge at stream mile 46.0.[1] The remainder of the West Fork is presented in Chehalis 500. This section contains 17.3 miles of mainstem channel and 11 tributaries with over 30 miles of stream channel. This portion of the watershed contains 36 square miles of drainage.

Stream Description

The West Fork Humptulips River follows a meandering course in a southerly to southwesterly direction below the gorge. Principal tributaries to this reach include Chester Creek (see Chehalis 500), Grouse, Newbury, Donkey, and Furlough creeks.

The West Fork encounters a number of high cutbanks in a broad valley. Most of the watershed in this reach is forested with second-growth timber. Old-growth is found only on the upper reaches of several of the tributary streams. There have been no residential or agricultural developments. Much of the upper portion of this section of the watershed is in the Olympic National Forest.

The main channel has a low to moderate gradient throughout this section with stream width varying from 25 to 30 yards. Deep pools and long riffles are common. Rapids and cascades are found only in the gorge. The bottom is comprised primarily of gravel and rubble.

The tributaries are generally steep in their upper reaches. The gradient is moderate near their mouths and provides a series of pools and riffles well suited for salmon production. These channels have width ranging from 1 to 15 yards near their mouths. Gravel and rubble are the major features of the bottom material with outcroppings of bedrock common in several streams. Marginal cover, consisting of both deciduous and evergreen vegetation, is excellent on most all of the tributaries.

Salmon Utilization

Large numbers of chinook, chum, and coho spawn in the main channel up to the lower end of the gorge. The river channel is also an important rearing area for juvenile salmon. Coho spawning and rearing occurs in all accessible tributary streams. Chum spawn in all those areas accessible to them, generally not progressing as far upstream as the coho. Chinook spawning is generally confined to the mainstem, Donkey, Grouse, and O'Brien creeks. Salmon presently utilize the entire 17 miles of mainstem channel and more than 8 miles of tributary streams in this section.

Limiting Factors

Barriers exist in the West Fork Humptulips gorge in the form of cascades created by large boulders sloughed off the canyon walls. Barriers are also found on all tributaries surveyed in this reach except on Newbury Creek. These falls are generally within 1.0 miles of the stream mouth.

Logging and road construction on the upper West Fork have created siltation problems following fall and winter freshets.

[1] *The mileages on the Humptulips River have been continued on the West Fork.*

Beneficial Developments

No beneficial development projects have been constructed in this section of the watershed. Coho smolt have been planted in recent years from the Simpson State Salmon Hatchery on the Satsop River. Survival rate of these fish is significantly higher than those planted in the Satsop River.

Habitat Needs

This watershed section is one of the finest salmon producers in the entire Grays Harbor drainage. Present production appears to be quite near the spawning and rearing capacity of the system. Water and bottom material quality must be maintained to preserve these runs. Application of less damaging road building and logging techniques will aid greatly in maintaining the habitat quality.

The cascades in the gorge on the West Fork should be made passable for salmon. Small fishways would increase salmon use in O'Brien Creek and improve fish passage into Rainbow Creek. Other areas, such as upper Donkey Creek, will benefit from annual plants of coho fry to utilize available rearing area upstream from barriers to adult salmon.

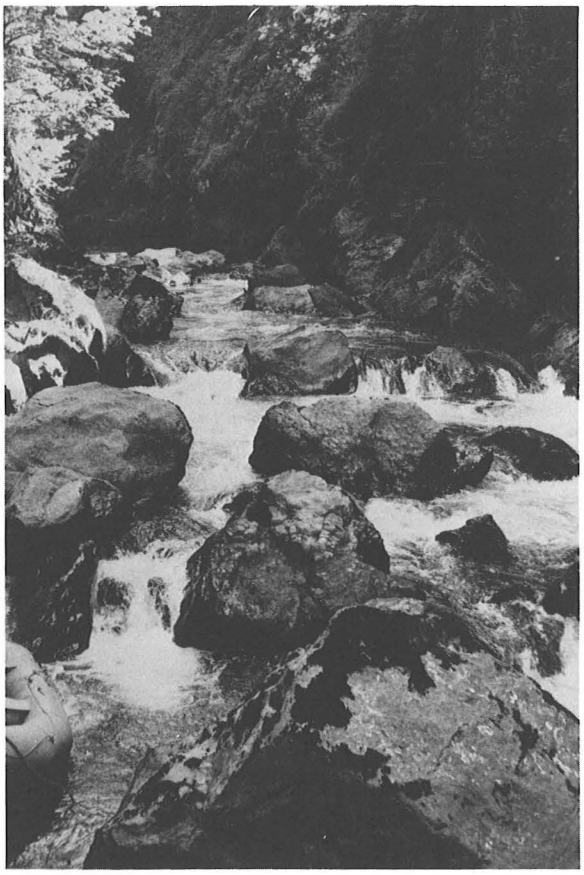
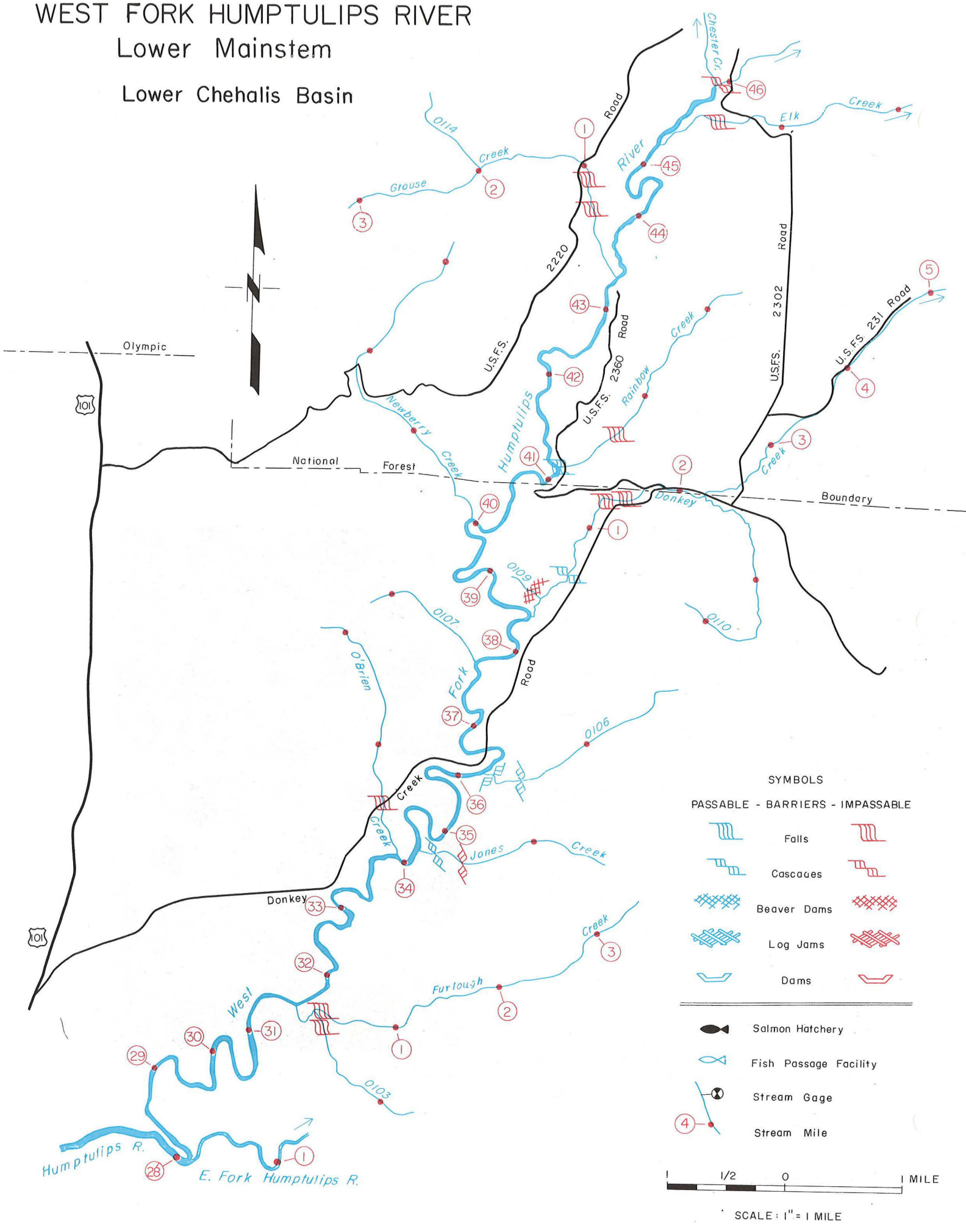


PHOTO 22-10. Humptulips gorge near R.M. 46.0.

WEST FORK HUMPTULIPS RIVER
Lower Mainstem
Lower Chehalis Basin



SYMBOLS

PASSABLE - BARRIERS - IMPASSABLE

	Falls	
	Cascades	
	Beaver Dams	
	Log Jams	
	Dams	

	Salmon Hatchery
	Fish Passage Facility
	Stream Gage
4	Stream Mile

1 1/2 0 1 MILE

SCALE: 1" = 1 MILE

WEST FORK HUMPTULIPS RIVER — LOWER MAINSTEM
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0004	Humptulips River				Chin.,Chum,Coho
	Humptulips R. cont. as W. Fk. Humptulips R.	@ mi. 28.11		73.2	
0102	Furlough Creek	LB-31.6	3.5	—	Chum, Coho
0103	Unnamed	LB-0.3	1.3	—	None
0104	O'Brien Creek	RB-33.9	2.2	—	Chin.,Chum,Coho
0105	Jones Creek	LB-34.15	1.6	—	Unknown
0106	Unnamed	LB-36.25	1.9	—	Coho
0107	Unnamed	RB-37.6	1.2	—	Coho
0108	Donkey Creek	LB-38.4	5.2	6.67	Chin.,Chum,Coho
0110	Unnamed	LB-2.2	2.3	—	None
0111	Newbury Creek	RB-39.95	3.2	—	Coho, Chum
0112	Rainbow Creek	LB-41.15	2.3	—	Coho,Chum,Chin.
0113	Grouse Creek	RB-43.3	3.1	—	Chin.,Coho,Chum
0115	Elk Creek	LB-45.2	2.25	—	Coho
0116	Chester Creek	RB-45.9	5.7	—	None
	(See Chehalis 503)				
	(Cont. Chehalis 503)				

WEST FORK HUMPTULIPS RIVER
Headwaters

This section describes the West Fork Humptulips River from the mouth of Chester Creek at mile 54.9 upstream to the headwaters and all tributary streams to this reach. The area contains 14.9 miles of mainstem West Fork and 10 tributaries with 27.1 linear miles of stream drainage.

Stream Description

The West Fork heads in the steep foothills of the Olympic Mountains and flows southwest between steep hills in a gradually broadening river valley. Chester Creek is the only major West Fork tributary. The remainder of its tributaries are quite short and steep.

Virtually all of this section is forested with conifer timber. Old-growth timber is common throughout. Logging is presently underway. There are no areas of farmland or residential development. The upper several miles of the West Fork are quite steep, with the remainder of the river having a moderate gradient. An adequate stream bank cover of deciduous vegetation exists along the West Fork. The tributary streams are quite steep except in their lower reaches where they enter the main river valleys. Most of these tributaries are in recently logged land or old-growth timberland. Their bank cover consists of conifer timber in their steeper sections and deciduous growth in the bottomland.

The lower reaches of the West Fork contain a good balance of pools and riffles. It has a relatively stable streambed and averages 4 to 15 yards in width. Gravel and rubble are the predominant features of the streambeds. The tributaries contain numerous cascades, rapids, and waterfalls in their upper reaches. Only their lower extremities contain significant amounts of pool and riffle area. The majority of these streams are less than 3 yards wide in their lower reaches. The streambeds are composed primarily of gravel. Deciduous vegetation and conifer timber provide generally good stream bank cover.

Salmon Utilization

The cascades in the gorge on the West Fork Humptulips River below mile 46.0 are impassable barriers to salmon. The West Fork and the lower reaches of several tributaries, however, are suited for salmon production. Recently, plants of coho fry have been made.

Limiting Factors

The major limiting factors in this section are the numerous barriers to salmon migration. The West Fork Humptulips River has a series of cascades in the gorge at mile 45.4-45.9 which prevents salmon from migrating upstream. Chester Creek has a 15-foot waterfall at mile 0.01. Most of the tributaries are quite steep and offer little spawning potential.

Beneficial Development

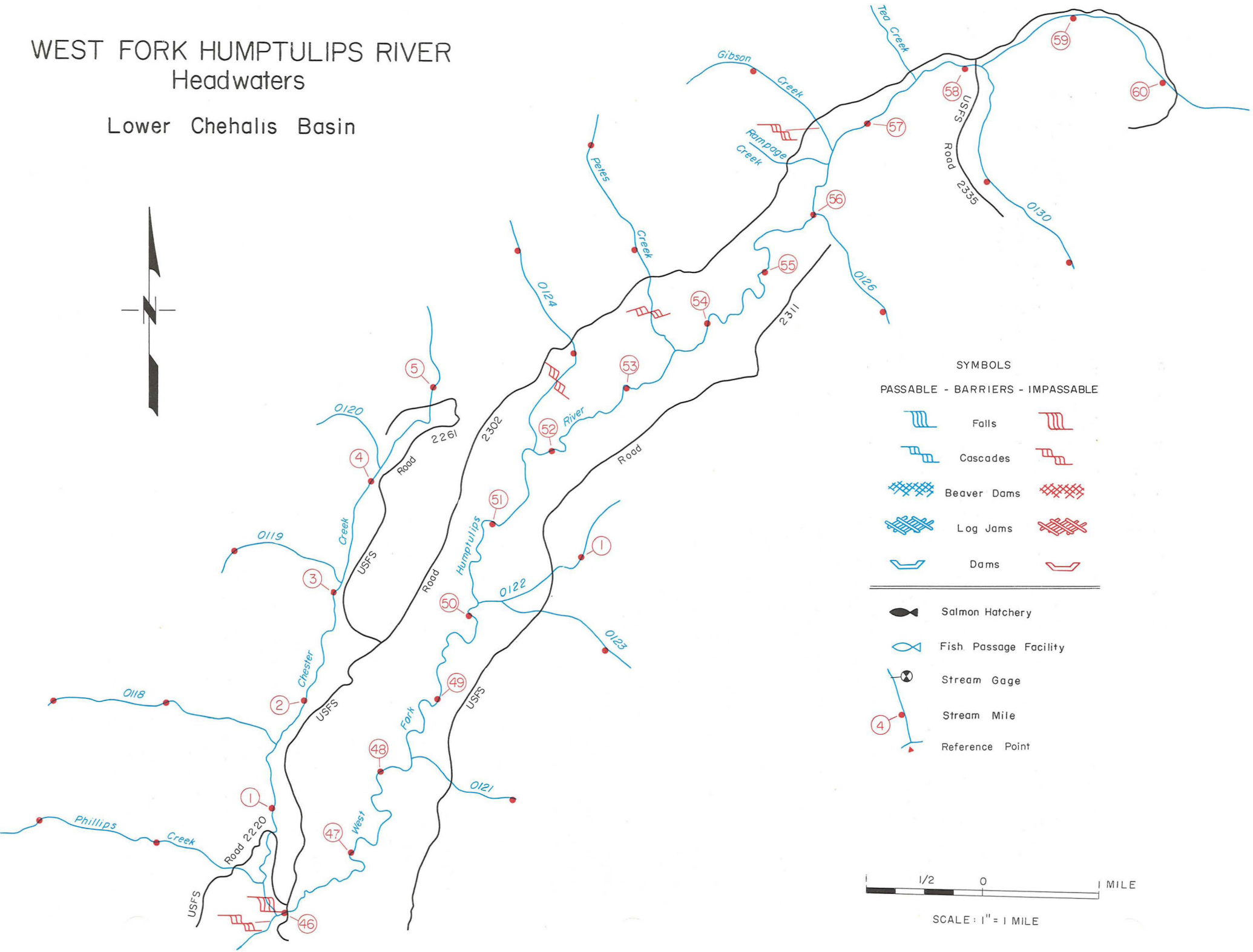
Annual coho fry plants have been made in recent years. No other beneficial developments have been undertaken.

Habitat Needs

Streambed and water quality in this section will be maintained if adequate protection is provided for road construction and logging. The cascades in the gorge on the West Fork Humptulips should be surveyed for possible remedial action. Fry plants should be continued.

WEST FORK HUMPTULIPS RIVER
Headwaters

Lower Chehalis Basin



WEST FORK HUMPTULIPS RIVER — HEADWATERS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0004	Humptulips River				Chin.,Chum,Coho
	Humptulips R. cont. as W. F. Humptulips R.	@ mi. 28.11	—	73.2	
0116	Chester Creek	RB-45.9	5.7	10.6	Unknown
0117	Phillips Creek	RB-0.3	2.4	—	None
0118	Unnamed	RB-1.6	2.1	—	None
0119	Unnamed	RB-3.1	1.2	—	None
0121	Unnamed	LB-48.3	1.0	—	None
0122	Unnamed	LB-50.1	1.6	—	None
0123	Unnamed	LB-0.2	1.3	—	None
0124	Unnamed	RB-51.8	2.3	—	None
0125	Petes Creek	RB-53.6	2.3	—	None
0126	Unnamed	LB-56.0	1.1	—	None
0128	Gibson Creek	RB-56.6	1.6	—	None
0130	Unnamed	LB-58.15	2.1	—	None

HOQUIAM RIVER

This section discusses the entire Hoquiam River watershed of over 90 square miles. The Hoquiam River is 7.0 miles long with 14 tributaries providing an additional 124 linear miles of stream drainage.

Stream Description

Hoquiam River is formed by the confluence of West and Middle Forks. The short stream flows south through flat terrain to Grays Harbor. Major tributaries include East Fork, Little Hoquiam, Middle Fork, and West Fork.

The upper half of Hoquiam River lies in a flat, brushy valley; the lower reaches flow through the City of Hoquiam. All of the river channel is used for log storage. The channel is influenced by tidal fluctuations for its entire length and ranges from 20 to over 100 yards wide. The river bed is almost entirely mud and silt.

The Hoquiam tributaries head in low hills and have a moderate gradient most of their length. The lower extremities of the major tributaries are affected by tide variations. Stream bank cover is generally good except in scattered areas of recent logging activity. The predominant bottom material, above tidal influence, is gravel and rubble except in the Little Hoquiam watershed where silt and sand predominate.

Some farmland is found adjacent to the middle portion of the East Fork and along the upper reaches of the Little Hoquiam. The City of Hoquiam straddles the lower mainstem. There are a number of industries adjacent to the river here. Rural residences are found along the lower reaches of all the major tributaries except the Middle Fork. The nonresidential uplands are in second-growth timber production.

There are three major water diversions in the watershed. Hoquiam maintains diversion dams on Davis Creek, Little North Fork Hoquiam and West Fork Hoquiam rivers. An industrial diversion was formerly operated on the East Fork.

Salmon Utilization

The Hoquiam watershed contains runs of fall chinook, chum, and both late and early run coho. The mainstem serves as transportation and rearing area only as it contains no suitable spawning gravel. The East Fork has spawning chinook, coho, and chum at least as far upstream as the falls at mile 16.0. No spawning is expected below mile 7.0. Chum and chinook also spawn in the West Fork between the head of tidewater at mile 9.3 and mile 13.5. The Middle Fork has excellent spawning facilities for chum and chinook upstream from tidewater to mile 5.0. Lesser numbers of chum spawn in other accessible tributaries. Major coho spawning areas include the upper East, West, and Middle forks. Their tributaries also support coho as far as accessible. An estimated 68 linear miles of tributary streams are presently accessible for salmon production.

Limiting Factors

Municipal diversions on the Hoquiam watershed have reduced the summer rearing area for juvenile coho. Dams on Davis Creek and West Fork Hoquiam, while equipped with fishways, may periodically not pass chinook, coho, or chum. The diversion dam on North Fork Little Hoquiam is a total barrier to all species. Flushing silt from these reservoirs is not compatible with salmon spawning and rearing.

Salmon must pass through the polluted estuary and Grays Harbor on their route to, and from, the ocean. Full effect of this pollution is not known; however, fish kills do occur.

A falls on East Fork Hoquiam River is an apparent barrier to chinook and chum. Falls are also known to exist on several unnamed tributaries to the East and West forks and on Polson, Hoover, and Bernard creeks.

The Little Hoquiam River has limited spawning area as do several smaller tributaries in the system.

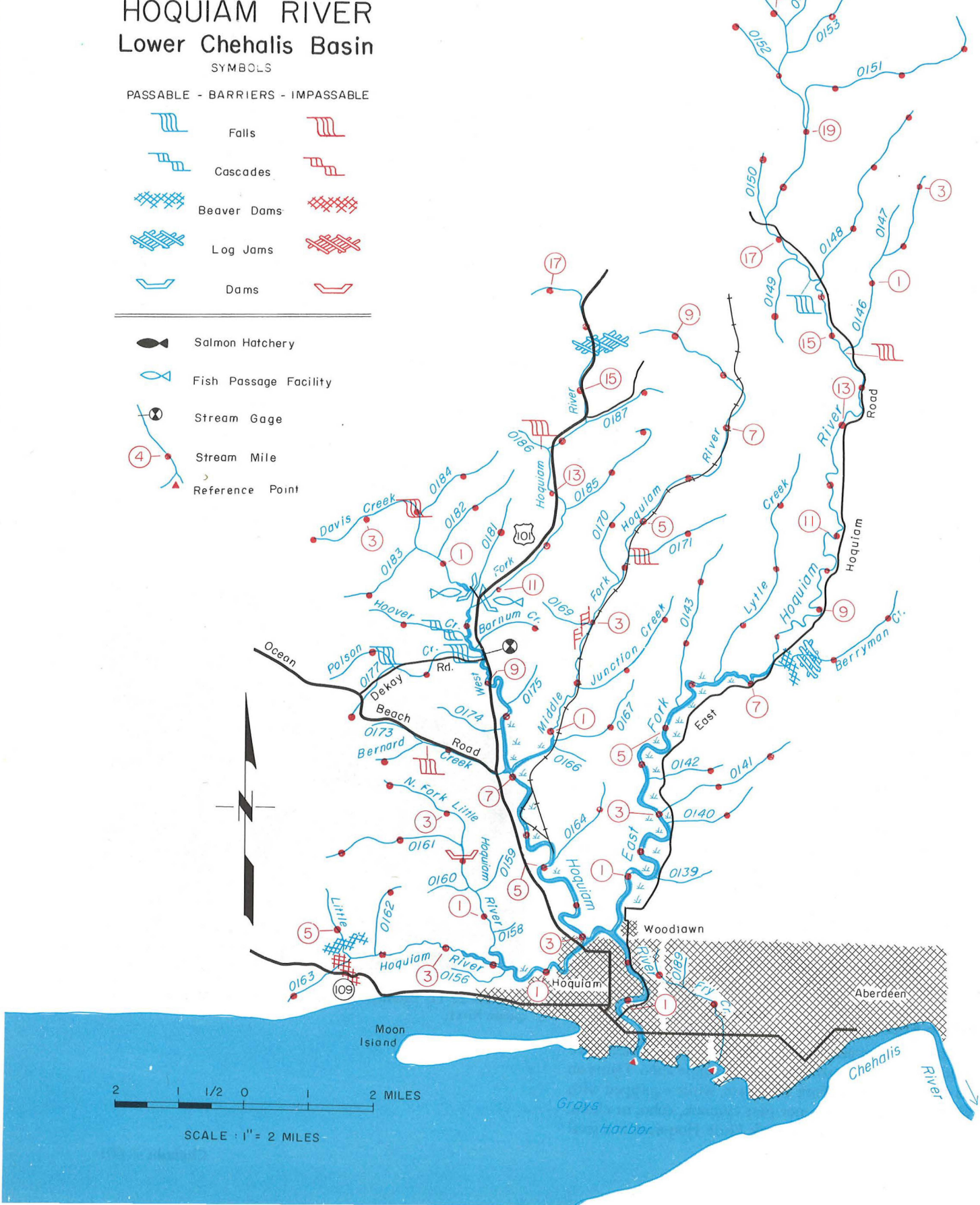
Beneficial Development

The diversion dam on Davis Creek formerly was a total block to adult salmon. Recent reconstruction of this dam included provision of fish passage facilities. A fishway has also been incorporated in the dam on the West Fork. However, salmon,nparticularly coho, are reluctant to use it.

Habitat Needs

Pollution abatement in Grays Harbor and Hoquiam River estuary will substantially improve runs into this system. Alternative methods of clearing the three reservoirs of silt deposits must be devised. Logging must be carefully conducted to prevent further siltation of the spawning gravel and degradation of water quality.nFurther water withdrawals will be detrimental to the existing fish populations. The excellent salmon habitat on the East and Middle forks must be sustained.

PHOTO 22-11. Excellent spawning area on the Middle Fork Hoquiam River.


HOQUIAM RIVER
Lower Chehalis Basin
SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage
Stream Mile
Reference Point
Davis Creek
Hoover Ct.
Barnum Ct.
Polson Cr.
Dekay Beach Road
Bernard Creek
N. Fork Little Hoquiam River
Little Hoquiam River
Hoquiam River
Middle Fork Hoquiam River
West Fork Hoquiam River
East Fork Hoquiam River
Junction Creek
Lytle Creek
Berryman Ct.
Fry Cr.
Woodlawn
Hoquiam
Aberdeen
Moon Island
Chehalis River
Grays Harbor
Ocean
101
109
2 1 1/2 0 1 2 MILES
SCALE : 1" = 2 MILES

HOQUIAM RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0137	Hoquiam River	Sec12,T17N,R10W	17.4	90.2	Coho,Chum,Chin.
0138	E. Fk. Hoquiam River	LB-2.4	22.05	40.4	Chin.,Coho,Chum
0140	Unnamed	LB-2.8	1.7	—	Coho, Chum
0141	Unnamed	LB-3.0	2.35	—	Coho, Chum
0142	Unnamed	LB-3.8	1.2	—	Coho, Chum
0143	Unnamed	RB-5.4	2.65	—	Coho, Chum
0144	Lytle Creek	RB-6.35	3.8	—	Coho, Chum
0145	Berryman Creek	LB-7.5	2.4	1.09	Coho, Chum
0146	Unnamed	LB-14.75	3.25	—	Chum, Coho
0148	Unnamed	LB-16.0	3.1	—	Coho
0149	Unnamed	RB-16.5	1.4	—	Coho
0150	Unnamed	RB-17.4	1.1	—	Coho
0151	Unnamed	LB-19.0	3.6	—	Coho
0152	Unnamed	RB-20.0	1.0	—	Coho
0153	Unnamed	LB-20.35	1.45	—	Coho
0154	Unnamed	LB-20.75	1.4	—	Coho
0155	Little Hoquiam River	RB-2.9	5.75	9.94	Coho, Chum
0157	N.F. Ltl. Hoquiam R.	LB-1.9	4.2	4.98	Coho, Chum
0161	Unnamed	RB-2.3	2.2	—	Coho
0162	Unnamed	LB-4.1	1.2	—	Coho
0164	Unnamed	LB-5.2	1.4	—	Unknown
0165	Middle Fk. Hoquiam R.	LB-7.1	9.65	—	Coho,Chum,Chin.
0167	Unnamed	LB-0.85	1.7	—	Coho
0168	Junction Creek	LB-1.9	2.2	—	Coho
0170	Unnamed	RB-3.7	1.4	—	Coho
0171	Unnamed	LB-4.2	1.6	—	None
	Hoquiam R. cont. as W. F. Hoquiam River	@ mi. 7.11			Coho,Chum,Chin.
0172	Bernard Creek	RB-7.15	2.2	—	Coho
0176	Polson Creek	RB-9.41	2.85	2.46	Chum, Coho
0177	Unnamed	RB-1.6	1.0	—	Coho
0178	Barnum Creek	LB-9.65	1.1	—	Chum, Coho
0179	Hoover Creek	RB-9.9	1.6	—	Chum, Coho
0180	Davis Creek	RB-10.4	4.0	—	Chum, Coho
0181	Unnamed	LB-0.3	1.7	—	Coho

HOQUIAM RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0182	Unnamed	LB-1.1	1.8	—	Coho
0183	Unnamed	RB-1.45	1.4	—	Coho
0184	Unnamed	LB-2.0	1.6	—	Coho
0185	Unnamed	LB-12.7	2.1	—	Coho
0187	Unnamed	LB-14.4	1.3	—	Coho
0188	Fry Creek	S½,Sec7,T17N,R9W	2.5	—	Coho

CHEHALIS RIVER
Lower Mainstem

This section discusses the Chehalis River from its mouth to the mouth of the Satsop River and its smaller tributaries to this reach. The Wishkah River (see Section 800) and the Wynoochee River (see Sections 900 to 1100) are excluded. The area includes 20.2 miles of mainstem Chehalis and 11 tributaries with an additional 74.7 linear miles of stream drainage.

Stream Description

The Chehalis River flows westerly through a broad, flat valley to Grays Harbor. The major tributaries are the Wishkah and Wynoochee Rivers, with numerous minor tributaries including Elliott, Mox Chuck, Blue, Preachers, Higgins, and Metcalf sloughs, and Mill, Stevens, and Elizabeth creeks.

The Chehalis valley and the lower reaches of several tributaries are extensively farmed. The land above the farming valleys is in timber production. Residential development is progressing rapidly in the Chehalis valley and Montesano. This development is having little direct influence on the stream habitat. Aberdeen and Cosmopolis are near the mouth of the Chehalis with Montesano located near the mouth of the Wynoochee.

This portion of the Chehalis has a low gradient and consists of the main channel and a number of sloughs and side channels. Much of this reach is influenced by tidal fluctuationsnand ranges from 50 to 300 yards wide. The streambed consists primarily of gravel, sand, and silt.

Streambeds in tributaries are predominantly sand, with scattered gravel riffles, gradient is low except in the headwaters of the streams, with excellent stream bank cover of deciduous vegetation. Spawning and rearing areas are fair, with a high pool to riffle balance. Stream widths average from 1 to 3 yards.

Salmon Utilization

The Chehalis serves as transportation water for juvenile and adult salmon including chum, coho, and both spring and fall chinook. No salmon are known to spawn in this reach. Juvenile rearing is probably limited but does occur in the river and connecting sloughs. Shad and sturgeon also are found. Coho and chum utilize approximately 12 linear miles of the smaller Chehalis tributaries for spawning and rearing.

Limiting Factors

The major limiting factor in the Chehalis watershed is pollution in Grays Harbor. High water temperatures and concentrations of predatory fish inhibit juvenile rearing in this reach of the Chehalis. Tributaries included in this section have limited spawning and rearing area.

Beneficial Developments

With the construction of a new section of U.S. Highway 12, a number of fishways were built to maintain access to upstream spawning areas on smaller streams.

In September 1972, an experimental project was undertaken in the lower Chehalis River to eradicate squawfish, predators of salmonids, with the use of a chemical known as Squoxin. The results were favorable and may be done again in the near future.

Plants of juvenile salmon in the Chehalis River tributaries contribute to the important sport fishery for salmon in this section of the Chehalis River.

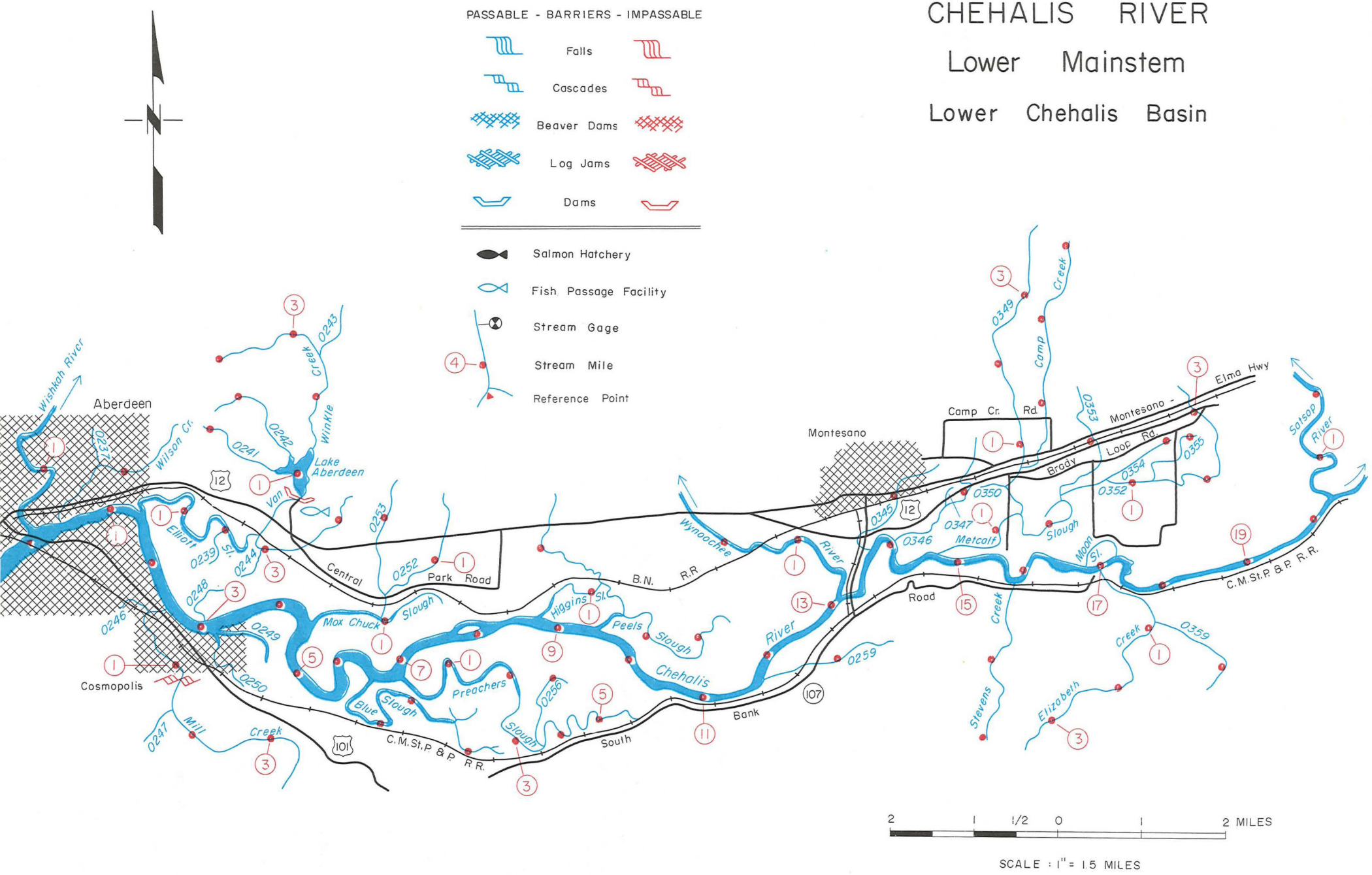
Habitat Needs

To maintain and increase the fish production potential of this drainage section, it will be mandatory to stop pollution in Grays Harbor and the Chehalis River estuary. Continued poisoning of undesirable freshwater fish, predators of salmonids and their food chain, would further help improve production potential.

CHEHALIS RIVER

Lower Mainstem

Lower Chehalis Basin



CHEHALIS RIVER — LOWER MAINSTEM
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River	Sec9,T17N,R9W	127.2	2114.0	Chin.,Chum,Coho
0191	Wishkah River	RB-0.15	37.3	—	
	(See Chehalis 803)				
0236	Wilson Creek	RB-0.5	1.95	—	Unknown
0238	Elliott Slough	RB-1.4	4.4	—	Chum, Coho
0240	Van Winkle Creek	RB-2.7	4.0	—	Chum, Coho
	Lake Aberdeen	Outlet-0.7	—	—	
0241	Unnamed	RB-1.0	1.1	—	None
0242	Unnamed	RB-1.1	1.35	—	None
0245	Mill Creek	LB-2.6	3.9	—	Coho
0251	Mox Chuck Slough	RB-4.5	1.9	—	Chum, Coho
0252	Unnamed	RB-0.9	1.9	—	Unknown
0253	Unnamed	RB-0.21	1.5	—	Unknown
0254	Blue Slough	LB-6.5	3.5	—	Chin.,Coho,Chum
0255	Preachers Slough	LB-6.8	5.6	—	Chin.,Chum,Coho
0256	Unnamed	RB-3.4	1.2		Unknown
0257	Higgins Slough	RB-8.7	2.7	—	Chin.,Chum,Coho
0258	Peels Slough	RB-9.4	2.5	—	Chin.,Chum,Coho
0259	Unnamed	LB-11.65	1.6	—	Unknown
0260	Wynoochee River	RB-13.0	63.25	—	
	(See Chehalis 903)				
0345	Unnamed	RB-13.8	1.7	—	Unknown
0346	Unnamed	RB-14.0	1.9	—	Unknown
0348	Metcalf Slough	RB-14.7	2.8	—	Coho, Chum
0349	Unnamed	RB-1.35	3.9	—	Chum, Coho
0351	Camp Creek	LB-0.7	3.0	—	Coho
0352	Unnamed	LB-2.5	3.4	—	Coho
0353	Unnamed	RB-0.05	1.8	—	Unknown
0354	Unnamed	RB-0.65	1.0	—	None
0355	Unnamed	RB-1.2	1.1	—	Unknown
0356	Stevens Creek	LB-15.8	2.2	1.65	Coho, Chum
0358	Elizabeth Creek	LB-16.9	3.6	—	Coho
0359	Unnamed	RB-1.0	1.4	—	Coho
0360	Satsop River	RB-20.2	28.6	—	
	(See Chehalis 1203)				
	(Cont. Chehalis 1703)				

WISHKAH RIVER
Chehalis River Drainage

This drainage section includes the entire Wishkah River watershed of over 100 square miles. The watershed contains over 37 miles of mainstem channel and 17 tributaries with over 110 linear miles of smaller stream drainage.

Stream Description

The Wishkah River and its two major tributaries, West and East forks, maintain southerly courses through gradually broadening river valleys between low hills. The Wishkah River picks up a number of tributary streams including Parker, Cedar, Big, Syman, Stewart, and Bear creeks, in addition to its East and West forks, and a number of smaller unnamed tributaries.

Most of the upper reaches of this watershed are in second-growth timber production. Farmland is found in the broader river valley along the lower reaches of the Wishkah and its two forks. The streams have a moderate gradient except in their extreme headwaters. Bank cover is adequate in most all instances and is provided by deciduous timber, brush, and conifer timber. The lower mile of the Wishkah flows through Aberdeen. Residences are numerous up to mile 12.0 and are scattered up to mile 20.0. Some rural residences are located on the lower West Fork and along lower Stewart and Bear creeks. Significant residential development has not occurred elsewhere.

A dam at mile 32.3, located above a high falls, provides for water storage and diversion to Aberdeen. The 15-acre reservoir lies within the municipal watershed and is not developed for residential use.

The streams in this watershed are well suited for salmon production. The Wishkah River from its mouth to the falls at mile 29.4 has a channel that ranges from 20 to 40 yards in width. The East and West forks have channels ranging from 12 to 15 yards wide in their lower reaches. The tributary streams are from 1 to 5 yards in width. Gravel and rubble are the predominant features of the stream bed. All of the streams provide an excellent ratio of pools and riffles with very few rapid areas. In the tributaries below the falls, stream bank cover is generally quite adequate to provide for cool water temperatures and protected rearing areas.

Salmon Utilization

The Wishkah River has runs of fall chinook, chum, and both early- and late-run coho. The lower Wishkah mainly provides transportation and rearing area for these fish. Little spawning is expected below mile 14.0. The lower mile of the East Fork and the lower mile of the West Fork also serve as transportation and rearing areas only, with little spawning expected. Chinook spawning occurs in the mainstem. It is estimated that over 29 miles of the mainstem Wishkah River and at least 55 linear miles of tributaries are presently accessible for salmon production.

Limiting Factors

The falls on the Wishkah River at mile 29.4 present a barrier to adult salmon; however, steelhead are known to spawn above. The water-supply dam at mile 32.3 is not equipped to handle either upstream or downstream passage of salmonids. This watershed formerly contained a number of splash dams which blocked significant portions of the watershed. Most of these dams have been removed and natural runs of fish have been reestablished. Other existing barriers include falls on Big Creek and on a number of unnamed tributaries. Low flows exist in the mainstem Wishkah downstream from the dam. The flow during the dry summer months consists only of tributary inflow. The flow in the remaining streams is generally adequate to maintain the present run. Municipal and industrial pollution in the lower reaches of the Wishkah River and in Grays Harbor affects juvenile salmon.

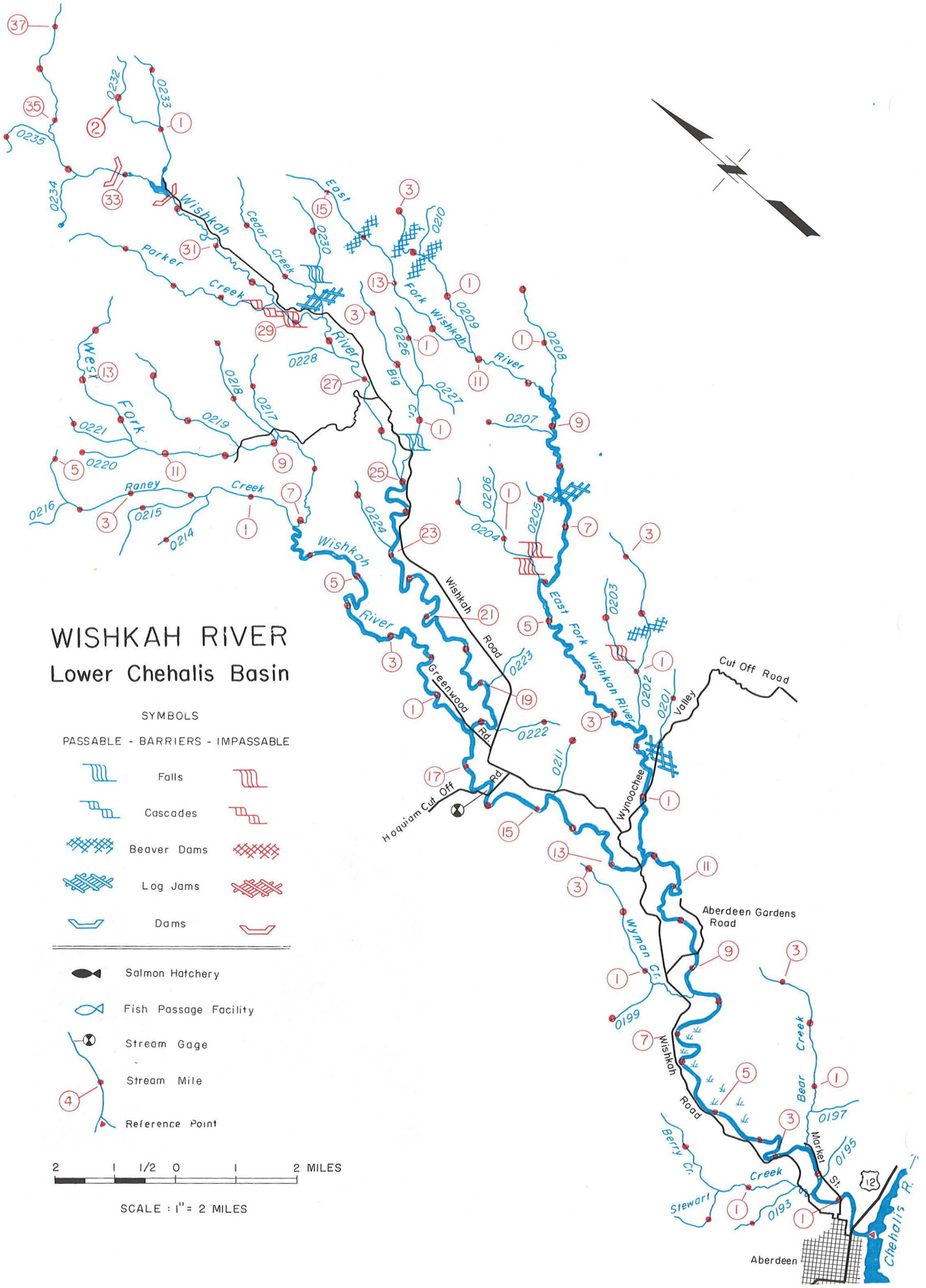
Beneficial Developments

No facilities have been constructed on the Wishkah watershed for the enhancement of salmon production.

Habitat Needs

Former logging practices in the Wishkah River system inflicted serious damage on the watershed, particularly with the construction of splash dams. Logging technology has advanced to the point that watershed damage can be held to a minimum if proper steps to prevent degradation of streambed and water quality are taken in the future. Stream bank cover must be maintained. Rural development should not be allowed to reduce water quality in the Wishkah or its tributaries. Removal of log jams and laddering or otherwise providing fish passage at certain areas is suggested. The area is suited for a small hatchery production and sites are also available for artificial spawning and egg incubation channels. Additional summer releases from the Aberdeen Reservoir would be desirable to provide improved rearing area for juvenile salmon. Pollution abatement in Grays Harbor should substantially improve runs of salmon.

PHOTO 22-12. Wishkah falls.


WISHKAH RIVER
Lower Chehalis Basin
SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage
Stream Mile
Reference Point
2 1 1/2 0 1 2 MILES
SCALE : 1" = 2 MILES
Wishkah River
West Fork Wishkah River
East Fork Wishkah River
Middle Fork Wishkah River
Parker Creek
Cedar Creek
Big Cr.
Raney Creek
Wishkah Road
Greenwood Rd.
Hoquiam Cut Off Rd.
Cut Off Road
Valley
Wynoochee
Aberdeen Gardens Road
Wyman Cr.
Bear Creek
Berry Cr.
Stewart Creek
Market St.
Aberdeen
Chehalis R.
0193
0195
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0234
0235

WISHKAH RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0191	Wishkah River	RB-0.15	37.3	—	Chin.,Chum,Coho
0192	Stewart Creek	RB-1.6	2.7	—	Coho, Chum
0193	Unnamed	RB-0.25	1.2	—	None
0194	Berry Creek	LB-1.55	1.7	—	Coho
0196	Bear Creek	LB-2.35	3.5	—	Coho, Chum
0198	Wyman Creek	RB-8.5	3.25	—	Coho, Chum
0199	Unnamed	RB-0.8	1.0	—	Coho
0200	E. Fk. Wishkah R.	LB-12.2	15.9	23.2	Chum,Chin.,Coho
0201	Unnamed	LB-1.8	1.6	—	Chum, Coho1
0202	Unnamed	LB-2.45	3.5	—	Coho, Chum
0203	Unnamed	RB-1.0	1.65	—	Coho
0204	Unnamed	RB-5.9	2.4	—	Coho, Chum
0205	Unnamed	LB-0.4	1.4	—	None
0207	Unnamed	RB-8.8	1.15	—	Unknown
0208	Unnamed	LB-9.55	2.05	—	Unknown
0209	Unnamed	LB-11.15	3.0	—	Coho
0211	Unnamed	LB-14.6	1.1	—	None
0212	W. F. Wishkah R.	RB-17.7	14.7	21.8	Chum,Coho,Chin.
0213	Raney Creek	RB-6.9	5.2	—	Coho
0214	Unnamed	RB-1.8	1.2	—	Unknown
0215	Unnamed	RB-2.0	1.7	—	Unknown
0217	Unnamed	LB-8.9	1.5	—	Coho
0218	Unnamed	LB-9.0	2.1	—	Coho
0219	Unnamed	LB-9.6	2.5	—	Coho
0220	Unnamed	RB-11.4	1.0	—	Coho
0221	Unnamed	RB-11.6	1.2	—	Coho
0222	Unnamed	LB-18.25	1.2	—	Coho
0224	Unnamed	RB-23.1	1.2	—	Unknown
0225	Big Creek	LB-25.05	3.55	—	Coho, Chum
0226	Unnamed	LB-1.45	1.3	—	None
0229	Cedar Creek	LB-28.5	2.9	—	Coho, Chum
0230	Unnamed	LB-0.5	1.6	—	Coho
0231	Parker Creek	RB-29.5	3.8	—	None
	Aberdeen Reservoir	Outlet-32.55	—	—	

WISHKAH RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0232	Unnamed	LB-32.7	2.7	—	None
0233	Unnamed	LB-0.9	1.3	—	None
0234	Unnamed	RB-34.1	1.0	—	None
0235	Unnamed	RB-34.8	1.3	—	None

WYNOOCHEE RIVER
Lower Mainstem

This section describes the Wynoochee River from the mouth to the mouth of Carter Creek (see Chehalis 1000-1100 for upper Wynoochee areas). This area provides 20.4 miles of mainstem and 14 tributaries with an additional 85.8 linear miles of stream drainage.

Stream Description

The Wynoochee River below Carter Creek flows south through a broad flat farming valley to the Chehalis. The low rolling hills along the valley are covered with deciduous vegetation and scattered coniferous timber. Its major tributaries in this reach are Sylvia, Geisler, Black, Caldwell, Mooney, Wedekind, Petzel, Helm, and Anderson creeks, plus several unnamed streams.

The Wynoochee below Carter Creek ranges from 25 to 50 yards wide and contains a number of suitable spawning riffles consisting primarily of gravel and rubble. Other river characteristics include low gradient, less than adequate stream bank cover, and a high pool to riffle ratio.

The tributaries are generally 2 to 4 yards in average width, and have a low gradient in their lower reaches. Stream bank cover and pool riffle balance is adequate throughout the tributaries. Spawning and rearing areas range from fair to good with gravel the predominant streambed material except in the very low gradient reaches where silt and sand are most common.

Salmon Utilization

A significant fall chinook and chum run spawns throughout the mainstem Wynoochee in this section. A remnant spring chinook run moves through this area to the upper river. The main channel also serves as transportation water for coho and juvenile salmon rearing areas. Coho utilize all accessible tributary streams, while chum spawn in several of the larger streams. Rearing conditions for juvenile chinook and coho are generally good. It is estimated that salmon presently utilize all of the mainstem Wynoochee River in this lower section and approximately 60 linear miles of tributary streams.

Limiting Factors

The principal factors limiting salmon production include siltation of spawning gravel, low summer flows, gravel removal projects, and the lack of adequate stream bank cover. Falls block salmon from utilizing significant portions of Black Creek and Sylvia Creek and several smaller streams. Some of the tributaries and the mainstems of Black and Sylvia creeks contain very little spawning area.

Low flows in the Wynoochee River near mile 5.7, resulting from industrial diversion at mile 8.1, periodically delay adult chinook and early coho. The Wynoochee Dam at mile 50.8 is expected to provide sufficient flow to overcome this problem. Some juvenile salmon are diverted into Lake Aberdeen through the industrial diversion.

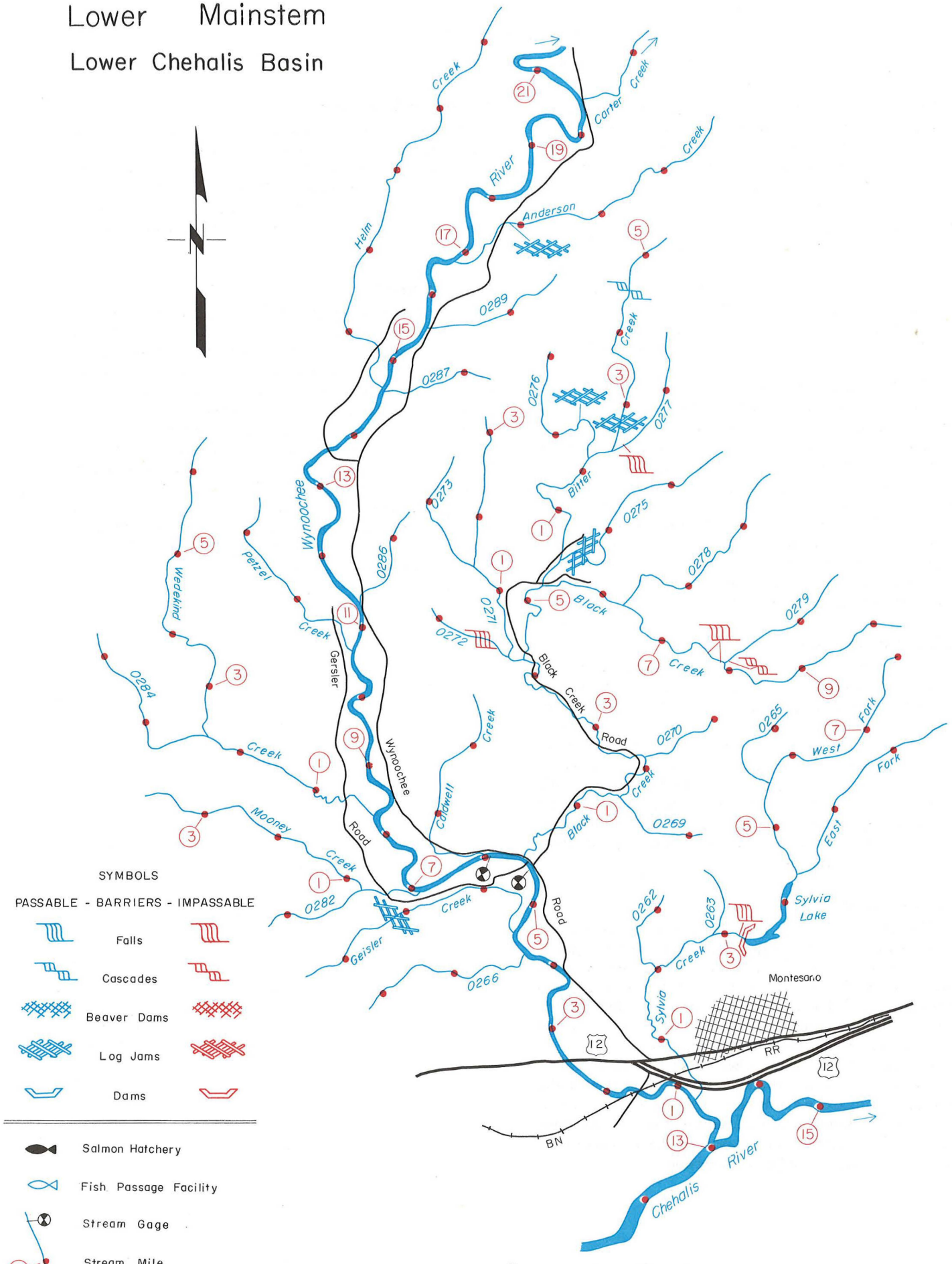
Beneficial Developments

A fishway on Lake Aberdeen provides access to the upstream spawning area. The water diversion at mile 8.1 on the Wynoochee is screened to prevent excessive loss of juvenile salmonids. Completion of Wynoochee Dam should assure adequate transportation flow below mile 8.1 at all times. Rearing area for juvenile salmon will be increased with a higher summer discharge.

Habitat Needs

The fish ladder on Sylvia Creek should have better flow controls to allow adult coho salmon to ascend the ladder at all times. Screens in Lake Aberdeen, at top of fish ladder, should not block downstream migration of coho smolts. Gravel removal operations should not be allowed in the stream channel. Future residential development can be expected in the Wynoochee valley floodplain following completion of Wynoochee Dam and subsequent flow control. These should be planned to prevent deterioration of stream bank cover, water, and streambed quality. Road construction and logging must be conducted in less damaging methods if the salmon runs are to be maintained. Gravel cleaning techniques should be applied to the Wynoochee River to improve spawning gravel quality for chinook and chum salmon.

WYNOOCHEE RIVER
Lower Mainstem
Lower Chehalis Basin



WYNOOCHEE RIVER — LOWER MAINSTEM
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0260	Wynoochee River	RB-13.0	63.25	—	Chum,Chin.,Coho
0261	Sylvia Creek	LB-0.7	8.0	—	Chum, Coho
0262	Unnamed	RB-2.0	1.2	—	Coho
	Sylvia Lake	Outlet-3.32	—	5.07	
0264	E. F. Sylvia Cr.	LB-4.4	2.8	—	None
	Sylvia Cr. cont. as W.F. Sylvia Cr	@ mi. 4.41			
0265	Unnamed	RB-5.5	1.2	—	None
0266	Unnamed	RB-4.4	2.2	—	Coho
0267	Geisler Creek	RB-4.6	3.6	—	Coho
0268	Black Creek	LB-5.6	10.3	25.1	Coho, Chum
0269	Unnamed	LB-1.5	1.2	—	Coho
0270	Unnamed	LB-2.2	1.0	—	Coho
0271	Unnamed	RB-4.3	3.2	—	Coho, Chum
0272	Unnamed	RB-0.2	1.2	—	Coho
0273	Unnamed	RB-1.4	1.6	—	Coho
0274	Bitter Creek	RB-5.3	5.3	7.86	Coho, Chum
0275	Unnamed	LB-0.3	2.9	—	Coho
0276	Unnamed	RB-2.2	2.1	—	Coho
0277	Unnamed	LB-2.5	1.7	—	Coho
0278	Unnamed	RB-6.3	2.7	—	Unknown
0279	Unnamed	RB-7.95	1.7	—	None
0280	Caldwell Creek	LB-6.0	2.6	—	Coho
0281	Mooney Creek	RB-6.9	3.7	—	Coho
0282	Unnamed	RB-0.7	1.2	—	Coho
0283	Wedekind Creek	RB-8.2	6.4	7.36	Coho, Chum
0284	Unnamed	RB-2.3	2.2	—	Coho
0285	Pretzel Creek	RB-10.7	2.5	—	Coho
0286	Unnamed	LB-11.3	1.3	—	Unknown
0287	Unnamed	LB-14.6	1.3	—	Unknown
0288	Helm Creek	RB-14.7	5.5	—	Coho, Chum
0289	Unnamed	LB-15.6	1.7	—	Coho
0290	Anderson Creek	LB-16.8	3.8	—	Coho, Chum
0291	Carter Creek (See Chehalis 1003)	LB-20.4	4.3	—	
	(Cont. Chehalis 1003)				

WYNOOCHEE RIVER
Carter Creek Area

This map section covers the Wynoochee River from the mouth of Carter Creek upstream to mile 35.4 and all tributaries to this reach. The Wynoochee contains 15.0 miles of river channel with its 3 tributaries in this section totaling 28.0 linear miles.

Stream Description

This portion of the Wynoochee River flows south, alternately through broad flood plains and narrow valleys. Its only major tributaries, Carter and Schafer creeks, enter the left bank from the gentle-sloping side hills.

Most of the terrain is low, timbered hills. The river has a low gradient with tributaries having low to moderate gradients except near their headwaters. Stream bank cover, except in the flood plain sections of the Wynoochee, is very good. Most of this cover is mixed timber. The only development of this section is a few scattered farm residences above Carter Creek. Much of the valley land between Cater and Schafer creeks has been cleared for farming.

The Wynoochee contains a number of deep pools and long riffles in a generally broad river channel. The stream has an average width of approximately 60 yards. Rubble and gravel are the main bottom materials in the Wynoochee and lower reaches of the tributaries. Gravel is the major feature of the other tributary reaches. These tributaries have good bank cover, except along a small portion of Neil Creek, of mixed timber and brush. Pool and riffle characteristics provide excellent salmon habitat. The lower reaches of Carter and Schafer creeks range from 8 to 12 yards wide. The upper reaches and the tributaries are generally less than 5 yards wide.

Salmon Utilization

The Wynoochee provides transportation water for adult and juvenile salmon, including chum, coho, fall chinook and a remnant spring chinook run. Chinook and coho rearing occurs in this reach. Several excellent spawning riffles are utilized by chum and chinook. The major spawning area is located above Carter Creek for about 1.5 miles; however, fish spawn on all suitable riffles in the reach. Significant chinook runs utilize the lower 2 miles of Carter Creek and the lower 3.5 miles of Schafer. This same portion of Schafer Creek supports a good chum population while Carter Creek contains very few. All accessible tributaries have both late- and early-run coho. All of the mainstem Wynoochee River in this section and over 20 linear miles of tributaries are presently utilized by salmon.

Limiting Factors

Several reaches of Wynoochee River are relatively unstable and provide only marginal spawning habitat for chinook and chum. Flow control from Wynoochee Dam may alleviate this problem. Low summer flows affect coho production in tributary streams. Several log jams on Carter Creek impede chinook and probably block chum.

Beneficial Developments

No beneficial developments have occurred in this section.

Habitat Needs

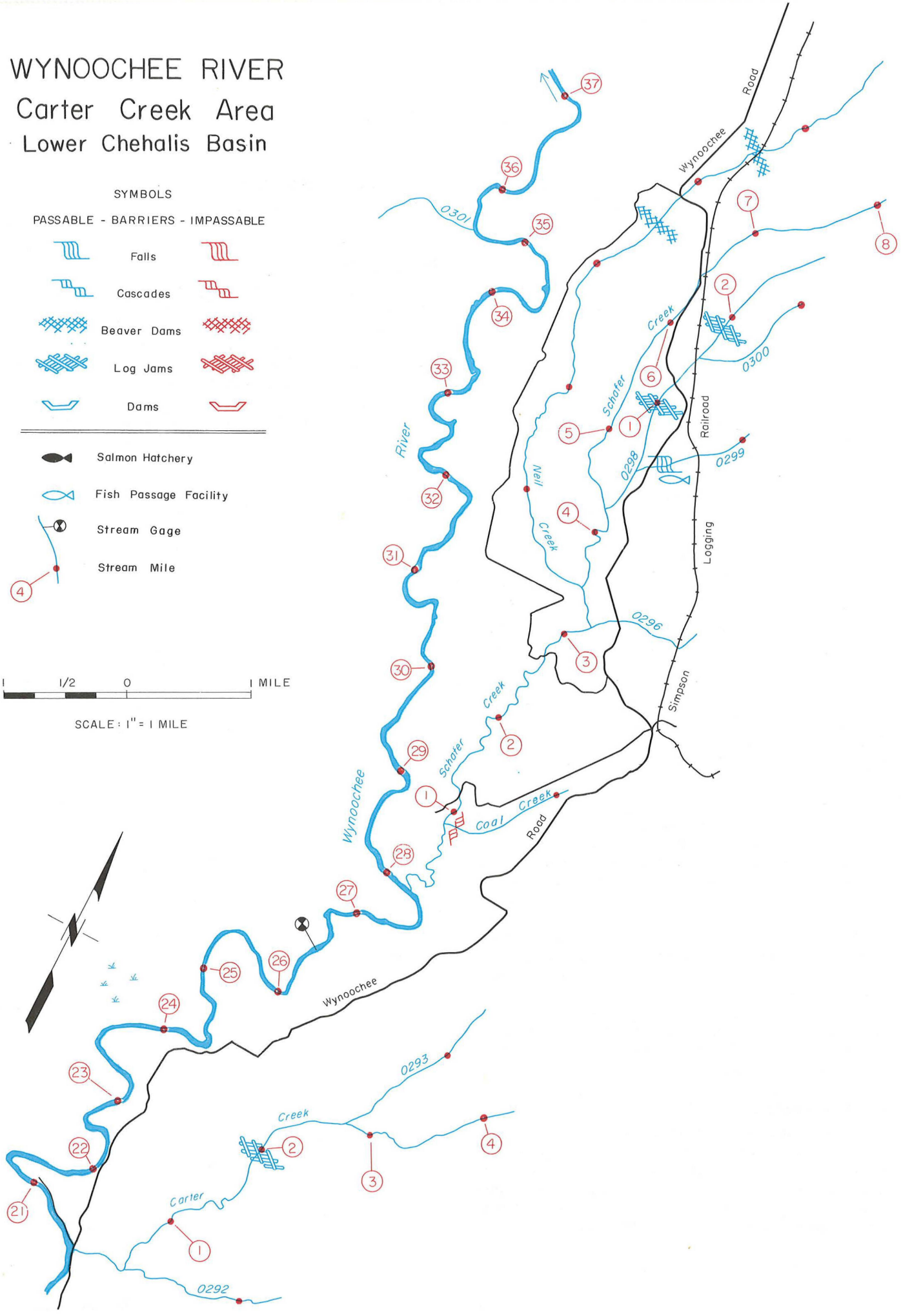
The maintenance of present habitat, particularly on the tributary streams, depends on future logging and road construction practices. Further residential or agricultural development is unlikely. Gravel removal must be confined to the flood plain areas and should not be permitted to further affect stream bed stability or water quality.

Flow controls should be rebuilt on a tributary to Schafer Creek. Further erosion below a culvert on Schafer Creek at mile 6.5 may create a barrier to coho. Log jams on Carter Creek near mile 2.0 should be removed.

WYNOOCHEE RIVER

Carter Creek Area

Lower Chehalis Basin



WYNOOCHEE RIVER — CARTER CREEK AREA
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chin.,Chum,Coho
0260	Wynoochee River				Chin.,Chum,Coho
0291	Carter Creek	LB-20.4	4.3	5.67	Chin.,Coho,Chum
0292	Unnamed	LB-0.4	1.3	—	Coho
0293	Unnamed	RB-2.8	1.5	—	Coho
0294	Shafer Creek	LB-27.75	8.0	12.9	Chin.,Chum,Coho
0295	Coal Creek	LB-0.9	1.1	—	None
0297	Neil Creek	RB-3.55	5.8	—	Coho, Chum
0298	Unnamed	LB-4.3	2.8	—	Coho, Chum
0299	Unnamed	LB-0.15	1.0	—	Coho, Chum
0300	Unnamed	LB-1.45	1.0	—	Coho
	(Cont. Chehalis 1103)				

WYNOOCHEE RIVER
Headwaters

This map section includes the entire Wynoochee watershed upstream from mile 35.0. The Wynoochee River in this area is 28.25 miles long. The 28 tributaries total nearly 72.0 linear miles in length. Lower reaches of the Wynoochee are discussed in Sections 900 and 1000.

Stream Description

The Wynoochee River heads in the steep mountains on the south side of the Olympic Mountain Range. The river drops rapidly from its headwaters to the falls at mile 58.15, flowing south through steep valleys and canyons. Below the falls the gradient gradually lessens and broader river basins are encountered. Between these broader basins the river is confined to steep canyons. Major tributaries to the Wynoochee in the reach include Save, Harris, Anderson, Big, and Trout creeks plus West Branch Wynoochee River.

All of this area is in timber production with old-growth timber being rapidly harvested on the steep slopes. Most of the land is controlled by the Olympic National Forest and a large timber company. There is no farmland. A large logging community, Grisdale, is located near Anderson Creek.

Below Wynoochee Falls the river provides excellent pools and riffles for salmonid production. The stream has generally adequate bank cover except in the future reservoir area above the Wynoochee Dam site. All vegetative cover is being removed from this area. The bottom is composed primarily of gravel and rubble. The stream width ranges from 20 to 50 yards below the falls.

Most of the tributaries are quite steep except in their lower reaches where they flow for short distances in the main valley to their confluence with the Wynoochee. In this lower gradient section, some of the streams contain pools and riffles suited for salmonid production. Except in recently logged areas, conifer timber and brush provides adequate stream bank cover. Gravel and rubble are the major bottom material. Tributaries are generally less than 4 yards wide in their lower portions.

Salmon Utilization

The upper Wynoochee contains runs of chum, coho, fall chinook and a remnant run of spring chinook. Major chum and fall chinook spawning areas are below mile 40.0. Few of these migrate further. Spring chinook spawning probably occurs up to Wynoochee Falls. Only coho, both early- and late-run, utilize the accessible tributaries. Major coho spawning areas include West Branch, Big Creek, and the mainstem below Wynoochee Falls. Salmon presently utilize 23 miles of the mainstem Wynoochee River and only about 12 linear miles of the tributary streams.

Limiting Factors

Falls on Wynoochee River at mile 58.15 block further salmon migration. Tributary streams are generally quite steep and have limited access for adult salmon. Significant amounts of spawning and rearing area are unavailable on Save, Harris, Big, and Scatter creeks and West Branch Wynoochee.

Beneficial Developments

No beneficial development projects have been conducted in this area. Wynoochee Dam has provided passage facilities for both upstream and downstream migrants.

Habitat Needs

Road construction and logging of the steep slopes, unless conducted with care, will result in excessive damage to existing spawning and rearing areas. Stream bank cover should be maintained to reduce siltation and high water temperatures. Gravel removal projects should be conducted only in the proposed reservoir area prior to inundation.

Plants of coho fry in Save Creek, West Branch Wynoochee, and Wynoochee River above the falls are recommended to increase production from the presently unutilized salmon rearing areas.

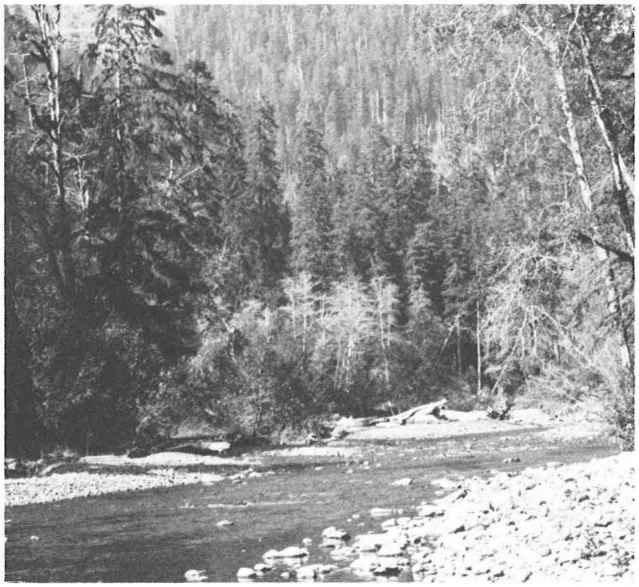
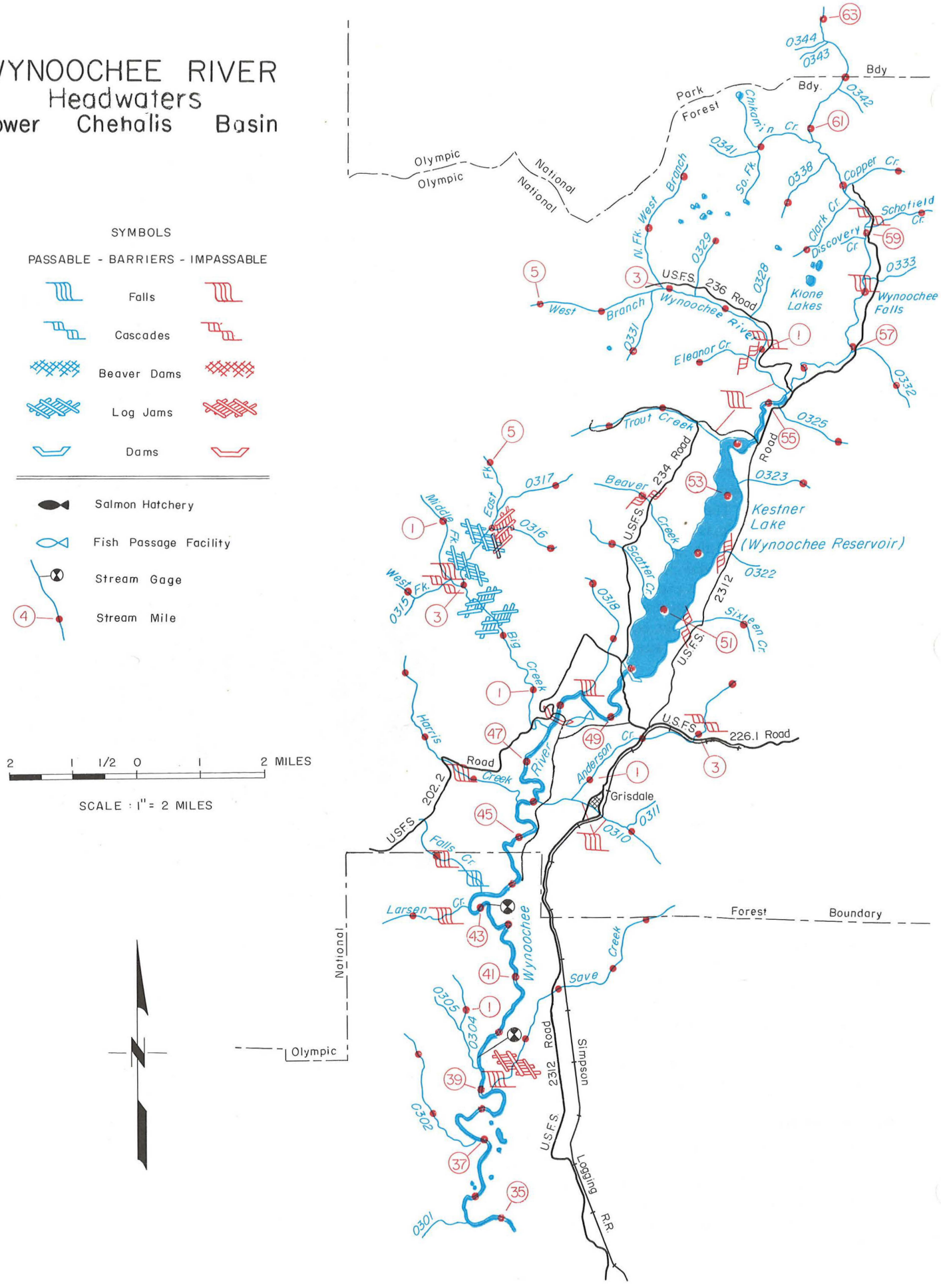


PHOTO 22-13. Wynoochee River above Wynoochee Reservoir.

WYNOOCHEE RIVER
Headwaters
Lower Chehalis Basin



WYNOOCHEE RIVER — HEADWATERS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chin.,Chum,Coho
0260	Wynoochee River				Chin.,Chum,Coho
0302	Unnamed	RB-37.05	2.4	—	Coho
0303	Save Creek	LB-38.75	4.6	—	None
0304	Unnamed	RB-39.4	1.6	—	Unknown
0306	Larsen Creek	RB-43.15	1.4	—	Coho
0307	Falls Creek	RB-43.45	1.8	—	Coho
0308	Harris Creek	RB-45.75	3.4	—	Coho
0309	Anderson Creek	LB-46.05	4.1	—	Coho
0310	Unnamed	LB-0.55	1.7	—	Coho
0312	Big Creek	RB-47.6	5.3	9.70	Coho
0313	W. F. Big Creek	RB-3.05	1.2	—	Coho
0314	M. F. Big Cr.	LB-0.2	1.55	—	None
	Big Cr. cont. as E. F. Big Creek	@ mi. 3.06			
0316	Unnamed	LB-4.1	1.1	—	None
0317	Unnamed	LB-4.4	1.3	—	None
0318	Unnamed	LB-48.4	2.15	—	None
	Kestner Lake	Outlet-50.01	—	—	
0319	Sixteen Creek	LS-50.9	1.5	—	None
0320	Scatter Creek	RS-51.1	1.55	—	None
0321	Beaver Creek	RS-51.9	1.8	—	None
0323	Unnamed	LS-53.3	1.2	—	None
0324	Trout Creek	RS-53.9	2.5	—	None
0325	Unnamed	LB-55.2	1.3	—	None
0326	W. Br. Wynoochee R.	RB-55.4	5.1	9.00	Coho, Chinook
0327	Eleanor Creek	RB-0.75	1.0	—	None
0329	Unnamed	LB-2.5	1.0	—	None
0330	N. F. West Br. Wynoochee River	LB-3.0	2.2	—	None
0331	Unnamed	RB-3.2	1.2	—	None
0332	Unnamed	LB-56.95	1.4	—	Unknown
0335	Schofield Creek	LB-59.1	1.1	—	None
0336	Clark Creek	RB-59.7	1.3	—	None
0337	Copper Creek	LB-59.8	1.1	—	None
0338	Unnamed	RB-60.4	1.2	—	None

WYNOOCHEE RIVER — HEADWATERS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0339	Chikamin Creek	RB-60.8	1.85	—	None
	Unnamed Lake	Outlet-1.85	—	—	

SATSOP RIVER

The Satsop River is formed by the confluence of the East and West forks. Its total drainage is over 300 square miles. This section includes the Satsop River and its tributaries, the East Fork Satsop and tributaries below Bingham Creek at mile 17.4. The East Fork headwaters, West Fork, Middle Fork, and Decker Creek are covered in Chehalis 1300-1600. The Satsop River and the portion of the East Fork provide some 17.0 miles of mainstem, while 12 tributaries covered in this section total over 32 linear miles of stream drainage.

Stream Description

The Satsop River below the forks flows south through a broad flat agricultural valley with scattered areas of deciduous vegetation. Adequate marginal vegetation exists along most of the banks with upland areas consisting of moderately sloping hills forested with second-growth timber. The stream bed is predominantly rubble and gravel with a low gradient. The river averages between 30 to 45 yards in width and provides a blend on long pools and short riffles. The small communities of Satsop and Brady are located near the lower Satsop River. Rural and farm residences are scattered throughout the valley land. Minor tributary streams include one unnamed stream, and Mitchell and Sherwood creeks.

The East Fork flows southwesterly through flat river valley land and deciduous-covered low-land hills. It picks up several tributary streams; namely Decker, Cook, and Dry Run creeks, and the Middle Satsop River. Several large tracts of adjacent land bordering the East Fork are being developed for recreational home sites. The East Fork has a very low gradient, averages between 9 to 20 yards in width, and has an excellent blend of long pools and short riffles. Deciduous timber provides adequate bank cover for the predominantly gravel streambed. Spawning and rearing areas are excellent for salmonids throughout the system.

The small tributaries to the East Fork have a steeper gradient near their headwaters but meander slowly through low lands to their confluence with the mainstem. The streams average between 1 to 6 yards in width, and have adequate bank cover and pool riffle-balance. Stream beds are predominantly gravel, providing good spawning area for chum and coho salmon. Numerous side channels and slough areas exist along the mainstem which provides excellent chum spawning areas.

Dry Run Creek, the largest named tributary discussed in this section, is a good salmon-producing stream. It has adequate pool riffle balance, predominantly gravel streambed, low gradient, and excellent bank cover.

Salmon Utilization

This drainage section supports large runs of fall chinook, chum, and coho salmon. Major chinook spawning occurs throughout the East Fork, lower Dry Run Creek, and upper mainstem Satsop above mile 2.5. Chum spawning occurs in these same reaches, but major chum areas are the sloughs and side channels to the East Fork. Coho are found throughout accessible portions of the watershed. Most of the streams provide excellent rearing area for juvenile coho during the summer months. The main river channels provide transportation water for all three species. Salmon utilize the entire 17 miles of mainstem Satsop and East Fork in this section and an estimated 18 linear miles of tributary streams.

Limiting Factors

Barriers to salmon migration exist on several tributary streams in this section. An old dam on Mitchell Creek is a partial barrier to coho. An earth dam on jn East Fork tributary, King Creek, limits coho production to the lower 0.4 miles and discharges very warm water during the summer months. Most of the tributary streams have rather limited summer rearing area due to low flow. Lower reaches of Dry Run Creek and several tributaries in the vicinity of Schafer State Park are dry during the summer months.

The population of predator fish does not appear excessively large and may have a relatively minor effect on the juvenile salmon. Gravel removal operations have generally been confined to areas away from the stream and have caused minor bed movement.

Beneficial Development

In December 1966, the Washington Department of Fisheries completed construction of the experimental egg incubation channel on the East Fork. In May 1971, the Department improved a natural spawning channel just above Schafer State Park, a popular recreational area, to improve potential chum spawning grounds, and cleaned the gravel to the inlet and outlet to the Satsop egg incubation channel. Simpson State Salmon Hatchery is located upstream from this section. Fish released from these projects pass through the East Fork and Satsop Rivers.

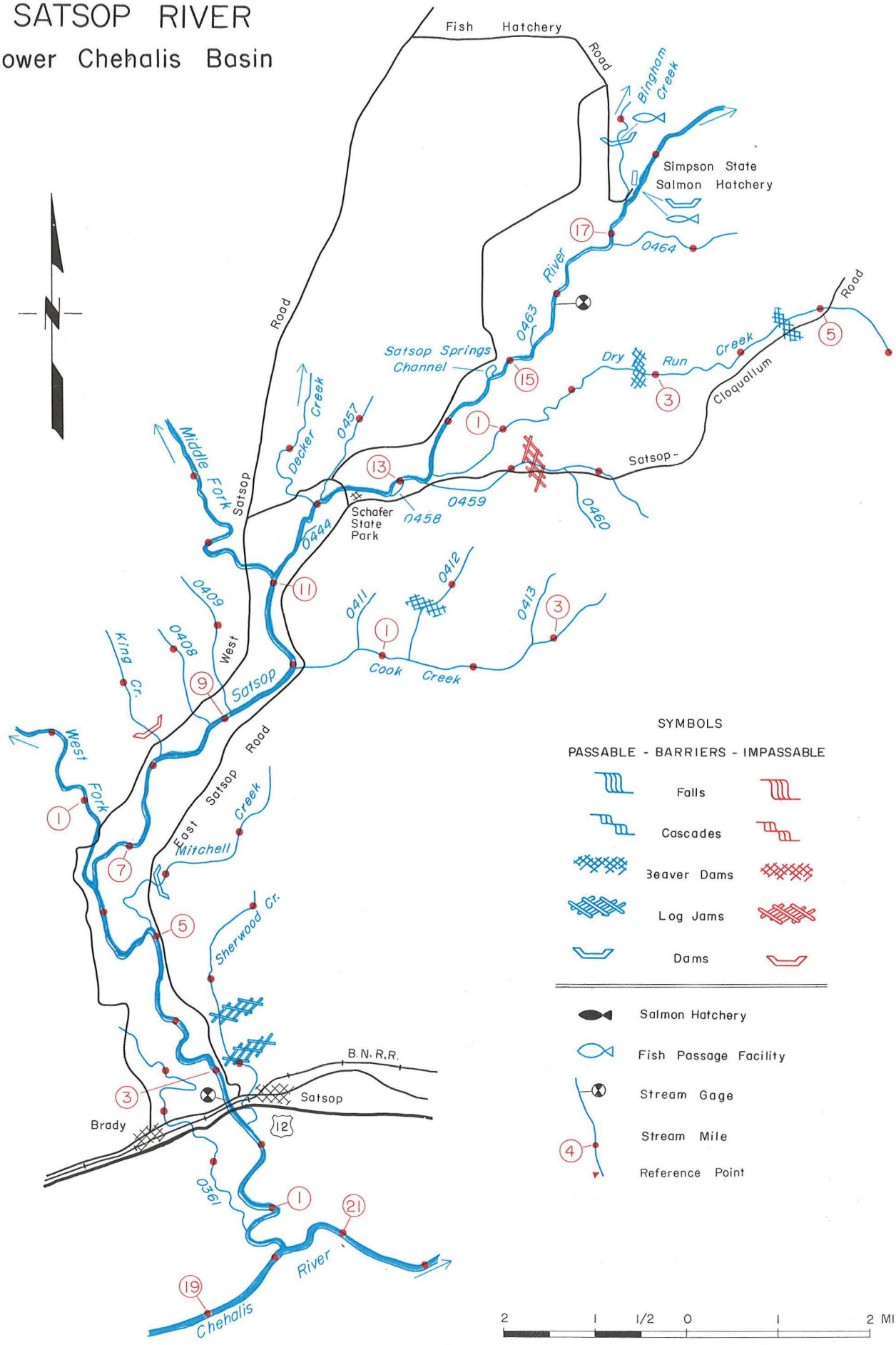
Habitat Needs

The excellent water quality of the East Fork and Satsop must be maintained. Logging and road construction should be done in a manner which will cause the least streambed and bank damage. Protective vegetation must be maintained along the banks.

Expansion of recreational homesites must be planned so as to prevent encroachment on the stream bed and banks. No major gravel removal operations should be allowed, and no operation should be permitted which would create unstable bed conditions.

SATSOP RIVER

Lower Chehalis Basin



SATSOP RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chin.,Chum,Coho
0360	Satsop River	RB-20.2	28.6	—	Chin.,Chum,Coho
0361	Unnamed	RB-0.5	3.8	—	Chum
0362	Sherwood Creek	RB-2.2	3.2	—	Coho
0363	Mitchell Creek	RB-5.1	2.8	—	Coho
0364	W. F. Satsop River	RB-6.3	41.3	—	
	(See Chehalis 1303)				
	Satsop R. cont. as E. F. Satsop River	@ mi. 6.31			Chin.,Coho,Chum
0407	King Creek	RB-8.1	1.6	—	Coho, Chum
0408	Unnamed	RB-8.85	1.3	—	Coho, Chum
0409	Unnamed	RB-9.1	1.7	—	Coho, Chum
0410	Coo Creek	LB-10.0	3.7	4.82	Coho, Chum
0412	Unnamed	RB-1.3	1.5	—	Coho
0414	M. F. Satsop River	RB-11.0	32.0	—	
	(See Chehalis 1503)				
0445	Decker Creek	RB-12.0	15.8	46.6	
	(See Chehalis 1503)				
0457	Unnamed	RB-12.1	1.3	—	Chum, Coho
0459	Unnamed	LB-13.3	2.7	—	Chum, Coho
0461	Dry Run Creek	LB-13.4	6.0	—	Chin.,Chum,Coho
0464	Unnamed	LB-16.9	1.5	—	Coho
0465	Bingham Creek	RB-17.4	13.8	—	
	(See Chehalis 1603)				
	(Cont. Chehalis 1603)				

WEST FORK SATSOP RIVER
Lower Mainstem

This section discusses the West Fork from its mouth to Canyon River and all tributaries (see Chehalis 1400 for the headwaters). This section contains 20.0 miles of mainstem channel and 9 tributaries totalling 27.2 linear miles of stream drainage within 30 square miles of watershed.

Stream Description

The West Fork Satsop River flows south through alternately broad valleys with low surrounding hills covered with deciduous vegetation. The river receives discharges from eight minor tributaries, including Still and Black creeks.

The majority of this watershed is in scattered timber production with scattered, cleared farmland in the lower reaches. There have been no residential developments in this watershed. Swinging Bridge Park is located at mile 7.3.

The West Fork Satsop River has an average width of 17 to 30 yards. The stream is comprised of a mixture of long pools and short riffles. Streambed composition is gravel, rubble, sand, and silt with scattered outcroppings of bedrock and boulders from mile 7.3 to 14.0. The upper 6 miles discussed have predominantly a gravel streambed with adequate bank cover of deciduous vegetation and scattered coniferous trees. The gradient throughout the mainstem is low.

The bottom composition of the smaller tributary streams which average 1 to 4 yards in width is predominantly gravel. Bank cover is adequate with a moderately low gradient. Most of the tributaries have a well-balanced pool and riffle composition.

Salmon Utilization

The West Fork Satsop River supports a run of chum, chinook, and coho salmon. Chum and chinook utilize the mainstem for spawning with major chinook spawning in the West Fork Satsop system below mile 20.0. All three species use the mainstem for transportation and rearing. Coho and a limited number of chum also spawn in all accessible tributary streams. All of the mainstem West Fork and approximately 9 linear miles of tributary streams are utilized by salmon.

Limiting Factors

The West Fork becomes rather warm during hot weather with temperatures known to approach, and likely exceed, 70°F. Its spawning gravels contain considerable sand and silt which inhibit successful incubation. This has resulted naturally from the high cut banks along the course and from logging the steep slopes in the headwaters. Falls on an unnamed West Fork tributary (22.0372) at mile 7.1 block salmon migration. Flooding and associated gravel movement appear to be limiting factors in some portions of the West Fork.

Beneficial Developments

No beneficial developments are present in this watershed section.

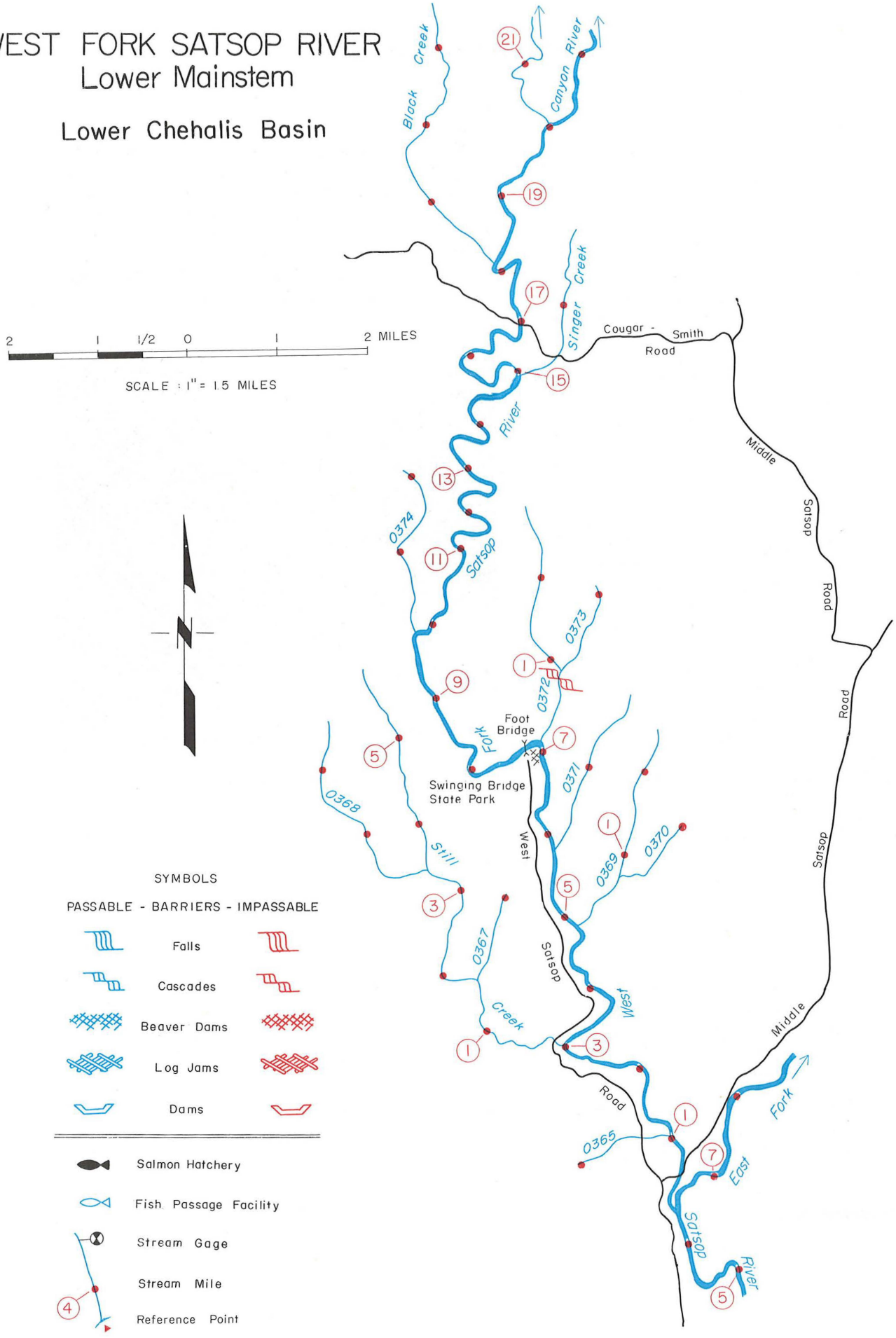
Habitat Needs

Further reduction of bottom quality in the West Fork Satsop River may have a drastic effect on the chinook and chum spawners using this reach. Logging and road construction should be done in a manner which would cause the least streambed and bank damage. Protective vegetation must be maintained along the banks. Development of gravel cleaning methods and application to the West Fork Satsop will improve production in existing areas.

PHOTO 22-14. Summer rearing area on the West Fork Satsop River.

WEST FORK SATSOP RIVER
Lower Mainstem

Lower Chehalis Basin



WEST FORK SATSOP RIVER — LOWER MAINSTEM
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0360	Satsop River				
0364	W. F. Satsop River	RB-6.3	41.3	—	Chin.,Chum,Coho
0365	Unnamed	RB-1.0	1.0	0.36	Coho
0366	Still Creek	RB-3.0	5.9	6.36	Coho
0367	Unnamed	LB-1.6	1.0	—	Unknown
0368	Unnamed	RB-3.4	2.5	—	Unknown
0369	Unnamed	LB-4.8	2.5	—	Coho
0370	Unnamed	LB-0.75	1.0	—	Unknown
0371	Unnamed	LB-5.8	1.9	—	Coho
0372	Unnamed	LB-7.1	2.8	—	Coho
0373	Unnamed	LB-0.8	1.1	—	None
0374	Unnamed	RB-9.8	2.1	—	Chum, Coho
0375	Singer Creek	LB-14.9	1.9	—	Chum, Coho
0377	Canyon River	LB-20.0	19.1	—	
	(See Chehalis 1403)				
	(Cont. Chehalis 1403)				

WEST FORK SATSOP RIVER
Headwaters

This section discusses the West Fork Satsop from the mouth of Canyon River, at mile 20.0, to the headwaters and all tributaries. This section contains 61.4 square miles of drainage with 21.3 miles of West Fork and 10 tributaries containing 23.7 linear miles of drainage. Canyon River contains 19.1 miles of mainstem plus 16 short run tributaries containing 13.7 linear miles of drainage.

Stream Description

The West Fork Satsop River heads in the steep foothills of the Olympic Mountains and flows southerly through a narrow valley to mile 33. Below here, the stream flows through a broad valley with low surrounding hills. The river receives discharge from numerous tributaries along its route. The major tributary is Canyon River. Smaller inflows include Schafer, Spoon, and Black creeks, Little River, and more than six other lesser streams.

The majority of this watershed is in timber production. The steeper slopes near the headwaters are forested with mature, old-growth timber, while the lower areas are in second-growth timber. Most of the land around the mainstem and its tributaries above mile 32 is composed of alternate patches of old growth and recently clear-cut land.

The West Fork Satsop River has a width ranging from 10 to 30 yards. The stream is composed of a mixture of pools and riffles, with some rapids found near the upper reaches. Streambed composition consists primarily of gravel and rubble with a less than adequate stream bank cover and a low gradient to the cascade area at mile 35.5.

Canyon River has a width ranging from 7 to 20 yards. Some rapid areas are found in the canyon near mile 11. The remainder of the stream has a well-balanced pool and riffle composition.

Gravel and rubble are predominant characteristics of the Canyon and Little rivers. Adequate stream bank cover is present along most of these streams, except in the more recently logged areas in the upper reaches of the watershed. Little River averages 4 to 7 yards in width, with a moderate gradient and a well-balanced pool and riffle composition to the falls at mile 1.5. The other tributaries to the West Fork Satsop have widths ranging from 1 to 7 yards.

The bottom composition of the smaller tributary streams is predominantly gravel.

Salmon Utilization

The West Fork Satsop River is suited for chum and chinook spawning to near mile 33. The lower 10 miles of Canyon River and the lower 0.8 miles of Little River are also suited for these species. Coho spawning is generally confined to the upper reaches of these streams. The lower reaches provide transportation and rearing area. Coho and a limited number of chum also spawn in all accessible tributary streams up to mile 35.5 on the West Fork Satsop River. It is estimated that salmon use about 15.5 miles of mainstem West Fork and some 15 linear miles of tributary streams in these headwaters.

Limiting Factors

Barriers are located on the West Fork Satsop River near mile 35.5. The specific barrier to salmon migration has not been ascertained; however, the stretch of river from mile 35.5 to 38.0 is known to contain at least three falls and a number of cascades. Other barriers to tributaries below mile 35.5 include a 90-foot falls on Spoon Creek, a falls on Little River near mile 1.5, numerous cascades on Robertson and Musgrove creeks, and a falls on Canyon River at mile 10.3. Other limiting factors within this section of watershed include siltation of the spawning gravels in the West Fork Satsop, lack of adequate stream bank cover on the upper West Fork, and low summer flows. Flooding and associated gravel movement appears to be a limiting factor on Little River and portions of the West Fork.

Beneficial Developments

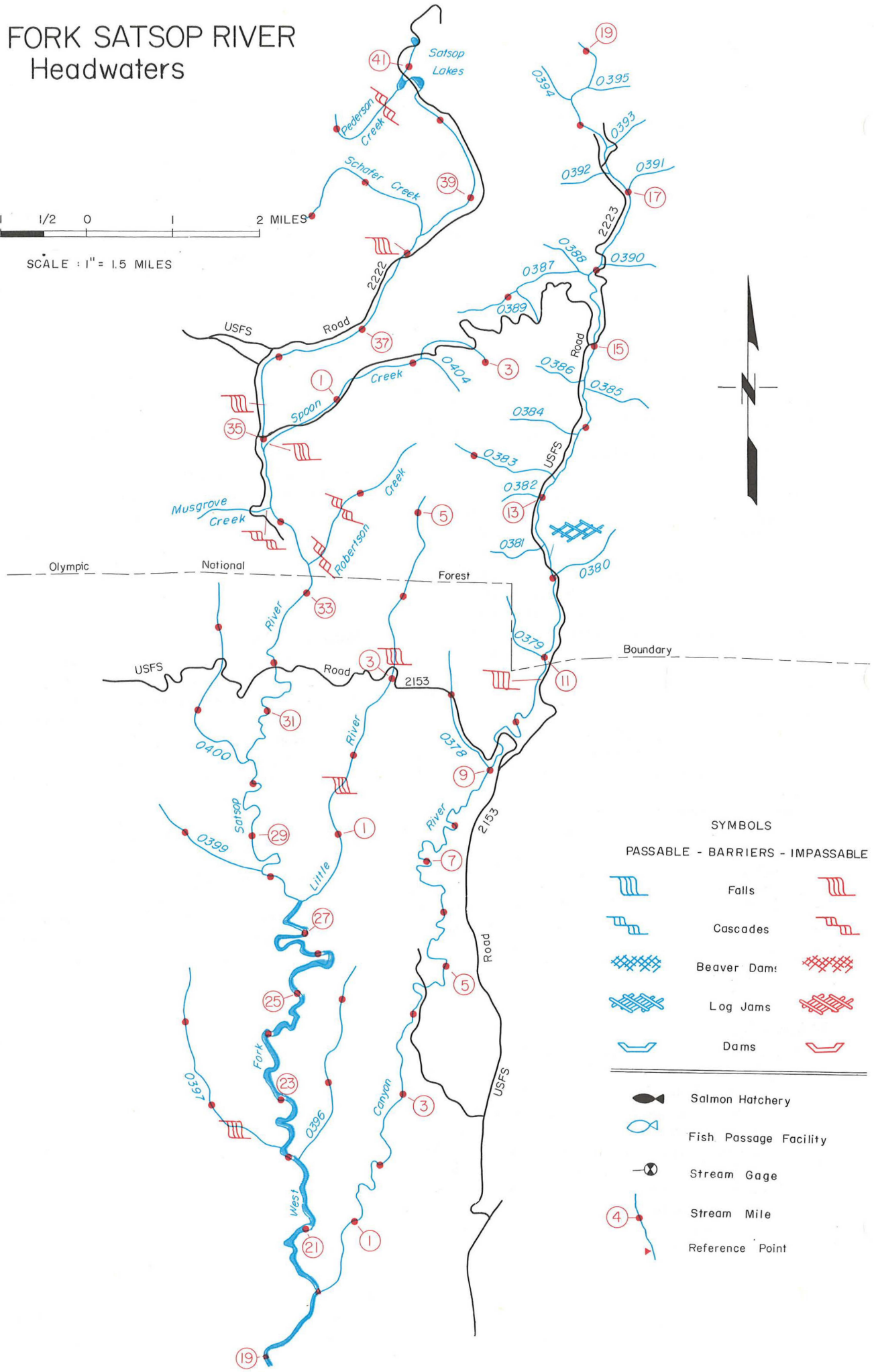
Coho fry plants and coho adults transplanted from the Wynoochee River have taken place in the last few years to utilize the areas above anadromous fish blocks. No other beneficial developments have been undertaken. In the near future, a permanent adult planting station may be constructed above the falls.

Habitat Needs

Logging and road construction should be done in a manner which would cause the least streambed and bank damage. Protective vegetation must be maintained along the banks. Beneficial projects include utilizing the upper West Fork Satsop and its tributaries above mile 35.5 for plants of coho fry. The extent of migratory barriers on the West Fork Satsop River should be more thoroughly investigated. Fish passage facilities may be feasible. Several smaller tributaries require removal of beaver dams and log jams. The falls on Canyon River may be created by a log jam. This could be removed to open up approximately 7.0 miles of coho spawning and rearing area. Until this is done, annual plants of coho fry should be made to utilize the available rearing area. The falls on Little River are not presently accessible for construction of fish passage facilities. These falls, however, block only 1.5 miles of suitable spawning and rearing habitat.

WEST FORK SATSOP RIVER
Headwaters

SCALE : 1" = 1.5 MILES



SYMBOLS

PASSABLE - BARRIERS - IMPASSABLE

- Falls
- Cascades
- Beaver Dams
- Log Jams
- Dams

- Salmon Hatchery
- Fish Passage Facility
- Stream Gage
- Stream Mile
- Reference Point

WEST FORK SATSOP RIVER — HEADWATERS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0360	Satsop River				
0364	W. F. Satsop River				Chinook, Coho
0377	Canyon River	LB-20.0	19.1	23.0	Chin.,Chum,Coho
0378	Unnamed	RB-9.0	1.3	—	Coho
0383	Unnamed	RB-13.3	1.25	—	None
0387	Unnamed	RB-15.9	1.6	—	None
0396	Unnamed	LB-21.9	2.4	—	Coho
0397	Unnamed	RB-22.1	2.6	—	Coho
0398	Little River	LB-27.5	5.2	—	Chin.,Chum,Coho
0399	Unnamed	RB-28.1	1.4	—	Coho
0400	Unnamed	RB-30.3	2.5	—	Coho
0401	Robzrtson Creek	LB-33.35	1.9	—	None
0403	Spoon Creek	LB-34.9	3.0	—	Coho
0405	Schafer Creek	RB-38.3	2.1	—	None
	Unnamed Lake	Outlet-40.45	—	—	
	Satsop Lake No. 4	Outlet-40.7	—	—	
0406	Pederson Creek	RB-40.8	1.2	—	None
	Upper Satsop Lake	Outlet-41.3	—	—	

MIDDLE FORK SATSOP RIVER AND DECKER CREEK

This drainage section includes the Middle Fork Satsop River and Decker Creek and all their tributaries. The Middle Fork and Decker Creek provide 49.0 miles of medium-sized stream channel (of which 40.0 miles are in salmon production) and 17 tributaries with over 81.2 linear miles of stream drainage.

Stream Description

The Middle Fork Satsop River heads in the foothills of the Olympic Mountain range and flows in a southerly direction through steep valleys and canyons to its confluence with Baker Creek, then through a gradually broadening valley to its confluence with the East Fork. Decker Creek flows southerlynthrough broad prairie land and gentle sloping valleys. Most of the Middle Fork watershed is in second-growth timber production. Old-growth timber is found in the foothills of the Olympics at the heads of several of the tributary streams. This timber is being rapidly harvested. Small acreages of farmland are found throughout the lowlands. Residential developments include the communities of Matlock and Deckerville. Recreational homesites are being developed at several locations.

The Middle Fork Satsop is composed predominantly of pools with generally short riffle areas and a low gradient. Stream bank cover is adequate with a predominantly gravel and rubble streambed. The Middle Fork has a width ranging from 10 to 25 yards.

Major tributaries to the Middle Fork include Smith, Rabbit, Baker, and Walter creeks, and more than 14 other lesser streams. These streams are comprised mainly of gravel streambeds, low to steep gradient, and average 1 to 8 yards in width. Stream bank cover is generally adequate with adequate pool riffle balance in lower reaches. The headwaters of most tributaries are in steep terrain and have little area usable by salmon.

Decker Creek has an average width of 10 to 15 yards and a predominantly gravel streambed. Pool and riffle balance is adequate, with a low gradient, and adequate bank cover.

Decker Creek has one major tributary, Dry Bed Creek, and three smaller minor tributaries. Average stream widths range from 1 to 10 yards with a predominantly gravel streambed. Gradient ranges from low to steep in the headwaters with adequate stream bank cover throughout the stream. Pools are predominant in the lower areas with riffles in upper areas of the streams.

Salmon Utilization

This drainage sectionnsupports very large runs of all three species of salmon found in the Chehalis Basin. Chinook salmon spawning occurs in the Middle Fork, Decker Creek, and lower Dry Run Creek. Chum spawning occurs in these same reaches and also in several of the other smaller tributaries. Coho are found throughout the accessible portion of the watershed. Most of the streams provide excellent rearing area for juvenile coho during the summer months. It is estimated that some 40 miles of mainstem in the Middle Fork and Decker Creek and some 34 linear miles of tributaries to these channels are presently utilized by salmon.

Limiting Factors

The major factors limiting salmon production in this drainage section include low summer flows and lack of stream bank vegetation with high water temperatures probably in the lower reaches of the Middle Fork Satsop. Dry streambeds are common throughout the Decker Creek tributary system. The only significant barriers are located in the Middle Fork canyon between Baker Creek and Walter Creek. Log jams and a series of cascades block upstream migration to anadromous fish. The Middle Fork Satsop periodically goes dry around the mouth of Walter Creek as does Walter Creek.

Beneficial Developments

A few log jams have been removed from the watershed. Coho fry have been planted in the Middle Fork above the barrier by Simpson Salmon Hatchery. No other beneficial developments have been undertaken at this watershed specifically for salmon production or enhancement.

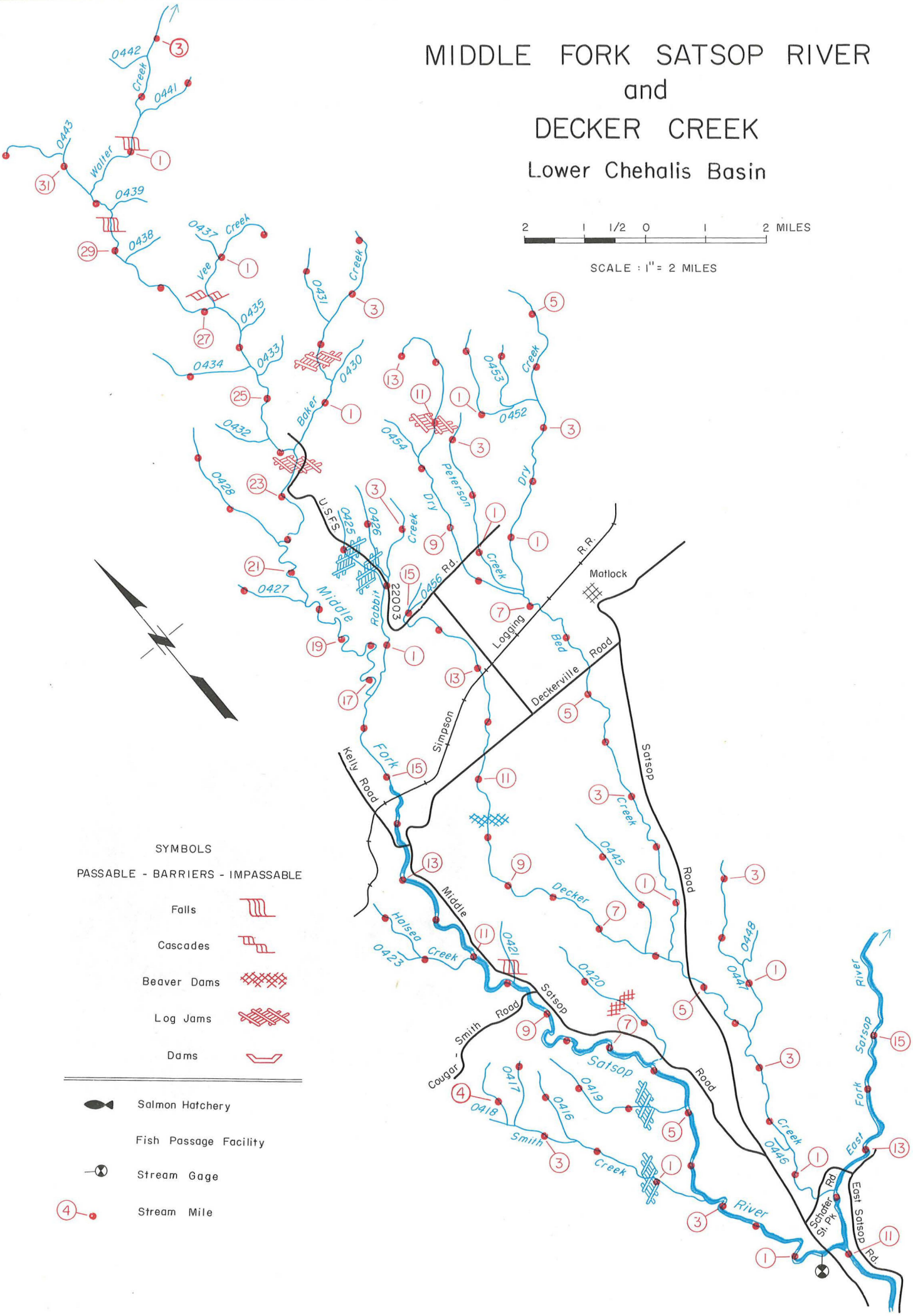
Habitat Needs

The generally excellent water and streambed quality found throughout this watershed must be maintained in the future. Present logging activity is now confined largely to the headwaters of Middle Fork. These activities should be monitored to prevent damage to the fisheries resource. Complete assessment of barriers on the Middle Fork should be carried out to determine feasibility of providing fish passage. Until these barriers are removed, the Middle Fork should receive annual plants of coho fry.

PHOTO 22-15. Potential coho production area above barriers on the Middle Fork Satsop River.

MIDDLE FORK SATSOP RIVER
and
DECKER CREEK
Lower Chehalis Basin

SCALE : 1" = 2 MILES



SYMBOLS

PASSABLE - BARRIERS - IMPASSABLE

- Falls
- Cascades
- Beaver Dams
- Log Jams
- Dams

- Salmon Hatchery
- Fish Passage Facility
- Stream Gage
- Stream Mile

MIDDLE FORK SATSOP RIVER & DECKER CREEK
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0360	Satsop River				
	Satsop River cont. as E. F. Satsop R.	@ mi. 6.31			
0414	M. F. Satsop River	RB-11.0	32.0	—	Chin.,Chum,Coho
0415	Smith Creek	RB-3.3	4.8	—	Chum, Coho
0416	Unnamed	LB-2.4	1.4	—	Chum, Coho
0417	Unnamed	LB-3.5	1.15	—	Coho
0419	Unnamed	RB-5.1	2.6	—	Chum, Coho
0420	Unnamed	LB-6.1	2.7	—	Chum, Coho
0421	Unnamed	LB-9.9	1.1	—	Coho
0422	Halsea Creek	RB-10.9	2.3	—	Coho
0424	Rabbit Creek	LB-16.55	3.6	—	Coho
0425	Unnamed	RB-1.9	1.6	—	Coho
0426	Unnamed	RB-2.05	1.6	—	Coho
0427	Unnamed	RB-20.3	1.1	—	Coho
0428	Unnamed	RB-21.7	2.45	—	Unknown
0429	Baker Creek	LB-23.8	4.1	—	Coho
0431	Unnamed	RB-2.4	1.3	—	Unknown
0434	Unnamed	RB-25.6	1.75	—	Unknown
0436	Vee Creek	LB-26.9	2.0	—	Unknown
0440	Walter Creek	LB-30.15	4.0	—	None
0441	Unnamed	LB-1.6	1.1	—	None
0445	Decker Creek	RB-12.1	15.8	46.6	Chin.,Chum,Coho
0447	Unnamed	LB-3.7	3.2	—	Chum
0449	Dry Bed Cr.	LB-5.75	13.0	24.2	Chum, Coho
0450	Dry Creek	LB-7.2	5.6	—	Coho
0451	Petersen Cr	RB-0.11	3.5	—	Coho
0452	Unnamed	RB-3.4	2.4	—	Coho
0453	Unnamed	LB-0.5	1.2	—	Coho
0455	Unnamed	LB-6.3	2.6	—	Coho

EAST FORK SATSOP RIVER
Headwaters

This section discusses the East Fork Satsop River from the mouth of Bingham Creek to the headwaters and all tributaries. The East Fork Satsop River contains 11.2 miles of mainstem plus 5 tributaries that provide an additional 40.3 linear miles of stream drainage.

Stream Description

The East Fork Satsop River flows southwesterly from the confluence of Phillips and Stillwater Creeks to Simpson State Salmon Hatchery at mile 17.5. The river flows through a broad flat valley of mixed coniferous and deciduous trees. One major tributary, Bingham Creek, and five smaller tributaries enter the East Fork.

The East Fork Satsop River streambed is predominantly gravel with an average width of 4 to 10 yards. The river is composed predominantly of pools with generally short riffle areas. The river has a low gradient of 13 feet per mile. Bank cover is adequate throughout the drainage.

Bingham Creek, the only major tributary, is an excellent salmon stream. The creek flows south through low rolling hills of mixed deciduous and coniferous trees. Occasional logging projects occur throughout the drainage, with a large private logging company operating the Bingham Creek logging railroad reloading station in the headwaters.

Streambed material is predominantly rubble and gravel to mile 9.0 and predominantly gravel to the headwaters. The creek averages 8 to 15 yards with a low gradient of 20 to 30 feet per mile to mile 12.0. Pool and riffle balance is adequate, providing excellent spawning and rearing areas for juvenile salmonids.

Outlet Creek, the major tributary to Bingham Creek, flows south from Lake Nahwatzel. The fish screens at the outlet of the lake stop upstream migration. The streambed is predominantly gravel and has a 2 to 4 yard width. Stream bank cover is adequate and gradient is low. Much of the stream channel is dry during the summer months.

Other tributaries in the East Fork drainage are predominantly low gradient, gravel streambeds, with adequate stream bank cover, and adequate pool and riffle balance. Stream widths average 1 to 4 yards.

Salmon Utilization

The East Fork Satsop River and Bingham Creek support a run of chinook, coho and chum salmon. Major chinook and chum spawning occurs below the fish hatchery collection dams on Bingham Creek and the East Fork. Coho utilize all accessible tributary streams with major spawning in Bingham Creek and East Fork Satsop above the collection dams. All of the mainstem East Fork and about 34 linear miles of tributaries are presently utilized by salmon.

Limiting Factors

No significant limiting factors affect salmon production in this area. Studies have shown that coho smolts released from Simpson Hatchery have a lower survival rate than those hauled to Humptulips River. This is attributed to pollution of Grays Harbor. Outlet Creek and some of the tributary streams to the East Fork go dry in the summer months. A screen operated by the Washington State Department of Game on Outlet Creek at the outlet of Nahwatzel Lake blocks coho from the lake and its tributary streams.

Beneficial Developments

The only hatchery still maintained in the Chehalis Basin is located on the East Fork Satsop River just above the mouth of Bingham Creek. Juvenile salmon produced in this station are released throughout the Chehalis basin. No other beneficial developments have been undertaken in this watershed specifically for salmon production or enhancement.

Habitat Needs

To enhance the fish production of this drainage section, it will be necessary to control the existing pollution in Grays Harbor. Controlling the pollution in Grays Harbor will improve both wild production and hatchery fish escapement to the hatchery. If an adequate chinook return is established at the hatchery, chinook should be allowed to spawn above the intake dam on Bingham Creek.

Screens are maintained at the outlet of Lake Nahwatzel to prevent trout from leaving the lake. These same screens prevent coho from entering the lake and utilizing the spawning area available in the tributary streams. These screens should be made passable for adults, with a trapping facility made to trap coho smolt. The area formerly supported a significant coho run.

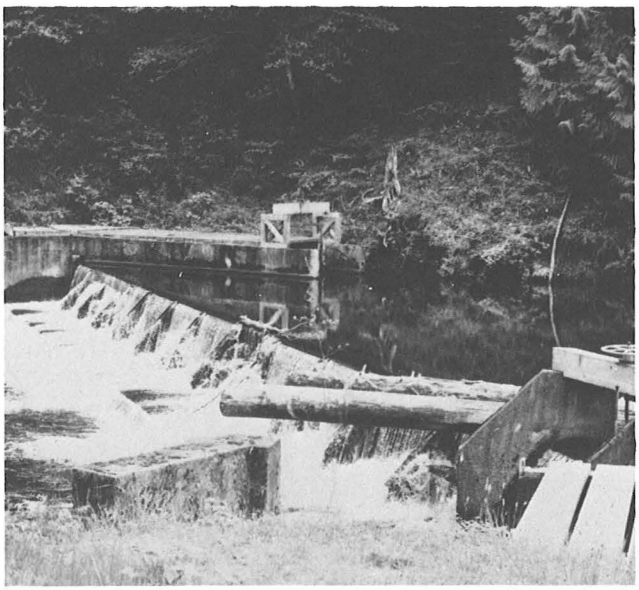
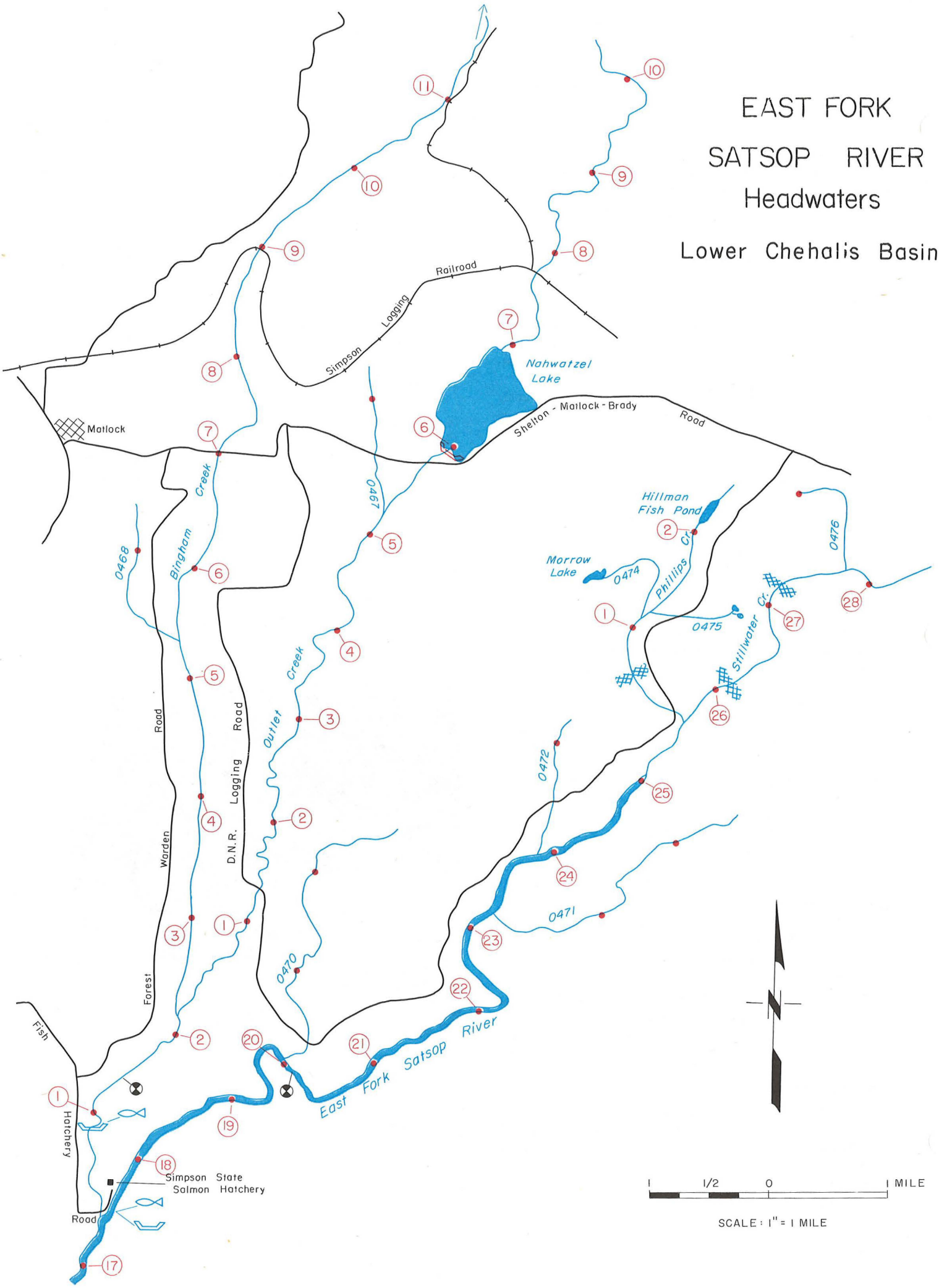


PHOTO 22-16. Hatchery water supply dam on Bingham Creek.


EAST FORK
SATSOP RIVER
Headwaters
Lower Chehalis Basin
Nahwatzel Lake
Hillman Fish Pond
Morrow Lake
Matlock
Shelton - Matlock - Brady Road
Simpson Logging Railroad
Bingham Creek
Outlet Creek
Phillips Cr.
Stillwater Cr.
0467
0468
0470
0471
0472
0474
0475
0476
Warden Road
D.N.R. Logging Road
Forest
Fish Hatchery
Road
Simpson State Salmon Hatchery
East Fork Satsop River
1/2
0
1 MILE
SCALE: 1" = 1 MILE

EAST FORK SATSOP RIVER — HEADWATERS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0360	Satsop River				
	Satsop R. cont. as E. F. Satsop River	@ mi. 6.31			Coho, Chinook
0465	Bingham Creek	RB-17.4	13.8	35.0	Coho,Chum,Chin.
0466	Outlet Creek	LB-2.2	10.5	12.5	Coho
0467	Unnamed	RB-5.2	1.3	—	Unknown
	Nahwatzel Lk.	Outlet-5.95	—	—	
0468	Unnamed	RB-5.3	1.4	—	Unknown
0469	Unnamed	LB-11.7	1.5	—	Unknown
0470	Unnamed	RB-20.0	2.9	—	Coho
0471	Unnamed	LB-23.2	2.6	—	Coho
0472	Unnamed	RB-23.9	1.2	—	Coho
0473	Phillips Creek	RB-25.6	2.5	—	Coho
	Hillman Fish Pond	Outlet-2.1	—	—	
	E.F. Satsop R. cont. as Stillwater Creek	@ mi. 25.6		—	Coho
0476	Unnamed	RB-27.8	1.0	—	Unknown

WORKMAN-DELEZENE CREEKS

This section describes the Chehalis River and all left bank tributaries from the Satsop River at mile 20.2 upstream to Porter Creek at mile 33.3. The right bank tributaries are covered in Chehalis 1200, 1600, and 1800. This section contains over 13.1 miles of mainstem Chehalis and six tributaries provide an additional 50.0 miles of stream drainage.

Stream Description

The Chehalis River meanders through the broad Chehalis valley in a northwesterly direction below Porter Creek. Near the mouth of Cloquallum Creek, the channel changes to a westerly flow. The major right bank tributaries in this reach are Mox-Chehalis, Cloquallum, and Newman creeks (see Chehalis 1800). The major left bank tributaries are Workman and Delezene creeks and four minor tributary streams. The main Chehalis valley has largely been cleared for farming. Farmland also exists in the broader valleys of the major tributaries. The Chehalis River in this reach has a low gradient with deciduous vegetation along its banks. Major residential developments include the communities of Porter and Malone near the upstream portion of this reach and Elma in the lower portion. Farm and rural residences are common in the Chehalis valley and are also present in the lowlands of the tributary streams.

The Chehalis River provides a fairly uniform habitat for salmon production throughout this reach. The river channel ranges from 60 to 80 yards in width with a number of slow-moving pools followed by relatively short riffle sections. The bottom is composed primarily of gravel and rubble.

Delezene and Workman creeks are short streams flowing in a generally northerly direction through fairly broad valleys from a short distance below their headwaters down to the main Chehalis River Valley. The smaller streams are generally confined to narrow ravines except in their lower reaches where they flow for varying distances through the broad Chehalis valley.

The lower reaches of Workman and Delezene creeks have widths ranging from 8 to 12 yards. The lower reaches of the remaining tributaries are generally less than 4 yards wide. These streams are comprised of a mixture of pools and riffles with some rapids found in their upper reaches. The bottom materials of these tributary streams are predominantly gravel and sand. Workman Creek is almost entirely sand with only an occasional patch of gravel. Good stream bank cover is present along most of these streams in the form of deciduous and conifer timber, except along portions of upper Delezene Creek.

Salmon Utilization

The Chehalis River in this reach is of primary importance for transportation of adult salmon to upriver spawning areas. A limited amount of chinook and chum spawning may occur in this reach. All of the accessible tributary streams to the Chehalis in this section support runs of coho and chum. Delezene Creek is most important salmon producer in this section. Workman Creek has very limited spawning habitat and consequently a very small run of coho and chum. These streams provide fair to good summer rearing habitat for juvenile coho. The 13.1 miles of mainstem Chehalis River in this section and over 26 miles of tributaries are accessible to salmon production.

Limiting Factors

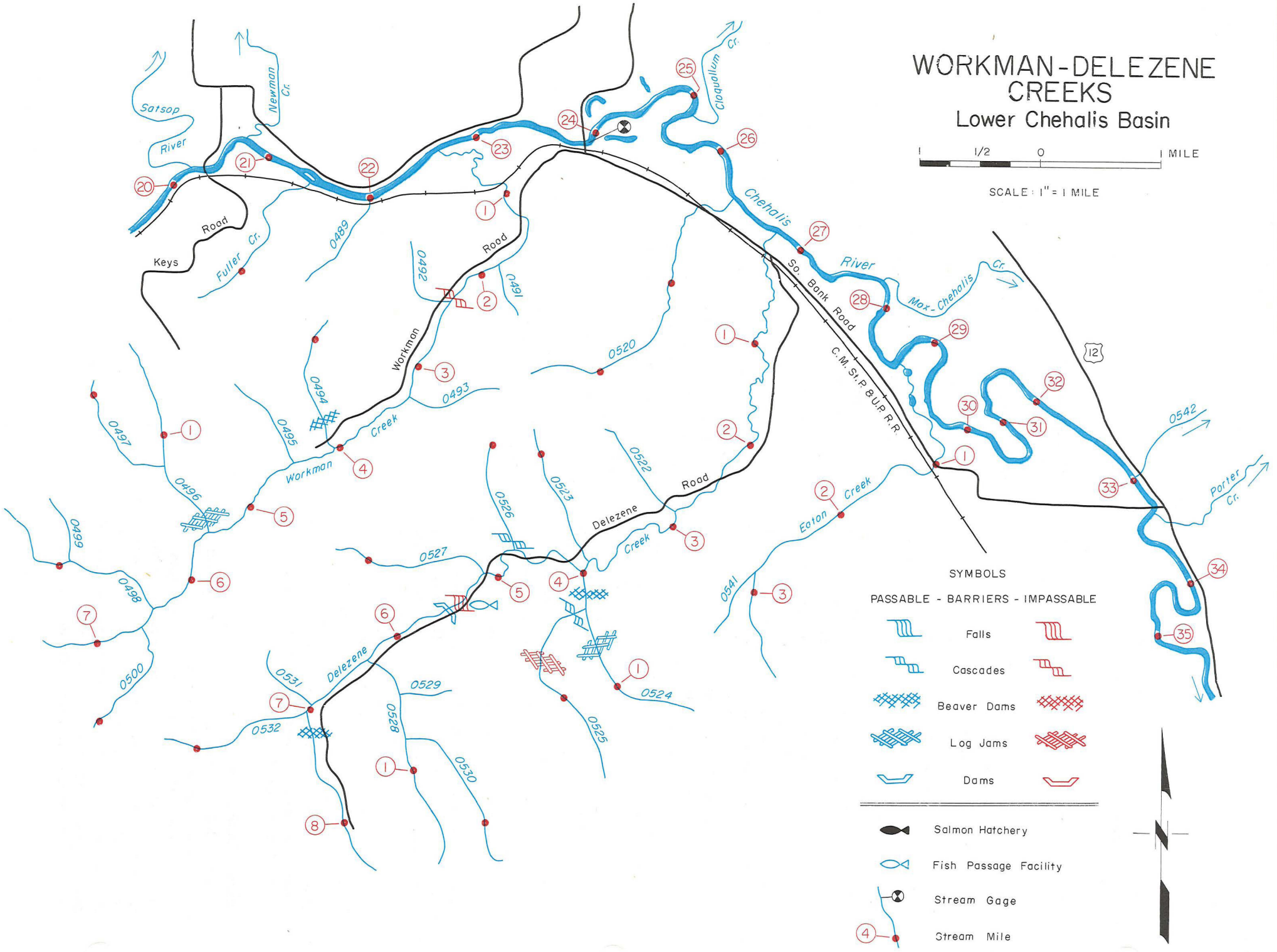
Summer water temperatures in the Chehalis River are too high for good coho rearing. Salmon production throughout this section of the Chehalis drainage is adversely affected by limited rearing areas and limited spawning areas. Stream flow during the summer months is generally quite low. The spawning gravels are of only fair quality. Minor debris jams and beaver dams exist on the other streams in the system; however, they do not block major spawning or rearing areas. The lower reaches of most of these streams are heavily populated with predator fishes. Smolts produced from these streams are also subjected to heavy predation in the Chehalis River.

Beneficial Developments

In 1970, the Washington State Department of Fisheries blasted the falls on Delezène Creek, providing upstream migration to near the headwaters. No other beneficial developments have taken place in this section. In September 1972, an experimental project was undertaken in the lower Chehalis River to poison squawfish with the use of a chemical known as "Squoxin". The results were quite favorable and may be applied again in the near future.

Habitat Needs

Stream bank cover must be maintained on these tributaries to avoid high water temperatures associated with the low stream flows. Further siltation of the spawning gravels from road construction or logging may remove these streams from production.


WORKMAN-DELEZENE CREEKS
Lower Chehalis Basin
1 1/2 0 1 MILE
SCALE: 1" = 1 MILE
Satsop River
Newman Cr.
Cloquallum Cr.
Chehalis River
So. Bank Road
C.M. St. P & U.P. R.R.
Max-Chehalis Cr.
Porter Cr.
Keys Road
Fuller Cr.
Workman Road
Workman Creek
Delezene Road
Delezene Creek
Eaton Creek
0489
0491
0492
0493
0494
0495
0496
0497
0498
0499
0500
0520
0522
0523
0524
0525
0526
0527
0528
0529
0530
0531
0532
0541
0542
SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage
Stream Mile

WORKMAN-DELEZENE CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chum,Coho,Chin.
0360	Satsop River	RB-20.2	28.6	—	
	(See Chehalis 1203)				
0477	Newman Creek	RB-20.8	7.4	—	
	(See Chehalis 1803)				
0488	Fuller Creek	LB-21.5	1.5	—	Coho
0490	Workman Creek	LB-22.7	7.4	20.4	Chum, Coho
0494	Unnamed	LB-4.05	1.2	—	None
0496	Unnamed	LB-5.4	1.8	—	Unknown
0497	Unnamed	RB-0.7	1.15	—	Unknown
0498	Unnamed	LB-6.25	1.75	—	Unknown
0500	Unnamed	RB-6.45	1.1	—	Unknown
0501	Cloquallum Creek	RB-25.2	20.4		
	(See Chehalis 1803)				
0520	Unnamed	LB-26.4	2.65	—	Coho
0521	Delezene Creek	LB-26.8	8.5	—	Coho
0523	Unnamed	LB-3.9	1.3	—	Coho
0524	Unnamed	RB-4.0	1.7	—	Coho
0525	Unnamed	LB-0.3	1.8	—	Coho
0526	Unnamed	LB-4.65	1.0	—	Unknown
0527	Unnamed	LB-5.1	1.25	—	None
0528	Unnamed	RB-6.4	1.85	—	None
0530	Unnamed	RB-0.7	1.4	—	None
0532	Unnamed	LB-7.01	1.3	—	None
0533	Mox Chehalis Creek	RB-27.8	15.8	—	
	(See Chehalis 1803)				
0540	Eaton Creek	LB-28.7	3.8	—	Coho
0542	Unnamed	RB-33.0	1.7	—	
	(See Chehalis 1903)				
	(Cont. Chehalis 1903)				

NEWMAN-CLOQUALLUM CREEKS

This map describes the right bank tributaries to the Chehalis River between the mouth of the Satsop River at mile 20.2 and the mouth of Porter Creek at mile 33.3. Left bank tributaries and mainstem Chehalis are discussed in Chehalis 1700. The four right bank tributaries to the Chehalis River in this section contain 123.9 linear miles of stream drainage.

Stream Description

Cloquallum, Mox-Chehalis, and Newman Creeks, the three major tributaries covered in this section, head in low hills and flow generally south or southwesterly to the confluence with the Chehalis River through fairly broad valleys. Most of the low hills are in timber production, with grazing lands and farm houses scattered through the low flat valleys. Recreational homesites are being developed on Arrowhead and Star Lakes in the Cloquallum Creek drainage.

Cloquallum Creek, the largest tributary in this section, has a low gradient from its mouth to its headwaters. The stream flows most of its length through a broad valley with good stream bank cover throughout. The Cloquallum channel is approximately 7 yards wide in its upper reaches and 16 yards wide near its mouth. Lower Newman Creek is approximately 5 yards wide and lower Mox-Chehalis Creek is 10 yards wide. These streams also have a low to moderate gradient throughout. With the exception of the headwaters, the tributaries to these three streams also have a low to moderate gradient. Stream bank cover is generally adequate in the form of deciduous brush and deciduous timber. Gravel is the predominant bottom material in Cloquallum and Mox Chehalis drainages. The Newman Creek watershed is predominantly sand with an occasional patch of gravel with long pool areas and short riffles. Tributaries to Newman Creek are very similar in characteristic. Cloquallum, Mox-Chehalis Creeks, and their tributaries have an excellent pool riffle balance.

Salmon Utilization

Cloquallum Creek has significant runs of chum, chinook, and coho. Its tributary streams have coho and a few chum. Coho and small numbers of chum salmon also spawn in Mox Chehalis and Newman creeks. A small unnamed tributary to the Chehalis downstream from Porter may have a run of coho. Chinook and chum spawning is generally restricted to the lower 10 miles of Cloquallum Creek. The majority of the coho spawn in the upper reaches of Cloquallum Creek and in its tributary streams. It is estimated that about 92 linear miles of tributary streams are presently accessible to salmon production.

Limiting Factors

Newman Creek and its tributaries have only a limited amount of generally poor quality spawning area. Most of the Cloquallum Creek watershed is accessible for salmon production with generally good spawning and rearing habitat. Barriers to coho migration exist on several of its tributaries. Log jams and log booms block minor portions of the Mox-Chehalis watershed. The upper and the lower reaches of its tributary streams have concentrations of predatory fishes which may limit salmon production. Industrial and municipal pollution in Wildcat Creek occasionally cause extensive fish kills downstream from McCleary.

Beneficial Developments

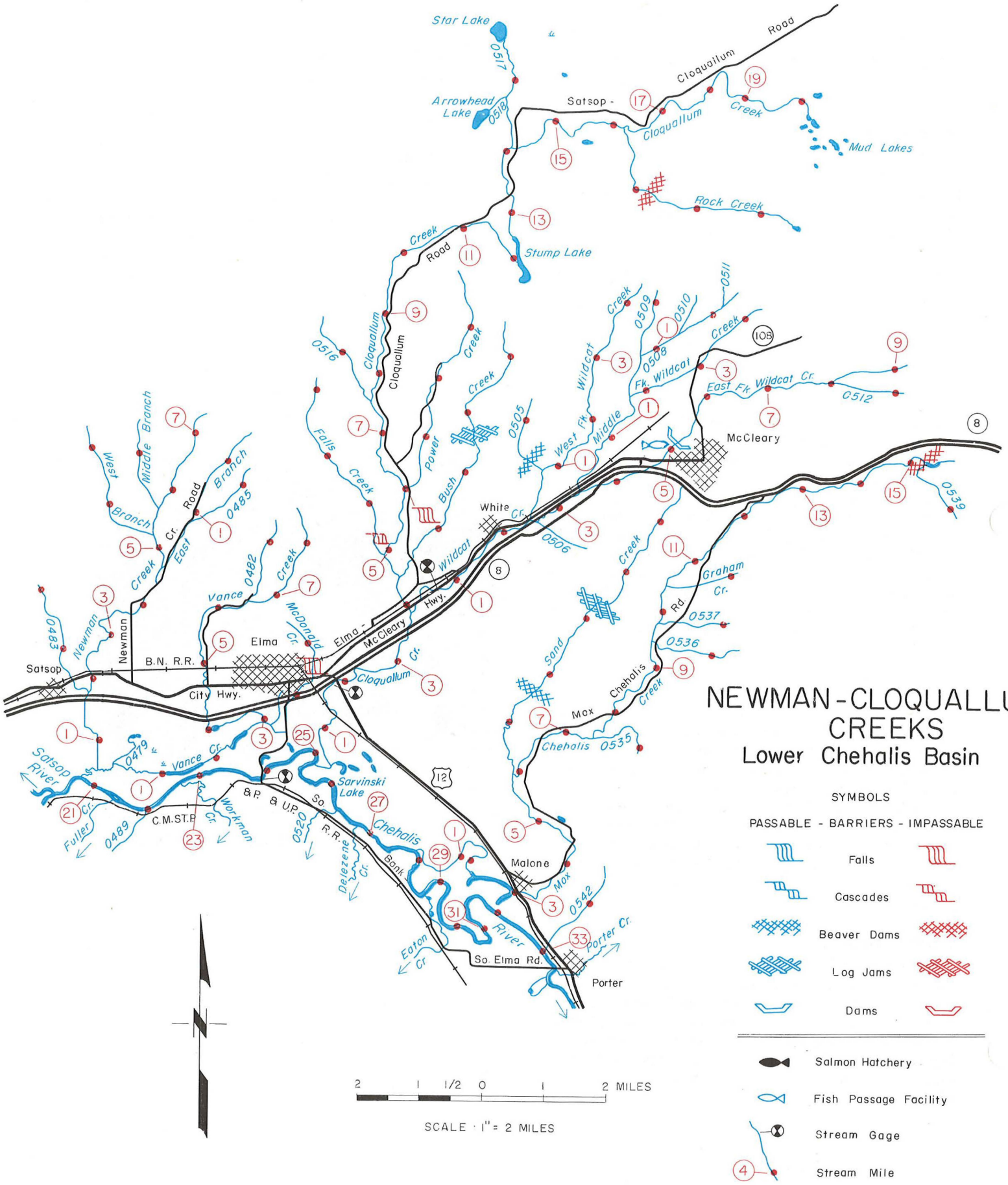
A fishway at a dam on the East Fork Wildcat Creek provides passage for coho salmon to the headwaters of that stream.

Habitat Needs

Abatement of the pollution problem in the vicinity of McCleary on Wildcat Creek is needed to assure continued production from this fine salmon stream. The otherwise good water quality present in the tributary streams can be maintained if adequate protection is taken for the streambed and bank areas. Extensive development of the lakes on the Cloquallum Creek drainage could result in pollution problems.

Lower Cloquallum Creek has sufficient summer flows to maintain a small hatchery operation. Artificial spawning channels or egg incubation channels could also be constructed in Cloquallum Creek or at the mouth of several tributary streams.

PHOTO 22-17. Typical coho rearing area on Mox Chehalis Creek near R.M. 6.0.



NEWMAN-CLOQUALLUM CREEKS

Lower Chehalis Basin

SYMBOLS

PASSABLE - BARRIERS - IMPASSABLE

Falls		
Cascades		
Beaver Dams		
Log Jams		
Dams		

Salmon Hatchery

Fish Passage Facility

Stream Gage

Stream Mile

NEWMAN-CLOQUALLUM CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0477	Newman Creek	RB-20.8	7.4	—	Coho, Chum
0478	Vance Creek	LB-0.5	8.6	—	Coho
	Vance Creek Lk.	Outlet-1.15	—	—	
	Moores Lake	Outlet-2.3	—	—	
0480	McDonald Creek	LB-3.0	2.45	—	Unknown
0482	Unnamed	RB-6.55	1.4	—	Unknown
0483	Unnamed	RB-1.85	2.1	—	Unknown
0484	E. Br. Newman Cr.	LB-4.8	2.5	—	Coho
0485	Unnamed	LB-0.9	1.3	—	Unknown
0486	W. Br. Newman Cr.	RB-5.2	2.4	—	Coho
0487	M. Br. Newman Cr.	RB-5.6	1.5	—	Coho
0488	Fuller Creek	LB-21.5	1.5	—	
	(See Chehalis 1703)				
0490	Workman Creek	LB-22.7	7.4		
	(See Chehalis 1703)				
0501	Cloquallum Creek	RB-25.2	20.4	—	Chum,Coho,Chin.
0503	Wildcat Creek	LB-3.8	9.2	—	Coho, Chum
0504	W.F. Wildcat Cr.	RB-2.55	4.4	5.46	Coho, Chum
0505	Unnamed	RB-0.8	1.3	—	Coho
	Wildcat Cr. cont. as E.F. Wildcat Cr.	@ mi. 2.56	—	13.3	
0507	M.F. Wildcat Cr.	RB-3.4	4.3	—	Coho, Chum
0508	Unnamed	RB-1.75	2.4	—	Coho
0509	Unnamed	RB-0.75	1.1	—	None
0512	Unnamed	LB-8.0	1.2	—	Coho
0513	Bush Creek	LB-4.4	4.6	4.20	Chum, Coho
0514	Falls Creek	RB-4.9	3.1	—	Coho
0515	Power Creek	LB-6.0	3.9	—	Chum, Coho
0516	Unnamed	RB-7.5	1.6	—	Coho
	Stump Lake	Outlet-12.15	—	—	
0517	Unnamed	RB-14.1	1.8	—	Coho
	Lystair (Star) Lk	Outlet-1.8	—	—	
0519	Rock Creek	LB-16.2	3.6	—	Coho
	Mud Lake	Outlet-20.4	—	—	

NEWMAN-CLOQUALLUM CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0520	Unnamed	LB-26.4	2.65	—	
	(See Chehalis 1703)				
0521	Delezene Creek	LB-26.8	8.5	—	
	(See Chehalis 1703)				
0533	Mox Chehalis Creek	RB-27.8	15.8	—	Chum, Coho
0534	Sand Creek	RB-5.9	5.7	—	Coho
0535	Unnamed	LB-7.5	1.1	—	Coho
0536	Unnamed	LB-9.5	1.4	—	Coho
0537	Unnamed	LB-9.8	1.1	—	Coho
0538	Graham Creek	LB-10.4	1.1	—	Coho
	Unnamed Lake	Outlet-15.3	—	—	
0539	Unnamed	LB-15.31	1.1	—	None
0540	Eaton Creek	LB-28.7	3.8	—	
	(See Chehalis 1703)				
0542	Unnamed	RB-33.0	1.7	—	Unknown
	(Cont. Chehalis 1903)				

PORTER CREEK

This area includes the Chehalis River from the mouth of Porter Creek upstream to, but excluding, Gibson Creek and all the watershed between these points north of the Chehalis River. The Chehalis River channel is 4.0 miles long in this section and there are 3 tributaries with over 51.0 miles of stream drainage.

Stream Description

The Chehalis River maintains a northwesterly course through this area. Porter Creek, the only significant right bank tributary, flows in a southwesterly direction. Gaddis Creek enters the left bank Chehalis River in this reach (see Section 2100). The Chehalis River maintains a northwesterly course through this area and the Porter reek system flows in a southwesterly course. The Chehalis River flows through a broad valley, much of which has been cleared for agricultural use. The lower 3 miles of Porter Creek are also in a broad valley and are used for farming. The remainder of this area is in timber production on moderately steep slopes. The community of Porter is located near the mouth of Porter Creek. Some farming residences are scattered throughout the remainder of the lowland areas.

The Chehalis River in this reach provides a fairly uniform environment for salmon production. The river channel averages approximately 60 yards in width with gravel and rubble the major streambed materials. Deciduous vegetation lines both banks except in an occasional area of rock riprap.

Porter Creek has an average width of 15 yards to its confluence of the North and South forks. Much of the stream is confined within gentle sloping banks. Stream bank cover in the form of deciduous vegetation provides adequate protection for ulmon and maintains cool water temperatures. The bottom material is primarily gravel in the lower gradient section below mile 4. The stream provides excellent pools for salmon resting and juvenile rearing and riffle areas suited for chum and chinook spawning. The accessible tributaries of Porter Creek range from 2 to 8 yards in width in their lower reaches. These streams have a moderate gradient in their lower reaches and are quite steep in their headwaters. Most of the land bordering these tributaries is in second -growth timber production. Stream bank cover is generally adequate.

Salmon Utilization

This section of the Chehalis River is the lower-most spawning reach for chinook and probably chum in the mainstem. Chinook are known to spawn on all of the suitable riffles in this reach. Chum have not been seen in this reach of river, but are believed to be present. An excellent run of chinook spawns in the lower 4 miles of Porter Creek. This reach formerly sustained a large run of chums but in recent years only a remnant run has been present. Coho spawn in the mainstem of Porter Creek and in all of its accessible tributaries. Juvenile rearing occurs throughout the accessible reaches of Porter Creek and, to a more limited extent, in the main Chehalis. All 4 miles of the Chehalis River and over 11 linear miles of the Porter Creek system are presently accessible to salmon production.

Limiting Factors

The major limiting factor affecting salmon production in this reach of the Chehalis is high water temperatures. Temperatures frequently exceed 70°F for extended periods during the summer months. High temperatures often extend into the early portion of the chinook spawning and undoubtedly affect survival of the eggs. Obstructions on Porter Creek prevent coho from utilizing its West Fork and several tributary streams. Low summer flows in several tributary streams reduce the production of juvenile coho. Siltation of the gravel in both lower Porter Creek and the Chehalis River has had an adverse effect on salmon production.

Beneficial Developments

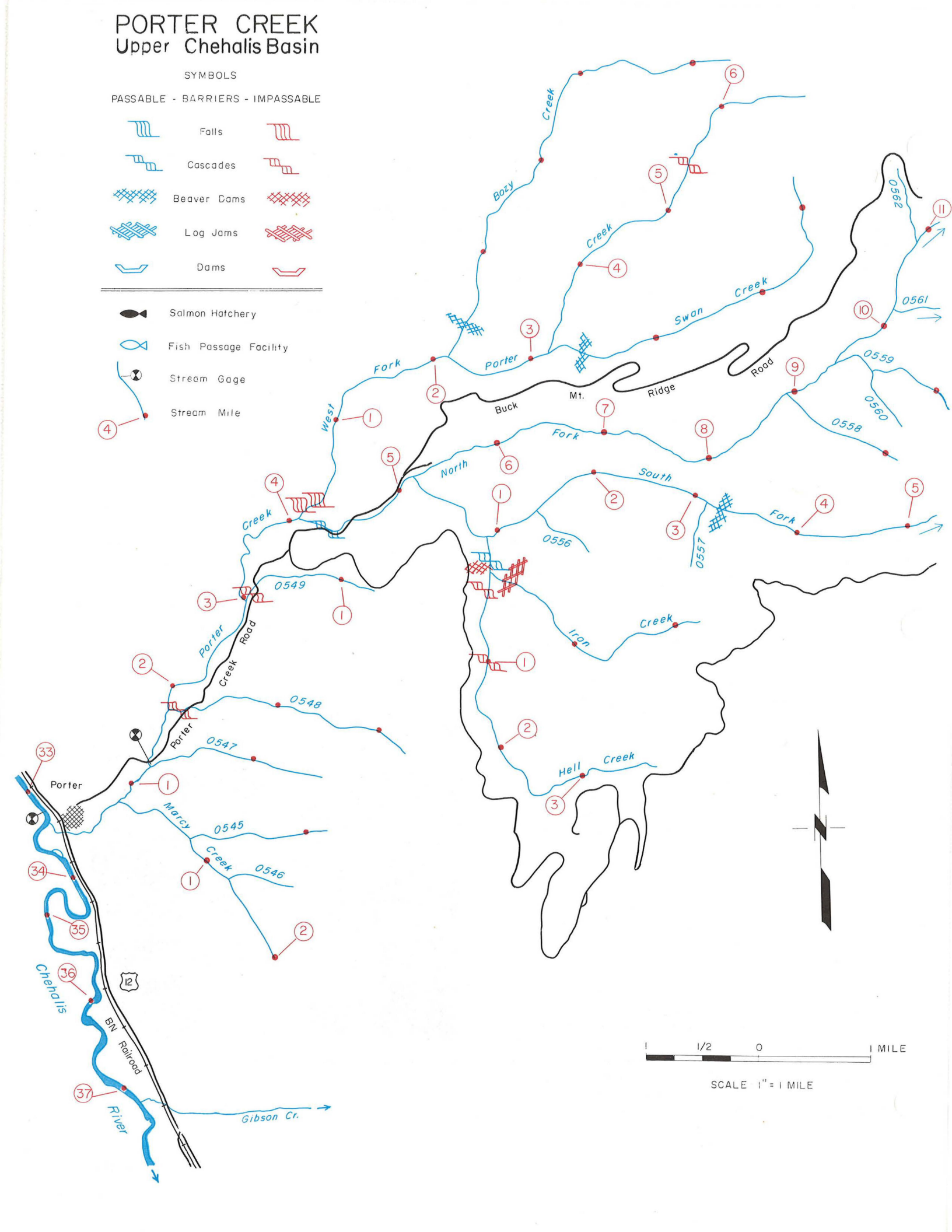
No beneficial developments for salmon production have been constructed in this section.

Habitat Needs

Increased flows of cool water during the summer and early fall months would improve conditions for salmon production in the Chehalis River. Gravel cleaning techniques applied to the Chehalis River and lower Porter Creek would increase survival of chum and chinook eggs. The chinook and chum spawning characteristics of Porter Creek must be maintained. Removal of gravel from the streambeds should not be permitted in any streams of this area. Construction of fish passage facilities at the falls on West Fork Porter Creek would improve coho production. Log and debris jams on several tributaries of South Fork Porter Creek and Marcy Creek should be examined further for possible clearance programs.

PHOTO 22-18. Chinook spawning area on lower Porter Creek.

PORTER CREEK
Upper Chehalis Basin



PORTER CREEK
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0543	Porter Creek	RB-33.31	11.8	39.8	Chin.,Chum,Coho
0544	Marcy Creek	LB-0.8	2.1	—	Coho
0545	Unnamed	RB-0.75	1.2	—	None
0547	Unnamed	LB-1.19	1.6	35.6	Coho
0548	Unnamed	LB-1.8	2.3	—	Unknown
0549	Unnamed	LB-3.0	1.3	—	Unknown
0550	W. F. Porter Creek	RB-4.1	6.75	10.7	None
0551	Bozy Creek	RB-2.2	4.3	—	None
0552	Swan Creek	RB-3.2	3.3	—	None
0553	S. F. Porter Creek	LB-5.2	5.7	9.48	Coho
0554	Hell Creek	LB-0.9	3.7	—	Coho
0555	Iron Creek	RB-0.3	2.2	—	None
	Porter Cr. cont. as N. F. Porter Cr.	@ mi. 5.21		9.92	Coho
0558	Unnamed	LB-8.9	1.1	—	
0559	Unnamed	LB-9.45	1.2	—	Unknown
0561	Unnamed	LB-10.2	1.4	—	Unknown
0563	Gaddis Creek	LB-34.8	4.0	—	
	(See Chehalis 2103)				
0565	Gibson Creek	RB-37.2	5.4	—	
	(See Chehalis 2003)				
	(Cont. Chehalis 2003)				

GIBSON-CEDAR CREEKS

This drainage section includes the Chehalis River from, and including, Gibson Creek up to, but excluding, Black River and all right bank tributaries in this reach. The mainstem of the Chehalis River provides 9.7 miles of stream channel. Its four right bank tributaries in this stream section total 83.0 miles. Left bank tributaries are discussed in Chehalis 1900.

Stream Description

The Chehalis River maintains a northerly course in a broad river valley through this stream section. The tributary streams entering the right bank of the Chehalis in this reach flow in a southerly or southwesterly direction out of the Black Hills. These tributaries are Gibson, Cedar, and Harris creeks, plus one small unnamed stream.

The Chehalis River and the lower mile or so of its tributaries flow through a broad river valley, most of which has been cleared for farmland. The tributaries in the reaches above the main valley floor flow through second-growth timberland.

The town of Oakville is the only urban development in this area. Farm and rural homes exist throughout the Chehalis Valley and, to a more limited extent, on the lower reaches of its tributaries. The river is adjacent to the Chehalis Indian Reservation in the upper half of this reach.

The Chehalis River in this reach is a placid, low gradient stream with long pools and short riffle areas. The bottom is composed of rubble and gravel. The marginal vegetation generally provides adequate cover. The tributary streams are steep, swift flowing in their headwaters, but provide a balance of spawning and rearing area in the middle and lower reaches. Their bottom composition is predominantly gravel.

Salmon Utilization

The Chehalis River provides transportation for coho and spring chinook, rearing water for coho and chinook, and spawning area on all suitable riffles for fall chinook and chum. Fall chinook also spawn in the Cedar Creek at least as far upstream as the mouth of Sherman Creek. The extent of chum spawning in the Chehalis and its tributaries is not known but the present runs are apparently small.

Coho spawn in all accessible tributary streams in this section. The major spawning areas are in the Cedar Creek watershed. Lesser numbers utilize other tributaries. 9.7 miles of the mainstem Chehalis River and approximately 30 linear miles of tributaries are presently utilized by salmon.

Limiting Factors

The major limiting factor to salmon production in this portion of the Chehalis River is low summer flow and high water temperatures. These factors, along with a large concentration of predacious fishes, limit juvenile rearing success. The effect of the Indian fishery on stocks of chinook and chum milling and spawning within the reservation is not known. The fishing rate on these stocks is probably quite high.

A major limiting factor in the tributary streams is low summer flow and limited rearing area for coho. Barriers are present on several streams which prevent coho from utilizing upstream spawning and rearing areas. A water storage dam on Cedar Creek at mile 8.0 blocks a small amount of spawning and rearing area, as does a series of beaver dams on upper Sherman Creek at mile 4.0. Log jams bar access to several small tributaries on Cedar Creek. Barriers are also found on Gibson Creek.

Gravel compaction and siltation on Cedar Creek and Sherman Creek restrict coho and chinook spawning success. Road construction has altered both Cedar Creek and Sherman Creek resulting in reduced spawning area and increased silt load.

Beneficial Developments

Log jam removal has assisted in maintaining access to spawning and rearing areas on Cedar and Sherman creeks. Periodic plants of coho yearlings have been made in the Cedar Creek watershed.

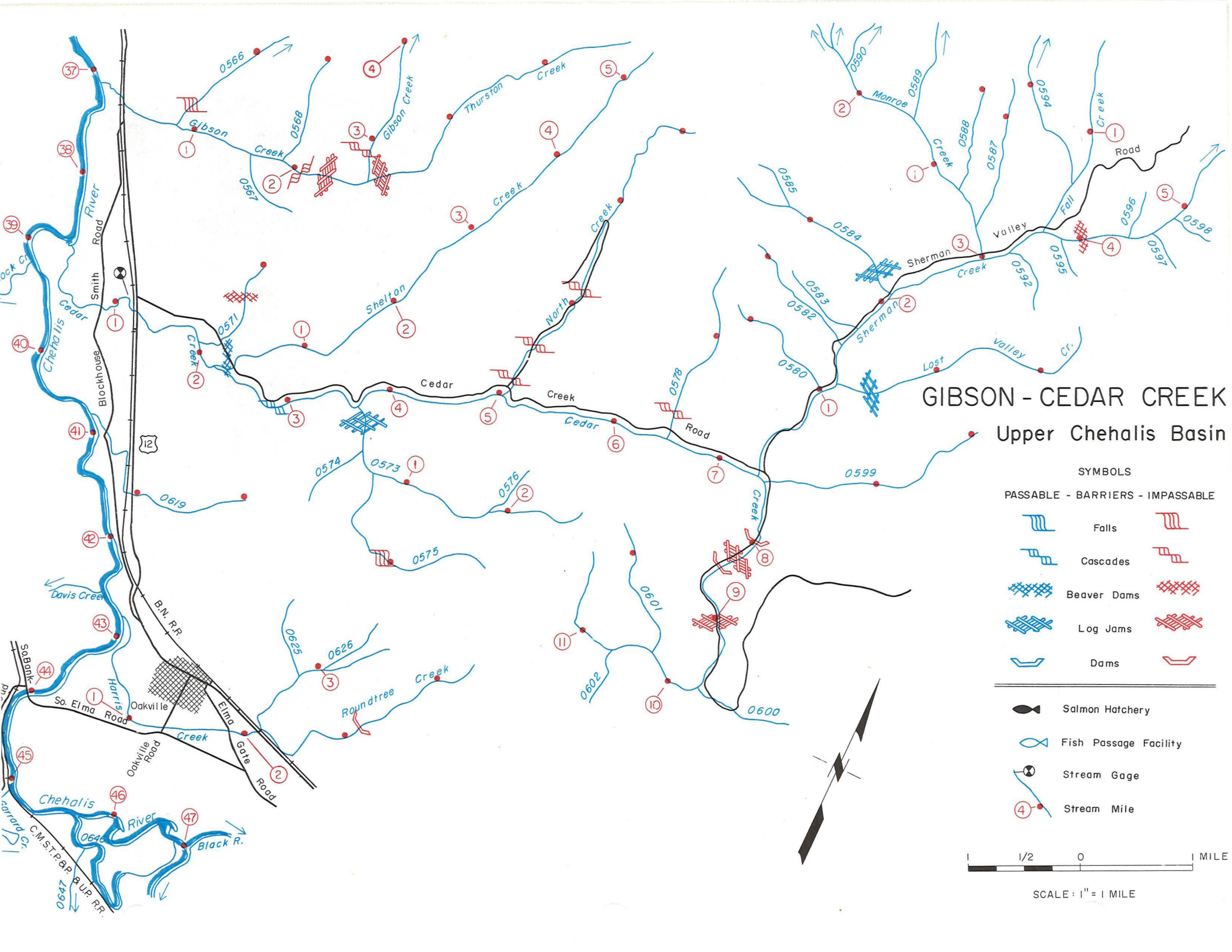
Habitat Needs

Removal of log jams on a tributary to Sherman Creek would add to the total coho production. Minor debris jams, particularly on Monroe Creek, provide retention of spawning gravel.

Maintenance of salmon runs in these tributaries of the Chehalis River will depend on the care taken in the future during logging and associated road construction and maintenance. If the water and streambed quality deteriorates no further, Cedar Creek and its tributaries will continue to make significant contributions.

The salmon production in the mainstem Chehalis River will benefit from low flow augmentation from upstream storage sites. Eradication of predatory fish, while desirable, is not yet feasible. Existing spawning areas must be maintained and gravel cleaning techniques applied. Gravel removal operations should not be allowed to encroach on the river or adjacent bars.

PHOTO 22-19. Chehalis River on Chehalis Indian Reservation.


GIBSON - CEDAR CREEK
Upper Chehalis Basin
SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage
Stream Mile
1/2
0
1 MILE
SCALE: 1" = 1 MILE
Chehalis River
Cedar Creek
Gibson Creek
Thurston Creek
Shelton Creek
North Creek
Monroe Creek
Sherman Creek
Fall Creek
Valley Road
Lost Valley Cr.
Smith Road
Blockhouse Road
Davis Creek
B.N. R.R.
So. Bank
So. Elma Road
Oakville
Oakville Road
Harris Creek
Elma Gate Road
Roundtree Creek
C.M.S.T.P.&P. & U.P. R.R.
Black R.
Garrard Cr.
0566
0567
0568
0571
0573
0574
0575
0576
0578
0580
0582
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0600
0601
0602
0619
0625
0626
0646
0647

GIBSON-CEDAR CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chin.,Chum,Coho
0565	Gibson Creek	RB-37.2	5.4		Chum, Coho
0566	Unnamed	RB-0.8	1.2	—	Coho
0568	Unnamed	RB-1.8	1.0	—	Unknown
0569	Thurston Creek	LB-2.6	2.7	—	None
0570	Cedar Creek	RB-38.7	11.8	39.5	Chin.,Chum,Coho
0571	Unnamed	RB-1.9	1.0	—	Coho
0572	Shelton Creek	RB-2.2	5.4	—	Coho
0573	Unnamed	LB-3.6	2.7	—	Coho
0575	Unnamed	LB-0.6	1.9	—	Coho
0577	North Creek	RB-5.0	3.1	—	None
0578	Unnamed	RB-6.5	1.6	—	Unknown
0579	Sherman Creek	RB-7.4	5.6	16.3	Coho
0580	Unnamed	RB-1.0	1.2	—	Coho
0581	Lost Valley Cr.	LB-1.2	2.6	—	Coho
0582	Unnamed	RB-1.5	1.2	—	Coho
0584	Unnamed	RB-2.1	1.75	—	Coho
0586	Monroe Creek	RB-3.0	3.2	—	Coho
0587	Unnamed	LB-0.3	1.4	—	Coho
0588	Unnamed	LB-0.65	1.0	—	Coho
0589	Unnamed	LB-1.45	1.35	—	Unknown
0593	Fall Creek	RB-3.6	1.8	—	Coho
0594	Unnamed	RB-0.5	2.0	—	Unknown
0599	Unnamed	RB-7.5	2.0	—	Coho
0601	Unnamed	LB-10.3	1.3	—	None
0603	Rock Creek (See Chehalis 2103)	LB-39.25	10.7	—	
0619	Unnamed	RB-40.8	2.0	—	Unknown
0620	Davis Creek (See Chehalis 2103)	LB-42.5	5.7	—	
0623	Harris Creek	RB-42.8	3.6	—	Coho
0624	Roundtree Creek	LB-2.15	2.4	—	Coho
0627	Garrard Creek (See Chehalis 2103)	LB-45.0	10.3	—	
0646	Unnamed (See Chehalis 2103)	LB-45.6	2.6	—	

GIBSON-CEDAR CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0649	Black River	RB-47.0	28.0	—	
	(See Chehalis 2203)				
	(Cont. Chehalis 2103)				

ROCK-GARRARD CREEKS

This section includes all of the left bank tributaries of the Chehalis River between miles 34 and 45.1. These tributaries include Gaddis, Rock, Davis, and Garrard creeks. Right bank tributaries of this reach of the Chehalis River are discussed in Chehalis 2000. Gaddis Creek contains 4.9 miles; Rock Creek has 32.2 miles,; Davis Creek has 7.4 miles; and Garrard Creek is the largest drainage with 45.5 miles for a total of 90 linear miles.

Stream Description

All tributaries to this reach head in the low Willapa Hills and flow in generally east or northeasterly directions to the Chehalis River. Tributaries to Garrard Creek include South Fork, Bloomquist, and Kellogg creeks. Williams Creek is the only major tributary to Rock Creek. The smaller streams in this section have no major tributaries.

The lower reaches of all of these streams meander through the broad Chehalis valley. Their upper reaches are generally confined to narrow stream valleys. Most of the lowland area adjacent to the Chehalis River has been cleared for farming. Farmland is also found on Garrard Creek and Rock Creek. The remainder of this area is in coniferous timber production. Rural and farm residences are scattered throughout the agricultural areas. No major residential developments are found in this section.

All of these streams have low gradients for several miles in the portions flowing through the Chehalis valley. These areas are comprised generally of pool areas with some short riffles. Sand is the predominant bottom material. Bank cover, provided by deciduous brush, is generally adequate. The channels in the Chehalis valley are deeply cut and range from 2 to 12 yards wide for the larger streams and generally less than 2 yards wide for the several smaller tributaries. Above the Chehalis valley these streams maintain a moderate gradient to near their headwaters. Stream bank cover in the upper areas is generally good and provided by mixed timber and deciduous brush. Gravel is the predominant bottom material; however, rubble is common in Rock Creek. The stream channels appear to be quite stable and have a balanced pool and riffle ratio to provide for spawning and rearing requirements of the salmon.

Salmon Utilization

All accessible streams in this reach support runs of coho salmon. Chum may also spawn in these streams; however, none have been seen in recent years. Rock Creek has a potential for chinook production; however, their existence is not verified. Coho spawn below the falls on Rock Creek and in Williams Creek and its tributaries. Coho spawning also occurs in the upper South Fork Garrard Creek and its tributaries in addition to upper Garrard Creek and its tributaries, Kellogg and Bloomquist creeks. Virtually all of the smaller tributaries located below barriers are utilized by coho. The lower reaches of these streams serve as transportation water for salmon destined for upstream spawning areas and as rearing area for juvenile coho. These channels have sufficient pool area to provide for resting and maturation of adult salmon. Juvenile coho rearing conditions are generally good, and they are found in virtually all of the accessible areas. The four tributaries in this section provide approximately 35.5 linear miles of accessible salmon production.

Limiting Factors

Low summer flow and siltation of the spawning gravels represent the major limiting factors in these streams. The only major barrier is located on Rock Creek near mile 5.3. A falls on an unnamed tributary to the South Fork Garrard Creek is also an obstacle to salmon migration. The lower reaches of all of these streams may contain large populations of predatory fishes.

Beneficial Developments

No facilities for the enhancement of salmon runs have been constructed in this area. Coho fry plants have been recommended for Rock Creek above its falls to utilize the available rearing area.

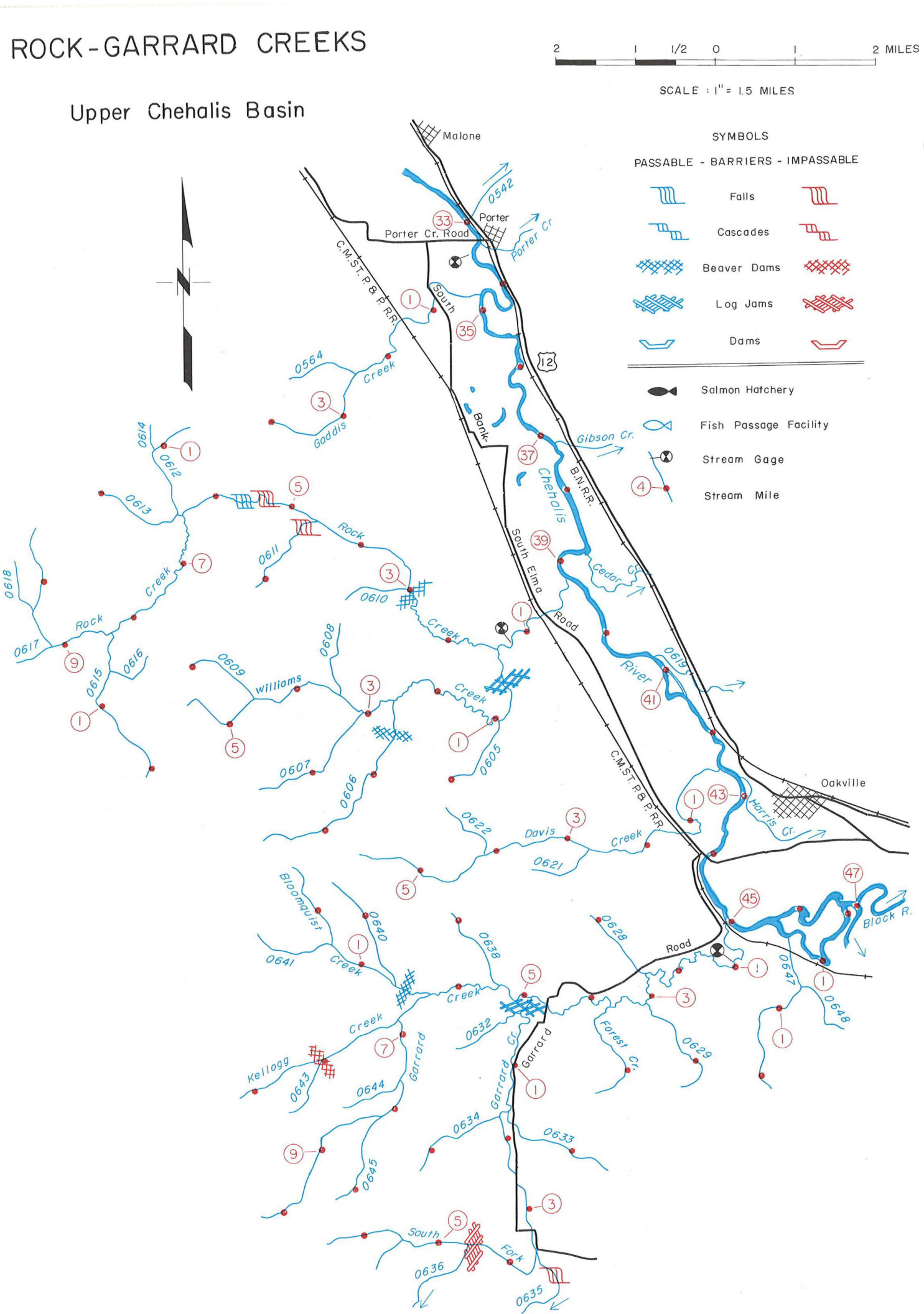
Habitat Needs

Bank cover must be maintained on all of these streams. Existing low summer flow, with lack of bank cover, will result in excessively high water temperatures. Granting of further water rights on most of these streams will reduce the presently limited coho rearing area.

PHOTO 22-20. Large boulders and rubble are common on Rock Creek riffles.

ROCK-GARRARD CREEKS

Upper Chehalis Basin



ROCK-GARRARD CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0563	Gaddis Creek	LB-34.8	4.0	—	Chum, Coho
0565	Gibson Creek	RB-37.2	5.4	7.0	
	(See Chehalis 2003)				
0570	Cedar Creek	RB-38.7	11.8	39.5	
	(See Chehalis 2003)				
0603	Rock Creek	LB-39.25	10.7	—	Chum, Coho
0604	Williams Creek	RB-1.4	5.7	—	Coho
0605	Unnamed	RB-0.95	1.0	—	Coho
0606	Unnamed	RB-2.6	2.75	—	Coho
0607	Unnamed	RB-3.05	1.6	—	Coho
0609	Unnamed	LB-4.6	1.0	—	Coho
0611	Unnamed	RB-4.6	1.15	—	Unknown
0612	Unnamed	LB-6.4	1.45	—	None
0613	Unnamed	RB-0.05	1.0	—	None
0615	Unnamed	RB-8.31	2.1	—	None
0619	Unnamed	RB-40.8	2.0	—	
	(See Chehalis 2003)				
0620	Davis Creek	LB-42.5	5.7	—	Chum, Coho
0623	Harris Creek	RB-42.8	3.6	—	
	(See Chehalis 2003)				
0627	Garrard Creek	LB-45.0	10.3	—	Chum, Coho
0628	Unnamed	LB-2.7	1.1	—	Coho
0629	Unnamed	RB-3.1	1.5	—	Coho
0630	Forest Creek	RB-3.6	1.6	—	Coho
0631	S. F. Garrard Cr.	RB-4.9	6.4	10.4	Coho
0633	Unnamed	RB-1.6	1.4	—	Coho
0634	Unnamed	LB-1.75	1.2	—	Coho
0635	Unnamed	RB-3.5	3.1	—	Coho
0636	Unnamed	RB-4.6	1.2	—	None
0638	Unnamed	LB-5.4	1.1	—	Coho
0639	Bloomquist Creek	LB-6.35	2.6	—	Coho
0640	Unnamed	LB-0.5	1.5	—	Unknown
0642	Kellogg Creek	LB-6.8	2.2	—	Coho
0645	Unnamed	RB-8.15	1.2	—	Coho

ROCK-GARRARD CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0646	Unnamed Side Channel	LB-45.6	2.1	—	Unknown
0647	Unnamed	LB-0.3	2.2	—	Unknown
0649	Black River	RB-47.0	28.0	136.0	
	(See Chehalis 2203)				
	(Cont. Chehalis 2303)				

BLACK RIVER

Black River originates in Black Lake southwest of Olympia. Its total drainage includes an estimated 136 square miles. There are 28.0 miles of mainstem channel and 15 tributaries providing an additional 84.0 miles of stream drainage.

Stream Description

Black River flows in a southwesterly direction out of Black Lake through the town of Littlerock. The course turns west near Rochester and continues in this direction to its confluence with the Chehalis River. A number of tributaries enter the Black River channel. These include Bloom's Ditch, Dempsey, Salmon, Waddell, Beaver, and Mima creeks, in addition to a few smaller unnamed streams.

The eastern portion of the Black River watershed is generally gentle hills and prairie land. Most of the prairie and some of the moderately sloping hills are presently utilized for agriculture. Some prairie farmlands also border the west side of Black River for a distance of up to 3 miles. The Black Hills, rising to over 2,500 feet, form the major portion of the westerly watershed. The Black Hills are forested with second -growth conifers. Some second-growth logging is underway.

Black Lake is heavily developed as a residential area as is Scott Lake on a Black River tributary. Other residential areas include Littlerock and Rochester. Numerous rural farm houses are located throughout the lowlands of the watershed.

Much of the Black River channel is almost entirely pool area. Pool-riffle areas are found near Littlerock and in the lower 7 miles. The channel width ranges from 5 to 30 yards. Bottom material is mostly gravel and rubble in the swifter flowing sections, and mud and sand in the long, quiet pool areas. Plant and algal growth is common in these reduced-velocity areas. Stream-side vegetation is mostly of deciduous brush and provides good stream bank cover.

Salmon Utilization

The Black River drainage has a significant run of coho and a small run of chinook. The watershed formerly supported large chum runs; however, recent surveys have indicated that this species may now be totally lacking. Black River provides transportation and rearing area for coho. Coho distribution in the watershed is nearly unlimited. A few barriers exist on the upper reaches of the tributaries, but for the most part do not block major production areas. Chinook spawning is known to occur in the river near Littlerock from mile 16.0 to 17.3 and likely occurs from mile 0.0 to 7.0. All of the mainstem Black River and at least 47.5 miles of tributaries are presently accessible for salmon production.

Limiting Factors

Chinook production in the mainstem of Black River is limited by a lack of good quality spawning area. Chinook spawning is not known to occur in any of the tributaries. Low summer flows influence coho production in several of the tributary streams. Low flow areas include Beaver, Salmon, and Dempsey creeks, and Bloom's Ditch. Low flows, particularly in Beaver Creek, are further diminished by irrigation diversions. Summer water temperatures in the lower reaches of Black River are quite high and have an adverse effect on juvenile rearing. The lower river also has a large population of predacious fishes which prey heavily on rearing juveniles and smolts. The upper reaches of Mima Creek and its tributaries are severely silted from past logging operations. Beaver dams on Beaver Creek and several Mima Creek tributaries prevent coho from utilizing minor potential production areas. A water diversion dam on Mima Creek may periodically delay adult coho and undoubtedly blocks chum.

Beneficial Developments

No hatchery facilities are maintained in this drainage. Streams periodically receive plants of coho fry and yearlings. A water diversion dam on Blooms' Ditch is equipped with a fishway.

Habitat Needs

Maintenance of salmon runs in the Black River drainage will require strict controls on future development. Residential and summer-home development is likely to expand rapidly on the upper watershed, particularly on Beaver and Dempsey creeks. Logging of second-growth timber and associated road construction in the western half of the drainage could severely damage coho production if proper steps are not taken to prevent deterioration of water and streambed quality.

PHOTO 22-21. Fishway on Blooms Ditch diversion dam.

BLACK RIVER

Upper Chehalis Basin

2 1 1/2 0 1 2 MILES

SCALE : 1" = 2 MILES

SYMBOLS

PASSABLE - BARRIERS - IMPASSABLE

Falls

Cascades

Beaver Dams

Log Jams

Dams

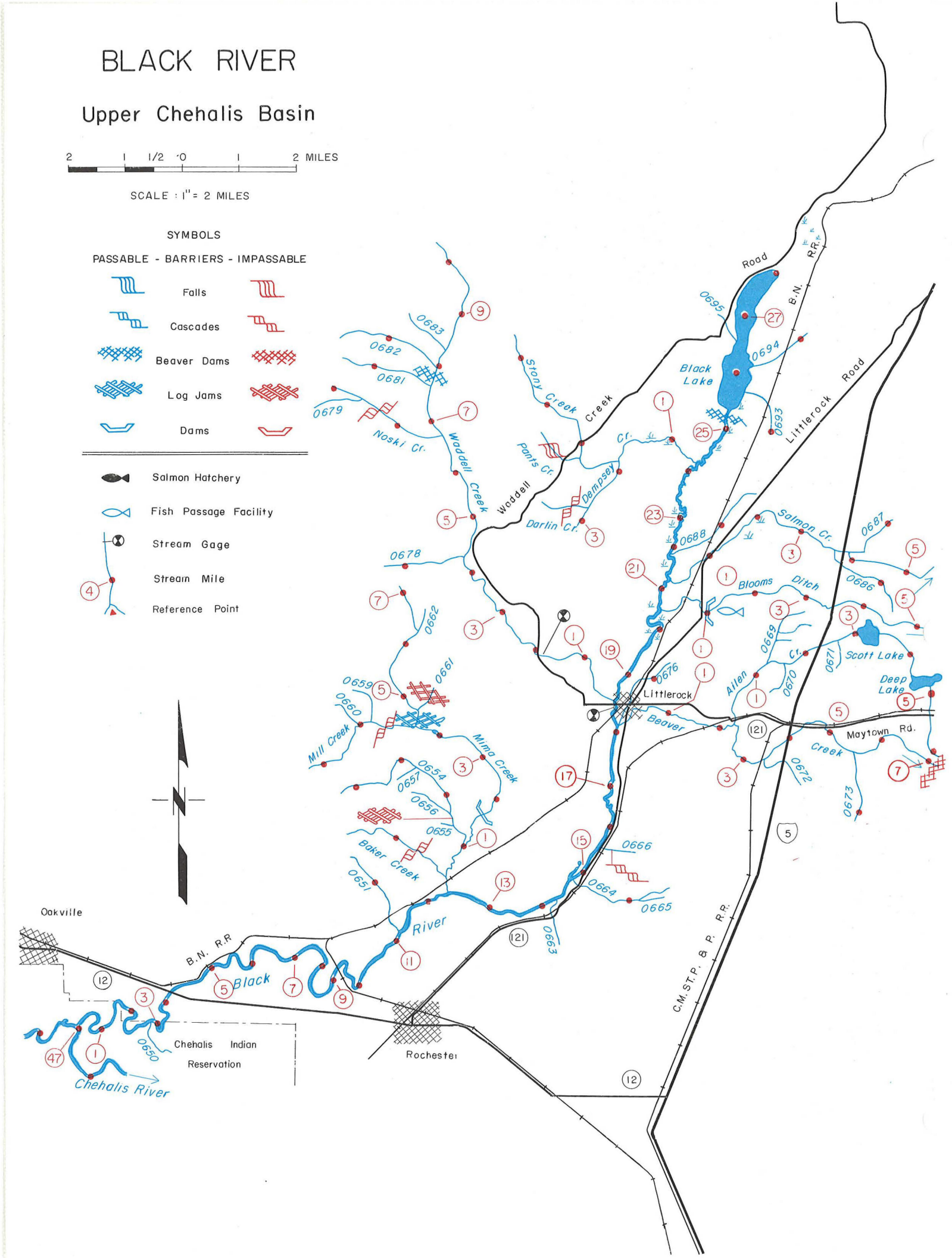
Salmon Hatchery

Fish Passage Facility

Stream Gage

Stream Mile

Reference Point



BLACK RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0649	Black River	RB-47.0	28.0	136.0	Coho,Chum,Chin.
0651	Unnamed	RB-11.15	1.75	—	Coho
0652	Mima Creek	RB-12.4	7.15	15.1	Coho
0653	Baker Creek	RB-0.3	1.9	—	Coho
0654	Unnamed	RB-1.0	3.3	—	Coho
0658	Mill Creek	RB-4.3	2.3	—	None
0664	Unnamed	LB-14.85	1.8	—	Coho
0667	Beaver Creek	LB-18.1	11.4	—	Coho
0668	Allen Creek	RB-2.3	6.3	—	Coho
0669	Drainage Ditch	RB-1.25	~ 2.1	—	
	Scott Lake	Outlet-3.0	—	—	
	Deep Lake	Outlet-4.5	—	—	
0673	Unnamed	LB-5.6	1.2	—	Coho
0674	Unnamed	LB-7.7	1.6	—	Coho
0675	Unnamed	LB-10.4	1.0	—	Coho
0676	Unnamed	LB-18.11	1.4	—	Unknown
0677	Waddell Creek	RB-18.5	10.4	18.2	Coho
0678	Unnamed	RB-4.3	1.4	—	Unknown
0679	Noski Creek	RB-6.7	2.0	—	Coho
0681	Unnamed	RB-7.6	1.6	—	Coho
0682	Unnamed	RB-8.0	1.85	—	Coho
0684	Bloom's Ditch	LB-20.6	8.5	—	Coho
	Pitman Lake	Outlet-6.5	—	—	
0685	Salmon Creek	LB-21.3	7.4	—	Coho
0686	Unnamed	LB-3.65	1.7	—	Coho
0687	Unnamed	RB-3.9	1.1	—	Unknown
0688	Unnamed	LB-21.8	1.8	—	Unknown
0689	Dempsey Creek	RB-24.2	3.05	—	Coho
0690	Stony Creek	LB-1.9	3.3	—	Coho
	Black Lake	Outlet-25.3	—	—	
0693	Unnamed	LS-25.6	1.1	—	Unknown
0694	Unnamed	LS-26.1	1.3	—	Unknown

CHEHALIS RIVER
SCATTER CREEK AREA

This section of the Chehalis basin includes the Chehalis River from the mouth of Skookumchuck River downstream to the mouth of Black River and the two right bank tributaries to this reach. There are 20.0 miles of mainstem channel and three tributaries with 36.0 linear miles of tributaries to the right bank of the Chehalis River.

Stream Description

The Chehalis River flows north from the confluence of the Skookumchuck River to the Grand Mound area. From here, the flow is generally in a western direction. The only two right bank tributaries in this section are Scatter Creek and Prairie Creek. The left bank tributaries to this portion of the Chehalis River are discussed in Chehalis 2400 and 3200.

Much of this section is low prairie land with gentle hills. Most of the prairie land is used for farming. The upland areas are generally in timber production with some slopes cleared for farming. The communities of Rochester, Grand Mound, and Tenino are located here. A number of rural and farm residences are scattered throughout the lowlands. The Chehalis Indian Reservation is situated in the Chehalis valley along the lower portion of this reach of the Chehalis River.

The Chehalis River below the confluence of the Skookumchuck River consists of placid pools and gentle riffles. The river width ranges from 40 to 60 yards. Deciduous vegetation lines most of the bank areas. The river bottom consists largely of gravel and rubble with some silt.

The lower reaches of two left bank tributaries entering this reach are low gradient, slow-moving streams flowing through broad prairie land. Their upper reaches have a moderate gradient. These stream banks generally have a good protective cover of deciduous vegetation. Gravel is the dominant feature of the bottom material. The streams present a mixture of riffle and pool area.

Salmon Utilization

Fall chinook and chum spawn on all suitable riffle areas in this reach of the Chehalis River. The section also serves as transportation water for chum, spring chinook, coho, and fall chinook destined for upriver spawning grounds. Juvenile salmon rearing occurs throughout the year but is restricted during the warm summer months.

Prairie Creek and Scatter Creek formerly supported significant runs of chum. These runs are presently at a very low level. Coho spawn in Scatter Creek and in at least one of its tributaries. Most of the spawning occurs above Tenino. Rearing occurs in all reaches which retain water during summer months. Small coho runs may enter Prairie Creek. Its limited spawning area for coho is believed to be near its upper reaches. There is no summer rearing area known in the creek. All the mainstem Chehalis River and approximately 26 linear miles of tributaries are presently in salmon production.

Limiting Factors

Chinook production in this section of the Chehalis River is limited by low stream flows and high water temperatures which occur periodically during the early segment of the spawning season.

Juvenile salmon, while rearing in the Chehalis and as they migrate downstream, are subject to extensive predation. The quality of the rearing area during the summer months is marginal due to low stream flows and water temperatures which frequently exceed 70°F.

The Chehalis River transports a very high silt load during the freshet periods. Deposition of this silt on the spawning gravel has an adverse effect on the spawning success of chum and chinook. The effects of flooding and related streambed movement do not appear to be serious.

Spawning of coho in Scatter and Prairie Creeks is affected by the limited amount of good spawning area. Most of Prairie Creek and a significant part of Scatter Creek are dry in the summer months.

Beneficial Developments

No beneficial developments have occurred in this section.

Habitat Needs

The major habitat need in the Chehalis River is improved water quality, particularly during the summer months. Low flow augmentation, while highly desirable, must have minimal effect on existing upriver runs. Eradication of predatory fishes is not feasible yet. Gravel cleaning techniques, when developed, may improve spawning success. Gravel removal operations should be restricted.

The coho runs in Scatter Creek depend on maintenance of the limited amount of summer rearing area. No further water diversions should be permitted.

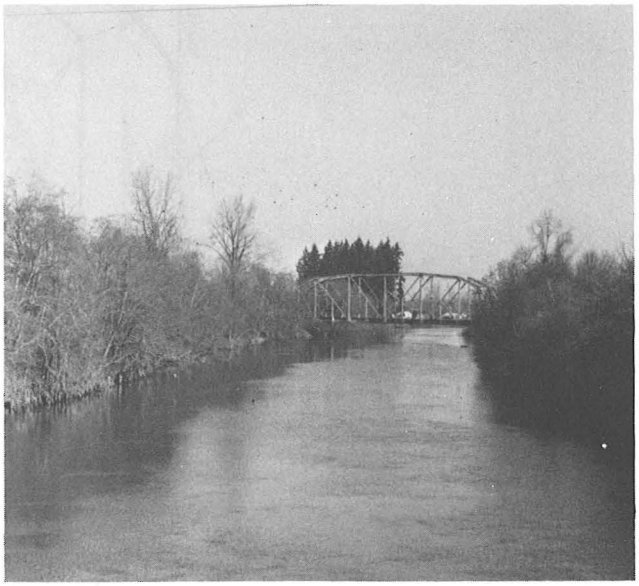
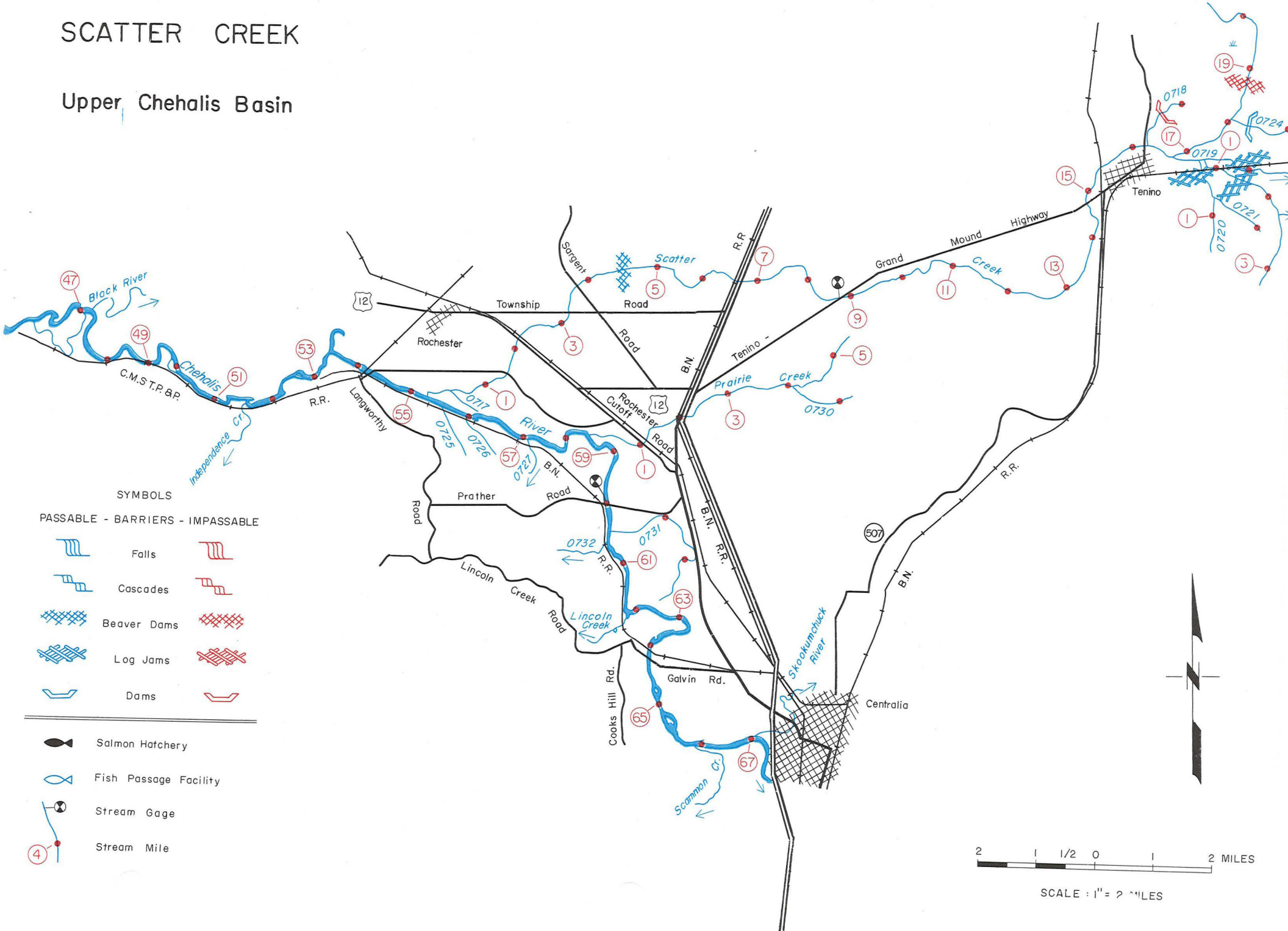


PHOTO 22-22. Long pool-glide area on Chehalis River near R.M. 64.0.

SCATTER CREEK

Upper Chehalis Basin



CHEHALIS RIVER — SCATTER CREEK AREA
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chin.,Chum,Coho
0649	Black River	RB-47.0	28.0	136.0	
	(See Chehalis 2203)				
0696	Independence Creek	LB-51.5	7.8	—	
	(See Chehalis 2403)				
0716	Scatter Creek	RB-55.2	20.6	—	Coho, Chum
0718	Unnamed	RB-16.3	1.1	—	Coho
0719	Unnamed	LB-16.8	3.3	—	Coho
0720	Unnamed	LB-0.4	1.6	—	Coho
0721	Unnamed	RB-0.8	1.0	—	Coho
0722	Unnamed	RB-0.6	1.5	—	Coho
0724	Unnamed	LB-18.1	1.0	—	Unknown
0727	Unnamed	LB-57.15	1.25	—	
	(See Chehalis 2403)				
0729	Prairie Creek	RB-58.35	5.5	—	Coho, Chum
0730	Unnamed	LB-4.1	1.2	—	None
0731	Unnamed	RB-60.4	2.8	—	None
0733	Lincoln Creek	RB-61.9	17.1	—	
	(See Chehalis 2403)				
0757	Scammon Creek	LB-65.9	5.5	—	
	(See Chehalis 3203)				
0761	Skookumchuck River	RB-67.0	40.2	181.0	
	(See Chehalis 2503)				
	(Cont. Chehalis 2703)				

INDEPENDENCE-LINCOLN CREEKS

This section discusses the left bank tributaries to the Chehalis River between mile 50.0 and mile 64.0. The only significant tributaries are Independence and Lincoln creeks. These stream systems have total lengths of over 92.0 miles. The mainstem Chehalis and right bank tributaries to this reach are discussed in Chehalis 2300.

Stream Description

Independence and Lincoln creeks head in low hills and flow in northeasterly directions to the Chehalis River. Independence Creek has five significant unnamed tributaries. Major tributaries to Lincoln Creek include Eagle, Sponenberg, North Fork, South Fork, and several unnamed streams. Each of the forks has one major tributary. The upper reaches of both Independence and Lincoln Creeks flow through narrow valleys in moderately sloped hills. Their lower reaches are in broad stream valleys. The adjacent slopes are generally in second-growth timber production. The majority of the broader stream valleys have been cleared for farming. Rural and farm residences are scattered throughout these lowland valleys. No concentrated residential developments have occurred.

The lower reaches of both Independence and Lincoln Creek have a very low gradient with only fair bank cover provided by deciduous brush. These channels are confined to their course by low-cut banks and average approximately 12 yards wide. Sand and silt are the predominant streambed materials. They generally overflow during the winter months and flood the surrounding farmland. The North and South forks of Lincoln Creek have a low gradient and range in width from 3 to 7 yards in their lower reaches with a moderate to steep gradient in their headwaters. These reaches have adequate bank cover provided by mixed timber. Gravel is the predominant streambed material in these tributaries. Most tributaries to lower Lincoln Creek and Independence Creek have only a limited amount of spawning area.

Salmon Utilization

Independence and Lincoln creeks support good runs of coho and a small run of chum. The small tributaries to the Chehalis River between these two streams may support coho. Major coho spawning areas are on the North and South forks of Lincoln Creek and their tributaries. Several smaller tributaries to Independence Creek appear to have good coho production. The mainstems, in their low gradient reaches, provide transportation water and summer rearing area. A limited amount of chum spawning may occur in these areas. It is estimated that at least 39 linear miles of tributaries are presently in salmon production.

Limiting Factors

Low summer flow in these streams has an adverse effect on juvenile coho rearing. Summer water temperatures in lower Independence and Lincoln creeks are likely to be high during warm weather. This warm water may also support significant populations of predacious fish. Compaction and siltation of the spawning beds reduces the success of chum and coho spawning. Log jams, particularly on North Fork Lincoln Creek and on Wildcat Creek (a tributary of South Fork Lincoln Creek), periodically block coho migrations. Domestic pollution was noted in several tributaries of Independence Creek.

Beneficial Developments

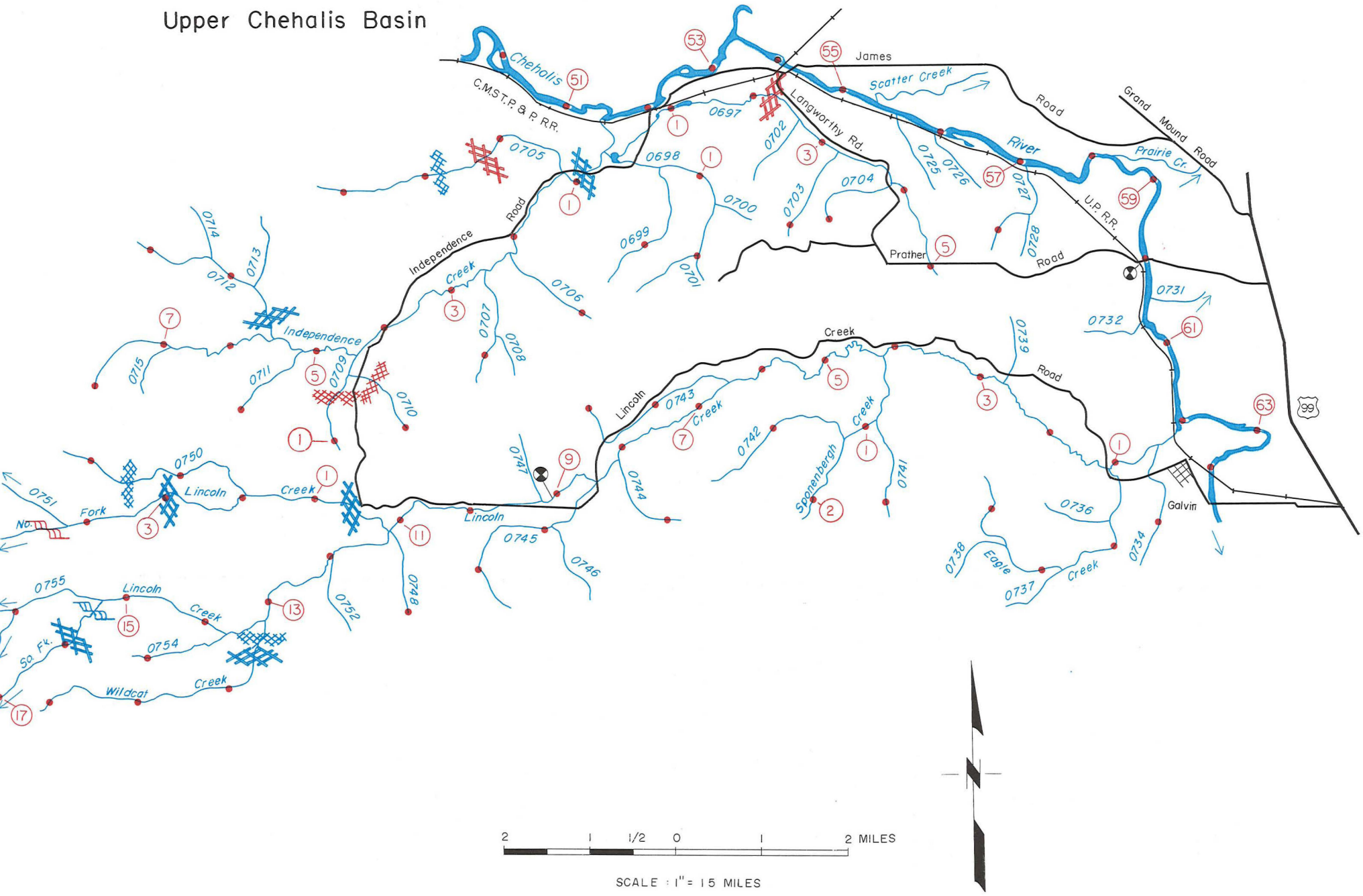
No permanent beneficial developments have been constructed in this section. Some log jam removal has been accomplished in Lincoln Creek.

Habitat Needs

Production levels in these streams will be maintained only with preservation of existing streambed and water quality. Future logging and road construction along the streams and on the steeper slopes must be conducted in a manner to prevent further siltation of the spawning beds. Stream bank cover should be maintained in all areas. Log jam removal on North Fork Lincoln Creek and on Wildcat Creek is recommended.

INDEPENDENCE-LINCOLN CREEKS

Upper Chehalis Basin



INDEPENDENCE-LINCOLN CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chin.,Chum,Coho
0696	Independence Creek	LB-51.5	8.0	—	Coho, Chum
0697	Unnamed	RB-0.5	5.1	—	Coho
0698	Unnamed	LB-0.1	2.9	—	Coho
0699	Unnamed	LB-0.5	1.6	—	Unknown
0703	Unnamed	LB-3.15	1.1	—	Unknown
0704	Unnamed	LB-3.9	1.0	—	Unknown
0705	Unnamed	LB-1.2	3.3	—	Coho
0706	Unnamed	RB-2.3	1.1	—	Unknown
0707	Unnamed	RB-2.6	1.3	—	Coho
0709	Unnamed	RB-4.5	1.15	—	Coho
0710	Unnamed	RB-0.25	1.0	—	Coho
0711	Unnamed	RB-5.15	1.0	—	Coho
0712	Unnamed	LB-5.5	2.2	—	Coho
0716	Scatter Creek	RB-55.2	20.6	—	
	(See Chehalis 2303)				
0727	Unnamed	LB-57.15	1.25	—	Unknown
0729	Prairie Creek	RB-58.35	5.5	—	
	(See Chehalis 2303)				
0731	Unnamed	RB-60.4	2.8	—	
	(See Chehalis 2303)				
0733	Lincoln Creek	LB-61.9	17.1		Coho
0734	Unnamed	RB-0.4	1.5	—	Coho
0735	Eagle Creek	RB-1.1	3.3	—	Coho
0740	Sponenbergh Creek	RB-4.15	2.3	4.52	Coho
0741	Unnamed	RB-0.9	1.2	—	None
0742	Unnamed	LB-1.25	1.8	—	None
0743	Unnamed	LB-6.5	2.0	—	None
0744	Unnamed	RB-8.1	1.2	—	None
0745	Unnamed	RB-8.4	2.55	—	Coho
0748	Unnamed	RB-11.05	1.0	—	None
0749	N. F. Lincoln Cr.	LB-11.1	6.2	—	Coho
0750	Unnamed	LB-1.9	2.4	—	Coho
0751	Unnamed	LB-4.4	1.05	—	None
	Lincoln Cr. cont. as S.F. Lincoln Cr.	@ mi. 11.11		9.56	Coho

INDEPENDENCE-LINCOLN CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0753	Wildcat Cr.	RB-13.1	3.1	—	Coho
0754	Unnamed	RB-13.5	1.2	—	Coho
0755	Unnamed	LB-14.9	1.95	—	Coho
	(Cont. Chehalis 2703)				

SKOOKUMCHUCK RIVER
Lower Mainstem

The lower Skookumchuck River includes the drainage from the river's mouth upstream to Skookumchuck Dam at mile 22.1, an area approximately 120 square miles. The mainstem channel of 22.1 miles has a tributary network of 20 streams with over 125 miles of stream channel, excluding the Skookumchuck River upstream from the dam (see Chehalis 2600).

Stream Description

The Skookumchuck River flows west then southwest from its discharge at Skookumchuck Dam. Major tributaries in this reach include Hanaford, Salmon, Thompson, and Johnson creeks and several smaller streams.

The river valley is a broad flat bordered by low hills. Much of this valley land is used for agriculture with the uplands generally in timber production. The towns of Bucoda and Centralia are located in this section. A number of rural and farm residences are found in the main valley and along the lower nine miles of Hanaford Creek.

The Centralia Steam-Electric Power Plant is located in Hanaford Valley. Coal to operate this plant is mined from Hanaford Valley. Water is pumped from Skookumchuck River near mile 7.2 for steam, coal washing, and other plant use. No water will be returned by surface flow. Skookumchuck Dam provides for storage for this project. Water is released into the stream channel for diversion below.

Skookumchuck River, below the dam, consists of quiet pools and moderate riffles. The river has an average summer width of 20 yards and winter width of 25 yards. Bottom materials are primarily gravel, rubble, and sand. Deciduous vegetation lines most of the stream bank.

Hanaford Creek, the major tributary in this reach, is a low to moderate gradient stream except in its extreme headwaters. The stream has an average width of 5 yards in the summer and 11 yards in the winter. Other tributaries in this reach range up to 10 yards wide during the winter months but most are less than five yards wide. Some of this is dry during the summer months. Streambed material is predominantly clay or sand in the lower reaches of Hanaford Creek and its tributaries, with gravel found in the upper reaches.

Salmon Utilization

The Skookumchuck River provides transportation, spawning, incubation, and rearing waters for coho, spring chinook, and fall chinook salmon. Chum have not been found in this area in recent years. Spawning of these fish occurs on suitable riffle areas between the Skookumchuck Dam and the confluence with the Chehalis River with rearing juveniles present in this same area. Chinook apparently do not utilize the tributary streams. Hanaford Creek has an excellent run of coho with smaller populations found in Thompson, Johnson, and Salmon creeks. Several lesser tributaries support a few coho. Coho spawning generally occurs throughout the accessible reach of the tributary streams. It is estimated that all of the mainstem Skookumchuck and at least 43 linear miles of tributary streams are presently in salmon production.

Limiting Factors

The Skookumchuck watershed has been subjected to many abuses and the salmon runs have suffered accordingly. Dams constructed in past years at mile 3.7, 11.5, and 23.8 were not properly equipped with fish passage facilities and partially or completely blocked upstream migration of salmon. Poaching was common in the vicinity of these dams. The last of these was removed in 1969.

Coal mining in Hanaford Valley resulted in the loss of spawning and rearing area for coho. Logging in the upper watershed has increased siltation of the spawning beds. Log and debris jams have hindered utilization of tributaries.

Tributary streams, except Hanaford Creek, offer very limited rearing area during the dry summer months and many become dry. The lower nine miles of Hanaford Creek and much of its tributary system does not provide suitable spawning habitat.

Beneficial Developments

No beneficial developments for salmon production have been constructed in this area.

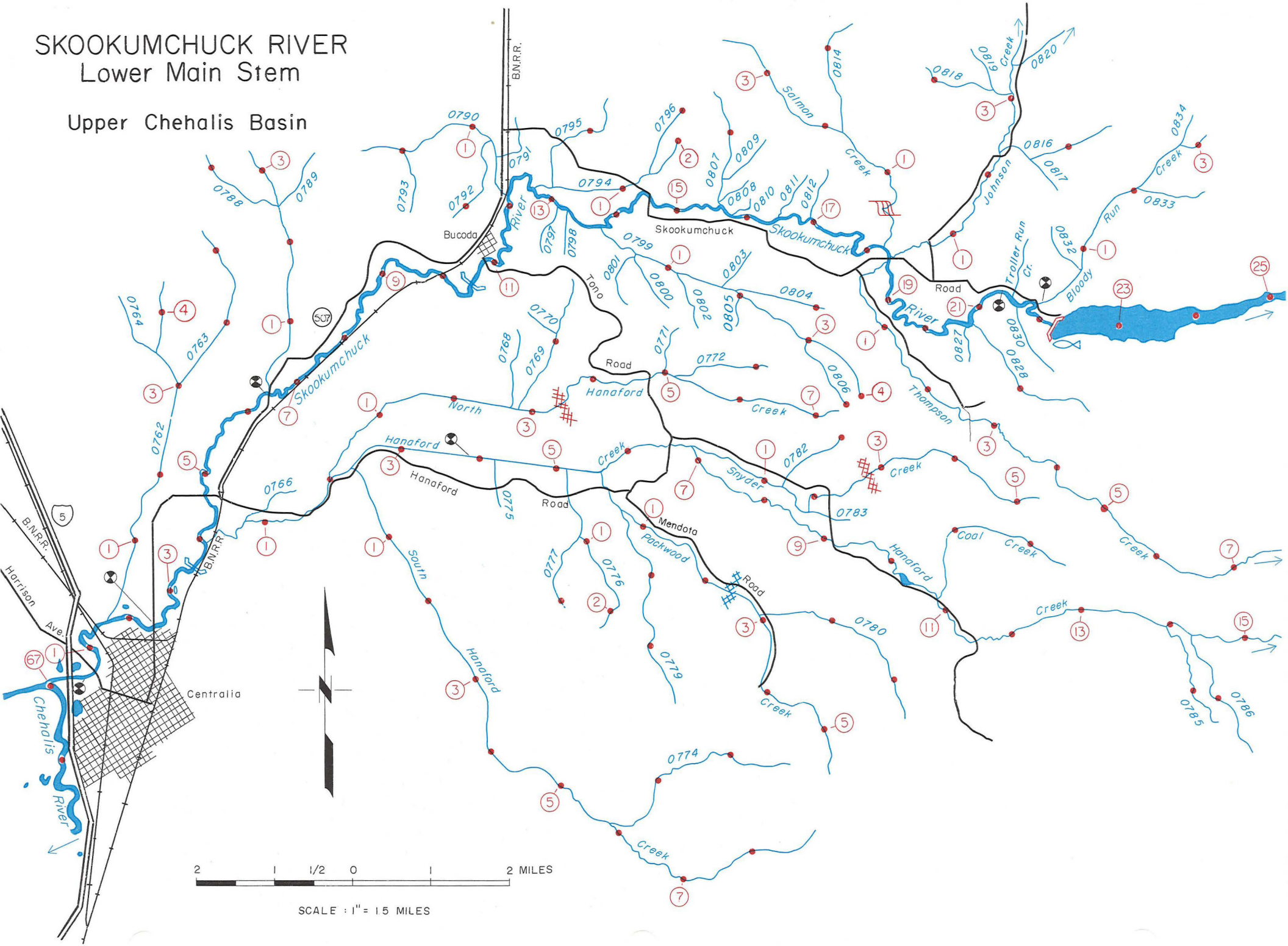
Habitat Needs

Existing water quality must be maintained. Sediment discharge, iron content, total acidity, and total alkalinity are of particular concern. Existing stream flows must be maintained below the pumping station at mile 7.2. Reduction of flood flows would improve spawning and egg incubation conditions. Water withdrawals must be limited and gravel removal in, and adjacent to, the stream channel prohibited.

Measures to maintain salmon runs affected by Skookumchuck Dam will be implemented.

SKOOKUMCHUCK RIVER
Lower Main Stem

Upper Chehalis Basin



SKOOKUMCHUCK RIVER — LOWER MAINSTEM
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chin.,Chum,Coho
0761	Skookumchuck River	RB-67.0	40.2	181.0	Chin.,Chum,Coho
0762	Unnamed	RB-1.8	4.4	—	Unknown
0763	Unnamed	LB-3.05	2.3	—	Unknown
0765	Hanaford Creek	LB-3.85	16.4	58.4	Chum, Coho
0767	N. Hanaford Cr.	RB-2.0	7.2	8.4	None
0769	Unnamed	RB-2.9	1.8	—	None
0772	Unnamed	RB-5.1	1.1	—	None
0773	S. Hanaford Cr.	LB-2.3	8.85	—	None
0774	Unnamed	RB-5.85	2.75	—	None
0776	Unnamed	LB-5.1	2.2	—	None
0777	Unnamed	LB-0.9	1.1	—	None
0778	Packwood Creek	LB-5.6	5.5	—	Chum, Coho
0779	Unnamed	LB-0.7	2.7	—	Coho
0780	Unnamed	RB-2.9	2.5	—	Coho
0781	Snyder Creek	RB-6.85	5.0	4.12	None
0782	Unnamed	RB-1.3	1.0	—	Coho
0784	Coal Creek	RB-10.8	2.6	—	Coho
0785	Unnamed	LB-13.9	1.6	—	Coho
0786	Unnamed	LB-14.3	1.8	—	Coho
0787	Unnamed	RB-6.4	3.3	—	Coho
0788	Unnamed	RB-2.45	1.2	—	None
0790	Unnamed	RB-12.05	2.8	—	Coho
0792	Unnamed	RB-0.75	1.4	—	None
0794	Unnamed	RB-12.7	2.0	—	Coho
0795	Unnamed	RB-0.1	1.55	—	None
0799	Unnamed	LB-13.7	3.8	—	None
0804	Unnamed	RB-1.95	1.0	—	None
0806	Unnamed	LB-3.0	1.0	—	None
0807	Unnamed	RB-15.6	1.5	—	None
0813	Salmon Creek	RB-18.25	3.8	4.28	Coho
0814	Unnamed	LB-1.85	1.5	—	None
0815	Johnson Creek	RB-18.35	6.0	—	Coho
0816	Unnamed	LB-2.4	1.55	—	None
0818	Unnamed	RB-3.1	1.2	—	None

SKOOKUMCHUCK RIVER — LOWER MAINSTEM
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0820	Unnamed	LB-3.4	1.4	—	Coho
0826	Thompson Creek	LB-18.5	8.4	—	Coho
0828	Unnamed	LB-20.8	1.9	—	None
0831	Bloody Run Creek	RB-21.7	3.2	—	None
	(Cont. Chehalis 2603)				

SKOOKUMCHUCK RIVER — UPPER MAINSTEM

The upper Skookumchuck River includes the entire watershed upstream from Skookumchuck Dam at mile 21.9 and encompasses approximately 77 square miles. The mainstem is approximately 20.0 miles in length with 24 tributaries providing over 60 linear miles of stream drainage.

Stream Description

The Skookumchuck River flows generally westward from its headwaters on the slopes of Huckleberry Mountain and Lookout Peak. Major tributaries include Pheeny, Fall, Laramie, and Eleven creeks. There are also a number of lesser named and unnamed inflows.

The upper Skookumchuck River has a steep to moderately steep gradient downstream to Skookumchuck Reservoir. The stream is confined in a narrow valley with some canyon areas. The entire watershed, except for the reservoir area, is in timber production. There is no farmland or residence in this area.

Low to moderate gradient, except for one short canyon, is found for the first 10 miles above the reservoir with a steeply sloped channel above. This lower area contains pools and riffles suited for salmon habitation. The stream has an average width of 17 yards in the summer and about 25 yards in the winter in its lower reach. Gravel and rubble are the dominant bottom materials. The stream is well shaded by marginal vegetation consisting of both deciduous and conifer timber and brush.

Skookumchuck Dam was completed in 1970. This dam provides water storage for the Centralia Steam-Electric Power Plant located in Hanaford Valley (see Section 2100). The reservoir has a storage capacity of 34,800 acre-feet and a surface area of 550 acres at full pool.

Tributaries of the upper Skookumchuck River are generally precipitous throughout their entire lengths. Moderately-sloped channels are found only in the lower reaches of Pheeny, Eleven, and Twelve creeks. All tributaries are less than 10 yards wide during the winter months and less than 5 yards wide during the summer. Some of the tributaries are dry in the summer. Gravel and rubble are the major bottom materials.

Salmon Utilization

Prior to construction of Skookumchuck Dam, coho utilized the river up to an impassable falls near mile 28.9. Coho spawning and rearing also occurred in the lower reaches of Pheeny Creek. Other tributaries have impassable falls at or near their confluence with the Skookumchuck River.

Both fall and spring chinook spawned and reared in the mainstem throughout the present reservoir prior to the dam. Salmon formerly utilized 7 miles of the Skookumchuck River and 1 mile of the branch streams. Future use of this area for salmon production is dependent upon negotiations with the operators of Skookumchuck Dam. It is presently anticipated that the upriver production will be replaced in the lower river and by artificial propagation (see Chehalis 2500).

Limiting Factors

Salmon production in the upper Skookumchuck River has been dependent on passage of adult salmon at dams located on the lower river at miles 3.7 and 11.5 and 23.8. All of these were at least partial barriers to salmon migration during their years of operation.

A low flow block in the canyon near mile 25.5 prevented further upstream migration of chinook and a high falls at mile 28.9 blocked coho. Steelhead are able to negotiate this falls. Limited spawning area for coho is found above this falls.

Log jams periodically collected in several areas and barred migration of adult salmon.

Beneficial Developments

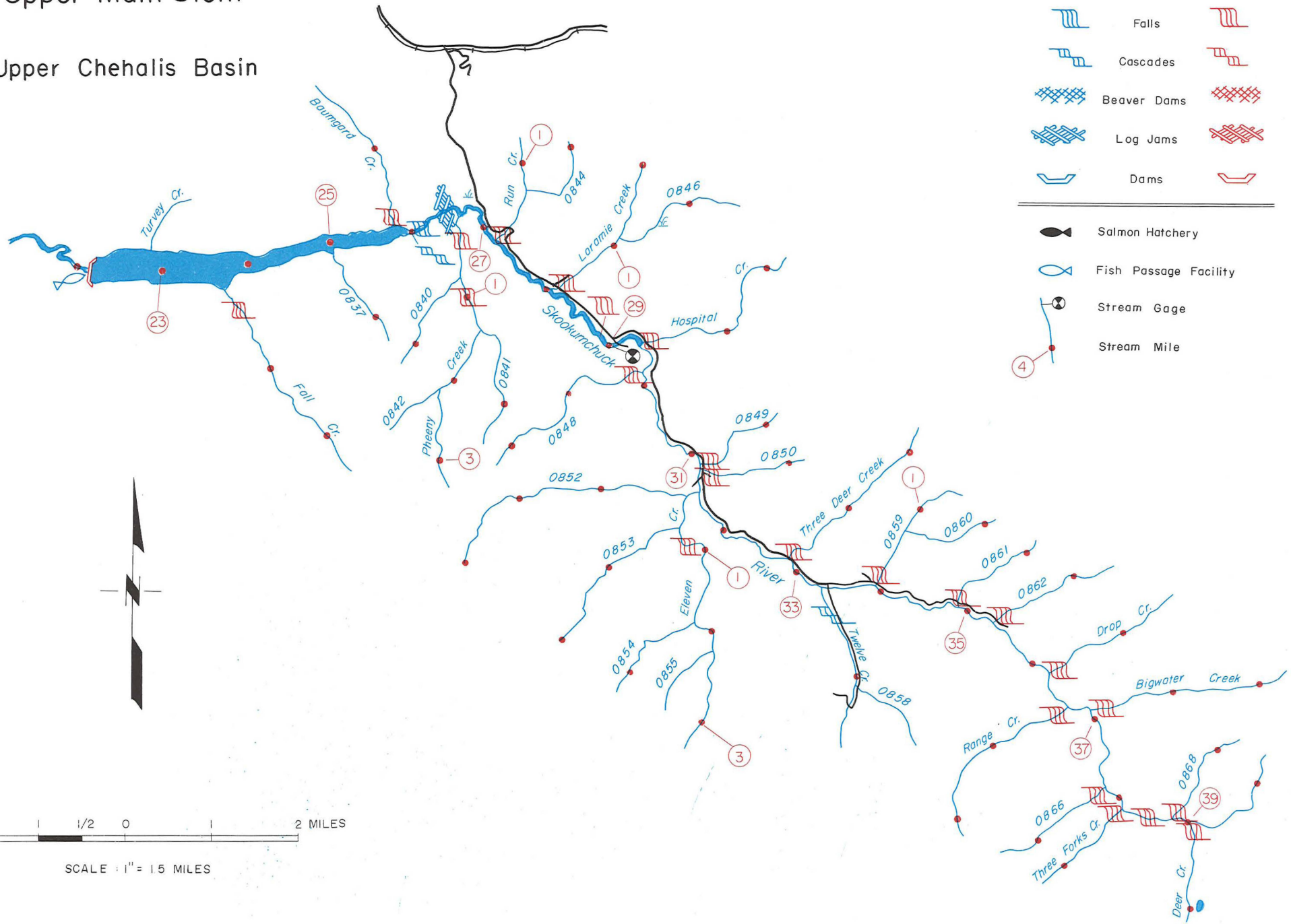
No beneficial developments have been constructed in this area.

Habitat Needs

Successful coho rearing could be expected if adults are released in the upper river or fry plants made. In question, however, is the success of passage through Skookumchuck Reservoir. Large populations of predator fish are anticipated. Survival through the dams during periods of non-spill is also in doubt.

SKOOKUMCHUCK RIVER
Upper Main Stem

Upper Chehalis Basin



SKOOKUMCHUCK RIVER — UPPER MAINSTEM
(mile 22.1 to headwaters)
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chin.,Chum,Coho
0761	Skookumchuck River				Chinook, Coho
0836	Fall Creek	LB-23.6	2.5	—	Coho rearing
0837	Unnamed	LB-24.55	1.3	—	None
0838	Baumgard Creek	RB-25.7	1.9	—	None
0839	Pheeny Creek	LB-26.6	3.4	—	Coho
0840	Unnamed	LB-0.8	1.25	—	None
0841	Unnamed	RB-1.4	1.5	—	None
0843	Run Creek	RB-27.2	1.3	—	None
0844	Unnamed	LB-0.7	1.1	—	None
0845	Laramie Creek	RB-28.1	2.0	—	None
0846	Unnamed	LB-1.1	1.6	—	None
0847	Hospital Creek	RB-29.55	2.4	—	None
0848	Unnamed	LB-29.95	2.35	—	None
0849	Unnamed	LB-31.2	1.2	—	None
0850	Unnamed	LB-31.25	1.15	—	None
0851	Eleven Creek	LB-31.5	3.4	7.25	None
0852	Unnamed	LB-0.15	3.0	—	None
0853	Unnamed	LB-0.5	2.0	—	None
0854	Unnamed	LB-1.8	1.3	—	None
0856	Three Deer Creek	LB-32.8	2.3	—	None
0857	Twelve Creek	LB-33.35	1.9	—	None
0859	Unnamed	RB-33.9	1.5	—	None
0860	Unnamed	LB-0.7	1.2	—	None
0861	Unnamed	RB-34.9	1.2	—	None
0862	Unnamed	RB-35.35	1.5	—	None
0863	Drop Creek	RB-36.15	1.8	—	None
0864	Range Creek	LB-36.7	2.2	—	None
0865	Bigwater Creek	RB-36.9	2.3	—	None
0866	Unnamed	LB-37.85	1.3	—	None
0867	Three Forks Creek	LB-38.15	1.3	—	None
0868	Unnamed	RB-38.7	1.3	—	None
0869	Deer Creek	LB-38.9	1.2	—	None

CHEHALIS RIVER—CENTRALIA AREA

This area includes the Chehalis River and all right bank tributaries upstream from the mouth of the Skookumchuck River to the mouth of the Newaukum River. The area provides 8.4 miles of mainstem Chehalis and 3 tributaries with 42.3 miles of stream drainage.

Stream Description

The Chehalis River follows a meandering course in a northerly direction throughout this reach. The right bank tributaries to the Chehalis River in this reach include China, Salzer, Coal, and Dillenbaugh creeks.

Most of the broad Chehalis valley east of the river in this area has been heavily developed. This area contains the cities of Centralia and Chehalis. Non-residential areas are used for farming. The low reaches of the majority of the tributary streams have been cleared and are in agricultural use. Upland areas are in timber production.

Most of the Chehalis River in this reach is confined to a deeply cut, meandering channel averaging 50 yards wide. The banks are generally lined with deciduous timber and brush. Most of the stream area consists of quiet pools with only an occasional riffle.

Sand and silt for the major portion of the streambeds of Salzer and China creeks, while Dillenbaugh and its tributary, Berwick Creek, have gravel bottoms except in their low gradient areas in the Chehalis River valley where sand predominates. Of the minor Chehalis River tributaries, only upper Dillenbaugh and Berwick creeks have adequate streamside vegetation. The other streams have been channelized for considerable length to facilitate field drainage.

Salmon Utilization

The mainstem of the Chehalis provides transportation water for runs of fall and spring chinook, coho, and chum. A few fall chinook spawn in this reach. Juvenile rearing, particularly during the summer months, is limited. Very little spawning is expected to occur in this reach. Very small runs of coho utilize China and Salzer creeks. Dillenbaugh and its tributary, Berwick Creek, have good facilities for spawning coho; however, the rearing capacity of these streams is small. Shad spawn and rear in the Chehalis in this section. All of the Chehalis River in this section and approximately 31 linear miles of tributaries are presently utilized by salmon.

Limiting Factors

The major limiting factor in this section is the poor water quality of the Chehalis River. This reach is affected by high water temperatures during the summer and early fall months and by pollution from the cities of Centralia and Chehalis. A limited amount of chinook spawning area exists. Oxygen levels in this reach during low flows are frequently critically low. Salzer and China creeks contain very little spawning or suitable rearing area for salmon. Low flows in all tributaries limit success of coho rearing. Agricultural pollution has caused kills of coho fingerlings in Dillenbaugh and Berwick creeks.

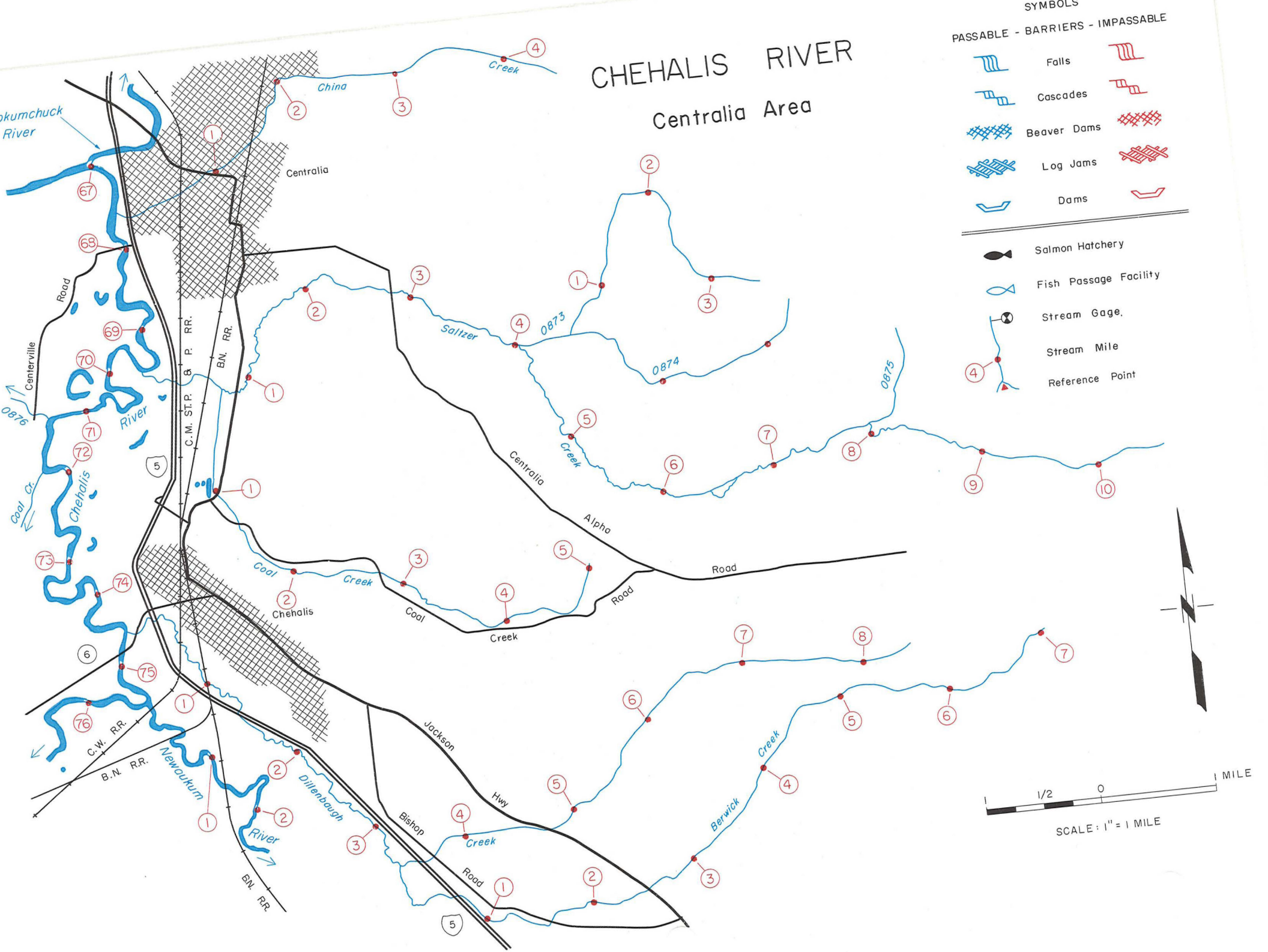
Beneficial Developments

No beneficial developments for salmon production have been constructed in this area.

Habitat Needs

Water quality in this area of the Chehalis River must not be allowed to deteriorate further. Improved sewage facilities should be constructed to handle municipal and industrial effluent.

PHOTO 22-23. Dillenbaugh Creek offers coho spawning and rearing area.


CHEHALIS RIVER
Centralia Area
SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage.
Stream Mile
Reference Point
Centralia
China Creek
Saltzer Creek
0873
0874
0875
0876
Centerville Road
Coal Cr.
Chehalis River
Newaukum River
Coal Creek
Centralia Alpha Road
Jackson Hwy
Bishop Road
Dillenbaugh Creek
Berwick Creek
C.M. ST.P. & P. RR.
B.N. RR.
C.W. RR.
B.N. RR.
B.N. RR.
Chehalis
1/2
0
1 MILE
SCALE: 1" = 1 MILE

CHEHALIS RIVER — CENTRALIA AREA
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chin.,Coho,Chum
0761	Skookumchuck River	RB-67.0	40.2	—	
	(See Chehalis 2503)				
0870	China Creek	RB-67.6	4.5	—	Coho
0871	Salzer Creek	RB-69.4	10.6	—	Coho
0872	Coal Creek	LB-0.8	5.0	—	Coho
0873	Unnamed	RB-4.1	3.4	—	Unknown
0874	Unnamed	LB-0.45	2.4	—	Unknown
0876	Unnamed	LB-71.3	1.1	—	
	(See Chehalis 3203)				
0877	Coal Creek	LB-71.8	2.8	—	
	(See Chehalis 3203)				
0880	Dillenbaugh Creek	RB-74.7	8.4	—	Coho
0881	Berwick Creek	LB-3.4	7.1	—	Coho
0882	Newaukum River	RB-75.4	37.3	158.0	
	(See Chehalis 2803)				
	(Cont. Chehalis 3203)				

NEWAUKUM RIVER

This reach includes the Newaukum River from the confluence of North and South Forks Newaukum River downstream to the Chehalis River. This area contains 21.0 square miles of drainage area with 10.8 miles of mainstem river and two tributaries with an additional 11.5 linear miles of stream drainage.

Stream Description

The Newaukum River flows in a generally west direction downstream from the confluence of its two major forks. Two small tributaries, Allen and Taylor creeks, enter the mainstem in this section. Most of the lowlands along the Newaukum River are in agricultural production with numerous farm and rural residences.

The Newaukum River has a low gradient through most of its length. The stream meanders through cleared farmland and patches of deciduous brush. The stream contains a number of deep pools with shallow riffles interspersed. The stream channel averages 10 to 25 yards in width and its bed is composed primarily of rubble and gravel. Stream bank cover is generally adequate. Gradient is low in the river with a low to moderate gradient in the two tributaries. Allen and Taylor creeks average 1 to 2 yards in width and consist primarily of pools with short riffle areas. Stream bank cover is adequate and beds are composed primarily of gravel and sand.

Salmon Utilization

Newaukum River provides transportation and rearing area for juveniles and adults. Both spring and fall chinook spawn in the mainstem. Juvenile rearing occurs throughout this river. The stream contains a number of deep pools necessary for the maturation of adult spring chinook. The smaller tributaries support coho. Shad spawn in the lower river. All of the mainstem Newaukum River and approximately 4 linear miles of tributaries are presently utilized by salmon.

Limiting Factors

Gravel mining operations on the Newaukum River have resulted in instability and siltation of the streambed in a number of areas. During periods of low summer flows, water temperatures are often quite high. Limited spawning and rearing areas exist in Allen Creek and Taylor Creek. Taylor Creek has several beaver dams which block upstream migration.

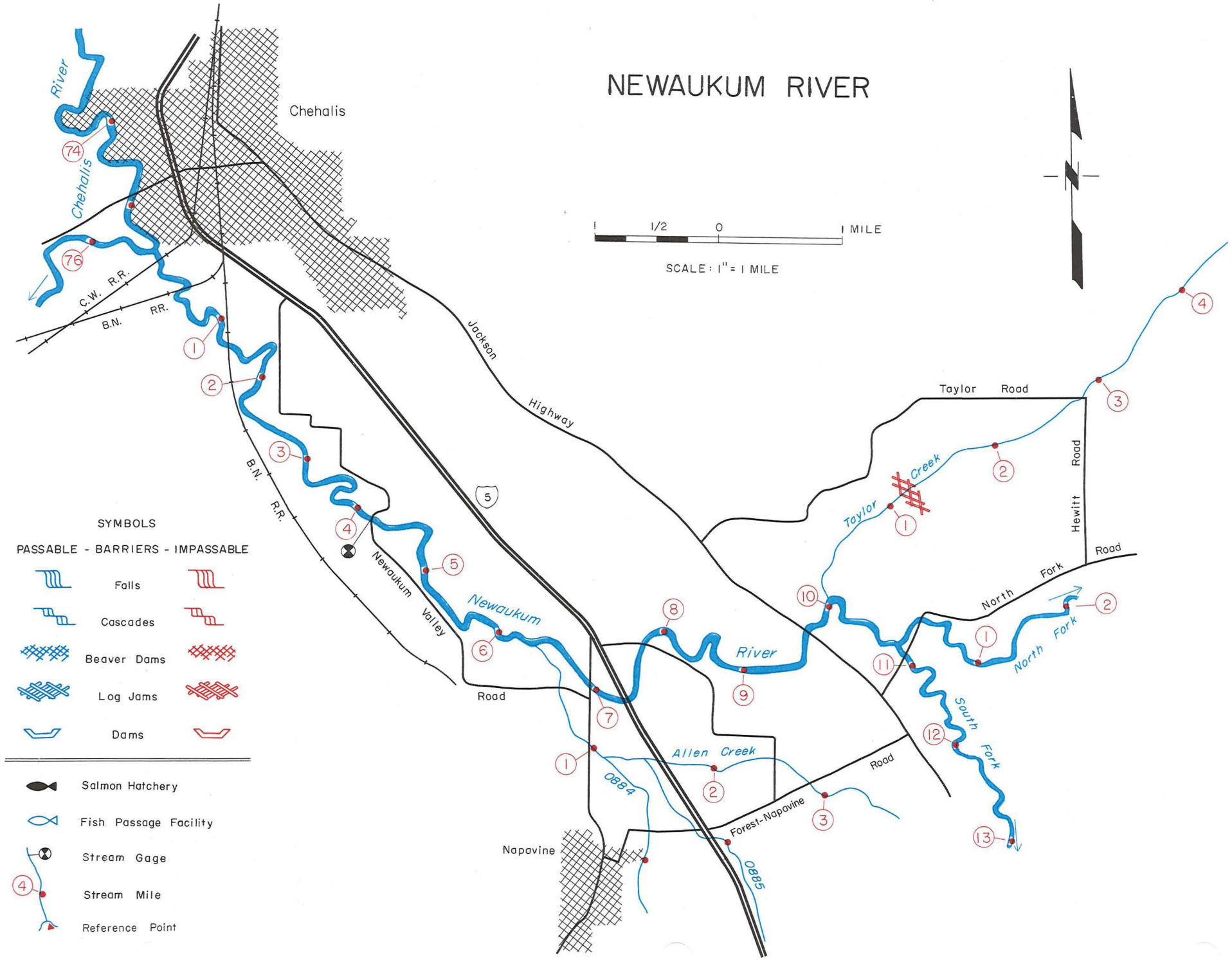
Beneficial Developments

No beneficial developments for salmon production have been constructed in this area.

Habitat Needs

Gravel removal should not be permitted in the Newaukum River. Better chinook runs can be expected with improved streambed stability and quality. Minimum flows for fisheries protection should be established in the Newaukum River. Beaver dams on Taylor Creek should be removed to provide additional spawning and rearing areas.

PHOTO 22-24. Gravel removal operations degrade spawning and rearing habitat.


NEWAUKUM RIVER
Chehalis
River
Chehalis
74
76
C.W. R.R.
B.N. RR.
1
2
3
4
5
6
7
8
9
10
11
12
13
B.N. R.R.
Newaukum Valley Road
Jackson Highway
5
Newaukum River
Taylor Road
Taylor Creek
Hewitt Road
North Fork Road
North Fork
South Fork
Allen Creek
0884
0885
Forest-Napavine Road
Napavine
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

NEWAUKUM RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0882	Newaukum River	RB-75.4	37.3	158.0	Chinook, Coho
0883	Allen Creek	LB-6.4	3.7	—	Coho
0884	Unnamed	LB-1.1	1.4	—	Unknown
0885	Unnamed	LB-1.5	1.9	—	Unknown
0886	Taylor Creek	RB-10.05	4.5	—	Coho
0887	N. Fk. Newaukum R.	RB-10.8	19.4	70.8	
	(See Chehalis 2903)				
	Newaukum R. cont. as S.F. Newaukum R.	@ mi. 10.81		62.2	
	(Cont. Chehalis 3003)				

NORTH FORK NEWAUKUM RIVER

This section includes the entire North Fork Newaukum River watershed of 70.8 square miles. The North Fork Newaukum River is 19.4 miles in length with 14 tributaries providing nearly 60 miles of tributary streams.

Stream Description

The North Fork maintains a westerly course, heading in steep hills and flowing through a gradually broadening river valley to its confluence with the South Fork. Along this course the North Fork picks up a number of tributary streams, including three large unnamed creeks and Mitchell Creek, Lucas Creek, and Middle Fork Newaukum River.

Agricultural production occurs in the lower 10 miles of the North Fork valley and along portions of Middle Fork and Lucas Creek. Most of the valley slopes are in timber production. Deciduous timber and brush provide bank cover. Farm and rural residences are common throughout the lower 10 miles of the North Fork valley, on the middle reach of the Middle Fork, and the lower half of Lucas Creek. No major residential developments are found in this drainage.

Gravel and rubble are the predominant features of the streambed in the moderate gradient area of the lower 10 miles of the North Fork. This is also the predominant feature of the lower Middle Fork. The steeper gradient upper North Fork contains outcroppings of bedrock and an abundance of gravel. Tributary streambeds are generally composed of gravel and have a moderate gradient. The stream channels in this area are generally confined by low banks on either side. Little evidence of extensive artificial channelization exists. The streams provide a balance of pools and riffles suited for salmon production with few rapids. The lower North Fork has an average width of 20 yards. Tributary streams, in their lower reaches, range from 2 to 7 yards wide.

Salmon Utilization

The North Fork watershed supports runs of both spring and fall chinook and coho. Chum are not known to be present. Chinook spawning is generally confined to the lower 10 miles of the North Fork. The North Fork contains a small number of pools suited for maturation of adults and supports a juvenile coho and spring chinook. Coho production occurs in virtually all of the accessible reaches of tributary streams. The major coho spawning areas are located on Lucas Creek and lower Mitchell Creek. Salmon presently utilize 17 miles of the main North Fork and an estimated 41 linear miles of tributaries.

Limiting Factors

A number of limiting factors affect salmon production in the North Fork Newaukum River watershed. One of the major factors is the municipal diversion by the cities of Centralia and Chehalis at river mile 12.5. Flow below the diversion during low flow periods consists largely of tributary inflow only. High temperatures are found in the lower river along with concentrations of predatory fish. The water intake dam, constructed on top of a small falls, was a barrier to virtually all adult salmon reaching this point prior to 1970. Siltation of the spawning gravels throughout this watershed is extensive. Low flows are critical in the Middle Fork Newaukum, the lower reaches of which consist of isolated pools during the summer months. This stream also has a number of log jams and beaver dams which prevent salmon from reaching the upper areas. A high falls on Mitchell Creek limits coho production to its lower reaches.

Beneficial Developments

In 1970 a fish ladder was constructed on the falls at the diversion dam. This will assure continued access to the coho production area in the upper watershed.

Habitat Needs

The present spring chinook run in the North Fork Newaukum is but a remnant of the formerly large runs. Further degradation of streambed quality, increased water diversion and associated higher water temperatures may result in total loss of this species. Fall chinook production, while small at the present time, can be increased if gravel cleaning techniques are applied to the spawning beds of the North Fork. Further deterioration of habitat in several tributaries may result in further reduction of the coho runs. No gravel removal operations should be permitted in this watershed. Channel alterations should be permitted only to prevent further erosion and siltation of spawning gravels. These should be accomplished without modifying the stream course.

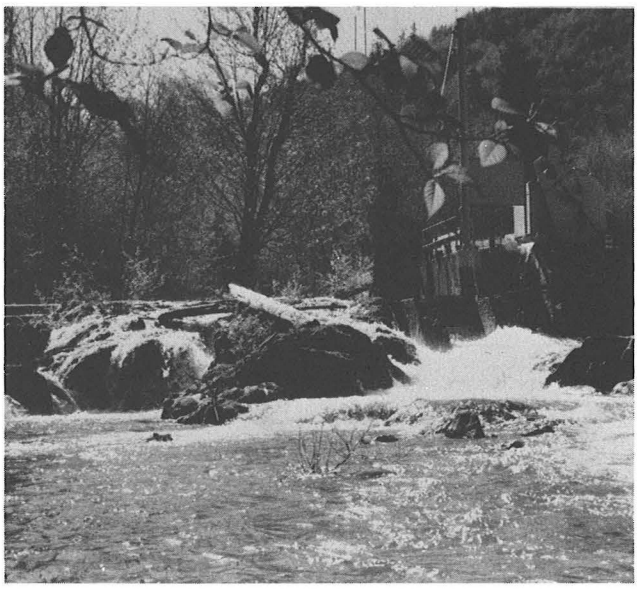
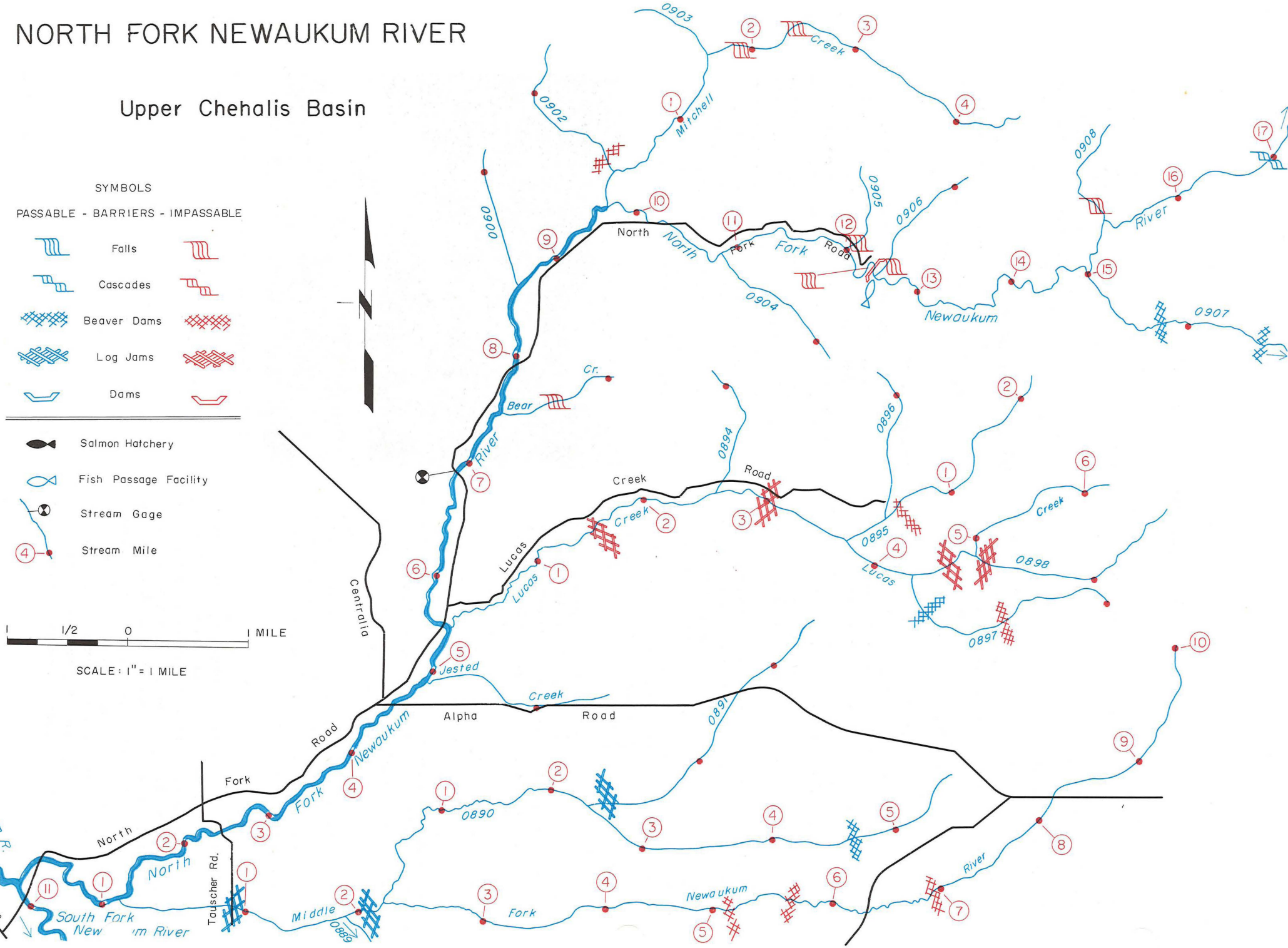


PHOTO 22-25. Municipal water diversion facility at R.M. 12.5.

NORTH FORK NEWAUKUM RIVER

Upper Chehalis Basin



NORTH FORK NEWAUKUM RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0882	Newaukum River				Chinook, Coho
0887	N. F. Newaukum R.	RB-10.8	19.4	70.8	Chinook, Coho
0888	M.F. Newaukum R.	LB-1.2	10.0	17.7	Coho
0889	Unnamed	LB-1.9	1.6	—	Coho
0890	Unnamed	RB-2.2	5.6	—	Coho
0891	Unnamed	RB-2.3	2.5	—	Coho
0892	Jested Creek	LB-4.9	1.7	—	Coho
0893	Lucas Creek	LB-5.4	6.2	—	Chinook, Coho
0894	Unnamed	RB-2.6	1.15	—	Coho
0895	Unnamed	RB-3.7	2.25	—	Coho
0896	Unnamed	RB-0.35	1.3	—	Coho
0897	Unnamed	LB-4.3	2.0	—	Coho
0898	Unnamed	LB-4.85	1.8	—	None
0899	Bear Creek	LB-7.5	1.05	—	Coho
0900	Unnamed	RB-8.6	1.1	—	Coho
0901	Mitchell Creek	RB-9.7	4.6	5.82	Coho
0902	Unnamed	RB-0.3	1.4	—	Coho
0904	Unnamed	LB-10.8	1.2	—	Coho
0906	Unnamed	RB-12.6	1.1	—	None
0907	Unnamed	LB-15.0	5.5	—	Coho
0909	Unnamed	RB-17.5	2.1	—	Coho
0910	Unnamed	LB-0.75	1.4	—	Coho
0911	Unnamed	RB-18.3	1.1	—	Coho

SOUTH FORK NEWAUKUM RIVER

Lower Mainstem

This section describes the South Fork Newaukum River downstream from the mouth of Kearney Creek. The area contains 16.2 miles of mainstem channel and two tributaries with only 3.1 miles of stream drainage. The South Fork upstream from, and including, Kearney Creek is discussed in Chehalis 3100.

Stream Description

The South Fork Newaukum River flows in a meandering course in a westerly direction below Kearney Creek. Only two small tributary streams, Lost and Gheer creeks, enter this reach.

The streams in this area run through a broad river valley for their entire lengths. Virtually all of this valley land has been cleared and is presently used for farming. The low range of hills on either side of the valley is forested with second-growth timber. The streams have low to moderate gradients. Deciduous timber and brush provide adequate stream bank cover throughout most reaches. Farm and rural residences are scattered in the lowland areas. The town of Onalaska is located near the South Fork near mile 20. [1]

The South Fork Newaukum River provides a uniform habitat throughout this reach. The stream channel has an average width of 20 yards and is generally confined to its course by low cut banks. The stream contains a number of deep pools with good riffle areas. No rapids were found. Gravel and rubble are the major features of the streambed. Most of this river has excellent bank cover in the form of deciduous timber and brush. Water temperature and flow are generally good.

The two tributaries to this reach of the South Fork are quite small. Their lower reaches are 3 yards wide. Gheer Creek has adequate stream bank cover; however, its streambed is composed primarily of silt, sand, and small gravel. Portions of Lost Creek have been channelized. Its streambed is primarily sand and silt. The stream lacks adequate bank cover in a number of areas. Both of these tributaries have a low gradient.

Salmon Utilization

South Fork Newaukum River supports runs of coho and both spring and fall chinook salmon. The river channel serves as transportation water for salmon destined for upriver spawning areas and also provides major spawning area for chinook. Virtually all of the coho production in the South Fork Newaukum River occurs in the upper reaches and its tributaries. Some limited coho production also occurs in Gheer and Lost creeks. The South Fork has excellent rearing habitat for juvenile coho and spring chinook. Cool water temperatures and a number of deep pools provide excellent resting and maturation area for adult salmon. All of the mainstem South Fork and approximately 3 linear miles of tributaries in this section are utilized for salmon production.

[1] *Mileages in the River Mile Index have been continued on the South Fork Newaukum River upstream from the Newaukum. The mouth of the South Fork is mile 10.8.*

Limiting Factors

The major limiting factors in this section of the South Fork Newaukum River are the result of extensive gravel removal operations in the streambed. These operations have affected streambed stability and degraded streambed quality. Siltation of the gravel has resulted in reduced survival of incubating eggs. Domestic and industrial pollution from Onalaska formerly affected water quality. Gheer and Lost creeks have only a limited amount of coho rearing and spawning area. A dam on Gheer Creek is a barrier to coho, but little production area would be gained by its removal.

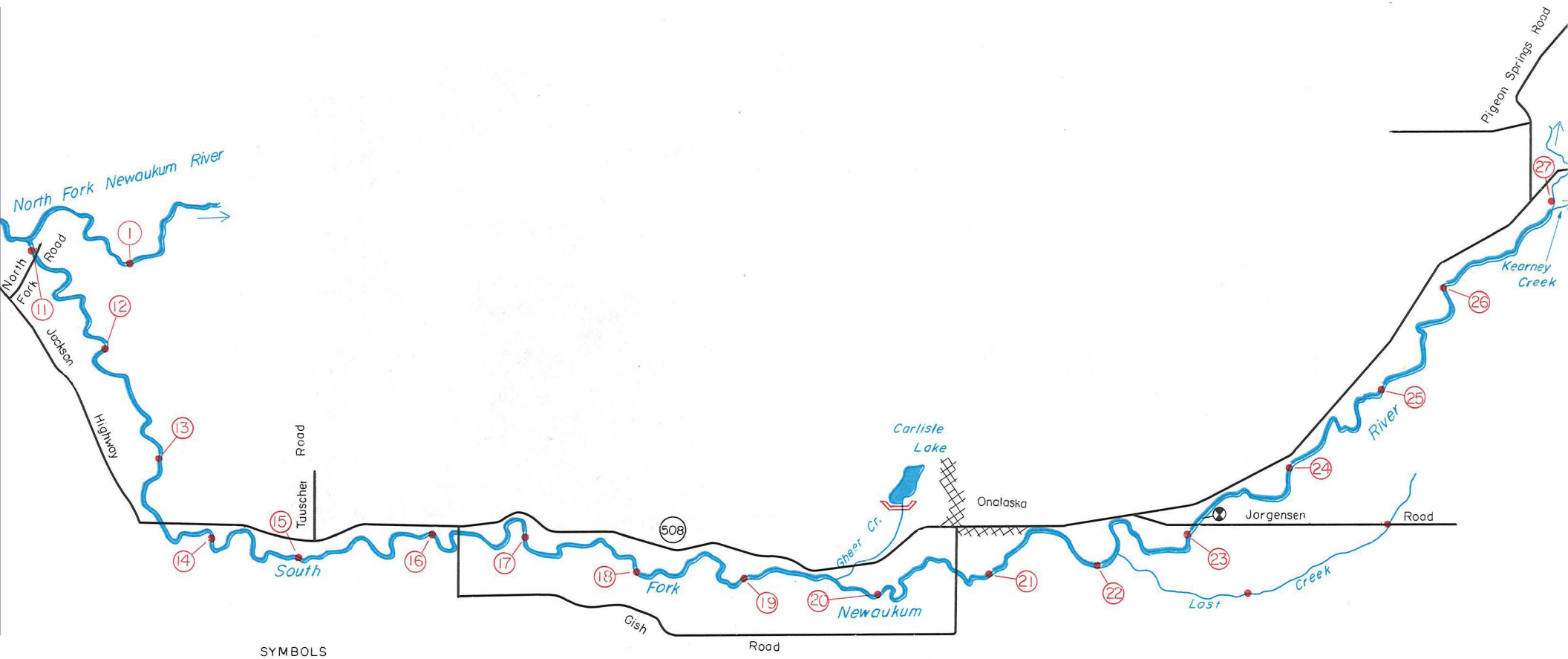
Beneficial Developments

No beneficial developments have been constructed in this watershed.

Habitat Needs

Maintenance of the spring chinook run in the Chehalis River Basin probably depends on its continuation in the South Fork Newaukum. The small runs present in other Chehalis River tributaries may be drastically reduced by increased water diversions, extensive logging, and dam construction. Runs maintained in the South Fork could serve as a brood stock source for spring chinook eggs to be reared and released elsewhere in the Chehalis River system. Gravel removal operations should not be permitted in this area. Any water-use project must provide for continued summer flows at present levels and temperatures.

PHOTO 22-26. Spring chinook spawning area on South Fork Newaukum River below Kearney Creek.



SYMBOLS

PASSABLE - BARRIERS - IMPASSABLE

- Falls
- Cascades
- Beaver Dams
- Log Jams
- Dams

- Salmon Hatchery
- Fish Passage Facility
- Stream Gage
- Stream Mile

SOUTH FORK NEWAUKUM RIVER

Lower Main Stem

Upper Chehalis Basin

1 1/2 0 1 MILE

SCALE : 1" = 1 MILE

SOUTH FORK NEWAUKUM RIVER
Lower Mainstem
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0882	Newaukum River				
	Newaukum R. cont. as S.F. Newaukum R.	@ mi. 10.81		66.2	Chinook, Coho
0914	Lost Creek	LB-22.1	2.4	2.36	Coho
0915	Kearney Creek	LB-27.0	5.3	—	
	(See Chehalis 3103)				
	(Cont. Chehalis 3103)				

SOUTH FORK NEWAUKUM RIVER
Upper Mainstem

This section includes the upper South Fork Newaukum River watershed upstream from, and including, Kearney Creek. This section includes 10.3 miles of mainstem channel and 9 tributaries with an additional 35 linear miles of stream drainage.

Stream Description

South Fork Newaukum River heads in Newaukum Lake and flows westerly for several miles through narrow valleys. The course then changes to southwest as the river approaches the gradually broadening lowland valley. The South Fork picks up a number of unnamed tributaries in addition to Bernier, Beaver, Frase, and Kearney creeks.

The upper reaches of the South Fork Newaukum lie in steep, low mountain terrain in timber production. Most of the stream area in this upper watershed above mile 33 has a steep gradient. Stream bank cover, coniferous and deciduous timber, is generally adequate to provide for cool water temperatures in the lower river. There has been no farm or residential development in the valley upstream from mile 30. Below here the valley broadens rapidly and farmland is encountered. Much of the Kearney Creek valley has been cleared for agricultural use. Limited rural and farm residences are scattered along the South Fork upstream to mile 30 and along lower Kearney Creek.

The South Fork Newaukum River averages 15 yards wide near the mouth of Kearney Creek with generally good to excellent stream bank cover. The channel is generally confined to a narrow valley or low banks. The streambed is predominantly gravel and rubble with frequent outcroppings of bedrock and appears to be quite stable.

Lower Kearney Creek, the largest tributary, has an average width of 5 yards with generally good stream bank cover provided by deciduous brush and timber. The lower reaches of this stream have a moderate gradient with steeper gradients encountered near its headwaters. The streambed is composed primarily of gravel and sand. The other tributaries to the South Fork in this section range from 2 to 4 yards wide in their lower reaches. The upper stream channels on these creeks have a moderate to steep gradient, with lower gradients encountered near the confluence with the South Fork. Gravel is the predominant bottom material in these streams and stream bank cover is generally good to excellent. The lower reaches of these streams have pool and riffle characteristics necessary for salmon production.

Salmon Utilization

This section of the South Fork watershed supports runs of both spring and fall chinook and coho. The majority of the chinook production occurs in the mainstem downstream from mile 31. Limited chinook production may occur in lower Kearney Creek. The South Fork is well suited for spring chinook production with ample spawning, rearing, and resting area available. Coho utilize the accessible tributary streams, with spawning also occurring in the mainstem. All accessible waters serve as fair to good coho rearing areas with the mainstem also utilized by juvenile spring chinook. Salmon presently utilize 5 miles of mainstem in this section and about 14 linear miles of tributaries.

Limiting Factors

Salmon production in this section has been reduced by siltation of the spawning gravels resulting from logging of the watershed. Road construction and logging on several tributaries has resulted in degradation of streambed and water quality. The most severe problem exists on Bernier Creek. Logging on several tributaries has been accomplished with complete disregard for the salmon habitat. A series of falls on the South Fork upstream from mile 31 apparently block salmon from reaching some potential production areas upstream.

Beneficial Developments

No beneficial developments have been constructed in this section.

Habitat Needs

The upper South Fork is one of the most important spring chinook spawning and rearing areas in the Chehalis Basin. Water quantity and quality are excellent for their needs. Logging activity is expected to increase in this area. Attention must be paid to protection of water and streambed quality if this run is to be maintained. This stream could provide an egg source for hatchery production or rehabilitation of spring chinook runs elsewhere in the Chehalis Basin.

Water diversion projects proposed for the upper watershed must not be allowed to increase water temperatures or reduce summer flows. No gravel removal should be permitted in this area.

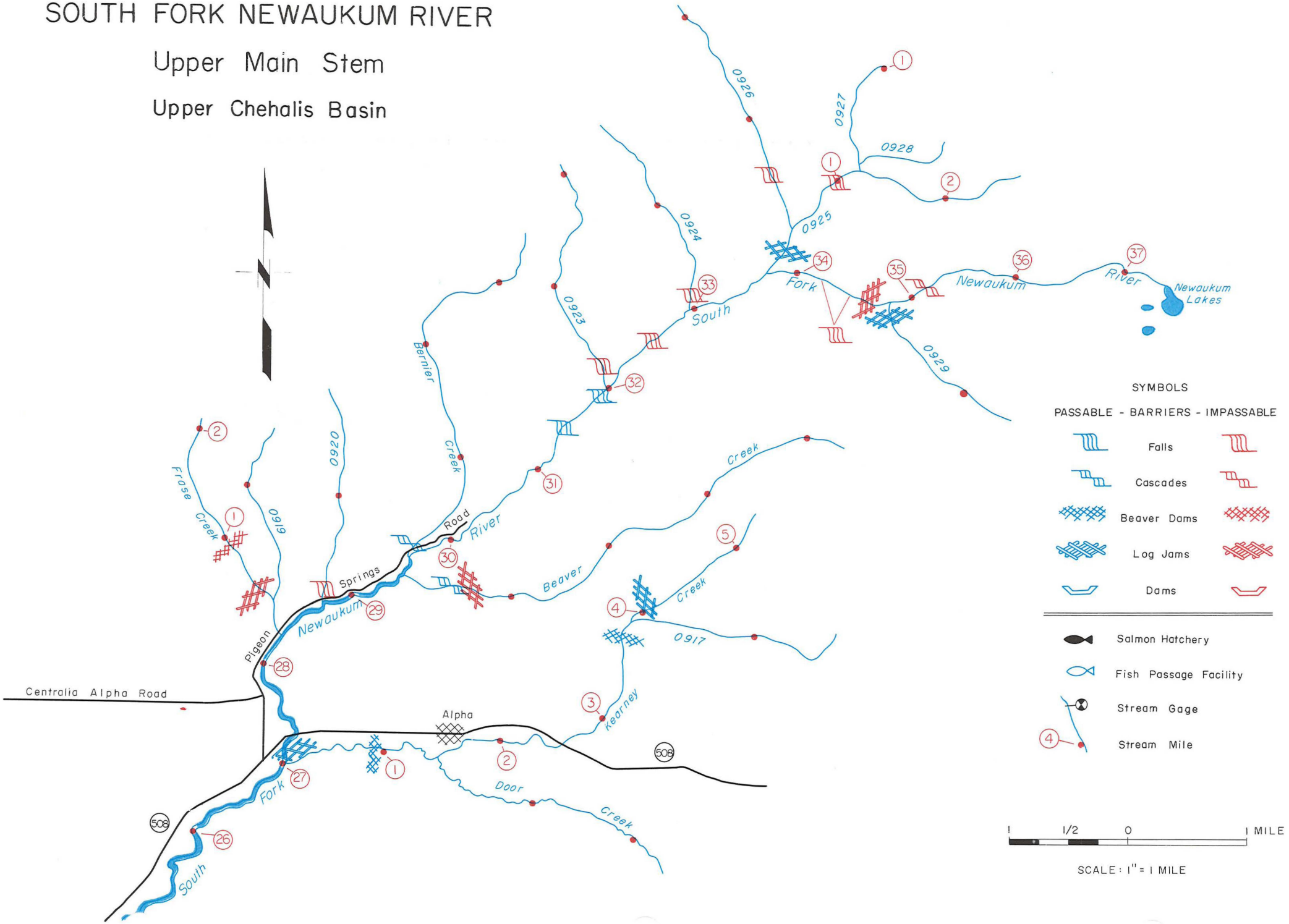
Further reduction in water and streambed quality on several tributary streams will result in even further reduction of coho production.

PHOTO 22-27. Large jams of debris are common above R.M. 31.0 on the South Fork.

SOUTH FORK NEWAUKUM RIVER

Upper Main Stem

Upper Chehalis Basin



SOUTH FORK NEWAUKUM RIVER
Upper Mainstem
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0882	Newaukum River				
	Newaukum R. cont. as S.F. Newaukum R.	@ mi. 10.81		66.2	Chinook, Coho
0915	Kearney Creek	LB-27.0	5.3	10.3	Coho
0916	Door Creek	LB-1.41	2.4	—	Coho
0917	Unnamed	LB-3.9	1.9	—	Coho
0918	Frase Creek	RB-28.25	2.1	—	Coho
0919	Unnamed	LB-0.3	1.6	—	Coho
0920	Unnamed	RB-28.7	1.9	—	None
0921	Beaver Creek	LB-29.45	4.4	2.79	Coho
0922	Bernier Creek	RB-29.6	3.5	—	Coho
0923	Unnamed	RB-32.0	2.1	—	None
0924	Unnamed	RB-33.0	1.9	—	None
0925	Unnamed	RB-33.7	2.7	5.31	None
0926	Unnamed	RB-0.5	2.2	—	None
0927	Unnamed	RB-1.25	1.1	—	None
0929	Unnamed	LB-34.8	1.5	—	None
	Newaukum Lake	Outlet-37.3	—	—	None

CHEHALIS RIVER-MILL-BUNKER CREEKS

This section includes a number of small to medium-sized left bank tributaries to the Chehalis River from mile 65.0 upstream to mile 100.0. The mainstem Chehalis River in this reach is discussed in Chehalis 2700 and 3300. Major tributaries in this reach are Scammon, Mill, Bunker, Marcuson, and Dunn creeks. A number of smaller named and unnamed tributaries are also included. Tributaries in this section have a total length of over 115.0 miles.

Stream Description

The majority of these small streams flow either south or east to the confluence of the Chehalis River. Bunker Creek is the only stream in this section with significant tributaries. Tributaries to the other streams are generally small.

Bunker Creek flows most of its length through a broad valley. The other streams are generally confined to narrower stream valleys except where they intercept the Chehalis valley. The slopes are forested with second-growth coniferous timber. Most of the Chehalis valley land has been cleared for agricultural use. Lowland areas along Bunker Creek, Mill Creek, Coal Creek, and Scammon Creek have been cleared for farmland. Rural and farm residences are scattered throughout the lowland areas. The communities of Fryad, Adna, and Littell are found in this section.

Bunker, Mill, Coal, and Scammon creeks have low gradients along most of their length. These streams are composed primarily of pool area with short riffle sections. Sand and gravel are the predominant bottom materials of Bunker and Mill creeks, whereas Coal and Scammon creeks are primarily sand. The tributaries upstream from Bunker Creek have moderate gradients and are composed of gravel and sand. These streams generally are less than 4 yards wide in their lower reaches. Stream bank cover provided by deciduous brush and mixed timber is generally adequate in most stream reaches.

Salmon Utilization

These small streams support important runs of coho and small runs of chum. No chinook utilization is known in these areas. Coho spawning occurs in all accessible streams containing suitable spawning material. Chum spawning is probably confined to the lower reaches of these streams. Major coho spawning areas include Mill, Bunker, Dell, and Dunn creeks. Lesser, but important, numbers of coho spawn in the other streams. Juvenile coho rearing occurs in all of these streams that contain water during the summer months. These streams have sufficient pools for resting and maturation of adult salmon. Maturation will usually occur in the Chehalis River. It is estimated that at least 42 linear miles of tributaries in this section are presently in salmon production.

Limiting Factors

Stream flows in this section of the Chehalis watershed are typically low during the summer months. Sufficient water remains in most of the streams to provide at least fair coho rearing opportunity. Very little spawning area has been located in Scammon and Coal creeks and Deep Creek (a tributary to Bunker Creek). A dam on Mill Creek prevents coho from utilizing a potential production area upstream. Log jams on Dunn and Dell creeks are known to be partial barriers to coho migration. All spawning beds in this section contain considerable quantities of silt.

Beneficial Developments

There have been no beneficial developments in this section.

Habitat Needs

Further reduction in stream flow in any streams in this section should be prevented. The limited rearing area for coho must be preserved. Stream bank cover must be maintained in all reaches and reestablished in those areas where needed. Logging and associated road construction must be conducted in a manner to prevent further degradation of water and streambed quality. Fish passage facilities at the dam on Mill Creek may be feasible. Further surveys on several tributaries may indicate a need for stream channel clearance.

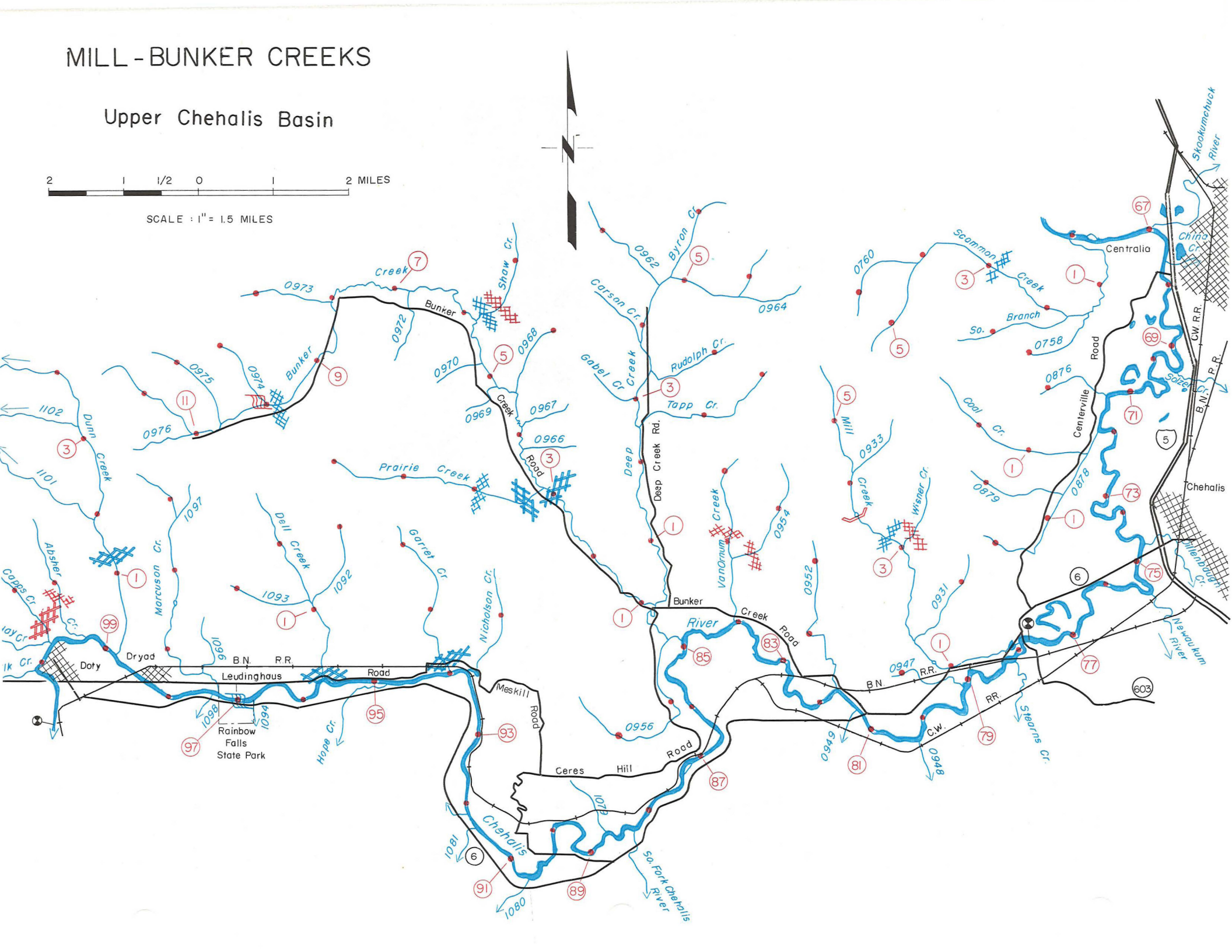
PHOTO 22-28. Typical section on Dunn Creek.

MILL-BUNKER CREEKS

Upper Chehalis Basin

2 1 1/2 0 1 2 MILES

SCALE : 1" = 1.5 MILES



CHEHALIS RIVER — MILL-BUNKER CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0757	Scammon Creek	LB-65.9	5.5	—	Coho
0758	Unnamed	RB-1.5	1.0	—	Unknown
0759	S. Br. Scammon Cr.	RB-1.8	1.5	—	Unknown
0760	Unnamed	LB-4.2	1.2	—	Unknown
0761	Skookumchuck River	RB-67.0	40.2	181.0	
	(See Chehalis 2503)				
0870	China Creek	RB-67.6	4.5	—	
	(See Chehalis 2703)				
0871	Salzer Creek	RB-69.4	10.6	—	
	(See Chehalis 2703)				
0876	Unnamed	LB-71.3	1.1	—	Unknown
0877	Coal Creek	LB-71.8	2.8	—	Coho
0878	Unnamed	RB-0.35	2.2	—	Unknown
0879	Unnamed	LB-0.65	1.4	—	Unknown
0880	Dillenbaugh Creek	RB-74.7	8.4	—	
	(See Chehalis 2703)				
0882	Newaukum River	RB-75.4	37.3	158.0	
	(See Chehalis 2803)				
0930	Mill Creek	LB-77.85	5.8	—	Coho
0931	Unnamed	LB-1.7	1.4	—	None
	Unnamed Pond	Outlet-3.7	—	—	
0934	Stearns Creek	RB-78.1	10.0	37.0	
	(See Chehalis 3303)				
0947	Unnamed	LB-79.1	1.2	—	Unknown
0948	Unnamed	RB-80.4	1.15	—	
	(See Chehalis 3303)				
0949	Unnamed	RB-81.35	2.6	—	
	(See Chehalis 3303)				
0952	Unnamed	LB-81.7	2.3	—	Unknown
0953	Van Ornum Creek	LB-84.0	2.2	—	Coho
0954	Unnamed	LB-0.8	1.65	—	Coho
0955	Bunker Creek	LB-84.8	12.8	36.2	Coho
0956	Unnamed	RB-0.3	2.7	—	Coho
0957	Deep Creek	LB-0.9	6.4	—	Coho

CHEHALIS RIVER — MILL-BUNKER CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0958	Tapp Creek	LB-2.6	2.0	—	Coho
0960	Rudolph Creek	LB-3.4	1.2	—	Coho
0962	Unnamed	RB-4.6	1.5	—	Coho
0963	Byron Creek	RB-4.8	1.4	—	Unknown
0965	Prairie Creek	RB-3.2	3.0	—	None
0968	Unnamed	LB-4.6	1.0	—	Unknown
0971	Shaw Creek	LB-5.8	1.5	—	Coho
0973	Unnamed	LB-8.1	1.2	—	Coho
0974	Unnamed	LB-10.0	1.0	—	None
0975	Unnamed	LB-10.5	1.3	—	Unknown
0977	S. Fk. Chehalis River	RB-88.3	28.4	125.0	
	(See Chehalis 3403)				
1080	Unnamed	RB-90.7	1.0	—	
1081	Unnamed	RB-91.7	1.4	—	
	(See Chehalis 3303)				
1082	Miller Swamp	RB-91.9	~ 4.1	—	
	(See Chehalis 3303)				
1083	Nicholson Creek	LB-93.8	1.6	—	Coho
1084	Garret Creek	LB-94.0	2.3	—	Coho
1085	Hope Creek	RB-94.8	4.7	—	Coho
	(See Chehalis 3303)				
1091	Dell Creek	LB-95.6	2.8	—	Coho
1092	Unnamed	LB-1.1	1.0	—	Coho
1093	Unnamed	RB-1.15	1.1	—	Coho
1095	Marcuson Creek	LB-97.3	3.6	—	Coho
	Unnamed Pond	Outlet-1.7	—	—	
1098	Unnamed	RB-97.31	1.3	—	
	(See Chehalis 3703)				
1100	Dunn Creek	LB-98.8	5.4	—	Coho
1101	Unnamed	RB-1.9	1.7	—	Coho
1102	Unnamed	RB-3.2	1.3	—	Unknown
1103	Absher Creek	LB-99.3	1.9	—	Coho
1104	Capps Creek	LB-99.8	2.2	—	Coho
1105	Hay Creek	RB-0.05	1.5	—	Coho
1106	Elk Creek	LB-100.2	15.8	58.2	
	(See Chehalis 3803)				

(Cont. Chehalis 3303)

STEARNS-HOPE CREEKS

This section describes the Chehalis River from the mouth of Newaukum River upstream to Rainbow Falls. All right bank tributaries to this reach are included except the South Fork Chehalis River (see Chehalis 3400, 3500, and 3600). The Chehalis River in this section is 27.1 miles long. The 7 smaller right bank tributaries total 59.7 miles.

Stream Description

The Chehalis River flows east below Rainbow Falls for several miles through an agricultural valley about one mile wide. Near mile 94.0, the river encounters a narrow constriction and turns south for one mile prior to entering the broad valley near the South Fork. Just below the South Fork, the valley again narrows for over one mile then enters a broad flat area and continues to its confluence with the Newaukum River. Major right bank tributaries along the course include Hope Creek, South Fork Chehalis, and Stearns Creek, plus several small unnamed streams. Left bank tributaries, including Dell, Bunker, and Mill creeks, are discussed in Section 3200.

Most of the suitable lowland areas along the Chehalis, South Fork, and Stearns Creek have been cleared for farming. Rural and farm residences are scattered throughout this valley land. Communities of Adna, Littell, and Claquato, are found in the lower valley. Gentle to moderate slopes are in timber production.

The streams in the area have a generally low gradient, except in their headwaters. Fair bank cover is found in the farming areas with good bank cover along the forested reaches. The Chehalis River consists of a series of slow pools with short riffle sections. Channel width averages 50 yards with a gravel and rubble substrate.

Stearns Creek has predominantly gravel bottom and a three-yard average width. Much of the lower downstream area is in a channelized ditch with very low gradient. The stream contains a number of well-shaped pool and riffle areas above its channelized length.

Hope Creek has an average width of three yards and a streambed composed primarily of sand and gravel in its lower reaches and almost entirely sand in its upper. Pools are generally long and shallow with short riffle sections in the lower extremity. Much of the upper stream consists of a series of beaver ponds.

Salmon Utilization

This portion of the Chehalis River watershed contains runs of spring and fall chinook and coho. A small run of chum may also be present. Some chinook spawning occurs on all suitable riffles in this section of the mainstem river. Chum may also spawn here. The river contains a number of deep pools suited for resting and maturwtion of adult salmon. Juvenile rearing, both chinook and coho, occurs throughout.

Coho spawning is limited to the accessible tributaries, notably Hope and Stearns creeks. A few chum may also utilize these. Coho spawning and rearing in Hope Creek is limited primarily to the lower three miles. Upper Stearns Creek and its tributaries are well suited for coho spawning and rearing. Some 27 miles of the mainstem Chehalis River and approximately 16 linear miles of tributaries are presently in salmon production.

Limiting Factors

Stream flow over Rainbow Falls on the Chehalis River is generally adequate for unhindered adult passage. Siltation of gravel affects egg survival in the mainstem spawning beds. Excessively warm water temperatures affect juvenile production in the lower 9.0 miles of the reach. Extensive predatory fish populations are found throughout this reach.

Spawning beds on Hope and Stearns creeks contain considerable quantities of silt affecting egg survival. Numerous beaver dams on upper Hope Creek have inundated much of the original spawning area. A falls forms a barrier on West Fork Stearns Creek. Low summer flows reduce coho production on all tributary streams. Some of these are virtually dry in the summer months.

Proposed dams above the South Fork (Meskill Site) and below (Ruth Site) may have a serious impact on future spawning runs.

Beneficial Developments

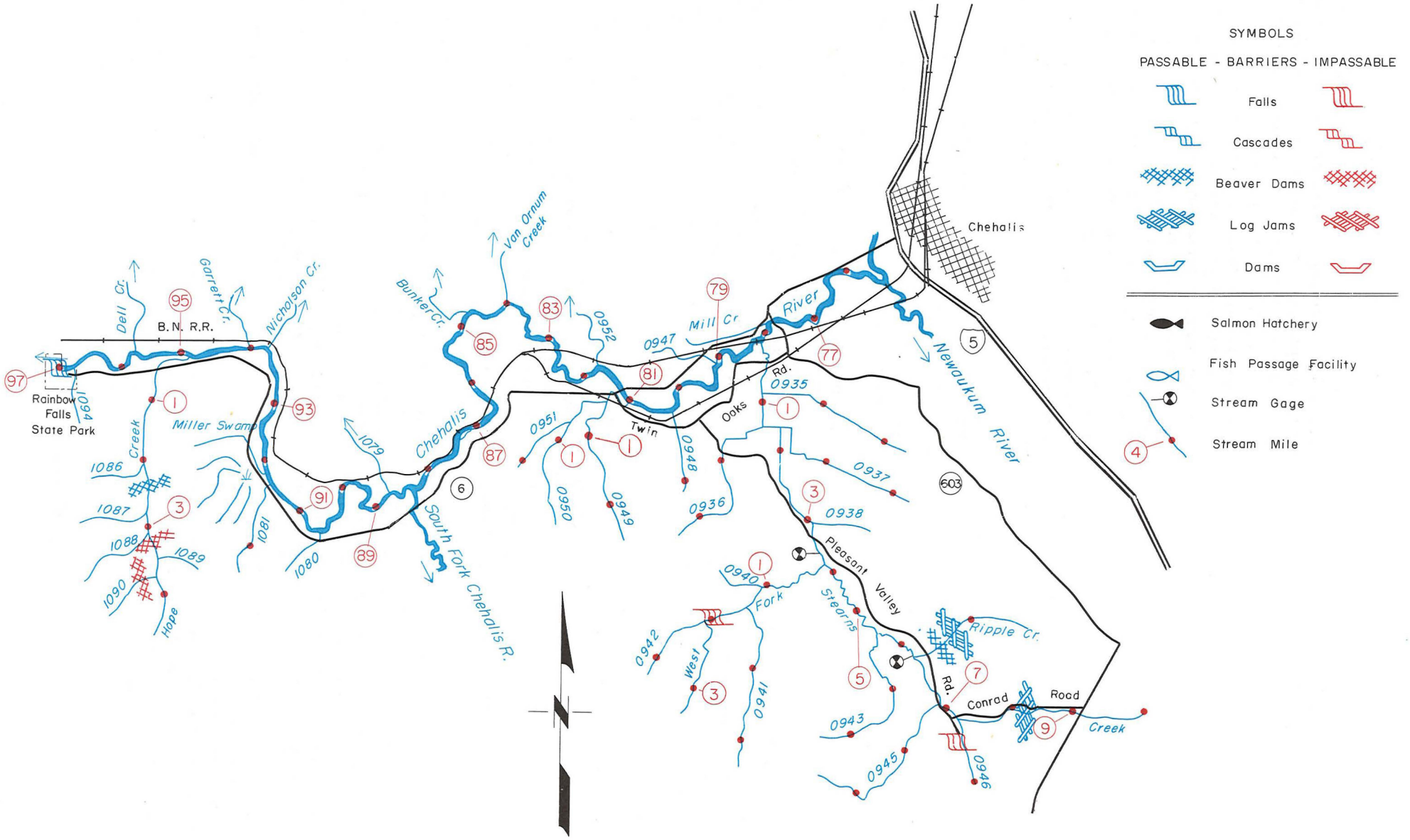
No enhancement facilities have been constructed in this section.

Habitat Needs

Further sources of gravel siltation in the Chehalis River must be strictly controlled. Reduction in summer flows will reduce rearing area and result in further temperature increases. Control of predatory fishes would be desirable. Stream bank cover should be maintained and improved where practical. Major tributary streams must be closed to further consumptive water diversions if the limited rearing areas are to be maintained. Further degradation of streambed quality, particularly in Hope Creek, must be restricted.

STEARNS-HOPE CREEKS

Upper Chehalis Basin



STEARNS-HOPE CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0930	Mill Creek	LB-77.85	5.8	—	
	(See Chehalis 3203)				
0934	Stearns Creek	RB-78.1	10.0	37.0	Chum, Coho
0935	Unnamed	RB-0.85	2.3	—	Coho
0936	Unnamed	LB-1.3	2.4	—	Coho
0937	Unnamed	RB-1.6	2.2	—	Coho
0939	W. Fk. Stearns Cr.	LB-2.8	3.4	—	Coho
0941	Unnamed	RB-1.4	2.3	—	Coho
0942	Unnamed	LB-2.1	1.3	—	None
0943	Unnamed	LB-5.4	2.4	—	Coho
0944	Ripple Creek	RB-6.2	1.8	—	Coho
0945	Unnamed	LB-6.9	2.6	—	Coho
0946	Unnamed	LB-7.11	1.0	—	Coho
0947	Unnamed	LB-79.1	1.2	—	
	(See Chehalis 3203)				
0948	Unnamed	RB-80.4	1.15	—	Unknown
0949	Unnamed	RB-81.35	2.6	—	Unknown
0950	Unnamed	LB-0.3	2.3	—	Unknown
0951	Unnamed	LB-0.65	1.05	—	Unknown
0952	Unnamed	LB-81.7	1.05	—	Unknown
	(See Chehalis 3203)				
0953	Van Ornum Creek	LB-84.0	2.2	—	
	(See Chehalis 3203)				
0955	Bunker Creek	LB-84.8	12.8	36.2	
	(See Chehalis 3203)				
0977	S. Fk. Chehalis River	RB-88.3	28.4	125.0	
	(See Chehalis 3403)				
1080	Unnamed	RB-90.7	1.0	—	
1081	Unnamed	RB-91.7	1.4	—	Unknown
1082	Miller Swamp	RB-91.9	4.1	—	Unknown
1083	Nicholson Creek	LB-93.8	1.6	—	
	(See Chehalis 3203)				
1084	Garret Creek	LB-94.0	2.3	—	
	(See Chehalis 3203)				

STEARNS-HOPE CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
1085	Hope Creek	RB-94.8	4.7	—	Chum, Coho
1091	Dell Creek	LB-95.6	2.8	—	
	(See Chehalis 3203)				
	(Cont. Chehalis 3703)				

SOUTH FORK CHEHALIS RIVER
Lower Mainstem

This section includes the lower South Fork Chehalis River from its mouth upstream to the mouth of Sears Creek at mile 14.0. All tributaries to this reach, except Stillman Creek, are included. Stillman Creek is discussed in Chehalis 3500 and upper South Fork Chehalis is discussed in Chehalis 3600. This section contains 14.0 miles of mainstem and 19 tributaries with 53.0 miles of stream drainage.

Stream Description

The South Fork Chehalis River maintains a southerly course through this section. Major tributaries to this reach include Stillman, Lentz, Beaver, and Lake creeks. A number of smaller tributaries also enter the South Fork.

The South Fork Chehalis valley in this section is one mile wide at the upper end and ranges from 1 to 2 miles wide in the lower reaches. Most of the valley land has been cleared for farming. Cleared farmland also is found in the lowlands around Lake Creek. The slopes are forested with coniferous timber. Some of the slopes contain large amounts of deciduous timber. A number of rural and farm residences are found throughout the valley. The communities of Curtis and Boistfort are also located in the South Fork Valley.

The South Fork Chehalis is a slow-flowing, meandering stream confined to its channel by deep-cut banks. The stream contains a number of deep, slow-moving pools with generally short riffle sections. The streambed is composed primarily of gravel with considerable quantities of silt. The channel has an average width of 15 yards. Portions of the stream bank have inadequate cover for maintenance of cool water temperatures. Other areas have a good bank cover of deciduous timber and brush. Lake Creek, the largest tributary discussed in this section, is a low gradient, meandering stream with a predominantly sand bottom. Very little gravel has been found in the mainstem. Most of the stream is pool area and has an average width of 4 yards in its lower reaches. Tributaries of Lake Creek generally have a sand bottom; however, patches of gravel are found.

A number of small, short tributaries flow from the ridges on either side of the South Fork. These streams generally have adequate bank cover; however, their steep gradients limit salmon use. These streams generally average less than 2 yards in width in their lower reaches. Some gravel is found in these areas.

Salmon Utilization

South Fork Chehalis River supports runs of both spring and fall chinook and coho. A small run of chum may utilize this system. The mainstem channel serves both as transportation water for salmon destined to upstream areas and as spawning and rearing area. Limited numbers of fall chinook spawn on all suitable riffles in this reach. Coho spawning is confined to several of the Lake Creek tributaries, lower Beaver Creek, and the lower reaches of the smaller tributary streams containing suitable spawning gravels. Juvenile spring chinook may rear in this reach of the South Fork Chehalis. Coho rearing occurs in this reach and in the suitable tributary streams. It is estimated that the 14 miles of mainstem Chehalis River and approximately 16 linear miles of tributaries in this section are presently used by salmon.

Limiting Factors

The major limiting factor in this reach of the South Fork is the low summer flow. Low flows and associated high summer water temperatures limit juvenile rearing. Chinook spawning is adversely affected by excessive silt in the spawning beds. Tributary streams generally have limited spawning area for coho and low summer flows. This reach of the South Fork Chehalis contains a high concentration of predatory fishes.

Beneficial Developments

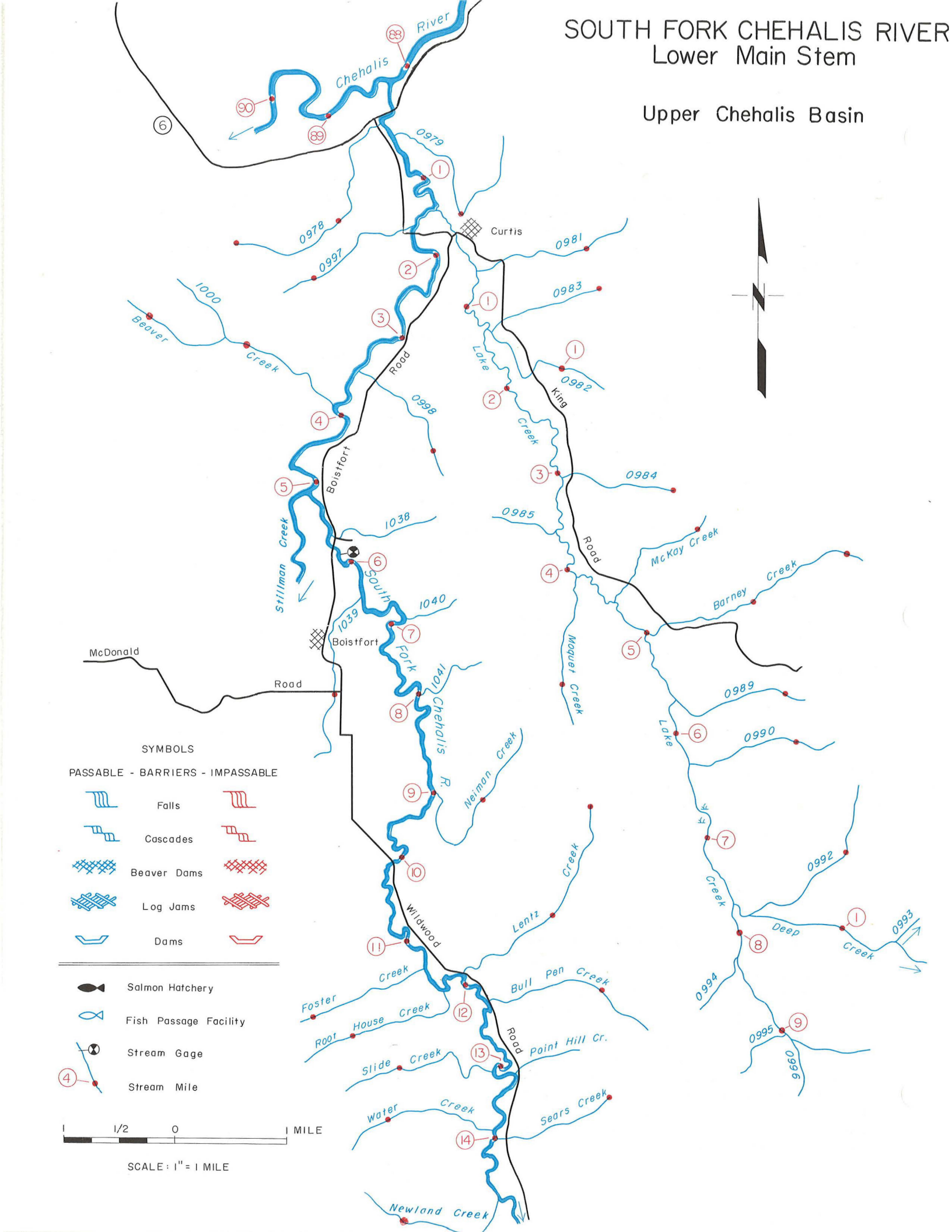
No enhancement facilities have been constructed in this section.

Habitat Needs

Further reduction of streambed quality in the mainstem South Fork Chehalis may result in total loss of the chinook production from this reach. The limited spawning facilities for coho on the tributary streams must be maintained. Bank Cover should be preserved in those areas where it is present and established along denuded stgetches of the South Fork. Further water right applications must be denied in this over-appropriated watershed. Low flow augmentation may benefit juvenile rearing and spring chinook transportation and maturation. Reservoir sites must be selected which avoid loss of the upriver salmon runs.

SOUTH FORK CHEHALIS RIVER
Lower Main Stem

Upper Chehalis Basin



SYMBOLS

PASSABLE - BARRIERS - IMPASSABLE

Falls		
Cascades		
Beaver Dams		
Log Jams		
Dams		

- Salmon Hatchery
- Fish Passage Facility
- Stream Gage
- (4) Stream Mile

1 1/2 0 1 MILE

SCALE: 1" = 1 MILE

SOUTH FORK CHEHALIS RIVER
Lower Mainstem
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0977	S. Fk. Chehalis R.	RB-88.3	28.4	125.0	Chin.,Chum,Coho
0978	Unnamed	LB-0.35	2.0	—	None
0979	Unnamed	RB-0.5	1.8	—	None
0980	Lake Creek	RB-1.4	9.8	21.3	Coho
0981	Unnamed	RB-0.6	1.5	—	Unknown
0982	Unnamed	RB-1.3	1.4	—	Coho
0983	Unnamed	RB-0.05	1.0	—	Coho
0984	Unnamed	RB-3.05	1.0	—	Unknown
0986	Moquet Creek	LB-4.1	1.3	—	Unknown
0987	McKay Creek	LB-4.6	1.1	—	None
0988	Barney Creek	RB-5.0	2.1	—	Coho
0989	Unnamed	RB-5.7	1.2	—	Unknown
0990	Unnamed	RB-6.35	1.3	—	Unknown
0991	Deep Creek	RB-7.7	2.2	—	Unknown
0992	Unnamed	RB-0.2	1.6	—	Unknown
0997	Unnamed	LB-1.6	1.3	—	None
0998	Unnamed	RB-3.5	1.3	—	None
0999	Beaver Creek	LB-3.9	2.2	—	Coho
1001	Stillman Creek	LB-5.1	14.9	45.9	
	(See Chehalis 3503)				
1039	Unnamed	LB-6.3	1.6	—	None
1042	Neiman Creek	RB-9.0	1.7	—	Coho
1043	Foster Creek	LB-11.3	1.1	—	Coho
1044	Root House Creek	LB-11.6	1.5	—	Coho
1045	Lentz Creek	RB-11.9	2.0	—	Coho
1046	Bull Pen Creek	RB-12.3	1.5	—	Coho
1047	Slide Creek	LB-13.1	1.5	—	Coho
1049	Water Creek	LB-13.9	1.4	—	Coho
1050	Sears Creek	RB-14.0	1.0	—	Coho
	(Cont. Chehalis 3603)				

STILLMAN CREEK

This section includes the entire Stillman Creek watershed. This tributary of the South Fork Chehalis River contains 14.9 miles of mainstem channel and 12 tributaries providing some 55.0 miles of tributaries.

Stream Description

Stillman Creek heads in the high hills separating the South Fork Chehalis from the upper Chehalis River. The stream flows north from its headwaters. Major tributaries include several small streams plus Little Mill, Halfway, and Lost creeks.

Upper Stillman Creek watershed consists of narrow valleys and steep-sided hills. The area was logged a number of years ago and second growth timber is now found on most slopes and in the upper valley. Deciduous timber and brush are common along the stream valleys. The lower reaches of Stillman Creek, downstream from Halfway Creek, have been partially cleared for farming. Some farmland and residences are also found along Halfway and lower Lost Creeks. Camp McDonald, formerly a large logging camp on lower Stillman Creek, has been abandoned.

Stillman Creek and its tributaries above Halfway Creek have moderate to steep gradients. The stream channels consist of pools, short riffles, and occasional rapids. Stillman Creek averages approximately 10 yards wide near Little Mill Creek. Its upper tributaries are generally less than 3 yards in width and most are considerably smaller. This upper watershed has good bank cover provided by deciduous vegetation. Streambeds are composed primarily of gravel with rubble and bedrock common. The lower 4 miles of Stillman Creek flow through broad valley land. The stream consists of numerous pools and short riffle sections. Fair stream bank cover exists in most of this area. The streambed is composed primarily of gravel and rubble and has an average width of 15 yards near its mouth. Halfway Creek, its largest tributary, has an average width of 5 yards in its lower reaches and is composed primarily of slow-moving pools. Gravel and sand are the predominant bottom features. This low gradient stream has generally good bank cover except in areas of recent logging and slash burning. Minor log jams are common. Tributaries to Halfway Creek have a moderate gradient in their lower reaches and steep gradients above. These tributaries are composed primarily of gravel and have good to excellent bank cover. They are generally less than 4 yards wide.

Salmon Utilization

Stillman Creek supports runs of spring and fall chinook and coho. A limited number of chum may spawn in the lower stream. Chinook spawning is probably confined to the lower five miles of stream. Major coho spawning areas in this section are the middle reaches of Stillman Creek, the lower reaches of one unnamed tributary, and in Halfway Creek and its tributaries. Slide and Keller creeks are the main spawning tributaries of Halfway Creek. Stillman Creek has sufficient flow and deep pool areas necessary for spring chinook resting and maturation. The stream also provides excellent rearing area for spring chinook and coho salmon. Coho rearing also occurs in all accessible tributaries. It is estimated that over 9.5 linear miles of Stillman Creek tributaries are presently utilized by salmon.

Limiting Factors

Upper Stillman Creek contains a number of extensive log jams which are at least partial barriers to salmon migration. This area also contains limited spawning facilities for coho production. Tributaries to upper Stillman Creek are generally quite steep and offer little salmon production potential. One large unnamed tributary to Stillman Creek has good spawning and rearing facilities in its lower reaches. Extensive log jams in the middle stretch of this stream prevent coho from using other potential production areas. Falls bar salmon from entering Little Mill Creek.

Spawning gravels on Halfway Creek are badly silted and compacted. The upper reaches of Halfway Creek contain little suitable spawning area. Two tributaries, Slide and Keller creeks, offer good spawning facilities in their lower reaches; however, their upper reaches are too steep.

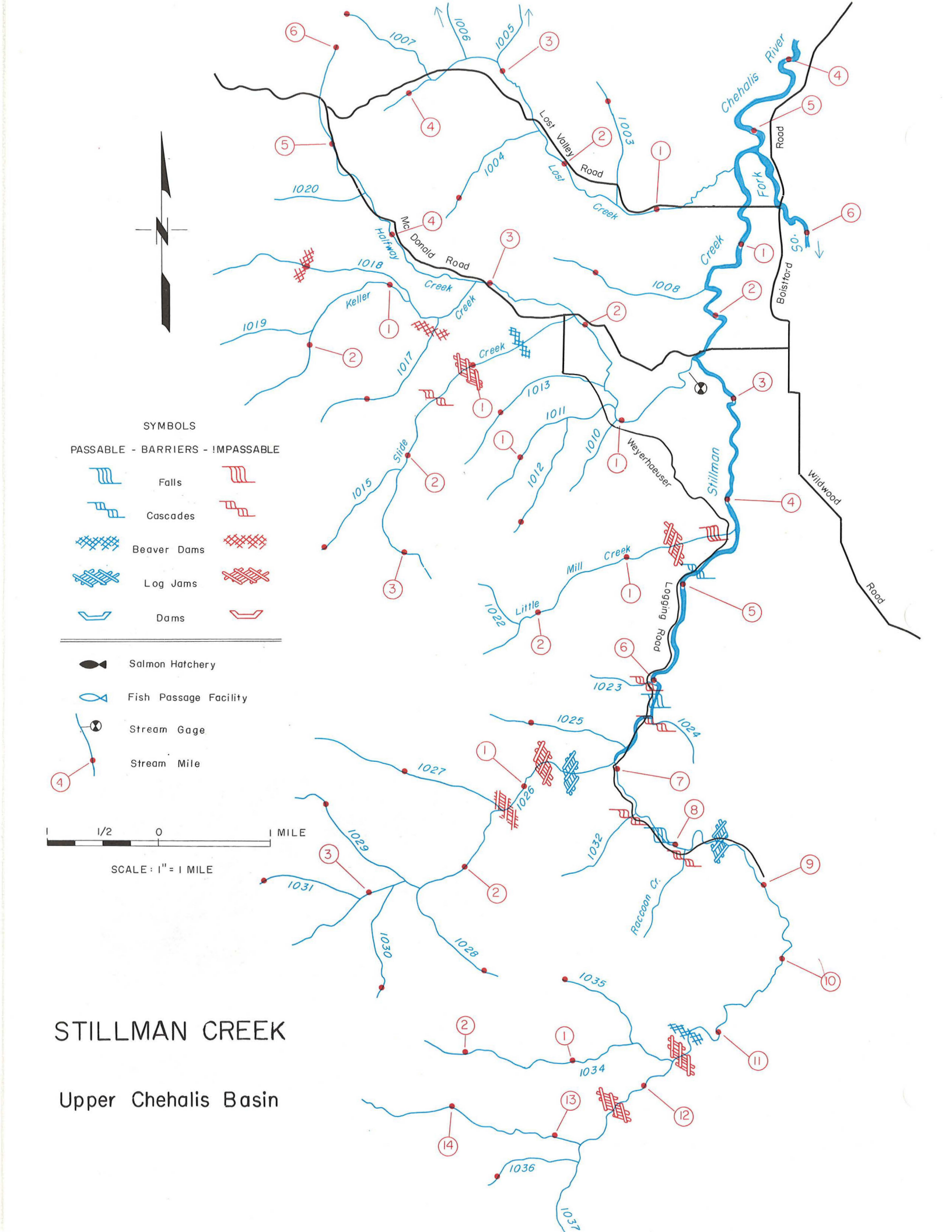
Beneficial Developments

No enhancement facilities have been constructed in this section.

Habitat Needs

Stillman Creek maintains good flow of cool water during the summer months. These flows must be continued to avoid total loss of rearing area in the South Fork Chehalis below Stillman Creek and to preserve the rearing habitat in Stillman Creek. Extensive channel clearance is required to attain full production of upper Stillman Creek. Streambed controls and additional gravel would increase the limited coho spawning area. No gravel removal should be permitted in the section.

PHOTO 22-29. Numerous logs on Stillman Creek hinder adult salmon migrations.



STILLMAN CREEK

Upper Chehalis Basin

STILLMAN CREEK
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0977	S. Fk. Chehalis R.				
1001	Stillman Creek	LB-5.1	14.9	45.9	Chin.,Chum,Coho
1002	Lost Creek	LB-0.2	4.3	6.60	Coho
1003	Unnamed	LB-1.4	1.2	—	Unknown
1004	Unnamed	RB-2.4	1.2	—	Unknown
1005	Unnamed	LB-3.1	1.25	—	Unknown
1007	Unnamed	LB-3.75	1.05	—	Unknown
1008	Unnamed	LB-1.6	1.4	—	Coho
1009	Halfway Creek	LB-2.5	6.0	13.7	Coho, Chum
1011	Unnamed	RB-1.1	1.4	—	Coho
1012	Unnamed	RB-0.5	1.1	—	Unknown
1013	Unnamed	RB-1.4	1.5	—	Coho
1014	Slide Creek	RB-2.1	3.3	—	Coho
1015	Unnamed	LB-2.2	1.0	—	None
1016	Keller Creek	RB-3.1	2.9	—	Coho
1017	Unnamed	RB-0.5	1.5	—	None
1018	Unnamed	LB-0.8	1.9	—	Coho
1021	Little Mill Cr.	LB-4.25	2.7	—	None
1025	Unnamed	LB-6.8	1.4	—	None
1026	Unnamed	LB-6.95	3.9	—	Coho
1027	Unnamed	LB-1.3	1.9	—	None
1028	Unnamed	RB-2.55	1.1	—	None
1029	Unnamed	LB-2.7	1.35	—	None
1030	Unnamed	RB-2.8	1.1	—	None
1031	Unnamed	LB-3.1	1.0	—	None
1034	Unnamed	LB-11.6	2.4	—	Unknown
1035	Unnamed	LB-0.4	1.0	—	Unknown
1036	Unnamed	RB-12.75	1.1	—	None

SOUTH FORK CHEHALIS RIVER
Upper Mainstem

This section describes the entire South Fork Chehalis watershed upstream from the mouth of Sears Creek. It includes a total of 13.9 miles of mainstem channel and 14 tributaries with over 35.0 miles of stream drainage.

Stream Description

The South Fork Chehalis flows in a southerly direction through a narrow river valley until it reaches the broad South Fork valley near mile 17.5. From here down to the mouth of Sears Creek the river courses through a broad, flat valley. Major tributaries to this reach include Hanlan, Black, and Cedar creeks and a number of smaller streams. The terrain along the upper reaches of the South Fork consist of moderately steep slopes with second-growth timber and a narrow river valley with deciduous vegetation. There has been no residential development of the South Fork upstream from mile 16.5. Farm and rural residences are scattered along the valley downstream from this point. Some farmland exists in the broader river valley in the lower end of this reach.

The South Fork below Black Creek consists of slow pools with short riffles in a low gradient area. Adequate bank cover in this reach consists mainly of deciduous timber and brush. Gravel is the predominant bottom feature of this section. The moderate gradient section above Black Creek consists of a number of deep pools followed by longer riffle sections and some rapids and cascades, with excellent stream bank cover. The stream has an average width of 15 yards in its lower reaches and 4 yards in its upper reach.

The tributaries to the South Fork below Black Creek have a very low gradient in their lower reaches and generally are less than 3 yards in width. The stream channels are confined by low-cut banks in the valley lands. Steeper gradient sections above the South Fork valley have a predominantly gravel streambed with good stream bank cover. These upper areas are generally too steep for salmon use. Black Creek maintains a low gradient throughout its length. This stream consists of predominantly mud bottom except in the lower half-mile where gravel is found.

Salmon Utilization

This area of the South Fork watershed supports runs of both fall and spring chinook and coho. The South Fork below mile 21 is primarily transportation and rearing water for coho. Chinook spawn throughout this section at least as far upstream as the mouth of Hanlan Creek. Coho spawning is generally confined to the lower reaches of the accessible tributaries. Major coho spawning areas are on the upper South Fork, Hanlan, Trout, and several unnamed creeks. This upper stream section provides cool temperatures necessary for spring chinook production. There are at least 13.5 miles of mainstem South Fork Chehalis River and approximately 12.5 linear miles of tributary streams presently utilized by salmon in these headwaters.

Limiting Factors

South Fork Chehalis received considerable damage during the original logging of the area a number of years ago. The watershed is rapidly recovering from these effects; however, siltation of gravel is still generally found in most of the spawning areas. Coho production downstream from Black Creek is generally limited to the extreme lower reaches of the tributaries. The steeper gradient sections of these tributaries and of many of the smaller tributaries upstream from Black Creek are not accessible. A falls on Hanlan Creek near mile 1.0 was a former block to salmon production. There are three low falls near mile 22 which may delay salmon migration at certain water levels. Beaver dams and log jams block coho on Black Creek above mile 1.0.

Beneficial Developments

Fish passage at the falls on Hanlan Creek has been assured by blasting of large boulders and removal of logs in the channel. Coho plants are being made in Hanlan Creek to establish a new wild run.

Habitat Needs

Any further water diversion from the South Fork will result in additional deterioration of the rearing habitat in the lower mainstem. This watershed is gradually recovering from the effects of logging. Salmon production increases can be expected if streambed and water quality are preserved. This will require protection during future logging and road construction.

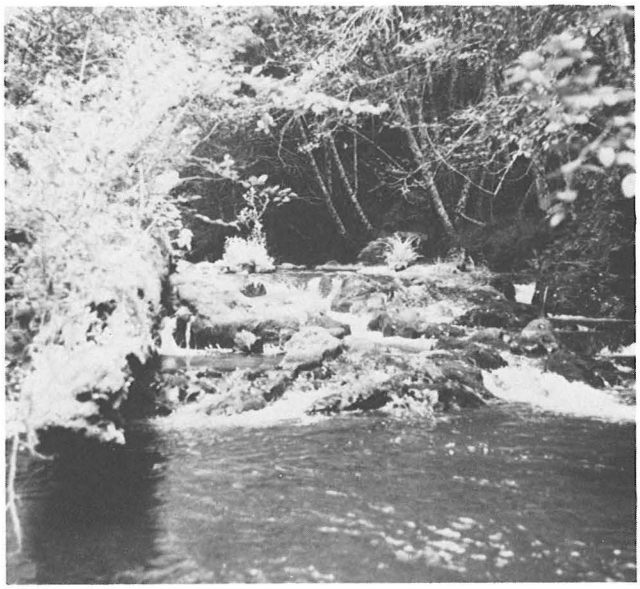
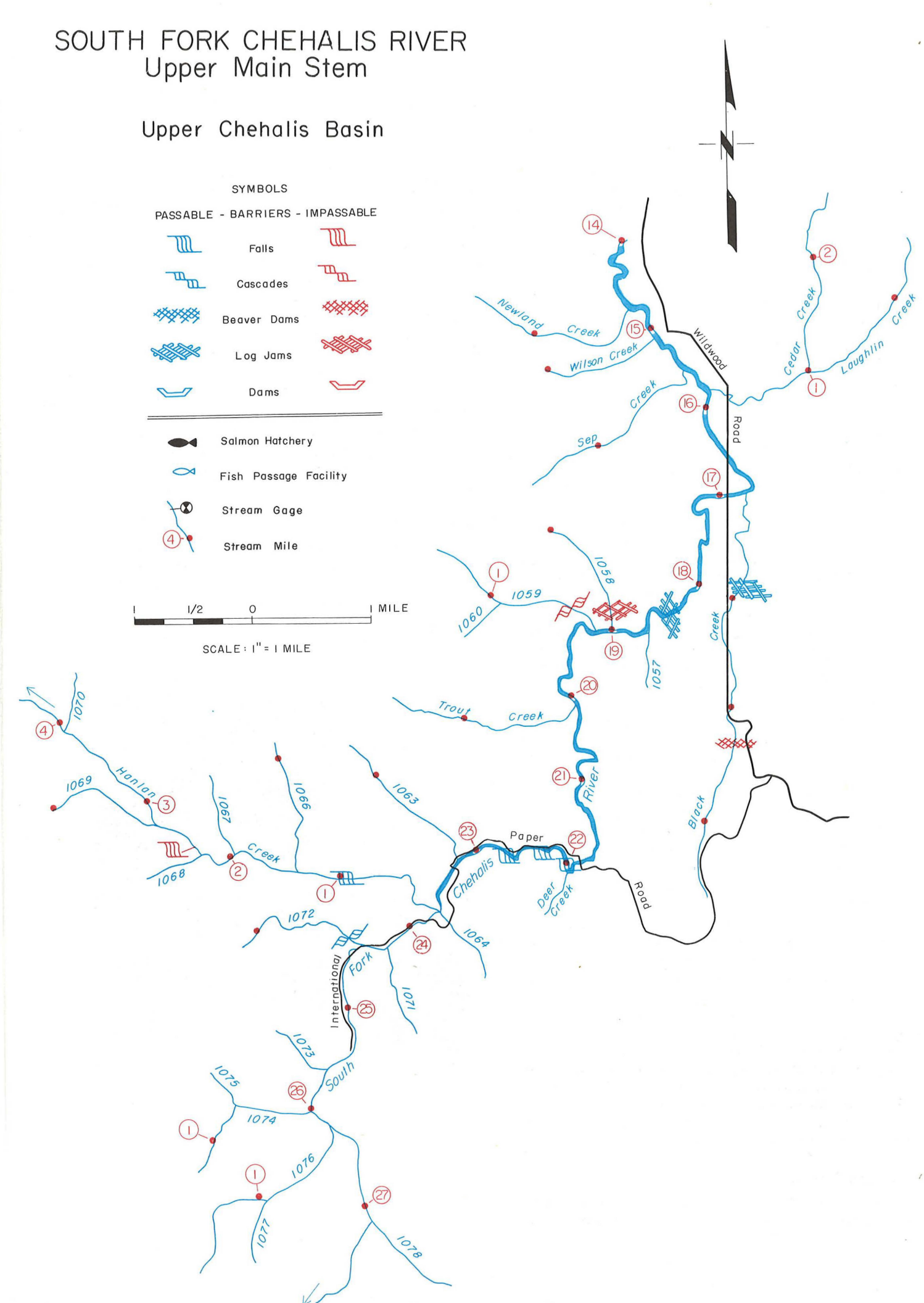


PHOTO 22-30. Cascades on South Fork Chehalis near R.M. 22.0.

SOUTH FORK CHEHALIS RIVER
Upper Main Stem

Upper Chehalis Basin



SOUTH FORK CHEHALIS RIVER
Upper Mainstem
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
0977	S. Fk. Chehalis R.				Chinook, Coho
1051	Newland Creek	LB-14.7	1.6	—	Unknown
1053	Sep Creek	LB-15.5	1.7	—	Unknown
1054	Cedar Creek	LB-15.8	2.6	—	Coho
1055	Laughlin Creek	LB-1.0	1.55	—	Unknown
1056	Black Creek	RB-16.8	3.6	—	Coho
1058	Unnamed	LB-19.0	1.0	—	Coho
1059	Unnamed	LB-19.1	1.6	—	Coho
1061	Trout Creek	LB-20.1	1.7	—	Coho
1063	Unnamed	LB-23.2	1.4	—	Coho
1065	Hanlan Creek	LB-23.65	4.4	5.74	Coho
1066	Unnamed	LB-1.4	1.1	—	Unknown
1069	Unnamed	RB-2.8	1.0	—	Unknown
1072	Unnamed	LB-24.45	1.2	—	Coho
1074	Unnamed	LB-26.0	1.3	—	Coho
1076	Unnamed	LB-26.2	1.95	—	Coho

CHEHALIS RIVER-CRIM-ROCK CREEKS

This section describes the Chehalis River upstream from Rainbow Falls at mile 97.1 to the mouth of Rogers Creek at mile 113.5. All tributaries upstream from Elk Creek and all right bank tributaries below Elk Creek are also included (see Chehalis 3300 and 3800 for other tributaries to this reach). This section contains 16.3 miles of mainstem channel and 14 tributaries providing an additional 81.0 linear miles of stream drainage.

Stream Description

The Chehalis River flows in a northerly direction below the mouth of Rogers Creek to the mouth of Elk Creek where the stream course turns easterly to Rainbow Falls. Major tributaries below Rogers Creek include Big, Crim, Rock, Stowe, Jones and Elk creeks.

The upper reaches of the Chehalis River in this section flow through narrow, steep-sided valleys. The river valley broadens near the town of PeEll. The entire watershed is in timber production upstream from PeEll and on the slopes below. Most of the river valley land below PeEll and along several tributaries has been cleared for agricultural production. The town of PeEll is located near mile 106 and the communities of Doty and Dryad are located below Elk Creek. Rural and farming residences are scattered throughout the lower valley and along several of the tributary streams.

This reach provides several types of river environment. Below PeEll, the stream has a moderate gradient in a channel averaging 20 yards wide in the summer with a number of deep pools followed by riffles. The river has a moderately steep gradient for several miles above PeEll. Pools are generally short and followed by long riffle and rapid areas. Above the cascades near mile 108 the stream gradient moderates and pools with long riffles are common. Gravel and rubble are the predominant bottom features throughout. Bank cover is generally adequate. Most of the smaller tributaries have a moderate to moderately steep gradient. Their channels are generally confined to narrow ravines with gravel and rubble the predominant bottom materials. The larger tributaries have moderate gradients in narrow stream valleys. Gravel and rubble are the predominant streambed materials. Bank cover is generally good to excellent on all tributaries. These streams average 3 to 5 yards wide in their lower reaches. Most of the tributaries to the Chehalis in this reach have cascades or falls near their confluence with the Chehalis.

Salmon Utilization

This reach of the Chehalis River provides spawning, rearing, and transportation water for runs of coho, and spring and fall chinook. Spawning occurs on most of the suitable riffle areas. The major chinook spawning areas are located upstream from PeEll. There are a number of deep pools suitable for resting and maturation of adults. Salmon utilization of the tributary streams is generally restricted to short sections near their mouths. The main coho spawning areas are Crim and Big creeks with lesser numbers in the accessible portions of the other tributaries. Juvenile coho and spring chinook rear in the mainstem. Coho rearing occurs in those streams containing suitable spawning area accessible to adult salmon. Coho fry plants are made in Stowe and Rock creeks. It is estimated that all of the mainstem Chehalis River in this section and approximately 9.5 linear miles of tributaries are presently utilized by salmon.

Limiting Factors

Salmon production in the mainstem Chehalis River has been adversely affected by siltation of the spawning gravels resulting from the extensive logging and road construction in this area and in the headwaters. Dams constructed prior to 1920 on the Chehalis River between miles 85 and 115 were barriers to adult salmon until removed in the 1930's. Original races of fish in these upriver areas were destroyed. The smaller streams are too steep for salmon production. Falls located near the mouths of Jones, Stowe, and Rock creeks are barriers to salmon.

Beneficial Developments

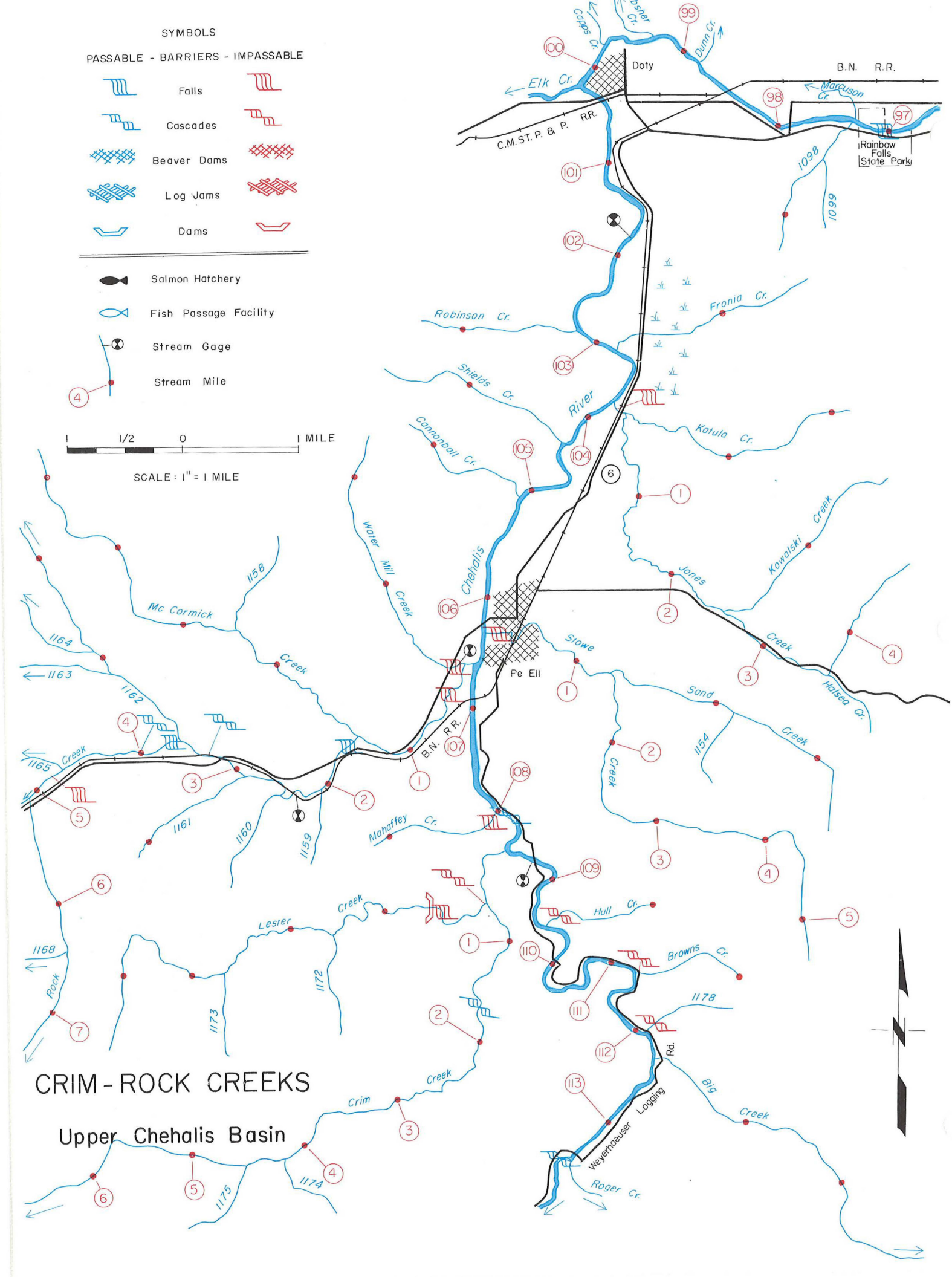
No facilities have been constructed for increased salmon production in this section. Coho fry plants are made in several streams containing suitable rearing area above migration barriers.

Habitat Needs

Maintenance of the runs in this area requires additional concern on the conduct of logging and road construction operations. Serious slides near mile 110 must be stabilized to prevent further siltation. Buffer strips should be retained along the Chehalis to provide cover and reduce siltation. Logging on the tributaries will further reduce streambed quality if not conducted with concern for the fish production habitat.

Coho fry plants should be made annually in Rock and Stowe creeks to utilize inaccessible rearing areas. It may be feasible to provide fish passage at the falls on Rock Creek.

PHOTO 22-31. Spawning area utilized by spring chinook near Browns Creek.


SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage
Stream Mile
1/2
0
1 MILE
SCALE: 1" = 1 MILE
CRIM - ROCK CREEKS
Upper Chehalis Basin
Doty
Elk Cr.
Capps Cr.
Dunn Cr.
B.N. R.R.
Marcuson Cr.
C.M.ST.P. & P. RR.
Rainbow Falls State Park
1098
1099
Robinson Cr.
Fronia Cr.
Shields Cr.
River
Cannonball Cr.
Katula Cr.
Chehalis
Water Mill Creek
Kowalski Creek
Jones
Creek
Halsea Cr.
Pe Ell
Slowe
Sand
Creek
Mc Cormick
Creek
1158
1164
1163
1162
1165
Creek
B.N. RR.
1161
1160
1159
Mahaffey Cr.
1154
Creek
Hull Cr.
Browns Cr.
1178
Rd.
Lester
Creek
1168
Rock
1172
1173
Crim
Creek
1174
1175
Weyerhaeuser Logging
Roger Cr.
Big
Creek

CHEHALIS RIVER — CRIM-ROCK CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chinook, Coho
1095	Marcuson Creek	LB-97.3	3.6	—	
	(See Chehalis 3203)				
1098	Unnamed	RB-97.31	1.3	—	Unknown
1100	Dunn Creek	LB-98.8	5.4	—	
	(See Chehalis 3203)				
1103	Absher Creek	LB-99.3	1.9	—	
	(See Chehalis 3203)				
1104	Capps Creek	LB-99.8	2.2	—	
	(See Chehalis 3203)				
1106	Elk Creek	LB-100.2	15.8	58.2	
	(See Chehalis 3803)				
1144	Robinson Creek	LB-102.8	1.35	—	Unknown
1145	Fronia Creek	RB-103.2	1.8	—	Unknown
1146	Jones Creek	RB-103.7	4.8	7.2	Coho
1147	Katula Creek	RB-0.15	2.15	—	None
1148	Kowalski Creek	RB-2.55	1.8	—	None
1150	Shields Creek	LB-104.3	1.8	—	None
1151	Cannonball Creek	LB-105.1	1.3	—	None
1152	Stowe Creek	RB-106.3	5.4	5.58	Coho
1153	Sand Creek	RB-1.4	2.7	—	Coho
1155	Rock Creek	LB-106.6	7.8	21.7	Coho
1156	Water Mill Creek	LB-0.1	2.4	1.98	None
1157	McCormick Creek	LB-1.5	4.3	4.07	Coho
1161	Unnamed	RB-2.9	1.2	—	Coho
1162	Unnamed	LB-3.6	3.3	—	Coho
1163	Unnamed	RB-0.9	1.3	—	None
1164	Unnamed	RB-1.1	1.8	—	None
1165	Unnamed	LB-4.7	1.0	—	Coho
1166	Salmon Creek	LB-5.0	1.85	—	Coho
1167	Unnamed	LB-0.55	2.4	—	Coho
1168	Unnamed	LB-6.4	2.6	—	None
1169	Mahaffey Creek	LB-108.0	1.1	—	None
1170	Crim Creek	LB-108.5	8.4	12.3	Coho
1171	Lester Creek	LB-0.6	4.6	—	Coho

CHEHALIS RIVER — CRIM-ROCK CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
1176	Hull Creek	RB-109.5	1.0	—	None
1177	Browns Creek	RB-111.3	1.0	—	None
1179	Big Creek	RB-112.3	3.2	3.48	Coho
1181	Roger Creek	RB-113.5	4.0	5.01	
	(See Chehalis 3903)				

ELK CREEK

This section includes the entire Elk Creek watershed of over 58 square miles. Elk Creek is 15.8 miles long and has 16 tributaries with over 71 linear miles of stream drainage.

Stream Description

Elk Creek maintains a westerly course from its waters to its confluence with the Chehalis River. Along its course it picks up a number of small tributaries in addition to Little Elk, Fourth, Swem, Smith, Ludwig, Eighth, Seven, Nine, and Deer creeks.

The Elk Creek watershed is bounded on the north by high hills and on the south by lower hills. Some old-growth timber is found in the higher terrain and second growth is found in much of the remaining area. Extensive deciduous growth is found along much of the Elk Creek valley. Most of this watershed is in timber production; however, some cleared farmland is found along the lower 2 miles of Elk Creek. Rural and farm residences are also found in this area.

Elk Creek, below the falls at mile 1.5, has an average width of 12 yards and provides pool and riffle characteristics necessary for salmon production. The streambed is predominantly gravel and rubble. The high banks and deciduous vegetation provide excellent stream cover. Some gravel and rubble are located above the falls for several miles. The remainder of Elk Creek has a predominantly sand and silt bottom. This section is composed primarily of pool area with a few riffle sections. Fair stream bank cover is provided by deciduous timber and brush. Most of Elk Creek is confined by low-cut banks.

The upper tributaries of Elk Creek, including Fourth, Little Elk, Brush, and several unnamed creeks, have low gradients and predominantly silt and sand streambeds. These creeks are composed primarily of pools, many of which are created by beaver ponds. Very little gravel exists in these streams. Most of the other Elk Creek tributaries have a steep gradient in their headwaters and a moderate gradient in the remainder of the stream. These streams generally have fair to good bank cover provided by deciduous timber and brush. They have an average width of 2 to 5 yards in their lower reaches. The streambeds are predominantly gravel with considerable siltation.

Salmon Utilization

Salmon production in Elk Creek was confined to the lower 1.5 miles prior to completion of a fishway in 1972. Elk Creek supports November runs of coho and both fall and spring chinook. Spawning and rearing occurs from the mouth upstream to approximately mile 8.8. This stream contains an adequate number of deep pools to provide for resting and maturation of adults. Both juvenile coho and spring chinook rear in this stream during the summer months.

The major coho spawning areas are found in the tributaries of Elk Creek. Prime streams are Eight, Smith, and Seven creeks. It is estimated that salmon presently utilize about 9 miles of mainstem Elk Creek and at least 17 linear miles of its tributaries.

Limiting Factors

A 12-foot falls at mile 1.5 on Elk Creek blocked all salmon migration to the upstream areas until November 1972. Above the falls, Elk Creek contains very little spawning area; however, its tributary streams have over 17 miles of suitable spawning and rearing habitat. These tributaries contain considerable amounts of silt resulting from watershed logging and road construction. Water quality and quantity are generally good, and concentrations of predacious fish are low. Deer Creek has a 20-foot falls at its mouth.

Beneficial Developments

In November 1972, Elk Creek falls fishway was completed. Numerous log jams have been removed with several more to be removed in the future. Plants of hatchery-produced coho fry and smolts are presently being planted above the fishway and are scheduled to be planted for the next several years.

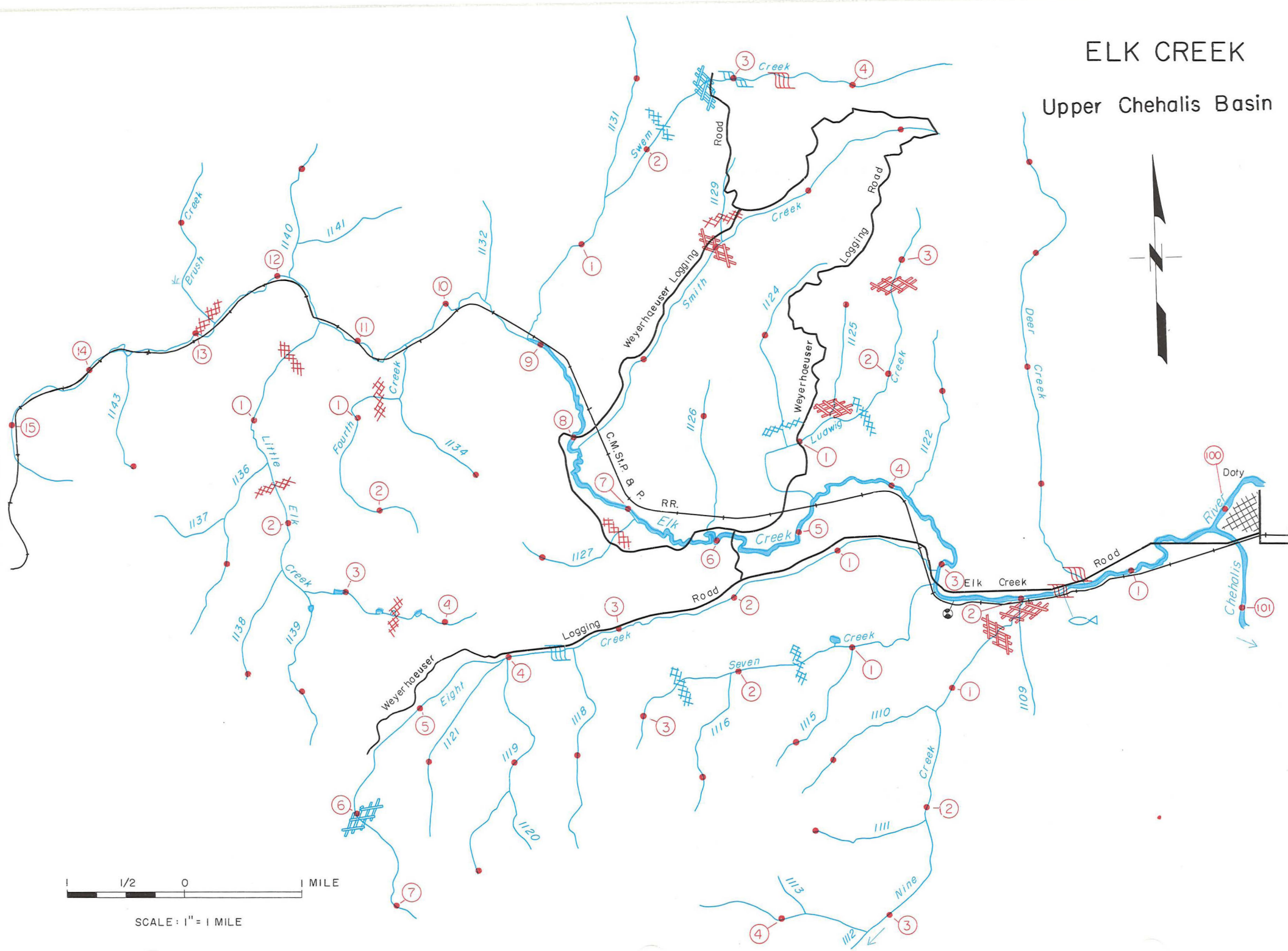
Habitat Needs

Lower Elk Creek presently supports a fair run of both spring and fall chinook. Maintenance of these runs depends on preservation of present streambed and water quality. Logging on the headwaters of Elk Creek, if not conducted in a careful manner, could result in further siltation of the spawning gravels below the falls. Coho fry plants should be continued in the suitable streams above Elk Creek falls.

Laddering of Elk Creek falls has opened up significant spawning and rearing area for coho. Stream channel clearance is presently being conducted to provide access to all of the potential spawning areas.

At present a dam is under consideration on Elk Creek near the mouth of Seven Creek. Low flow augmentation with cool water releases would benefit juvenile salmon in lower Elk Creek and downstream in the Chehalis River. The reservoir above this dam will inundate potential coho spawning and rearing area.

PHOTO 22-32. Laddering of Elk Creek falls opened many miles of coho production area.


ELK CREEK
Upper Chehalis Basin
Creek
Brush
Swem
Road
Creek
Logging
Road
Smith
Weyerhaeuser Logging
C.M.St.P. & P. RR.
Weyerhaeuser
Ludwig
Creek
Deer
Creek
Doty
River
Fourth
Creek
Little
Elk
Creek
Elk Creek
Road
Chehalis
Logging
Road
Creek
Weyerhaeuser
Eight
Seven
Creek
Creek
Nine
1131
1129
1132
1140
1141
1143
1136
1137
1134
1124
1125
1126
1122
1127
1138
1139
1121
1119
1118
1120
1116
1115
1110
6011
1111
1113
1112
1 1/2 0 1 MILE
SCALE : 1" = 1 MILE

ELK CREEK
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				
1106	Elk Creek	LB-100.2	15.8	58.2	Chinook, Coho
1107	Deer Creek	LB-1.5	4.5	3.84	None
1108	Nine Creek	RB-2.0	4.7	5.06	Coho
1110	Unnamed	LB-1.2	1.4	—	None
1111	Unnamed	LB-2.1	1.0	—	None
1114	Seven Creek	RB-2.8	3.3	—	Coho
1115	Unnamed	RB-1.0	1.3	—	Coho
1116	Unnamed	RB-2.1	1.3	—	None
1117	Eight Creek	RB-2.9	7.2	6.45	Coho
1118	Unnamed	RB-3.4	1.8	—	Coho
1119	Unnamed	RB-4.01	2.0	—	Coho
1121	Unnamed	RB-4.05	1.7	—	None
1122	Unnamed	LB-3.8	1.5	—	Coho
1123	Ludwig Creek	LB-4.7	3.5	—	Coho
1124	Unnamed	RB-0.9	1.8	—	Coho
1125	Unnamed	RB-1.3	1.0	—	None
1126	Unnamed	LB-6.1	1.4	—	None
1127	Unnamed	RB-6.9	1.2	—	Coho
1128	Smith Creek	LB-7.8	4.25	—	Coho
1130	Swem Creek	LB-9.1	4.8	5.77	Coho
1131	Unnamed	RB-1.5	1.6	—	Coho
1133	Fourth Creek	RB-10.5	2.5	—	None
1134	Unnamed	RB-0.5	1.0	—	None
1135	Little Elk Creek	RB-11.45	4.3	—	None
1136	Unnamed	LB-1.5	1.7	—	None
1138	Unnamed	LB-2.45	1.0	—	None
1139	Unnamed	LB-2.7	1.45	—	None
1140	Unnamed	LB-11.9	1.25	—	None
1142	Brush Creek	LB-12.65	1.6	—	None
1143	Unnamed	RB-13.6	1.0	—	None

UPPER CHEHALIS RIVER

This section includes the entire Chehalis River watershed upstream from, and including, Rogers Creek. This section contains 5.4 miles of mainstem channel and 12 tributaries with nearly 60.0 miles of tributaries.

Stream Description

The Chehalis River is formed by the confluence of its East and West forks. The river flows in a northerly direction below the forks through this section. Its major tributaries include East and West Forks Chehalis River, and Thrash and Roger creeks.

Most of the terrain in this upper watershed is steeply sloped. Both old-growth and second-growth coniferous timber is found in this area. Much of the land has been logged in recent years and has little regrowth. Virtually all of this property is owned by a private timber corporation and no residential developments have occurred.

The stream has a moderate gradient and an average width of 20 yards. It flows through a narrow valley for most of its length. Gravel and rubble are the predominant bottom materials with bedrock common. The Chehalis contains a balance of pools and riffles with adequate bank cover suited for salmon production. A few rapid areas are found. Tributaries have a moderate to moderately steep gradient except in their lower reaches. Rubble and gravel are the predominant features of the streambed and stream bank cover is generally fair to good on these tributaries. Most have suitable pools and riffles for salmon production. The East and West forks have average widths of 15 and 12 yards, respectively, in their lower reaches. The other tributaries to the mainstem and its two forks have average widths of 1 to 4 yards in their lower reaches. Bedrock is common in the two forks, creating a number of cascades and falls. All streambeds appear to be fairly stable.

Salmon Utilization

Prior to 1970 Fisk Falls was a barrier to all salmon migration. Steelhead were able to overcome this barrier and utilized much of the upper watershed. During the winter of 1969-1970 Fisk Falls was modified to allow passage of adult salmon. It is anticipated that both fall and spring chinook will utilize the mainstem upstream to the forks and the lower reaches of the East Fork, West Fork, and Thrash Creek. Coho spawning is anticipated in the upper East Fork and its tributaries and in Thrash Creek. Some coho spawning may also occur in the West Fork. Coho rearing will occur in all areas accessible to adult salmon. Juvenile spring chinook rearing is anticipated in the mainstem and lower reaches of Thrash Creek, and East and West forks.

Limiting Factors

Modification of Fisk Falls opened much of this watershed to salmon. Barriers on the tributary streams include a 10-foot falls at the mouth of Rogers Creek, log jams on lower Thrash Creek, and cascades at the mouths of Smith and Alder creeks. A channel change on the West Fork Chehalis River near mile 3.8 created a falls of 14 feet, and cascades at the mouth of Sage Creek will limit coho production in this tributary. The East Fork Chehalis has cascades and falls in its upper reaches that are expected to be partial barriers to coho migration. Siltation of the gravel has resulted from road construction, logging and natural slides.

Beneficial Developments

The barrier at Fisk Falls was removed in 1970 and has opened approximately 15.6 miles of spawning and rearing area for salmon production. Log jams have been removed from Cinnabar and Thrash creeks and minor falls on Thrash Creek have been modified.

Habitat Needs

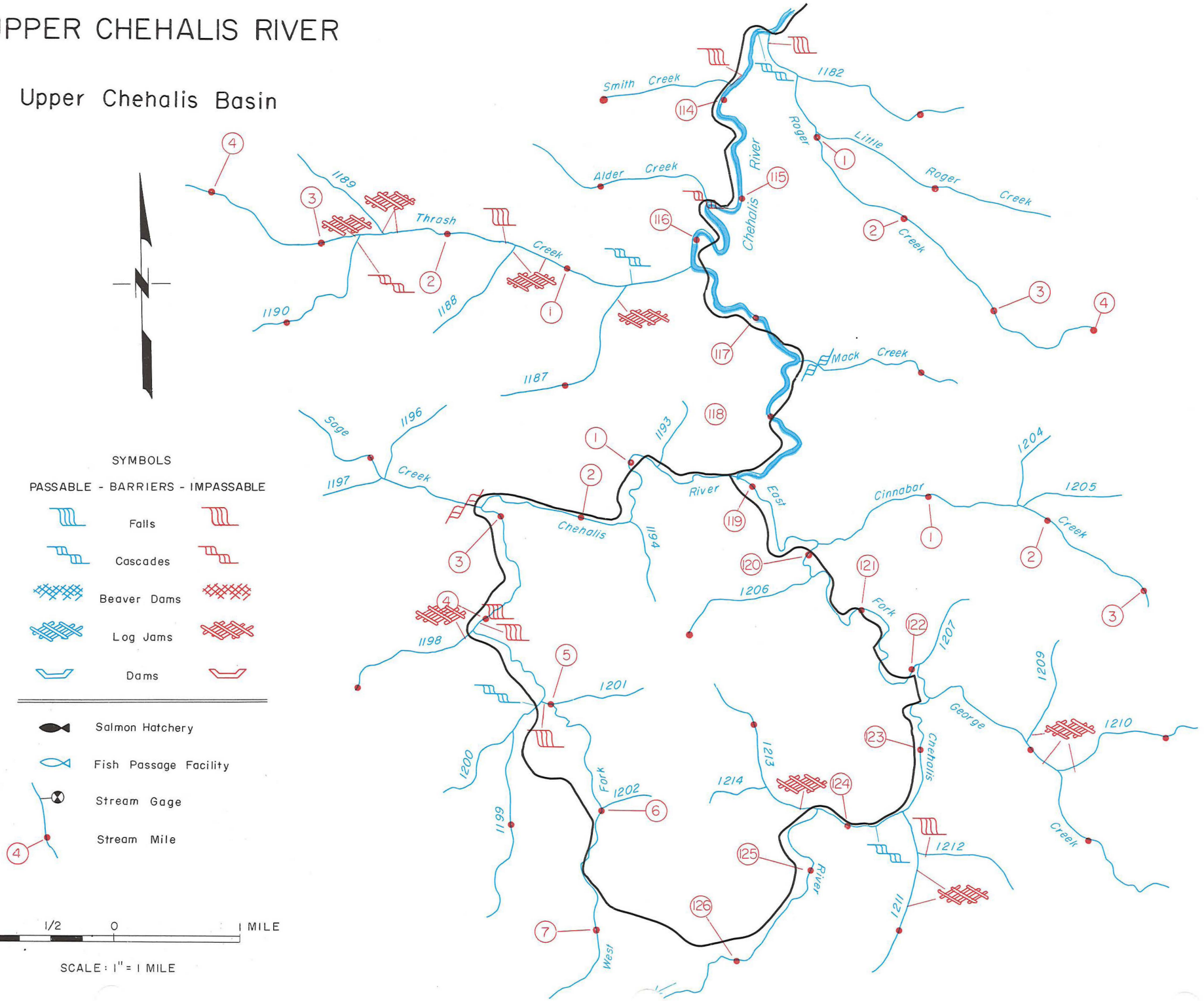
Establishing natural spawning runs in the upper Chehalis watershed is expected to be a slow process. Only limited numbers of "strays" can be expected to enter the area. Consequently stocking of coho and fall chinook is conducted. If a suitable stock of spring chinook becomes available, yearlings of this race should also be planted.

Much of this watershed has been recently logged or will be logged in the near future. Increased runs can be expected with reforestation. Existing bank cover should be maintained and reestablished in denuded areas. Siltation of the streambed must be avoided and no gravel removal operations should be permitted adjacent to the stream channels. Additional channel clearance may be required on tributary streams to permit full use of the coho spawning area.

PHOTO 22-33. West Fork falls created by channel change during road construction.

UPPER CHEHALIS RIVER

Upper Chehalis Basin



UPPER CHEHALIS RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0190	Chehalis River				Chinook, Coho
1181	Roger Creek	RB-113.5	4.0	5.01	None
1182	Unnamed	RB-0.45	1.4	—	None
1183	Little Roger Creek	RB-1.0	1.9	—	None
1184	Smith Creek	LB-113.9	1.0	—	None
1185	Alder Creek	LB-115.3	1.6	—	None
1186	Thrash Creek	LB-116.2	4.2	6.57	Coho, Chinook
1187	Unnamed	RB-0.55	1.5	—	Coho
1190	Unnamed	RB-2.7	1.25	—	None
1191	Mack Creek	RB-117.45	1.3	—	None
1192	W. Fk. Chehalis R.	LB-118.9	8.1	13.2	Coho, Chinook
1195	Sage Creek	LB-2.85	1.75	—	Unknown
1198	Unnamed	LB-4.1	1.0	—	None
1199	Unnamed	LB-4.9	1.8	—	None
	Chehalis R. cont. as E. Fk. Chehalis R.	@ mi. 118.91		17.6	Coho, Chinook
1203	Cinnabar Creek	RB-119.9	3.15	—	Coho
1206	Unnamed	LB-120.2	1.0	—	
1208	George Creek	RB-122.4	2.9	—	Coho
1210	Unnamed	RB-1.3	1.3	—	Coho
1211	Unnamed	RB-123.55	1.4	—	Coho
1213	Unnamed	LB-124.3	1.45	—	Coho

CHARLEY-NEWSKAH CREEKS

This section includes the independent tributaries to the south shore of Grays Harbor between the mouth of the Chehalis River and the mouth of Johns River. This includes Charley Creek and Newskah Creek and five lesser tributaries to Grays Harbor. These small streams have a total length of nearly 60.0 miles.

Stream Description

Charley Creek and Newskah Creek head in the low hills of the North River Divide. They flow in a northwesterly direction through gradually broadening valleys to their confluence with Grays Harbor. The other tributaries in this section are relatively short and flow through shallow ravines to their mouths.

Most of this section is in second-growth timber. Much of the Charley Creek watershed has been completely clear-cut logged in the past few years. The remainder of this section is in second-growth timber or deciduous brush. Stream gradients are generally low to moderate except in the headwaters. Stream bank cover is adequate in all areas except adjacent to Charley Creek. There are scattered farm and rural residences along the lower five miles of Newskah Creek. Other residential developments have been confined to the area adjacent to Grays Harbor. Some farmland is present along lower Newskah Creek.

The smaller tributaries in the section — Chapin, Campbell, Indian, Stafford, and O'Leary creeks — have a low gradient and are comprised mainly of pool areas. Their stream beds are predominantly silt and mud with very little gravel present. Charley Creek also has very little gravel. Newskah Creek is the only tributary in this section of significance to salmon production. It has a low to moderate gradient throughout most of its length and provides both pool and riffle areas suitable for salmon spawning and rearing. Stream bank cover is generally in the form of deciduous timber. Newskah and Charley Creeks have maximum widths of approximately six yards. The lesser tributaries have maximum widths of about 3 yards.

Salmon Utilization

Newskah Creek is the major spawning stream in this section. The lower three miles of Newskah Creek are primarily used for transportation and juvenile rearing. Spawning is confined to the 3 miles below the falls. Stream surveys on the other streams in this section revealed little actual or potential salmon production. It is estimated that approximately 23 linear miles of these independent streams are presently utilized by salmon.

Limiting Factors

The major limiting factor in this section is the limited spawning area in all streams except Newskah Creek. Surveys on these other streams revealed virtually no gravel suitable for coho or chum use. Stream flow in Newskah and Charley creeks appears to be adequate for juvenile rearing; however, flows in the other streams tributary to Grays Harbor are extremely low during the summer months. The lack of adequate bank cover on Charley Creek has resulted in extremely warm water temperatures. A falls and old splash dam on Newskah Creek prevent salmon from using several miles of stream with a potential for salmon production.

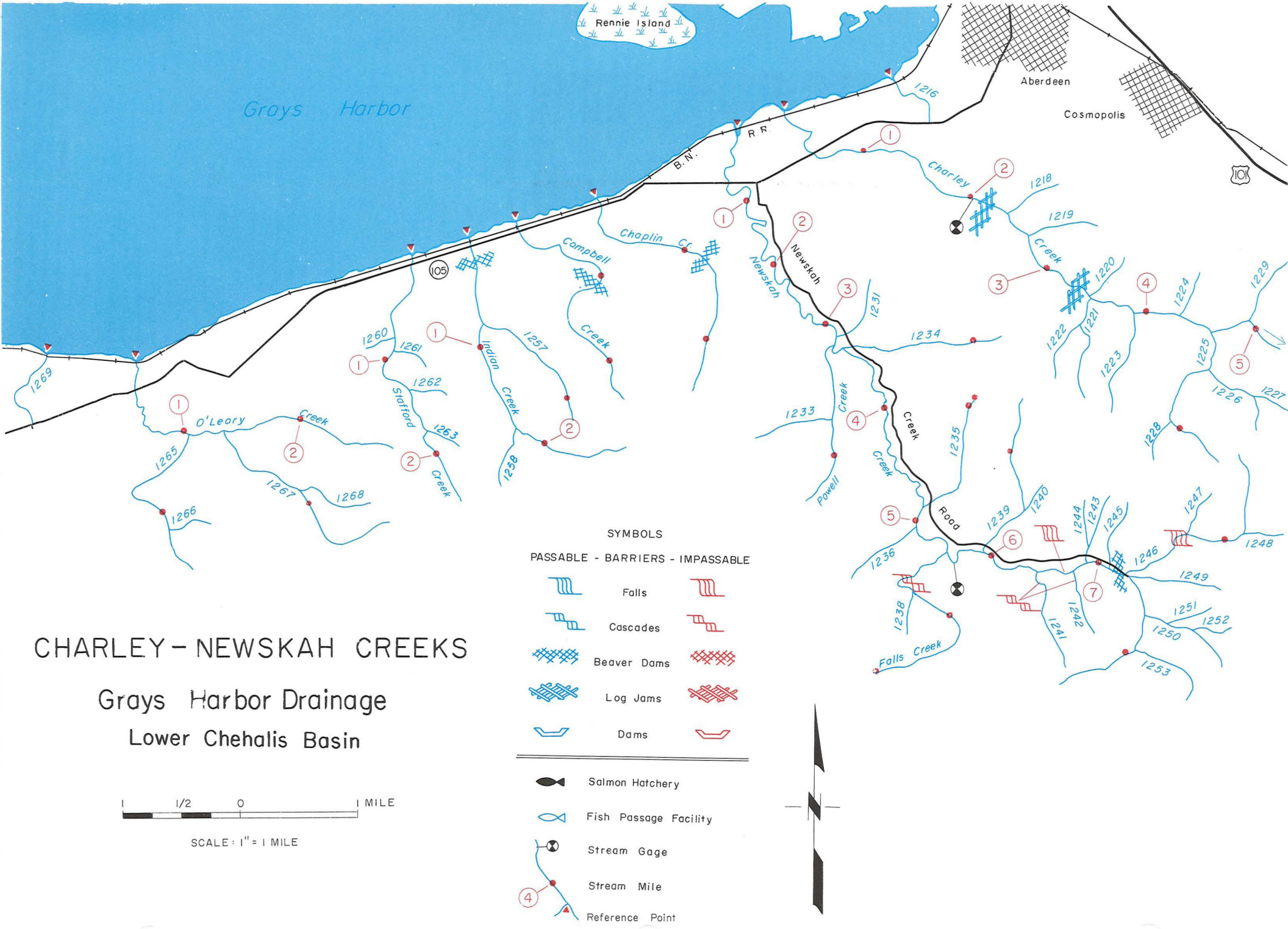
Beneficial Developments

There have been no beneficial developments in this area.

Habitat Needs

The low production levels present in these streams other than Newskah Creek, will probably maintain themselves. A small egg incubation or artificial spawning channel may be feasible for chum and coho on Charley Creek. Stream bank cover should be maintained along Newskah Creek to protect the water and streambed quality.

PHOTO 22-34. Denuded stream banks and logging debris on Charley Creek.



CHARLEY - NEWSKAH CREEKS

Grays Harbor Drainage

Lower Chehalis Basin

CHARLEY-NEWSKAH CREEKS
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
1215	Alder Creek	SE¼,Sec9, T17N,R9W	2.35	—	Coho
	Unnamed Lake	Outlet-1.26	—	—	
1217	Charley Creek	SE¼,SE¼,Sec18, T17N,R9W	6.75	—	Coho
1225	Unnamed	LB-4.65	1.45	—	Unknown
1226	Unnamed	RB-0.3	1.0	—	
1230	Newskah Creek	SW¼,SE¼,Sec18, T17N,R9W	8.7	—	Chum, Coho
1232	Powell Creek	LB-3.2	1.45	—	Coho
1234	Unnamed	RB-3.25	1.2	—	Coho
1235	Unnamed	RB-4.9	1.1	—	Coho
1237	Falls Creek	LB-5.46	2.0	—	Coho
1239	Unnamed	RB-5.9	1.5	—	Coho
1246	Unnamed	RB-7.21	1.9	—	None
1254	Chapin Creek	SW¼,Sec24, T17N,R10W	2.5	1.44	Coho
1255	Campbell Creek	SE¼,Sec23, T17N,R10W	2.4	1.40	Coho
1256	Indian Creek	NW¼,Sec26, T17N,R10W	2.7	—	Coho
1257	Unnamed	RB-0.8	1.2	—	Coho
1259	Stafford Creek	NE¼,Sec27, T17N,R10W	2.4	—	Coho
1264	O'Leary Creek	NW¼,Sec32, T17N,R10W	2.8	—	Coho
1265	Unnamed	LB-1.05	1.55	—	Coho
1267	Unnamed	LB-1.35	1.85	—	Coho

JOHNS RIVER

The Johns River section includes Johns River and its tributaries. Johns River provides 7.5 miles of mainstem channel. Its 17 tributaries have a total length of over 54.0 miles. (All of the mainstem and at least 26.0 miles of tributaries are presently utilized by salmon.)

Stream Description

Johns River flows northwesterly for 7.5 miles downstream from the confluence of its North and South forks. Its major tributaries include North Fork, South Fork, Gold, Unnamed (RB-3.1), Bluff, Atwood, and Balloon creeks.

Most of the Johns River watershed is in low, gentle hills forested with second-growth timber. Logging has been conducted in the past few years on the North Fork watershed. Johns River has a low gradient along its course. Its tributaries have low to moderate gradients except in their headwaters. Marginal vegetation generally provides adequate stream cover on the mainstem and all tributaries except along much of the North Fork and its tributaries.

Some farmland has been cleared along the lower reaches of Johns River. A few farm residences are found in the lower valley, with moderate industrial development of the river mouth. A public hunting area encompasses much of the tide marsh area.

Johns River is influenced by tidal fluctuations to near mile 4.0. Pools with short riffles interspersed are present upstream to the North and South Forks. Most of the channel above tidal influence is confined by shallow, cut banks with the stream width averaging 12 yards. The bottom is composed primarily of sand and small gravel.

Both the North and South Forks flow through broad valleys with numerous debris jams partially obstructing their channels. These streams average approximately 9 yards wide in their lower reaches. The streambeds are composed primarily of sand and small gravel. Their tributaries are generally less than 4 yards wide with sand the predominant bottom material with sufficient gravel for limited spawning.

Salmon Utilization

A small run of both chum and coho use this watershed. Chum spawning is apparently confined to the mainstem and the lower reaches of the North and South forks. Coho spawning occurs in the North and South forks and the accessible reaches of all tributaries containing suitable gravel. This system is not known to have a run of chinook.

Johns River provides both transportation for adults and rearing of juvenile salmon. The extensive estuary area provides for transition between fresh to salt water. The river has an adequate number of deep pools for resting and maturation of salmon on their spawning migration. Juvenile coho rearing occurs in all waters accessible and suitable for spawning. All of the mainstem Johns River and at least 26 linear miles of tributaries are presently utilized by salmon.

Limiting Factors

Surveys conducted on the Johns River watershed in 1932 described the watershed as containing "a most excellent bed of spawning gravel" and South Fork "represents about three miles of ideal spawning area." These conditions have changed to the extent that Johns River and its tributaries are now marginal production habitat. Logging and road construction have caused excessive siltation of gravel and have reduced much of the tributary production to a low level. Stream bank cover on much of the North Fork and its tributaries has been removed, resulting in high water temperatures and continued erosion.

Beneficial Development

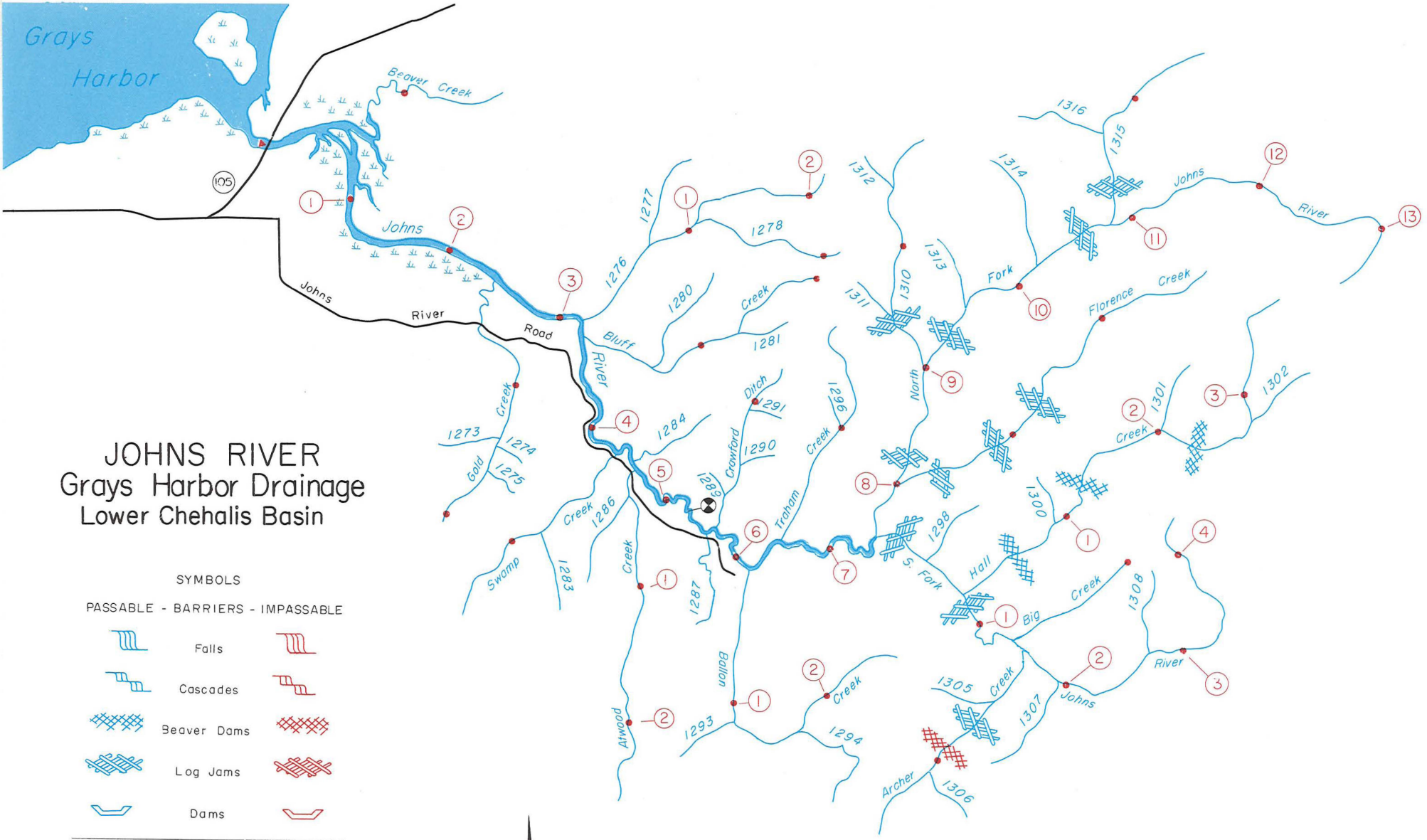
There have been no beneficial developments in this watershed.

Habitat Needs

Further deterioration of the streambed quality in the Johns River watershed will completely destroy the production capabilities of this system. Future logging and road construction must be conducted in manner to cause no further siltation of the gravel. Stream bank cover must be maintained.

Johns River, particularly its North Fork, would serve as an excellent model study for watershed rehabilitation. Channel clearance, gravel cleaning techniques, and planting of suitable bank cover are recommended. The stream is small enough to allow evaluation of results.

PHOTO 22-35. Many tributaries of Johns River are clogged with debris.



JOHNS RIVER
Grays Harbor Drainage
Lower Chehalis Basin

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

JOHNS RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
1270	Johns River	SE¼,Sec2, T16N,R11W	13.55	31.1	Chum, Coho
1271	Beaver Creek	RB-0.5	1.8	—	Unknown
1272	Gold Creek	LB-2.45	2.05	—	Unknown
1276	Unnamed	RB-3.2	2.2	—	Coho
1278	Unnamed	LB-1.1	1.15	—	Unknown
1279	Bluff Creek	RB-3.3	2.0	—	Unknown
1282	Swamp Creek	LB-4.4	1.7	0.96	Unknown
1285	Atwood Creek	LB-4.6	2.6	2.10	Coho
1288	Crawford Ditch Creek	RB-5.6	1.3	—	Unknown
1292	Balloon Creek	LB-6.15	2.6	—	Unknown
1295	Traham Creek	RB-6.5	1.85	—	Coho
1297	S. Fk. Johns River	LB-7.5	4.3	7.03	Chum, Coho
1299	Hall Creek	RB-0.75	3.8	—	Coho
1303	Big Creek	RB-1.5	1.0	—	Coho
1304	Archer Creek	LB-1.6	1.7	—	Coho
	Johns R. cont. as N. Fk. Johns River	@ mi. 7.51		8.36	Chum, Coho
1309	Florence Creek	LB-8.0	2.8	—	Coho
1310	Unnamed	RB-9.0	1.9	—	Coho
1315	Unnamed	RB-10.8	1.6	—	Coho

ELK RIVER

This section includes all tributaries to South Bay on Grays Harbor. The main river system is Elk River with a number of smaller independent tributaries. Elk River contains 8.9 miles of mainstem plus 19 tributaries providing an additional 31.9 linear miles of stream drainage. The 13 independent streams have a combined total of 47.6 linear miles of drainage.

Stream Description

South Bay is a large, shallow harbor at the southwest end of Grays Harbor. It is composed of large tidal marshes and a number of small- to medium-sized sloughs. Beardslee Slough, approximately two miles long, has several small tributaries including Barlow Creek. Elk River enters the upper end of South Bay. Andrews Creek is an important confluent on the south side of the bay. Several lesser streams enter the bay's west side.

All of the streams entering South Bay originate in the low ridge dividing the Grays Harbor drainage from Willapa Harbor drainage. Most of these low hills and intervening valleys are grown over with second-growth timber and brush. Some farmland exists adjacent to the bay. Some residential development has occurred along State Highway 105 with little development elsewhere.

Most of the streams in this area are less than 5 yards wide and have a streambed comprised primarily of silt and sand. Deposits of gravel exist in several at a depth of one foot or more beneath the sand layer. Channels are frequently cut deeply into the valley bottom. These streams have a generally low gradient except in the headwaters. Bank cover is good except in recently logged areas. Pools are adequate for resting and maturation of adults. Riffle area is usually shallow, slow-moving water over a sand bottom.

Andrews Creek is an atypical stream in this area. This creek, and its West Fork, have a gravel bottom with the common pool-riffle characteristics and excellent bank cover.

Salmon Utilization

Most of the accessible streams containing suitable spawning gravel support runs of coho and most likely chum. Andrews Creek is probably the most important of the salmon production areas in the South Bay drainages. Spawning area is also located on the West Branch of Elk River and on several small tributary streams. Other reaches surveyed have no spawning area and lack juvenile coho. The total stream mileage in salmon production in this section has not been determined.

South Bay serves as an important transition area between fresh and salt water for juvenile salmon produced in its tributaries. It may be a key rearing area for juvenile salmon spawned in its tributaries and elsewhere in the Grays Harbor drainage.

Limiting Factors

Most of the tributaries of South Bay contain very little spawning area. Former spawning area is now covered with a layer of silt and sand. Logging debris creates numerous partial barriers on Elk River and its tributaries. Adequate bank cover is lacking along many of the streams in recently logged areas.

Beneficial Developments

This area has had no beneficial development.

Habitat Needs

Further decline of habitat quality will result in complete loss of production in Elk River and its tributaries. Logging and road construction have not been conducted with concern for the water and streambed quality.

Andrews Creek still provides an excellent environment for coho and chum production. This must be maintained in the future during logging and road construction activities.

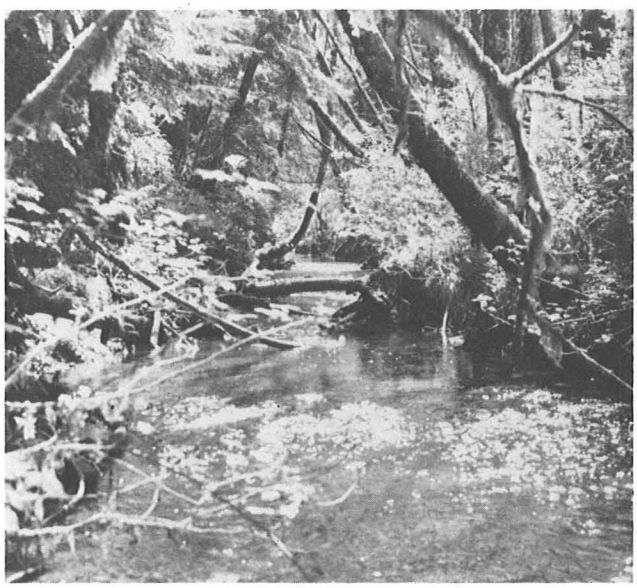
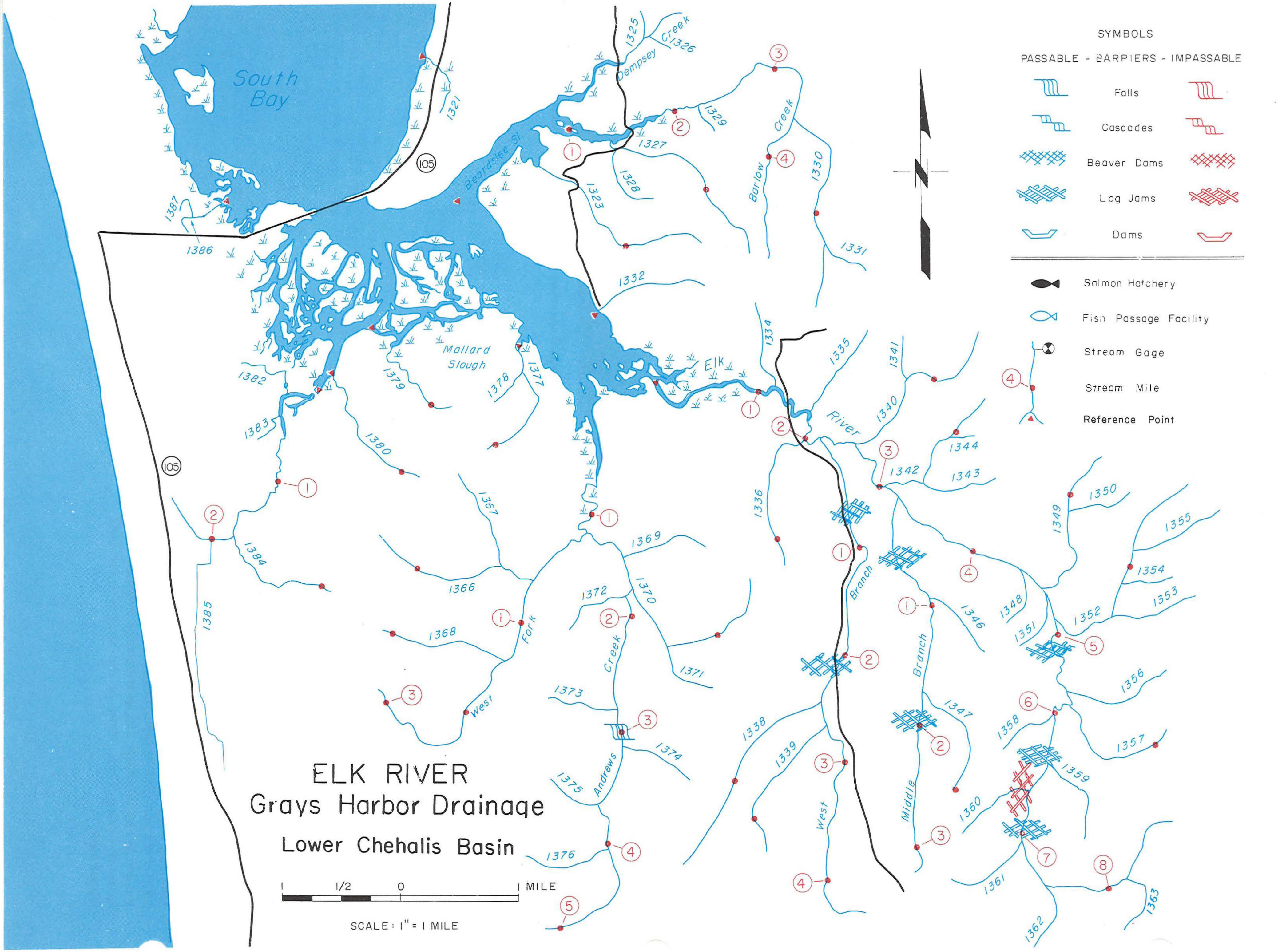


PHOTO 22-36. Typical spawning and rearing habitat on Andrews Creek.


ELK RIVER
Grays Harbor Drainage
Lower Chehalis Basin
SCALE: 1" = 1 MILE
1 1/2 0 1 MILE
SYMBOLS
PASSABLE - BARRIERS - IMPASSABLE
Falls
Cascades
Beaver Dams
Log Jams
Dams
Salmon Hatchery
Fish Passage Facility
Stream Gage
Stream Mile
Reference Point
South Bay
Beardslee Sl.
Mallard Slough
Elk River
Dempsey Creek
Barlow Creek
West Fork
Andrews Creek
Branch
Middle Branch
West
105

ELK RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
1317	Redman Slough	SE¼,Sec3, T16N,R11W	2.0	—	Unknown
1322	Beardslee Slough	NE¼,Sec21, T16N,R11W	4.85	—	Unknown
1323	Unnamed	LB-0.5	1.6	—	Unknown
1324	Dempsey Creek	RB-0.9	1.5	—	Unknown
1327	Unnamed	LB-1.45	1.7	—	
	Beardslee Slough cont. as Barlow Creek	@ mi. 1.6	—	—	
1330	Unnamed	RB-3.6	1.8	—	Unknown
1333	Elk River	SW¼,Sec26, T16N,R11W	8.9	18.2	Coho, Chum
1336	Unnamed	LB-2.05	1.2	—	Coho
1337	W. Br. Elk River	LB-2.2	4.5	—	Coho
1338	Unnamed	LB-2.45	1.8	—	Unknown
1339	Unnamed	LB-2.7	1.3	—	Unknown
1340	Unnamed	RB-2.5	1.6	—	Unknown
1342	Unnamed	RB-3.05	1.4	—	Unknown
1345	M. Br. Elk River	LB-3.15	3.2	—	Coho
1347	Unnamed	RB-1.75	1.0	—	Unknown
1349	Unnamed	RB-4.65	1.4	—	Unknown
	Elk R. cont. as E. Br. Elk River	@ mi. 4.66	—	—	Coho
1352	Unnamed	RB-4.9	1.9	—	Coho
1357	Unnamed	RB-5.75	1.1	—	Unknown
1364	Andrews Creek	SE¼,Sec27, T16N,R11W	5.1	11.4	Coho, Chum
1365	W. Fk. Andrews Cr.	LB-1.2	3.1	—	Coho, Chum
1366	Unnamed	LB-0.6	1.5	—	Coho
1368	Unnamed	LB-1.4	1.1	—	Coho
1370	Unnamed	RB-1.75	1.6	—	Coho
1377	Unnamed	NW¼,Sec27, T16N,R11W	1.05	—	Unknown
1379	Mallard Slough	NW¼,Sec28, T16N,R11W	1.2	—	Unknown
1380	Unnamed	SE¼,Sec29, T16N,R11W	1.2	—	Unknown
1381	Unnamed	SW¼,Sec29, T16N,R11W	2.5	—	Unknown

ELK RIVER
Chehalis Basin — WRIA 22 & 23

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
1384	Unnamed	RB-1.8	1.1	—	Unknown
1385	Drainage Ditch	RB-2.0	~ 2.1 [1]	—	Unknown
1390	Unnamed	N½,Sec7, T16N,R11W	1.05	—	Unknown

[1] *Drains Cranberry Bog.*