

DESCHUTES BASIN

Water Resource Inventory Area 13

The Deschutes River system is the principal drainage within this basin. There are 143 identified streams providing over 256 linear miles of drainage. Three important small drainages enter Puget Sound independent of the Deschutes River, Woodward, Woodland, and McLane creeks. Each contains accessible stream area and suitable spawning and rearing conditions for various species of anadromous and resident fishes.

The Deschutes River heads in the foothill slopes of the Cascades approximately 12 miles southwest of Eatonville. Moving away from the relatively steep, forested slopes, the river flows generally northwest across a broad prairie-type valley floor. This flatland condition continues for approximately 40 miles to the river's confluence with the southernmost extension of Puget Sound at Budd Inlet. The upper 11 miles of the Deschutes, river mile 41.0 to the headwaters, has moderately steep gradient and presents numerous small cascades and rapid areas with few good quality pool-riffle sections. The remaining river below contains considerable excellent quality pool-riffle streambed interspersed with occasional rapid sections. The majority of the lower river area is highly suitable for use by both anadromous and resident fishes. Adjacent stream banks are mostly open farm land and are occasionally interspersed with dense thickets of mixed deciduous and coniferous growth. Only a few short tributaries enter the Deschutes along this stretch, each contributing some additional fish habitat.



PHOTO 13-1. Capitol Lake and Dam (Budd Inlet in foreground).

At Tumwater, southwest of Olympia, the Deschutes River flows over a series of falls. These barriers were laddered by the Washington Department of Fisheries in 1954, opening the upper river to anadromous fish. Immediately below the falls the river flows through Capitol Lake, an artificial impoundment of 333 surface acres. Entering this managed, fish-producing lake from the southwest is Percival Creek, one of the Deschutes system's more important spawning and rearing tributaries.

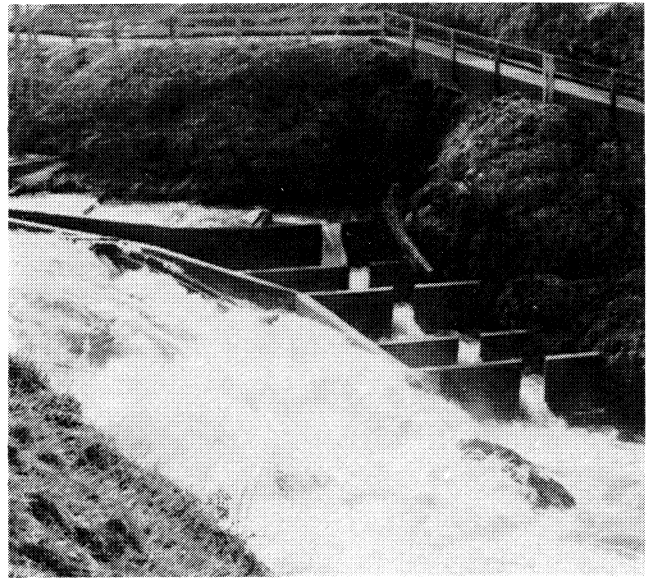


PHOTO 13-2. The second of three fishways located immediately above Capitol Lake.

McLane, Woodward, and Woodland creeks, three of the basin's larger independent drainages, flow over mostly gentle gradient with the surrounding area containing intermittent sections of cleared land, mixed deciduous and coniferous thickets, and increasing urbanization. Throughout their accessible lengths these streams offer sections suitable for use by certain anadromous and resident fish species; however, human encroachment is rapidly altering and destroying these fish producing areas. Independent streams add an additional 63.9 linear miles of stream length to the Deschutes basin, most of which is accessible.



PHOTO 13-3. Upper Tumwater Falls with fishway in foreground.

Fish Inventory and Distribution

Three species of Pacific salmon, chinook, coho, and chum, currently utilize Deschutes basin drainages. A few sockeye have been recorded in the Deschutes River; however, their numbers are presently insignificant. These fish migrate, spawn, and rear in approximately 103 miles of Deschutes River, its tributaries, and independent basin drainages.



PHOTO 13-4. Chinook spawn throughout the lower sections of the Deschutes River.

Chinook Salmon — In this basin chinook salmon utilize mainly the Deschutes River. These fish are principally fall run chinook as distinguished from summer or spring chinook races. Spawners are known to use river sections throughout the accessible length of the Deschutes with major spawning occurring between Tumwater and Vail, a distance of nearly twenty-five miles. Of the Deschutes tributaries, only Percival Creek is known to support significant numbers of spawning chinook. Use of independent basin drainages by this species is minimal since each of these streams exhibits very low flows during normal chinook migration and spawning periods.

Juvenile chinook rear in the total accessible length of the mainstem Deschutes, plus the tributary streams inhabited by spawning adults. Extensive rearing also takes place in Capitol Lake.

The adult chinook spawning migration begins in late July when the adults first appear at the Capitol Lake ladder. This migration is usually terminated by mid-November. Spawning commences in some areas in mid-September and is usually completed throughout the system by the end of November. Following incubation and subsequent emergence, the majority of chinook fry rear in the system about three months prior to seaward migration. Some chinook juveniles are known to remain for longer periods within the system; however, the major out-migration occurs between March and June during the higher spring runoff flows.

Adult chinook salmon counts at the Tumwater ladder show that the annual escapement has ranged from 3,900 to 11,600 fish for the period 1966 to 1971, averaging 8,200 per

year. In addition, it is estimated that Percival Creek chinook runs have averaged approximately 3,155 fish per year for the same period. A large portion of adult returns stems from the intensive planting and rearing program in Capitol Lake.

Coho Salmon — Virtually all accessible streams and tributaries draining the Deschutes basin are utilized by coho salmon. Spawning occurs in almost every stream area where suitable conditions permit, including many sections of the mainstem Deschutes River. Tributaries known to be of particular importance include Spurgeon and Percival creeks. The various independent basin drainages also receive relatively good runs of coho.

Juvenile coho rear throughout the accessible lengths of all basin streams, as well as in Capitol Lake. Additional important rearing also takes place in Puget Sound estuary and marine habitats.

Adult coho begin entering Deschutes basin streams from early to mid-September and the run continues well into December. Spawning commences in mid-October and is generally completed by late December. Following incubation and emergence from the gravel, the juveniles generally remain in the system for more than a year, migrating seaward early in their second year of freshwater life. The major portion of this out-migration occurs from late February to mid-April.

Based on adult counts at the Tumwater ladder and on spawning ground information, it is estimated that coho escapements to the basin have ranged from 465 to 3,500 for the period 1966 to 1971, averaging 1,500 annually.

Chum Salmon — The occurrence of chum salmon spawning in the basin is confined principally to the independent drainages, primarily Woodward, Woodland-Himes, and McLane creeks. Some chum do utilize Percival Creek; however, as is characteristic of the species, they do not readily ascend fishways and thus do not often reach available spawning ground in the Deschutes River.



PHOTO 13-5. McLane Creek drainages support a large run of chum (Swift Creek).

Timing of salmon fresh-water life phases in Deschutes Basin WRIA 13

Species	Fresh-water Life Phase	Month											
		J	F	M	A	M	J	J	A	S	O	N	D
Summer-Fall Chinook	Upstream migration												
	Spawning												
	Intragravel develop.												
	Juvenile rearing												
	Juv. out migration												
Coho	Upstream migration												
	Spawning												
	Intragravel develop.												
	Juvenile rearing												
	Juv. out migration												
Chum	Upstream migration												
	Spawning												
	Intragravel develop.												
	Juvenile rearing												
	Juv. out migration												

The quality of the basin's estuary and marine waters is the major factor in the successful early rearing of the young chum fry produced in basin streams as well as those produced in important adjacent southern Puget Sound drainages.

Adult chum salmon enter the basin drainages beginning in October with the run continuing well into November. Spawning occurs from mid-November through most of December. Following incubation and subsequent fry emergence the juveniles journey seaward. This migration occurs from mid to late February into May.

Based on spawning ground information it is estimated that annual chum escapements to the Deschutes basin have ranged from 3,800 to 19,900 for the period 1966 to 1971, averaging about 11,500 annually.

Salmon Production

The Fisheries Department initiated a program of releasing fall chinook salmon fingerlings into the Deschutes River estuary in 1964. Since the falls at the river mouth blocked migration into the river, returning adult chinook were trapped and trucked above the falls to spawn naturally. Capitol Lake, now occupying the former intertidal estuarial basin, was created in 1950 when an earth-fill dam was built. In 1954 a series of vertical-baffle fishways was completed affording free access for mature adult salmon to the upper river.

The excellent present-day returns of chinook and coho to this river system originated entirely from plants made above the falls. Present production is maintained at a high level through intensive stocking of Capitol Lake, a managed salmon rearing area existing as an integral part of the Deschutes River system.

Although no salmon hatcheries exist within the basin, eggs are obtained annually at the Deschutes River-Tumwater Falls fishway, with incubation and early rearing taking place at Washington Department of Fisheries hatcheries

outside the basin. For the period 1966 to 1971, chinook returns to the Tumwater Falls holding pond ranged from 3,908 to 11,621 adults, averaging 8,219 annually. Coho returns were allowed to ascend and spawn naturally in the upper river. Between 1961 and 1966 a total of 18,264,239 chinook and 2,019,872 coho were introduced, most of these directly into Capitol Lake. The average annual plants over this six year period were 5,309,319 chinook and 336,645 coho. Chinook plants from 1966 through 1971 have ranged from 3,600,000 to 7,220,000, averaging 5,467,000 annually. In 1971, a plant of 10,555,100 chinook fry (74,900 lbs.) was released in Capitol Lake to rear. 473,993 coho fry were released here in 1968, and 40,690 yearling coho of the 1969 brood year in 1970.



PHOTO 13-6. Controlled chinook rearing area in Percival Cove.

TABLE 13-2. Salmon Escapement Level for the Deschutes River Basin WRIA 13.

1966-1971 Escapements ¹		
Species	Range	Average
Chinook	3,900—11,600	8,200
Coho	465— 3,500	1,500
Chum	3,800—19,900	11,500

Natural Escapement Potential

Chinook	14,000
Coho	7,600
Chum	13,500

¹ Includes natural plus artificial combined escapements.

Preliminary information from commercial and sport catch statistics indicate that the present salmon planting program contributes approximately 17,000 chinook to these fisheries annually. The large chinook plants in the last 3 years are expected to double the contributions to commercial and sport fisheries in the next two years. Since the Deschutes system is primarily a chinook salmon production area, coho plants have been limited in recent years.

Harvest

Salmon produced or reared in the Deschutes basin contribute to U.S. and Canadian, Pacific Ocean sport and commercial fisheries and to the sport and commercial fisheries existing through the Strait of Juan de Fuca and Puget Sound. Some sport harvest also occurs within the lower Deschutes River system itself. The estimated total contribution (all species) to these various fisheries has, in recent years, ranged from 37,800 to 79,500 salmon.

The basin's marine waters are closed to commercial salmon fishing. Since no Indian fishery is conducted within the basin, the only commercial harvest of Deschutes-produced salmon is in upper Puget Sound and in the Pacific Ocean fisheries.

Sport angling for salmon is very popular in this area's marine waters with fishermen concentrating their efforts around Johnson Point, Cooper Point, and the southern tips of Harstene and Anderson islands. Large numbers of immature feeding fish utilize these waters the year around. This fact combined with good returns of adult salmon through the area, relatively good access for fishermen, and fishing areas semi-protected from winds and rough water all combine to make the basin's saltwater sport fishery a popular year-round activity. The angling sites are among the most popular in southern Puget Sound where, in 1971, over 150,000 angler trips were recorded.

Sport salmon angling is permitted in Capitol Lake, the impounded lower reaches of the Deschutes River, and in the Deschutes River proper upstream from the old Highway "99" bridge. Adult salmon may be harvested from Capitol

Lake while the upper Deschutes River is restricted to the taking of jack salmon.¹ These waters receive moderate to intense sport fishing effort throughout the fishing season, which lasts from July through October in the lake and through November in the lower river. Catches are composed principally of fall chinook salmon.

Limiting Factors

Limiting factors refer to conditions that lead to a complete loss or reduction of the environment's fish production potential, excluding harvest or exploitation. They include only those conditions presently considered alterable. Within the Deschutes basin major limiting factors include occasional flooding, low summer flows, intermittent debris or beaver dams in the streams, and water quality problems throughout the area.

Stream flow — Destructive seasonal flooding occurs infrequently in each of the basin's drainages. Within the smaller streams the effect is usually minimal. In the Deschutes River, floods occasionally reach an intensity capable of destroying salmon spawn or altering the quality of the rearing habitat. Extensive logging over the upper Deschutes watershed intensifies intermittent runoff, increasing the magnitude of short duration floods.

Seasonal low flows are a serious limiting factor in virtually every basin stream, but are especially critical where excessive land clearing has occurred. For most of the smaller fish producing streams there is little opportunity for flow augmentation.

¹ Not less than 10 inches nor more than 20 inches in length.



PHOTO 13-7. Upper limit of anadromous fish migration at Deschutes Falls.

Physical barriers — A falls at river mile 41.1 on the upper Deschutes River blocks anadromous fish migrations. Although some spawning and rearing potential does exist above these falls, a project involving installation of fish passage facilities at this time has been deemed economically unfeasible. Intermittent barriers created by debris buildup, or by beaver activity, occur periodically on all of the basin's smaller streams.

Water quality — Poor water quality is not a particularly significant factor within the basin at this time. Woodland Creek suffers from heavy siltation created by erosion of a highway construction land fill. Excessive leaching of mud and silt into this stream has covered, and for all purposes, has destroyed what was previously good coho and chum salmon spawning area. The continued deposition of silt into Capitol Lake will eventually eliminate it as a major production area. An effort should be initiated immediately to alleviate this condition.



PHOTO 13-8. Channelization and elimination of stream bank cover are limiting factors on the lower Deschutes.

Limited spawning and rearing — Most water courses throughout the Deschutes basin provide a generally good balance of spawning and rearing area. Extreme low summer flows on some streams limit rearing capacity. Such conditions are prevalent on Woodward and McLane creeks, as well as on the Deschutes River during particularly dry summers. Capitol Lake is rapidly silting in and a high ridge is forming in the middle basin which seriously reduces the rearing capacity.

Watershed development — Logging over the upper Deschutes River watershed remains one of the major activities affecting streams and fish life. Extensive clear-cut section logging tends to influence water runoff patterns and water quality conditions in the streams below.

Construction of summer homes and some permanent residences adjacent to the Deschutes River and the smaller basin drainages, is accelerating at the present time.

The removal of water from basin drainages for municipal, agricultural, or industrial purposes presents a limiting

factor on virtually all streams of the basin. It is expected that future demands for such water will present further limitations on natural fish production.

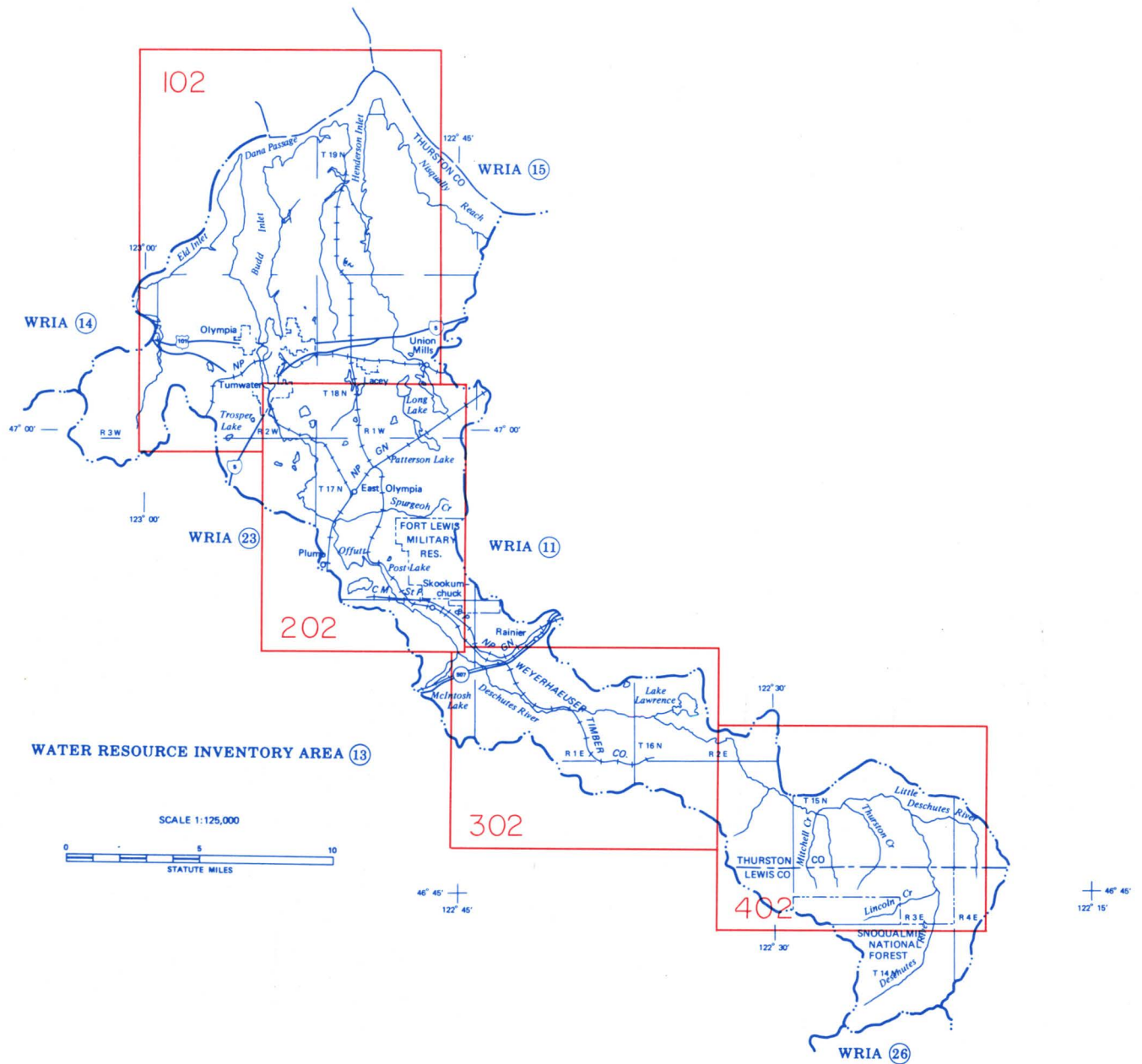


PHOTO 13-9. Manipulation of stream channels in logging area for flood control destroys fish habitat.

DESCHUTES BASIN WRIA 13 **Index to Key Map**

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WRIA - 13



BUDD INLET-CAPITOL LAKE

Independent Drainages

This segment covers approximately 22 independent tributaries entering southern Puget Sound. The stream drainages are located generally north of the Tumwater-Olympia-Lacey area and are accessible via county roads. These streams drain to salt water along the western portion of Nisqually Reach, and in Henderson, Budd, and Eld inlets. Together they include nearly 124 stream miles, much of which is available for anadromous fish use. Capitol Lake and Deschutes River areas are depicted here, but are in Deschutes 201.

Stream Description

The major fish production streams in this area include Woodland, Woodward, Percival, and McLane creeks.

The streams entering Henderson Inlet, Woodland and Woodward creeks, present similar physical characteristics and stream-side land use. Each flows through mixed second growth conifer-deciduous timber and underbrush, and open rural pastureland. The upper drainage of each is experiencing considerable residential, and some commercial development. These streams present gentle to moderate gradients throughout their lengths, with stream widths ranging from 2 to 5 yards. They offer fairly good pool-riffle conditions and primarily gravel stream bottoms over much of their upper reaches. Channels contain considerable sand and fine material and take on slough-like characteristics as they approach their lower tidal areas. Each produces good numbers of chum and some coho.

Percival Creek once flowed into Budd Inlet but now enters Capitol Lake. It has a moderate gradient over most of its length, with a good pool-riffle balance and good quality spawning and rearing conditions. The stream ranges in width from 3 to 7 yards, with bottom material of gravel, rubble, and some sand. Draining from Trosper Lake, it runs through pasture and forest land, much of the stream being well shaded by mixed conifer and deciduous cover. Black Lake also drains via a man-made ditch into the stream. Much of the drainage is rural with some increasing development.

McLane Creek enters Eld Inlet and is one of the more important salmon production streams in southern Puget Sound. It presents a moderate gradient over most of its length with the upper Black Hills portion of the drainage being considerably steeper. Most of the channel appears quite stable, presenting numerous good quality pool-riffle conditions. Stream widths range from 3 to 9 yards over much of the lower section. Cover is moderate to dense deciduous trees and underbrush, with some mixed conifers. There is some limited rural and suburban development, particularly along the lower stream reaches.

The other smaller independent drainages in the southern Puget Sound area are generally steeper gradient streams, often presenting intermittent flow conditions. A few are salmon producers supporting small numbers of coho and chum.

Salmon Utilization

Each of the independent drainages mentioned produce

coho. Exceptionally large numbers of chum are produced in McLane Creek along with some coho and occasionally chinook. Fewer chum return to Woodland, Woodward, and some of the smaller drainages. Percival Creek, technically a tributary of Capitol Lake, has a large return of chinook, some coho and occasionally chum.

Limiting Factors

Principal limitations on production in these smaller streams include low summer flows, high water temperatures, siltation of spawning areas, and poaching of adult fish. Urbanization has impacted the habitat in a number of streams, removal of irrigation and stock water, removal of stream-side cover, and alteration of natural runoff patterns by extensive commercial developments.

Beneficial Developments

Fish passage facilities have been installed on Ellis Creek, at Capitol Lake Dam, and in Percival Creek. A small cascade approximately 1 mile above Capitol Lake has been laddered to aid salmon passage. Also the Capitol Lake chinook rearing program results in large numbers of returning spawners to Percival Creek. Three spawning bed improvement projects have recently been completed on McLane Creek to benefit chum production.

Habitat Needs

To maintain existing production, all available spawning areas, stream-side cover, and existing water flow must be preserved. Changing land use patterns dictate close scrutiny of developments which will be located near streams. Spawning and rearing areas already disturbed may require some extensive stream rehabilitation.



PHOTO 13-10. Streambed stabilization on Swift Creek, tributary to McLane Creek.

PASSABLE - BARRIERS - IMPASSABLE

Falls

Cascades

Beaver Dams

Log Jams

Dams

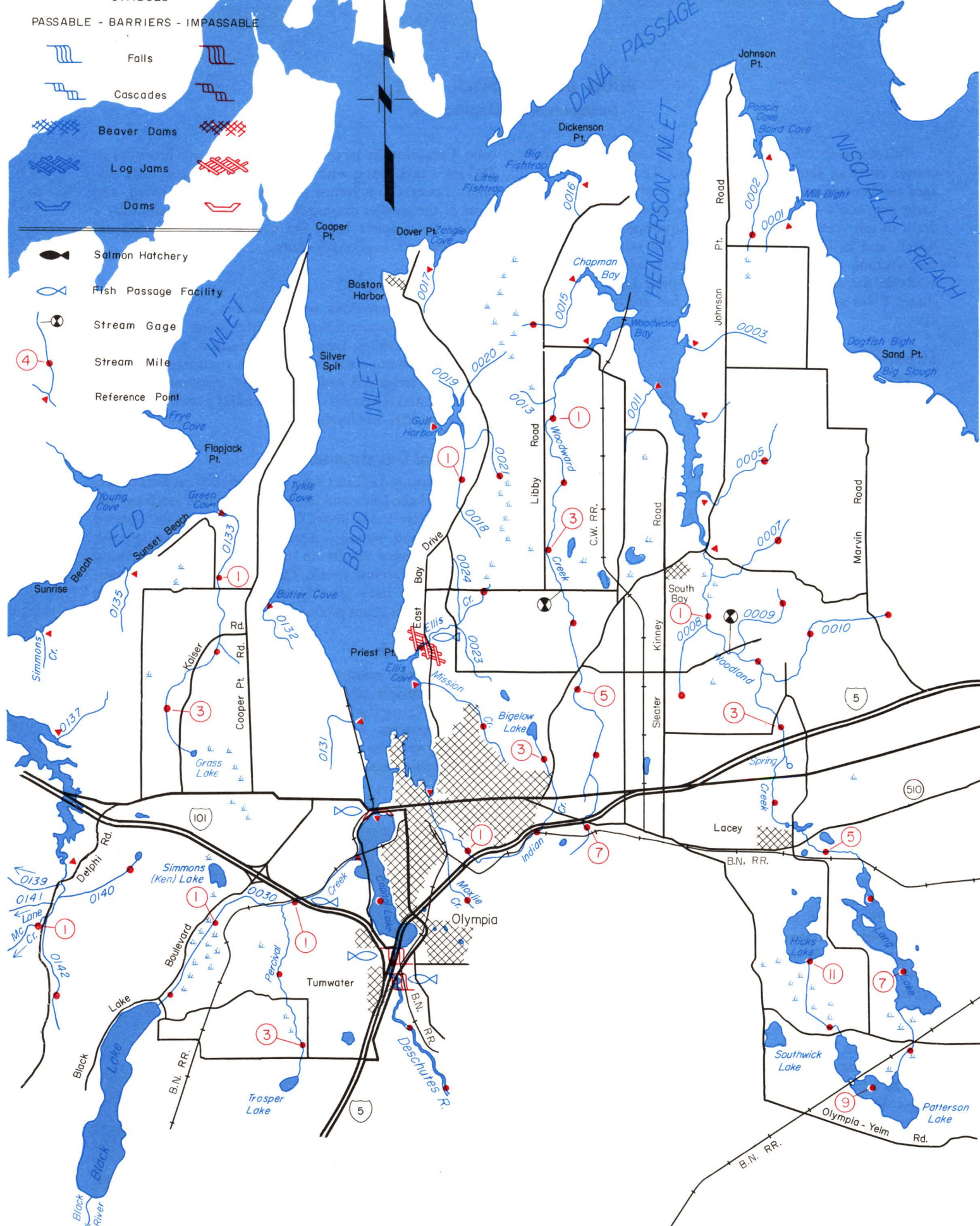
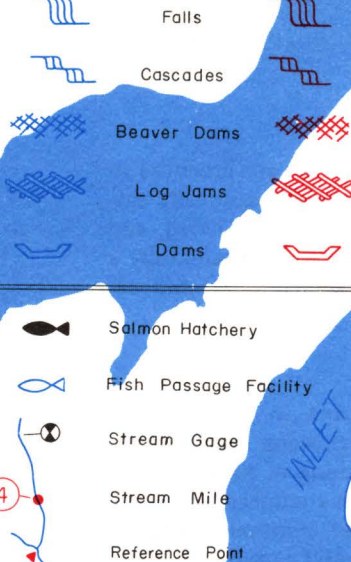
Salmon Hatchery

Fish Passage Facility

Stream Gage

Stream Mile

Reference Point



BUDD INLET-CAPITOL LAKE
Independent Drainages



SCALE : 1" = 1.5 MILES

BUDD INLET-CAPITOL LAKE — INDEPENDENT DRAINAGES
Deschutes Basin — WRIA 13

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0002	Unnamed	Sec4,T19,R1W	1.2	—	Unknown
0005	Unnamed	Sec28,T19N,R1W	1.5	—	(Coho), (Chum)
0006	Woodland Creek	Sec33,T19N,R1W	11.0	—	Coho, Chum
0007	Unnamed	RB-0.4	1.3	—	Coho, (Chum)
0008	Unnamed	LB-1.1	1.0	—	Unknown
0009	Unnamed	RB-1.7	1.2	—	(Coho),(Chum)
0010	Unnamed	RB-2.1	2.0	—	Coho, (Chum)
	Lois Lake	Outlet-4.4	—	—	
	Long Lake	Outlet-5.6	—	—	
	Patterson Lake	Outlet-8.3	—	—	
	Hicks Lake	Outlet-11.0	—	—	
0012	Woodard Creek	Sec19,T19N,R1W	7.5	—	Coho, Chum
0015	Unnamed (Libbey Cr.)	Sec18,T19N,R1W	1.1	—	Unknown
0018	Unnamed (Adams Cr.- Cannery Cr.)	Sec23,T19N,R2W	1.8	—	(Coho),(Chum)
0021	Unnamed (Adams Creek)	RB-0.6	1.05	—	(Coho),(Chum)
0022	Ellis Creek	Sec2,T18N,R2W	1.1	—	Coho, (Chum)
0025	Unnamed (Mission Cr.)	Sec11,T18N,R2W	1.5	—	Coho, (Chum)
0026	Indian Creek	Sec14,T18N,R2W	3.3	—	None
0027	Moxlie Creek	LB-0.61	1.1	—	None
	Bigelow Lake	Outlet-3.3	—	—	
0028	Deschutes River	Sec15,T18N,R2W	52.2	—	Chin., Coho, (Chum)
	Capitol Lake	Outlet-0.0	—	—	
0029	Percival Creek	LS-0.5	3.3	9.80 ¹	Chin., Coho, (Chum)
0030	Unnamed	LB-1.1	2.2	—	Coho
	Black Lake	Secondary outlet-2.2	—	—	
	Trosper Lake	Outlet-3.3	—	—	
	(Cont. Deschutes 203)				
0133	Unnamed	Sec32,T18N,R2W	3.6	—	Coho, Chum
	Grass Lake	Outlet-3.6	—	—	
0138	McLane Creek	Sec19,T18N,R2W	5.6	11.5	Coho, Chum
0139	Unnamed (Swift Cr.) ²	LB-0.3	2.9	—	Coho, Chum
0140	Unnamed (Perkins Cr.)	RB-0.5	1.1	—	Chum, Coho
0141	Cedar Flats Cr. (local name)	LB-0.6	2.0	—	Coho, (Chum)

¹ Does not include area of Black Lake which overflows at times to Percival Creek.

² Swift Creek or West Fork McLane Creek — (local name).

BUDD INLET-CAPITOL LAKE — INDEPENDENT DRAINAGES
Deschutes Basin — WRIA 13

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0142	Unnamed	RB-0.8	1.5	—	Coho, (Chum)
0143	Beatty Creek	RB-4.0	1.4	—	Coho, (Chum)

DESCHUTES RIVER

Tumwater Area

This segment covers the lower 19 miles of the Deschutes River, plus 6 tributaries totalling nearly 24 linear miles of stream drainage. The area extends from the Olympia-Tumwater vicinity southeast toward the town of Rainier in central Thurston County, and is accessible via county roads.

Stream Description

From the vicinity of the Military Road crossing (R.M. 19.5), about 2.5 miles west of Rainier, the Deschutes River meanders in a northwest direction more than 17.5 miles to Tumwater Falls, from there into Capitol Lake, then north for about 1.5 miles to salt water at the southern tip of Budd Inlet. Six tributaries enter the Deschutes before it reaches Capitol Lake, the principal one being Spurgeon Creek. Percival Creek enters directly into Capitol Lake (see Deschutes-101).

The Deschutes River, plus a majority of its tributaries, flows over moderate to gently sloped terrain. Adjacent land is primarily agricultural, with scattered residential development. Intermittent sections have been cleared for grazing or annual crop production. Considerable land remains in second or third growth forest consisting of mixed deciduous and conifer growth. Increasing numbers of rural and suburban dwellings, plus a large golf course are encountered as a stream moves toward more heavily populated Tumwater and Olympia. Suburban development, particularly of summer and recreational housing, is increasing along the upper portion of this section. Considerable recreation use is also made of this area.

The Deschutes River meanders a great deal, offering a moderate gradient with a good to excellent pool-riffle balance. Channel widths range from 6 to over 20 yards, with numerous broad, clean gravel riffles. Bottom composition is mainly gravel and rubble, and is generally quite stable. Shorelines consist mainly of broad, gently sloping gravel beaches and low, steep slope earth banks. A few higher, steep, unprotected earth banks are found along this stretch. Along some stream sections, the bank has been contoured and riprapped for protection, particularly over the lower 4-5 miles. Stream-side cover consists of intermittent stands or strips of deciduous growth, interspersed by cleared farm or recreational use of land.

Capitol Lake is a shallow, 300 acre impoundment approximately 1.5 miles in length. The lake is situated in a relatively shallow basin, its shoreline consisting of riprap along the roads or steep slope, heavily wooded, sparsely developed hillsides.

Salmon Utilization

The lower Deschutes River, including Capitol Lake, is the major transportation reach for salmon using this system. The river in this section provides the main spawning habitat for chinook salmon in the entire Deschutes drainage. Coho also spawn here, as well as in each of the accessible tributaries. Juvenile chinook salmon rear through the spring and summer within these waters, while juvenile coho maintain year around residence. In addition to the natural fish production, highly significant numbers and pounds of chinook are reared in Capitol Lake by feeding artificial diets.

Limiting Factors

The major factors limiting salmon production in this section include warm summer temperatures, siltation in Capitol Lake and the lower 2-3 miles of river, low summer-fall flows in the Deschutes and its tributaries, plus streambed and bank alterations associated with land development and erosion control.

Beneficial Development

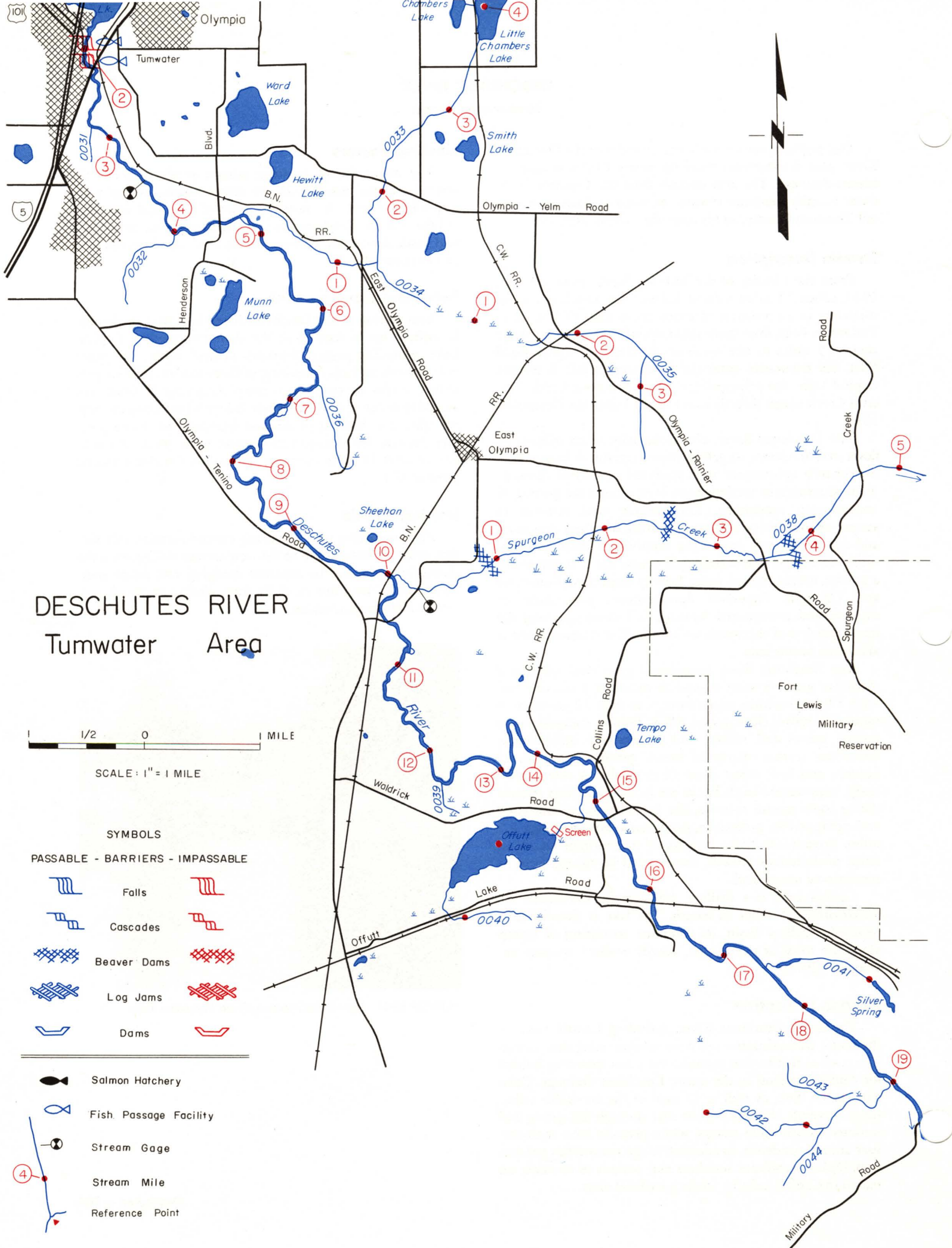
This section of the Deschutes River has two fish passage facilities. One is located at the dam impounding Capitol Lake, providing passage from salt to fresh water. The other is at Tumwater Falls consisting of three ladder facilities providing access to the upper river. Trapping facilities are available at the upper Tumwater ladder where chinook eggs are taken for artificial production. Hatchery produced juvenile chinook are planted into Capitol Lake, many of which are fed artificial diets and other that utilize the lake's natural productivity.

Habitat Needs

Any alterations of the existing environment in this section must be compatible to fish requirements. Capitol Lake should be reclaimed by selective dredging and future sedimentation or land fills carefully controlled to maintain present and future production.



PHOTO 13-11. Typical river section above Tumwater Falls.



DESCHUTES RIVER Tumwater Area

1/2 0 1 MILE
SCALE: 1" = 1 MILE

- SYMBOLS**
- PASSABLE - BARRIERS - IMPASSABLE**
- Falls
 - Cascades
 - Beaver Dams
 - Log Jams
 - Dams
 - Salmon Hatchery
 - Fish Passage Facility
 - Stream Gage
 - Stream Mile
 - Reference Point

DESCHUTES RIVER — TUMWATER AREA
Deschutes Basin — WRIA 13

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0028	Deschutes River			—	Chin., Coho, (Chum)
0033	Unnamed	RB-4.7	4.15	—	Coho
0034	Unnamed	LB-1.4	3.6	—	Unknown
	Little Chambers Lake	Outlet-3.65	—	—	
	Chambers Lake	Outlet-4.15	—	—	
0037	Spurgeon Creek	RB-10.01	5.8	—	(Chin.), Coho
0040	Unnamed	LB-14.8	2.6	—	Coho
	Offutt Lake	Outlet-0.5	—	—	
0041	Unnamed (Silver Springs-local name)	RB-17.5	1.0	—	Coho
0042	Unnamed	LB-18.9	2.0	—	Coho
	(Cont. Deschutes 303)				

DESCHUTES RIVER

Lake Lawrence Area

This section covers approximately 12 miles of the mainstem Deschutes River, plus 4 smaller tributaries providing more than 17 additional stream miles. The area is located just a few miles south of the town of Rainier in southeastern Thurston County. Access is via Highway 507 out of Rainier, the Vail Loop Road, and private logging roads extending into the drainage.

Stream Description

From a point about a half-mile above Pipeline Creek (R.M. 31.0) the Deschutes River flows generally west-northwest for 12 miles, passing beneath the Rainier-Tenino Highway about 2.5 miles southwest of Rainier and Military Road immediately north of Lake McIntosh. Principal tributaries include Pipeline Creek, Lake Lawrence Outlet, Reichel Lake drainage, and one small unnamed spring feed stream (R.M. 20.9). Lake McIntosh does not provide a true surface connection with the Deschutes.

The Deschutes channel winds across a relatively broad, gently sloping valley floor through this section. The same is true with tributaries, except for the upper, steeper slope of Pipeline Creek and of one feeder tributary to the Reichel Lake drainage. The Deschutes skirts along the north rim of the valley bordered by mountainous terrain, and the steeper side slopes densely forested with mostly conifer timber. The valley floor has cleared farmland with intermittent stands of mixed deciduous and conifer growth. Aside from the small community of Vail, this section is developed mostly with rural-type residences and small summer home development along the river. Forested slopes on either side of the floor are managed principally for logging with numerous cleared sections, particularly over the upper drainage. Also, moderate to heavy recreation use is made of the area.

The Deschutes channel presents a moderate gradient through this section, with only occasional reaches showing steeper conditions. Stream widths range from 4 to 16 yards, averaging about 10 yards. A good pool-riffle balance exists and stream bank cover is generally dense, thus promoting exceptional rearing conditions through much of the area. The stream bottom is quite stable, comprised mainly of large rubble, with boulders and gravel interspersed across most riffles. Most pools are quite shallow and contain sand and fine gravel bottom material. Stream banks are generally quite low and stable and comprised of gently sloping gravel beaches with a few sharp earth cuts. Stream-side cover consists of moderate to dense stands or strips of deciduous trees and underbrush.

Salmon Utilization

This section of the Deschutes provides transportation for adult and juvenile salmon that utilize the upper drainage. Limited spawning area in this section is used largely by chinook and by some coho which also use the accessible tributaries. Juvenile chinook rear through the spring months in these waters with coho inhabiting the stream year around, particularly in stretches of dense stream-side cover.

Limiting Factors

Factors which limit salmon production in this section include low summer flows in the main channel as well as in the small feeder streams, stream bank clearing through logging or development projects, removal of streambed gravel, and poaching of adult salmon.

Beneficial Developments

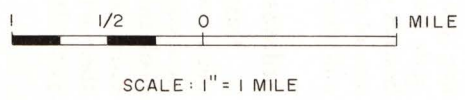
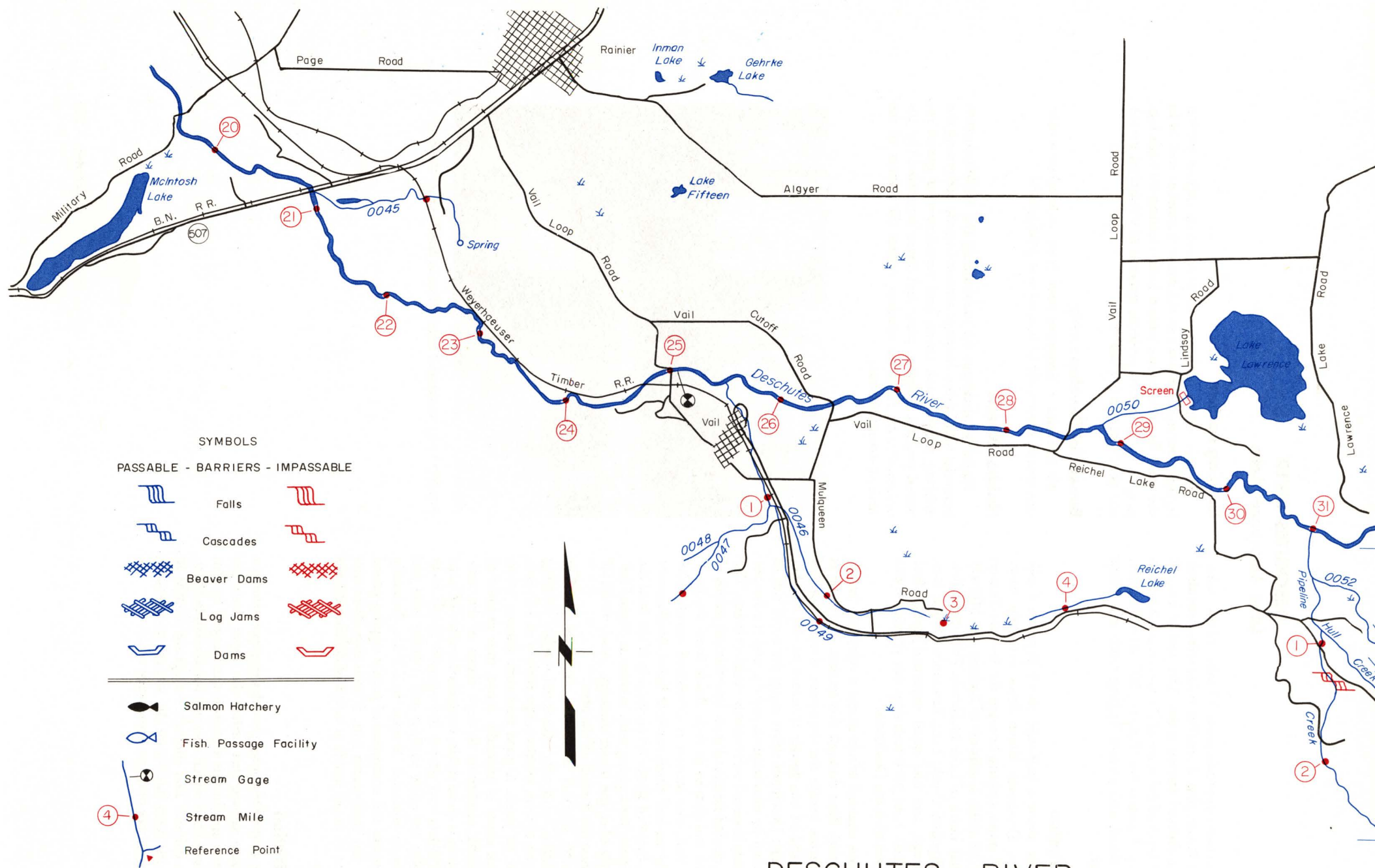
No facilities or programs have been undertaken within this area to specifically benefit salmon production.

Habitat Needs

Major requirements for maintaining the fish production potential within this drainage section include preserving the existing stream bank cover, and curtailment of gravel removal projects. Logging plans and operations should be coordinated with Fisheries' needs to reduce the impact on the natural stream habitat.



PHOTO 13-12. Good pool riffle section in middle Deschutes River.



DESCHUTES RIVER Lake Lawrence Area

DESCHUTES RIVER — LAKE LAWRENCE AREA
Deschutes Basin — WRIA 13

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0028	Deschutes River				Chin., Coho, (Chum)
0045	Unnamed	RB-20.85	1.6	—	Coho
0046	Unnamed	LB-25.5	4.5	—	Coho
0047	Unnamed	LB-1.1	1.1	—	Unknown
0049	Unnamed	LB-1.15	1.6	—	(Coho)
	Reichel Lake	Outlet-4.5	—	—	
0051	Pipeline Creek	LB-31.0	2.8	—	Coho
0052	Unnamed	RB-0.5	1.2	—	Coho
0053	Hull Creek	RB-0.9	2.0	—	(Coho)
	(Cont. Deschutes 403)				

DESCHUTES RIVER

Headwaters

This drainage section encompasses the entire upper Deschutes River including nearly 18 miles of mainstem, plus 21 tributaries adding nearly 92 stream miles. The area is located about six miles southwest of Alder Lake in eastern Thurston County. Access is available by private logging roads southeast of Rainier and the small community of Vail. The upper reaches of some tributaries, plus the upper main Deschutes, from just below Buck Creek, are within Snoqualmie National Forest.

Stream Description

From its mountain headwater southeast of Alder Lake, the Deschutes flows generally north for nearly seven miles to its major tributary, the Little Deschutes River (R.M. 42.5). From here it travels mainly west for more than six miles to the vicinity of Fall Creek (R.M. 35.3), then generally northwest toward Pipeline Creek (R.M. 31.0). In addition to the Little Deschutes River and Fall Creek, principal tributaries entering within this section include Lincoln, Thurston, Johnson, Huckleberry, and Mitchell creeks.

In this section, the Deschutes channel, as well as the majority of its tributaries, fall over mostly steep terrain with the streambeds confined by relatively narrow valleys. Adjacent slopes are quite steep and most are densely forested. Over the lower 3-4 miles of this section the Deschutes moves out onto a more gently sloping, wider valley floor. Here the adjacent hillsides are still densely forested, having mixed deciduous and conifer growth. Practically no development has taken place in the upper watershed, and only widely separated farms and a few recreational homes are located along the lower 5-6 miles.

The Deschutes River presents two slightly different environment types in this section. Above Deschutes Falls (R.M. 41.1), the gradient is moderately steep, in some sections presenting a series of short cascades. Stream widths range from 2 to 12 yards, averaging about seven yards. There are relatively high proportions of fast riffle and rapids sections. Pools, although somewhat scarce, are generally quite deep. The stream bottom is predominantly rubble and boulder with some lengthy sections of bedrock. Stream banks have moderate to dense conifer and deciduous growth, providing good to excellent cover for much of the area.

Below Deschutes Falls the channel gradient is mostly moderate, with only occasional rapid or cascade stretches. Stream widths range from 4 to over 17 yards, averaging near 10 yards. A good pool-riffle balance prevails, with most pools being quite deep and well shaded. The stream bottom is predominantly clean rubble and gravel, with only a few sections having a large proportion of boulders. Stream banks are mostly low and sharp cut, containing dense stands of mixed deciduous and conifer growth. The channel is well shaded and quite stable.

Virtually all tributaries entering the Deschutes in this section exhibit a swift-flowing character. Boulders and cascades predominate, with only the lower reaches of tributaries entering below Deschutes Falls offering relatively stable gravel and rubble bottoms, and fairly good pool-riffle conditions.

Salmon Utilization

Salmon use within this section is restricted to the mainstem river below Deschutes Falls, and to the lower reaches of tributaries entering just below the falls. The river receives scattered concentrations of chinook spawning, primarily in the lower 5 or 6 miles below Mitchell Creek. Some coho spawning takes place in the main channel up to the falls, as well as in the accessible portions of lower tributaries. Juvenile rearing occurs primarily in the main channel, and in those tributaries that maintain adequate summer flows. Juvenile chinook rear through the spring months, with coho inhabiting these waters year-round.

Limiting Factors

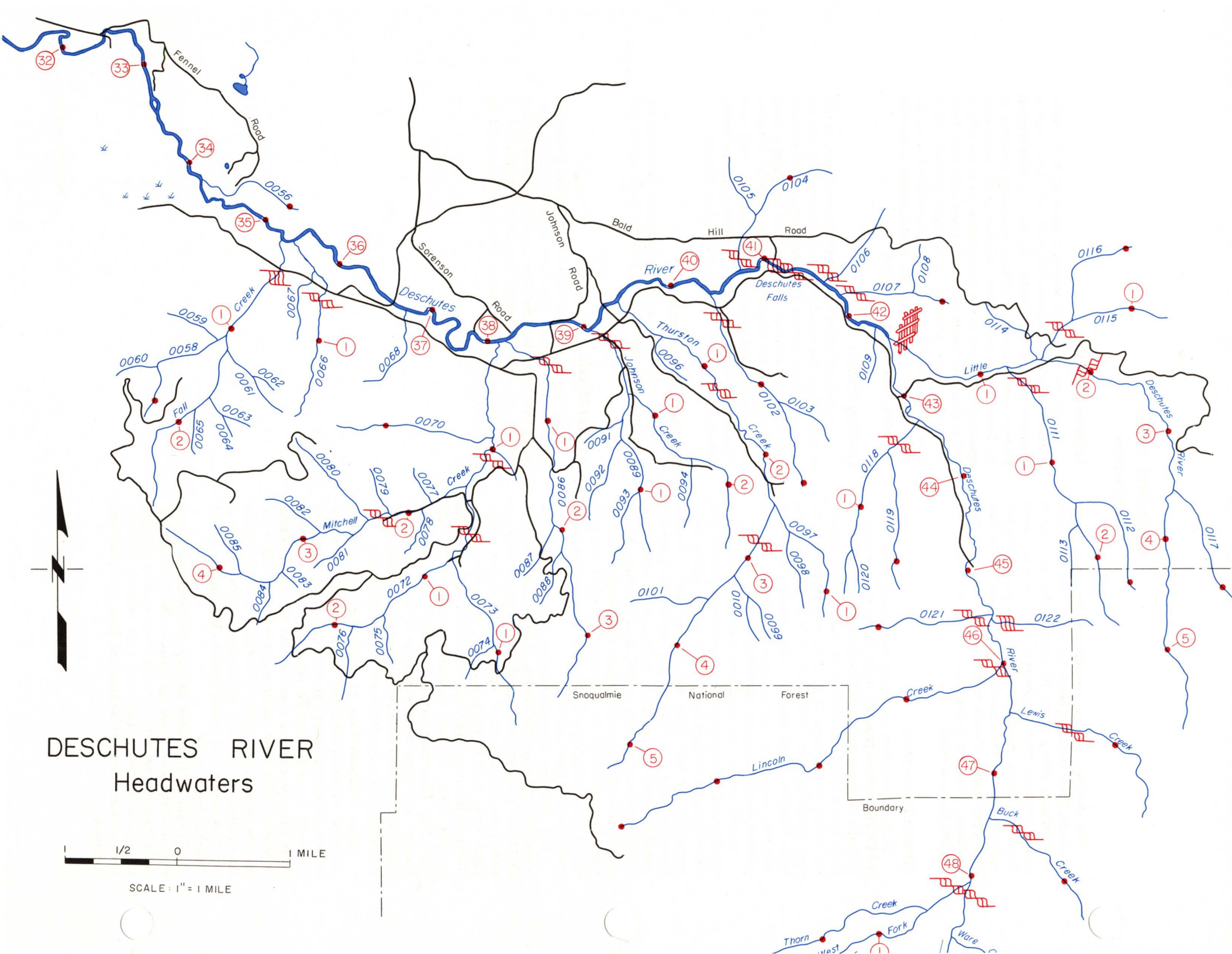
The principal factors limiting salmon production in this section include the total barrier at Deschutes Falls, and the occurrence of low summer flow conditions. Above Deschutes Falls additional cascades and falls, plus the general steep gradients, limit the salmon production potential. Clear-cut section logging and associated road building, along with occasional gravel removal operations, serve as further limitations to salmon production within this upper drainage.

Beneficial Developments

No other facilities, projects, or programs have been undertaken within this section to directly benefit salmon production.

Habitat Needs

Major requirements for maintaining the fish production potential of the upper Deschutes drainage include preserving existing streambank cover and curtailment of gravel removal and stream channel alterations. Replacement of stream-side cover along reaches already cleared would be highly desirable.



DESCHUTES RIVER Headwaters

1/2 0 1 MILE

SCALE: 1" = 1 MILE

DESCHUTES RIVER — HEADWATERS
Deschutes Basin — WRIA 13

Stream Number	Stream Name	Location Of Mouth	Length	Drainage Area	Salmon Use
0028	Deschutes River				Chin., Coho, (Chum)
0056	Unnamed	RB-34.2	1.1	—	Unknown
0057	Fall Creek	LB-35.3	2.9	—	Coho
0058	Unnamed	LB-1.1	1.2	—	None
0066	Unnamed	LB-35.4	1.7	—	Coho
0069	Mitchell Creek	LB-38.15	4.6	—	(Chin.), Coho
0070	Unnamed	LB-0.9	1.4	—	Unknown
0072	Unnamed	RB-1.4	2.8	—	None
0073	Unnamed	RB-0.75	1.7	—	None
0086	Unnamed (Huckleberry Cr.)	LB-38.2	3.6	—	(Chin.), Coho
0089	Johnson Creek	LB-39.1	2.6	—	(Coho)
0090	Unnamed	LB-0.7	1.7	—	None
0095	Thurston Creek	LB-39.4	5.3	—	(Chin.), Coho
0097	Unnamed	RB-2.5	1.2	—	None
0102	Unnamed	LB-40.4	2.0	—	(Coho)
0104	Unnamed	RB-40.7	1.4	—	Unknown
0107	Unnamed	RB-41.8	1.0	—	None
0110	Little Deschutes R.	RB-42.5	5.7	7.89	None
0111	Unnamed	LB-1.2	2.7	—	None
0112	Unnamed	RB-1.5	1.1	—	None
0115	Unnamed	RB-1.55	1.4	—	None
0116	Unnamed	RB-0.5	1.0	—	None
0117	Unnamed	RB-3.5	1.2	—	None
0118	Unnamed	LB-43.3	1.8	—	None
0119	Unnamed	RB-0.4	1.3	—	None
0121	Unnamed	LB-45.45	1.2	—	None
0123	Lincoln Creek	LB-46.0	4.0	—	None
0124	Lewis Creek	RB-46.5	1.7	—	None
0125	Buck Creek	RB-47.4	1.4	—	None
0126	W. Fk. Deschutes R.	LB-48.0	2.7	—	None
0127	Thorn Creek	LB-0.4	1.8	—	None
0128	Ware Creek	RB-48.6	1.0	—	None
0129	Hard Creek	RB-49.0	1.1	—	None
0130	Mine Creek	RB-49.6	1.1	—	None