State of Washington
Department of Ecology

STATE WATER PROGRAM

WASHINGTON STATE WATER PROGRAM

W.W.I.R.P.P. SERIES - NO. 11

NOOKSACK
INSTREAM RESOURCES PROTECTION PROGRAM

(WATER RESOURCE INVENTORY AREA 1)

INCLUDING
ADMINISTRATIVE RULES

(CHAPTER 173-501 WAC)

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

NOVEMBER 1985

NOOKSACK WATER RESOURCE INVENTORY AREA
INSTREAM RESOURCES PROTECTION PROGRAM
INCLUDING
ADMINISTRATIVE RULES
(WATER RESOURCE INVENTORY AREA #1)

PREPARED BY
WATER RESOURCES PLANNING AND MANAGEMENT SECTION

WASHINGTON STATE DEPARTMENT OF ECOLOGY

PROGRAM PLANNER – CYNTHIA NELSON
(PRELIMINARY DRAFT – MARSHA BEERY)

WASHINGTON STATE DEPARTMENT OF PRINTING
OLYMPIA, WASHINGTON

NOVEMBER 1985

TABLE OF CONTENTS

Page

TABLE OF CONTENTS – Continued

Page

LIST OF FIGURES

LIST OF TABLES

Page

SUMMARY

The Nooksack Water Resource Inventory Area #1 (WRIA #1) is located at the northernmost end of the Puget Sound lowlands of Washington State. It is bordered on the north by the Canadian border, on the east by the Cascade Mountains, on the south by the Skagit Basin, and on the west by the Straits of Georgia. It covers a land area of approximately 1,628 square miles with elevations from sea level to 10,000 feet. Figure 1 locates the Nooksack WRIA in the state, and Figure 2 describes WRIA in more detail.

The eastern portion of the WRIA is characterized by steep mountainous terrain covered by coniferous forests. To the west is a broad floodplain which is extensively farmed. This area also contains the largest population centers, particularly the city of Bellingham and major industries such as Intalco Aluminum, Georgia Pacific Pulp and Paper Company, and the ARCO refinery at Cherry Point.

Surface water is used for a variety of out-of-stream purposes. The Middle Fork of the Nooksack River is used as a municipal supply for the City of Bellingham. The mainstem of the Nooksack River is the source of industrial water for the Cherry Point area, supplied by the Public Utility District #1 of Whatcom County. Surface waters of many Nooksack River tributaries as well as that of other independent streams of the WRIA are used for irrigation purposes. Many of the residences along lakes and creeks use surface water for domestic purposes, including lawn and garden irrigation. In recent years, there has been an increased interest in developing small scale hydroelectric facilities on small streams throughout the WRIA. This use generally requires diversion of surface water from a portion of a stream.

Streams and lakes of the area are also important for their instream values including fish and wildlife habitat, recreation, scenic and aesthetic qualities, maintenance of water quality, and other environmental values. Chinook, chum, coho, pink, and sockeye salmon use the watershed for spawning, rearing, and migration. Other anadromous and resident fish important to the recreational fishery include steelhead, cutthroat, and Dolly Varden trout. Many of the lakes and streams are used for recreational boating, swimming, and fishing. Lands adjacent to these areas are used for hiking, sightseeing, and camping. Mt. Shuksan and Mt. Baker are two of the most picturesque mountains in the state and are major tourist attractions. The WRIA is also the home of numerous water-using wildlife species.

Runoff in the WRIA varies depending on the source. The independent lowland streams which are primarily fed by precipitation experience high runoff in the winter months and extreme low flows in the late summer and early fall months. Streams which originate in mountainous areas where snow occurs at higher elevations and rain at lower elevations experience two high runoff periods, one in winter followed by a second high flow period in late spring. Lower flows on these streams occur in late summer or early fall. Streams which head in the Cascade Mountain glaciers experience a high flow period during the late spring and summer months followed by a low flow period in the winter.

FIGURE 1 Washington WRIA Designations

FIGURE 2 Nooksack WRIA

In order to protect flows for instream uses in the Nooksack WRIA, the department will implement the following actions if adopted as proposed on November 19, 1985:

> Establishment of minimum instream flows on approximately 29 streams or stream reaches, setting of new seasonal or year round closures to future consumptive appropriation on approximately 26 streams, and confirmation of former low flow restrictions and/or closures on approximately 19 streams and lakes. The WAC establishes policy regarding the protection of lakes and ponds, ground water development, hydroelectric power projects and other consumptive uses.
>
> Future water rights will be subject to the instream flows listed in WAC 173-501 as adopted. Minimum flows will be measured at the control points indicated in Figure 3 and in WAC 173-501-030(l).

PROGRAM OVERVIEW

In June 1979, a Western Washington Instream Resource Protection Program (WWIRPP) document, including a final environmental impact statement, was distributed to the public and governmental agencies. (Copies are available upon request from the Department of Ecology, Olympia). In this document, the Washington State Department of Ecology proposed a plan for developing and adopting instream flows in 24 Western Washington Water Resource Inventory Areas (WRIAs) and two Eastern Washington WRIAs, the Wind-White Salmon Basin (WRIA 29) and the Klickitat Basin (WRIA 30). Another eastern Washington drainage, the Wenatchee River Basin (WRIA 45), was added to the program in 1981.

The methods and procedures used in the Nooksack Instream Resources Protection program generally follow those outlined in the Western Washington Instream Resource Protection Program report. Some methodologies have been updated. The anticipated environmental impacts of the program are discussed in the WWIRPP final environmental impact statement. Therefore, no basin-specific environmental impact statement has been prepared regarding the Nooksack program. The requirements of the State Environmental Policy Act have been satisfied. An environmental checklist and a supplemental sheet for nonproject actions were filed with the Environmental Review Section, and a determination of nonsignificance (DNS) was signed and filed August 7, 1985. Comments on the DNS were accepted until September 27, 1985. Comments on the draft were accepted through October 4, 1985.

In the Nooksack program, Ecology proposes establishment of specific minimum instream flow levels and other policies to protect the instream resources of fish, wildlife, water quality, navigation, recreation, scenic, aesthetic, and other environmental values.

FIGURE 3 WRIA I Control Points

Authority

The Water Resources Act of 1971 provides that perennial streams and rivers shall be retained with base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic, and other environmental and navigational values [RCW 90.54.020(3)(a), 1971]. The state may also establish minimum water flows or levels for streams, lakes, or other public waters for the purposes of protecting fish, game, birds, or other wildlife resources, recreational and aesthetic values, and water quality under the Minimum Water Flows and Levels Act [RCW 90.22.010, 1969]. Under provisions of the State Fisheries Code, the Department of Ecology may deny or otherwise limit water right permits if, in the opinion of the director of Game or director of Fisheries, such permits might adversely affect the ability of the stream to support game or food fish populations [RCW 75.20.050, 1949]. The Nooksack program is established under Chapter 90.54 RCW and Chapter 90.22 RCW and supported by Chapter 75.20 RCW.

The base or minimum flows proposed in this program are referred to by the generic term "instream flows."

Public Participation

Distribution of the draft document initiated public involvement in the Instream Resources Protection Program for the Nooksack WRIA (WRIA #1). Interested individuals, private groups, and agencies were encouraged to comment on proposed measures for streams and lakes in the Nooksack WRIA. A public meeting was held in Bellingham, at the Roeder School on July 31, 1984. A public meeting to discuss the proposed draft regulation was held on September 12, 1985 at the Bellingham public library. A public hearing to receive comment on the draft regulation program document was held at the library on September 25, 1985. Numerous meetings were held with local, county, state, federal agencies, and interested private individuals and organizations.

Over 150 written and oral comments were received and considered in preparation of the final proposed administrative rules and final program document. Formal adoption of the proposed rules will be held at the Department of Ecology headquarters on November 19, 1985, at 2:06 p.m. The proceeding will be held at Raphael Hall, St. Martin's College campus in Lacey. The adoption was rescheduled from October 29.

WATER RESOURCE INVENTORY AREA #1 DESCRIPTION

Geography

The Nooksack Water Resource Inventory Area (WRIA) #1 is located on the west slope of the Cascade Mountains and at the northern end of the Puget Sound lowlands, occupying a large portion of western Whatcom County as well as a small portion of northern Skagit County. The WRIA is bounded on the north by the Canadian border, on the south by the Skagit Basin, on the west by the Strait of Georgia and Bellingham Bay, and on the east by the Cascade Mountains. It covers a total land area of approximately 1,628 square miles with elevations from sea level to 10,000 feet.

The eastern two-thirds of the WRIA is characterized by high mountainous terrain covered with coniferous forests. Most of the high mountain area of the WRIA is under federal jurisdiction, including the Mt. Baker-Snoqualmie National Forest, the Mt. Baker Wilderness Area, the Mt. Baker National Recreation Area and the North Cascades National Park. These holdings are, for the most part, devoted to recreational use and have remained minimally developed. The development which has occurred in this region is found primarily in the floodplain areas along the lower sections of the three major forks of the Nooksack River, the North, South, and Middle Forks, where mountainous terrain drops to a valley floor. The westernmost third of the WRIA is a broad fertile lowland containing the major population centers. The mainstem of the Nooksack River with its tributaries is the largest waterway traversing and draining this section. Many of the tributaries have been ditched and channelized as they flow through extensively farmed lands. Bellingham, the largest urban center in the WRIA, is located in this area.

Also found within this WRIA are Lummi Island off the tip of the Lummi peninsula, and Point Roberts, located at the tip of the Canadian Peninsula which extends south across the international boundary. Lummi Island covers an area of 8.8 square miles. Point Roberts covers approximately four square miles. Neither area is specifically addressed by the Nooksack Instream Resources Protection Program.

Climate

The Cascades mountain range affects climatic conditions in the Nooksack Basin in two ways: 1) the mountains protect the area from continental airflow from the east, maintaining a maritime environment, and 2) the abrupt rise in topography increases the quantity of precipitation from winter storms. Lower temperatures in the higher elevations lead to the winter precipitation of snow, some of which is stored in permanent ice fields or glaciers. Alpine glaciers occur in the vicinity of Twin Sisters Mountain, Mount Baker and Mount Shuksan. Subject to snow deposit and subsequent snow melt in warmer months, these naturally controlled snow and ice reserves are of prime importance to streamflow regimes and cool water temperatures in the north and middle forks of the Nooksack River. Precipitation varies considerably between the lowland areas which average from 30 inches per year at sea level to 200 inches/yr. in the mountainous areas.

Maximum mean monthly temperatures of 85^{o}F occur in July, while mean minimum temperatures of 13^{o}F occur in January. From May through August, when agricultural water needs are highest, there is a steady decrease in precipitation. Fortunately, maximum stream discharge due to snow melt occurs in mid-summer for the north and middle forks, providing irrigation water to lands adjacent to the main stem.

Population

The population of Whatcom County has shown an irregular but steady growth since the 1860's. During the period 1880 to 1910, large numbers of people migrated into the area and population increased from 3,000 to 49,500 people. The population has continued to grow since that time but at a much slower rate.

Bellingham is the major city in the WRIA and is the Whatcom county seat. In recent years, considerable growth has occurred in the Ferndale area due to the development of the Cherry Point area and the annexation of new housing. Everson, Nooksack, and Lynden have grown in population since the 1930s.

Growth of population in Whatcom County in the 1970s was much more rapid than in the previous few decades. The county population grew from 81,983 in 1970 to 99,800 in 1979 or an average of 2.2 percent, exceeding the rate of growth in most other areas of the state. The projected growth forecast for the county shows an average annual rate of 2.3 percent and total county population is expected to increase to about 162,000 by the year 2000. (See Table 1)

Table 1

Baseline Projection
Population Trends & Forecasts 1970-2000

	1970[1]	1980[2]	1985[2]	1990[2]	1995[2]	2000[2]
Whatcom Co.	81,983	103,941	115,713	128,432	144,705	162,648
Bellingham	39,375	44,672	48,361	52,195	56,787	61,754
Blaine	1,955	2,051	2,178	2,302	2,434	2,571
Everson	633	877	990	1,115	1,280	11463
Ferndale	2,164	3,653	4,262	4,947	5,888	6,944
Lynden	2,808	3,976	4,506	5,092	5,873	6,743
Nooksack	322	387	425	464	514	569
Sumas	722	674	692	705	706	702
Unincorporated	34,004	47,652	54,299	61,612	71,220	71,399

[1] U-S. Census

[2] Mt. West Research Inc., from the Final Environmental Impact Statement, Cherry Point Marine Construction Facility, Feb. 1981.

Economy and Land Use

The agricultural and forest industries have traditionally been important to the economy of the Nooksack WRIA. These two industries become the foundation of the region's economy as early as the 1850's when the first sawmill was built on Whatcom Creek at the present site of Bellingham and the first land claim was filed for land in the fertile Nooksack Valley.

Prior to this time, Native American tribes had subsisted in this area, with an economy based on salmon fishing and hunting and gathering.

As the valleys were logged and cleared for agriculture, the lumber industry became less dominant in the region, although still important. Most logging now takes place within the Mount Baker-Snoqualmie National Forest. The State Department of Natural Resources also owns and manages timberland in the WRIA. Several private corporations also own forest land, among them Georgia-Pacific, Scott, Bloedel, Port Blakely and Publishers.

As logging and lumbering have declined, more people have found employment in plywood manufacturing, paper making, fish and farm product processing, construction, boat building, and oil refining. Growth of agriculture in the Nooksack Valley has continued along with industrial growth. Three major agricultural activities most common in the basin are: 1) dairying and associated fodder crops; 2) livestock and poultry raising; and 3) cash crops, e.g., berries, green peas, and corn.

Dairying has long been the primary agricultural activity in Whatcom County and today the county leads all other northwest counties in the number of dairy cows and the volume of dairy products sold.

The bulk of the farming area extends from the towns of Ferndale, and Everson to Sumas, with Lynden at the center. Due to its strategic location, Lynden has grown to become the trading and processing center of Whatcom County. The acreages of different categories of land uses in Whatcom County are listed in Table 2.

Fishing has also traditionally been an important part of the economy. While it has declined in recent years, Whatcom County has remained a major base for the Alaskan fishing industry.

Historical trends show a decrease in employment in the occupations of agricultural/forestry/ fisheries industries. Changes in agriculture are largely due to increased mechanization and urban development. The current county policy is to preserve agricultural lands, thus slowing the trend of decreasing employment in this area. Table 3 on page illustrates historical and projected employment in Whatcom County.

Manufacturing traditionally contributed only a small portion of the economy of the basin but has recently become much more important. The additions of an aluminum reduction plant, oil refinery, cement plant, pulp mill, and food processing plant have increased the basin's reliance on the manufacturing sector. Manufacturing employment had grown from 3,600 persons in 1940 to 5,400 in 1970. From 1971 to 1977, employment in the manufacturing industry averaged a 2.2 percent increase annually.

Mining has been a basic industry in Whatcom County since coal was first taken from the area of Bellingham. In the past, mining centered around coal and gold; today it is confined to limestone, clay, sand and gravel, building stone, and olivine. These materials are found in the central and eastern parts of the county.

The trade economy is one of the most important sectors in Whatcom County in terms of numbers employed. Employment growth in this area from 1971 to 1977 averaged 7 percent per year. It is estimated that 80 percent of employment is in this sector. Canadian trade and tourism as well as the fact that Whatcom County serves as a market center for other counties has influenced this sector of the economy.

Table 2

Land Use in Whatcom County

Subarea (as defined by Whatcom County Planning Department	Land Use in Acres							
	Agriculture	Forestry	Vacant	Urban	Freshwater	Tribal	Federal Land	Total
Point Roberts Subarea	760	2,339	439	309	—			3,838
Lake Whatcom Subarea	1,107	30,429	320	1,492	21			33,369
Cherry Point-Ferndale Subarea	23,516	5,112	775	4,704	482			34,589
Urban Fringe Subarea	6,988	3,840	426	1,383	1			12,639
Foothill Subarea	3,976	130,742	560	1,388	78			136,744
South Fork Valley Subarea	6,066	28,713	166	285	8			85,238
Linden-Nooksack Subarea	82,511	81,105	1,217	3,836	161			118,831
Blaine-Birch Bay Subarea	17,581	8,724	1,001	1,649	12			21,967
Chuckanut-Lake Samish Subarea	76	12,702	573	—				15,040
Lummi Island Subarea	587	3,279	388					5,435

Table 2 - continued

Subarea (as defined by Whatcom County Planning Department	Land Use in Acres							
	Agriculture	Forestry	Vacant	Urban	Freshwater	Tribal	Federal Land	Total
National Forest and National Park Land							940,000	940,000
Lummi Reservation boundaries						12,500		
Indian-owned Lands within boundaries						8,000		12,500
	136,169	256,985	5,855	20,901	763		940,000	1,360,600

Total acreage is based on a county-wide estimate of 2,126 square miles. The county boundaries do not precisely match those of the WRIA; the difference occurs mainly in the upland forest on federal lands. Estimate of federal lands is rounded off to nearest 10,000 acres. Forest lands owned by the state or by private companies are categorized under forestry.

Lummi acreages include two breakdowns: 1) lands owned by Indians, and 2) lands within the reservation boundary.

Table 3

Baseline Projection
Whatcom Co. Total Employment by Place of Work

	1950[1]	1975[2]	1980[2]	1990[2]	2000[2]
Agriculture/Forestry/ Fishing	5,044	3,321	3,160	3,000	2,970
Mining	216	57	96	134	180
Construction	1,476	1,843	2,470	2,917	3,428
Manufacturing	4,163	6,394	7,530	9,070	10,601
Transportation Communication Public Utilities	843	1,790	1,981	2,274	2,727
Trade	4,425	7,043	9,335	13,783	19,399
Finance, Insurance Real Estate	–	1,095	1,534	2,091	2,771
Miscellaneous Service Doctors, Lawyers	4,847	5,622	6,814	9,593	13,074
Govt. Employment	846	6,966	7,698	10,373	13,661
Other Employment	1,047	2,930	3,522	4,794	6,300

[2] Mountain West Research Inc., Final Environmental Impact Statement Cherry Point Marine Construction Facility, Feb. 1981.

BASIN-WIDE WATER RESOURCES AND RELATED USES

This section describes resources and resource uses which occur over the entire Nooksack Basin. Resources discussed included surface and ground water resources and uses, water quality, hydroelectric power development, fisheries and wildlife resources, recreation, navigation and scenic values. The following sections discuss individual subbasins and resource uses in more detail.

Surface Water

WRIA #1 is comprised of a number of independent basins. Together, they cover 1,000 miles of streams and rivers draining a total area of approximately 1,628 square miles, 49 of which are in Canada. The annual runoff for the entire area is approximately 3,700,000 acre-feet.

The largest basin in WRIA #1 is the Nooksack River Basin of 826 square miles. The headwaters originate in the western Cascade Mountains and flow into Bellingham Bay.

Several other drainages are the headwaters of rivers which flow northerly into Canada and discharge into the Fraser River. These include the Sumas River, Saar Creek, Tomyhoi Creek, Chilliwack Creek and Damfino Creek.

There are a number of small drainages that originate in the western lowlands and flow into Bellingham Bay or the Strait of Georgia. Among these are: California, Dakota, Terrell, Squalicum, Whatcom, Padden, Chuckanut, Oyster and Colony creeks.

Runoff and Low Flow Characteristics

The runoff pattern of streams originating from the glaciers of Mt. Baker and adjacent peaks is characterized by a high flow in the late spring and early summer from melting winter snow pack, a (sustained) uniform flow during the summer to early fall from melting glacial ice, and a pronounced low flow period during the winter from freezing of glaciers and snow pack. These glaciers serve as natural reservoirs by storing snow and ice during the winter and releasing it gradually during the spring, summer, and fall. From March to July, much of the stream flow is melted snow, which is replaced by glacial melt in the summer and fall. In addition to the winter low flow, a second less pronounced low flow occurs in August and September after the major snowmelt has occurred. There are also numerous lakes in these subbasins which provide some natural storage. The North and Middle forks show these characteristic regimes. See Figure 4 for the hydrograph of the North Fork Nooksack River.

The runoff pattern in streams that originate in mountainous areas where snow is found at the higher elevations and rain at the lower show a characteristic high runoff in the winter from high rainfall followed by a second high runoff period in late spring from snowmelt. The low flow occurs in late summer and early fall, resulting from lack of permanent ice and snow. The South Fork of the Nooksack River shows this characteristic pattern, seen in Figure 5.

Streams that originate at low altitudes show runoff patterns which follow annual precipitation. The maximum discharge occurs in fall and winter. As precipitation decreases in the summer months, stream flows recede to a minimum. Fishtrap Creek, tributary to the mainstem, shows this general runoff characteristic, illustrated in Figure 6.

The gage at Deming shows the characteristic flows of the mainstem Nooksack River with a flow average of 5,000 cfs during May and June to a low flow of 1,800 cfs in September.

Although the South Fork derives its water from lower elevation snowfields, the annual runoff of 800,000 AF is comparable to the other two forks primarily due to the location and southwest exposure of the stream system.

Flooding

Floods occur during the fall and winter when rain falls on the snowpack, and in the spring when melting snow is enhanced by rainfall. The most destructive floods occur in the winter and are of high magnitude and short duration. The highest recorded flood discharge from the period 1933 to 1959 occurred in 1951 with a peak flow of 43,200 cubic feet per second (cfs) measured at Deming. Most of the floodplain was inundated during this flood. In January 1984, parts of the Nooksack basin received 12 inches of rain in 24 hours. This led to numerous debris f lows and much damage to property and fish habitat.

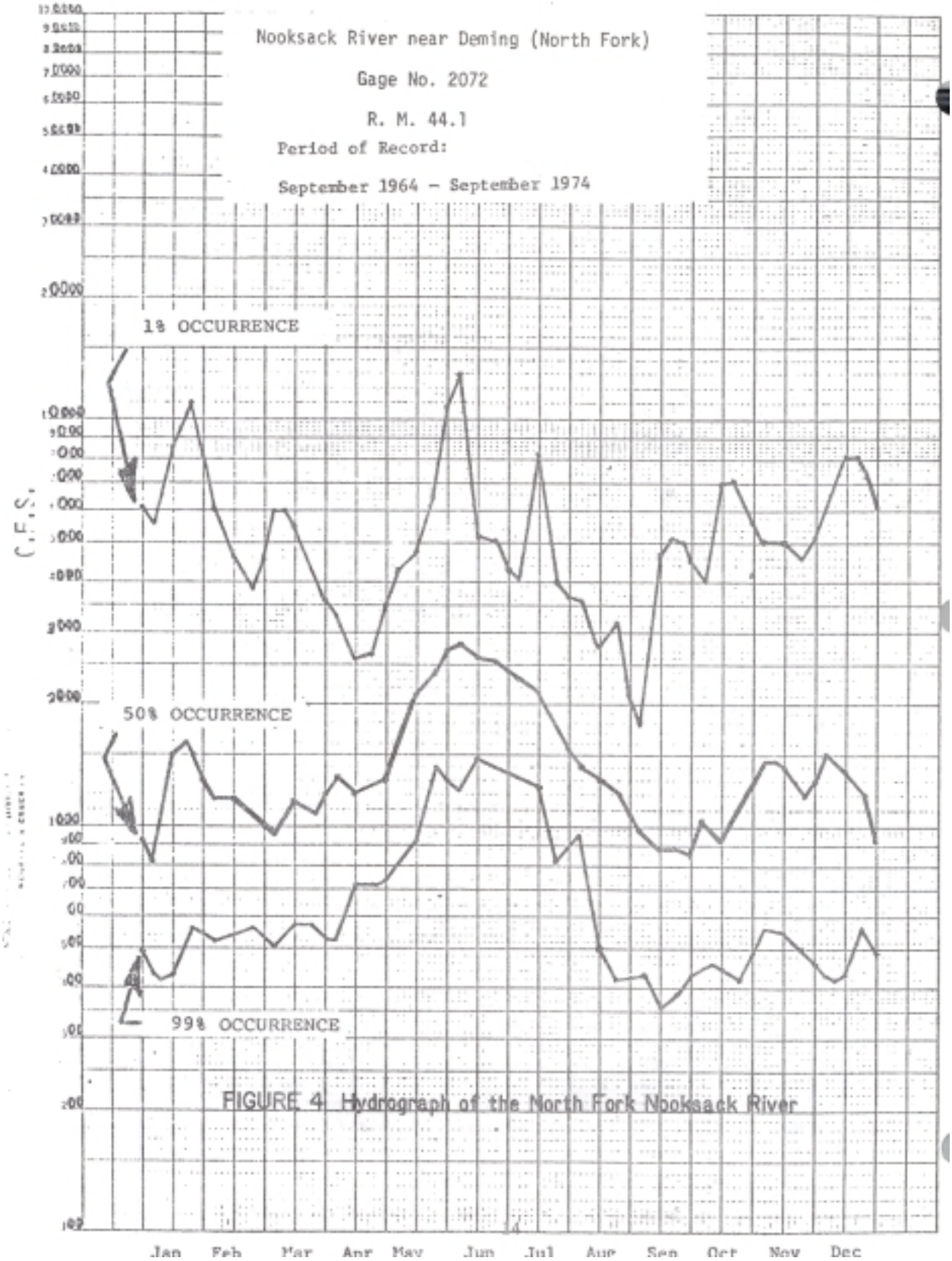


FIGURE 4. Hydrograph of the North Fork Nooksack River

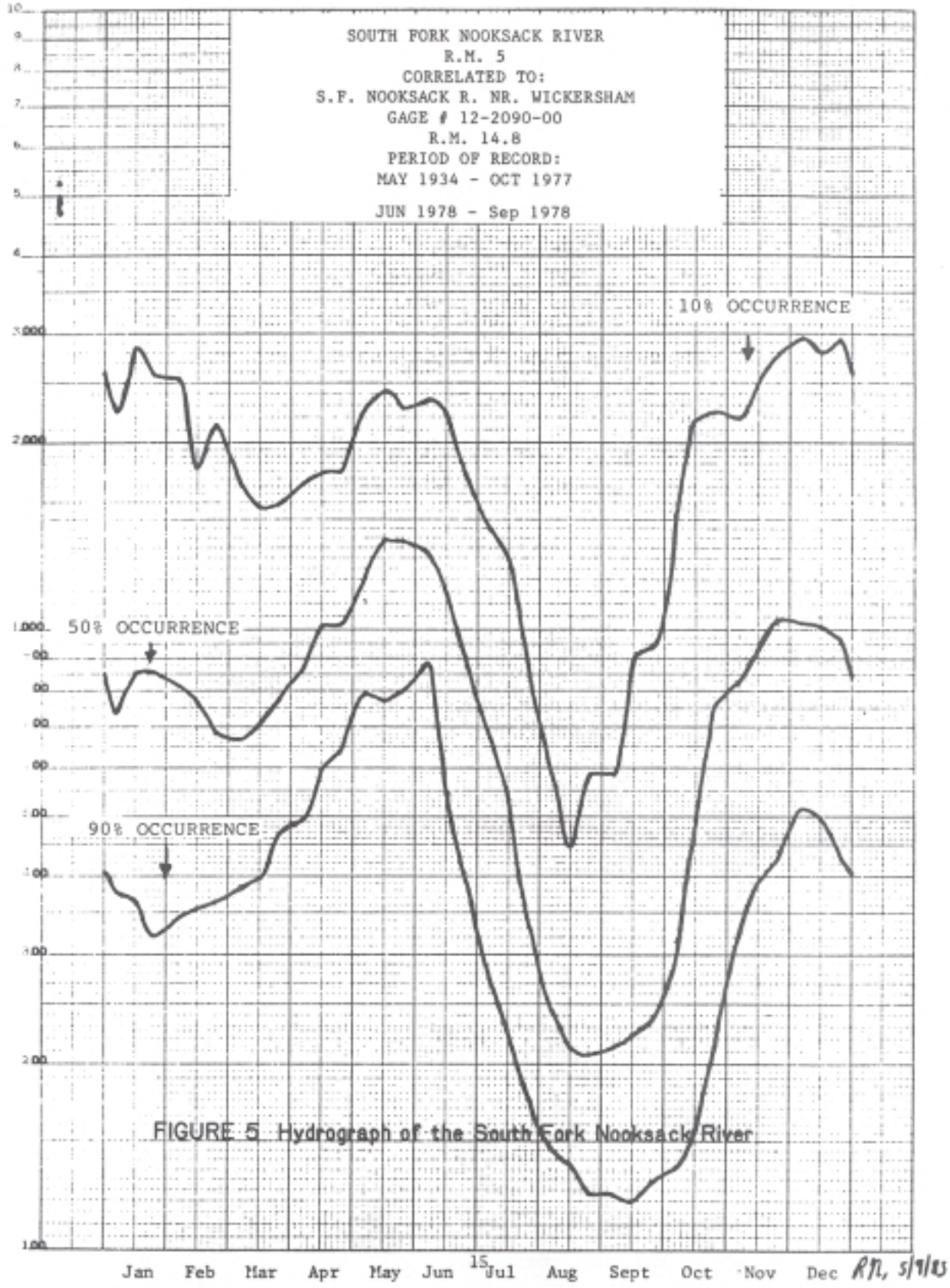


FIGURE 5 Hydrograph of the South Fork Nooksack River

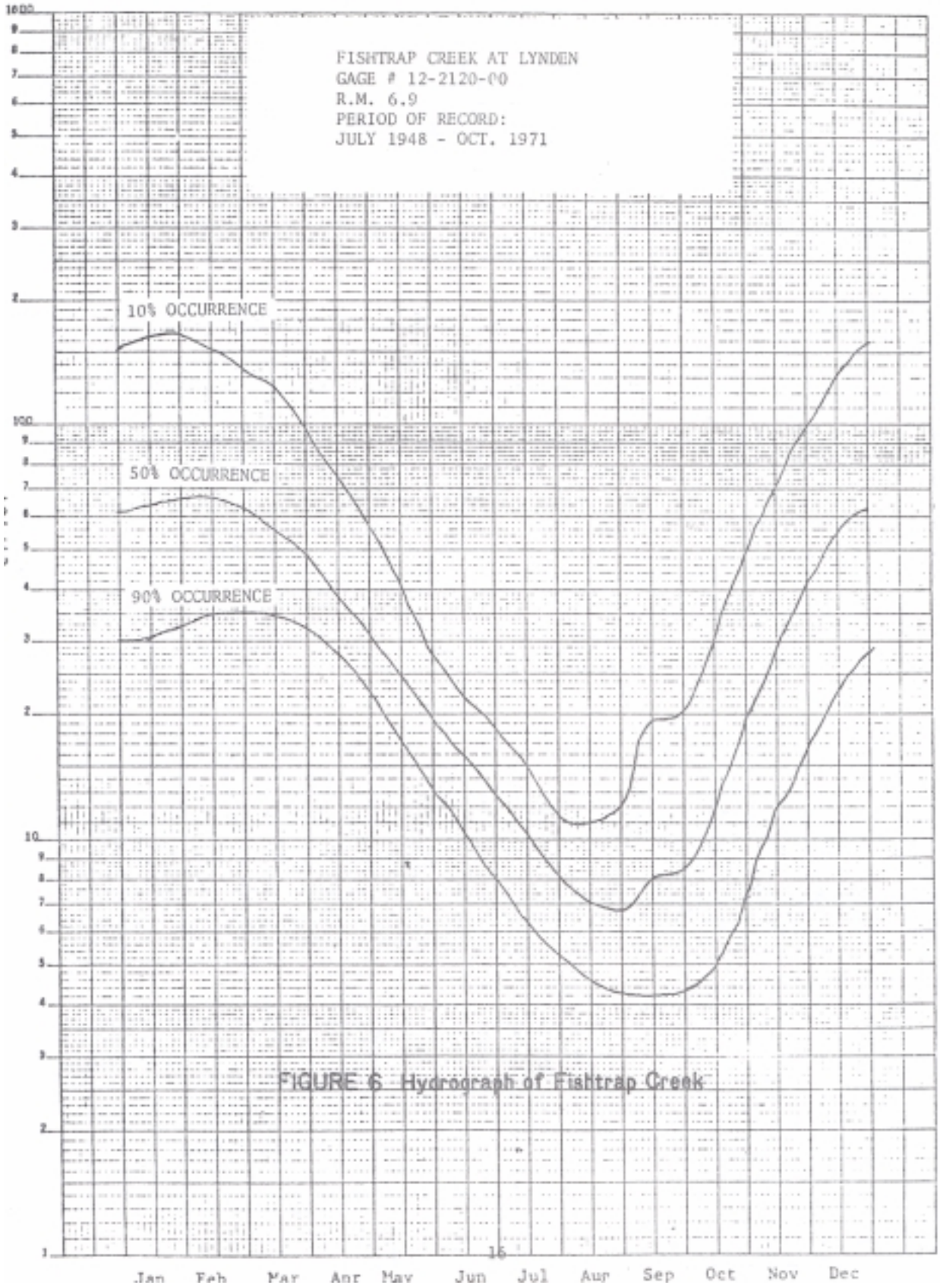


FIGURE 6 Hydrograph of Fishtrap Creek

Local flooding occurs annually over large scattered areas. The flood frequency for the remainder of the floodplain is approximately once in two to five years. A zero damage flow is considered to be 19,000 cfs measured at Deming. Flows of 25,000 cfs at Deming have caused flood damage to land and crops in valley areas. A 49,000 acre area is subject to flooding. The annual average cost for flood damage exceeds $800,000 with projected costs by the year 2020 of $3,350,000. Other streams which exhibit frequent flooding are Anderson Creek, Boulder Creek, Fishtrap Creek, Bertrand Creek, and Silver Creek. The preliminary phase of a two-year flood control study has recently begun, sponsored by Whatcom County and contracted to URS Engineers of Seattle.

Storage

Over 100 lakes are found in WRIA 1, the largest of which is Lake Whatcom at 5,003 acres. Other principal natural lakes in the basin are Green, Padden and Barrett lakes. Many of the basin's larger lakes are used for recreational purposes and summer home or residential development.

Lake Whatcom is used for storage of Bellingham's municipal and industrial water supply. The city has a water right for storage in the lake, and another for diversion from the Middle Fork Nooksack for municipal and industrial supply, up to 125 cfs.

The city is obligated by court order to maintain the lake level at or below 314.94 feet. The normal fluctuation is four feet, to 310.94 feet. The city diverts Middle Fork water when inflow from the Whatcom Basin is insufficient to maintain its needs plus lake level maintenance. A dam at the north end of the lake controls spill and lake level. Hydropower production was recently added to uses allowed on Bellingham's Middle Fork diversion, so that when Bellingham diverts for municipal supply, hydropower may be generated concurrently.

Others also make use of water from Lake Whatcom, including individual residences located along the lake, and Whatcom water district No. 10. Water district No. 10 supplies water to residences and small communities around Lake Whatcom.

Ground Water

For the most part, ground water supplies in the basin are abundant. The major water-bearing materials in the lowland areas often produce wells yielding up to 1,000 gpm. Such high yielding wells are found in the extensively farmed Nooksack and Sumas lowland areas where ground water supplies contribute to summer irrigation demands. In this area, there is generally only a single water table and wells drilled into this zone draw water from an unconfined ground water system. In the lowlands, where ground water is unconfined at shallow depths, wells taking water from this aquifer are less than 50 feet deep and generally only 10-15 feet deep. Recharge to the ground water is through direct precipitation or seepage from adjacent streams or rivers. In some lowland areas, the slope of the land is insufficient for adequate drainage to occur and ditch systems have been dug to improve the drainage problem. A series of drainage ditches were constructed on Bertrand and Fishtrap creeks to improve farmland by lowering the characteristic high water table of the region. Because of the shallowness of wells and high permeability of ground water supplies, well pollution from surface runoff is a very real problem. The natural

discharge of ground water is mostly into the Nooksack River and tributaries as well as into Bellingham Bay and the Strait of Georgia.

Highly permeable sands, silts, and gravels also occur in the flat-bottomed lower portions of the three major tributaries. However, because there is little demand for irrigation in the narrow valleys, water producing capabilities of these sediments is not known. Domestic and stockwater needs are satisfied through shallow wells. Kendall Creek on the North Fork appears to be the only area of the three tributary valleys which contains limited ground water supplies.

Moderate quantities (from 50-200 GPM) of water have been encountered in the alluvial and outwash materials in the delta lowlands of the Nooksack and Lummi rivers, and in the lower portions of the upper three major tributaries in addition to some other areas.

Wells producing up to 400 gallons per minute are found in several areas including the Kendall Creek Valley, parts of the three major forks, Point Roberts, Lummi Island and the Peninsula, and other areas. Here, impermeable till or hardpan causes the precipitation to run off or be captured as a perched water table in limited local depressions overlain by sediments. Occasionally, narrow sediment layers within the till are adequate to supply domestic and stockwater uses all year round, but a large number of wells drilled into the till run dry in the summer. The till is com- posed of clay, silt, sand, and pebbly gravel with occasional cobbles and boulders, and extends from the edge of the alluvial deposits of the river valleys over the uplands and up the mountain slopes. Ground water recharge to the till occurs from water seepage through occasional sand and gravel streaks within the till or from lateral movement of ground water in areas adjacent to the till covered area. Discharge to the ground water system is through springs, lakes, streams, or river depressions.

Flowing artesian wells have been encountered in the Anderson Creek area, the eastern slope of Mountain View upland, and the south slope of Boundary upland.

Domestic, Municipal, and Industrial Supply

The municipal supply for the City of Bellingham comes from surface waters of the Middle Fork of the Nooksack River and the Whatcom Basin. A water right permit allows the city to divert up to 125 cubic feet per second (cfs) from the Middle Fork. Water is delivered to Lake Whatcom where the city has a right to store up to 20,000 acre-feet. Lake elevations have been established through court order restricting fluctuations in lake level. From Lake Whatcom the water is diverted to the city water treatment plant and distributed to the city water system. One hundred million gallons per day (mgd) are available at the plant; sixty mgd is consumed by industry and the remainder is used for domestic supply.

Water from the mainstem of the Nooksack River is used by the City of Lynden for its water supply. The diversion structure is located near Hannigan Bridge where water is withdrawn from the river and piped to the city water treatment plant. The water also supplies two industries and three water associations adjacent to the city. The city has three reservoirs (a 100,000 gallon, 200,000 gallon and 3 million gallon structure) to provide flow equalization and backup supply for the city.

The city has water rights to divert 11.77 cubic feet per second (5273 gallons per minute (gpm)) of water from the river. The average monthly consumption for the period of January 1979 - August 1980 fluctuated between 800,000 gallons/day during the winter and spring months to as high as 2 million gallons per day during the summer (July 1979). Because of water quality problems associated with silt in the river and insufficient plant capacity to meet demands that may occur during hot slimmer weather, the city is proposing to go to ground water as a source. One test well has been drilled north of town which yielded salt water and had to be abandoned. A second test well is proposed to be drilled south of town. The wells will supplement or, eventually, replace the existing system.

Water from the mainstem of the Nooksack River is also used as municipal supply for the City of Ferndale. The city has an agreement with Public Utility District #1 of Whatcom County to have its supply delivered through the county's system. Water is diverted to the city's water treatment plant where up to 5 million gallons of water per day (mg/d) can be passed through the system. Currently, the maximum amount used is approximately 3 million gallons/day from June through December when the food processing plant, Simplot, is in operation, and 700,000 gpd when only domestic use is occurring in January-May. The city has three reservoirs with capacities of 1 million, 1.7 million, and 340,000 gallons. Two more storage facilities are proposed for the future. In addition to this storage which serves as a backup for the surface supply, the city has several wells which are used to serve the municipal supply and also provide emergency supply. The city will be drilling an additional well soon as a backup to the surface supply.

The largest industrial users of surface water from the Nooksack River are the developments located in the Cherry Point area. Water is supplied to these operations through the facilities of the Public Utility District #1 of Whatcom County. The PUD has two diversion facilities. Plant #1 serves Intalco (aluminum plant), Mobil Oil and the City of Ferndale. The PUD has a water right for this facility for 50 cfs. Plant #2 serves water to Atlantic Richfield, Liquid Carbonic, Puget Power, and Culligan. A water right of 28 cfs is recorded for this facility. The PUD has no storage facilities for its supply. Several of the industries however, maintain limited on-site water storage. The largest water users of this supply system are Intalco (8 mg/d), ARCO (3k-4 mgd), Mobil Oil (2 mg/d) and the City of Ferndale (1-2 mg/d).

In addition to the use of water for municipal and industrial supply, Nooksack River water is also used for single and multiple domestic use. Many of the lakes and streams in the WRIA are also used for this purpose. Much of the domestic use is lawn and garden irrigation.

Water Quality

State water quality standards were set in 1973 following passage of the Federal Water Pollution Control Act of 1972. The Department of Ecology was designated the agency responsible for conducting and coordinating water quality planning in the state. Water quality parameters measure the physical, chemical, and bacteriological characteristics of water. Water quality standards have been described for the state, and the classification system is included here. The rating system as it has been applied to WRIA 1 follows in Table 4, which was obtained from the "Water Quality Management Plan, Phase I," report by CH2M/Hill, Consulting Engineers, published in April 1974.

Classification of Washington waters is as follows:

Lake Class: Lake Class applies to lake waters in virtually their natural condition. Water uses include fish reproduction and rearing, wildlife habitat, drinking water supply, swimming, and other recreational uses.

Class AA: Class AA applies to quality associated with the natural state and generally pertains to watersheds in an undeveloped condition. Uses are the same as for Lake Class.

Class A: Class A waters are excellent in quality, but allow for some slightly degrading effects due to land use and human activity.

Class B: Class B applies to waters slightly more polluted than A, but still of good quality. Uses differ from Class A in that drinking water supply and fish reproduction and rearing are not intended.

Class C: Class C waters are described as fair in quality. Quality criteria for this class are the least stringent and are based on a possible heavy use of a water's waste-assimilation capacity.

The "highest" designated use of a surface water generally determines its classification. The higher the classification, the more stringent are the water quality criteria defined as minimum requirements by the Department of Ecology. If surface water quality is better than that associated with its classification, it is to be maintained; if it is poorer than that associated with its classification, it is to be upgraded, generally by abating or eliminating waste sources.

The lakes of WRIA have been given a lake class designation. Lakes which qualify are at least 20 acres, or are smaller lakes which are of public interest and exhibit eutrophication. Lakes currently classified as such include Padden, Louise, Toad, Squalicum, Terrell, Barrett, Tennant, Wiser, Fazon, Canyon, Pangborn, Silver, Judson, Whatcom, and an unnamed lake located in Section 32, T. 37N, R. 4 E.W.M.

Table 4

WATER QUALITY CLASSIFICATIONS IN WRIA 1*

	Classification
WRIA 01 (Nooksack-Sumas River Basin)	
Bellingham Bay:	
East of a line bearing 185^{o} true from entrance of boat basin *light No. 1 (except as otherwise noted.	B
Inner, easterly of a line bearing 142^{o} true through fixed green navigation light at southeast end of dock (approximately 300 yards northeast of bell buoy "2") to the base of the east boat basin jetty.	B
Drayton Harbor:	
South of entrance	A
Nooksack River	
From mouth to river mile 4 (just below Ferndale)	A
From river mile 4 to confluence with Maple Creek	A
From confluence with Maple Creek to headwaters	AA
Middle Fork	AA
South Fork, from mouth to Skookum Creek	A
South Fork, from Skookum Creek to headwaters	AA
Sumas River	
From Canadian border (river mile 12 to headwaters (river mile 23)	A

NOTES

- All surface waters lying within the mountainous regions of the state assigned to national parks, national forests and/or wilderness areas are either Class AA or Lake Class.
- All lakes and their feed streams within the state are Lake Class and Class AA, respectively.
- All reservoirs with a mean detention time greater than 15 days are Lake Class; if the detention time is 15 days or less, the classification of the river applies.
- All other waters within the state are Class A.

Two sources of pollutants recognized in the Act were point and nonpoint. A permit system, the National Pollution Discharge Elimination System (NPDES), was developed to regulate point sources, which enter water from an outfall or a discrete point. Nonpoint sources of pollution travel in run-off and seepage, and are difficult to control. Numerous point sources of pollution in the Nooksack drainage are permitted under the NPDES system. These are listed in Table 5, and include industrial and municipal sources.

Table 5

NPDES Permits Issued in WRIA 1

Entity	City
A&M By-Products	Bellingham
ARCO	Ferndale
Bellingham Cold Storage	Bellingham
Bellingham Frozen Foods, Inc.	Bellingham
Bellingham Hatchery (WDG)	
City of Bellingham	Bellingham
Blaine Protein, Inc.	Blaine
City of Blaine	Blaine
Bornstein Seafoods, Inc.	Bellingham
Boundary Fish Co.	Blaine
Chevron, USA	Bellingham
Columbia Cement Corp.	Bellingham
Consolidated Products	Lynden
Dahl Fish Co.	Bellingham
DeJong Packaging Co.	Lynden
Everson, City of	Everson
Ferndale Ready Mix & Gravel, Inc.	Lynden
City of Ferndale	Ferndale
Ferry Bros. Inc.	Ferndale
First Wa Net Factory	Blaine
Frank Brooks Manufac.	Bellingham
Friday Harbor Sand & Gravel	Bellingham
Georgia-Pacific	Bellingham
Intalco	Bellingham
Liquid Carbonic Corp.	Ferndale
Lynden Ready Mix, Inc.	Lynden
City of Lynden	Lynden
City of Lynden (Water Treatment)	Lynden
Mt. Baker Plywood	Bellingham
Mobil Oil Corp.	Ferndale
Niehimo, Northwest Net, Inc.	Everson
Nooksack Salmon Hatchery (WDF)	
Oeser Cedar Co.	Bellingham
Durine Corp.	Bellingham
Pacific Concrete	Bellingham

Peter Pan Seafoods, Inc.	Bellingham
R. G. Haley Int'l Corp.	Bellingham
Schenk Seafood Sales	Bellingham
Sea Pac. Co.	Blaine
Sea Pac Co.	Bellingham
Sea-K Fish	Blaine
Sea West Industries	Bellingham
Shuksan Frozen Foods	Lynden
Simples Foods	Ferndale
Sumas, City of	Sumas
Whatcom County PUD #1	Ferndale
Whatcom County PUD #2	Blaine

Much of the surface water in WRIA 1 is of excellent quality but problems occur related to intensive agricultural use and municipal and industrial discharges. A 1974 water quality report identified septic tank leachate and agricultural run-off, including animal waste, as primarily responsible for high bacteriological counts in areas of WRIA 1. Although the Nooksack River and tributaries are designated as Class A (excellent) and better, concentrations of coliform bacteria which increase downstream in the lower Nooksack River have consistently caused violations of state water standards. Increased nutrient concentrations have also contributed to stream degradation in the lower river, causing algal bloom conditions. Sedimentation from natural sources, increased by forest practices in the upper watershed, agricultural practices and other land-disturbing activities, constitutes another nonpoint pollutant.

Water quality monitoring data from the mainstem Nooksack are listed in Table 6. The two sampling points were at river mile 3.4 at Brennan, and at North Cedarville, river mile 30.8. Sumas River data are also listed, monitored at Huntington, British Columbia. These data were gathered over several years. Statistical analyses were run, separating winter from summer months to compare results. The numbers displayed are the arithmetic mean. Further information regarding water quality criteria is in Appendix D.

Violations of total coliform bacteria have occurred in the Sumas drainage due to nonpoint source contamination from agricultural and urban runoff. High levels of nitrate and orthophosphate levels combined with low slimmer flows and warm temperatures cause algae blooms. Table 6 contains information on the Sumas drainage. To improve the water quality of Johnson Creek, tributary to the Sumas River, the Whatcom County Conservation District and the Consolidated Drainage Improvement District #31, assisted by the Soil Conservation Service and the State Department of Fisheries, have developed a watershed plan. Through this plan water quality and fish rearing habitat will be improved, animal waste in the stream reduced, and livestock access to nine miles of the stream restricted. This plan is being implemented with much success, primarily through cooperation with local dairy operators. A similar plan is proposed for the Saar Creek system.

Another watershed which is receiving attention for its water quality and potential improvement in Tea Mile Creek and its tributaries. The conservation districts technician is directing attention to this area. Additionally, the Lummi Tribe received Referendum 39 funds from Ecology to study water quality and flow enhancement in this drainage. An inventory is being taken of dairies along the streams, and water quality parameters are being measured.

Table 6

Water Quality Characteristics of the Nooksack and Sumas Rivers

Water Quality Characteristics	Nooksack River								Sumas River			
	Brennan (r.m. 3.4)				North Cedarville (r.m. 30.8)				Huntington, B.C. (r.m. 11.9) [5]			
	summer [1]		Winter [2]		Summer		winter		summer		winter	
	(71-83) [3]	(79-83)[4]	(72-84)	(78-84)	(71-83)	(79-83)	(73-84)	(78-84)	(71-83)	(79-83)	(73-84)	(78-84)
cfs	2516.9	(2178)	5947.56	(6461.4)	2567.81	(1995)	4064.72	(3797.5)	34.6	(29.44)	176.53	(161.51)
Water temperature	13.6	(13.96)	4.82	(4.83)	12.7	(13.8)	4.74	(4.68)	15.95	(16.12)	5.77	(5.83)
Dissolved oxygen (mg/l)	10.1	(10.0)	12.25	(12.3)	10.96	(10.85)	12.68	(12.77)	9.29	(10.12)	10.21	(9.97)
DO % saturation	95.3	(95.12)	95.29	(95.16)	103.12	(102.02)	99.42	(98.98)	101.24	(100.89)	79.85	(79.13)
pH (standard units)	7.41	(7.41)	7.32	(7.35)	7.5	(7.5)	7.37	(7.38)	7.64	(7.73)	7.42	(7.37)
Turbidity (NTU)	30.72	(37.39)	57.6	(94.61)	35.21	(41.39)	48.87	(58.64)	9.08	(7.61)	23.38	(32.04)
Fecal coliform (/100)	421.42	(182.01)	170.46	(174.13)	17.68	(16.0)	41.0	(46.88)	384.88	(343.39)	1160.98	(1727.8)
Total conductivity												
Nitrate (mg/1)	0.13	(0.16)	0.5	(0.58)	0.13	(0.11)	0.39	(0.45)	1.23	(1.47)	1.62	(2.0)

1) Summer measurements were recorded July through September. Measurements in table are arithmetic means.

2) Winter measurements were recorded December through March.

3) The first column of measurements in each column is based on 11-13 years of sampling.

4) Numbers in the second column for each location are based on 5-7 years of sampling.

5) Measurements on the Sumas River are taken downstream of Sumas at Huntington, British Columbia located a short distance across the border.

In recognition of the severe impacts of logging practices on fisheries habitat, water quality and soil in the upper basin, in the winter of 1985 the U.S. Forest Service convened an interagency group to look at such problems in the Nooksack drainage. The objectives of the group are education as to current and potential watershed conditions, gathering existing information, and identification of monitoring or rehabilitation projects. This group has established a schedule of meetings and selected project areas of interest.

The Lummi Tribe received grant money to assist a water quality study related to sedimentation. In several locations, logging and road construction have combined to cause severe erosion and sedimentation problems in the upper Nooksack watershed. The Lummi's study will assess heavily impacted areas and propose a plan of rehabilitation for the upper watershed. Complementing this, the U.S. Forest Service is completing an inventory of its holdings in certain drainages, mapping geologic formations which cause soils to be extremely susceptible to erosion or mass wasting when tree cover is removed.

Irrigation

According to the 1978 Census of Agriculture, approximately 28,900 acres of land are irrigated in the Nooksack Basin. Most of the irrigation occurs in the summer months from July through August. There are no irrigation districts or ditch companies used for water delivery. Rather, drainage districts have been formed to take care of excess water in the basin. Because ground water supplies in much of the farming area are adequate, much of the irrigation utilizes ground water sources.

Hydroelectric Projects

Hydroelectric power has long been the mainstay of the Northwest's power. Since the 1900s, dams have been built to supply electricity to the region. Puget Power's North Fork Nooksack dam was an early project in WRIA 1. Since the late 1970's, much interest has also been taken in small scale hydro projects which can be located on tributary streams.

The Public Utilities Regulatory Policies Act of 1978 (PURPA) encouraged domestic energy self-sufficiency. The Pacific Northwest Electric Power Planning and Conservation Act of 1980 emphasized reliance on conservation and renewable sources of energy. A result of these two energy-related acts was a widespread search for potential hydropower sites and subsequent filing for developments rights with the Federal Energy Regulatory Commission (FERC).

In spite of the unpredicted surplus of electricity in the region and the lack of need in the foreseeable future, numerous projects are in various stages of development throughout the WRIA and also statewide. Within WRIA 1 approximately 26 projects are presently proposed. Table 9 gives proposal project names, approximate locations and status before FERC. The list presented is only approximate, since changes occur frequently.

TABLE 7

HYDRO PROPOSALS IN WRIA 1

Project Name	Tributary to	FERC #	Status
Anderson Creek	Nooksack N. Fk.	8477	PPG
Bagley Cr. (U)	Nooksack N. Fk	6415	EXG
Bellingham Water Supply	Lake Whatcom	7747	CXO
Boulder Cr.	Nooksack N. Fk.	4270	MLA
Canyon Cr.	Nooksack M. Fk.	4904	PPG
Canyon Cr.	Nooksack N. Fk.	4312	MLA
Cavanaugh Cr.	Nooksack S. Fk.	7615	PPG
Clearwater Cr.	Nooksack M. Fk.	8372	PPA
W. Cornell Cr.	Nooksack N. Fk.	7621	PPG
Damfino Cr.	Chilliwack R.	8479	PPG
Deadhorse Cr.	Nooksack N. Fk.	4282	MLA
Diamond Cr.	Nooksack N. Fk.	5978	EXC
Falls Cr.	Glacier Cr.	7969	MinLA
Glacier Cr.	Nooksack N. Fk.	4738	MLA
Lookout Cr.	Nooksack N. Fk.	8480	PPG
Nooksack Falls	Nooksack R.	3721	MLA
Racehorse Cr.	Nooksack N. Fk.	4238	MLA
Ruth Cr.	Nooksack N. Fk.	4587	MinLA
Smith Cr.	Nooksack R.	5982	EXO
Skookum/Orsino	Nooksack S. Fk.	4158	MLA
Swamp cr.	Nooksack N. Fk.	4586	MinLA
Sygitowicz Cr.	Nooksack S. Fk.	5069	EXC
Thompson Cr.	Glacier Cr.	8478	PPG
Warm Cr.	Nooksack M. Fk.	8373	PPA
Wells Cr.	Nooksack N.F.	4628	MLA
Unnamed	Nooksack M.F.	-	NFO

EXA Exemption to FERC licensing process applied for
EXC Exemption under construction
EXG Exemption granted
EXO Exemption operating
CXO Conduct exemption operating
MLA Major license application
MinLA - Minor license application
PPA - Preliminary permit applied for
PPG - Preliminary permit granted
NFO -Non-FERC project operating

Information obtained from Washington Department of Fisheries printout, updated July 11, 1985.

Hydro projects are a consumptive water use for the affected stream channel. Projects usually divert stream flow out of the channel and through a penstock and the turbine, then back to the stream. The length of stream which loses water in this way is referred to as the bypass reach. Since protection of instream resources is one of Ecology's missions, the department becomes involved with other agencies and the developer to negotiate the minimum instream flow which will be maintained in the bypass reach. Several concerns are considered by Ecology in this decision process, including protection of habitat for anadromous and resident fish, wildlife use, impact to aesthetics and scenery, recreational use, and the maintenance of water quality. The Federal Clean Water Act's section 401 requires the department to issue a water quality certification for hydropower projects.

The minimum flow for a hydropower project is usually project-specific. The instream flow for the bypass reach may differ from that the rest of the stream set in the IRPP regulation for, which has flows set at a given control point usually located near the confluence of the tributary and a major stream. Hydropower projects have gauges installed near the diversion point to facilitate monitoring and enforcement. The department will be monitoring hydro operations to ensure that minimum flows are met.

Table 8 lists proposed or operating hydropower projects which have had minimum flows approved by state and federal fish and wildlife agencies and Indian tribes.

Table 8

Proposed and Operating Hydroelectric Projects with
Negotiated Minimum Flows in WRIA 1

FERC #	Project	Minimum Flow
4586	Swamp Creek	5 cfs
4587	Ruth Creek	15 cfs
4628	Wells Creek	30 cfs
4904	Canyon Creek	6 cfs
5069	Sygitowicz Creek	3.5 cfs
5978	Diamond Creek	2.5 cfs
5982	*Smith Creek	3.0 cfs
7747	*Bellingham Water Supply	10-15 cfs – City of Bellingham low flow on water diversion March- September

*Operating

Fisheries

The stream systems of WRIA #1 support all five species of Pacific salmon: chinook, coho, pink, chum, and sockeye (see Figure 7, page 30, life cycles), as well as steelhead, anadromous and searun cutthroat and Dolly Varden and numerous species of resident fish. All anadromous species use the Nooksack River and tributary streams for migration, spawning, and rearing. Lakes and sloughs throughout the basin also provide important rearing habitat. Resident fish are found throughout the WRIA. Releases of hatchery-bred salmon, steelhead, and resident fish from several Nooksack basin hatcheries help maintain the fisheries resource. Hatcheries run by the Department of Fisheries on Kendall Creek, by the Lummi Tribe on Skookum Creek, and by the Natural Heritage hatchery on Whatcom Creek produce anadromous and non-anadromous species. The Lummi tribe operates a salmon rearing facility in Lummi Bay, and the Nooksack tribe has an egg box program on Rutzadt Slough. Egg boxes are located in numerous other creeks in the WRIA. The Lynden Christian High School also has an egg box program on Fishtrap Creek. Anadromous production figures are found in Table 9. Hatcheries run by the Department of Game produce nonanadromous species. Production is shown in Table 9, also.

The salmon reared in WRIA #1 contribute to the United States and Canadian ocean commercial and sport fishery as well as local fisheries. Lummi and Nooksack tribal members fish the lower Nooksack and marine waters adjacent to the mouth in their usual and accustomed fishing grounds.

The accessible reaches of the North, Middle, and South Nooksack forks, as well as tributary streams and the upper mainstem, are primary spawning grounds for chinook salmon. Chinook salmon spawn in riffles and side channels in the North Fork. In the Middle Fork and the South Fork many miles upstream until blocked by falls or dams. Chinook salmon also spawn in the mainstem. Although spawning occurs sporadically in other tributaries, one noted for chinook spawning is Canyon Creek on the North Fork. Although low flows often limit spawning in small drainages, Dakota Creek has a small run of summer/fall chinook.

The Nooksack River supports one of the few viable spring chinook salmon runs in the state. This run has become severely depressed in recent years due to high interception rates, poaching and habitat degradation. To restore spring chinook populations the Lummi tribe and Department of Fisheries have been collecting native brook stock for hatcheries on the north and south forks. This program is producing adult hatchery returns and supplementing natural spawning where straying occurs. Maintenance of stream flow for wild spring chinook stocks is an important consideration for the fisheries agencies.

Coho spawn in numerous small tributaries to the forks and mainstem areas throughout the Nooksack River drainage. Coho rear in almost any accessible area. Coho and chum are the species generally found in smaller drainages. Spawning chum salmon use the mainstem and the forks and sloughs and side channels. Chum runs occur in some independent drainages, also. Pink salmon spawn mainly in the North Fork Nooksack drainage and its tributaries.

FIGURE 7 TIMING OF SALMON, SEARUN TROUT & RESIDENT FISH FRESHWATER LIFE PHASES IN NOOKSACK BASIN.

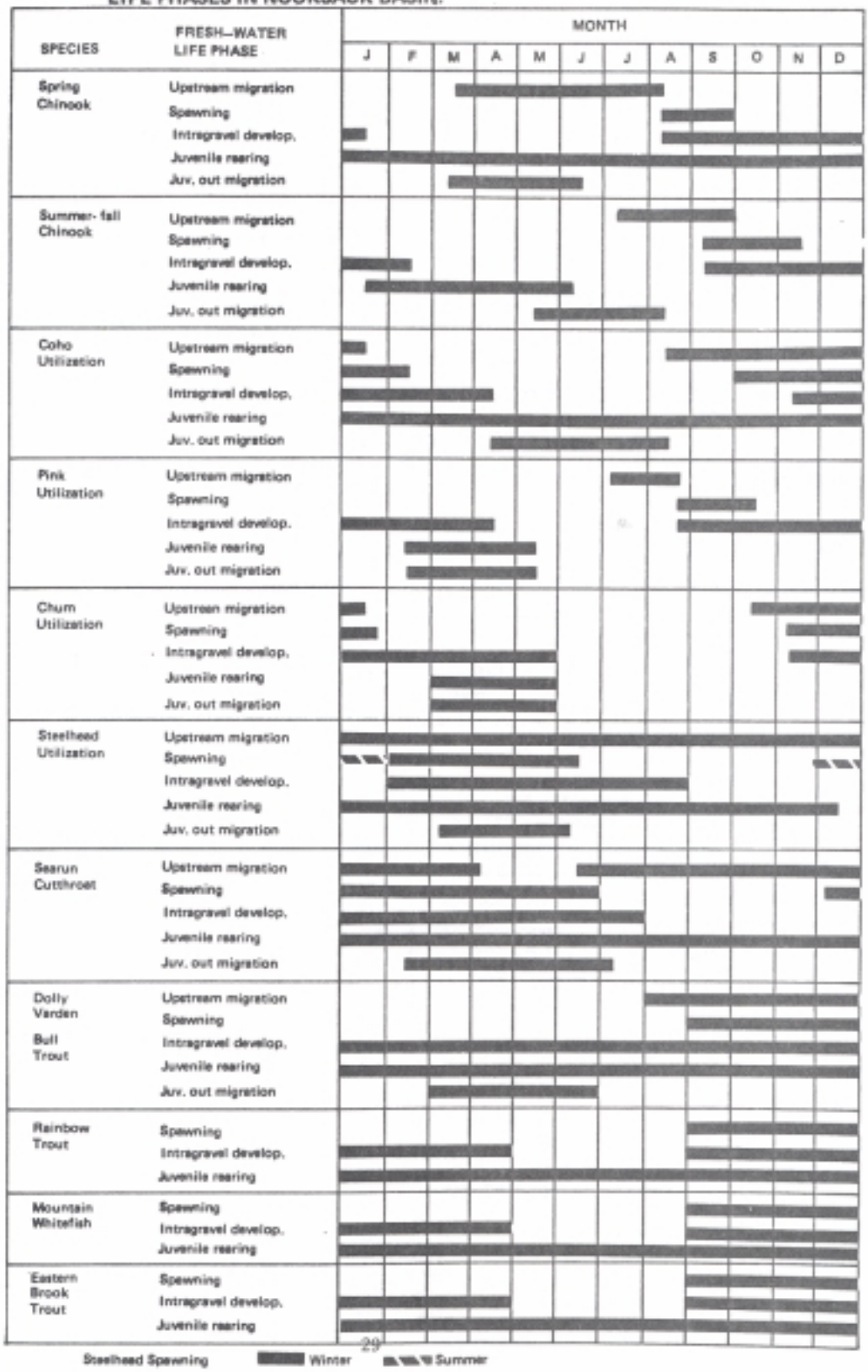


Table 9

HATCHERY PRODUCTION IN THE NOOKSACK BASIN
(1983 - 1984)

Hatchery	Species and Ages					
	Fry		Juveniles +			
	Chinook (fall)	Coho	Chinook Spring	Chinook Fall	Coho	Steelhead
Kendall Creek (WDF) '83-'84 season (7/ - 6/30)	11,800,000	2,345,000	54,000		2,100,000	
Natural Heritage Voc. Tech. '83-'84 season	330,000	235,000*		29,000		
Skookum Creek - Lummi 1983 - year production			76,270	3,716,500	2,050,000	67,500

	Juveniles +					
	Kokanee	Rainbow trout	Cutthroat trout	Searun cutthroat	Channel catfish	Steelhead
Whatcom Creek (WDG) '83-'84 season		565,326	102,082	5,564	10,179	119,741
Lake Whatcom (WDG) '83-'84 season	2,616,252	33,630				101,047

* Planted in Whatcom and Squalicum Creeks
+ Juvenile plus category includes fingerlings, smolts, catchables, legal planted classifications
Fry category includes fry, released and 90-day fish

Anadromous Fish

Limited sockeye salmon spawning occurs in tributary streams of the three Nooksack forks and in the North Fork. Streams supporting each species are listed in the subbasin discussion chart.

Steelhead spawn throughout the basin, in the mainstem, forks and tributaries. Steelhead rear year round in streams. Both summer steelhead and winter steelhead occur in the basin. Steelhead are produced at the Bellingham hatchery operated by WDG on Whatcom Creek and the hatchery operated by the Lummi Indian Tribe on Skookum Creek.

In addition to steelhead, the basin supports populations of anadromous searun cutthroat trout and searun Dolly Varden. The cutthroat will spawn and rear in all accessible streams and tributaries of the Nooksack River. Significant numbers of these fish rear in ponds and lakes of the basin, as well as the estuarine reach of the Nooksack River.

Resident Game Fish

Resident fish present in the basin are rainbow trout, cutthroat trout, brook trout, Dolly Varden, kokanee, mountain whitefish, large mouth bass, yellow perch, black crappie, pumpkin seed, and brown bullhead. The rainbow and cutthroat trout are found above and below anadromous fish barriers and in many of the lakes, while the Dolly Varden occurs primarily within the Nooksack River. Brook trout populate the higher elevation streams, especially on the North Fork, and one low elevation stream, Hutchinson Creek. Kokanee are found in large lakes and spawn in inlet creeks such as Brannian Creek tributary to Lake Whatcom. Mountain whitefish inhabit the Nooksack River system and other independent drainages. The bass, perch, crappie, pumpkin seed, and bullhead live in lowland lakes. Resident fish are produced at the WDG hatchery on Whatcom Creek at Whatcom Falls Park and kokanee are produced at the Lake Whatcom fish hatchery at the mouth of Brannian Creek at the southeast end of the lake.

Flow Recommendations

Information and recommendations regarding the flow needs of fish were provided by WDF, WDG, the Lummi Tribe and the Nooksack Tribe. WDG and WDF obtained channel width measurements for most of the streams supporting anadromous fish in WRIA 1. These measurements were used by WDG and WDF to derive recommended instream flows for salmon and steelhead using the "USGS" method, (toe-width) an instream flow technique developed cooperatively by WDF, WDG, and the U.S. Geological Survey. This method uses standard regression equations developed from data collected at sample sites on numerous western Washington streams to derive preferred rearing and spawning flows. Recommended flows which were derived in this manner are listed in Appendix C, which contains letters from the Washington Department of Fisheries and Game and the Lummi tribe.

Because of the importance of habitat and water quantity, and the greater reliability of the methodology, instream flow incremental method studies were undertaken on several streams. The instream flow incremental method (IFIM) was developed by the Cooperative Instream Flow Service Group of the U.S. Fish and Wildlife Service. This technique involves the correlation of

discharge, stage, velocity, and depth measurements over a range of flows to develop a hydraulic model of behavior of these parameters with changes in flow through typical channel sections. The distribution of substrate types and sizes is included in the model. Velocity, depth, and substrate preference criteria are specified for various fish species and life stages of interest. These criteria are interfaced by computer with the hydraulic model to derive weighted usable channel area for various levels of discharge for each fish species and lifestage. Graphs of weighted usable area versus discharge can be created for each species/lifestage and used to evaluate instream flow requirements for fish. IFIM studies were conducted for the North, Middle, and South Forks of the Nooksack River, and Kendall, Silver, Terrell and Maple Creeks.

Marine Fish & Shellfish

The marine water of the Strait of Georgia system is typical of deep ocean with low temperatures, high salinity, and abundant nutrient salts. The waters around Point Roberts and Boundary Bay are affected by Frasier River discharge. Bellingham Bay is affected by the Nooksack River. Various other bays and estuaries in the WRIA are also influenced by river runoff, tidal currents, and mainland or island topography. These shallower areas are generally warmer and less saline than the marine waters and support an abundance of flora and fauna.

Marine waters of this WRIA support a variety of fish including cod, hake, lingcod, greenling, flounder, sole, surfperch, rockfish, herring, dogfish, ratfish, skate, and smelt. These are fished both commercially and for sport. There is also sometimes a significant herring fishery.

The major shellfish producing areas include the protected waters of Portage, Bellingham, Chuckanut and Samish bays. Dungeness and red crab, several species of oysters, clams, mussels, scallops and shrimp, octopi, sea cucumber, and sea urchins are found in these waters.

Historically, the Olympia oyster occurred in significant numbers in Drayton Harbor and Samish Bay. However, poor water quality, tideland development and other factors have limited the range to Samish Bay. The Pacific oyster is now commercially grown in areas ranging from Drayton Harbor to Samish Day. Some are also found in Birch, Lummi, and Bellingham bays. The Lummi Indian Tribe has a facility to grow oysters on the Lummi Reservation. The spats developed in this center are transplanted to their oyster beds located in Bellingham Bay. This operation began in 1981.

Clams, mussels, and scallops are found throughout the area. Shrimp inhabit Bellingham Bay in large numbers.

Both the Lummi and Nooksack tribes have usual and accustomed fishing rights in the adjacent marine waters.

Wildlife

Some of the larger game animals inhabiting the WRIA include: elk, bear, mountain goat, black-tailed deer, and cougar. All of the elk found in the region come from releases made in 1946 and 1948 and are concentrated in the lower elevations of the South and Middle Forks of the Nooksack River. Black bear inhabit the lowland mountainous areas, becoming more numerous in remote areas. Mountain goat are restricted to National Forest lands or the National Park and are found in large numbers in the Mt. Baker area. High density herds of deer are located on the peninsula between Birch Bay and Drayton Harbor, on Lookout Mountain, and in the lowlands of the North Fork Nooksack River. A few cougar inhabit the eastern portion of Whatcom County.

Waterfowl are found in the wetland areas of the WRIA, which provide a valuable feeding and resting area for migrating waterfowl and nesting areas for resident waterfowl. Mallard, wood duck, and teal are the most common ducks. Snow geese and Canadian geese, as well as other species of waterfowl, use the area during migration. The main dryland feeding area for waterfowl is located at Lake Terrell Wildlife Recreation Area in western Whatcom County and the Lynden agricultural area in the north central section of the county. The agricultural areas of the Sumas Valley and the lower Nooksack Valley are also used as feeding areas, especially in the winter and fall.

The shoreland areas of the WRIA provide habitat for waterfowl such as western and red-necked grebe, black brandt, dunlin, bufflehead, greater scaup, arctic loon, canvasback, pintail, whistling swan and others. Important areas for nesting include Drayton Harbor, Birch, Lummi, and Bellingham bays, Lake Terrell and Wiser, Semiahmoo Spit and Point Francis.

Native upland game found in the area are generally located below the 2,000' elevation in the forests and woodland stream bottoms. These include blue and ruffed grouse, and snowshoe hare. Introduced species found in the agricultural areas of the Sumas and Nooksack basins include ringnecked pheasant, California quail, Hungarian partridge, and cottontail.

There are a number of species of furbearing animals found locally including beaver, muskrat, mink, river otter, marten, weasel, skunk, raccoon, opossum, bobcat, lynx, red fox, and coyote. The skunk, raccoon, opossum, red fox, and coyote are found throughout the lowland areas while marten, bobcat and lynx, which are more sensitive to human presence, are restricted to the more remote forested areas.

Stream flows can affect wildlife habitat and food chains in several ways. Flow regime, together with topography, controls the extremely valuable wildlife habitat of the riparian zone. Riparian vegetation is not a climax vegetation; it persists at a very productive successional stage due to occasional high flows which preclude development of climax vegetation. Natural fluctuations are therefore important for the maintenance of the riparian zone. While formal methodologies are unavailable to determine instream flow requirements for wildlife, flows may directly affect the food supply of a species.

A number of wildlife species are dependent upon fish for food. While extreme low flows facilitate the capture of fish by some wildlife, continued heavy predation, together with other adverse aspects of low flows, could reduce the fish population, resulting in a decline of the wildlife populations dependent on fish. The list of fish-eating wildlife is long and includes; kingfishers, several species of herons, ducks, (especially mergansers) ravens, crows, eagles, ospreys, several members of the weasel family, raccoons and bears.

Bald eagles winter in significant numbers along the Nooksack River, and a few nest in the basin. A major factor affecting the number of eagles wintering along the Nooksack is availability of salmon carcasses. The number of carcasses is related to the size of the salmon run, which in turn can be affected by instream flows as well as other factors. The Nooksack River's anadromous zone upstream of Deming is considered an area of national significance for wintering bald eagles.

Ospreys are unusual in Western Washington. There are two known osprey nests in the Nooksack Basin. Ospreys are almost exclusively dependent upon fish for food. Flows that benefit fish will therefore benefit ospreys.

Insect species found in the area include the shell butterfly, Oreas anglewing butterfly, high mountain blue butterfly, a hair streak butterfly, Pacuvious' dusky wing butterfly and sonora skipper butterfly.

In addition, the brassy minnow a fish of northeastern and north central North America, has an isolated Pacific slope population in the lower Fraser Valley of British Columbia. It occurs in the Canadian reaches of the Sumas River and could occur in the Washington segment of that watershed.

Wetlands and Estuaries

Wetlands are lands transitional between terrestrial and aquatic systems and include marshes, sloughs, potholes, wet meadows, river overflows, mudflats, and natural ponds and lakes. In WRIA #1, there are numerous wetland and estuarine areas.

Wetlands and estuaries are among the most productive biological systems in the world, supporting a diversity of life forms. They provide nesting, feeding, resting, and rearing habitat for a number of wildlife species including fish, waterfowl, shorebirds, aquatic mammals, and amphibians. In addition, these areas are used for a variety of recreational purposes such as fishing, boating, hunting, hiking, or observing wildlife, and offer unique scenic opportunities. Wetlands protect water quality by absorbing pollutants and trapping sediments. In numerous instances, wetlands aid in ground water recharge and maintenance of stream flows.

In the report, "Inventory of Wetland Resources and Evaluation of Wetlands Management in Western Washington," information has been compiled on the numbers of wetland acres in Whatcom County as well as other western Washington counties. The report indicates that of 336,000 acres inventoried in Whatcom County (or 25 percent of the total county area), approximately 14,748 acres are wetlands. One important wetland area is the estuary at the mouth of the Nooksack River.

The Nooksack River delta is an especially important area for rearing of salmon and steelhead. The young of these fish use the estuary as a rearing holding area on their way from fresh water to marine environment. The young generally stay in the estuary a week or more moving in and out with the tide, feeding on nutrients and adjusting to the salinity of the water. Later, these fish will migrate through the estuary on their way to freshwater spawning grounds. In addition to anadromous fish, the estuary is an important production ground for crabs, clams, bottomfish, and herring.

Wetlands and estuaries are extremely complex sensitive systems that are in a constant state of change. Some changes may be rapid and some sites vary from year to year while other sites are more stable and remain constant. The natural rate of change in a wetland can be accelerated by development. This includes dredging, filling, and draining an area, which destroy valuable habitat for fish and wildlife. Also, since development reduces the ability of the wetland to store flood water, stream flows often increase, causing flooding, erosion, and other related damages downstream. Logging in a wetland will compact soil and destroy habitat, creating increased runoff and sedimentation to the wetland itself. Pollution from urban runoff can change the chemistry of an area, resulting in destruction of valuable plant life. Loss of plant life as food and shelter can affect fish and wildlife dependent on these plants.

Recreation

The Nooksack Basin contains a wide variety of outdoor recreational opportunities. The basin is close to residents of Vancouver B.C. and Seattle, and probably receives more Canadian visitors than any other region in the state. There are three popular state parks in the basin. The acreage and visitation of these areas is as follows:

State Park	Acres	Annual Visitation
Birch Bay	192	550,000
Larrabee	1,965	350,000
Peace Arch	21	575,000

The eastern one-third of the basin is almost entirely administered by the U.S. Forest Service (Mt. Baker-Snoqualmie National Forest) and the National Park Service (North Cascades National Park). Both the Forest Service and the National Park Service provide facilities in the basin.

No recreation participation figures are available for the Nooksack Basin, but figures are available for Whatcom County. Whatcom County includes part of the North Cascades National Park and National Recreation Area which are outside the WRIA boundaries, so these numbers cannot be considered accurate but are at least indicative of use. The 1979 State Outdoor Recreation Plan shows the following figures for Whatcom County:

Activity	1975	1980	2000
Camping	421,400	494,800	664,500
Picnicking	185,300	219,200	280,600
Swimming	184,300	213,500	265,600
Boating	233,800	279,110	354,600

Not reflected in these figures are the hiking and backpacking activities that occur in the upper basin. Most of the Forest Service land is well traversed by trail. There are abundant hiking opportunities around Mt. Baker/Mt. Shuksan and the North Cascades National Park. Fishing is popular in all parts of the basin with participation levels being dependent on season and species.

In the lower basin, opportunities for fishing and boating abound. Whatcom County has a county park system regarded as one of the best in the state.

Congress recently passed the Washington State Wilderness Act which established additional wilderness areas in Washington. The Mt. Baker Wilderness and Mt. Baker National Recreation Area are now designated in the Mt. Baker area (see Figure 2, page 3).

Navigation

Navigation on the Nooksack is primarily limited to white water boats, although some reaches of the river are used by jet boat. Kayakers run the Nooksack forks. Indian fishermen also use the river. Commercial outfitters conduct raft trips down the Nooksack. Most navigation in the region occurs on the saltwater of the Strait of Georgia and adjacent Puget Sound waters and in lakes in the WRIA.

Aesthetic and Scenic Values

The Nooksack River basin has some spectacular scenic resources. One of the most notable and most photographed mountains in the state is Mt. Shuksan, Mt. Baker, Twin Sisters, the Nooksack River, and Nooksack Falls are also scenic attractions in the basin and receive numerous visitors from throughout the state and Canada.

Several reaches of the river are listed as candidates for wild and scenic river status. This includes the three forks downstream to the confluence of the South and North Forks; as well as Wells Creek. The characteristics which qualify the Nooksack for this status are outstanding scenery, recreational values, geologic interest and fish and wildlife populations and their habitat. The Nooksack Falls on the North Fork are specifically cited as a valuable resource by the National Park Service.

WATER RESOURCES BY SUBBASIN

Nooksack River Basin

The largest and most important river system in WRIA #1 is the Nooksack River and its tributaries. The river arises as small tributaries in the snow fields and glaciers of the Cascade range. Eventually these small tributaries form the North, Middle and South forks, the three major tributaries of the Nooksack. These forks converge at Deming to form the mainstem. Together these forks drain over 576 square miles of mountainous terrain with a total average runoff of 2,400,000 acre-feet/yr, half of which is contributed by the North Fork.

From Deming, the river runs 35 miles through a broad fertile lowland, the Whatcom Basin. In this stretch, the gradient flattens to a meandering braided channel. A broad delta with numerous channels forms where the river discharges into the marine waters of Bellingham Bay.

Aside from a few recreational residences and small communities, the upper sections of the three forks are relatively undeveloped. Most of the development in the WRIA has occurred in the floodplain areas along the lower sections of the forks and in Whatcom Basin. The largest city in the WRIA is Bellingham located on Bellingham Bay, southeast of the Nooksack River delta. Other smaller cities found in the basin include Ferndale, Lynden, Blaine, Sumas, Everson and Deming. Most of the population in the Nooksack River Basin is contained in the middle and lower sections. This area is intensively farmed, especially around the Lynden and Everson areas. Many of the tributaries to the mainstem in this section have been channelized or ditched.

North Fork Nooksack

The area referred to in the text as the North Fork subbasin is delineated in Figure 8. The North Fork originates from glaciers on Mt. Shuksan in the eastern portion of the WRIA. The mountainous terrain is steep with river gradients averaging approximately 100'/mile. Average annual precipitation is estimated to be 77 inches, for a total annual runoff of 1,187,000 acre-feet. There are over 110 tributaries that contribute water f low to the North Fork. Because glacial melting contributes much of the flow, the water is turbid through much of the year. One-third of the North Fork's total annual flow originates from Wells, Glacier, and Canyon creeks. Boulder and Maple Creek produce less runoff per unit area than basins further upstream because of their lower mean elevations. Other important tributaries to the North Fork are Kendall, Coal, Racehorse and Bells creeks. The largest diversion on the North Fork is owned by the Puget Sound Power and Light Co. This diversion is located above Nooksack Falls. The company generates power and returns the water to the North Fork a few hundred feet downstream of the falls.

The North Fork drainage basin encompasses 285 square miles with elevations ranging from 300 feet near Deming to 10,778 feet on Mt. Baker. Most of the area is forested, with some farming and grazing in available bottom lands.

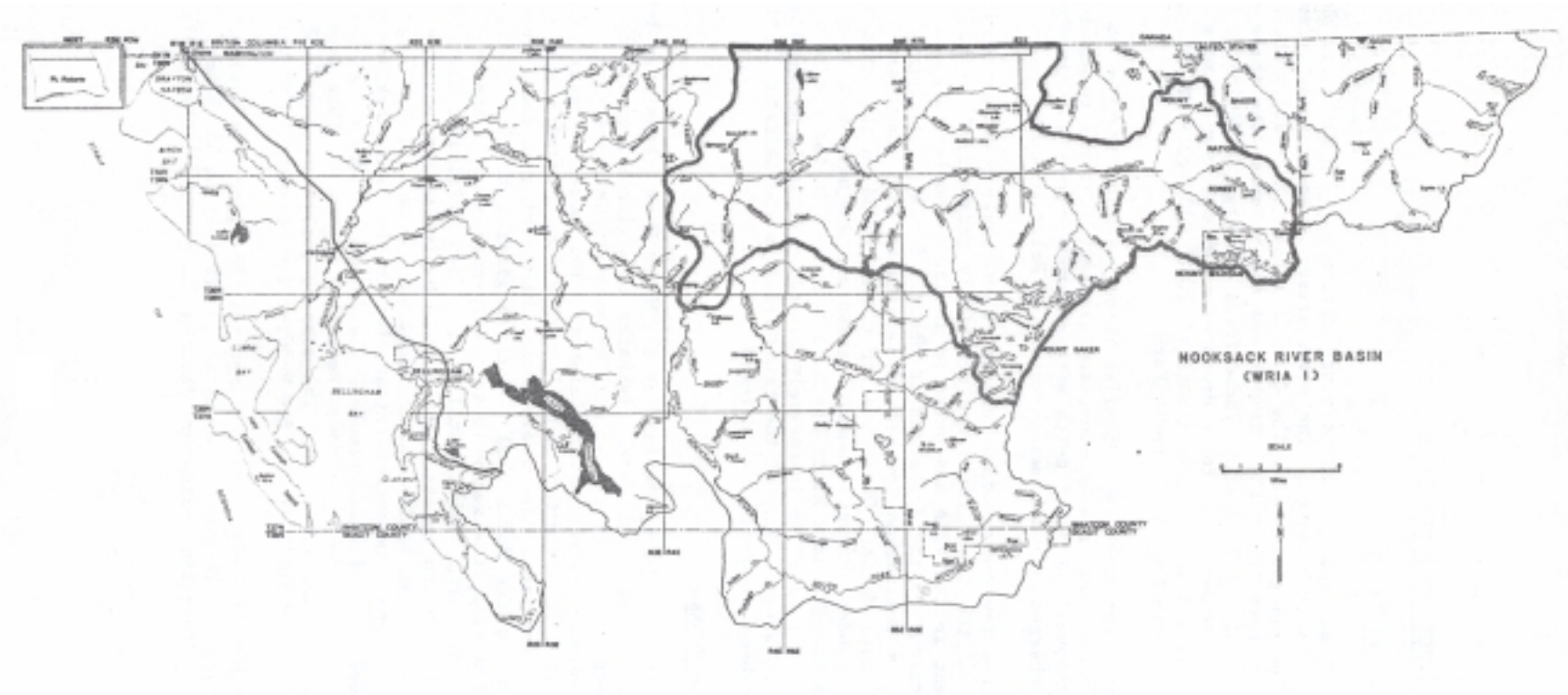


FIGURE 8 North Fork Nooksack River Subbasin

The department had previously administratively established minimum flow requirements on the North Fork. Tributaries were also subject to this limitation. Higher minimum instream flows are now set for the North Fork. Water rights granted after adoption are subject to these higher flows.

Table 10 lists certain important characteristics of the North Fork tributaries and uses. Stream habitat is used extensively by anadromous and resident fish for spawning and rearing. Species previously discussed are all found in this fork, with the exception of sockeye. Cutthroat listings often indicate both searun and resident cutthroat. Numerous proposals have been made for hydroelectric development. The table indicates status of project proposals as of July, 1985. Some indication of water appropriation is given in the category labeled "water rights," although this is restricted to hydro projects. If a stream has been either previously closed or subject to a low flow, this is listed under "administrative status." All North Fork Nooksack tributaries were previously subject to the low flow on that river, but this restriction has not been repeated in the table. Water rights certified with previous low flow provisos are unaffected by the new regulation. In numerous cases, prior administrative restrictions have been made much more stringent in the new regulation, and future water rights will be subject to either higher flows or seasonal closures, or both.

Table 10

Characteristics of North Fork Nooksack Tributaries

Stream	Fish Species	Proposed Hydropower Proponent	FERC #	Size	Water Rights	Administration Status	Comments
Anderson Creek	coho, chum, steel-head, cutthroat, char	Stephen Gaber	#8477				
Bagley Creek	resident, char	Slush Cup Co.	#6415	0.85 mg	Applications for power and commercial/industrial		
Bells Creek	coho, chum, steelhead, resident, cutthroat				Application for hydro development recently withdrawn		
Boulder Creek	coho, chum, pink, chinook, resident steelhead, cutthroat	Mt. Rhythym Resources	#4270	1.5 mg	Water right application filed for hydro and commercial/ industrial uses		Streambed has problems with bedload movement and aggrading, which has damaged the bridge on SR 542. Frequent flooding.
Canyon Creek	chum, coho, pink, chinook, steelhead, resident, cutthroat, Dolly Varden	Water Song Resources	#4312	5 mg	Application for hydro and commercial/industrial uses		Lummi Tribe is studying cumulative effects on Canyon Creek, concurrently with U.S. Forest Service
Coal Creek	coho, steelhead, cutthroat				Domestic water use		

Stream	Fish Species	Proposed Hydropower Proponent	FERC #	Size	Water Rights	Administration Status	Comments
Cornell Creek	coho, chum, pink. chinook, steelhead, cutthroat, resident, Dolly Varden						
West Cornell Creek	coho, chum, pink, chinook, steelhead, cutthroat, resident, Dolly Varden	Western Power, Inc.	#7621	2.06 mg	None filed for hydro		Watershed impacted by logging
Deadhorse Creek	coho, pink, chinook, steelhead, cutthroat, chum	Mountain Water Resources	#4282	1 mg	Application for hydro on file		
Gallop Creek	coho, pink, chum, steelhead, chinook, resident, cutthroat, Dolly Varden				Gallop Creek		Good fish habitat
Glacier Creek	chinook, coho, pink, steelhead, resident, cutthroat, Dolly Varden, chum	McGrew & Assoc.	#4738	4.8 mg	Application for hydro development on file		License application before FERC #4738
Kendall Creek	coho, chum, pink, chinook, steelhead, rainbow and searun cutthroat				Domestic and irrigation water rights permits, fish propagation		Washington Department of Fisheries maintains hatchery at mouth of Kendall Creek; creek itself is used as a rearing pond; hatchery flow is released back into Kendall Creek

Stream	Fish Species	Proposed Hydropower Proponent	FERC #	Size	Water Rights	Administration Status	Comments
Maple Creek	coho, pink, chum, chinook, steelhead, cutthroat, resident				Numerous withdrawals for domestic; irrigation use; small power withdrawals on file; consumptive withdrawals total over 5 cfs		Stream runs inter-gravel above confluence in late summer. Average low flow estimated at 2 cfs
Racehorse Creek	chinook, coho, pink, chum, cutthroat, steelhead, resident	Racehorse Company	#4238	1.5 mg	Application on file for power and commercial/ industrial withdrawals		Unstable slopes, problems with sedimentation
Ruth Creek	resident	McGrew, McMaster Koch	#4587	3.1 mg	Application for hydro on file	Negotiated minimum flow in bypass reach = 5 cfs	License application before FERC
Swamp Creek	resident	McGrew, McMaster, Koch	#4586	3.7 mg	Application on file for hydro-power withdrawal	Negotiated minimum flow in bypass = 5 cfs	
Thompson Creek	coho, pink, steelhead, resident	Stephen Gaber	#8478		Application on file for hydro withdrawal		Good fish habitat, heavy pink spawning
Wells Creek	resident, Dolly Varden	McGrew & Associates	#4620	9.1 mg	Negotiated minimum flow = 30 cfs		License application before FERC

Middle Fork Nooksack

The Middle Fork originates in the glaciers of Mt. Baker at the 4,600' elevation. The Middle Fork drains over 100 square miles. Elevations range from 300' to 10,778' at Mt. Baker. The topography of the basin is similar to the North Fork. The river gradient averages 279 feet per mile. Annual runoff is estimated for the entire basin at more than 400,000 af/yr. Approximately 30 streams contribute flow to the Middle Fork, which in turn contributes from 15-18 percent of the total volume of the Nooksack River. Like the North fork, water of the Middle Fork is turbid much of the year due to glacial sediment. Boundaries of the sub-basin are delineated in Figure 9.

The City of Bellingham holds a water right to 125 cfs of municipal and industrial water supply from the Middle Fork Nooksack, which augments its Whatcom Basin water supply. A pipeline transports the water to Lake Whatcom from the Middle Fork. The city has storage rights on Lake Whatcom, also, and withdraw its municipal supply from the lake. The city's historical amount of Middle Fork diversion has been approximately 95-100 cfs, with a low flow provision requiring that a 10-15 cfs minimum flow be left in the stream.

A hydroelectric project which produces approximately 0.9 megawatts, FERC #7747, has been constructed on the City of Bellingham's water supply pipeline. This project was exempted from the normal FERC licensing process since it uses Bellingham's diversion and conduit. Under Bellingham's water right, the project will produce power only when the city diverts water from the Middle Fork for municipal supply. If the project were to expand the diversion period, the hydro project would be subject to instream flows greater than those on Bellingham's water right whenever water was diverted superfluous to Bellingham's municipal requirements.

Chinook, coho, pink, and chum salmon, as well as steelhead, and cutthroat trout spawn and rear in the Middle Fork. Upstream migration is limited by the municipal diversion structure at approximately river mile 7. Above the dam, cutthroat and rainbow trout are found.

Clearwater Creek above Heisler Ranch is a major tributary. It drains 1/5 of the Middle Fork area and has an estimated average annual runoff of 100,000 acre-feet. Clearwater Creek is the site of a proposed hydropower project. See Table 11 for a listing of more details on the Middle Fork Sub-basin.

FIGURE 9 Middle Fork Nooksack River Subbasin

Table 11

Characteristics of Middle Fork Nooksack Tributaries

Stream	Fish Species	Proposed Hydropower Proponent	FERC #	Size	Water Rights	Administration Status	Comments
Clearwater Creek	resident throat (rainbow)	Puget Power	#5150	7.2 mg			Preliminary permit expired
		Deep Water, Inc.	#8372				Preliminary permit application
Canyon (Lake) Creek	chinook, coho, pink, chum, cutthroat, steelhead, resident, char	NRG and Scott Paper	#4904	4 mg	Water right application for hydro minimum flow negotiated at 6 cfs		License application before FERC; watershed severely damaged by winter storm runoff
Falls Creek		Thomas McMaster	#7969				Minor license application
Heislers Creek	cutthroat, steelhead, coho, resident						
Porter Creek	coho, pink, cutthroat, steelhead, chum, resident	Georgia Pacific					Allowed permit to expire

South Fork Nooksack

The South Fork of the Nooksack River originates in the mountainous area southwest of Mt. Baker. The terrain is similar to the ruggedness of the North and Middle forks but elevation are slightly lower ranging between 200 and 7,000 feet and no glaciers feed the stream. The river gradient averages 131 feet/mile. The basin receives about 100" of precipitation per year. There are approximately 52 tributaries in the drainage. South Fork subbasin boundaries are shown in Figure 10.

Thirty percent of the Nooksack River's total annual discharge is derived from the South Fork drainage. This equals about 800,000 acre-feet. The basin drains an area of 193 square miles. Farming and grazing occur along the bottom lands.

Chinook, coho, chum, pink salmon, steelhead, and Dolly Varden use the South Fork for spawning and rearing. Both resident and searun cutthroat are widespread, and also rainbow trout. It is an important spawning area for spring chinook. The heaviest concentration of spawning is found below RM 21. Enhancement of the anadromous fish runs occurs at the Skookum Creek hatchery operated by the Lummi Indian Tribe. Production figures for this hatchery are found in Table 9. Table 12 includes more details on the South Fork Nooksack.

FIGURE 10 South Fork Nooksack River Subbasin

Table 12

Characteristics of South Fork Nooksack Tributaries

Stream	Fish Species	Proposed Hydropower Proponent	FERC #	Size	Water Rights	Administration Status	Comments
Black Slough	coho, chum, resident, cutthroat					Low flow	
Cavanaugh Creek	coho, pink, steelhead, chum, resident, cutthroat	WP, Inc.	#7615	5 mg	No application filed		Lummi's intervened
Deer Creek	chinook, coho, pink, resident, steelhead						
Edfro Creek	coho, steelhead, resident						
Howard Creek		WP, Inc.	#7616				Preliminary permit cancelled
Hutchinson Creek	chinook, pink, coho, resident, cutthroat, steelhead				Water right for fish propagation WDF		
Jones Creek	coho, chum, cutthroat, resident, steelhead						
McCarty Creek	chum, coho, resident, cutthroat, steelhead						
Plumbago Creek	coho, pink, resident, steelhead						
Roaring Creek	chinook, coho, pink, resident						

Stream	Fish Species	Proposed Hydropower Proponent	FERC #	Size	Water Rights	Administration Status	Comments
Saxon Creek	coho, resident, cutthroat, chum						
Skookum Creek	chinook, coho, chum, resident, steelhead, cutthroat	Georgia Pacific	#4158	6 mg	Fish propagation by Lummi Tribe	Low flow	Major license application before FERC Skookum hatchery – Lummi
Wanlick Creek	chinook and coho, planted						
Orsino Creek		Georgia Pacific			Application for power – nonsumptive		Part of Skookum/Orsino project
Sygitowicz Creek	steelhead, coho, chum, cutthroat	Douglas Marr	#5069	.185 mg	Permit issued for hydro	Minimum flow for hydro bypass reach	Project under construction

Mainstem Nooksack River

The Nooksack River below Deming meanders through the Nooksack lowlands for 37 miles before discharging into Bellingham Bay. This area encompasses about 72 square miles from Deming to the Nooksack River delta. Most of the terrain adjacent to the river is inundated during high water runoff periods. There is intensive agricultural activity in the lowland areas. Mainstem subbasin boundaries are shown in Figure 11.

The mouth of the Nooksack is a marine estuary delta with numerous meandering channels. The Lummi River at one time was the main channel to the Strait of Georgia; however, a log jam blocked the channel and diverted water to the present streambed. The river reaches about 93 percent of its total volume at Deming. The river channel below the three forks is very braided and the floodplain widens steadily. The mean annual flow in the mainstem at Ferndale is 4,099 cfs with an annual runoff of 2,970,000 af/yr. Two unincorporated communities, Lawrence and Deming, and three incorporated communities, Lynden, Ferndale, and Everson, are found along the mainstem.

There are several tributaries which discharge into the mainstem below Deming. Those of note are Smith Creek, Anderson Creek, Fishtrap Creek, Bertrand Creek, Wiser Lake Creek, and Ten Mile Creek.

Anderson Creek encompasses a 14 square mile area with elevations ranging from 115 feet at the confluence to 3,060 feet. The creek originates on the northwest face of Sultan Mountain and flows into the mainstem at an elevation of 115 feet. The estimated average annual runoff is 36" or 27,800 af/yr. Extremely low flows can be expected in the summer.

Bertrand Creek has a drainage area of 43.5 square miles and contains elevations ranging from 25 feet in the south to 450 feet in the north. The creek produces a mean annual runoff of 24 inches or 56,000 acre-feet. The upper watershed originates in Canada and flows southerly into Washington. The geologic characteristics of the drainage are such that there is a high degree of surface runoff. Low flows tend to be extreme in the upper western watershed. Much of the lower section of the creek flows through intensively farmed areas and is ditched to improve drainage for farming. In the glacial outwash area of the lowlands, increasing ground water inflow makes stream flow more uniform and reliable. There is little natural storage in the watershed aside from one or two small marsh areas and several small lakes and ponds.

Fishtrap Creek lies to the east of Bertrand Creek. The upper half of the watershed lies in Canada where headwater tributaries begin in two marshes. Topographically, the basin is a nearly flat plain sloping gently south. The flat area encompasses most of the Lynden terrace where intensive farming occurs. The watershed totals about 30.6 square miles. Elevations vary from 25 feet near the confluence to 475 feet in Canada. The estimated runoff for the entire basin is about 26 inches or 43,000 acre-feet. The creek receives a major portion of its flow from groundwater runoff but does show peak characteristics during periods of heavy precipitation. The system contains a number of parallel drainage ditches forming the major tributary system. These were developed to improve farming by lowering the high water table. Surface storage is limited to two marshy areas in Canada.

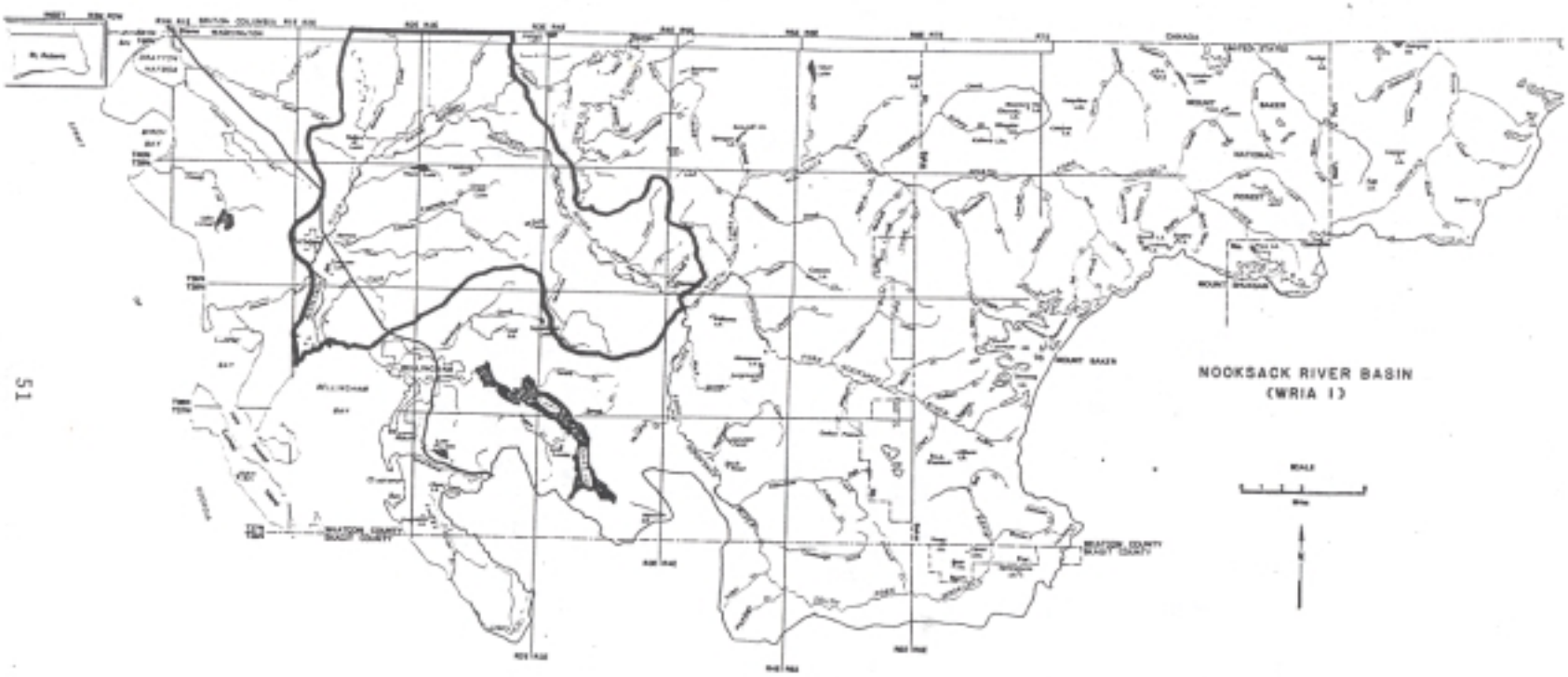


FIGURE 11 Mainstem Nooksack River Subbasin

Smith Creek originates near the summit of the Sumas Mountains and flows into the Nooksack River west of Deming, draining a 10.6 square mile area. It is estimated that Smith Creek produces as average annual runoff of 29,000 acre-feet. Streamflow is primarily maintained by precipitation and shows characteristic extreme low flows below 1 cfs, and frequently dries up in the lower reaches in summer. Mr. Bob Shipp of Bellingham has an existing hydroelectric project on Smith Creek.

Wiser Lake Creek drains a narrow area lying between Scott Ditch and Ten Mile Creek. Wiser Lake in the upper watershed covers a 123-acre area. The creek is the outlet and flows for three miles to the confluence with the mainstem Nooksack. The mean annual flow is approximately 15 inches or 5,800 acre-feet. The lake provides storage and regulates about half the runoff from the basin.

Tenmile Creek watershed drains 34 square miles. The headwaters begin in the King Mountain upland area south of Fazon Lake and discharge into the mainstem near Ferndale. Tenmile Creek, along with its two major tributaries, Fourmile and Deer creeks, drains a major portion of the Whatcom Basin north of Bellingham. The estimated total annual runoff is 18 inches or 33,400 acre-feet. Fourmile Creek discharges into Tenmile Creek above laurel and flows in a southwesterly direction for three miles to Barrett Lake. Barrett Lake, a mile long marshy enlargement of the creek, is actually caused by a beaver dam at its lower end. Deer Creek, another main tributary, flows into this lake. Tenmile Creek meets the mainstem Nooksack about one-half mile below the outlet to Barrett Lake. Barrett Lake, along with two other lakes, Green and Frazon, provides the surface storage for this watershed.

Currently, Ecology has closed several tributary streams and lakes of the Nooksack mainstem to any out-of-stream appropriations. These include Barrett lake and tributaries, Bertrand Creek, Deer Creek, Fishtrap Creek, Fourmile Creek, Kamm Ditch, Ten Mile Creek, Wiser Lake and outlet, and Green Lake and outlet. See Table 16 for more information.

Table 13 lists further information on mainstem tributaries.

Table 13

Characteristics of Main Stem Nooksack Tributaries

Stream	Fish Species	Water Rights	Administration Status	Comments
Anderson Creek	coho, chum, steelhead, resident, cutthroat	Numerous consumptive water rights	Low flow	Correlated to Fishtrap Creek gage at Lynden. Average low flow 8.2 cfs at confluence with Nooksack
Bertrand Creek	coho, chum, cutthroat, steelhead	A small number of domestic users; large majority of withdrawals are for irrigation	Closed	Correlated to Fishtrap Creek gage at Lynden. Water quality problems; possibly problems with continuity between creek and wells; average low flow 9 cfs at confluence with Nooksack
Fourmile Creek	coho, chum, resident, cutthroat	Numerous appropriations for domestic and irrigation; irrigation the largest proportion	Closed	Ten Mile Creek gage at Laurel
Deer Creek	coho, chum, steelhead, cutthroat, resident	Small number of appropriations for domestic and irrigation use	Closed	Correlated to Ten Creek gage at Laurel. Creek is much ditched; average flow = 1 cfs at confluence with Barrett Lake
Squalicum Creek	coho, chum, steelhead, resident, cutthroat	The largest amount of appropriation is for irrigation	Closed	

Stream	Fish Species	Water Rights	Administration Status	Comments
Ten Mile Creek	chum, coho, tribe outplants, native chum	Heavily used for irrigation	Closed	Ten Mile Creek gage at Laurel. Average low flow = 5 cfs; at confluence with Nooksack; stream is part of water quality monitoring project.
Fishtrap Creek	chum, coho, steelhead, resident, cutthroat	Heavily appropriated for irrigation; also withdrawals for commercial/ industrial heat exchange and fire control applications	Closed	Fishtrap Creek gage at Lynden. Area heavily agriculture; water quality problems; high school has egg box program upper 6 miles dredged to improve habitat average low flow at confluence with Nooksack = 10 cfs. Ecology concerned about aquifer recharge; stream very silty
Smith Creek	coho, chum, steelhead, cutthroat	Irrigation and domestic use; hydropower production		Low flow and hydro bypass reach minimum flow. Hydro project operating (Bob Shipp)
Wiser Lake Creek	coho, cutthroat	Several water rights for irrigation use, minimal domestic use	Low flow	Correlated to Fishtrap Creek at Lynden. Lake closed administratively; creek has low flow status; beaver dam on lake; average low flow = 1.8 at confluence with Nooksack

Fraser River Tributaries

There are several streams which arise in Washington State and flow northerly into Canada where they discharge into the Fraser River system. The Chilliwack River, Tomyhoi Creek, Silesia Creek, and Damfino Creek arise in the high mountainous terrain of the northeast part of the WRIA and flow into Canada. The boundaries of this subbasin are shown in Figure 12. Little development has occurred in these basins because of their remoteness from populated areas and their location in the Mt. Baker National Forest or the North Cascades National Park. Salmon, steelhead, or resident fish use of these streams is unquantified. Average annual run-off in the chilliwack River basin is approximately 70 inches, or 650,000 acre-feet/year.

The Sumas River arises in the Sumas Mountains north central Whatcom County and winds northward through important agricultural areas, eventually discharging into the Fraser River in Canada. At one point along its water course, the Sumas lies less than 1/2 mile from the Nooksack River and its lowlands are subject to flooding by the Nooksack. The river drains an area of 56 square miles with a mean annual runoff of 81,080 inches at Clearbrook to 100 inches in the Sumas Mountains. Approximately one-third of the flow of the river is contributed by Johnson Creek, a major tributary. Coho salmon, steelhead, and cutthroat trout are found in the Sumas River and its tributaries. The Sumas River and its tributaries have been closed to additional consumptive uses.

The Saar Creek watershed cover 10 square miles and drains the Vedder Mountains and the northeastern part of Sumas Trough. In addition to the many marshy springs along the creek which help to maintain flows during dry periods, the porous material of the valley floor has a sizable groundwater storage capacity. In the lower sections of the creek, the stream bank has been diked to alleviate flooding. The mean annual runoff is estimated to be 22,000 acre-feet.

Table 14 lists further information on the Sumas drainage and other Fraser River tributaries.

FIGURE 12 Fraser River Subbasin

Table 14

Characteristics of Fraser River Tributaries

Stream	Fish Species	Water Rights	Administration Status	Comments
Breckenridge Creek	coho, chum, resident, chinook, steelhead, cutthroat	Irrigation withdrawals	Closed	Closed as tributary to Sumas River
Chilliwack River	coho, chum, Dolly Varden, cutthroat			
Johnson Creek (and N. Fk)	coho, chum, steelhead, cutthroat, resident	Irrigation withdrawals		Hydrograph correlated to Sumas River gage near Sumas
Saar Creek	chinook, chum, coho, steelhead, cutthroat	Irrigation withdrawals		Correlated to Canyon Creek Kulshan Gage. Closed as tributary to Sumas River
Sumas River	coho, cutthroat, chum, steelhead, resident, pink	Numerous water rights for irrigation withdrawal	Closed	Gage near Sumas

Lowland Coastal Drainages

There are several coastal basin streams which arise in the low elevation foothills in the western part of the WRIA and flow into marine waters of Puget Sound. Stream flow levels in these basins are dependent upon direct precipitation in the form of rain or snow. Storage to supplement these flows is provided by lakes, ponds, and ground water inflow. Many of these creeks and their tributaries become dry in the summer when precipitation subsides. Generally, the lower 1 or 2 miles of stream is tidally influenced. Streams in this area include California Creek, Dakota Creek, Terrell Creek, Squalicum Creek, Whatcom Creek, Chuckanut Creek, Oyster Creek, Colony Creek, and Padden Creek. Lowland coastal subbasin boundaries are shown in Figure 13.

Adjacent land on several of the creeks has been cleared for pasture or agricultural use. Little development has occurred in the upper reaches of Colony, Oyster, Chuckanut, and Padden creeks, but light residential and agricultural development is found in lower sections.

Dakota Creek is located in the northwestern corner of the WRIA. This drainage encompasses an area of 28.3 square miles, extending a short distance into Canada. The mean annual runoff is estimated at 34,400 acre-feet. Many small tributaries in the upper sections of the watershed become dry in summer. Storage is contained in a five million gallons reservoir previously used by the City of Blaine, and several farm ponds. Flows of this stream become very low in the summer months due to out-of-stream use and limited storage. A cooperative salmon enhancement program uses the old City of Blaine water reservoir, releasing fall chinook, coho and chum into Dakota Creek.

The California Creek drainage is located south of Dakota Creek. It falls in a slight rain shadow produced by an adjacent upland and as a result, receives somewhat less precipitation than Dakota or Terrell creeks. Average annual runoff is about 18,000 acre-feet. Much of the marshland has been drained for farming, so storage occurs in the few remaining small lakes and ponds.

Terrell Creek is located south of California Creek and receives its major water sources from Terrell Lake. Flow from the lake is controlled by a Washington Department of Game dam at its outlet and the amount of water spilled controls the flows downstream. Groundwater is scarce in the watershed since much of the ground is hardpan. Surface stream flow consists primarily of surface runoff, and portions of the stream dry up in the summer. It is estimated that the mean annual runoff is 14,000 acre-feet.

Silver Creek has an 18 square mile watershed east of the Nooksack River and northwest of Bellingham. The eastern portion is flat to gently rolling with several swamps and ponds. Silver Creek discharges into the Nooksack Delta, with the mean annual runoff approximately 11,500 acre-feet. Little groundwater is present in the upper watershed. Consequently, many streams dry up during the summer low flow period.

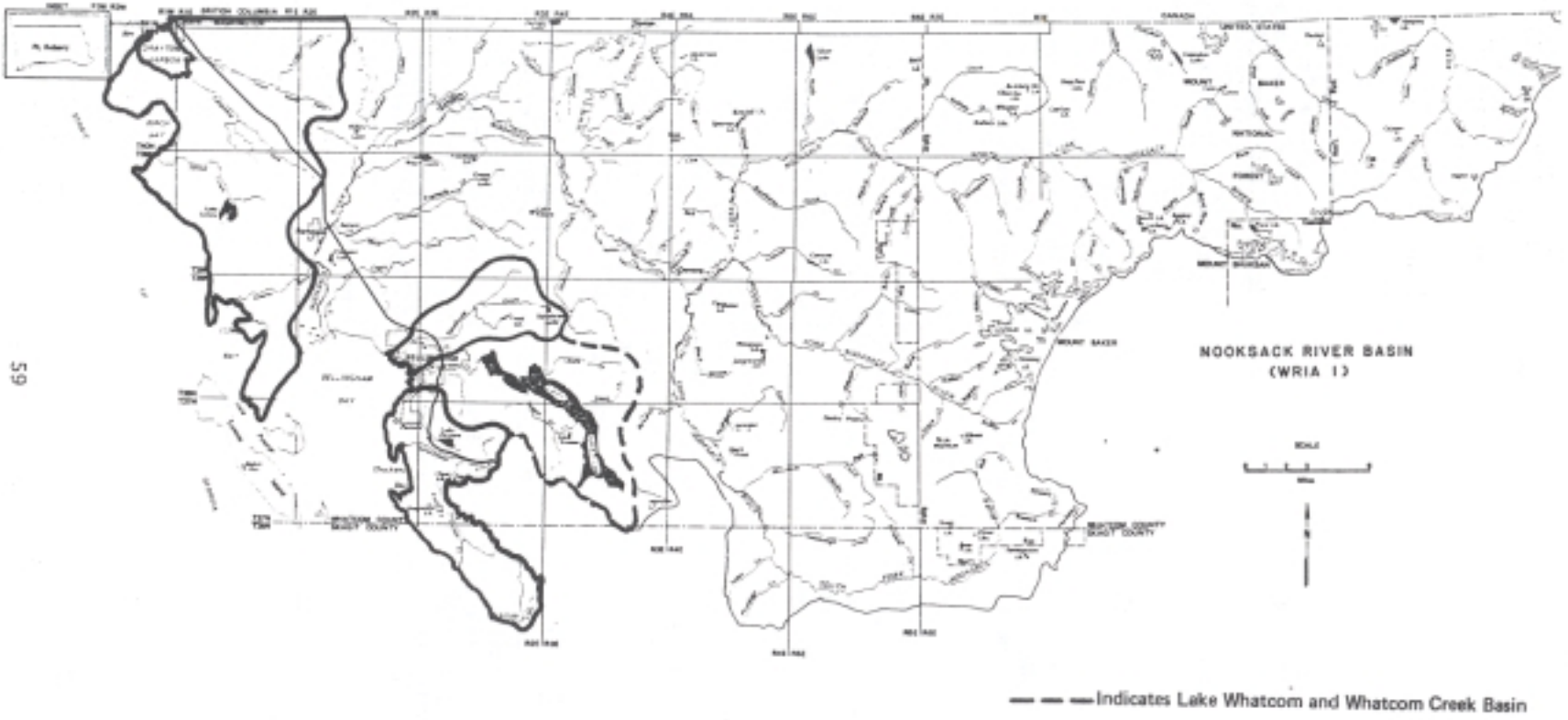


FIGURE 13 Lowland Coastal Drainages

Squalicum Creek begins in the Squalicum Mountains and in its lower reaches flows through the City of Bellingham. It drains an area of 28 square miles.

Ecology has previously closed California Creek, Dakota Creek, Terrell Creek, Squalicum Creek, and an unnamed stream tributary to Colony Creek, to further consumptive appropriations because of low summer flows.

Padden Creek has been the site of a recent fisheries habitat rehabilitation project. Culverts on Padden Creek now form barriers to fish passage. Concerned biologists have been working with the City of Bellingham to obtain funds for culvert reconstruction. Species expected to use the habitat would likely include searun cutthroat, coho, steelhead, and chum. The City of Bellingham holds water rights to Lake Padden, which was the former water supply of South Bellingham. This right has not been exercised in many years. Some additional withdrawals are taken from Lake Padden and the creek for domestic supply and irrigation.

Lake Whatcom

The water rights situation within the Lake Whatcom watershed has been a complicated one. Bellingham has a certificate of water right for 20,000 acre-feet of storage in the lake. The city is responsible for maintaining the lake level at less than 314.94 feet, as set by the court, and normally does not allow more than a four foot fluctuation below that level.

The city diverts water from the Middle Fork Nooksack to augment its Whatcom Basin supply via a pipeline and Mirror Lake. The diversion period in recent years has occurred from March to October. Although the water right is for 125 cfs, less than this amount has historically been withdrawn. See the section entitled Middle Fork Nooksack for further discussion of City of Bellingham water use.

Numerous water users surround Lake Whatcom, many classified as single domestic uses. Although Bellingham had previously protested issuance of domestic rights, this has been resolved. Water District No. 10, which serves the area around Lake Whatcom, has been attempting to negotiate a contract with the City of Bellingham for water from the city to supply other multiple domestic developments, but the issue remains unresolved. The WAC 173-501 proposes closure of Lake Whatcom to further consumptive appropriation, with the exception that one year from the date of adoption will be allowed to resolve these questions.

Table 15 contains additional details of streams in the lowland coastal drainages.

Table 15

Characteristics of Streams Tributary to Bellingham Bay

Stream	Fish Species	Water Rights	Administration Status	Comments
California Creek	coho, chum, cutthroat, steelhead	Numerous irrigation withdrawals	Closed	Correlated to Dakota Creek gage near Blaine. Average low flow 1.5 cfs
Chuckanut Creek	coho, chum, steelhead, cutthroat	Some irrigation and numerous domestic withdrawals	Low flow	Two egg boxes
Colony Creek	coho, chum, steelhead, cutthroat			Whitehall Creek, a tributary to Colony, Creek, is closed
Dakota Creek North Fork	chinook, coho, chum, cutthroat, steelhead			Dakota Creek has an egg box for coho on it, and cooperative program releasing chinook, coho and chum
Double Ditch Creek	steelhead, searun, cutthroat	irrigation		Closed, tributary to Fishtrap Creek
Lummi River	coho planted, chum	Some minimal irrigation		
Oyster Creek	coho, chum	One commercial/ industrial withdrawal		Chum egg box and egg taking facility
Padden Creek	coho, cutthroat, steelhead, chum			Potential rehab project; egg box for coho; culvert problems

Table 15 - continued

Stream	Fish Species	Water Rights	Administration Status	Comments
Silver Creek	coho, chum, resident, cutthroat, steelhead	Numerous appropriations for irrigation; several other consumptive & nonconsumptive applications	Low flow	Correlated to Ten Mile Creek gage at Laurel. Silver Creek average low flow = 0.6 cfs at confluence with Nooksack River, which is in delta area. IFIM Study by WDF for IRPP
Terrell Creek	coho, chum, cutthroat	Some irrigation		IFIM Study for IRPP. Lake Terrell has administrative closure on it; WDG game refuge control stream and lake; average low flow = 0 cfs
Whatcom Creek	coho, chum, chinook, steelhead, cutthroat, hatchery rainbow	Fish propagation permit for WDG fish hatchery; lake level	Lake has court ordered lake level	Lake Whatcom has a court ordered lake level; falls on stream; two hatcheries on stream: WDG on Whatcom Creek at outlet of Lake Whatcom, and the Natural Heritage Hatchery at the mouth of Whatcom Creek
Whitehall Creek	chum, coho, cutthroats			Chum egg box

Table 16 lists streams and lakes which previously have had an administrative restriction on further appropriation, either a low flow or a closure. These closures and low flows are adopted in Ch. 173-501 WAC as designated, and in some cases, are more restrictive (e.g. from a low flow to closure status). Please refer to WAC 173-501, Appendix B, for further details.

Table 16

FORMER ADMINISTRATIVE STATUS

SOURCE	TRIBUTARY OF	STATUS	F/L DATE*
Anderson Creek	Nooksack R.	Low Flow	3/8/67
Barrett Lake & Tributaries	Tenmile Cr.	Closed	11/8/78
Bertrand Creek	Nooksack R.	Closed	12/24/46 8/11/75
Black Slough	S.F. Nooksack R.	Low Flow	6/17/54
California Creek	Drayton Harbor	Closed	1/5/50 9/22/50
Chuckanut Creek	Chuckanut Bay	Low Flow	7/3/47
Dakota Creek	Drayton Harbor	Closed	4/13/53
Deer Creek	Barrett Lake	Closed	11/8/78
Elder Ditch/Scott Ditch		Low Flow	
Fishtrap Creek (& Tributaries)	Nooksack R.	Closed	5/9/42
Fourmile Creek (includes Green Lk.	Tenmile Creek	Closed	10/22/45 1/19/59
Johnson Creek	Sumas River	Closed	
Kamm Ditch	Nooksack R.	Closed	9/2/53
Lake Terrell	Terrell Creek	Closed	5/3/68
Nooksack R., Middle Fork	N.F. Nooksack	Low Flow	
Nooksack R., North Fork	Nooksack R.	Low Flow	9/5/74
Silver Creek		Low Flow	
Skookum Creek	S.F. Nooksack R.	Low Flow	8/25/71 9/5/74
Smith Creek		Low Flow	
Squalicum Creek	Bellingham Bay	Closed	5/28/45
Sumas River (& Tributaries)	Vedder Canal (in Canada)	Closed	9/16/47 11/27/74
Tenmile Creek (& Barrett Lk.)	Nooksack R.	Closed	11/8/78

Table 16 - Continued

SOURCE	TRIBUTARY OF	STATUS	F/L DATE*
Unnamed stream (Elder Ditch) (Scott Ditch) (31-40-3E)		Low Flow	
Unnamed stream (White Cr.)	Colony Cr.	Closed	7/10/74
Wiser Lake		Closed	
Wiser Lake Creek	Nooksack R.	Low Flow	

*F/L Date – First and last dates of letters and/or regulations: later date usually indicates when restriction was set.

BIBLIOGRAPHY

1. Beecher, Hal. Report on Wildlife of the Nooksack River Basin and its Relationship to Instream Flows. Unpublished Report. 1980.

2. CH2M/Hill, Consulting Engineers. Phase I report on Water Quality Management Plan. 1974.

3. Department of Game in cooperation with Evergreen State College and Bureau of Sport Fisheries and Wildlife. Estuaries, A Resource Worth Saving, Dec. 1972.

4. Ernie E. Wolcott. Lakes of Washington, Vol. 1, Western Wash., Water Supply Bulletin #14. State of Washington, Department of Conservation, Olympia, WA, 1961.

5. Guidelines for King Co. Westlands, draft Jan. 1983.

6. Jones & Jones. The Nooksack Plan: A Documented Approach to the Inventory and Evaluation of a River System. 1973.

7. Lewis M. Cowarden, Virginia Carter, Francis C. Golet, and Edward T. La Roe for U.S.FWS Washington, D.C. Classification of Wetlands and Deepwater Habitats of the United States, Dec. 1979.

8. Lummi Island Report. Whatcom Co. Planning Dept., June 30, 1978.

9. Moore, Wallace & Kennedy, Inc. for the City of Lynden, Comprehensive Water Plan, March 1982.

10. Parametrix Inc. for Whatcom Co. Planning Dept. Final EIS Cherry Point Marine Construction Facility, Chicago Bridge and Iron Co./Snelson Anvil Inc., Parametrix Inc., Feb. 1981.

11. Pool Engineers, Inc. Consulting Engineers and Surveyors. Comprehensive Water Plan for the City of Bellingham. August 1982.

12. Puget Sound Task Force of the Pacific N.W. River Basin Commission. Comprehensive Study of Water and Related Land Resources, Puget Sound and Adjacent Waters, State of Washington, 1970. Appen. III, XIV, XI.

13. Straam Engineers, Inc. Water Supply Analysis for the City of Bellingham. December 1978.

14. Wash. State Dept. of Ecology. 303(e) Water Quality Management Plan for Water Resource Inventory Area 1, Nooksack Basin. Water Quality Planning Section. Oct. 1975.

15. Wash. State Dept. of Ecology, Nooksack Basin Technical Document, Office Report #79, Water Resource Technical Group, Oct. 1980.

16. Wash. State Dept. of Ecology, Water Resources of the Nooksack River Basin and Certain Adjacent Streams, Water Supply Bulletin #12. 1960.

17. Wash. State Dept. of Fisheries, A catalogue of Washington Streams and Salmon Utilization Vol. 1. Puget Sound. Nov. 1975.

18. Whatcom Co. Agriculture Service, County Agriculture Data Series, Washington State Department of Agriculture, Crop and Livestock Reporting Service Bulletin, Whatcom Co. 1956.

19. Whatcom Co. Council of Governments. An Inventory of Existing Physical, Social, and Economic Data of Whatcom Co., Washington, (Nooksack-Sumas River Basin) June 1973.

20. Whatcom Co. Planning Commission. Environmental Resource Data Book. Whatcom Co. Planning Dept., Bellingham, 1979.

21. Whatcom Co. Planning Commission. Whatcom Co. Comprehensive Plan, 1970.

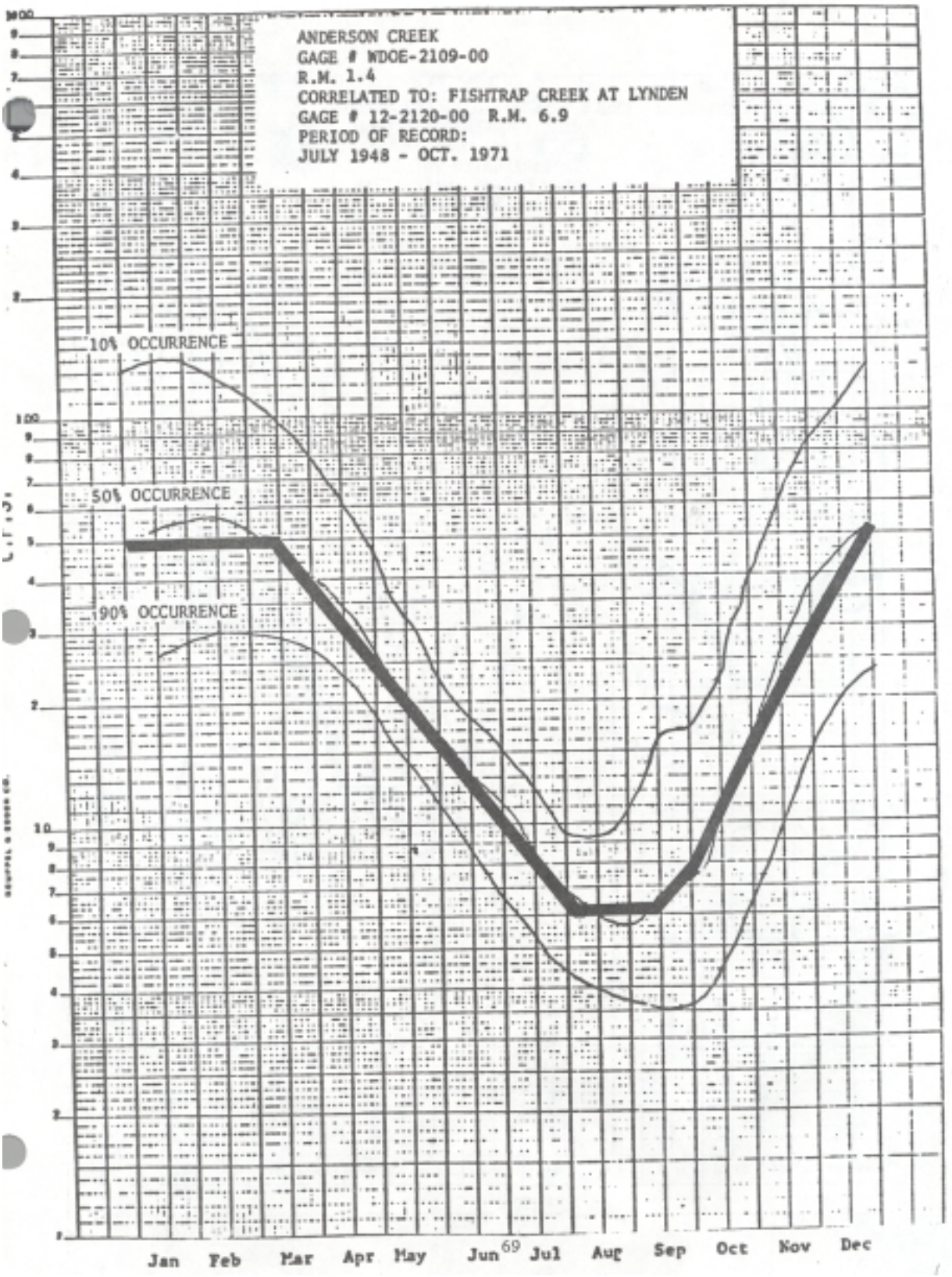
22. Whatcom Co. Planning Commission. Subarea and background documents for Whatcom County Subareas, Whatcom County Comprehensive Land Use Plan 1979-1985.

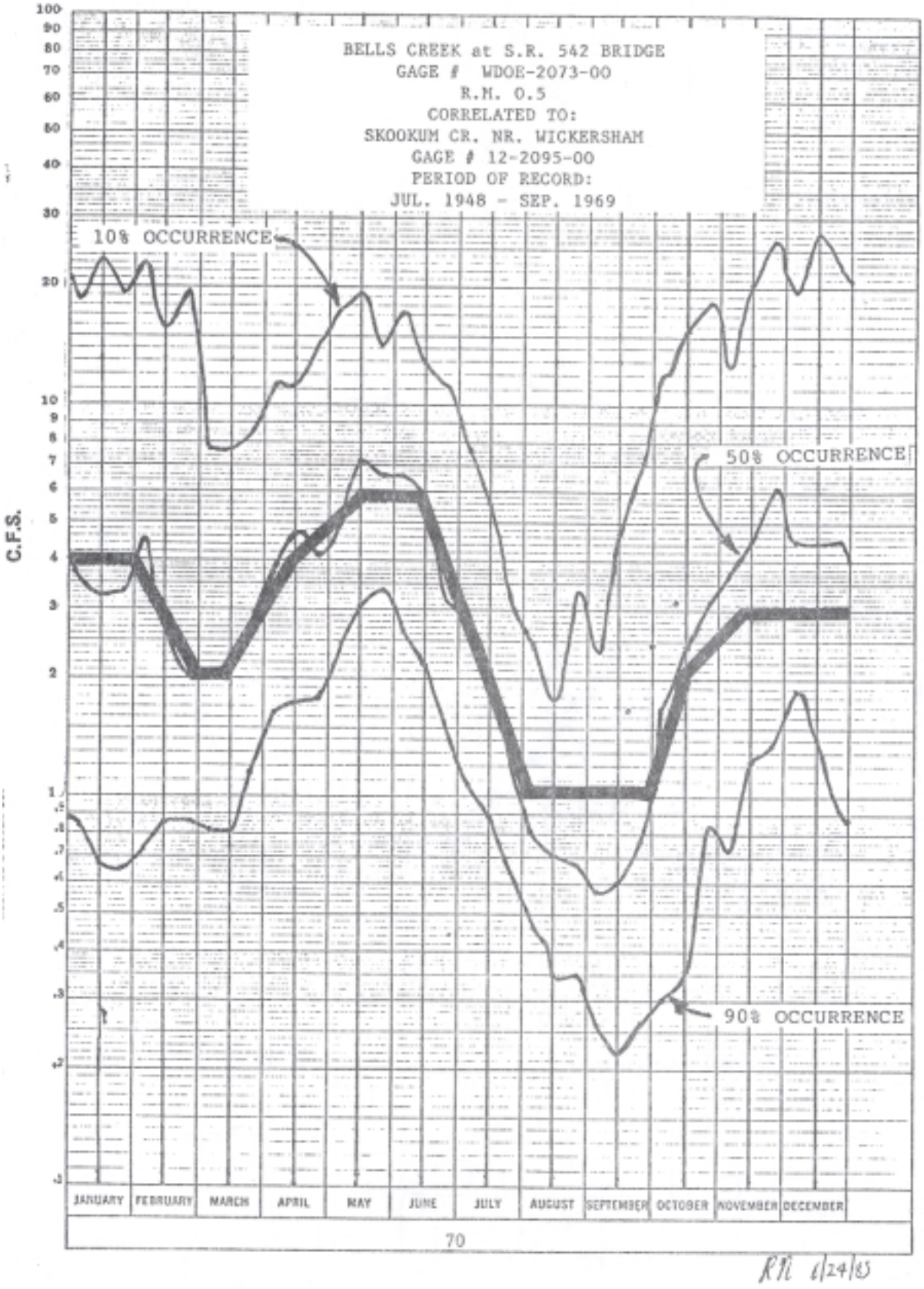
23. Personnel communication, October 25, 1985 with Mark Schuller, WDF; re: corrections to fisheries information.

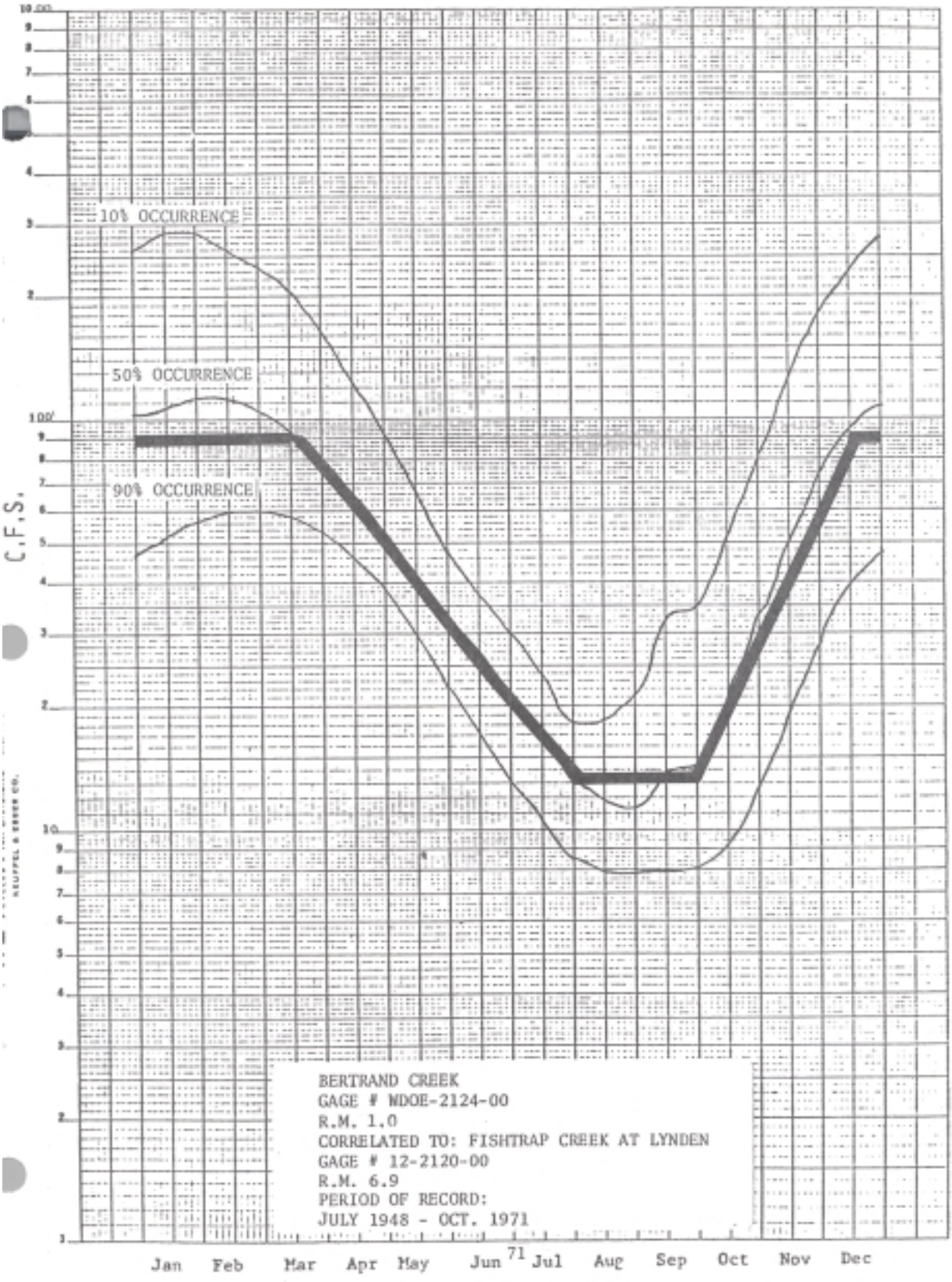
24. Personal communication; Hal Beecher, WDG re: corrections to fisheries section.

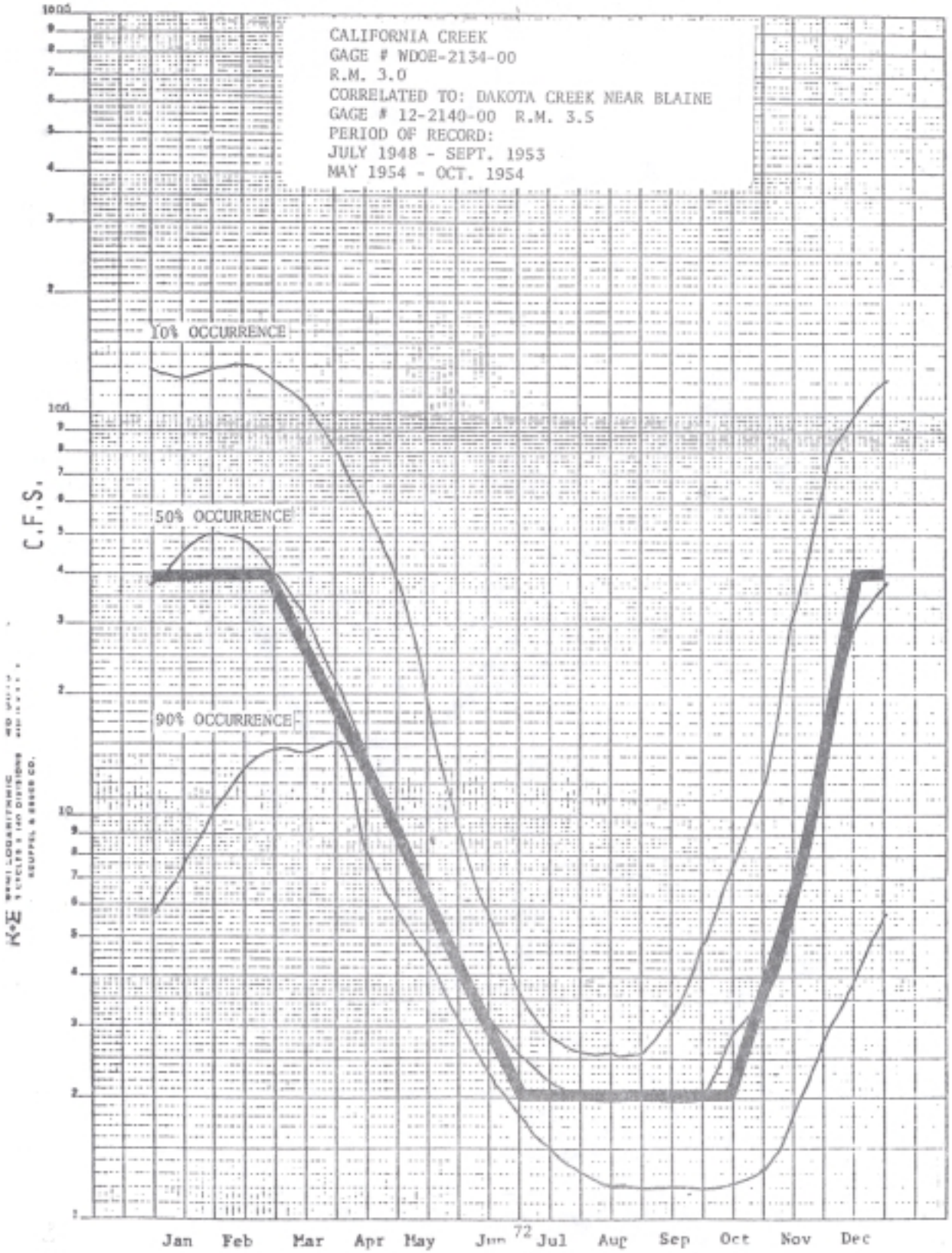
APPENDIX A

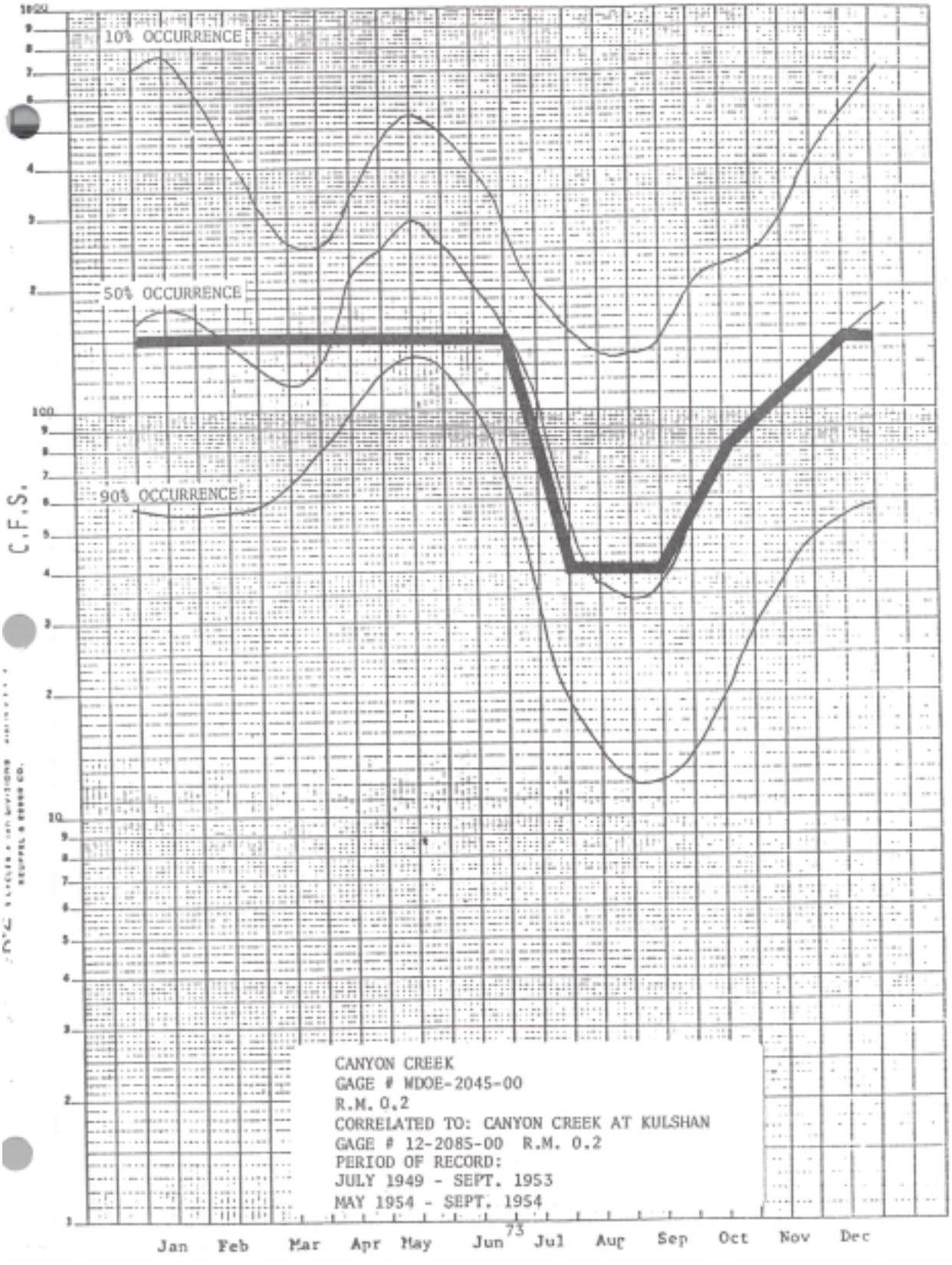
HYDROGRAPHS, WRIA 1
WAC 173-501

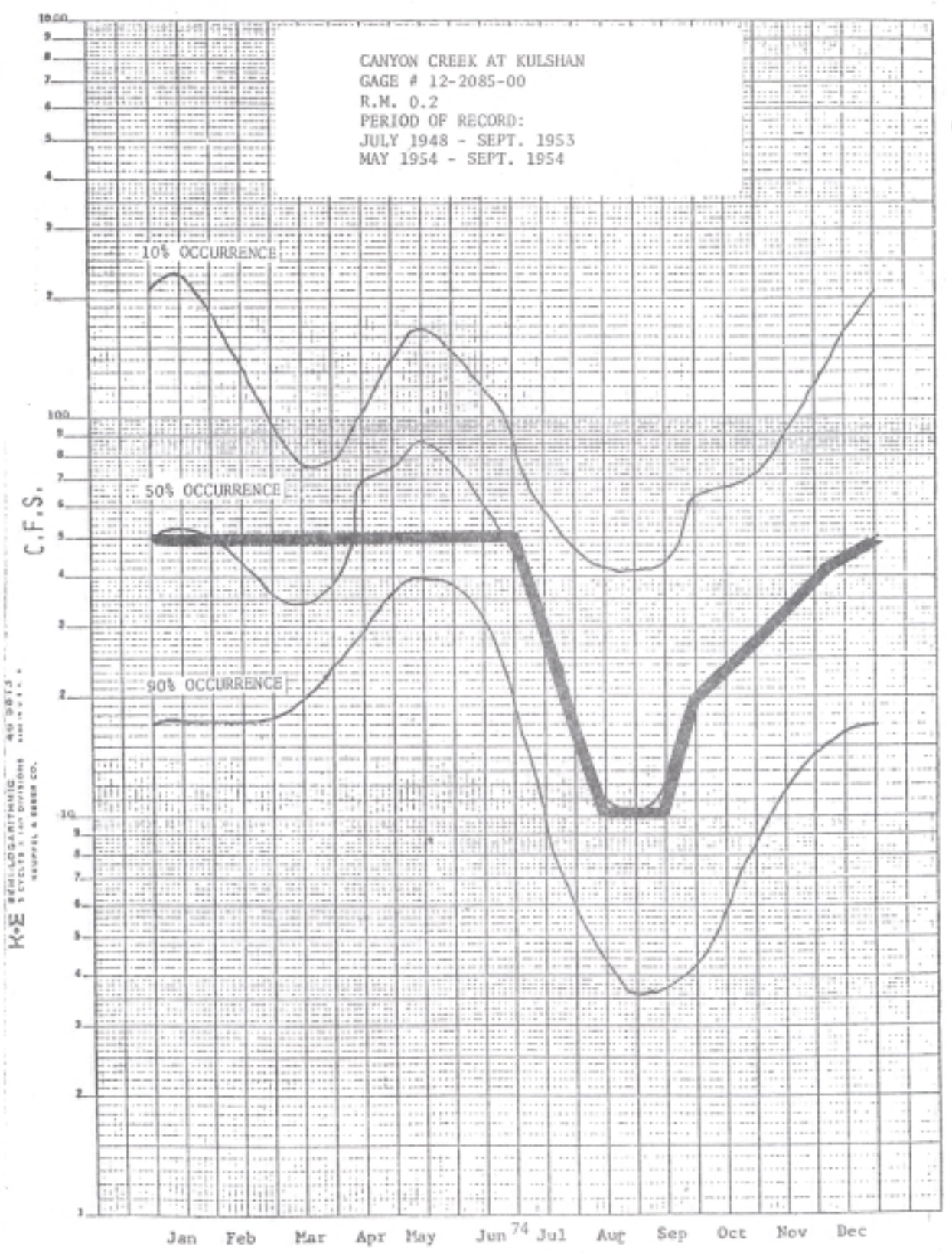

ANDERSON CREEK
GAGE # WDOE-2109-00
R.M. 1.4
CORRELATED TO: FISHTRAP CREEK AT LYNDEN
GAGE # 12-2120-00 R.M. 6.9
PERIOD OF RECORD:
JULY 1948 - OCT. 1971
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

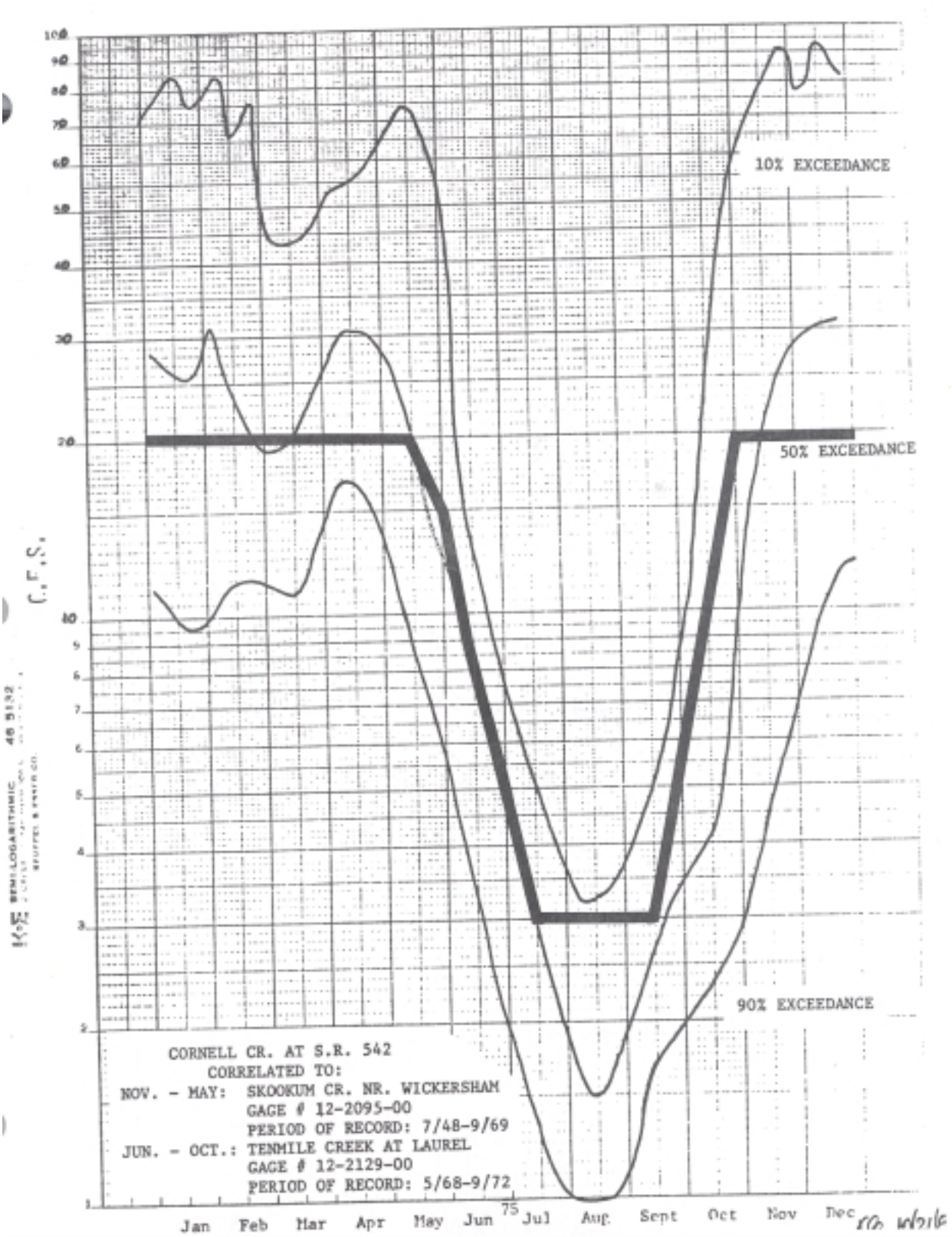

BELLS CREEK at S.R. 542 BRIDGE
GAGE # WDOE-2073-00
R.M. 0.5
CORRELATED TO:
SKOOKUM CR. NR. WICKERSHAM
GAGE # 12-2095-00
PERIOD OF RECORD:
JUL. 1948 - SEP. 1969
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
JANUARY
FEBRUARY
MARCH
APRIL
MAY
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
70
RH 6/24/85

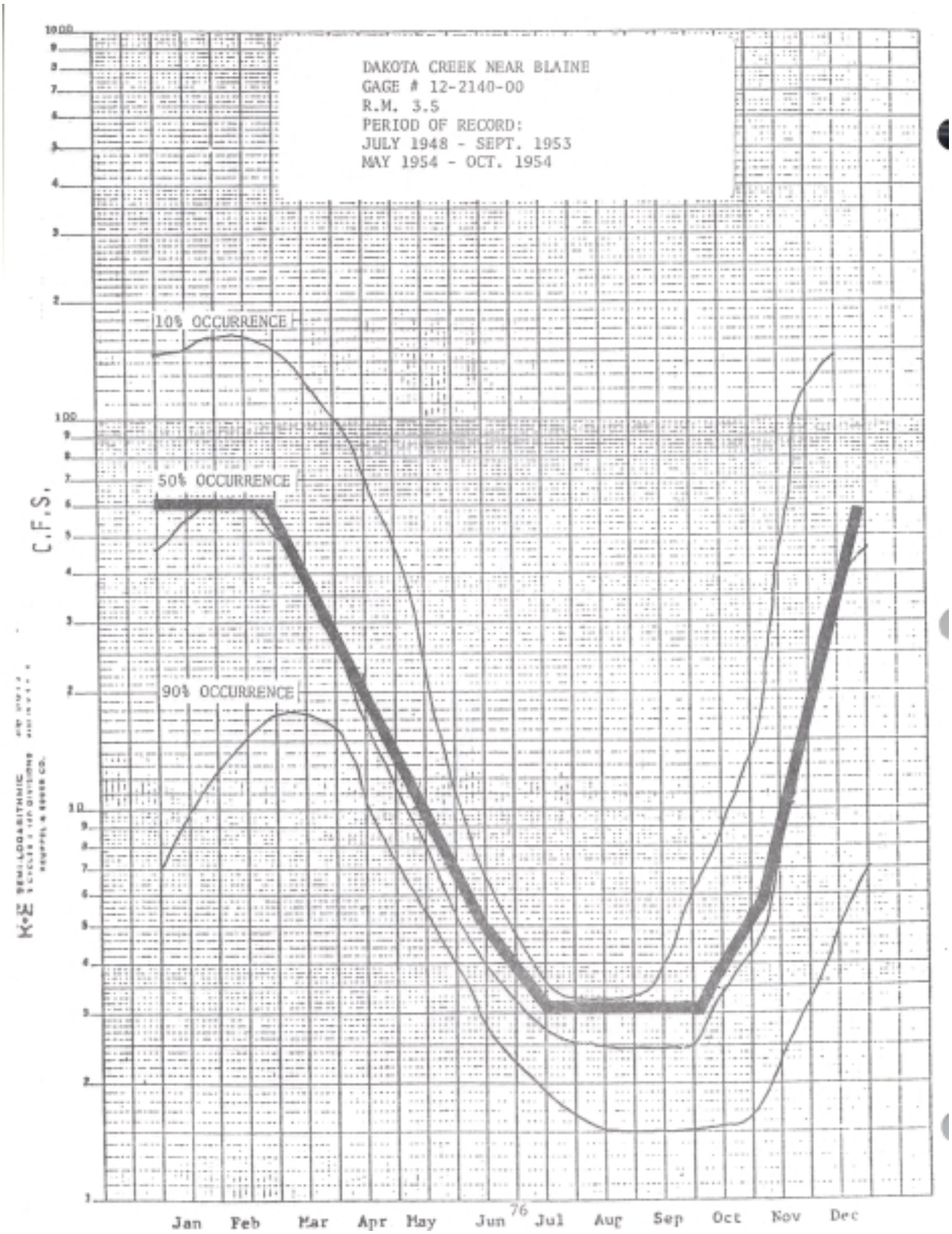

10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
BERTRAND CREEK
GAGE # WDOE-2124-00
R.M. 1.0
CORRELATED TO: FISHTRAP CREEK AT LYNDEN
GAGE # 12-2120-00
R.M. 6.9
PERIOD OF RECORD:
JULY 1948 - OCT. 1971
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

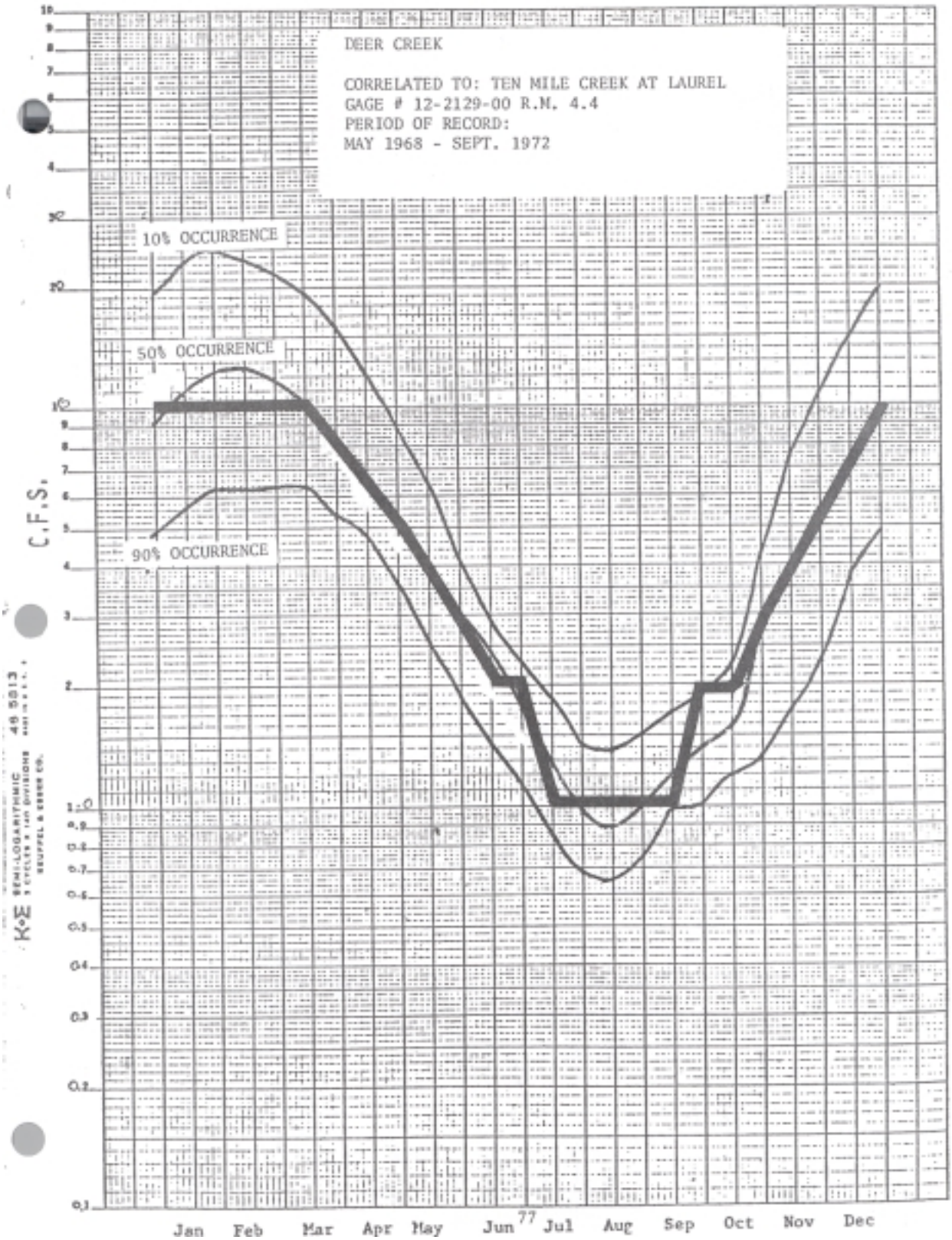

CALIFORNIA CREEK
GAGE # WDOE-2134-00
R.M. 3.0
CORRELATED TO: DAKOTA CREEK NEAR BLAINE
GAGE # 12-2140-00 R.M. 3.5
PERIOD OF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - OCT. 1954
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

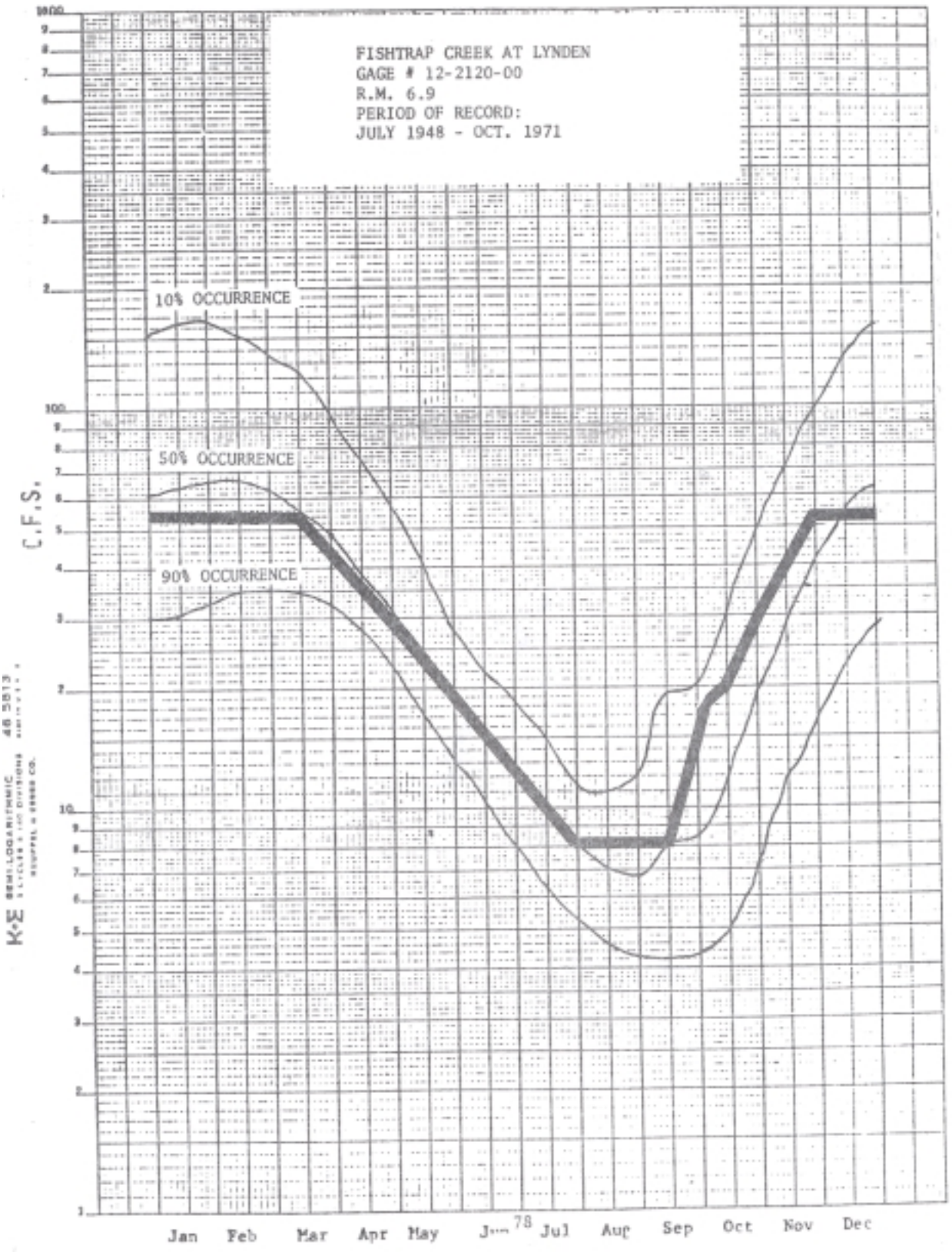

10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
CANYON CREEK
GAGE # MDOE-2045-00
R.M. 0.2
CORRELATED TO: CANYON CREEK AT KULSHAN
GAGE # 12-2085-00 R.M. 0.2
PERIOD OF RECORD:
JULY 1949 - SEPT. 1953
MAY 1954 - SEPT. 1954
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

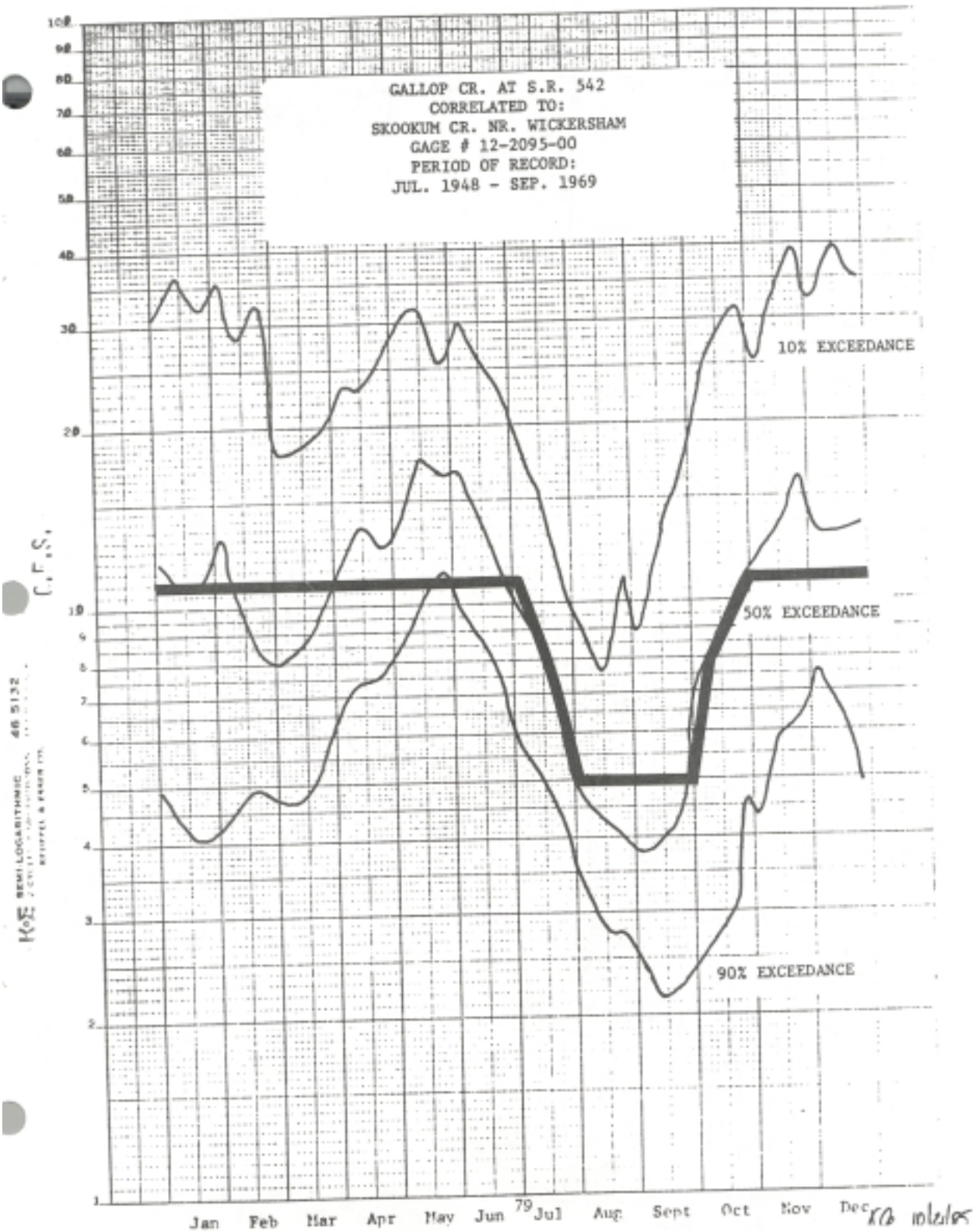

CANYON CREEK AT KULSHAN
GAGE # 12-2085-00
R.M. 0.2
PERIOD OF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - SEPT. 1954
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

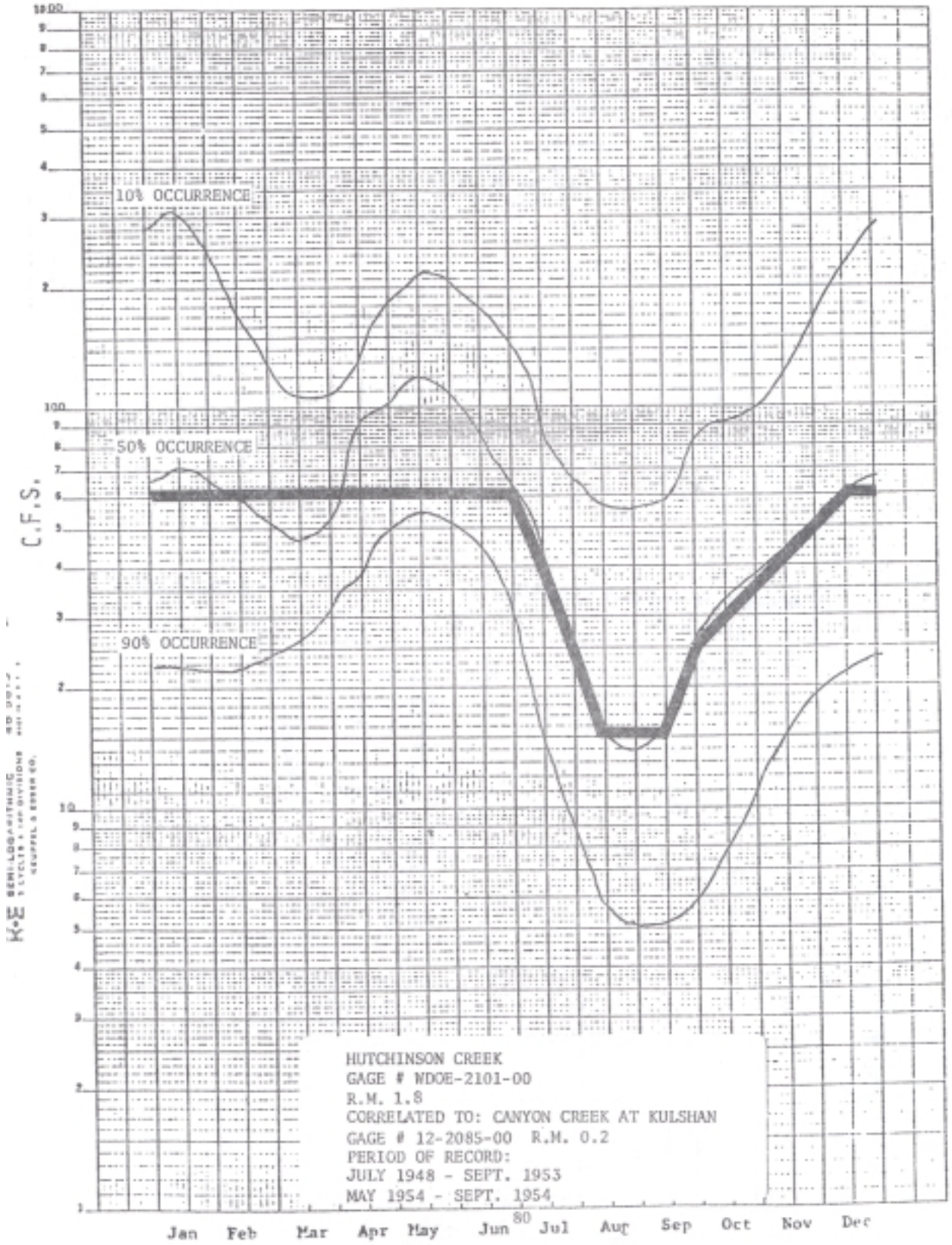

10% EXCEEDANCE
50% EXCEEDANCE
90% EXCEEDANCE
C.F.S.
CORNELL CR. AT S.R. 542
CORRELATED TO:
NOV. - MAY: SKOOKUM CR. NR. WICKERSHAM
GAGE # 12-2095-00
PERIOD OF RECORD: 7/48-9/69
JUN. - OCT.: TENMILE CREEK AT LAUREL
GAGE # 12-2129-00
PERIOD OF RECORD: 5/68-9/72
Jan
Feb
Mar
Apr
May
Jun
75
Jul
Aug
Sept
Oct
Nov
Dec

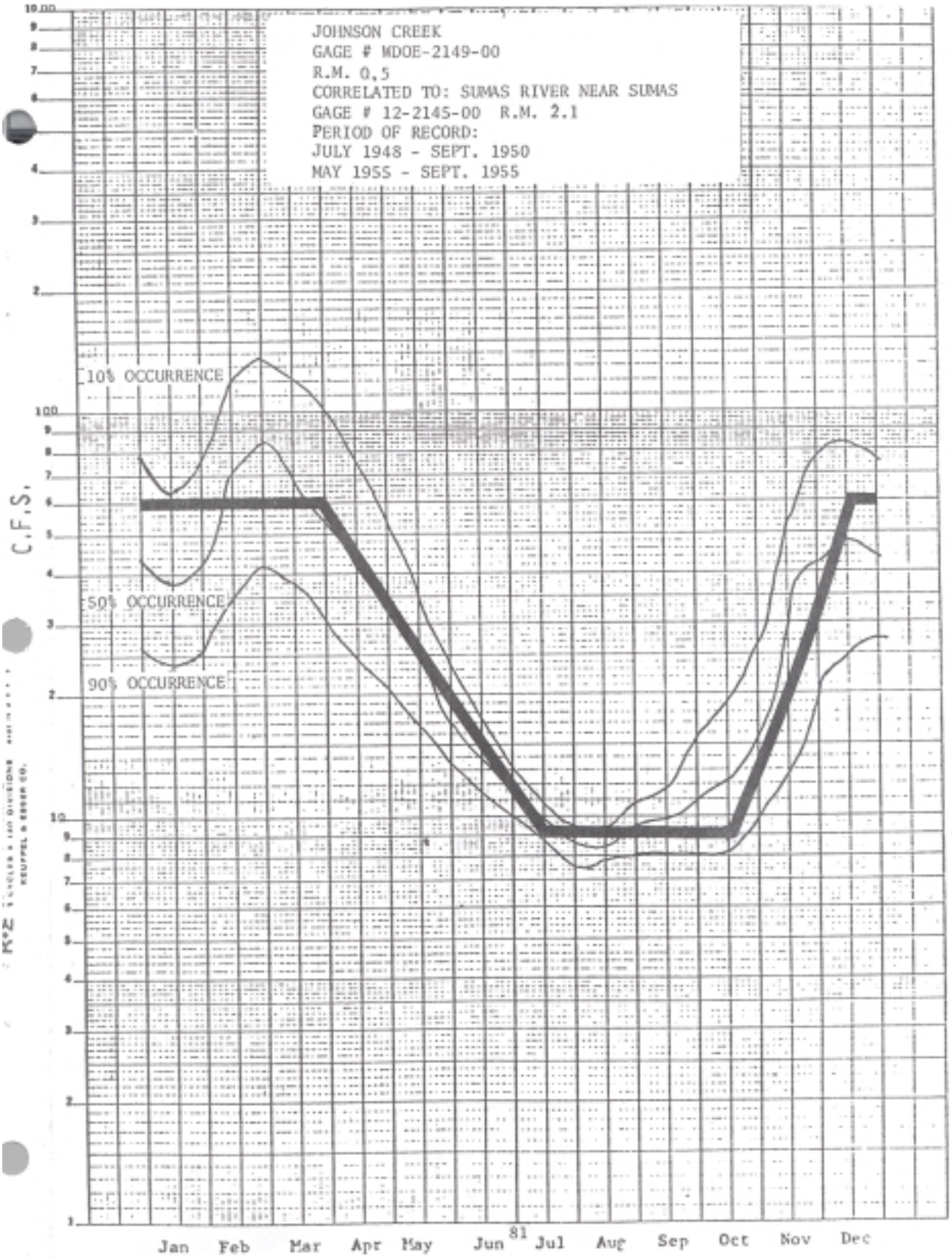

DAKOTA CREEK NEAR BLAINE
GAGE # 12-2140-00
R.M. 3.5
PERIOD OF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - OCT. 1954
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

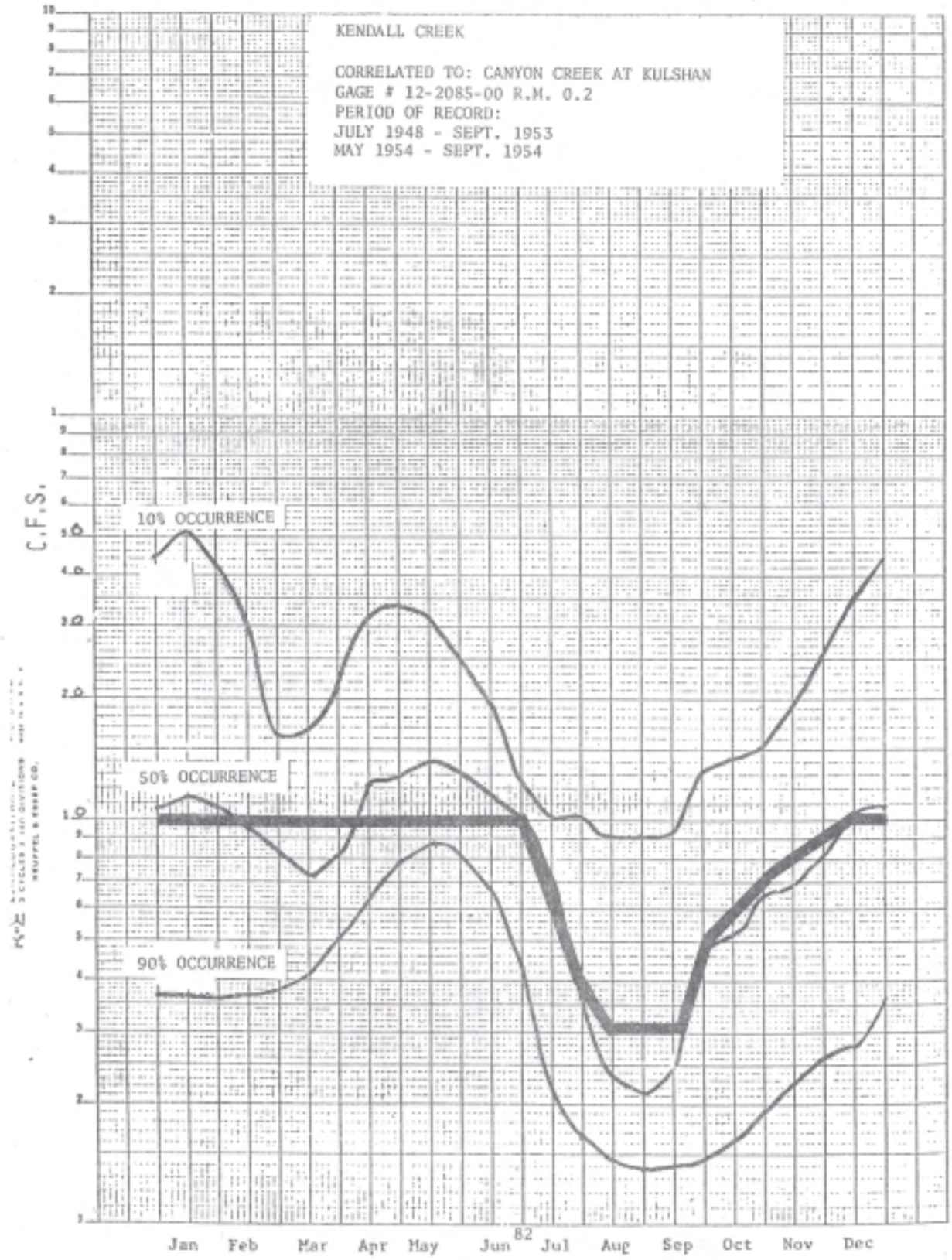

DEER CREEK
CORRELATED TO: TEN MILE CREEK AT LAUREL
GAGE # 12-2129-00 R.M. 4.4
PERIOD OF RECORD:
MAY 1968 - SEPT. 1972
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
77

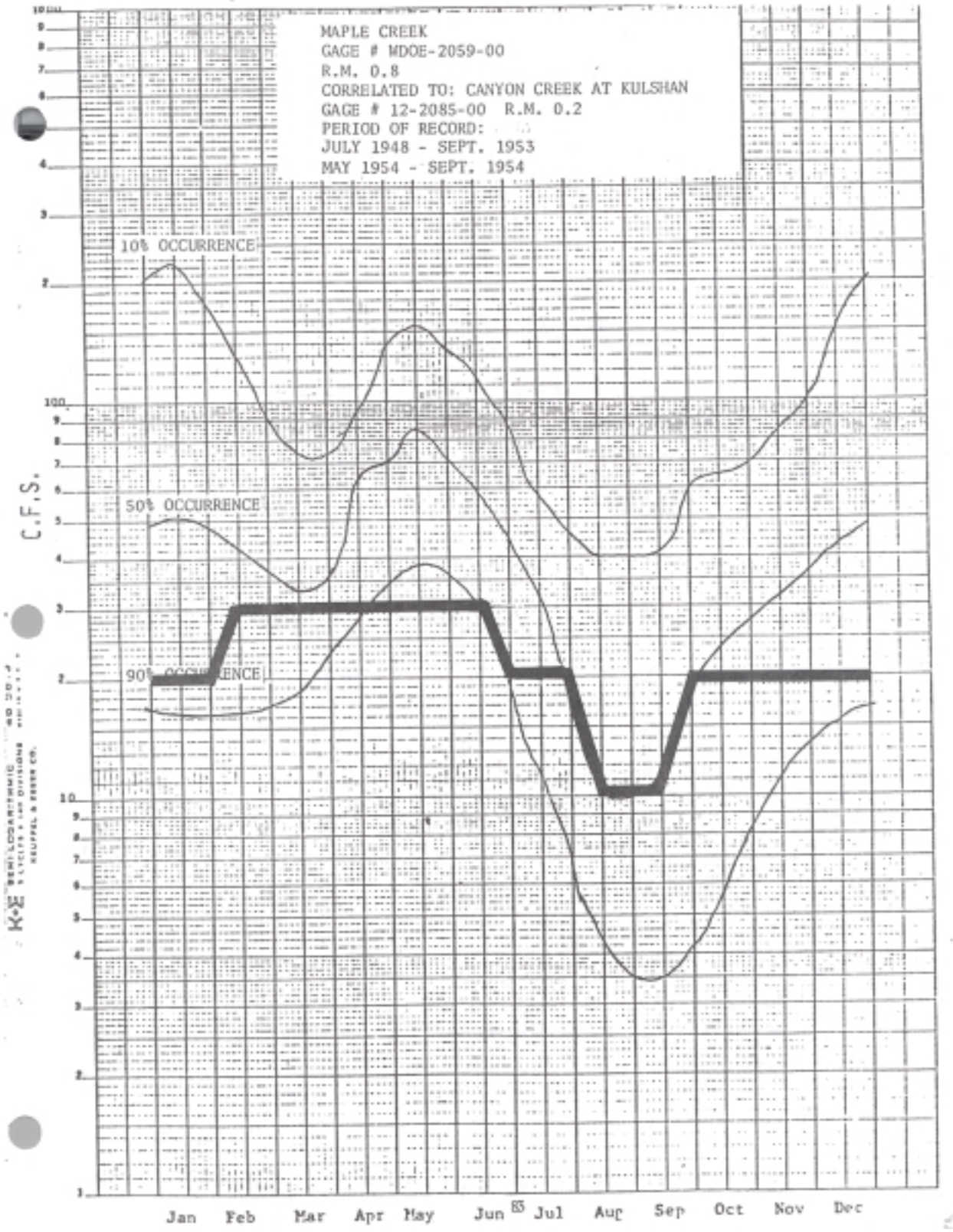

FISHTRAP CREEK AT LYNDEN
GAGE # 12-2120-00
R.M. 6.9
PERIOD OF RECORD:
JULY 1948 - OCT. 1971
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

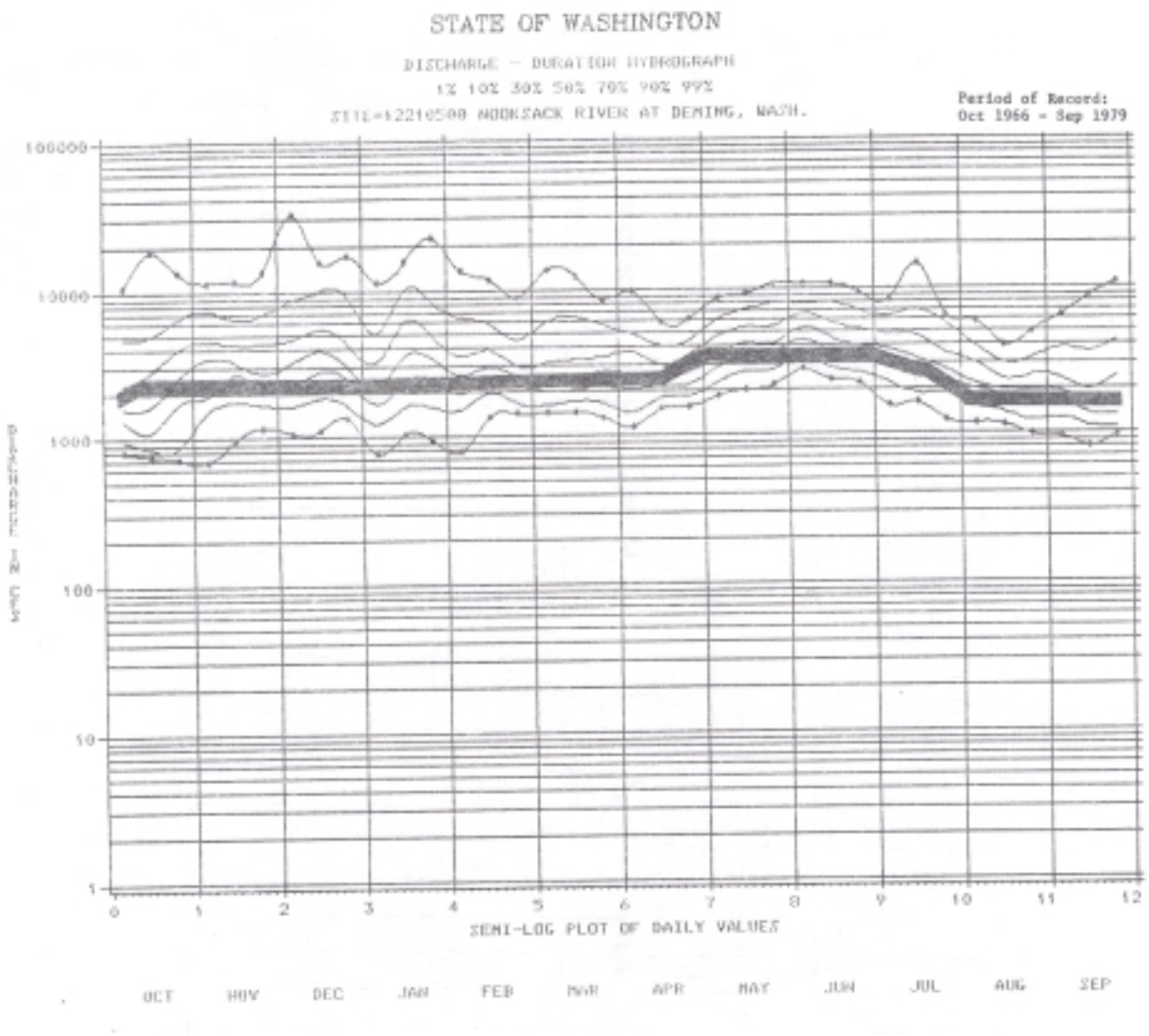

GALLOP CR. AT S.R. 542
CORRELATED TO:
SKOOKUM CR. NR. WICKERSHAM
GAGE # 12-2095-00
PERIOD OF RECORD:
JUL. 1948 - SEP. 1969
10% EXCEEDANCE
50% EXCEEDANCE
90% EXCEEDANCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
79 Jul
Aug
Sept
Oct
Nov
Dec


10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
HUTCHINSON CREEK
GAGE # WDOE-2101-00
R.M. 1.8
CORRELATED TO: CANYON CREEK AT KULSHAN
GAGE # 12-2085-00 R.M. 0.2
PERIOD OF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - SEPT. 1954
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


JOHNSON CREEK
GAGE # WDOE-2149-00
R.M. 0.5
CORRELATED TO: SUMAS RIVER NEAR SUMAS
GAGE # 12-2145-00 R.M. 2.1
PERIOD OF RECORD:
JULY 1948 - SEPT. 1950
MAY 1955 - SEPT. 1955
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

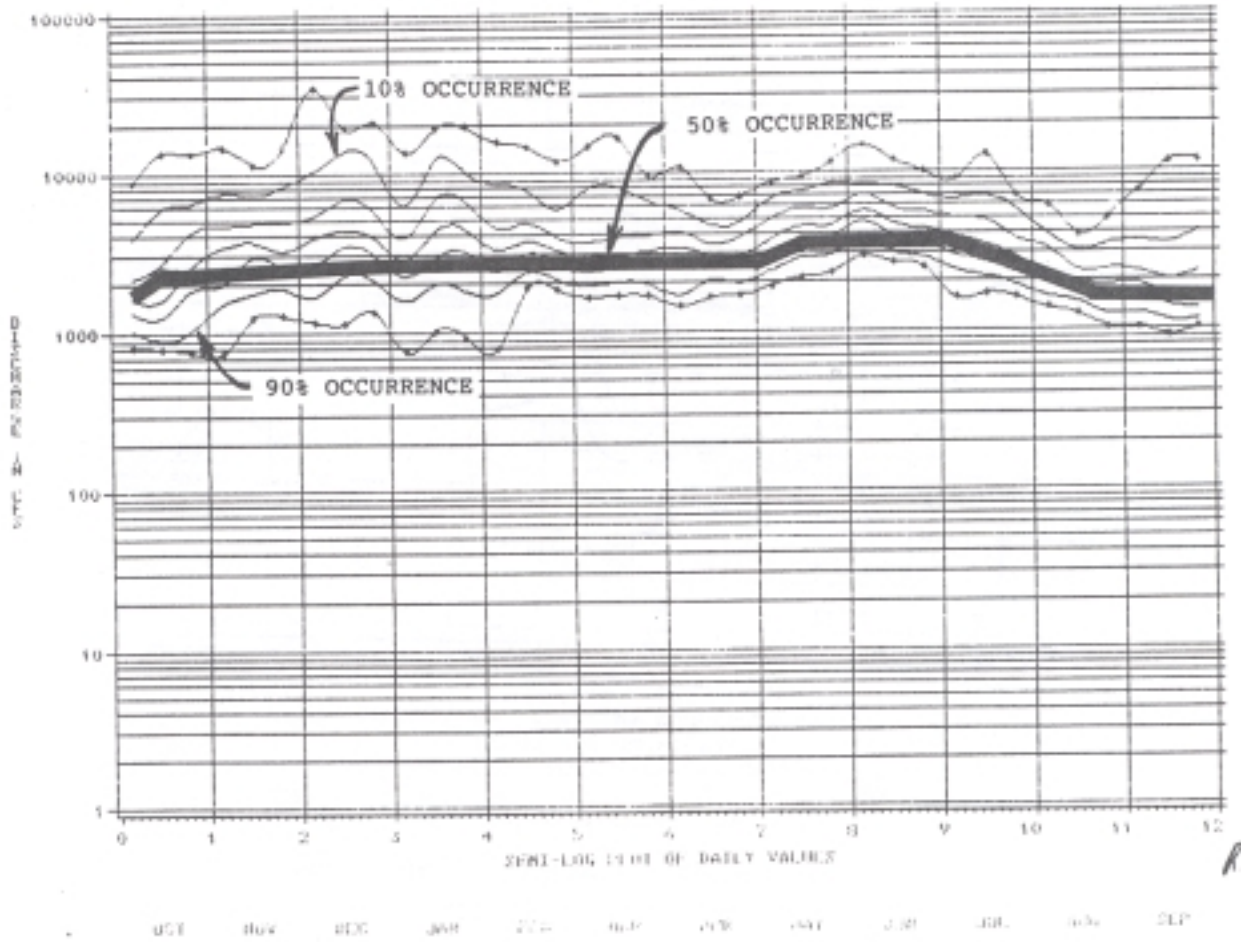

KENDALL CREEK
CORRELATED TO: CANYON CREEK AT KULSHAN
GAGE # 12-2085-00 R.M. 0.2
PERIOD OF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - SEPT. 1954
C.F.S.
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

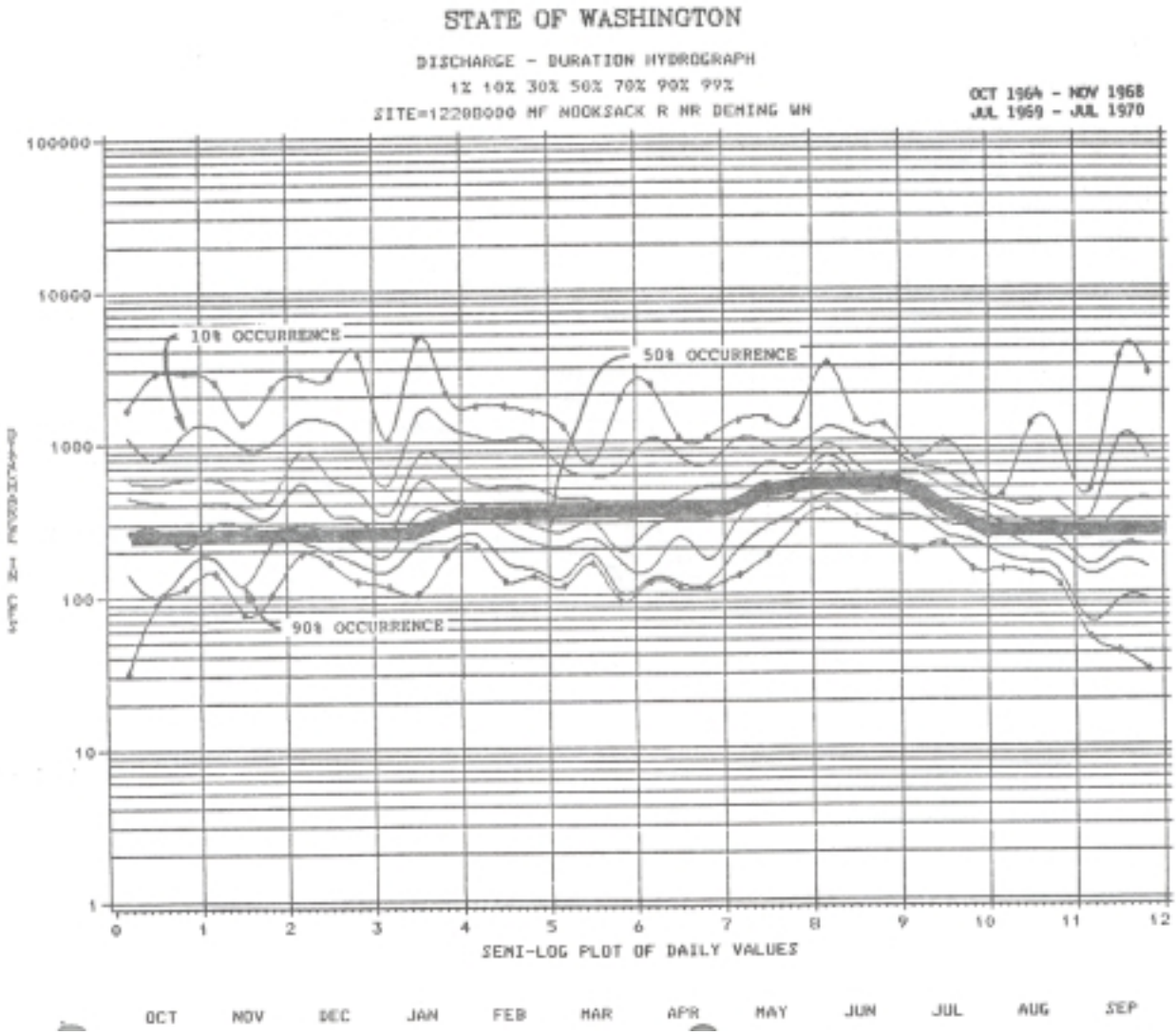

MAPLE CREEK
GAGE # WDOE-2059-00
R.M. 0.8
CORRELATED TO: CANYON CREEK AT KULSHAN
GAGE # 12-2085-00 R.M. 0.2
PERIOD OF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - SEPT. 1954
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

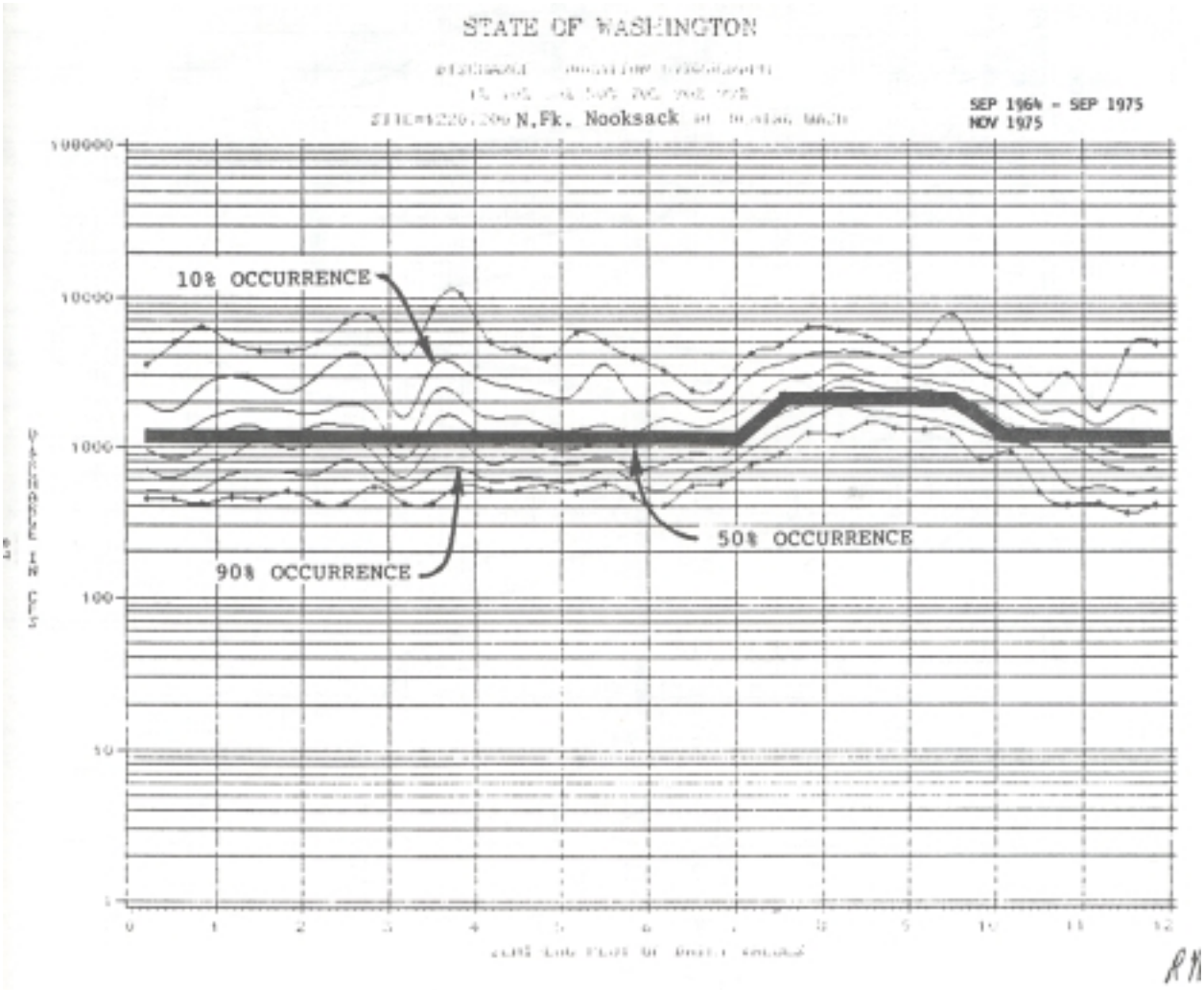

STATE OF WASHINGTON
DISCHARGE - DURATION HYDROGRAPH
1% 10% 30% 50% 70% 90% 99%
SITE=12210500 NOOKSACK RIVER AT DEMING, WASH.
Period of Record:
Oct 1966 - Sep 1979
100000
10000
1000
100
10
1
0
1
2
3
4
5
6
7
8
9
10
11
12
SEMI-LOG PLOT OF DAILY VALUES
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP

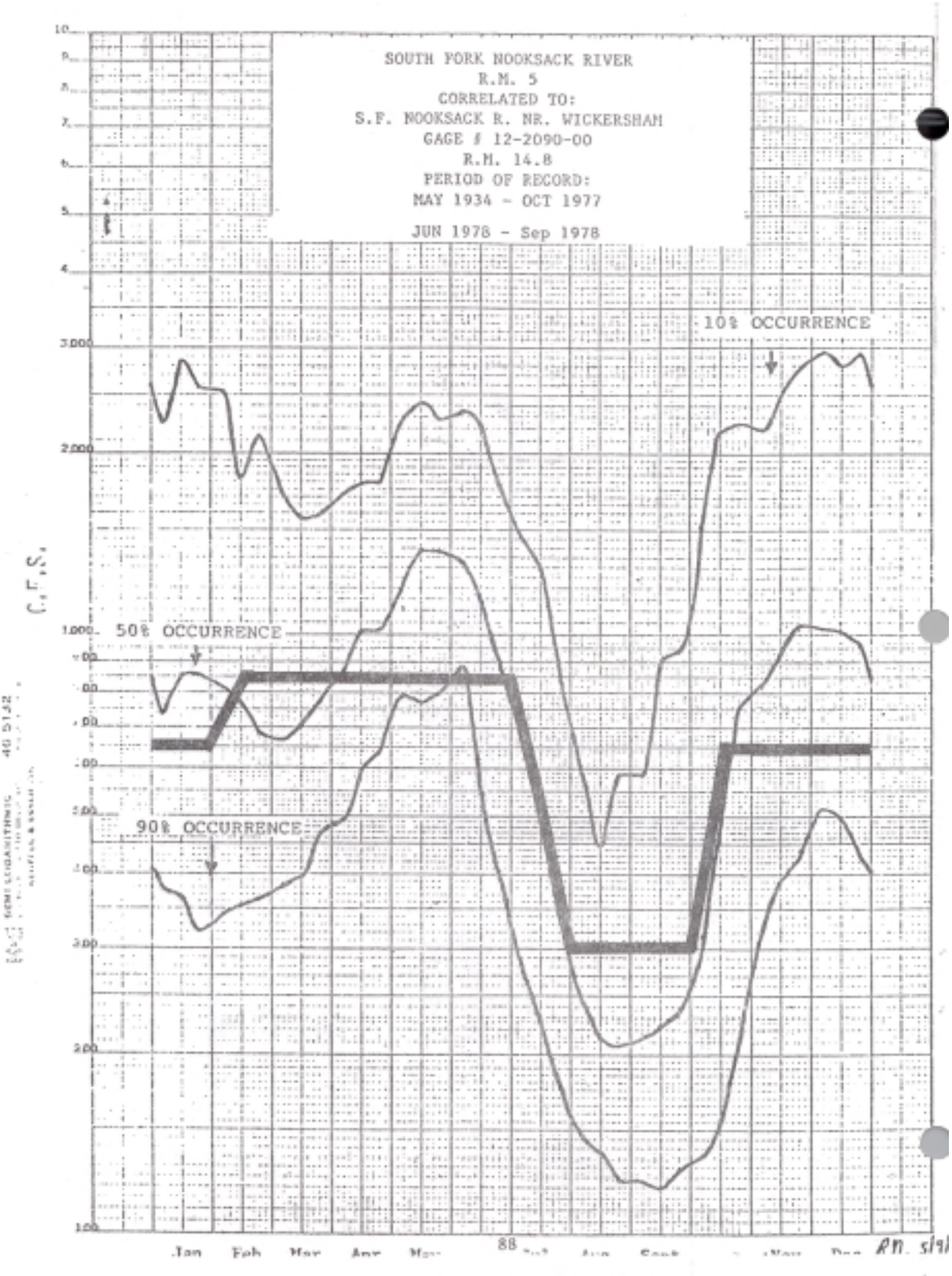
STATE OF WASHINGTON

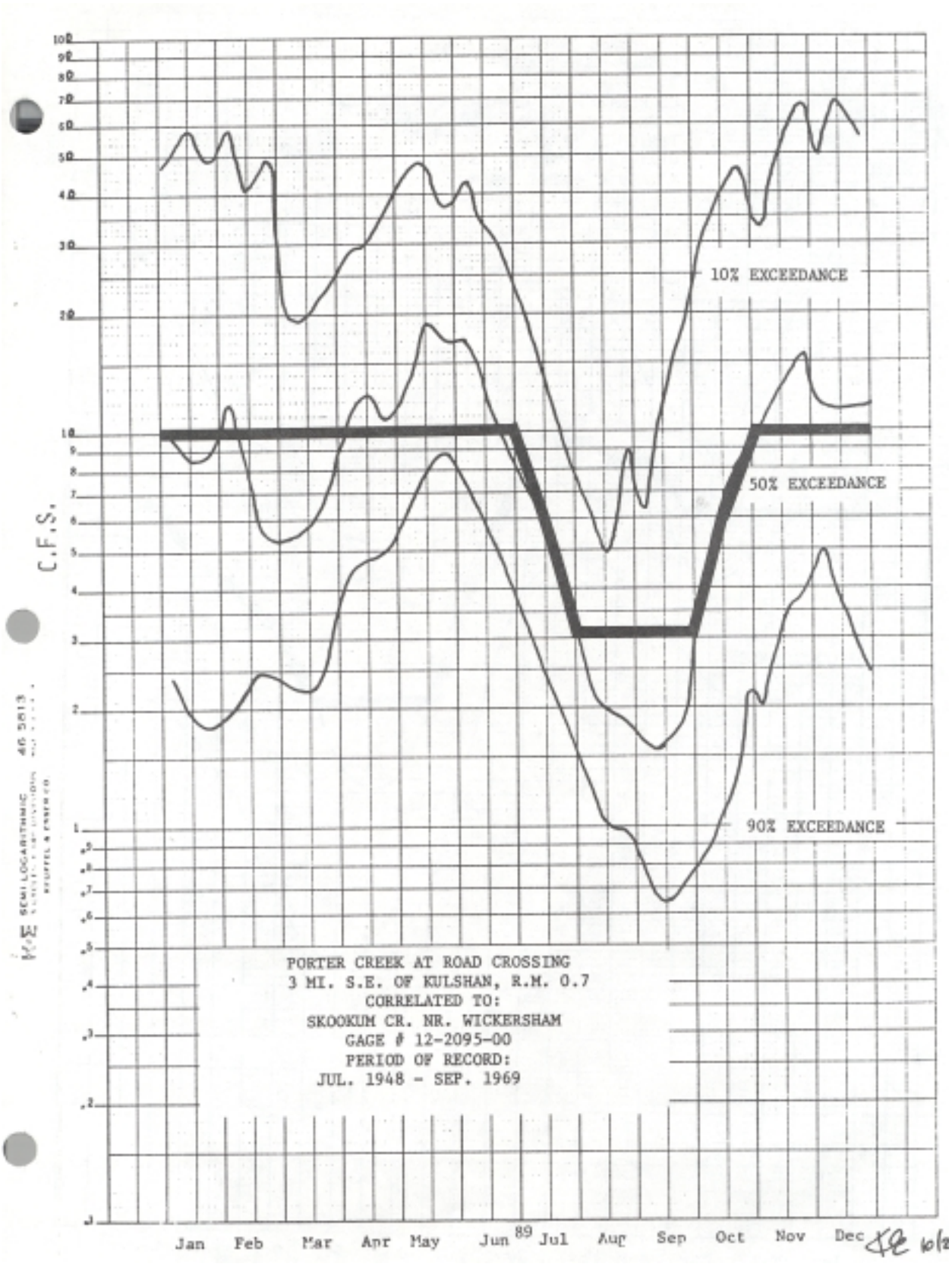
OCT 1966 - SEP 1979

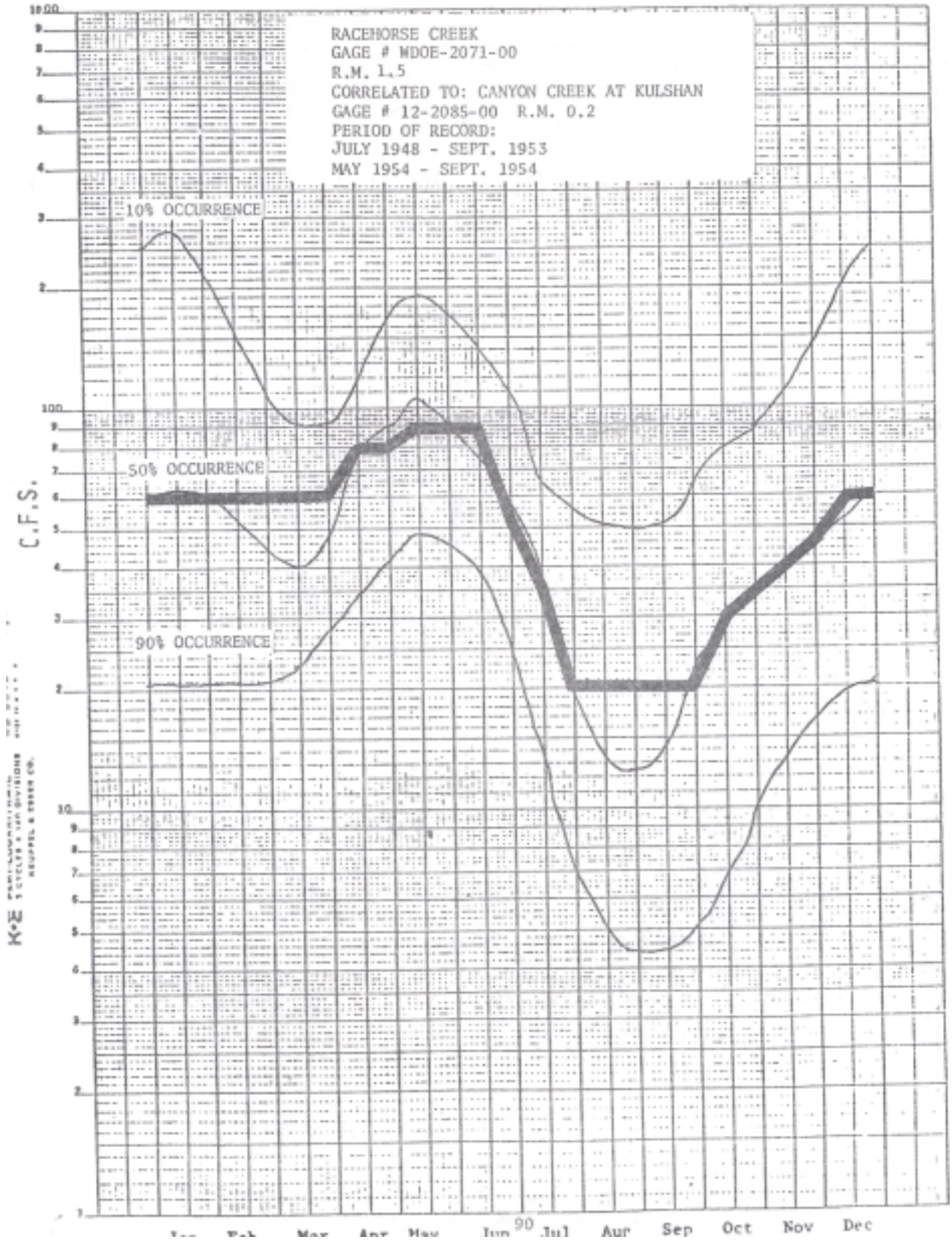


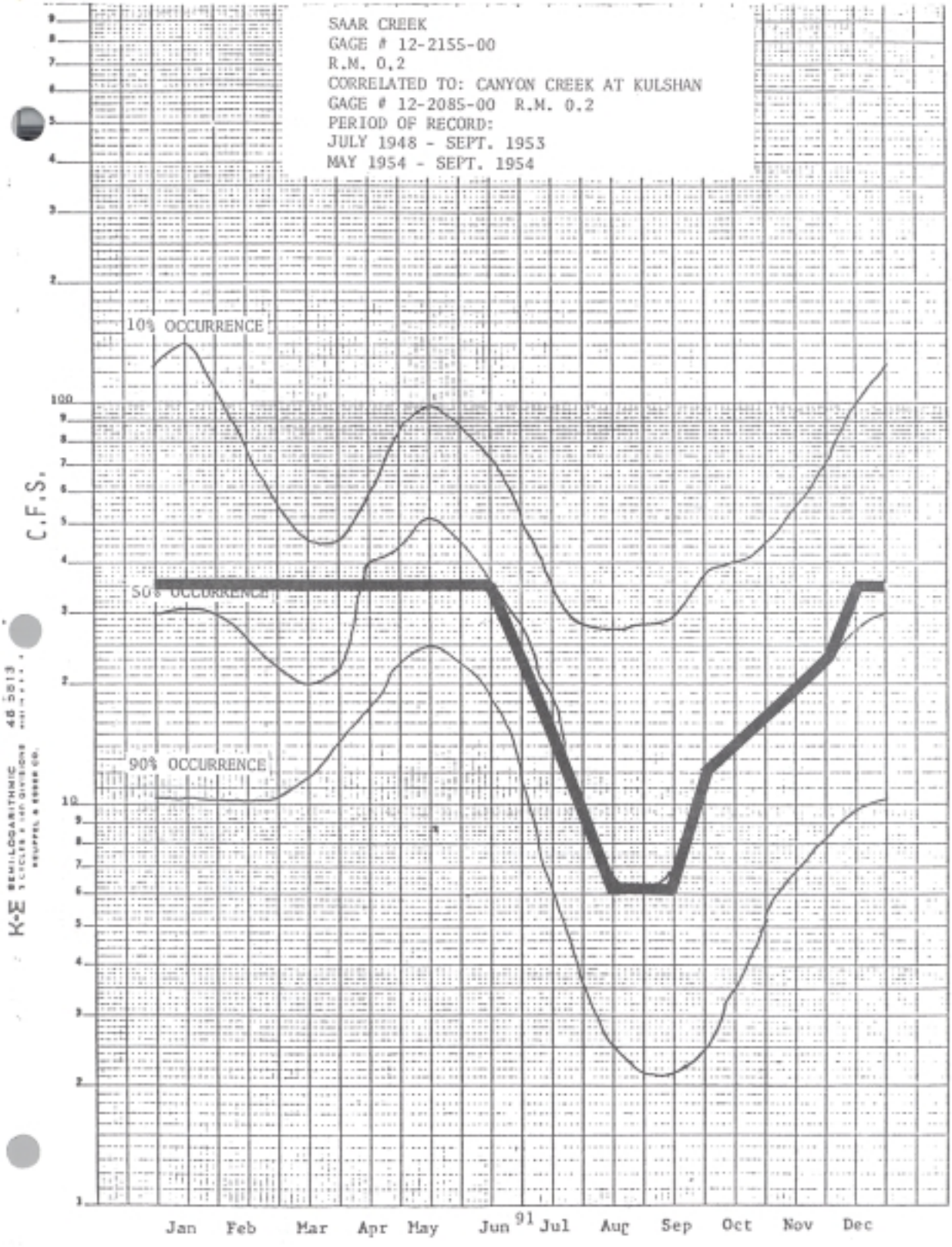

STATE OF WASHINGTON
DISCHARGE - DURATION HYDROGRAPH
1% 10% 30% 50% 70% 90% 99%
SITE=12200000 NF NOOKSACK R NR DEMING WN
OCT 1964 - NOV 1968
JUL 1969 - JUL 1970
100000
10000
1000
100
10
1
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
0
1
2
3
4
5
6
7
8
9
10
11
12
SEMI-LOG PLOT OF DAILY VALUES
OCT
NOV
DEC
JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEP

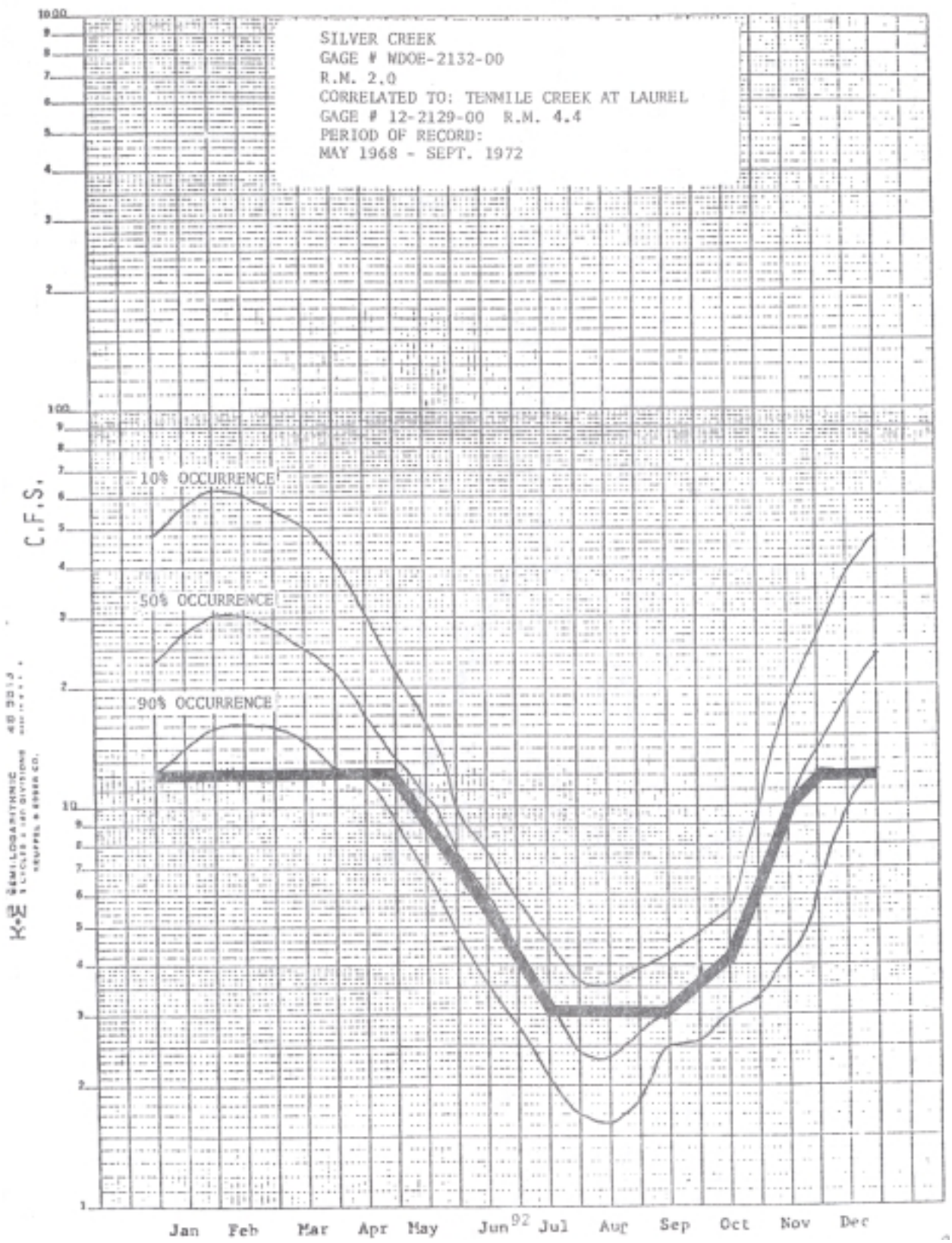

STATE OF WASHINGTON
N.Fk. Nooksack
SEP 1964 - SEP 1975
NOV 1975
100000
10000
1000
100
10
1
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
0
1
2
3
4
5
6
7
8
9
10
11
12

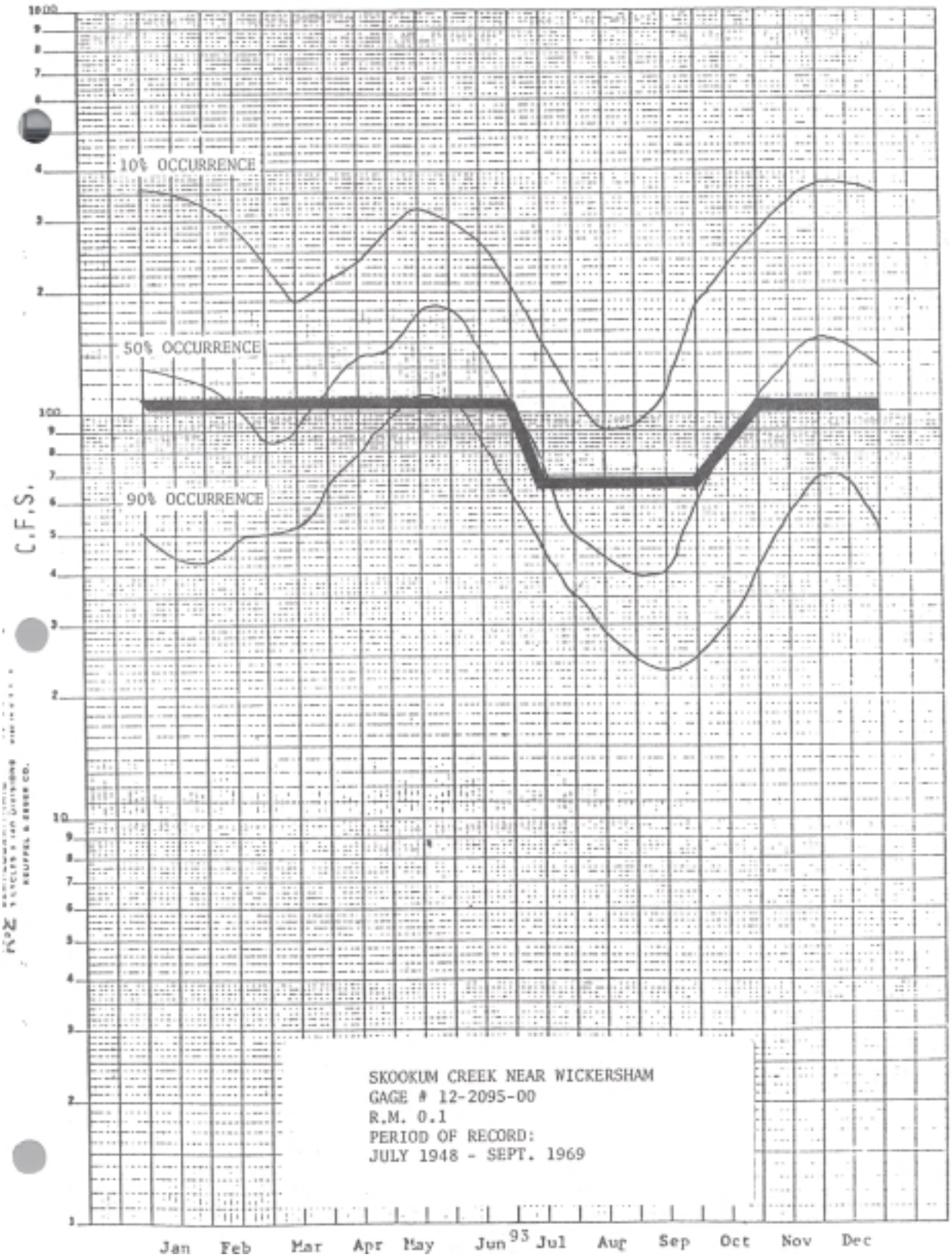

SOUTH FORK NOOKSACK RIVER
R.M. 5
CORRELATED TO:
S.F. NOOKSACK R. NR. WICKERSHAM
GAGE # 12-2090-00
R.M. 14.8
PERIOD OF RECORD:
MAY 1934 - OCT 1977
JUN 1978 - Sep 1978
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
88

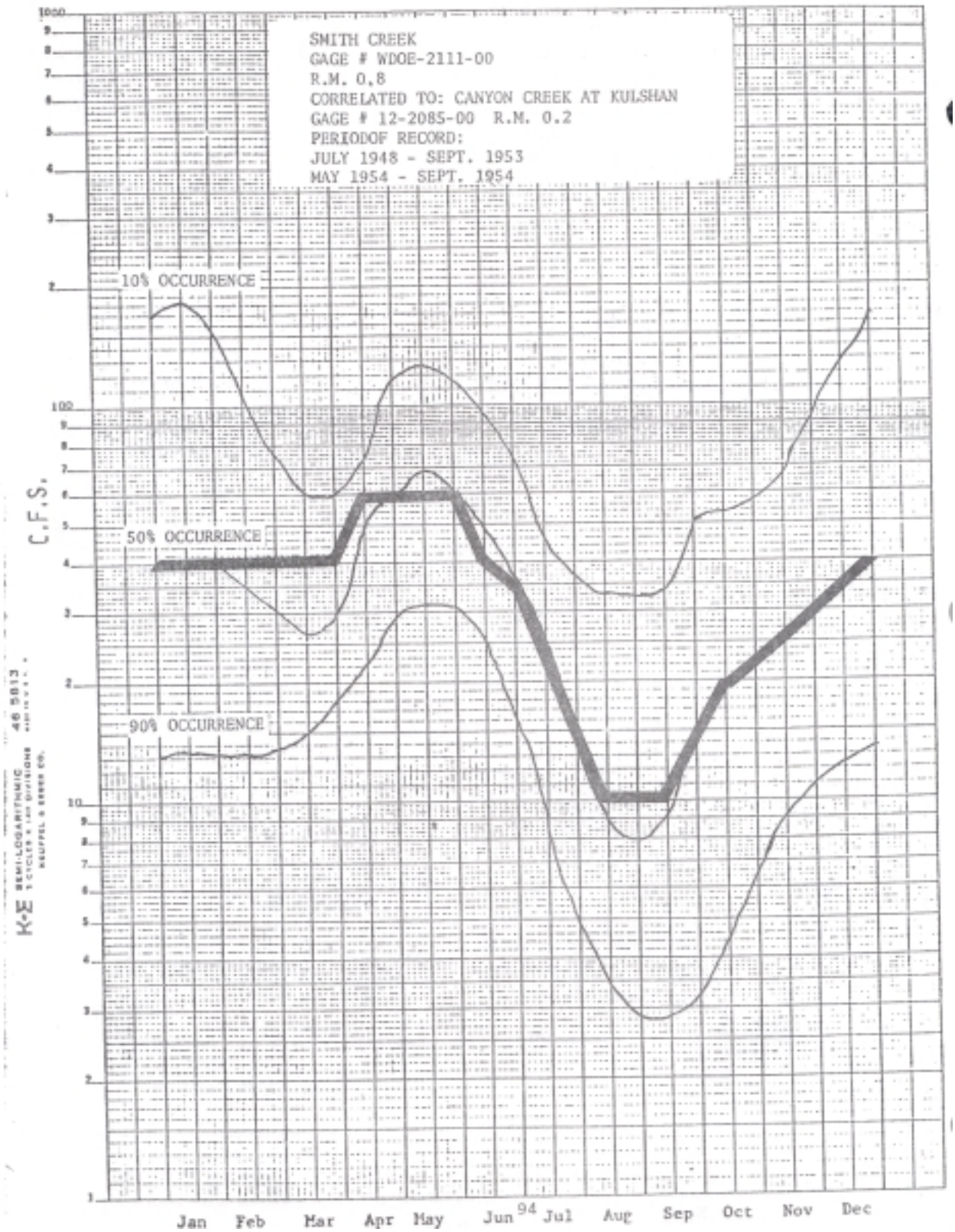

C.F.S.
10% EXCEEDANCE
50% EXCEEDANCE
90% EXCEEDANCE
PORTER CREEK AT ROAD CROSSING
3 MI. S.E. OF KULSHAN, R.M. 0.7
CORRELATED TO:
SKOOKUM CR. NR. WICKERSHAM
GAGE # 12-2095-00
PERIOD OF RECORD:
JUL. 1948 - SEP. 1969
Jan
Feb
Mar
Apr
May
Jun
89
Jul
Aug
Sep
Oct
Nov
Dec

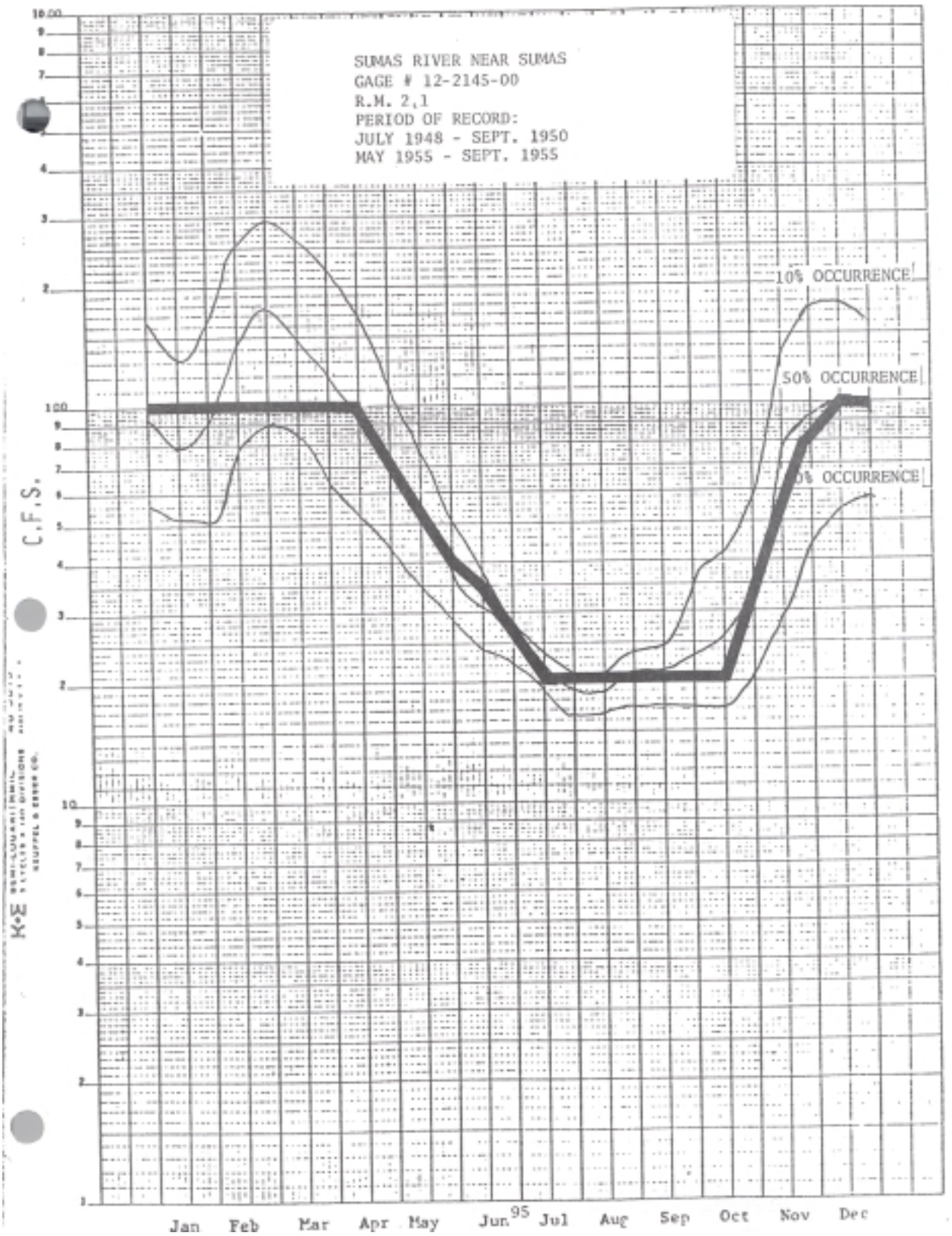

RACEHORSE CREEK
GAGE # WDOE-2071-00
R.M. 1.5
CORRELATED TO: CANYON CREEK AT KULSHAN
GAGE # 12-2085-00 R.M. 0.2
PERIOD OF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - SEPT. 1954
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

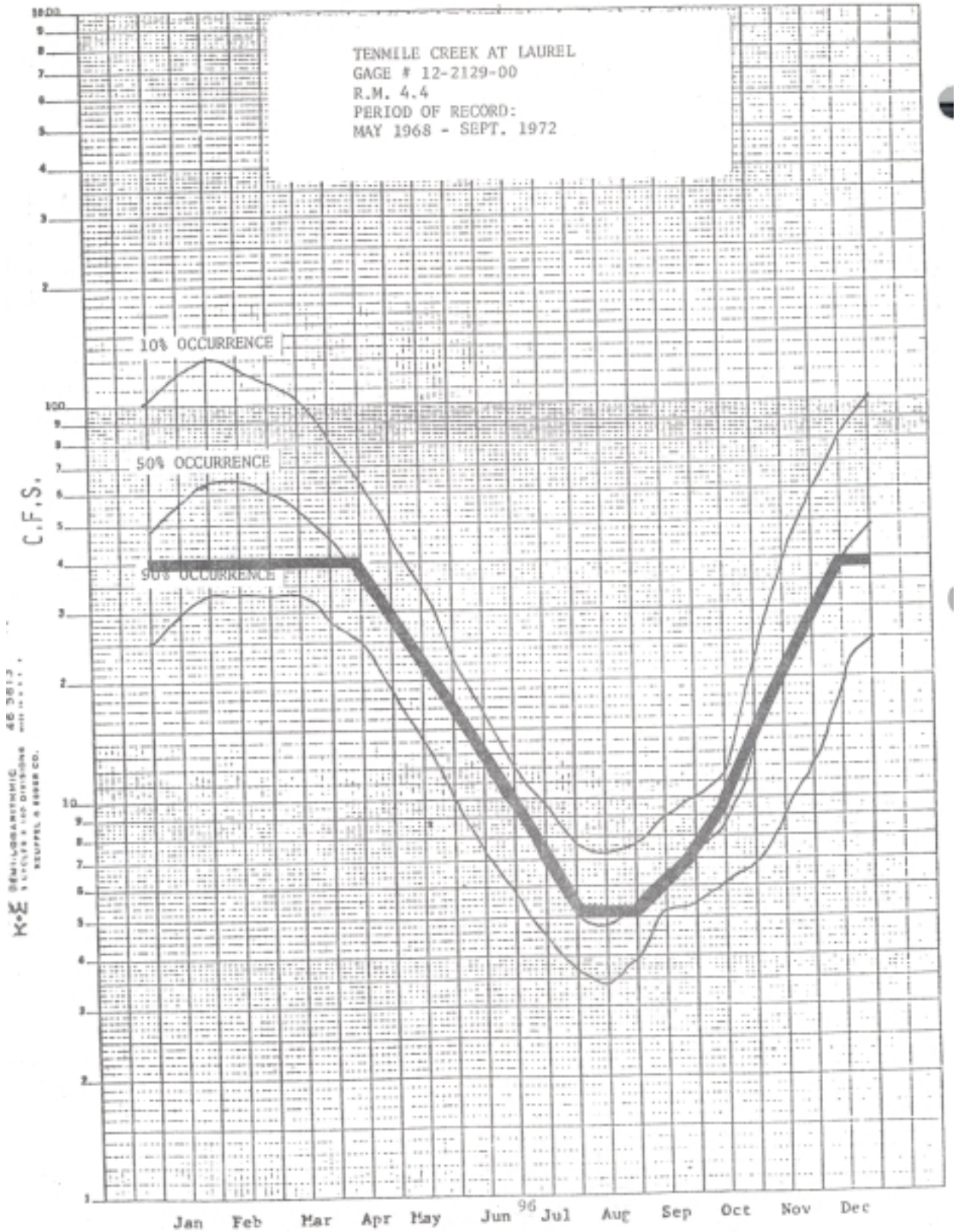

SAAR CREEK
GAGE # 12-2155-00
R.M. 0.2
CORRELATED TO: CANYON CREEK AT KULSHAN
GAGE # 12-2085-00 R.M. 0.2
PERIOD OF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - SEPT. 1954
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

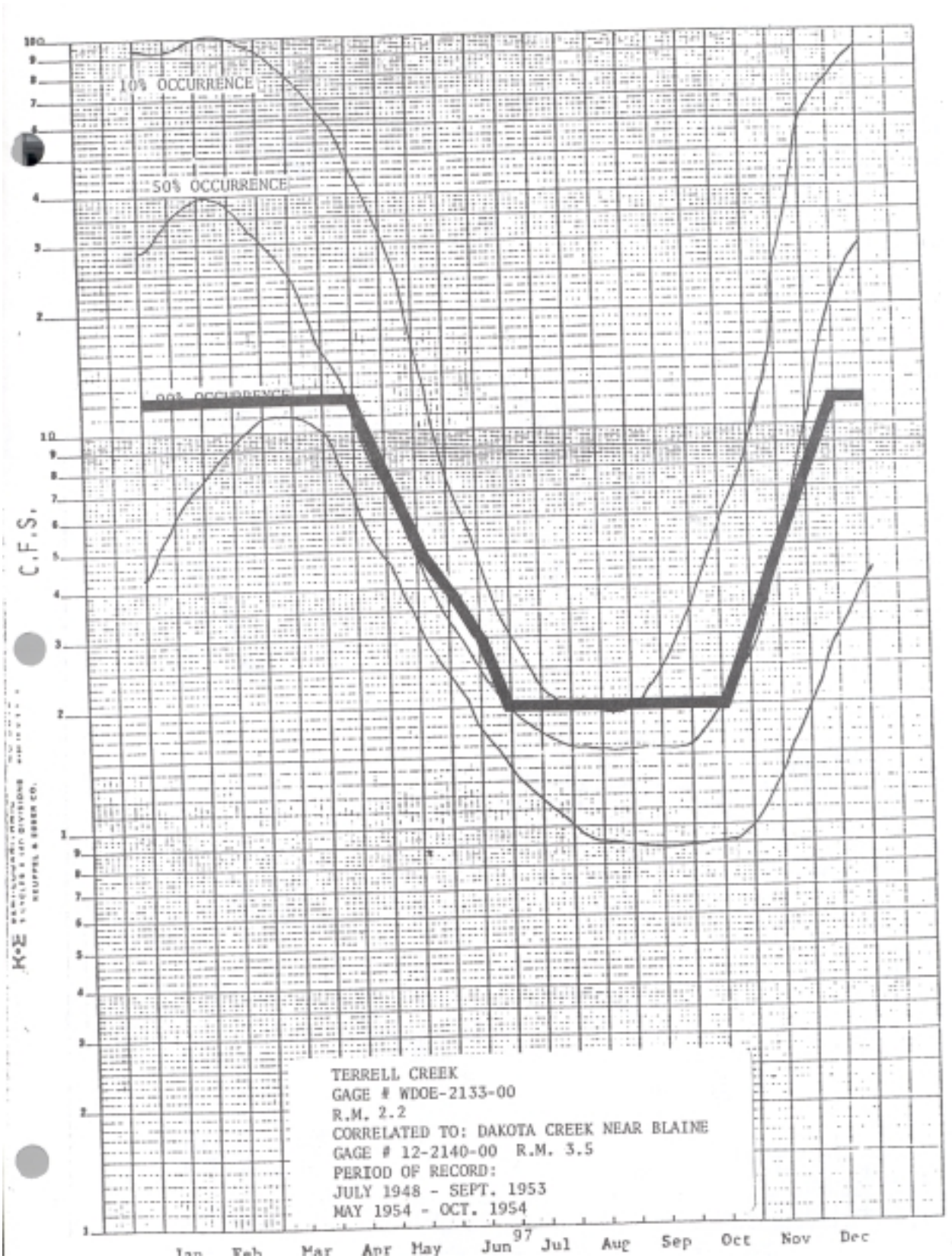

SILVER CREEK
GAGE # WDOE-2132-00
R.M. 2.0
CORRELATED TO: TENMILE CREEK AT LAUREL
GAGE # 12-2129-00 R.M. 4.4
PERIOD OF RECORD:
MAY 1968 - SEPT. 1972
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
92
Jul
Aug
Sep
Oct
Nov
Dec

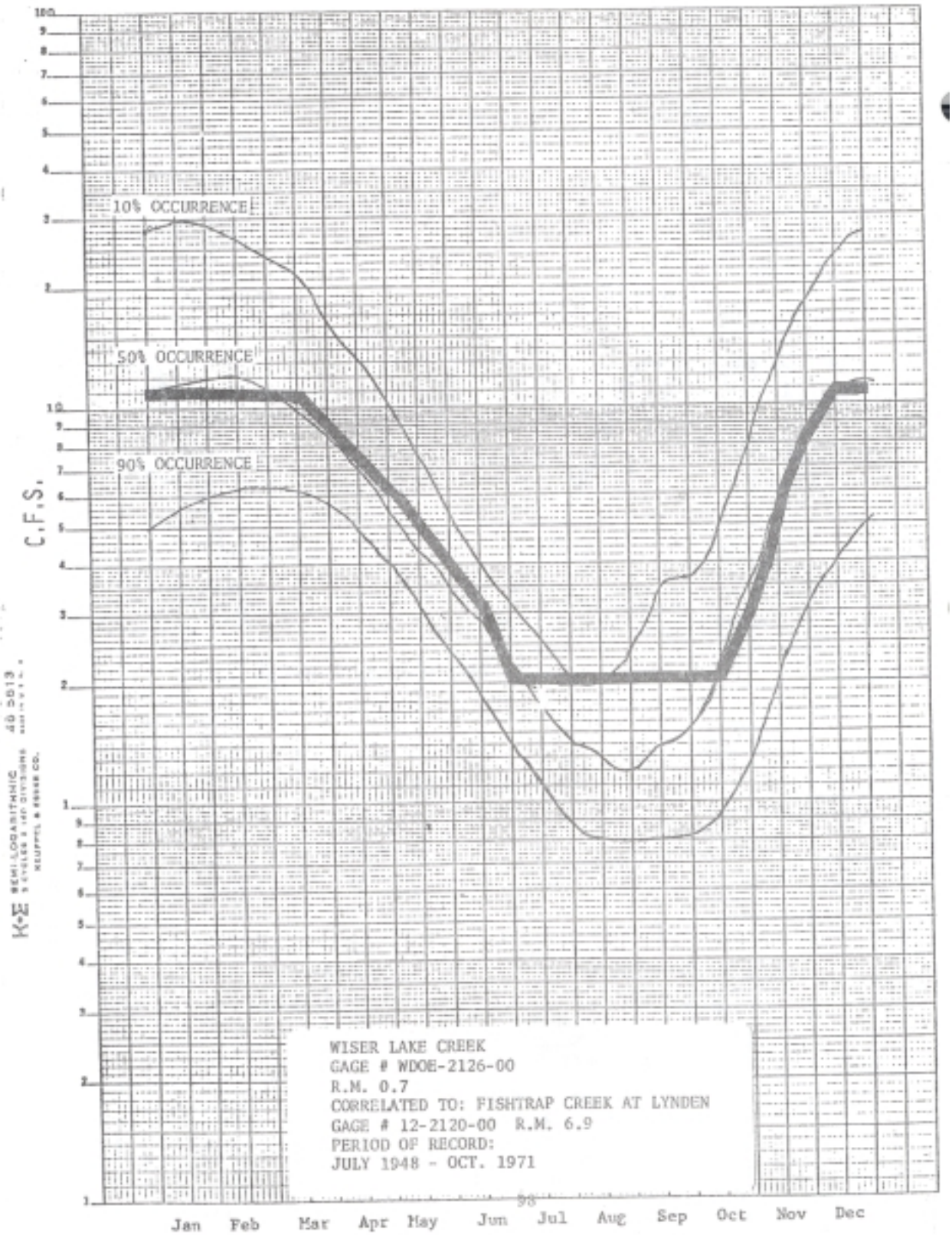

10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
SKOOKUM CREEK NEAR WICKERSHAM
GAGE # 12-2095-00
R.M. 0.1
PERIOD OF RECORD:
JULY 1948 - SEPT. 1969
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


SMITH CREEK
GAGE # WDOE-2111-00
R.M. 0.8
CORRELATED TO: CANYON CREEK AT KULSHAN
GAGE # 12-2085-00 R.M. 0.2
PERIODOF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - SEPT. 1954
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
94
Jul
Aug
Sep
Oct
Nov
Dec


SUMAS RIVER NEAR SUMAS
GAGE # 12-2145-00
R.M. 2.1
PERIOD OF RECORD:
JULY 1948 - SEPT. 1950
MAY 1955 - SEPT. 1955
10% OCCURRENCE
50% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


TENNILE CREEK AT LAUREL
GAGE # 12-2129-00
R.M. 4.4
PERIOD OF RECORD:
MAY 1968 - SEPT. 1972
10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
TERRELL CREEK
GAGE # WDOE-2133-00
R.M. 2.2
CORRELATED TO: DAKOTA CREEK NEAR BLAINE
GAGE # 12-2140-00 R.M. 3.5
PERIOD OF RECORD:
JULY 1948 - SEPT. 1953
MAY 1954 - OCT. 1954
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec


10% OCCURRENCE
50% OCCURRENCE
90% OCCURRENCE
C.F.S.
WISER LAKE CREEK
GAGE # WDOE-2126-00
R.M. 0.7
CORRELATED TO: FISHTRAP CREEK AT LYNDEN
GAGE # 12-2120-00 R.M. 6.9
PERIOD OF RECORD:
JULY 1948 - OCT. 1971
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

APPENDIX B

ADMINISTRATIVE RULES
WAC 173-501

Chapter 173-501 WAC

INSTREAM RESOURCES PROTECTION PROGRAM—NOOKSACK WATER RESOURCE INVENTORY AREA (WRIA) 1

WAC

NEW SECTION

WAC 173-501-010 GENERAL PROVISION. These rules apply to waters within the Nooksack water resource inventory area (WRIA 1), as defined in WAC 173-500-040. This chapter is promulgated pursuant to chapter 90.54 RCW (Water Resources Act of 1971), chapter 90.22 RCW (Minimum water flows and levels), and in accordance with chapter 173-500 WAC (Water resources management program).

NEW SECTION

WAC 173-501-020 PURPOSE. Chapter 90.54 RCW (Water Resources Act of 1971) requires that utilization and management of waters of the state be guided by a number of fundamentals, including:

Uses of water for domestic, stock watering, industrial, commercial, agricultural, irrigation, hydroelectric power production, mining, fish and wildlife maintenance and enhancement, recreational, and thermal power production purposes, and preservation of environmental and aesthetic values, and all other uses compatible with the enjoyment of the public waters of the state, are declared to be beneficial. (RCW 90.54.020(1))

The quality of the natural environment shall be protected and, where possible, enhanced as follows:

Perennial rivers and streams of the state shall be retained with base flows necessary to provide for preservation of wildlife, fish scenic, aesthetic and other environmental values, and navigational values. Lakes and ponds shall be retained substantially in their natural condition. Withdrawals of water which would conflict therewith shall be authorized only in those situations where it is clear that overriding considerations of the public interest will be served. (RCW 90.54.020 (3)(a))

Waters of the state shall be of high quality. Regardless of the quality of the waters of the state, all wastes and other materials and substances proposed for entry into said waters shall be provided with all known, available, and reasonable methods of treatment prior to entry.

Notwithstanding that standards of quality established for the waters of the state would not be violated, wastes and other materials and substances shall not be allowed to enter such waters which will reduce the existing quality thereof, except in those situations where it is clear that overriding considerations of the public interest will be served. (RCW 90.54.020 (3)(b))

The purpose of this chapter is to retain perennial rivers, streams, and lakes in the Nooksack water resource inventory area with instream flows and levels necessary to provide for preservation of wildlife, fish, scenic, aesthetic, and other environmental values, and navigational values, as well as recreation and water quality.

In administering and enforcing this regulation, the department's actions shall be consistent with the provisions of chapter 90.54 RCW.

NEW SECTION

WAC 173-501-030 ESTABLISHMENT OF INSTREAM FLOWS. (1) Stream management units and associated control stations are established as follows:

Stream Management Unit Information

Control Station No. Stream Management Unit Name	Control Station by River Mile and Section, Township and Range	Stream Management Reach
Anderson Creek Gage # WDOE-2109-00	1.4 Section 19 T. 39 N., R. 4 E.	From confluence with Nooksack River to headwaters, including all tributaries.
Bells Creek Gage # WDOE-2073-00	0.5 Section 21 T. 39 N., R. 5 E.	From confluence with Nooksack River to headwaters, including all tributaries
Bertrand Creek Gage # WDOE-2124-00	1.0 Section 26 T. 40 N., R. 2 E.	From U.S./Canada border to confluence with Nooksack River, including all tributaries
California Creek Gage # WDOE-2134-00	3.0 Section 21 T. 40 N., R. 1 E.	From influence of mean annual high tide at low instream flow levels to headwaters, including all tributaries
Canyon Creek Gage # WDOE-2045-00	0.2 Section 35 T. 40 N., R. 6 E.	From confluence with N. Fk. Nooksack River to headwaters, including all tributaries
Canyon Creek at Kulshan Gage # 12-2085-00	0.2 Section 27 T. 39 N., R. 5 E.	From confluence with N. Fk. Nooksack River to headwaters, including all tributaries
Cornell Creek Gage # WDOE-2057-00	1.4 Section 1 T. 39 N., R. 6 E.	From the confluence with N. Fk. Nooksack River to headwaters, including all tributaries

Control Station No. Stream Management Unit Name	Control Station by River Mile and Section, Township and Range	Stream Management Reach
Dakota Creek near Blaine Gage # 12-2140-00	3.5 Section 9 T. 40 N., R. 1 E.	From influence of mean annual high tide at low instream flow levels to headwaters, including all tributaries.
Deer Creek Gage # WDOE-2130-50	0.2 Section 28 T. 39 N., R. 2 E.	From the confluence with Tenmile Creek to headwaters, including all tributaries
Fishtrap Creek at Lynden Gage # 12-2120-00	6.9 Section 16 T. 40 N., R. 3 E.	From U.S./Canada border to confluence with Nooksack River, including all tributaries.
Gallop Creek Gage # WDOE-2056-00	0.3 Section 7 T. 39 N., R. 7 E.	From the confluence with N. Fk. Nooksack River to headwaters, including all tributaries.
Hutchinson Creek Gage # WDOE-2101-00	1.8 Section 36 T. 38 N., R. 5 E.	From confluence with South Fork Nooksack River to headwaters, including all tributaries.
Johnson Creek Gage # WDOE-2149-00	0.5 Section 35 T. 41 N., R. 4 E.	From U.S./Canada border to headwaters, including all tributaries.
Kendell Creek Gage # 12-2065-00	0.1 Section 3 T. 39 N., R. 5 E.	From the confluence with N. Fk. Nooksack River to headwaters, including all tributaries.
Maple Creek Gage # WDOE-2059-00	0.8 Section 30 T. 40 N., R. 6 E.	From confluence with N. Fk. Nooksack River to headwaters, including all tributaries.
Nooksack River (at Deming) 12-2105-00	5.6 Section 31 T. 39 N., R. 5 E.	From confluence with Smith Creek to confluence of North Fork and Middle Fork Nooksack Rivers, and including South Fork Nooksack River to the control point at river mile 5.7.
Nooksack River (at Ferndale) 12-2131-00	5.8 Section 29 T. 39 N., R. 2 E.	From influence of mean annual high tide at low instream flow levels to confluence with, and including, Smith Creek.
Nooksack River (Middle Fork) 12-2080-00	5.0 Section 13 T. 38 N., R. 5 E.	From confluence with North Fork to headwaters.

Control Station No. Stream Management Unit Name	Control Station by River Mile and Section, Township and Range	Stream Management Reach
Nooksack River (North Fork) 12-2072-00	44.1 Section 10 T. 39 N., R. 5 E.	From confluence with Middle Fork to headwaters.
Nooksack River (South Fork) 12-2090-00	5.0 Section 19 T. 38 N., R. 5 E.	From control point at river mile 5.0 to headwaters.
Porter Creek Gage # WDOE-2084-00	0.7 Section 11 T. 38 N., R. 5 E.	From the confluence with M. Fk. Nooksack R. to headwaters, including all tributaries.
Racehorse Creek Gage # WDOE-2071-00	1.5 Section 11 T. 39 N., R. 5 E.	From the confluence with N. Fk. Nooksack River to headwaters, including all tributaries.
Saar Creek Gage # 12-2155-00	0.2 Section 31 T. 41 N., R. 5 E.	From U.S./Canada border to headwaters, including all tributaries.
Silver Creek Gage # WDOE-2132-00	2.0 Section 4 T. 38 N., R. 2 E.	From confluence with Nooksack River to headwaters, including all tributaries.
Skookum Creek near Wickersham Gage # 12-2095-00	0.1 Section 27 T. 37 N., R. 5 E.	From confluence with South Fork Nooksack River to headwaters, including all tributaries.
Smith Creek Gage # WDOE-2111-00	0.8 Section 22 T. 39 N., R. 4 E.	From confluence with Nooksack River to headwaters, including all tributaries.
Sumas River near Sumas Gage # 12-2145-00	2.1 Section 2 T. 41 N., R. 4 E.	From U.S./Canada border to headwaters, including all tributaries.
Tenmile Creek at Laurel Gage # 12-2129-00	4.4 Section 13 T. 39 N., R. 2 E.	From confluence with Nooksack Rivers to headwaters, including all tributaries.
Terrell Creek Gage # WDOE-2133-00	2.2 Section 31 T. 40 N., R. 1 E.	From influence of mean annual high tide at low instream flow levels to headwaters, including all tributaries.
Wiser Lake Creek Gage # WDOE-2126-00	0.7 Section 2 T. 39 N., R. 2 E.	From confluence with Nooksack River to headwaters, including all tributaries.

(2) Instream flows are established for the stream management units in WAC 173-501-030(1) as follows:

Instream Flows in the Nooksack WRIA
(Instantaneous cubic feet per second)

Month	Day	WDOE-2109-00 Anderson Cr.	WDOE-2073-00 Bells Creek	WDOE-2124-00 Bertrand Cr.	WDOE-2134-00 California Cr.
Jan.	1	50	4*	90*	40*
	15	50	4*	90*	40*
Feb.	1	50	4*	90*	40*
	15	50	3*	90*	40*
Mar.	1	50	2*	90*	40*
	15	50	2*	90*	25*
Apr.	1	40	3*	80*	18*
	15	31	4*	60*	13*
May	1	25*	5*	50*	9*
	15	20*	6*	40*	6*
Jun.	1	16*	6*	33*	4*
	15	13*	6*	25*	3*
Jul.	1	10*	3*	21*	2*
	15	8*	2*	17*	2*
Aug.	1	6*	1*	13*	2*
	15	6*	1*	13*	2*
Sept.	1	6*	1*	13*	2*
	15	6*	1*	13*	2*
Oct.	1	8*	1*	13*	2*
	15	11*	2*	20*	2*
Nov.	1	15*	3*	30*	4*
	15	20	4*	40*	7*
Dec.	1	30	4*	60*	15*
	15	50	4*	90*	40*

*Denotes closure period. No further consumptive rights issued for use during this time.

Month	Day	WDOE-2045-00 Canyon Creek	WDOE-2085-00 Canyon (Lk) Cr.	WDOE-2057-00 Cornell Creek
Jan.	1	150	50	20
	15	150	50	20
Feb.	1	150	50	20
	15	150	50	20
Mar.	1	150	50	20
	15	150	50	20
Apr.	1	150	50	20
	15	150	50	20
May	1	150	50	20
	15	150	50	20
Jun.	1	150	50	15
	15	150	50	9
Jul.	1	150*	50*	5*
	15	80*	30*	3*
Aug.	1	40*	15*	3*
	15	40*	10*	3*
Sept.	1	40*	10*	3*
	15	40*	10*	3*
Oct.	1	55*	20*	5*
	15	80*	23*	10*
Nov.	1	90*	27*	20*
	15	110	32	20
Dec.	1	130	40	20
	15	150	43	20

Month	Day	12-2140-00 Dakota Creek	WDOE-2130-50 Deer Creek	12-2120-00 Fishtrap Cr.
Jan.	1	60*	10*	55*
	15	60*	10*	55*
Feb.	1	60*	10*	55*
	15	60*	10*	55*
Mar.	1	60*	10*	55*
	15	40*	10*	55*
Apr.	1	30*	8*	45*
	15	20*	6*	35*
May	1	15*	5*	30*
	15	10*	4*	25*
Jun.	1	7*	3*	20*
	15	5*	2.0*	15*
Jul.	1	4*	2*	12*
	15	3*	1*	10*
Aug.	1	3*	1*	8*
	15	3*	1*	8*
Sept.	1	3*	1*	8*
	15	3*	1*	8*
Oct.	1	3*	2*	18*
	15	3*	2*	20*
Nov.	1	5*	3.0*	30*
	15	10*	4.0*	40*
Dec.	1	20*	5.0*	55*
	15	60*	7.0*	55*

Month	Day	WDOE-2056-00 Gallop Creek	WDOE-2101-00 Hutchinson Creek	WDOE-2149-00 Johnson Creek	12-2065-00 Kendall Cr.
Jan.	1	12	60	60*	10*
	15	12	60	60*	10*
Feb.	11	12	60	60*	10*
	15	12	60	60*	10*
Mar.	1	12	60	60*	10*
	15	12	60	60*	10*
Apr.	1	12	60	60*	10*
	15	12	60	45*	10*
May	1	12	60	35*	10*
	15	12	60	25*	10*
Jun.	1	12	60	20*	10*
	15	12	60	15*	10*
Jul.	1	12*	60*	12*	10*
	15	8*	40*	9*	6*
Aug.	1	6*	25*	9*	4*
	15	5*	15*	9*	3*
Sept.	1	5*	15*	9*	3*
	15	5*	15*	9*	3*
Oct.	1	5*	25*	9*	5*
	15	5*	30*	9*	6*
Nov.	1	8*	35*	13*	7*
	15	12	40	20*	8*
Dec.	1	12	50	30*	9*
	15	12	60	60*	10*

Month	Day	WDOE-2059-00 Maple Creek	12-2105-00 Nooksack R. (at Deming)	12-2131-00 Nooksack R. (at Ferndale)
Jan.	1	20	2050	2900
	15	20	2050	2900
Feb.	1	20	2150	2900
	15	30	2350	2900
Mar.	1	30	2350	2900
	15	30	2350	2900
Apr.	1	30	2350	2900
	15	30	2350	2900
May	1	30	3325	2900
	15	30	3400	3500
Jun.	1	30	3400	3500
	15	30	3400	3500
Jul.	1	20*	3400	3500
	15	20*	2950	3000
Aug.	1	20*	1700	2400
	15	10*	1700	1700
Sept.	1	10*	1700	1700
	15	10*	1700	1700
Oct.	1	20*	1700	1700
	15	20*	2050	2050
Nov.	1	20*	2050	2300
	15	20	2050	2500
Dec.	1	20	2050	2900
	15	20	2050	2900

Month	Day	12-2080-00 Nooksack River (Middle Fork)	12-2072-00 Nooksack River (N. Fk nr. Deming)	12-2090-00 Nooksack River (South Fork)
Jan.	1	275	1100	650
	15	275	1100	650
Feb.	1	380	1100	850
	15	380	1100	850
Mar.	1	380	1100	850
	15	380	1100	850
Apr.	1	380	1100	850
	15	380	1100	850
May	1	380	1100	850
	15	450	2000	850
Jun.	1	525	2000	850
	15	525	2000	850
Jul.	1	525	2000	850*
	15	400	2000	550*
Aug.	1	275	1100	300*
	15	275	1100	300*
Sept.	1	275	1100*	300*
	15	275	1100*	300*
Oct.	1	275	1100*	300*
	15	275	1100*	650*
Nov.	1	275	1100*	650
	15	275	1100	650
Dec.	1	275	1100	650
	15	275	1100	650

Month	Day	WDOE-2084-00 Porter Creek	WDOE-2071-00 Racehorse Cr.	WDOE-2155-00 Saar Creek
Jan.	1	10	60	35*
	15	10	60	35*
Feb.	1	10	60	35*
	15	10	60	35*
Mar.	1	10	60	35*
	15	10	60	35*
Apr.	1	10	60	35*
	15	10	80	35*
May	1	10	80	35*
	15	10	90	35*
Jun.	1	10	90	35*
	15	10	90	35*
Jul.	1	10*	50*	22*
	15	6*	35*	15*
Aug.	1	3*	20*	9*
	15	3*	20*	6*
Sept.	1	3*	20*	6*
	15	3*	20*	6*
Oct.	1	3*	20*	12*
	15	6*	30*	14*
Nov.	1	10*	35*	17*
	15	10	40	19*
Dec.	1	10	47	23*
	15	10	55	37*

Month	Day	WDOE-2132-00 Silver Creek	12-2095-00 Skookum Cr.	WDOE-2111-00 Smith Creek
Jan.	1	12	115	40
	15	12	115	40
Feb.	1	12	115	40
	15	12	115	40
Mar.	1	12	115	40
	15	12	115	40
Apr.	1	12	115	40
	15	12	115	60*
May	1	12*	115	60*
	15	9*	115	60*
Jun.	1	7*	115	60*
	15	6*	115	40*
Jul.	1	4*	115*	35*
	15	3*	66*	25*
Aug.	1	3*	66*	15*
	15	3*	66*	10*
Sept.	1	3*	66*	10*
	15	3*	66*	10*
Oct.	1	3.5*	66*	15*
	15	4*	80*	20*
Nov.	1	6*	115*	23*
	15	10	115	25
Dec.	1	12	115	30
	15	12	115	35

Month	Day	12-2145-00 Sumas River	12-2129-00 Tenmile Cr.	WDOE-2133-00 Terrell Creek	WDOE-2126-00 Wiser Lk. Cr.
Jan.	1	100*	40*	12	11
	15	100*	40*	12	11
Feb.	1	100*	40*	12	11
	15	100*	40*	12	11
Mar.	1	100*	40*	12	11
	15	100*	40*	12	11
Apr.	1	100*	40*	12	9
	15	100*	40*	12	7
May	1	70*	30*	8*	6*
	15	60*	22*	5*	5*
Jun.	1	40*	17*	4*	4*
	15	35*	12*	3*	3*
Jul.	1	25*	10*	2*	2*
	15	20*	7*	2*	2*
Aug.	1	20*	5*	2*	2*
	15	20*	5*	2*	2*
Sept.	1	20*	5*	2*	2*
	15	20*	6*	2*	2*
Oct.	1	20*	7*	2*	2*
	15	20*	10*	2*	2*
Nov.	1	35*	15*	3*	3*
	15	60*	20*	5	6
Dec.	1	80*	30*	7	8
	15	100*	40*	12	11

(3) Instream flow hydrographs, as represented in Appendix A of the document entitled Nooksack Instream Resources Protection Program, shall be used for identification of instream flows on those days not specifically identified in WAC 173-501-030(2).

(4) Future consumptive water right permits issued hereafter for diversion of surface water in the Nooksack WRIA and perennial tributaries shall be expressly subject to instream flows established in WAC 173-501-030 (1) through (3) as measured at the appropriate gage, preferably the nearest one downstream and at all other downstream control stations, except for those uses described in WAC 173-501-070 (1) through (3).

(5) Projects that would reduce the flow in a section of stream's length (e.g., hydroelectric projects that withdraw streamflow from some length of the channel) are considered consumptive with respect to the affected stream reach. Such projects will be subject to instream flow requirements as specified by the department. These flows will be those established in WAC 173-501-030 (1) through (3) and WAC 173-501-040, or may be flows specifically tailored to that particular project and stream reach. When studies are required to determine such reach and project-specific flow requirements, the department will require the project proponent to conduct such studies in consultation with affected state and federal agencies and Indian tribes.

NEW SECTION

WAC 173-501-040 SURFACE WATER SOURCE LIMITATIONS TO FURTHER CONSUMPTIVE APPROPRIATION. (1) The following table indicates the status of streams, tributaries and lakes affected by this chapter.

OTS-226:1 040:12

Source Name	Tributary to	Former Administrative Status	Status under Regulation	Period of Closure	Flow Established
Anderson Creek	Nooksack River	low flow	partial year closure	May 1–Oct. 31	WAC 173-501-030(2)
Bells Creek	North Fork Nooksack	open	closure	year round	WAC 173-501-030(2)
Bertrand Creek	Nooksack River	closure	closure	year round	WAC 173-501-030(2)
Black Slough	Nooksack – South Fork	low flow	low flow		
California Creek	Drayton Harbor	closure	closure	year round	WAC 173-501-030(2)
Canyon Creek	North Fork Nooksack	open	partial year closure	July 1-Oct. 31	WAC 173-501-030(2)
Canyon (Lake) Creek	Middle Fork Nooksack	open	partial year closure	July 1-Oct. 31	WAC 173-501-030(2)
Chuckanut Creek	Chuckanut Bay	low flow	closure	year round	natural flow
Colony Creek (incl. Whitehall)	Samish Bay	open	closure	year round	natural flow
Cornell Creek	North Fork Nooksack	open	partial year closure	July 1-Oct. 31	WAC 173-501-030(2)
Dakota Creek	Drayton Harbor	closure	closure	year round	WAC 173-501-030(2)
Deer Creek	Barrett Lake (Tenmile)	closure	closure	year round	WAC 173-501-030(2)
Fishtrap Creek (incl. Double Ditch)	Nooksack River	closure	closure	year round	WAC 173-501-030(2)
Fourmile Creek	Tenmile Creek	closure	closure	year round	
Gallop Creek	North Fork Nooksack	open	partial year closure	July 1-Oct. 31	WAC 173-501-030(2)
Hutchinson Creek	South Fork Nooksack	open	partial year closure	July 1-Oct. 31	WAC 173-501-030(2)
Johnson Creek	Sumas River	closure	closure	year round	WAC 173-501-030(2)
Kamm Ditch/ Stickney Slough	Nooksack River	closure	closure	year round	natural flow
Kendall Creek	North Fork Nooksack	open	closure	year round	WAC 173-501-030(2)
Maple Creek	North Fork Nooksack	open	closure	July 1-Oct. 31	WAC 173-501-030(2)
Nooksack River – mainstem	Bellingham Bay	low flow	low flow (new flow)		WAC 173-501-030(2)
Nooksack River – Middle Fk.	Nooksack River	low flow	low flow (new flow)		WAC 173-501-030(2)
Nooksack River – North Fk.	Nooksack River	low flow	partial year closure	Sept. 1-Oct. 31	WAC 173-501-030(2)
Nooksack River – South Fk.	Nooksack River	open	partial year closure	July 1-Oct. 31	WAC 173-501-030(2)
Oyster Creek	Samish Bay	open	closure	year round	natural flow
Padden Creek	Bellingham Bay	open	closure	year round	natural flow
Porter Creek	Middle Fork Nooksack	open	partial year closure	July 1-Oct. 1	WAC 173-501-030(2)
Racehorse Creek	North Fork Nooksack	open	partial year closure	July 1-Oct. 31	WAC 173-501-030(2)
Saar Creek	Vedder Canal – Canada	open	closure	year round	WAC 173-501-030(2)
Saxon Creek	South Fork Nooksack	open	closure	year round	natural flow

Source Name	Tributary to	Former Administrative Status	Status under Regulation	Period of Closure	Flow Established
Silver Creek	Nooksack River	low flow	partial year closure	May 1-Oct. 31	WAC 173-501-030(2)
Skookum Creek	South Fork Nooksack	low flow	partial year closure	July 1-Oct. 31	WAC 173-501-030(2)
Smith Creek	Nooksack River	low flow	partial year closure	May 1-Oct. 31	WAC 173-501-030(2)
Squalicum Creek	Bellingham Bay	closure	closure	year round	
Sumas River	Vedder Canal – Canada	closure	closure	year round	WAC 173-501-030(2)
Tenmile Creek	Nooksack River	closure	closure	year round	WAC 173-501-030(2)
Terrell Creek	Birch Bay	open	partial year closure	May 1-Oct. 31	WAC 173-501-030(2)
Thompson Creek	Glacier Cr./N. Fk.	open	partial year closure	July 1-Oct. 31	natural flow
Unnamed Stream – Elder Ditch/Scott Ditch	Nooksack River	low flow	low flow		
Unnamed Stream – White Creek	Colony Creek	closed	closure		
Whatcom Creek*	Bellingham Bay	open	closure	year round	natural flow
Wiser Lake Creek	Nooksack River	low flow	partial year closure	May 1-Oct. 31	WAC 173-501-030(2)
Lummi Indian Reservation Streams		closed	closure		
Barrett Lake	Tenmile Creek	closure	closure		NA
Green Lake	Fourmile Creek	closure	closure		NA
Lake Terrell	Terrell Creek	closure	closure		NA
Lake Whatcom**	Whatcom Creek	court-ordered lake level	closure	year round	
Wiser Lake	Wiser Lake Creek	closure	closure		NA

For streams listed as "natural flow," insufficient data are available to develop instream flows outside the closure period. Water right applications for consumptive use will be considered on a case by case basin in consultation with the departments of fisheries and game.

Streams which are not specifically listed in this regulation are affected by the regulation if they are tributary to streams or lakes listed herein; otherwise such streams are not affected.

*No exceptions. See WAC 173-501-070 (2).

**Lake Whatcom and its tributaries are closed to all further consumptive appropriation; however, any water right applications for consumptive use which were on file with the department of ecology on August 7, 1985 shall be exempt from the closure through the period extending one year from the effective date of this chapter.

(2) When a project (as described in WAC 173-501-030(5)) is proposed on a stream that is closed to further appropriations, the department shall deny the water right application unless the project proponent can adequately demonstrate that the project does not conflict with the intent of the closure.

NEW SECTION

WAC 173-501-050 LAKES. In future permitting actions relating to withdrawal of lake waters, lakes and ponds shall be retained substantially in their natural condition. Withdrawals of water which would conflict therewith shall be authorized only in those situations where it is clear that overriding considerations of the public interest will be served.

NEW SECTION

WAC 173-501-060 GROUND WATER. If department investigations determine that there is significant hydraulic continuity between surface water and the proposed ground water source, any water right permit or certificate issued shall be subject to the same conditions as affected surface waters. If department investigations determine that withdrawal of ground water from the source aquifers would not interfere with stream flow during the period of stream closure or with maintenance of minimum instream flows, then applications to appropriate public ground waters may be approved.

NEW SECTION

WAC 173-501-070 EXEMPTIONS. (1) Nothing in this chapter shall affect existing water rights, perfected riparian rights, federal Indian and non-Indian reserved rights, appropriative or otherwise existing on the effective date of this chapter, nor shall it affect existing rights relating to the operation of any navigation, hydroelectric, or water storage reservoir or related facilities.

(2) Single domestic, (including up to 1/2 acre lawn and garden irrigation and associated noncommercial stockwatering) shall be exempt from the provisions established in this chapter, except that Whatcom Creek is closed to any further appropriation, including otherwise exempted single domestic use. For all other streams, when the cumulative impact of single domestic diversions begins to significantly affect the quantity of water available for instream uses, then any water rights issued after that time shall be issued for in-house use only, if no alternative source is available.

(3) Nonconsumptive uses which are compatible with the intent of this chapter may be approved.

NEW SECTION

WAC 173-501-080 POLICY STATEMENT FOR FUTURE PERMITTING ACTIONS. (1) No rights to divert or store public surface waters of WRIA 1 shall hereafter be granted which shall conflict with the purpose of this chapter except as provided in RCW 90.54.020 (3)(a).

(2) Consistent with the provisions of chapter 90.54 RCW, it is the policy of the department to preserve an appropriate minimum instream flow in all perennial streams and rivers as well as the water levels in all lakes in the Nooksack WRIA by encouraging the use of alternate sources of water which include (a) ground water, (b) storage water, or (c) acquisition of existing water rights.

NEW SECTION

WAC 173-501-090 ENFORCEMENT. In enforcement of this chapter, the department of ecology may impose such sanctions as appropriate under authorities vested in it, including but not limited to the issuance of regulatory orders under RCW 43.27A.190 and civil penalties under RCW 43.83B.335.

NEW SECTION

WAC 173-501-100 REGULATION REVIEW. Review of the rules in this chapter shall be initiated by the department of ecology within five years of the date of adoption.

APPENDIX C

FLOW RECOMMENDATIONS FROM WDF, WDG, LUMMI TRIBE

Nooksack Basin Flow Recommendations from Washington Department of Fisheries

Stream	Stream No.	Species	PREFERRED Spawning Discharge (cfs)	Time Period	PREFERRED Rearing Discharge (cfs)	Time Period	Additional Recommendations
Canyon Cr.	0437	chinook, coho, pink	228	7-1/1-31	53	2-1/6-30	summer-fall closure (pink-chinook spawning)
Kendall Cr.	0406	chinook, coho, pink, chum	Use IFIM Data				Closed all year (hatchery)
Racehorse Cr.	0394	chinook, coho, pink, chum	149	7-1/1-31	33	2-1/6-30	summer-fall closure (pink, chinook spawning)
Bell's Cr.	0390	coho, chum	80	10-1/1-31	16	2-1/9-30	
Cornell Cr.	0464	chinook, coho, pink, chum	122	7-1/1-31	26	2-1/6-30	summer-fall closure (pink, chinook spawning)
Gallop Cr.	0468	coho, pink	63	8-1/1-31	12	2-1/7-31	summer-fall closure (pink spawning)
Maple Cr.	0415	coho, chum	Use IFIM Data				summer-fall closure (coho rearing)
Thompson Cr.	0472	coho, pink	48	8-1/1-31	9	2-1/7-31	summer-fall closure (coho rearing, pink spawning)
Canyon Cr.	0340	chinook, coho, chum	70	7-1/1-31	14	2-1/6-30	summer-fall closure (chinook spawning)
Porter Cr.	0350	coho, pink	86	8-1/1-31	17	2-1/7-31	summer-fall closure (pink spawning, coho rearing
Bertrand Cr.	0201	coho, chum	108	10-1/1-31	22	2-1/9-30	closed all year – (existing)
Fishtrap Cr.	0210	coho, chum	58	10-1/1-31	11	2-1/9-30	closed all year – (existing)
Saxon Cr.	0270	coho	17	10-1/1-31	3	6-1/10-31	summer-fall closure – (coho rearing)
Skookum Cr.	0273	chinook, coho, pink, chum	153	7-1/1-31	33	2-1/6-30	closed all year – (hatchery)

Stream	Stream No.	Species	PREFERRED Spawning Discharge (cfs)	Time Period	PREFERRED Rearing Discharge (cfs)	Time Period	Additional Recommendations
Hutchinson Cr.	0264	chinook, coho, pink	70	7-1/1-31	14	2-1/6-30	summer-fall closure (pink-chinook spawning)
Chuckanut Cr.	0626	coho, chum	41	10-1/1-31	7	2-1/9-30	summer-fall closure (coho rearing)
Oyster Cr.	0638	coho, chum	41	10-1/1-31	7	2-1/9-30	summer-fall closure (coho rearing)
Colony Cr.	0648	coho, chum	40	10-1/1-31	7	2-1/9-30	summer-fall closure (coho rearing)
Whitehall Cr.	0650	coho, chum	30	10-1/1-31	5	2-1/9-30	summer-fall closure (coho rearing)
N.F. Dakota Cr.	0300	coho, chum	39	10-1/1-31	7	2-1/9-30	closed all year – (existing)
Johnson Cr.	None	coho	31	10-1/1-31	5	2-1/6-30	closed all year – (existing)
Dakota Cr.	0200	chinook, coho, pink, chum, sockeye	80	7-1/1-31	16	2-1/6-30	closed all year – (existing)
Deer Cr.	0165	chinook, coho, pink, chum, sockeye	48	7-1/1-31	9	2-1/6-30	closed all year – (existing)
Ten Mile Cr.	0163	chinook, coho, pink, chum, sockeye	41	7-1/1-31	7	2-1/6-30	closed all year – (existing)
Wiser Cr.	0194	chinook, coho, pink, chum, sockeye	30	7-1/1-31	5	2-1/6-30	summer-fall closure (pink, chinook spawning)
Saar Cr.	None	chinook, coho, pink, chum, sockeye	62	7-1/1-31	12	2-1/6-30	summer-fall closure (pink, chinook spawning)
Silver Cr.	0124	coho, pink, chum					closed all year – (pink spawning, coho rearing, existing diversions)
Stickney Slough	0222	unknown					closed all year – (existing)
Squalicum Cr.	0552	coho, chum					closed all year – (existing)
California Cr.	0045	coho, chum					closed all year (existing)

Stream	Stream No.	Species		Additional Recommendations
Terrell Cr.	0089	coho, chum	IFIM Data	Closed all year – (WDG Regulation)
Anderson Cr.	0228	coho, chum		Closed all year – (water quality, low flows)
Smith Cr.	0234	coho, chum		Summer-fall Closure – (coho rearing)
Sumas River	None	Unknown		Closed all year – (existing)
Whatcom Cr.	0566	coho, chum		Closed all year – (water quality, complexity of existing flow agreements)

Nooksack Basin Flow Recommendations from Washington Department of Game

Stream (RM)	Gauge	Feb-mid July	Mid July-Jan	Comments
Nooksack Mainstem and Lower Tributaries				
Nooksack River (5.8)	12213100	4,000		
Nooksack River (36.6)	12210500	2,350		
Fishtrap Creek (6.8)		50	12	Maintain closure
Bertrand Creek (5.9)		90	25	Maintain closure
Smith Creek (–)		Close	Close	
Anderson Creek (–)		Close	Close	
Silver Creek (1.9)		Close	Close	IFIM indicates that any flow reduction reduces game fish habitat
Tenmile Creek (2.9)		37	8	Maintain closure
Wiser Lake Creek (0.5)		Close (28)	Close (6)	
Stickney Slough/ Kamm Ditch				Maintain closure
Deer Creek (0.6)		43	10	Maintain closure
North Fork Nooksack River and Tributaries				
North Fork Nooksack River (44.1)	12207200			
North Fork Nooksack River (45.0)		550	Close	IFIM indicates that any flow reduction reduces game fish habitat
North Fork Nooksack River (57.6)	12205000	400		
Canyon Creek (0.2)		185	60	Close August & Sept.
Racehorse Creek (0.4)		125	35	Close 15, July - 31, Oct.
Bells Creek (0.6)		70	18	
Gallop Creek (0.4)		55	13	
Cornell Creek (0.5)		105	30	

Stream (RM)	Gauge	Feb-mid July	Mid July-Jan	Comments
North Fork Nooksack River and Tributaries				
Thompson Creek (0.1)		45	10	
Maple Creek (0.8)		30	Close	IFIM indicates juvenile SH+CT habitat limitation in Aug. & Sept.
Kendal Creek (0.2)		Close	Close	IFIM indicates that any flow reduction reduces game fish habitat
Kendall Creek (0.7)		Close	Close	IFIM indicates that any flow reduction reduces game fish habitat
Middle Fork Nooksack River and Tributaries				
Middle Fork Nooksack River (5.6)	12209000	315	110	
Middle Fork Nooksack River (1.4)		550	250	(IFIM)
Canyon Creek (0.3)		60	15	("Canyon Lake Creek")
Porter Creek		75	20	
South Fork Nooksack River and Tributaries				
South Fork Nooksack River (5.0)		Close	Close	IFIM indicates that any flow reduction reduces game fish habitat
South Fork Nooksack River (14.8)	12209000	Close	Close	based on IFIM at RM 5.0
Skookum Creek (0.1)	Do Not issue any consumptive rights other than pending lummi application 522899			See HAB memo 12/18/84
Hutchinson Creek (0.2)		60	15	
Sumas River and Tributaries (Fraser River system)				
Sumas River	12215900	200	35	Maintain closure
Saar Creek		55	13	
Johnson Creek				Maintain closure

Stream (RM)	Gauge	Feb-mid July	Mid July-Jan	Comments
Sumas River and Tributaries (Fraser River system)				
Slesse Creek (0.8)	12215900	300	105	
Chilliwack River	12215700	600	200	
Independent Drainages into Puget Sound				
Dakota Creek (2.8)		69	18	Maintain closure
California Creek				Maintain closure
Terrell Creek (4.9)		Close	Close	IFIM indicates that any flow reduction reduces game fish habitat
Squalicum Creek				Maintain closure
Whatcom Creek		Close	Close	Closure request indicates tributaries see HAB memo 12/18/84
Chuckanut Creek (0.1)		38	8	
Oyster Creek (0.1)		39	8	
Whitehall Creek (0.2)		28	6	
Colony Creek (2.2)		37	8	

Nooksack Basin Flow Recommendations from Lummi Tribal Fisheries Department

Lummi Indian Fisheries
RECOMMENDED CLOSURES IN WRIA 1 2/22/85

STREAM	JUSTIFICATION
Fishtrap Creek (0210)	This stream is already closed. I recommend continued closure.
Dakota Creek (0002)	This stream is already closed. I recommend continued closure.
N. Fork Dakota Creek S. Fork Dakota Creek	These streams is already closed. I recommend continued closure.
California Creek (0045)	This stream is already closed. I recommend continued closure.
Bertrand Creek (0201)	This stream is already closed. I recommend continued closure.
Terrell Creek (0089)	I recommend closure of the stream, with a recommendation to the WDG to regularly release water down the creek to maximize fisheries habitat, as far as possible within the management goals at Lake Terrell.
Silver Creek (1024)	I recommend closure of the stream. Current water allocations seem to total 3.6 cfs, which is the 10% exceedence flow in July and August. This stream is a good candidate for rehabilitation efforts, since spawning habitat is limited. If a low flow is to be set, I recommend setting a flow using the IFIM study results, in consultation with all concerned agencies.
Ten Mile Creek (1067)	This stream is already closed. I recommend continued closure. This stream is part of a joint study effort by the DOE, Lummi Fisheries and Soil Conservation Service. If a low flow is to be set, I recommend waiting until study results are available.
Deer Creek (0165)	This stream is already closed. I recommend continued closure.
Wiser Lake Creek (0194)	It is not clear whether or not this stream is already closed. I recommend continued closure, or closure if it is not already. If there is an existing low flow, I recommend review of the low flow by all concerned agencies.

Lummi Fisheries Recommended Closures in WRIA 1

STREAM	JUSTIFICATION
Squalicum Creek (0552)	This stream is already closed. I recommend continued closure.
Whatcom Creek (0566)	I recommend closure of this stream.
Stickney Slough/ Kamm Ditch (0222)	These streams is already closed. I recommend continued closure.
Anderson Creek	I recommend closure. This is a stream used by salmonids, where reduced flows, organic wastes and high BOD are a continuing problem. I believe that the existing and potential productivity of the stream warrant protection.
Johnson Creek	This stream is already closed. I recommend continued closure.
Saar Creek	This stream is a tributary to the Fraser River. If a minimum flow is to be set, it should be set with consultation with all concerned fisheries agencies.
Sumas River	This stream is already closed. I recommend continued closure.
Breckinridge Creek	This stream is a tributary to the Sumas River. If a minimum flow is set, it should be in consultation with all concerned fisheries agencies.
Smith Creek (0234)	This stream is severely affected by upstream logging. Summer low flow conditions may be limiting. I recommend closure.
Racehorse Creek (0394)	This stream is a productive salmonid producer. If an instream flow is set for this stream, it should be based on an acceptable IFIM study, in consultation with all concerned fisheries agencies. The proposed DOE appropriation flow of 37.66 cfs was not arrived at by an acceptable method that I know of. This stream is affected by upstream logging. I would also like to note that an instream flow set for a hydropower project's diversion reach will not necessarily provide needed instream flows in the anadromous zone.

STREAM	JUSTIFICATION
Maple Creek (0415)	This stream tends to dry up during the summer. I recommend closure for that reason. An instream flow can be set, using the 1983 IFIM data, in consultation with all concerned fisheries agencies.
Kendall Creek (0406)	I recommend closure for this stream. Instream flows can be set, both above and below the hatchery, using the 1983 IFIM data, in consultation with all concerned fisheries agencies.
Bells Creek (0390)	I do not have enough information to recommend anything for this stream. An instream flow can be set, in consultation with all concerned fisheries agencies.
Canyon Lake Creek (0340)	I do not have enough information to recommend an instream flow for this stream. The IFIM study that was done for hydro project evaluation related to a study site at the mouth of Canyon Lake. The setting of an instream flow for fisheries protection would be more appropriately done near the mouth, at or near the gauge site. This lower instream flow should be set to protect habitat for all species of salmonid present.
Canyon Creek (0437)	This stream is very productive for salmonids, and is of concern for damage from cumulative logging impacts. The setting of an instream flow should take these factors into account. The reach is not adequate to protect anadromous fisheries values in the lower part of the stream.
Boulder Creek	I do not have enough information to make a recommendation yet. The setting of an instream flow for a hydropower project's diversion reach should not be considered adequate to protect anadromous fisheries values in the lower part of the stream.
Cornell Creek (0464)	This watershed is severely affected by logging. An instream flow should be set to allow the most possible stream rehabilitation, in consultation with all concerned fisheries agencies. The setting of an instream flow for hydropower project's diversion reach should not be considered adequate to protect fisheries values in the lower part of the stream.

STREAM	JUSTIFICATION
Gallup Creek (0468)	There is not enough information to set flows for this stream. An instream flow needs to be set to maintain fisheries values, in consultation with all concerned fisheries agencies.
Thompson Creek (0472) Hutchinson Creek (0264)	These streams are productive salmonid streams. Instream flows need to be set to protect these resources. The instream flow proposed for hydropower projects, particularly that proposed for Thompson Creek, is not adequate to protect fisheries values. An instream flow can be set, in consultation with all concerned fisheries agencies, to protect fisheries values.
Skookum Creek (0273)	I recommend closure for this stream. The instream flow set for the Skookum Creek Hatchery intake is probably very close to the minimum necessary instream flow in the lower part of the stream, in a dry year.
Chuckanut Creek (0626) Oyster Creek (0638) Whitehall Creek Colony Creek (0648)	Instream flows should be set for these streams, in consultation with all concerned fisheries agencies. I request a summary of all existing water rights on these streams, to attempt an analysis of current appropriation levels.

APPENDIX D

WATER QUALITY CRITERIA

APPENDIX D

GENERAL INFORMATION

WATER QUALITY MANAGEMENT PLAN, PHASE I REPORT, CH2M/Hill

DEFINITIONS AND STREAM CLASSIFICATIONS

The chemical, physical, and biological properties of water determine its quality. These properties are determined by the presence of a variety of materials commonly called pollutants, and heat energy. A typical classification of these is:

- Microorganisms: bacteria, algae, others
- Macroorganisms: plants and aquatic animal life
- Dissolved gases: oxygen, nitrogen, carbon dioxide
- Suspended solids: soil, organic debris
- Oxygen-demanding organic matter: BOD, COD
- Nutrients: Nitrogen and phosphorus compounds, others
- Industrial chemicals
- Agricultural chemicals: pesticides, herbicides, others
- Metals: lead, mercury, cadmium, copper, etc.
- Inorganic ions: sulphate, chloride, etc.
- Heat energy (determines temperature)
- radioactive elements

The entry or occurrence of these materials and energy in water is the result of both natural processes, manmade systems, and human activity.

Water quality parameters are measures of the concentration or amount of these materials and energy present.

Water quality criteria are specific values of these parameters or judgments about their effects which have been established to protect desirable water uses.

Classifications of surface waters in Washington are based on water uses and are defined by specific criteria: minimum or maximum values of certain parameters (total coliforms, dissolved oxygen, temperature, turbidity, toxic, radioactive or deleterious materials, and aesthetic reaction to overall water quality. These criteria define acceptable conditions. There is, however, a wide range of possible quality levels.

Physical Parameters

Temperature. Temperature is a primary factor in determining the organisms found in surface waters. Temperature affects the rates of chemical and biological reactions. For example, the saturation concentration of oxygen in water, exertion of BOD, and oxygen production by photosynthesis are all functions of temperature. Seasonal variation of temperature causes major changes in dissolved oxygen concentrations: higher concentrations are found in winter when temperatures are lower, and lower concentrations are found in summer when higher temperatures prevail.

Suspended Solid. Suspended solids consist of natural clays, silicates, carbonates, oxides, living and dead microorganisms and the products of their decomposition, and manmade organic and inorganic colloidal pollutants. Stream velocity and turbulence are the key factors affecting the suspension of solids in water. Suspended solids affect aquatic life in several ways. They can reduce the light available for aquatic plants. Upon settling, they can affect the composition of bottom life as well as destroy fish spawning beds. Suspended solids can interfere with fish respiration by clogging gills.

Eroded soils are a major source of suspended solids in Whatcom County. In addition to affecting aquatic life, they reduce scenic values and can promote algal and aquatic plant growth because they carry nutrients. They can also carry absorbed pesticides. When deposited in Bellingham Bay, they increase dredging requirements and interfere with navigation.

Turbidity. Turbidity is a measure of the relative clarity of water. The suspended material measured as turbidity may be organic or inorganic, living or nonliving solids.

Dissolved Solids. The type and amount of dissolved matter in water are determined generally by geologic formations since ground and surface waters contain soluble matter derived from geologic structures. Surface waters in the headwaters of the Nooksack-Sumas Basin Typically are lower in dissolved solids than those near its confluence with Bellingham Bay. Lower concentrations also occur during peak flows, which consist mainly of surface runoff which has a shorter contact period with soluble sub- stances. As flow decreases, concentration of dissolved solids generally increases because a large percentage is of subsurface origin.

Conductivity. Conductivity or specific conductance is a measure of the ability of water to conduct an electric current. It depends on the amount of dissolved minerals, their degree of ionization in solution, and temperature. The conductivity of a nonpolluted stream is generally low (for example, in the upper Nooksack River, at Deming, it averages 72 pmho/cm, whereas in the Sumas River near the Canadian border, it averages 168 pmho/cm). The conductivity of a surface water remains relatively constant if there are (1) no major discharges of municipal, industrial, or other wastes; or (2) no dilution from tributaries with lower conductivities.

Chemical Parameters

Organic Pollution. Organic pollutants have a major influence on water quality. Biochemical oxygen demand (BOD) is the most-used parameter for determining the concentration of degradable organic materials present in water or wastewater. Its control or reduction is one of the principal objectives of municipal and industrial waste treatment.

Waste discharges and surface runoff principally determine stream concentrations of BOD. Storm runoff from dairy farms and livestock operations can be quite high in BOD, particularly following long dry periods. Initial runoff from an urban area is often high in BOD. Runoff from solid wastes sites can also be high in BOD. There are however, no available data on BOD levels of surface waters in Whatcom County.

Dissolved Oxygen. Dissolved oxygen (DO) is a measure of the healthfulness of water with respect to its ability to support aquatic life. DO is an important factor in determining the type, variety, and density of biological organisms. Its absence results in septic conditions and the destruction of most life forms dependent upon free oxygen. DO concentrations in a stream are the result of several interacting physical, biological, and biochemical processes. Most important are transfer of oxygen from the atmosphere and use of oxygen by living organisms. Other important factors are the velocity and depth of streamflow, water surface turbulence, turbidity, type of pollutants present, and temperature.

pH (Hydrogen Ion Concentration). pH is important to the type and condition of aquatic organisms found in a stream. It also influences many important chemical reactions.

Nutrients. Nutrients are of major concern because they may stimulate excessive growth of algae and aquatic weeds, and hence can affect the quality of water supply and recreational purposes. Of principal concern are nitrogen and phosphorus compounds.

Nutrients have several sources: (1) natural overland runoff, particularly from organically rich soils; (2) runoff from agricultural lands--fertilized fields--and from animal wastes; (3) ground water component of streamflow due to leaching from soils; (4) treated and untreated municipal sewage and urban storm runoff; and (5) certain industrial wastes. The contribution from agricultural runoff is highly variable depending on the erodibility of the fine solid fraction, farm management practices, and other factors.

Biological Parameters

Microorganisms. The occurrence and persistence of total or fecal coliform in streams are used extensively as indicators of bacteriological quality for water supply, contact sports, and recreational purposes. Total coliform can include coliforms of nonfecal origin which have no significance with regard to health aspects. Fecal coliform are harmless bacteria which originate in the intestinal tract of warmblooded animals. Their presence indicates that a pathway for disease-causing organisms exists.

WDOE WATER QUALITY CRITERIA (June, 1973)

Classification	Total Coliforms
AA	Median value shall not exceed 50 colonies/100 ml and less than 10 percent of samples exceeding 230 when associated with fecal source.
A	Median values shall not exceed 240 colonies/100 ml and less than 20 percent of samples exceeding 1,000 when associated with fecal source.
B	Median values shall not exceed 1,000 and less than 10 percent of samples exceeding 2,400 when associated with any fecal source.
	Dissolved Oxygen
AA	Shall exceed 9.5 mg/L.
A	Shall exceed 8.0 mg/L.
B	Shall exceed 6.5 mg/L or 70 percent saturation, whichever is greater.
	pH
AA	Shall be in range of 6.5 to 8.5 with an induced variation of less than 0.1 units.
A	Shall be in range of 6.5 to 8.5 with an induced variation of less than 0.25.
B	Shall be within range of 6.5 to 8.5 with an induced variation of less than 0.5.
	Turbidity
AA	Shall not exceed 5 JTU over natural conditions.
A	Shall not exceed 5 JTU over natural conditions.
A	Shall not exceed 10 JTU over natural conditions.
AA	Water temperature shall not exceed 60* F. due in part to measurable 0.50 F. increases resulting from human activities, nor shall such temperature increases, at any time, exceed t=75/(T-22); T=permissive increase, T resulting temperature due to all causes combined.

Classification	Total Coliforms
A	Same, except 65^{o} F. and t=90/(T-19)
B	Same, except 70^{o} F. and t=110(T-15)
	Toxic, Radioactive, or Deleterious Materials Concentration
AA	Shall be less than those which may affect public health, the natural aquatic environment, or the desirability of water for any usage.
A	Shall be below those of public health significance or which cause acute or chronic toxic conditions to the aquatic biota or which may adversely affect any water use.
B	Shall be less than those which adversely affect public health during the exercise of characteristic usages or which may cause acute or chronic toxic conditions to the aquatic biota or which may adversely affect characteristic water uses.
	Aesthetic Values
AA	Shall not be impaired by the presence of materials or their effects, excluding those of natural origin, which offend the senses of sight, smell, touch, or taste.
B	Shall not be reduced by dissolved, suspended, floating, or submerged matter not attributable to natural causes so as to affect water usage or taint the flesh of edible species.

Water Use	Lake	Classification* AA	A	B	C
FISHERIES					
Salmonid	F	F M	F M	F M	F M
Rearing	F	F M	F M	F M	
Spawning	G	G	G		
Warm Water Game					
Rearing	F	F	F	F	
Spawning	F	F	F	F	
Other Food Fish	F	F M	F M	F M	
Commercial Fishing	F	F M	F M	F M	
Shellfish	F	M	M	M	
WILDLIFE	F	F M	F M	F M	
RECREATION					
Water Contact	F	F M	F M		
Boating and Fishing	F	F M	F M	F M	F M
Environmental Aesthetics	F	F M	F M	F M	F M
WATER SUPPLY					
Domestic	F	F	F		
Industrial	F	F M	F M	F M	F M
Agricultural	F	F	F	F	F
NAVIGATION	F	F M	F M	F M	F M
LOG STORAGE & RAFTING	F	F M	F M	F M	F M
HYDROPOWER	F	F	F	F	F

* F denotes freshwaters
M denotes marine waters

APPENDIX E

SUMMARY OF
PUBLIC COMMENT AND RESPONSES

INDEX TO NOOKSACK COMMENTS AND RESPONSES

Name	Representing	Response Numbers
Wilfred E. Maberry	Self	112-117
Charles H. Weston	Petition with 77 signatures	118
R. W. Clubb, Ph.D	Puget Power	119-121
Wayne J. Beech	Self	122-125
D. Brady Green	U.S. Forest Service	126-128
Oral Hearing Testimony	Miscellaneous	129-148
Donna M. Simmons	Washington State Ecological Commission	149
Fred A. Shiosaki	Washington State Ecological Commission	150
Russ Orrell	Department of Fisheries	151
C. C. Pittack	Washington State Ecological Commission	152

ENFIELD FARMS INC.
1064 Birch Bay-Lynden Road
Lynden, WA 98264

September 17, 1985

Dept. of Ecology
Attn: Cynthia Nelson
Mail Stop PV-11
Olympia, Wa 98504

Dear Cynthia,

I am writing this letter in regard to the proposed Nooksack instream program, to be submitted as written testimony.

I am a strawberry & raspberry farmer and use the Bertrand Creek and it's tributaries for irrigation purposes. My ground is sandy loam soil and I rely heavily on Irrigation water in dry years to make my crop successful. This sandy loam soil is essential for raspberry and strawberry plants. The availability of this sandy loam soil makes Washington, and more specific, Whatcom County, the leading producer of Red Raspberries. Most of this sandy loam soil is found around the Bertrand and Fishtrap creeks. **1**

It has been a very dry summer this year and we have had to irrigate a lot more than normal. Yet we have not dried up these creeks and have worked together as farmers between one another to regulate the flow of water. So we do not need some regulatory committee to take care of these streams for us.

Agriculture land is becoming harder and harder to find, especially good sandy loam berry ground, as more and more gets eaten up by residential developments.

The water is what makes this sandy loam soil so valuable for the berry industry and without it we will not survive. For this reason I ask that Bertrand creek be taken off the minimum flow list of streams. **2**

Sincerely,
Marv. Enfield

ME/lh

STATE OF WASHINGTON
DEPARTMENT OF GAME
600 North Capitol Way, GJ-11 Olympia, Washington 98504 (206) 753-5700

September 17, 1985

Ms. Karen Johnson
Hearings Officer
Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504

RE: Nooksack Instream Resources Protection Program (Water Resources Inventory Area 1)

Dear Ms. Johnson:

The Department of Game supports, with reservations, adoption of the proposed minimum flows and closures in the Nooksack basin and other waters of WRIA 1. Our reservations pertain to discrepancies between Department of Game recommendations and Department of Ecology proposals and to omission of tributaries from surface water source limitations.

In proposed WAC 173-501-030(2), Department of Ecology has proposed substantially lower minimum flows than those recommended by Department of Game in Cornell Creek and Gallop Creek. Given the hydrology and channel morphology of these streams, we believe that closures in both streams should be extended to all year. **3** Results of a Department of Fisheries study using the Instream Flow Incremental Method (IFIM) indicate that <u>any</u> flow reduction in the North Fork Nooksack River would reduce habitat for juvenile steelhead. For this reason we have recommended that the North Fork Nooksack River be closed to any further appropriation of water rights, but Ecology's proposed regulations do not include closure. **4** We strongly urge Department of Ecology to close the North Fork. We note that in many streams Ecology is proposing lower minimum flows than the Game Department recommended for the late winter-spring spawning season for steelhead and sea-run cutthroat trout; we urge Ecology to reconsider these flows to protect spawning habitat. **5**

Department of Game personnel and area residents have pointed out Double Ditch as a serious low flow/water rights violation problem. This stream should be closed and water laws should be enforced. **6**

The language in proposed WAC 173-501-040 differs from the corresponding sections in other recently adopted Instream Resources Protection Programs. It does not indicate that the proposed status will apply to the named water body (source name) <u>and</u> <u>tributaries</u>. Tributaries appear to have been omitted from the regulation. We strongly urge that this omission be corrected. **7**

Establishment and protection of minimum flows is essential to the survival of Washington's fish and wildlife, as has been recognized by the state legislature and the state Game Commission, and as shown by biological studies. During 1985 the importance of protecting minimum flows has been illustrated by drought-related fish kills in the lower Nooksack basin. Not only fish, but fish-dependent wildlife, such as bald eagles and some fur-bearing mammals, depend upon protection of minimum flow.

Establishment of minimum flow is worthwhile only if minimum flow provisions are enforced. Elsewhere in Washington the Department of Ecology has begun enforcement of minimum flows and related water laws. A similar positive enforcement effort is urgently needed in the Nooksack basin. **8**

Sincerely,

THE DEPARTMENT OF GAME

Hal A. Beecher
Instream Flow Biologist
Habitat Management Division

cc: Cynthia Nelson (WDOE)
Ted Muller (Region 4)
Jim Johnston (Region 4)
Art Stendal (Region 4)
Brian Williams (Nooksack Tribe)
Joanne Schuett-Hames (Lummi Tribe)
Gordy Zillges

HAB:jt

MABERRY PACKING, INC.
816 LOOMIS TRAIL RD. 354-2094
LYNDEN, WA 98264
JAKE MABERRY
STRAWBERRIES AND RASPBERRIES

'85 SEP 20 A8:58

September 19, 1985

Hearings Officer, Wash. State Dept. of Ecology
Mail Stop PV-11
Olympia, Washington 98504

Re: draft Nooksack Instream Protection Program and
proposed Administrative Rules

Dear Sir:

I attended the preliminary hearing in Bellingham, Sept. 12, 1985, concerning water problems on the Nooksack River and its tributaries. My family and I have farmed in Whatcom County since 1943s and I am questioning several items brought up at the meeting.

This has been an unusually dry year in this County; quite possibly almost a record. We must remember, however, that Whatcom County is NOT Eastern Washington. The "Life-Blood" of Whatcom County agriculture is WATER, which we normally have too much of. When the time comes to irrigate, however, (only 1 or 2 summer months) we need to use water from ditches, creeks, swamps, and the river. Is it necessary to open up a "Water War" in this area of our State, when peaceful co-existence is the answer?

The Dept. of Ecology people (i.e. Cynthia Nelson), who moderated the meeting are uninformed. It is obvious from their statements that they know little about Whatcom County streams and agriculture. Here are some examples:

(1) They did not even know of the Double Ditch Creek near Lynden. **9**

(2) Ms. Nelson suggested we might get Water Rights in the Winter. FOR WHAT?? How absurd - in the winter and spring we have a problem with TOO MUCH WATER! **10**

In summary, I am opposed to the Bertrand and Fish Trap creeks and tributaries being included on your list of minimum flow streams, because of their location to prime agriculture land. Farmers have been led to believe that irrigation out of these streams is all right Now our Ecology Dept. is wanting to come in and regulate! It is unnecessary! **11**
All zoning and comprehensive planning has been and is to save FARM LAND. What good will it be in Whatcom County if we can't water in critical times; what it will amount to is WORTHLESS FARM LAND! **12**

THIS IS A WRITTEN TESTIMONY TO GO ON RECORD AGAINST YOUR PROPOSALS.

Sincerely Yours,

Jake Maberry

Jake Maberry, Pres.
Maberry Packing, Inc.

cc/Cynthia Nelson
Pete Kremen

WDE914.85

William L. Devine
P.O. Box 67
Maple Falls, WA 98266

September 14, 1985

Director
Washington State Department of Ecology
Mail Stop PV-11
Olympia, WA. 98504

ATTN: Ms Cynthia Nelson:

RE: Draft Nooksack Instream Protection Program and Proposed Administrative Rules, your letter dated August 21, 1985.

Dear Ms Nelson:

I have reviewed the above referenced document and the Declaration of No Significant Impact and have the following general and specific comments for your consideration.

General Comments:

1. Although there is a considerable amount of accurate and relevant data in the draft document, I have noted that numerous conclusions and recommendations have been proposed that are based on incorrect information and without a thorough analysis of the available data and facts. It appears that there has not been sufficient information provided to write a Declaration of No Significant Impact. **13**

2. It is my understanding from reading the documents that the proposed regulations would prohibit water withdrawals below the proposed minimums on many streams. I have noted that the proposed minimum flows have been arrived at -without a thorough review of the available information, is: FERC License Proceedings, and without specific information needed to verify the need for a specific instream flow. In many cases the flows proposed exceed those that occur naturally in the streams or in specific stream reaches. The adoption of such flows would not be appropriate for many reasons, and may create a need for further hearings, appeals and increased costs. As a result of these findings I have prepared a response to specific items below. **14**

Specific Comments:

<u>Page 4:</u>

WDE has proposed WRC policies to:

(a) establish minimum flows on 29 streams; (b) close 24 streams to future consumptive appropriations and (c) to confirm existing low flows and closures on 29 streams and lakes.

No reasons are provided for establishing flows on specific streams while ignoring other streams. At the meeting on September 12, you stated that there was not sufficient information available for other streams. It does not appear that sufficient data has been acquired on some of the streams where you have proposed minimum flows either. Perhaps the program should be postponed until sufficient data is available to accurately make instream flow recommendations. **15**

<u>Paces 33 & 34:</u>

It is stated in this Section that information and flow recommendations for fish requirements were provided by WDF, WDG and the tribes based on USGS toe-width methods and that the Incremental Instream Flow Method (IFIM) was also utilized or, some streams to evaluate flow needs.

I have in my possession numerous recent letters from these agencies, as well as other studies that state that the conventional application of these methods may not be appropriate to determine instream flows, particularly on steeper gradient streams. I have also been told that there is no statistical correlation in the results of the application of these two methods. I have applied both methods to two of the streams you have proposed to establish flows on and find no validity for your proposed flows. In fact it appears that the establishment of the flows you propose could adversely impact fish production. The agencies have written to me on numerous occasions to inform me that instreams flows must be established on site specific reaches following specific habitat mapping, development of preference curves, etc, etc., therefore, WDEs setting of minimum flows based on generic and unreliable methods would be in contradiction to other state agencies stated policies. If WDE can override other agencies policies, then this needs to be clarified and the same policies to establish flows should apply to individuals as well. This should be clarified in the regulations. **16** **17**

Page 103: New Section, WAC 173-501-020s

It is stated in this section that uses of water for hydroelectric power is declared to be beneficial and that base flows shall be established to provide for the preservation of wildlife, fish etc.

I have noted that WDE has not provided a specific description of the information or methods used to determine what an appropriate base flow should be, or to identify the benefits of hydroelectric power. The methods utilized to assess base flows and hydroelectric valuation should be described, be valid, and be fully explained to the public prior to the adoption of any instream flows and this program. **18**

Page 104-110, New Section WAC 173-501-030:

Unfortunately I am not knowledgeable of many of the streams on which specific flows have been proposed. I have however conducted extensive stream studies and observations over the last five years on the following streams:

Canyon Creek (Section 35,T40N,RGE)
Racehorse Creek (Section 11T39NR5E)
Maple Creek (Section 30,T40N, R6E)

I will therefore restrict my comments on this Section to these streams at this time.

Canyon Creek:

WDE has proposed an instream flow on Canyon Creek that varies from 150 to 40 CFS and has proposed a closure period.

My information shows that there is absolutely no basis for the proposed base flows or for the closure proposed. Much of the time the proposed base flows do not even exist in the steam. I have noted that in Appendix C the WDF, WDG and Lummi Tribe have proposed minimum flows front 228-53cfs. I note no valid documentation to support these proposed flows. There is much evidence in fact to illustrate that lower flows may enhance the fishery. **19**

I have completed extensive hydrology, geology, soils fisheries and other studies on this stream over the last five years while in the process of completing a License Application for a Small Hydro Energy Project (FERC NO 4312). It appears the WOE has not consulted the License Application and supplemental information reports that have been circulated to the WDE to assist in proposing instream flows. Had WDE consulted the information in the License proceeding it would have found that the WDG has written that an instream flow at the project diversion of 22 cfs appears reasonable and that the Nooksack Tribe has suggested that 35 cfs near the proposed powerhouse location my be an appropriate flow. An incremental flow study has been underway for over three years and the extensive photographic and measurement records illustrate that the proposed flows in the License application appear valid and are expected to improve conditions for fish production in this high gradient, turbulent, ungraded stream. **20**

In my opinion the adoption of the instream flows as proposed in your draft document for Canyon Creek are not necessarily valid and should not be adopted without further information. The flows proposed for the by-pass reach in the License Application for this project appear to be valid and should be recognized.

As a further note, I have noticed that the WDE recently approved an instream flow of 30 cfs or Wells Creek, a stream with similar characteristics and located within a few miles of Canyon Creek. **21**

Racehorse Creek: In general, my observations indicate that the same general comments on Canyon Creek above would apply to Racehorse Creek. A sixty foot falls exists on Racehorse Creek and prohibits salmon migration. The proposed instream flows have no validity above these falls and may be detrimental to fish production below the falls. **22**

Maple Creek: Although I do riot have a project proposed on Maple Creek it flows through land that I own and I am familiar with its hydrology and characteristics. Again your proposed flows are often greater than that which exist in the stream. In reviewing the limited information provided on the instream flow study that your agency completed I have noted that preference curves utilized have been stated to be invalid by the WDG and WDF. Should you wish to see letters from these agencies so stating I am sure those agencies would provide copies. **23**

Page 111: Section WAC 173-501-030 (5):

In this paragraph it is stated that hydroelectric projects that are proposed on streams with instream flows established by this regulation may adopt lower flows within specified reaches and that these flows shall be established by the Department. The last sentence states that when studies are required to determine such reach and project specific flow requirements the Department will require the project proponent to conduct such studies in consultation with affected state and federal agencies and Indian tribes. My concern with this paragraph is that there is no apparent method to identify the type of studies that are valid or which should be required, and there is no apparent method for resolution of conflicts between the various agencies and a project proponent. These items must be addressed and be clarified. **24**

Thank you for, the opportunity to comment on the proposed instream flow regulations.

CURT MABERRY FARM
STRAWBERRIES AND RASPBERRIES
729 LOOMIS TRAIL ROAD, LYNDEN, WA 98264
PHONE 354-4318 OR 354-4504

Dept. of Ecology
ATTN: Cynthia Nelson
Mail Stop PV-11
Olympia, WA 98504

Cynthia:

I, Curt Maberry, am writing this letter to be submitted as a written testimony regarding the proposed Nooksack Instream Resource Protection Program.

I am a third generation strawberry and raspberry farmer and have strawberries and raspberries along Bertrand Creek and its tributaries and Fishtrap Creek in Northern Whatcom County.

Farming has changed drastically in the last ten years and berry farming in particular has become very intensive. Strawberries and raspberries are located along these streams because it is here that we have good well drained sandy loam soil which is a must in the growing of these two berries. They can not stand a heavy undrained soil because they won't survive. It is along these streams that most of your berries in Whatcom County are located and it is not by accident but because of the particular soil that is found here and because of the water available for irrigation.

Because the plants require a sandy loam soil to grow in, they also require water to survive and that's where irrigation is a must. That's hard to believe in Western Washington, but water is the live blood to our farming operation, especially on the sandy loam soil that our plants have to be planted on.

Washington State is the leading state in the United States in the production of Red Raspberries, and Whatcom County is the leading County in the State of Washington in production of raspberries, and along these streams, the Bertrand and Fishtrap, are found most of your strawberries and raspberries. They are located here because of the sandy loam soil that is a must for them to grow in and the water availability that the streams offer for irrigation.

Most of our irrigation is done in the late spring and early summer-May, June, and July-when the fruit is starting to set. This is a very critical time for irrigation and usually our streams have plenty of water in them at these times. However, in a dry year like this past summer, we've had to water through August and up to the present with the fall rains

CURT MABERRY FARM
STRAWBERRIES AND RASPBERRIES
729 LOOMIS TRAIL ROAD, LYNDEN, WA 98264
PHONE 354-4318 OR 354-4504

just now beginning in order for the plants to survive. I've been told by most of the old timers that this summer has been as dry as they have ever seen. This is a very rare situation since we usually have more rain than we want in our summer season. But without water for irrigation from these streams, we would be out of the berry business. Irrigation is a must at certain times. It is the life blood to our farming and we are totally against any regulation or establishing a minimum flow on the Bertrand and Fishtrap and their tributaries. We and all the other farmers along these streams have managed in the past to work it out among ourselves, and we don't need someone regulating or establishing a minimum flow on these streams and their tributaries which flow through some of the most prime agricultural land anywhere. **23**

We are also sportsmen and own and manage many miles of land along these streams, and have done a good job as stewards of these resources. But we are also farmers, and when irrigation is necessary for our crops, we are going to irrigate!

We have been lead to believe that irrigating out of these streams was okay, and nothing has ever been done because they flow through such prime agricultural land, and that irrigation was a top priority with the water in these streams. The Department of Ecology after all these years of looking the other way or letting us believe that the water was there for irrigation if needed, is now wanting to regulate and establish minimum flows on these heavily agricultural streams. That is something that farmers along these streams just won't accept. **26**

Today with zoning and comprehensive planning so important in preserving agricultural land from urban encroachment, you are trying to take away the one thing that we have going for us besides our good sandy loam soil, and that is the water that makes this land what it is. I can't begin to see the Department's reasoning.

We ask that the Bertrand Creek and Fishtrap Creek and their tributaries, because of their location in such prime agricultural land, be taken off the minimum flow list of streams, and be left in the hands of the farmers who have taken care of and managed their water resources for irrigation purposes and so depend on that water for their crops. **27**

Sincerely,

Curt Maberry

Curt Maberry

CM:ml

Dick Bedlington Farms

Growers and Shippers of Certified Seed Potatoes

September 23, 1985

Department of Ecology
Mail Stop PV-11
Olympia, WA 98504

ATTN: Cynthia Nelson

Dear Ms. Nelson:

I, Dick Bedlington, am writing this letter to be submitted as a written testimony regarding the proposed Nooksack Instream Resource Protection Program.

As a second generation seed potato farmer, in northern Whatcom County, I am concerned about the minimum flow requirement proposed for the Bertrand and the Fishtrap Creek and their tributaries.

For seed potatoes, the sandy loam soil found along these waterways is ideal for seed potato farming and also important is the availability of water for irrigation.

Most of our irrigation takes place in June, July and August. This is a critical time for potato growth, and at this time water flow in these waterways normally is plentiful.

The summer of 1985 was exceptionally dry, necessitating more irrigation than usual. During the past summer, farmers have worked together to manage the limited water resources and it is my feeling that it has worked out very well. Do we need to spend taxpayer's money to regulate water usage when the present system is satisfactory?

The use of irrigation from these streams is essential to agriculture in Whatcom County. Our industry depends on that water.

It is therefore my request that Bertrand Creek and Fishtrap Creek and their tributaries, because of their location in such prime agriculture land, be taken off the minimum flow list of streams, and the management left to the farmers who depend on this water for their crops. **28**

Sincerely,

Dick Bedlington

8497 Guide Meridian / Lynden, Washington 98264 / Office (206) 354-5264 / Res. (206) 354-4561

Cynthia:

Pertaining to, the proposed Nooksack Instream Resource Protection Program for establishing a minimum flow on Bertrand and Fishtrap streams and their tributaries as well as some other 30 streams and lakes in Whatcom County by the Department of Ecology, I, Dwight V. Chilton would like to make a few comments.

First of all, because these streams are located right in the center of most of the sandy loam land of the county, and without this water for irrigation of strawberry and raspberries of which 1 am a grower of about 125 acres, the land drops in value with every new control the government puts on it. With out this water the land becomes almost useless.

In case some have forgotten, fishing and parkas and some of these other things are not No. 1 industries in the state of Washington farming is. If we are to continue to have the abundance and quality of food we have enjoyed for the past 100 years, the farmer must have No. 1 priority du the water of these small streams in Whatcom County. **29**

I do not see any problems at this time to merit such control at least on the two streams that I am familiar with, the Bertrand and Fishtrap.

I would like to suggest that these two streams and their tributaries not be included on the list of streams to have a minimum flow established.

Thank-You,

Dwight V. Chilton **30**

Dwight V. Chilton

Sept. 23, 1985

DEPT. OF ECOLOGY
ATTN: CYNTHIA NELSON
MAIL STOP PV-11
OLYMPIA, WA. 98504

CYNTHIA:

I, STAN VANDIEST, AM WRITING THIS LETTER REGARDING THE PROPOSED NOOKSACK INSTREAM RESOURCE PROGRAM.

I AM A RASPBERRY FARMER ALONG THE BERTRAND CREEK IN NORTHERN WHAT COUNTY. RASPBERRIES ARE A CROP THAT REQUIRE SOIL THAT IS WELL DRAINED WHILE THEY STILL REQUIRE SUFFICIENT WATER WHILE THEY ARE GROWING AND PRODUCING FRUIT. EVEN THOUGH THE PLANTS NEED WELL DRAINED SOIL, IRRIGATION IS A VERY IMPORTANT FACTOR IN THE PRODUCTION OF RED RASPBERRIES.

WATER IS A VERY IMPORTANT RESOURCE IN THIS COUNTY AND THE WAY FARMERS UTILIZE THIS RESOURCE IS THROUGH IRRIGATION.

AT THE MEETING ON SEPT. 12TH THE IDEA OF WATER STORAGE WAS BROUGHT UP. THIS IDEA WOULD NOT BE ECONOMICALLY POSSIBLE. THIS YEAR WAS AN UNUSUALLY DRY YEAR. I DON'T FEEL THIS YEAR COULD BE USED AS AN EXAMPLE. IF EVERY YEAR WERE THIS DRY AND THE CREEKS STAYED UNUSUALLY LOW THEN SOMETHING SHOULD BE CONSIDERED. **31**

IF I DIDN'T HAVE AMPLE WATER SUPPLY IN THE CREEK I WOULD FIND AN ALTERNATIVE. THAT IS ALL PART OF MANAGEMENT. BUT I WOULD LIKE THAT TO BE MY CHOICE. FROM WHAT I HAVE OBSERVED IN THE PAST WHEN GOVERNMENT STEPS IN AND TRIES TO REGULATE THINGS, IT DOES NOT NECESSARILY SOLVE THE PROBLEM. I PERSONALLY FEEL THAT IF THERE IS A PROBLEM THE FARMERS WILL WORK IT OUT THEMSELVES. **32**

TO REGULATE THE FLOW OF WATER IN THE STREAM WOULD BE DIFFICULT AND UNFAIR. MANY PARTS OF THE CREEK ARE FED BY GROUND WATER OR UNDERGROUND STREAMS. IN THESE AREAS THERE IS PLENTY OF WATER, EVEN ON A DRY YEAR SUCH AS THIS YEAR. I DON'T SEE HOW A MINIMUM FLOW COULD BE DETERMINED. ALSO, WE HAVE NO CONTROL OVER WHAT CANADA DOES ON THE NORTH END. **33**

ANOTHER POINT THAT WAS BROUGHT UP AT THE SEPT. 12TH MEETING WAS THAT THERE IS TROUBLE ENFORCING THE LAWS THAT ARE ALREADY IN EXISTENCE. TO PUT A MINIMUM FLOW ON THE CREEKS AND STREAMS WOULD ONLY PUT THE FARMERS AT ODDS WITH EACH OTHER.

FARMING IS A VERY IMPORTANT INDUSTRY IN THIS COUNTY AND WATER IS A VERY NEEDED RESOURCE TO THE FARMERS. TO PUT A MINIMUM FLOW ON CREEKS AND STREAMS MIGHT MEAN FINANCIAL DISASTER FOR FARMERS. I STRONGLY URGE THAT OUR CREEKS AND STREAMS IN THIS PRIME AGRICULTURAL COUNTY BE TAKEN OFF THE MINIMUM FLOW LIST OF CREEKS AND STREAMS AND LET THE FARMERS MANAGE THE WATER RESOURCES AMONG THEMSELVES. **34**

SINCERELY,

Stan Van Diest

STAN VAN DIEST

Sept. 24, 1985

Department of Ecology
Mail Stop PV-11
Olympia, Wa. 98504

Attn: Cynthia Nelson

Dear Cynthia:

I, Marty McPhail, am writing this letter regarding the proposed Nooksack Instream Resource Protection Program.

I farm raspberries along the Bertrand Creek and its tributaries in Whatcom County, west of Lynden. It is here that you find the sandy loam soil which is a must for growing raspberries. However, the soil is only the half of it. In order for these plants to survive and produce they need water. Irrigation water is applied in various methods, using the most modern and efficient equipment.

Historically, we irrigate late spring and early summer. This year was an exception with an extremely dry year. However, plenty of water was available. Without this irrigation water from these streams, we would be out of the berry business right now. We have always worked with the other farmers along these streams and feel we can continue to do so.

We are totally against any type of regulation or establishing a minimum flow on these streams. Irrigation is a top priority for the growth of these raspberries and we are going to irrigate! I don't understand the department's reasoning at all.

We suggest you remove the Bertrand Creek, and its tributaries, from the minimum flow list of streams and leave it to the farmers who have managed these streams for years. **35**

Thank you,

Marty McPhail

Marty McPhail
McPhail Berry Farms

DEPARTMENT OF PUBLIC WORKS, 210 Lottie St. Bellingham, Washington 98225
Telephone (206) 676-8061

September 25, 1985

Mr. Fred D. Hahn
Acting Supervisor
Water Resources Division
Washington State Dept. of Ecology
Mail Stop PV-11
Olympia, Washington 98504

Dear Mr. Hahn:

RE: Nooksack Instream Protection

The following comments are made in response to the Department of Ecology's draft Nooksack Instream Resources Protection Program (WRIA-1). We have reviewed the draft program and the Western Washington Instream Resources Protection Program Overview and have a number of serious concerns about the methodology and results of the program.

Page 4 of the draft Nooksack program states the methods and procedures used to develop the program came from the Western Washington program. A review of that document shows, for each stream, the 'hydraulic' approach will be used to calculate base flows and these figures will be used as the basis of discussions with Fish and Game. The draft Nooksack program makes no mention of this methodology and no results are presented. **36**

The "hydraulic' approach described in the Western Washington program distinguished between the high and low flow time periods with different formulae used to calculate the base flows. This approach clearly does not fit the Middle Fork of the Nooksack River where flows are remarkably uniform year around. **37**

Without a presentation in the report on the hydraulic approach results, it is difficult for someone interested in the process to gauge how effectively and aggressively the Department of Ecology "negotiated" with Fish and Game over the eventual recommendations. **38**

With respect to the recommendations of Fish and Game on flow levels, it does not appear that they are appropriate for use in establishing instream flows. The legislative mandate for instream flows (RCW 90.54-020) is a flow necessary for "preservation" of wildlife, fish, etc. Page 33 of the draft Nooksack program makes clear that the Fish and Game recommendations are preferred flows and not the amounts needed for preservation. These flows are clearly higher than necessary for preservation and have the effect of precluding the maximum net benefit analysis. **39**

Clearly the legislative intent was to establish base or minimum flows for preservation and allocate additional flows based on maximum net benefit. Neither the process used nor the results obtained lead me to believe the legislative intent has been followed. **40**

To correct these problems, I would suggest, for the Nooksack River, an appropriate method of establishing hydraulic flows be utilized and those values be used for meaningful negotiations with Fish and Game on the flow levels necessary for the preservation of wildlife, fish, etc. I would further suggest that these negotiations be conducted in a public forum or, at the very least, be available for review at a subsequent public hearing. **41**

Very truly yours,

John M. Garner, P.E.
Director of Public Works

JMG/ct

cc: Mayor Douglas
Senator Barney Goltz
Representative Dennis Braddock
Representative Pete Kremin

SEPTEMBER 27, 1985

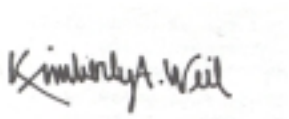
TO THE HEARINGS OFFICER:

I WISH TO EXPRESS MY SUPPORT OF THE GOALS OF THE "INSTREAM RESOURCE PROTECTION PROGRAM" AND THE ACCOMPANYING SET OF ADMINISTRATIVE RULES. WITH THIS PROGRAM I HAVE RENEWED OPTIMISM THAT FISH, WILDLIFE, & WATER QUALITY HAVE A CHANCE TO REALIZE A HEALTHY PERPETUATION INTO THE FUTURE, OUR ULTIMATE GOAL.

I ATTENDED THE SEPTEMBER 25, 1985 PUBLIC MEETING WHERE THOSE WITH THE STRONGEST INTERESTS IN THE WATERS OF THE NOOKSACK WATER RESOURCE INVENTORY AREA SPOKE OUT. FISHERIES & AGRICULTURE ARE THOSE WHOSE CONTINUANCE OF PRODUCTIVITY DEPEND ON ADEQUATE WATER SUPPLIES. I THINK DR. SUSAN COOK'S RECOMMENDATION OF AN INTEGRATED DESIGN ON THE CARE & USE OF THESE WATERS BETWEEN THE TWO PRIMARY USER GROUPS IS THE IDEAL SOLUTION. WITH EXISTING EXAMPLES OF MUTUALLY BENEFICIAL DESIGNS IN PLACE, I THINK THIS IS THE ROUTE TO FOLLOW. RIPARIAN ZONE IMPROVEMENT IS BUT ONE EXAMPLE OF FISH & FARM INTERESTS WORKING TOWARD THE SAME END.

PLEASE ACT IN THE FUTURE, AS WELL AS IN THIS NEW POLICY CONSIDERATION, TO PROTECT THOSE RESOURCES WHICH AFFECT US ALL & WITH WHICH WE ALL MUST LIVE IN HARMONY. WATER IN PARTICULAR. HAVING LIVED IN WESTERN WASHINGTON ALL MY LIFE I HAD NEVER EXPERIENCED A SHORTAGE OF WATER, UNTIL THIS SUMMER. THE STREAM THAT FILLS OUR WELL & ALSO EMPTIES INTO LAKE WHATCOM, RAN DRY. WE WERE FORCED TO BE ULTRA CONSERVATIVE LESS THE WELL RUN DRY, TOO. IT ONLY MADE EVIDENT TO ME HOW PRECIOUS WATER IS & HOW IT MUST BE MANAGED IN ORDER FOR FISH, COWS, BERRIES, SPUDS, & PEOPLE TO EACH TAKE A LIFE-SUSTAINING SHARE. ONLY THROUGH WATCHFUL MANAGEMENT CAN THIS BE ACCOMPLISHED.

ONCE AGAIN, I AM IN FAVOR OF PROTECTING INSTREAM RESOURCES AS DESCRIBED IN YOUR DRAFT PUBLICATION. IN THE FUTURE I HOPE TO BE ONE OF THOSE WORKING TO COORDINATE AGRICULTURAL & FISHERY NEEDS IN A WAY THAT ASSURES SUSTAINABILITY OF OUR INVALUABLE WATER RESOURCE. **42**



KIMBERLY A. WEIL
336½ N. GARDEN
BELLINGHAM, WA 98225

Hearing Officer
Department of Ecology
State of Washington
PV 11
Olympia, Washington 98504

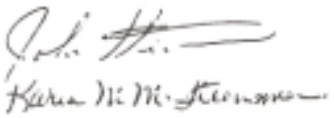
September 25, 1985

RE: Proposed Administrative Rules (Chapter 173-501 WAC) for the Nooksack Instream Resources Protection Program (Water Resource Inventory Area 1) under the State Water Program, as outlined in a booklet produced by the Washington State Department of Ecology, August 19th, W.W.I.R.P.P. Series – No. 11

Please send us copies of all original water rights held on the Bertrand and Fishtrap Creeks. **43**

Please include the two enclosed statements in the public record for the hearing held on the evening of September 25, 1985 at the Bellingham Public Library.

Thank you



John Steensma
Karen Steensma
9295 Axling Road
Lynden, Washington 98264

My family owns property through which the Fishtrap Creek flows; my husband's family owns property through which the Bertrand Creek flows. Both of these properties are portions of dairy farms which have, from time to time, put creek water to agricultural use. I hold a master's degree in marine biology and as a biologist with agricultural ties, I have observed these two creeks with much interest.

In the past 15 years the Fishtrap Creek has degenerated from a clear stream bursting with fish and freshwater clams to a dark and sometimes smelly ditch. The Bertrand Creek has similarly degenerated. I believe that certain agricultural and industrial uses of these streams, both in British Columbia and in Whatcom County, have had adverse effects on fish habitat area. Something must be done.

But I do not recommend enforcement of complete closure of Bertrand, Fishtrap and other creeks as proposed by the Washington State Department of Ecology. I have been rather unimpressed with WDOE's past recommendations in relation to agriculture. They have been impractical and shown a lack of foresight. Likewise, the current issue and its presentation have been poorly handled. For example, much of the material in the booklet distributed at the public hearings was unreadable. **44**

I would recommend that the WDOE, Washington Department of Fisheries, Washington Department of Game, Washington Department of Agriculture, Soil Conservation Service and any other pertinent agencies make a cooperative effort to:

1) develop an agreement with British Columbia on Canadian uses of these streams; **45**

2) develop regulations for agricultural use of these streams such that water in excess of minimum flows necessary for fisheries be more fairly allocated to property owners, perhaps on a per acre basis as has been done in California. **46**

3) enforce regulations consistently, perhaps hiring enforcement agents during the summer only, since this is when most problems occur. **47**

I am hopeful that a balanced solution to these problems can be reached, allowing for the maintenance of one of the richest agricultural regions in the state as well as for healthy fisheries. **48**

Karen M. M. Steensma

I own a dairy farm which in irritated, in part, by water from the Bertrand Creek. My family applied for water rights on the Bertrand Creek some 8 years ago, at which time we discovered that no further rights would be granted for this creek. However, we and other property owners along the creek have always irrigated without concern for the legality of our actions as no state agency has ever enforced stream closure for Bertrand Creek to the best of our knowledge. **49**

The portion of Bertrand Creek which runs through my property has never been completely dry. However, this past summer it reached a condition of no flow, or stagnant water, for the first time in the 23 years I have lived here. This was due in part to the building of a temporary dam by a property owner just upstream from me. The dam was installed for irrigation purposes and its construction destroyed perhaps 50 feet of the stream bank vegetation. **50** **51**

In my lifetime I have witnessed the degeneration of Bertrand Creek from a healthy, free-flowing stream of at least 12 inches in depth to a dirty, brown trickle. I am unhappy with the abuse of this and other local streams by property owners who have taken more and more water over the years, removed stream bank vegetation, allowed livestock to enter streams and dumped garbage in the streams. Some type of regulation is needed.

But I do not recommend enforcement of complete closure of Bertrand, Fishtrap and other creeks as proposed by the Washington State Department of Ecology. Instead, I recommend that the WDOE, Washington Department of Fisheries, Washington Department of Game, Washington Department of Agriculture, Soil Conservation Service and any other pertinent agencies make a cooperative effort to:

1) develop an agreement with British Columbia on Canadian uses of these streams; **52**

2) develop regulations for agricultural use of these streams such that water in excess of minimum flows necessary for fisheries be more fairly allocated to property owners, perhaps on a per acre basis as has been done in California.

3) enforce regulations consistently, perhaps hiring enforcement agents during the summer only, since this is when most problems occur.

I am hopeful that a balanced solution to these problems can be reached, allowing for the maintenance of one of the richest agricultural regions in the state as well as for healthy fisheries.

John V. Steensma

MABERRY PACKING, INC.
816 LOOMIS TRAIL RD. 354-2054
LYNDEN, WA 98264
JAKE MABERRY
STRAWBERRIES AND RASPBERRIES

September 19, 1985

Hearings Officer, Wash. State Dept. of Ecology
Mail Stop PV-11
Olympia, Washington 98504

Re: draft Nooksack Instream Protection Program and
proposed Administrative Rules

Dear Sir:

I attended the preliminary bearing in Bellingham, Sept. 12, 1985, concerning water problems on the Nooksack River and its tributaries. My family and I have farmed in Whatcom County since 1943, and I am questioning several items brought up at the meeting.

This has been an unusually dry year in this County; quite possibly almost a record. We must remember, however, that Whatcom County is NOT Eastern Washington. The "Life-Blood" of Whatcom all County agriculture is WATER, which we normally have too much of. When the time comes to irrigate, however, (only 1 or 2 summer months) we need to use water from ditches, creeks, swamps, and the river. Is it necessary to open up a "Water War" in this area of our State, when peaceful co-existence is the answer?

The Dept. of Ecology people (i.e. Cynthia Nelson), who moderated the meeting are uninformed. It is obvious from their statements that they know little about Whatcom County streams and agriculture. Here are some examples:

(1) They did not even know of the Double Ditch Creek near Lynden.
(2) Ms. Nelson suggested we might get Water Rights in the Winter. FOR WHAT?? How absurd - in the winter and spring we have a problem with TOO MUCH WATER!

In summary, I am opposed to the Bertrand and Fish Trap creeks and tributaries being included on your list of minimum flow streams, because of their location to prime agriculture land. Farmers have been led to believe that irrigation out of these streams is all right. Now our Ecology Dept. is wanting to come in and regulate! It is unnecessary! All zoning and comprehensive planning has been and is to save FARM LAND. What good will it be in Whatcom County if we can't water in critical times; what it will amount to is WORTHLESS FARM LAND!!

THIS IS A WRITTEN TESTIMONY TO GO ON RECORD AGAINST YOUR PROPOSALS.

Sincerely Yours,
Jake Maberry
Jake Maberry, Pres.
Maberry Packing, Inc.

53

cc/Cynthia Nelson
Pete Kremen

My name is Dick Clark. I am the President of the Whatcom Chapter of the N.W. Steelhead and Salmon Council of Trout Unlimited, Area Director for Northern Washington and Projects Chairman for the State of Washington.

The N.W. Steelheaders of Trout Unlimited are dedicated to the conservation and protection of the coldwater fisheries.

This afternoon I attended a meeting of a newly formed Whatcom Enhancement Council. These are volunteer fisher people, both commercial and sport with enhancement projects in the Nooksack drainage area.

It was pointed out by one of our area biologists, fish are stranded in pools without sufficient water and are dying by the thousands in many areas. The Nooksack River is at a serious low level flow this fall. The resident fish are withdrawing from the tributary streams because of lack water, to the main river to survive.

No longer can a person draw water from a creek for irrigation with utter disregard for the fishery resource and his fellow neighbors.

There is not much sense in the various enhancement groups spending thousands of dollars to enhance the fisheries resource if the fish haven't any place to live when they are planted in the streams.

The Dept. of Ecology must define minimum flows in our streams that will adequately protect the fish and then enforce these laws. 54

We realize farming and logging are important industries to our economy, but they cannot be pursued to the ruination of our fishery.

TESTIMONY OF
WHATCOM COUNTY FARM BUREAU
FOR
DEPARTMENT OF ECOLOGY HEARING
BELLINGHAM PUBLIC LIBRARY
PRESENTED BY
LINDA ZANDER
SEPTEMBER 25, 1985

My name is Linda Zander, 2003 Pangborn Rd., Lynden, Wa. I am testifying on behalf of the Whatcom County Farm Bureau.

As farmers; we share your interest in protecting the Nooksack Instream Resources, but we are concerned with the way this might be done. The Voter Resources Act of 1971 - 90.54.020 states, "Uses of water for domestic, stock watering, industrial, commercial, agricultural, irrigation, hydro-electric power production, mining, fish and wildlife maintenance and enhancement, recreation, thermal power production purposes, and preservation of environmental and aesthetic values shall be the fundamentals for utilization and management of waters of the state."

It further states, "Allocation of waters among potential uses and users shall be based generally on securing, of the maximum net benefits, not minimum, for the people of the state." How do you secure maximum benefits if the D.O.E. emphasis is completely biased towards environmental protection with no other consideration given toward other legislative mandated multiple uses? **55**

The document of Determination of Nonsignificance, D.O.E., Pg. 8, states that the proposed project of raising the minimum stream flows, "May enhance recreation by retaining minimum flows to streams, and retaining lakes and ponds in their natural condition." Does this not recognize that appropriate information an this counties water flows and reserves are not presently known? **56**

The 1985 Legislature has provided seven now positions to begin the project of mapping the states water reserves in co-operation with the U.S. Geological Survey and the states health organizations. Most material presented by the Department of Ecology on stream flows, minimum and maximum are twenty years old.

Some streams may have more water now than 1971 and some must certainly have less. Yet, the Dept. of Ecology is proposing to raise the minimum stream flows without the information that justifies this action. Even our Legislature recognizes the need for current readings; why doesn't the D.O.E.? 57

D.O.E. official John Glenn stated in the Bellingham Hearald, June 25, 1985, that, "In the absence of good data we can't afford to gamble." Is it possible that the Dept. of Ecology is afraid to receive the information from the geological surveys that might substantiate that there is no need to raise the stream minimums? 58

In the Environmental Checklist the D.O.E. states, "The proposal will not adversely impact parks, wilderness, wild and scenic rivers, endangered species habitat, historic and cultural sites, wetlands, flood plains, or prime farmlands." Raising the minimum flows on the Nooksack River could adversely affect agriculture by denying them the right to irrigate good farmland and hence limit production in these areas. It also would limit the right of hydro-electric utilization of excess waters; this means a loss of income and jobs to Whatcom County people. A suggestion brought up by farmers is that because some pumping on streams without permits has been going on; that time be allowed to develop alternate sources of water. 59

We would, therefore, request that a Basin – specific environmental impact statement be required with the information included from the new geological survey being done on the water in Whatcom County. 60

The N.I.S.P. program states, "The agricultural and forest industries have traditionally been important to the economy of the Nooksack WRIA. Why then, has the D.O.E. not given proper considerations to this? 61

Farm Bureau takes issue with the intent to set higher minimum instream flows without justification. We feel that the attitude the Dept. of Ecology is taking regarding water protection of "out of sight, out of mind" is not within the intent of the State Water Resources Act of 1971. Water in Whatcom County must be used to achieve the maximum benefits and should be shared by all uses. 62

Thank you for your time and the opportunity to input into this critical Whatcom County issue.

5079 Everson-Goshen Rd.
Bellingham, Washington 98226
2 October 1985

Hearings Officer
Washington Dept. of Ecology
Olympia, Washington 98504

Dear Madam/Sir:

I am writing in regard to the Nooksack Instream Resources Protection Program. I have read the August 1985 report (WWIRPP Series, #11), and I attended the 25 Sept public hearing in Bellingham.

I support the establishment of minimum instream flows in this area and throughout the state. Valuable riparian habitat for fish and wildlife must be protected, as well as water resources for domestic and agricultural use. In addition, the provisions of WAC 173-501 must be enforced. **63**

The public hearing was well-attended, and of the 16 people who spoke 8 were in favor, 7 were not, and 1 was mixed. Perhaps there was a misunderstanding that pre-existing water rights would be preserved, but more likely there was a feeling that the state was taking away what farmers felt was their right to an inexhaustible resource. In my opinion agricultural practices and forestry practices can – and should – be modified to accommodate not only fish and wildlife but farmers and loggers as well. **64**

One apparent problem, however, is alternative water resources. Retention of winter flood water sounds like a good idea, but it may be expensive and impractical. Groundwater resources are notoriously unreliable here, since much of Whatcom County is hardpan; I do not know enough about soils to predict the viability of wells in areas which have soils suitable for agriculture. One simple, and relatively inexpensive solution, is the construction of holding ponds. They can provide not only water for summer irrigation but also year-round habitat for waterfowl and some wildlife. Finally, they are easy for hardpan soil, which simply holds the winter rains all year round and without seepage. **65**

Thank you for this opportunity to comment.

Sincerely yours,
Sylvia A. Thorpe

Bonnie Strode
1440 Lowe Avenue
Bellingham, Washington 98226

September 30, 1985

Washington State Department of Ecology
Attention: Hearings Officer
PV-11
Olympia, Washington 98504

Dear Hearings Officer,

On September 24, 1985, I attended the public hearing at the Bellingham Public Library conducted by the Department of Ecology regarding the proposed closure of further appropriations in the Lake Whatcom basin.

I am a rate-payer of Whatcom County Water District #10 and live in the Geneva area. The District, under the present arrangement with the City of Bellingham, buys treated water from the City and sells it to their Geneva customers.

Lake Whatcom is geographically located within the District's jurisdictional boundaries. As a rate-payer, I am forced to pay the city (through the district) for what appears to be an impractical means of water distribution. The District owns and maintains a sophisticated water treatment plant on Lake Whatcom and could provide the necessary service, eliminating the need to pump the water presently being taken from the lake by the city two (2) miles beyond my house and then back again – at my expense.

Water District #10 Commissioners are elected by the people they are to serve within the District and to protect their interests. Because I live outside the City limits, I am not allowed to vote for the Mayor of Bellingham or the City Council. Therefore, I have no say, under the present arrangement, on how I get my water or how much required to purchase water on a wholesale basis from the City, our Commissioners cannot serve the rate-payers effectively.

I support the proposed closure of the Lake Whatcom basin provided that the water rights filed for by Whatcom County Water District #10 with the Department of Ecology be certified. **66**

Thank you for the opportunity to respond and for your consideration in this matter.

Respectfully

Bonnie Strode

Bonnie Strode

cc: Ms. Joan Thomas, Regional Mgr.
Whatcom County Water District #10

NOOKSACK INDIAN TRIBE
P.O. Box 157
Deming, Washington 98244
Telephone (206) 592-51767

Ms. Karen Johnson
Hearings Officer
Department of Ecology
Mail Stop PV-11
Olympia, Wa. 98504

RE: Nooksack Instream Resources Protection Program (Water Resources Inventory Area 1)

Dear Ms. Johnson:

The Nooksack Tribe is uncomfortable with the adoption of the proposed flows and closures in the Nooksack basin and other waters of WRIA 1. We appreciate the opportunity to comment on the proposed WWIRPP for the Nooksack basin and offer the following concerns and reservations for your consideration.

1. The use of 50% exceedance as a blanket methodology for establishing minimum flows usually reflects flows lower than those proposed by WDF and WDG. In support of WDF and WDG proposed flows, we feel that in many cases the flows set by 50% exceedance do not adequately protect the salmonid fish species in the basin. **67**

2. The hydrographs used to establish minimum flows for the following tributaries, Canyon (NF), Cornell , Gallop, Hutchinson, Maple, Porter, Racehorse, and Smith Creeks are of questionable value in that they have been correlated to tributaries or river sections that reflect dissimilar watershed and/or physical characteristics. To establish minimum flows by using these hydrographs in combination with applying 50% exceedance without considering WDF and WDG proposed flows does not, in our opinion, reflect the utilization of the best available data. We urge you to review the hydrographs and reconsider WDF and WDG recommended flows before setting minimum flow provisions for the afore mentioned tributaries. **68**

3. The proposed partial closures for the following tributaries, Canyon (NF), Racehorse, Skookum, Hutchinson, Saar, and Porter Creeks seem arbitrary and inconsistent with WDF and WDG recommended closures and therefore are inadequate to insure salmonid species protection. In review of these closures we would recommend and support a July 1 - November 15 closure of the afore mentioned tributaries. **69**

4. We do not feel that the location of the gauging station at RM 14.8 on the South Fork Nooksack will adequately reflect South Fork minimum flow provisions based on IFIM data at RM5. We would urge DOE to use and ably the best Available data in establishing and monitoring minimum flow provisions for the South Fork Nooksack and therefore locate the gauging station at or near the IFIM study site at RM5. **70**

5. We would recommend that a summer-fall closure of the North Fork Nooksack river be considered for three reasons: 1. To maintain and protect juvenile steelhead rearing habitat availability. 2. To insure adequate spawning habitat availability for summer-fall salmon species. 3. And to maintain adequate summer-fall flows in the North Fork Nooksack in order to contribute a significant enough flow contribution to the mainstem Nooksack below Deming so as to offer a dilution effect for a mainstem water quality problem that exists below Ferndale. Water quality in the mainstem Nooksack has been brought to our attention as a possible problem area and we would urge DOE to further identify the water quality aspect of the lower Mainstem Nooksack River before finalizing minimum flow provisions for the North Fork Nooksack. **71**

6. The Nooksack Tribe supports the recommendation of WDG that closures for Cornell and Gallop Creeks be extended to all year in order to protect the fisheries resources present. We would also recommend full year closures for the following tributaries; Kenny Creek, Coal Creek, Thompson Creek, Boyde Creek, attention in the WWIRPP process, each provides valuable salmonid spawning and rearing habitat and have historically supported steelhead and salmon populations that are significant to the overall North Fork basin productivity. We therefore urge their closure and protection via the WWIRPP process. **72**

7. Maple Creek has historically supported a strong spawning population of native chum salmon during a November 1 - January 31 time period. Chum salmon in the Nooksack basin are managed on a native stock (i.e. natural spawning production) basis and we feel that the contribution of the Maple Creek chum salmon spawning population to the overall basin chum protection is significant enough to justify protection. We would recommend that the closure on Maple Creek be extended to include the months of November, December and January or that the minimum flow threshold for these same months be set at 30 cfs rather than the proposed 20 cfs. **73**

8. Minimum flow provisions are only as strong as the degree to which they are enforced. If WWIRPP flow provisions are to afford significant protection for the Nooksack basin, then a positive enforcement effort will be needed. We would urge the DOE to be attentive to this aspect of the provisions. **74**

9. The proposed siting of the gauging station in the vicinity of RM5 on the Middle Fork Nooksack while utilizing IFIM data collected in the vicinity of RM1 does not in our opinion employ the best available data. We are aware that an IFIM study has **75**

Discussion continued on appropriate species and spawning flows for November, December and January. Since chum salmon are the most viable wildstock species to spawn in the Nooksack River during these months, Pete Rittmueller recommended that the minimum instream flows be set at the peak of the curve for chum salmon spawning in November, December, and January.

Brad Caldwell questioned whether the recommended flows would be sufficient to satisfy chinook incubation flows throughout the period and steelhead holding flows in January.

The question of incubation flows was answered by reviewing the reduction in depth at the spawning transect (#2) from middle to low flows at the CES study site. Since the recommended minimum flow for October was 275 cfs, nearly equal to the middle calibration flow of 310 cfs, and the recommended minimum flow for November, December, and January was 175 cfs, nearly equal to the low calibration flow of 200 cfs, it was felt that the drop in water surface elevation (WSE) for the calibration flows would be fairly accurate in predicting the reduction in depth for the respective minimum flow. Transect #2 at the CES study site showed a 0.34 foot decrease in WSE from middle to low flow. This decrease is well within the standard of a 0.5 decrease in depth normally used in calculating incubation flows. After the meeting the modeled calibration details were examined by Pete Rittmueller for the recommended minimum flows of 275 cfs and 175 cfs and the difference in WSE between these flows was 0.31 feet. It was agreed by all parties that a flow of 175 cfs would provide adequate incubation flows for pink and chinook salmon.

To generate the data necessary to resolve the question of steelhead holding flows, Pete Rittmueller and Art Stendal calculated the weighted usable area (WUA) for steelhead holding at two minimum flow regimes. Combined steelhead holding for both study sites was arrived at by weighting the lower (WDF) study regime of 175 cfs at the upper site and 200 cfs at the lower site produced a steelhead holding WUA of 14,467 ft^2/1,000 feet of river. A minimum flow regime of 275 cfs at the upper site and 300 cfs at the lower site produced a steelhead holding WUA of 14,307 ft^2/1,000 ft. of river. The difference in steelhead holding WUA was 1% between the two flow regimes and it was a consensus of all parties that a minimum flow set at the optimum chum salmon spawning flow would adequately provide for steelhead holding habitat.

It was tentatively agreed by all parties that optimum chum salmon spawning flows should be the minimum flow for November, December and January and optimum chinook spawning flows should be the minimum flow for October.

Steelhead spawning timing in the Nooksack River was then discussed. Available data from WDG spawner and redd surveys indicate that steelhead spawning does not generally begin in the Nooksack River until after March 1 and peak spawning is in May. Since it had been established previously that optimum flows for chum salmon would be adequately provided for steelhead holding, optimum chum salmon spawning flows were agreed to for February.

The following is a summary of minimum Instream Flows to be left in the Middle Fork Nooksack River for operation of the Mirror Lake Project.

MONTH	RM 5.6	RM 1.4
October	275 cfs	300 cfs
November		
December		
January		
February	175 cfs	200 cfs

Agreement for these flows was given by Jean Caldwell of WDF and Brian Williams of Nooksack Tribal Fisheries. Tentative agreement was given by Art Stendal for WDG and Steve West for WDOE, subject to approval by their respective agencies.

Pete Rittmueller noted that the analysis of pre and post project spawning habitat, based on actual daily flow data, indicated that the tentative flow agreement is expected to produce a net 9% increase in spawning habitat for chinook and chum salmon.

The discussion turned to the issue of how the instream flow would be monitored. An agreement was reached that a recording instrument would be installed at the present USGS gauging station at mile 5.6 and in addition whenever the flow stabilized near the agreed minimum flow then a flow reading would also be taken at mile 1.4 for the first year. The Shipps will keep these records and make them available to the agencies upon request.

Following the tentative agreement on instream flows, the discussion was opened to any other concerns the agencies might have with the proposed diversion. In response to a question from Steve West, on how the water in Lake Whatcom would be managed, Bob Shipp gave a review of the present and proposed operational procedures for the total project. The review covered the following items.

The Shipps contractual agreement with the City of Bellingham reserves to the city the right to control the amounts of water and times of use in the pipeline. This control is based on the city's water right which allows a year round withdrawal of up to 95 cfs from the Middle Fork.

For the 1985 year the city gave approval for a pipeline withdrawal of 57 cfs for the period of March 1 through October 1 with the right to cancel that approval on 24 hours notice. The project is now operating with this withdrawal.

The city has also given approval of up to 57 cfs during the period of October 1 through March 1, with the condition that the Shipps either provide for withdrawal from Lake Whatcom of the same amount each day as is diverted into the lake by the pipeline or that the pipeline only be operated at times it will help assure that the level of Lake Whatcom is close to its established minimum level and thus a beneficial use of the water occurs in addition to power production.

The city regulates the level of Lake Whatcom under Reservoir Permit 121. Their established policy is to have the level of the lake at 314' during the months of April through September and at 311.5' from November through February with March and October being transition months. For the 1985-86 winter season the city stipulated that if the lake level is at 311.5 or below, the pipeline may be operated. In addition, if the lake is between 312 and 311.5 and not increasing, the pipeline may also be operated.

During the discussion that followed, Steve West pointed out that any water diverted from Lake Whatcom by the Shipps would have to be for a beneficial use. Bob Shipp replied that the plan is to use the additional capacity in the city's industrial pipeline serving Georgia Pacific and also generate power at that point, which would be another project.

To conclude the meeting, Pete Rittmueller indicated that he would be mailing to everyone a summary of consultation which would include the tentative flow agreements.

In addition, Bob Shipp will be mailing to each agency a request for permission to operate the project from October 1 to March 1, with the stipulation that the instream flows will be maintained and also listing the conditions set by the city and agreeing to abide by those. When each agency has responded affirmatively, the project can proceed.

Each agency is requested to review this summary of consultation and respond in a letter to verify the contents of this summary and the final instream flow agreement. If you have any questions please call me.

Very truly yours,

Pete Rittmueller

Department of Ecology
Mail Stop PV-11
Olympia, Washington 98504-8711

Attention: James Bucknell

This letter and the attached reports are hereby submitted as part of the hearing record held on Wednesday, September 25, 1985 at 7:00 p.m. in Bellingham for proposed administrative rules (Chapter 173.501 WAC) and support the oral testimony given by Robert Shipp at that time.

Our position is that the flows for the Middle Fork of the Nooksack River should be set no higher than 275 cfs for the month of October, and 175 cfs for the months of November through February at mile 5.0. **79**

This position is based on the enclosed report prepared by Cascade Environmental Services, which summarizes the results of two independent studies done on the Middle Fork , and on the summary of consultation dated July 2, 1985.

The following major points support our contention.

1. The Department of Ecology in its handout on the Washington Instream Protection Program under the title "Minimum Flow Setting Procedure" states that "I.F.I.M. is considered by most experts to be the superior method currently available." **80**
2. The two I.F.I.M. studies, one done by the Department of Fisheries at Mile 1.4, the other by Cascade Environmental Services at Mile 5.3 accurately modeled the Middle Fork and were remarkably consistent with each other.
3. The studies demonstrated that 275 cfs is the optimum flow for Chinook spawning at river Mile 5.3 and 175 cfs is the optimum flow for Chum and Coho spawning at the same point. **81**

Received Oct 4 1985
Federal Express

LUMMI INDIAN BUSINESS COUNCIL
2616 KWINA RD. • BELLINGHAM, WASHINGTON 98226-9298 • (206) 734-8180
DEPARTMENT FISHERIES EXT 236

October 1, 1985

Ms. Karen Johnson
Hearings Officer
Department of Ecology
Mail Stop PV-11
Olympia, WA 98504

Dear Ms. Johnson,

Enclosed are technical comments from the Lummi Fisheries Department on the proposed Nooksack Instream Resources Protection Program.

The Lummi Indian Tribe has reserved to its use and benefit all of the waters of the Nooksack River and its tributaries which are necessary and appropriate to carry out the purposes of the Treaty of Point Elliott. This Treaty, signed in 1855 by the United States and many Indian Tribes, acts as an 1855 priority date reservation of sufficient waters, and of waters of sufficient purity, as are necessary to assure the Indian signers of the Treaty a productive and permanent home on their reservations. The rights reserved in the Treaty, especially the fishing rights, extend off the reservation into the whatever drainage area affects the ability of the Indians to exercise their treaty rights. The state is not permitted to reduce the quantity or the quality of the reserved waters in derogation of the tribal reserved rights.

I encourage you to work with us to ensure that the proposed regulations protect our treaty rights and the fisheries resource.

Sincerely,

William E Jones

William Jones
Vice Chairman
Lummi Indian Business Council

DS/lt

4. The principal activity requiring the greatest flows during October is Chinook spawning and during November through January it is Chum spawning. **82**

5. The optimum Chum spawning flow provides the required less than 6" reduction in flow height for Chinook incubation. In fact, the actual reduction was .31 feet.

6. The studies show that flows in excess of 175 during November through January will decrease Chum spawning habitat by as much as 13% if a minimum flow of 300 cfs is used.

7. The Department of Ecology in relying on the Department of Game and Fisheries for recommendations must be knowledgeable that they are using optimum flows or greater in their recommendations and that the use of optimum flows or greater is in conflict with the intent of Chapter 90.54 R.C.W. specifically 90.54.020 (2) and (3) a. We contend that the proper flow is a maintenance flow which would provide the same weighted usable habitat after withdrawal as would have existed without the withdrawal. **83**

   A quick example will support this point. A project is proposed be it industrial, agricultural, commercial, or hydroelectric, which would remove 50 cfs from the Middle Fork at Mile 5.3 and needs a minimum instream flow of 250 cfs in October to be profitable. Under these conditions the studies show the maintenance flow would be 235 cfs but the optimum flow is 275 cfs. If the optimum flow is used as the minimum flow the project dies, but it would have been beneficial to the fisheries resource as it could have accepted a minimum flow above the maintenance level and succeeded.

   Therefore if a major disagreement arises over the recommendations of Game and Fisheries, the Department of Ecology should by law support the position closer to maintenance flows than optimum flows. **84**

Removed: Instream Flow Studies / Whatcom County
Report by Cascades Environmental Services
Bellingham, June 1985 - Sent to Cynthia Nelson

Following are comments from the Lummi Tribal Fisheries Department on the Nooksack Instream Resources Protection Program proposed by the Washington State Department of Ecology. While the Lummi Fisheries Department supports the goal of the program to protect instream resources we believe that the methods used to determine the minimum flows were flawed and the proposed program is inadequate to protect instream fisheries resources or provide for the tribes need for water in the Nooksack River on the Lummi Reservation. **85**

Our first concern is that a large number of fish producing streams were left out of the program. Among those excluded are Aldrich, Boulder, Boyd, Cavanaugh, Coal, Deadhorse, Diamond, Doubleditch, Edfro, Hedrick, Howard, Jones, Kenney, Pond, Stygitowitz, and Wildcat Creeks. All these streams produce anadromous fish and some are heavy producers. With these streams excluded the current program is incomplete at best. We recommend that they be included at this time. **86**

A second concern is the methodology used to determine the stream flow hydrographs. The lack of factual data on actual flow regimes in many of these streams is a serious flaw in the program. Hydrographs for most of the streams in the program were created by correlation and extrapolation of stream gauging records from other streams for which records are available. Because of differences in geographic location, flow regime and watershed characteristics such as size, elevation and precipitation, this process is highly inaccurate and has produced erroneous and highly questionable flows for the ungauged streams.

An example of the type of errors that have resulted are the "Backwards" hydrographs developed for Cornell, Gallup and Porter Creeks which show a mid-summer peak flow and a winter low flow when actual conditions are just the opposite. This happened because Cornell, Gallup and Porter Creeks are small tributaries of non-glacial origin whose hydrographs were correlated with and extrapolated from stream flow records from the North Fork and/or Middle Fork Nooksack River which are glacial in origin. Glacial origin streams show a mid-summer peak associated with glacial melt which is quite different from the typical winter high flow, summer low flow regime typical of the non-glacial tributaries. Consequently the hydrographs and the recommended instream flows derived from them are worthless. The use of gauging records for Canyon Creek at Kulshan would be much more appropriate for these three streams as well for Anderson Creek, a mountainous stream which was correlated with Fishtrap Creek, a lowland agricultural creek. These errors indicate a serious lack of factual data, knowledge of the area, and disregard for actual stream conditions in the development of the program. We find this poor quality work unacceptable, given the importance of the instream resources program to the fisheries resource as well as the water user. **87**

Our third concern is that the use of the 50% occurrence flow (based on suspect hydrographs) has no scientific justification and will result in lack of protection for instream resources. The use of the 50% occurrence is not based on the biological needs of fish populations and will consequently fail to protect the fisheries resource. In most cases the 50% occurrence flow recommended by DOE was much lower than the flows recommended by the Department of Fisheries for spawning and rearing of salmon. It is important to note that the Department of Fisheries recommendations were derived from actual field measurements based on the flows needed for spawning and rearing at the appropriate times of year. In addition to being substantially lower than the Department of Fisheries recommendations, the 50% occurrence flows are in seasonal conflict with the life cycle timing of the salmon resource. This is because the 50% occurrence flows are higher in the winter and spring when run-off is high and lower in the summer and fall for the majority of stream which are of non-glacial origin. The late summer/fall low flow period is one of the most critical times for the fish however. Juvenile mortality due to reduced habitat area and increased temperatures is high. Spawning for Spring Chinook, Pink and Coho Salmon is also occurring and the available spawning area is reduced and limited by low flow conditions. By setting minimum stream flows at the 50% occurrence level minus the already over appropriated withdrawals, we are artificially creating a situation where we will never have any good years of high productivity, but will permanently reduce natural production levels of most salmon species to low levels. For this reason we object to the use of the biologically unjustified 50% occurrence flows and strongly recommend that they be replaced by the minimum flows recommended by the Fisheries Department. **88**

A fourth area of concern is the failure of the proposed program to consider the cumulative effect of upstream water appropriations on the quantity and quality of water in the lower Nooksack River as it passed through the Lummi Indian Reservation. Present low flow conditions are not meeting the Tribe's needs for adequate quantities of water for fisheries purposes or for the dilution of pollutants such as vegetable processing wastes. The Lummi Tribe currently takes water from the river for a fish hatchery and limited residential use. The tribe also engages in an intensive net fishery in the lower river. Shallow water at low flow (Sept.-Oct.) impedes the fishery by causing difficulty in navigating skiffs and setting nets. Fishermen have also observed delay of Chinook Salmon migration because of low flow conditions. Additional problems are caused by vegetable processing slime fouling the nets. These problems are the source of numerous complaints by Tribal fishermen and were mentioned to DOE early on in this process. We are disappointed that these important Tribal issues were not addressed by DOE in this proposal. **89**

We request again that DOE investigate the current effects of low flow conditions and water quality problem in the lower river during the summer fall period and insure that adequate water is available to meet the needs of the Lummi Tribe on the reservation.

We are concerned that the Lower Nooksack is already over appropriated and that the proposed instream flow program does not address the effects of additional appropriations in the upper watershed on the flows finally reaching the Lower Nooksack River. Consequently, even if new diversions on the lower river are shut off as the 50% occurrence flow is reached, the lower river level may continue to drop due to additional new withdrawals of water from open upstream tributaries. Therefore we think it is imperative that additional upstream appropriations be examined in light of their effect on flows at the mouth of the river. We would also like to go on record as opposing the granting of approval for diversion of water out of the Nooksack Basin into other watersheds. **90**

Until the concerns mentioned in the last two paragraphs are addressed, it is our position that the proposed program has failed to provide adequate flows to meet the needs of the Lummi Tribe and adequately protect instream resources on the Lummi Reservation. **91**

Concerning Administrative status actions, we generally support DOE actions to close most streams during critical low flow periods. We would like to request extension of the partial year closure for the South Fork Nooksack to begin on June lst to ensure holding flows for Spring Chinook. The partial closure for Rasehorse Cr. fails to cover the entire critical low flow period and should be extended to cover the period from July 15, to October 15. We support the Game Departments request for a full year closure of the North Fork Nooksack to protect steelhead rearing habitat. In addition we request a July 15-Oct 15 closure of the lower mainstem Nooksack River to alleviate the adverse conditions discussed earlier. **92**

The current program relies heavily on partial year or low flow closures to protect instream resources at critical periods while allowing diversion of water at other times of the year or until flows drop to a critical level. The success of this approach depends on future water diversions shutting down at the appropriate time, which in many cases will be at times when the demand for water is most critical, such as for late summer irrigation. Strict enforcement of these closures will be necessary to ensure they are respected. We are very concerned about the current lack of enforcement of water rights in the Nooksack Basin. Illegal and/or excessive pumping in the simmer of 1985 resulted in the dewatering of a number of salmon producing streams. **93**

DOE was unable or unwilling to take enforcement action. Consequently we question if and how these complex new closures are going to be enforced. How is DOE going to determine if water diverters have water rights, and are shutting down at the appropriate times? It sounds as if we are creating an enforcement nightmare on top of a situation where enforcement is totally lacking. Given the current lack of enforcement, it appears certain that over appropriation is inevitable as additional water rights are granted with requirements for shutdown at low flow which will never be enforced. **94**

We also believe that many streams are already over-appropriated, including the lower mainstem Nooksack River. We think DOE should identify areas where over appropriation has occurred, and develop plans to alleviate the situation. **95**

In conclusion, the Lummi Fisheries Department finds that the proposed Nooksack Instream Resources Protection Program fails to adequately protect both instream fisheries resources and the Tribal need for water in the Lower Nooksack River on the Lummi Reservation. We request that the DOE delay adoption of the proposed plan until it is amended to address our concerns. **96**

STATE OF WASHINGTON

DEPARTMENT OF FISHERIES

115 General Administration Building, Olympia Washington 98504 206 753-6000

September 30, 1985

Ms. Andrea Beatty Riniker, Director
Washington Department of Ecology
St. Martin's Campus
Lacey, Washington 98504

Dear Ms. Riniker:

Comments on Washington Department of Ecology
Draft Nooksack River Instream Resources
Protection Program Recommendations

We wish to thank the Washington Department of Ecology (DOE) staff for working with us in regard to setting of base flows for the Nooksack WRIA. In general, it appears DOE's recommended flows are based on a normalized line, close to the 50 percent exceedence flow on a hydrograph. In almost all cases, this flow differs from the ones recommended by the Washington Department of Fisheries (WDF), usually lower. These flow differentials are somewhat compensated for through the use of stream closures. We generally support the closures, except in those cases where the dates of closure are too narrow to fully protect fisheries resources. Closures which we feel are inadequate are the following:

Canyon Creek (0437)	WDF Recommends	7/1 - 10/31 closure
Racehorse Creek (0394)	WDF Recommends	7/1 - 10/31 closure
Skookum Creek (0273)	WDF Recommends	closure year-round
Hutchinson Creek (0264)	WDF Recommends	7/1 - 10/31 closure
Sarr Creek	WDF Recommends	7/1 - 10/31 closure
Porter Creek (0350)	WDF Recommends	7/1 - 10/31 closure

97

While many of the hydrographs used by DOE are acceptable, many are not. Those which we question are based on comparison between streams which are dissimilar in slope, altitude, aspect, presence of lakes, presence of glacial input, or stream size. Has DOE done any checking to determine if the more marginal hydrographs are acceptable? The hydrographs which we feel are suspect are the following:

98

Canyon Creek (0437)
Cornell Creek (0464)
Gallup Creek (0468)
Hutchinson Creek (0264)
Naple Creek (0415)
Porter Creek (0360)
Racehorse Creek (0394)
Sarr Creek
Smith Creek (0234)
Terrell Creek (0089)
Wiser Lake Creek (0194)

In cases where questionable hydrographs must be used, it seems to be especially important to be conservative when setting instream flows. Limiting flows to the 50 percent exceedence line in these cases is not being conservative in our opinion.

DOE's Nooksack River recommendations appear to be based generally on IFIM data and the 50 percent exceedence line. We have the following problems with DOE's Nooksack River recommendations:

1. The "stream management unit" for "Nooksack River at Deming" (i.e., the mainstem), includes South Fork Nooksack River up to the Skookum Creek confluence (River Mile 14 or so). We are concerned that this will not afford the lower stretches of the South Fork Nooksack River enough protection. We would like to see a flow based on Brad Caldwell's IFIM work, set for the lower South Fork Nooksack River and gaged somewhere near the IFIM site, possibly at Clipper (River Mile 4 or 5). **99**

2. DOE has set flows derived from IFIM sites and then proposed gaging sites for these flows. Often, the gaging site is not very close to the stretch of the river that the IFIM was supposed to model. This is true for the Middle Fork Nooksack River and for the South Fork Nooksack-River. We recommend that DOE monitor flows in the reach of stream that is represented by the IFIM study. **100**

We support the DOE recommended flows for the Middle Fork Nooksack River. We feel that a summer-fall closure is justified for both the North Fork and the South Fork Nooksack River for rearing salmonids. With such a closure we would also support DOE's recommended flows for these Forks. **101**

We do not feel that adequate information exists to support DOE's recommended Nooksack River mainstem flows. We recommend that DOE monitor water quality in the mainstem and adjust flows if monitoring indicates a need. **102**

We have a general concern with the language proposed in WAC 173-501-040 in that it fails to indicate that the proposed status would also apply to tributaries of the stream in question. We think this apparent oversight should be corrected. **103**

It is our understanding that DOE believes establishing minimum flows greater than the 50% exceedence line would be in violation of the statutes relative to minimum flows. If that belief is based on a written Attorney General's (AG;s) opinion or other written advice from the AG's office or DOE staff analysis of the statutes, we would appreciate a copy of that material. **104**

Finally, a lot of the testimony given by the public and others regarding this program has been critical of DOE's past lack of enforcement of water right laws in this basin. We hope that DOE heeds these comments and makes enforcement a meaningful part of this program. **105**

insert signature

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Mail Stop PV-11 o Olympia Washington 98504 o (206) 459-6000

M E M O R A N D U M

TO: Ecological Commission Members

FROM: Andrea Beatty Riniker, Director

RE: Request

In accordance with RCW 43.21A.190 and RCW 43.21A.200, I request advice and guidance on the subject matter below. Background information is set forth in Attachment A; the proposal itself is in Attachment B. Please submit your views to me in writing. If you need further information, the contact person is Cynthia Nelson telephone (206) 459-6116.

Chapter 173-501 – – Nooksack Instream Resource Protection Program Draft Regulation

---

TO: Andrea Beatty Riniker, Director

FROM: Bob Jamison

In accordance with your request, I submit the following views: **106**

From information gleaned from the reports and my colleagues, this item is relatively non controversial and necessary, and should move forward therefore I concur assuming the pending workshop & formal deliberations will not impact this item.

Signature Robert D. Jamison Date 9/30/85

_____ Please send me the approved or adopted document

_____ Other

WHATCOM COUNTY WATER DISTRICT NO. 10
1010 LAKEVIEW STREET
BELLINGHAM, WASHINGTON 98226

COMMISSIONERS
ERIK UNGERN
BONNIE STRODE
FRANK R. FISHER

OFFICE
1010 LAKEVIEW STREET
734-9224

October 3, 1985

Ms. Joan Thomas, Regional Manager
Department of Ecology
4350 150th St. N.E.
Redmond, Washington 98052

Dear Ms. Thomas:

This letter responds to the Department of Ecology's proposed administrative rule (WAC 173-510) which embodies the Nooksack Instream Resources Protection Program (IRPP). Please incorporate this letter into your hearing record.

Whatcom County Water District 10 supports the proposed closure of further appropriations in the Lake Whatcom basin as long as the Water District is assured of a long-term water supply. As a means of effecting a resolution to the existing situation, the District requests that the Department of Ecology certify Surface Water Applications numbered 21361; 21470; and 21471. These Applications were filed in 1968 and 1969, and total 5 cubic feet per second (cfs) year round.

107

There is a long and complex history to the issue of Lake Whatcom water rights. The City of Bellingham bases its claims on uses initiated in 1883 under the prior appropriation doctrine. There are factual and legal questions about the present validity of those claims, since Lake Whatcom did not become the exclusive supply for the City until 1967. Previous to that the nature and amount of the City's use varied widely. So far as the District is aware, the City has not filed an application for withdrawal of water from Lake Whatcom under the 1917 water code. It would be expensive and time-consuming to establish with precision what the City's rights are and how they affect or are affected by the small amounts being sought by the District.

The Legislature directed the Department of Ecology to manage the waters of the state according to the concept of "securing the maximum net benefit for the people of the state" (RCW 90.54.010(2)). The District believes that the action it is requesting is consistent with that direction.

The District presently serves some of its customers with water withdrawn at its Sudden Valley treatment plant, at a cost of approximately 8.45 per hundred cubic feet. It serves the rest of its customers with water purchased wholesale from the City of Bellingham. This involves a commodity charge of $.90 per hundred cubic feet, one of the highest rates in the State. The District contends that it could serve its customers at a lower rate in the future.

However, the absence of clear-cut legal rights to sufficient water to provide for its present and future needs has made it extremely difficult for the District to plan ahead. Certainty of position with respect to water rights, both for the customer and the purveyor, has obvious merit.

The request that Water District 10 is making is a very modest one. The amount of water needed to satisfy the District's needs even for the long-term future are a minute proportion of the total municipal and industrial water withdrawals from Lake Whatcom. Five cubic feet per second, at a full use factor, would be 3,500 acre-feet per year. Average total municipal and industrial use from the lake is 64,000 acre-feet per year. What we are asking is 5%. As a matter of interest, the District has instituted ambitious and effective conservation measures. It undertook in 1982 a program, paid for entirely by its ratepayers, to meter all customers. Because they are metered and the commodity rates are high, per capita usage is very conservative. In the highest-usage areas of Sudden Valley, even in a dry summer, the usage averages slightly over 200 gallons per day per household.

All parties -- the Department of Ecology, the City of Bellingham, and the Water District -- have the public interest in view. There are several way to provide Lake Whatcom water to our customers. What is at issue before you is the most equitable, efficient, low-cost, and sensible way to get it there.

Thank you for your attention to our request.

Sincerely,

Peter Willing
General Manager

cc: Jack Garner
Gene Wallace
Hearing Examiner

Whatcom County Conservation District

AGRICULTURAL SERVICE CENTER – 6975 HANNEGAN ROAD – LYNDEN, WASHINGTON 98264
PHONE (206) 354-5658

October 3, 1985

Ms. Cynthia Nelson
Department of Ecology
Mail Stop PV-11
Olympia, WA 98504

RE: Nooksack Instream Resources Protection Program

Dear Ms. Nelson:

The Whatcom County Conservation District reviewed the draft Nooksack River Instream Resources Protection Program at their October meeting and wish to offer the following comments on the proposed program.

1. On page 26 under irrigation a statement is made that "most irrigation utilizes ground water supplies". We would like to see an inventory of *irrigation water use* providing a more precise breakdown of source. Thirty thousand acres of irrigated land in the county represents a significant segment of the agricultural production. It appears as though the role or need for irrigation may have been down-played in the report. For example, the county leads the nation in red raspberry production with about 1500 acres in production. Virtually all this land requires irrigation for an economic crop. **108**

2. In the district's opinion, the state has in the past, taken a very "low profile" approach to enforcement of existing rules regarding surface water use. As a result, many farm operations developed a dependency on a surface water source which is or may be closed to further appropriations. Provisions should be incorporated in the final rules which will allow for reevaluation of closures based on historical uses of water and flow records. **109**

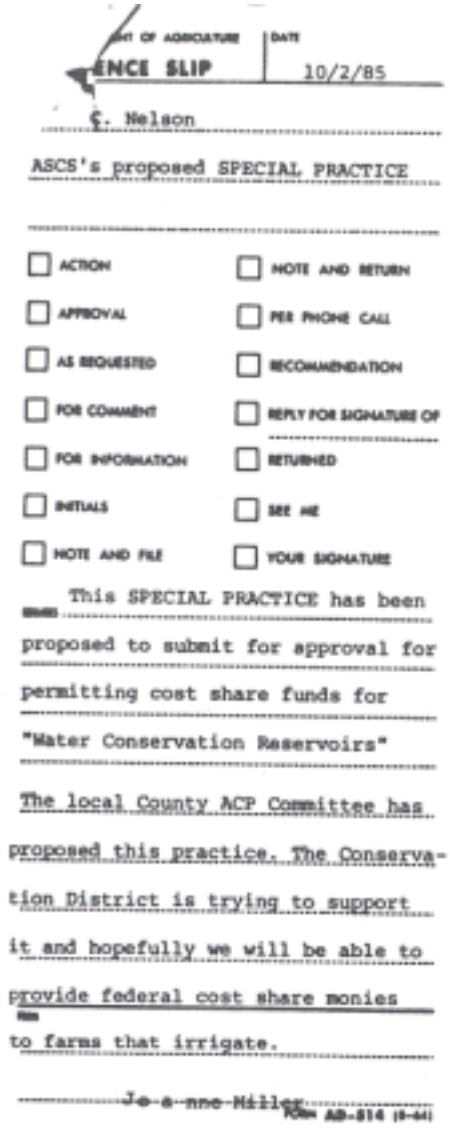
3. On page 54, first sentence of the fifth paragraph, the area of Ten Mile watershed is erroneously reported as .."311 square miles". The actual size of the watershed in 34 square miles[1] or 22.000 acres. ([1]Page 92 Water Resources of the Nooksack River Basin and Certain Adjacent Streams) **110**

Thank for the opportunity to comment on this proposal.

Sincerely,

WHATCOM COUNTY CONSERVATION DISTRICT

Joanne Miller
District Manager



DEPT OF AGRICULTURE | DATE

ENCE SLIP | 10/2/85

C. Nelson

ASCS's proposed SPECIAL PRACTICE

☐ ACTION ☐ NOTE AND RETURN

☐ APPROVAL ☐ PER PHONE CALL

☐ AS REQUESTED ☐ RECOMMENDATION

☐ FOR COMMENT ☐ REPLY FOR SIGNATURE OF

☐ FOR INFORMATION ☐ RETURNED

☐ INITIALS ☐ SEE ME

☐ NOTE AND FILE ☐ YOUR SIGNATURE

This SPECIAL PRACTICE has been proposed to submit for approval for permitting cost share funds for "Water Conservation Reservoirs"

The local County ACP Committee has proposed this practice. The Conservation District is trying to support it and hopefully we will be able to provide federal cost share monies to farms that irrigate.

Jo-a-nne Miller

FORM AD-314 (8-64)

SPECIAL PRACTICE

WATER CONSERVATION RESERVOIRS

A. The purpose of this practice is to develop measures for water conservation for agricultural uses.

B. Apply this practice to farmland or ranchland on which the construction or sealing of water impoundment structures is needed for conservation control as well as other related eligible benefits.

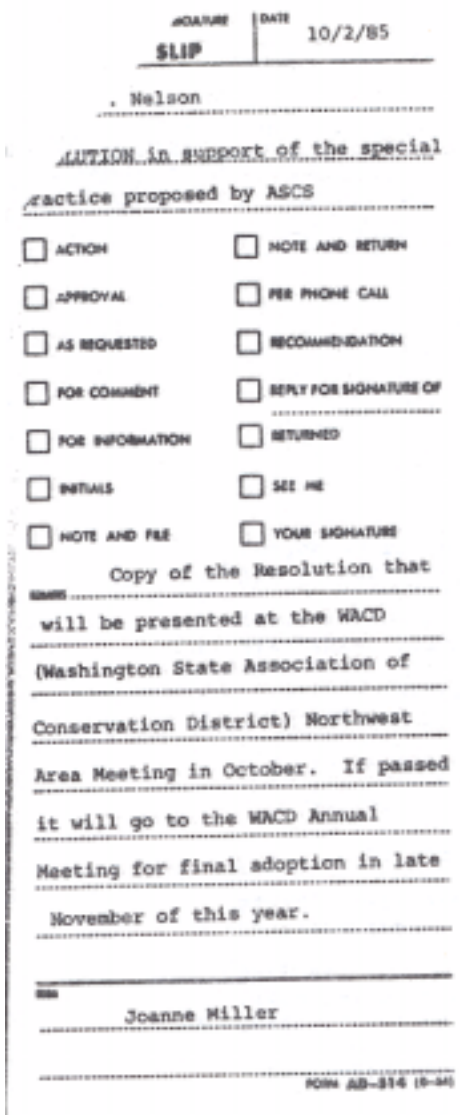
C. Policies for this practice are as follows:

1. Cost-sharing is authorized only for structures that provide water conservation benefits for the purpose of:
   a. Irrigation supply during the summer months for watering dried fields that have had animal waste applied.
   b. Decrease the uptake of stream water for irrigation purposes. This would allow the fish population to survive long dry spells during the summer.
   c. Provide areas to recharge the ground water levels.
2. Cost-sharing may be authorized for permanent fencing, if essential to permit the structure to serve its conservation purpose.
3. Cost-sharing is not authorized for any reservoir in the farm headquarters area that would be used primarily for:
   a. Irrigation water, except as provided in subparagraph 1a.
   b. Recreation or household water.
   c. The commercial production of fish or other wildlife.
4. Cost-sharing is not authorized for pipelines or troughs to furnish water to form buildings.
5. Structures that provide multiple benefits in addition to water conservation control shall be encouraged.
6. The structure shall be maintained for a minimum of 10 years following the calendar year of installation.

111

Specifications. This practice shall be performed in accordance with SCS Standards and Specifications.

Technical Responsibility is assigned to SCS.



SIGNATURE | DATE 10/2/85

SLIP

. Nelson

LUTION in support of the special

ractice proposed by ASCS

☐ ACTION ☐ NOTE AND RETURN

☐ APPROVAL ☐ PER PHONE CALL

☐ AS REQUESTED ☐ RECOMMENDATION

☐ FOR COMMENT ☐ REPLY FOR SIGNATURE OF

☐ FOR INFORMATION ☐ RETURNED

☐ INITIALS ☐ SEE ME

☐ NOTE AND FILE ☐ YOUR SIGNATURE

REMARKS: Copy of the Resolution that will be presented at the WACD (Washington State Association of Conservation District) Northwest Area Meeting in October. If passed it will go to the WACD Annual Meeting for final adoption in late November of this year.

FROM: Joanne Miller

FORM AD-316 (9-84)

WHATCOM COUNTY CONSERVATION DISTRICT

RESOLUTION NO__ __ __ __

TITLE: IRRIGATION RESERVOIR COST SHARE

PROBLEM:

High fish fatalities created by low flows in fish rearing streams which can be attributed in part to land use change or over use of water rights.

Land changes that alter the "slow release" factor and reduce the ground water recharge (such as: removal of forest cover or urban development) and the negative impact from direct pumping under authorized water rights from streams need to be addressed.

The need to distribute animal waste during dry summers are contingent on the ability to irrigate. Irrigation increases the water utilization problem.

A feasible alternative must be established.

RECOMMENDATION:

That the Washington Association of Conservation District (WACD), in working toward a better utilization of water program, support the requested "special practice" made by the Whatcom County ASC Committee for "WATER CONSERVATION RESERVOIRS" cost share funds.

And further support the policy that irrigation reservoirs would provide the alternative to direct stream pumping. And/or provide a substitute "slow release" facility to increase the natural recharge of ground water.

Winfred E. Maberry
881 Loomis Trail Road
Lynden, WA 98264

October 2, 1985

Dept. of Ecology
Mail Stop PV-11
Olympia, WA 98504

Cynthia:

I am writing this letter to be submitted as a written testimony in regards to the proposed Nooksack Instream Protection Program. I live on Bertrand Creek and also own property on Fishtrap Creek in Northern Whatcom County.

I've been retired from farming for some ten years, but my son, Curt Maberry, and son-in-law, Marv Enfield, are now farming the farms I once farmed. Like me, they are growing strawberries and raspberries along the Fishtrap and Bertrand Creeks and their tributaries.

I understand there are two points to be addressed in this issue. The first being the adoption of the Proposed Nooksack Instream Protection Program on some 30 streams in Whatcom County and secondly the adoption or formation of some enforcement policy.

Addressing the first issue concerning the adoption of the proposal, my question along with many others, is why adopt or propose something that you already have power to regulate? **112**
You know as well as we do that the Fishtrap and Bertrand Creeks and their tributaries flow from Canada and they flow through the heart of Northern Whatcom County Agriculture. They are the life blood to Dairying, Berry, Potato, and other types of farming operations. You have absolutely no control over their flows coming from Canada yet you are going to try to establish minimum flows on them, and thus regulate and restrict water usage with your own farmers. **113**

In a dry summer year, such as the past summer, Canada lets very little water through. But in the spring and winter seasons these streams become roaring rivers. We have never seen such volumes of water in these streams as we've had in the past few years. It's getting greater every year. My son, Curt Maberry, had to spend $15,000 last year doing some rock work just south of Loomis Trail Road to protect his buildings because of the increased water flows during flood stages. Why is flooding so much more prevalent in recent years? Because of urban growth along these streams right across the Canadian border and this creates so much more runoff. We've never had such flooding as we've had in the past few years and it's getting worse every year. What do these floods do for the fisheries of these streams? These creek beds are full of silt and sand and not that suited for the spawning of fish. I've tried to get the steelhead clubs to stock the Bertrand Creek in front of my house, but they wouldn't, and this was one of the reasons-- too much sand and silt in the stream bed along with the Indians getting them when they might return from the salt water.

getting them when they might return from the salt water. So why are we worrying so much about these two streams in regards to fish when you have no control over what happens across the border in Canada. They let virtually no water through for our farmers in dry summers, and we get all their runoff in the spring and winter seasons. These reasons alone create enough hardship on the Bertrand and Fishtrap Creeks to make it almost impossible to sustain any fish runs. Luckily from West Badger Road or Berthusen Park south along Bertrand Creek to Nooksack River, springs feed the creek and we have a lot more water flow than those farmers between West Badger and the border. Where do you establish these minimum flows when this is happening? I am totally against any more regulations on the establishment of a minimum flow on these two streams because of these locations and where they originate! Leave them off your lists and let the farmers have them because of what's happening across the border.

114

The farmers have been doing a pretty good job of regulating and managing these two creeks in the past, and I can't see any need to change. You people have led the farmers to believe that this water was there for his use and now you want to pull the plug on him. Berry farming water needs are usually earlier than potato and grass needs, so the farmer, because of different types of farming, is already doing a good job of managing their flows. There are no alternative sources for water along these two streams because of geological formations. Wells, because of quick sand, can't nearly supply the water needed.

115

If you didn't know it already, the farmers are having a tough time of it nation wide, and Whatcom County is no different. There are half a dozen berry growers going out of business this year and you take the much needed water away from the rest and their crops and land will be worthless! If there is no problem, then leave it alone.

116

Because of where the Fishtrap and Bertrand Creeks and their tributaries originate, in Canada, and because of the silt and sand found in the stream beds during flood stages because of the tremendous runoff caused by the development across the border, I urge you to let these two streams and their tributaries to be left off your minimum flow lists. Let them serve the farmers where the fish have a better chance than with what happens across the border where you have no control over what happens, and they seem to have little or no regard also.

117

Sincerely,

W.E. Maberry

W.E. Maberry

SEPT 26, 1985
BELLINGHAM, WA.
98225

DEPARTMENT OF ECOLOGY

ATTENTION HEARING OFFICER:

THE NOOKSAK RIVER HAS REACHED AN ALL TIME LOW. THERE ARE NUMEROUS PLACES IN THE RIVER WHERE THE WATER IS NO MORE THAN ANKLE DEEP ALL THE WAY ACROSS THE RIVER, MAKING IT IMPOSSIBLE FOR ANY SPAWNING FISH TO REACH THEIR SPAWNING BEDS.

THERE ARE NUMEROUS SALMON AT THE MOUTH OF THE NOOKSAK RIVER THAT CAN NOT GET UP RIVER BECAUSE OF EXTREMELY LOW WATER. THESE FISH ARE TURNING BLACK AND DYING. IF SPAWN IS LOST DUE TO LOW WATER OR ANY OTHER CAUSE, IT COULD TAKE MANY YEARS TO BUILD IT BACK, AND POSSIBLY NEVER.

THE SPORT FISHERY ON THE NOOKSAK RIVER, ALONE, PROVIDES A VERY LARGE AMOUNT OF REVENUE TO THE STATE OF WASHINGTON.

WE, THE FOLLOWING, ASK THAT THE DEPARTMENT OF ECOLOGY SET MINIMUM FLOWS ON THE NOOKSAK RIVER AND ALL OF ITS TRIBUTARIES AND ENFORCE THE LAW AGAINST ALL ILLEGAL USE OF WATER FROM THE NOOKSAK RIVER AND ITS TRIBUTARIES.

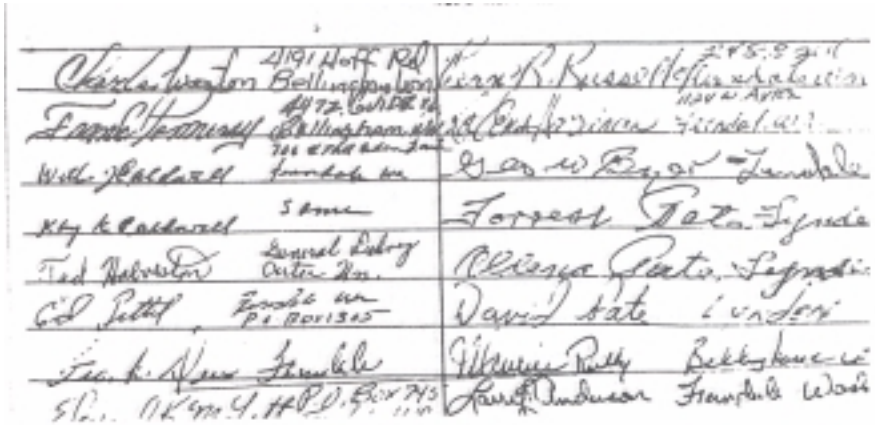
118

RESIDENTS OF WHATCOM COUNTY, WASHINGTON.

THANK YOU

CHARLES H. WESTON

4191 HOFF ROAD



SEPT 26, 1985
BELLINGHAM, WA.
98225

DEPARTMENT OF ECOLOGY

ATTENTION HEARING OFFICER:

THE NOOKSAK RIVER HAS REACHED AN ALL TIME LOW. THERE ARE NUMEROUS PLACES IN THE RIVER WHERE THE WATER IS NO MORE THAN ANKLE DEEP ALL THE WAY ACROSS THE RIVER, MAKING IT IMPOSSIBLE FOR ANY SPAWNING FISH TO REACH THEIR SPAWNING BEDS.

THERE ARE NUMEROUS SALMON AT THE MOUTH OF THE NOOKSAK RIVER THAT CAN NOT GET UP RIVER BECAUSE OF EXTREMELY LOW WATER. THESE FISH ARE TURNING BLACK AND DYING. IF SPAWN IS LOST DUE TO LOW WATER OR ANY OTHER CAUSE, IT COULD TAKE MANY YEARS TO BUILD IT BACK, AND POSSIBLY NEVER.

THE SPORT FISHERY ON THE NOOKSAK RIVER, ALONE, PROVIDES A VERY LARGE AMOUNT OF REVENUE TO THE STATE OF WASHINGTON.

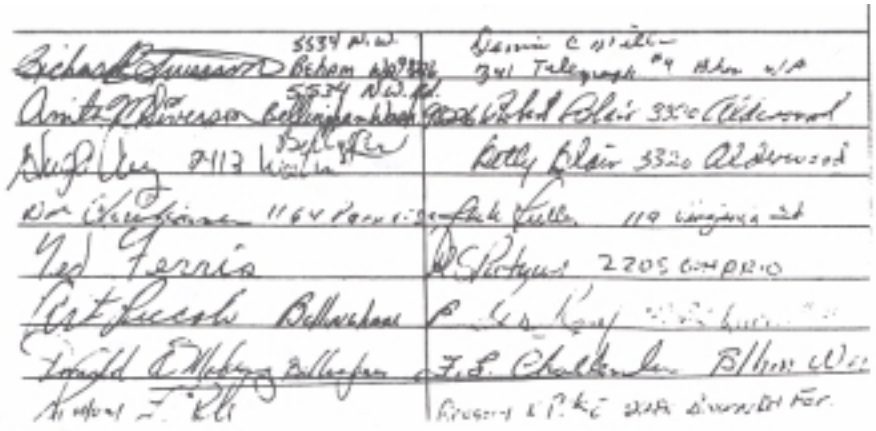
WE, THE FOLLOWING, ASK THAT THE DEPARTMENT OF ECOLOGY SET MINIMUM FLOWS ON THE NOOKSAK RIVER AND ALL OF ITS TRIBUTARIES AND ENFORCE THE LAW AGAINST ALL ILLEGAL USE OF WATER FROM THE NOOKSAK RIVER AND ITS TRIBUTARIES.

RESIDENTS OF WHATCOM COUNTY, WASHINGTON.

THANK YOU

CHARLES H. WESTON

4191 HOFF ROAD



SEPT 26, 1985
BELLINGHAM, WA.
98225

DEPARTMENT OF ECOLOGY

ATTENTION HEARING OFFICER:

THE NOOKSAK RIVER HAS REACHED AN ALL TIME LOW. THERE ARE NUMEROUS PLACES IN THE RIVER WHERE THE WATER IS NO MORE THAN ANKLE DEEP ALL THE WAY ACROSS THE RIVER, MAKING IT IMPOSSIBLE FOR ANY SPAWNING FISH TO REACH THEIR SPAWNING BEDS.

THERE ARE NUMEROUS SALMON AT THE MOUTH OF THE NOOKSAK RIVER THAT CAN NOT GET UP RIVER BECAUSE OF EXTREMELY LOW WATER. THESE FISH ARE TURNING BLACK AND DYING. IF SPAWN IS LOST DUE TO LOW WATER OR ANY OTHER CAUSE, IT COULD TAKE MANY YEARS TO BUILD IT BACK, AND POSSIBLY NEVER.

THE SPORT FISHERY ON THE NOOKSAK RIVER, ALONE, PROVIDES A VERY LARGE AMOUNT OF REVENUE TO THE STATE OF WASHINGTON.

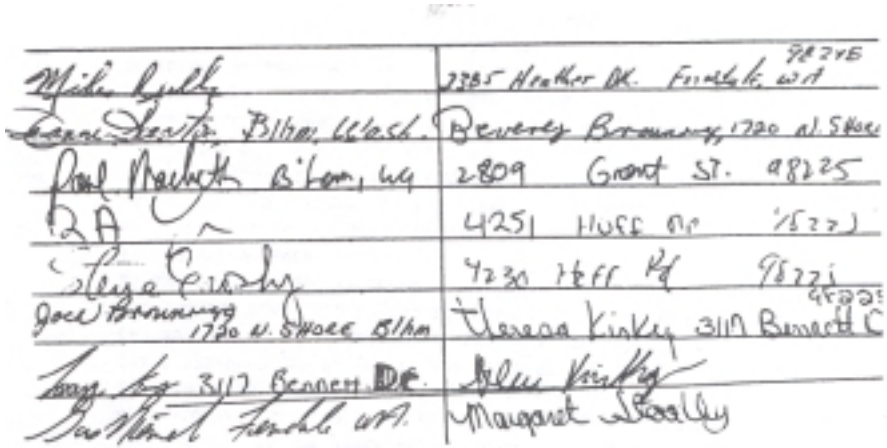
WE, THE FOLLOWING, ASK THAT THE DEPARTMENT OF ECOLOGY SET MINIMUM FLOWS ON THE NOOKSAK RIVER AND ALL OF ITS TRIBUTARIES AND ENFORCE THE LAW AGAINST ALL ILLEGAL USE OF WATER FROM THE NOOKSAK RIVER AND ITS TRIBUTARIES.

RESIDENTS OF WHATCOM COUNTY, WASHINGTON.

THANK YOU

CHARLES H. WESTON

4191 HOFF ROAD



SEPT 26, 1985
BELLINGHAM, WA.
98225

DEPARTMENT OF ECOLOGY

ATTENTION HEARING OFFICER:

THE NOOKSAK RIVER HAS REACHED AN ALL TIME LOW. THERE ARE NUMEROUS PLACES IN THE RIVER WHERE THE WATER IS NO MORE THAN ANKLE DEEP ALL THE WAY ACROSS THE RIVER, MAKING IT IMPOSSIBLE FOR ANY SPAWNING FISH TO REACH THEIR SPAWNING BEDS.

THERE ARE NUMEROUS SALMON AT THE MOUTH OF THE NOOKSAK RIVER THAT CAN NOT GET UP RIVER BECAUSE OF EXTREMELY LOW WATER. THESE FISH ARE TURNING BLACK AND DYING. IF SPAWN IS LOST DUE TO LOW WATER OR ANY OTHER CAUSE, IT COULD TAKE MANY YEARS TO BUILD IT BACK, AND POSSIBLY NEVER.

THE SPORT FISHERY ON THE NOOKSAK RIVER, ALONE, PROVIDES A VERY LARGE AMOUNT OF REVENUE TO THE STATE OF WASHINGTON.

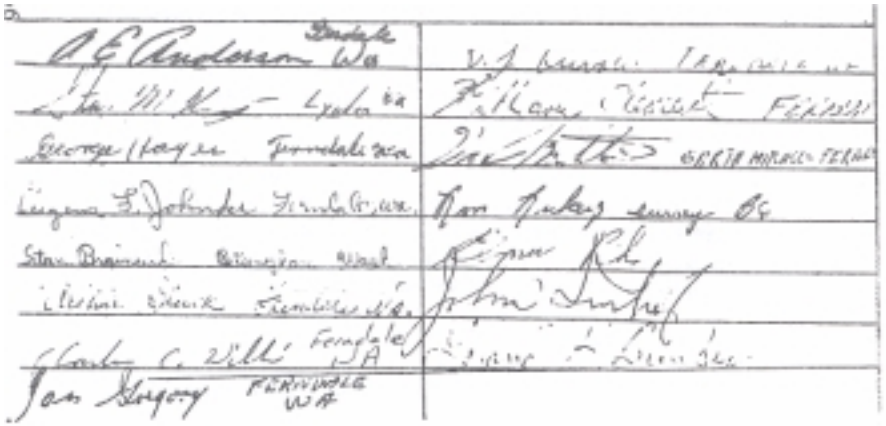
WE, THE FOLLOWING, ASK THAT THE DEPARTMENT OF ECOLOGY SET MINIMUM FLOWS ON THE NOOKSAK RIVER AND ALL OF ITS TRIBUTARIES AND ENFORCE THE LAW AGAINST ALL ILLEGAL USE OF WATER FROM THE NOOKSAK RIVER AND ITS TRIBUTARIES.

RESIDENTS OF WHATCOM COUNTY, WASHINGTON.

THANK YOU

CHARLES H. WESTON

4191 HOFF ROAD



SEPT 26, 1985
BELLINGHAM, WA.
98225

DEPARTMENT OF ECOLOGY

ATTENTION HEARING OFFICER:

THE NOOKSAK RIVER HAS REACHED AN ALL TIME LOW. THERE ARE NUMEROUS PLACES IN THE RIVER WHERE THE WATER IS NO MORE THAN ANKLE DEEP ALL THE WAY ACROSS THE RIVER, MAKING IT IMPOSSIBLE FOR ANY SPAWNING FISH TO REACH THEIR SPAWNING BEDS.

THERE ARE NUMEROUS SALMON AT THE MOUTH OF THE NOOKSAK RIVER THAT CAN NOT GET UP RIVER BECAUSE OF EXTREMELY LOW WATER. THESE FISH ARE TURNING BLACK AND DYING. IF SPAWN IS LOST DUE TO LOW WATER OR ANY OTHER CAUSE, IT COULD TAKE MANY YEARS TO BUILD IT BACK, AND POSSIBLY NEVER.

THE SPORT FISHERY ON THE NOOKSAK RIVER, ALONE, PROVIDES A VERY LARGE AMOUNT OF REVENUE TO THE STATE OF WASHINGTON.

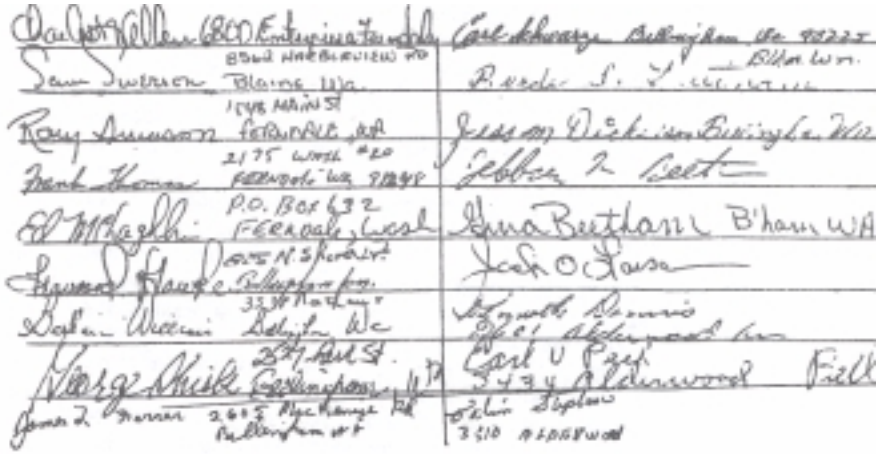
WE, THE FOLLOWING, ASK THAT THE DEPARTMENT OF ECOLOGY SET MINIMUM FLOWS ON THE NOOKSAK RIVER AND ALL OF ITS TRIBUTARIES AND ENFORCE THE LAW AGAINST ALL ILLEGAL USE OF WATER FROM THE NOOKSAK RIVER AND ITS TRIBUTARIES.

RESIDENTS OF WHATCOM COUNTY, WASHINGTON.

THANK YOU

CHARLES H. WESTON

4191 HOFF ROAD



PUGET POWER

October 4, 1985

Hearing Officer, Nooksack IRPP
Washington State Department
of Ecology
PV-11
Olympia, WA 98504

Dear Sir/Madam:

Puget Sound Power & Light Company has reviewed the Nooksack Water Resource Inventory Area Instream Resources Protection Program and wish to correct errors on page 27 and page 40 pertaining to our Nooksack Falls Power Plant. On page 27 the IRPP document correctly states that the Nooksack Project was an early project in WRIA 1 but then goes on to state that the Nooksack Falls Project was typical of early-constructed dams In its relatively large generating capacity of 1,700 kW (1.7 MW). This latter statement is simply not true. Built in 1906 with an installed capacity of 1.7 MW Nooksack was much smaller than a number of its contemporaries in Puget's system such as the Snoqualmie Falls Project, 11 MW In 1898, 22 MW by 1910; the Electron Project, 26 MW, 1903, and the White River Project, 27 MW in 1911, 45 MW in 1918 and 63 MW by 1924. Thus, even when it was built the Nooksack Project was a small scale generating project and is even more so now compared to most existing hydroelectric projects on major river systems. We would also observe that while there is some debate over the installed capacity range for small hydro projects most would agree that it extends upward to at least 15 MW or even 30 MW rather then the 300 kW stated In the IRPP document.

119

On page 40 of the IRPP document it is stated that Puget diverts 125 cfs for generation at the existing Nooksack Falls Power Plant. This is incorrect. As stated in the License Application for the Nooksack Falls Project (FERC Number 3721), Puget currently holds a vested water right claim to 328 cfs under WDOE Water Right Claim Register Number 160816. The company has been remitting the appropriate fees to the state under provisions of the State Water Power Tax Law since 1930 for the use of water in this amount. The actual amount of water diverted at present is well in excess of 125 cfs and increases significantly when the project is operated in a continuous sluicing mode with a slide gate open in the flowline. Under these conditions, we believe that the amount of water diverted at the intake may well approach the existing water right claim. In recognition of this fact, Puget has a water right application, WDOE #S1-23599A, for an additional 272 cfs, on file with the WDOE with a priority date of March 26, 1980, for the expansion of the existing project as described in the License Application for FERC Project 3721. If granted, the combination of the new and old water rights would permit Puget to divert up to a maximum of 600 cfs for power purposes from the North Fork Nooksack River.

120

121

If you require any further information, please feel free to contact Mr. Robert Barnes of my staff at (206) 462-3096. Thank you for the opportunity to comment on this document.

Sincerely,

R. W. Clubb, Ph.D.
Manager, Environmental
Sciences

RWC:cl

October 7, 1985

Department of Ecology

Mail Stop PV-11

Olympia, Wa 98504-8711

Dear Mr. Bucknell:

I would like to apologize for getting my input into your office after the October 4th deadline, but I would appreciate your considering my input regarding the Nooksack Instream Resources Protection Program.

Basically I am concerned about your filing of the Determination of non-significance of August 7th. This document as well as the main one (W.W.I.R.P.P. Services – #11) appears to have been put together with the lack of knowledge of the existing environment and consideration for existing or future development in the area. 122

For example I reside adjacent to Maple Creek in T40N, R6E sec 18 and on page 86 of the main document you show a minimum of 10 C.F.S. with a 90% occurrence. I have lived adjacent to this stream for about 25 years and it is not unusual for it to be dry 2-3 months a year. This is largely due to beaver activity but on the given dry year like this one Silver Lake which feeds this stream is just too low to provide water for the stream. 123

The outlet of this creek as with most in the upper Nooksack River drainage lies in a porous glacial till material and is underground in the fall of the year.

Also I do not believe that the underground aquifers are affected by the levels of the streams in the area, or that the reverse is true. Therefore, I do not believe that the restricting of water rights is necessary as suggested on page one of the environmental checklist supplement. 124

While Fisheries is an important resource; water is in demand for a multitude of resources and should be treated in an equitable manner. 125

Sincerely,

Wayne J Beech

Wayne J. Beech

Box 187

Maple Falls, Wa 98266

United States Department of Agriculture | Forest Service | Mt. Baker Ranger District | 2105 Highway 20 Sedro Wooley, WA 98284

Reply To: 2630 (2610)

Date: October 3, 1985

Fred D. Hahn
Department of Ecology
Water Resources Division
Mail Stop PV-11
Olympia, WA 98504-8711

Dear Mr. Hahn:

The following comments relate to the draft "Nooksack Instream Resources Program".

We support the Department of Ecology's goal of establishing specific minimum instream flow levels and other policies to protect instream resources in the Nooksack River Basin. All instream resources need to be considered in the decision process including: anadromous and resident fisheries habitat, the stream channel (hydraulic) integrity, wildlife use, aesthetic and scenic values and water quality. **126**

Table 2 (pages 10-11), entitled "Land Use in Whatcom County," does not display acreages for state and private forest lands. These lands are fairly significant in portions of the Nooksack and by not showing them, gives a misleading perception of land uses in the basin. **127**

Most of the instream flow proposals displayed are for mainstem portions of the Nooksack River, however, few headwater tributary streams were considered. Many of these streams contain valuable anadromous and resident fisheries resources and have considerable small hydro power development potential. These streams need to have minimum instream flows set for them. **128**

Thank you for the opportunity to comment on this document.

Sincerely,

D. Brady Green
for Bernard A. Smith
DISTRICT RANGER

Ms. Linda Zander

See written testimony. **129**

Mr. Bob Shipp

Bellingham resident. Owns small business. Depends on water and runs small salmon enhancement program with Nooksack Tribe. Re: Middle Fork Nooksack - supports changing the control point, which was formerly at an inaccessible site. The U.S. Geological Survey established a new control point at Mosquito Lake in 1981. If control point is changed, also need to change instream flows. Submitted flow recommendations. Also submitted copy of CES IFIM study. **130**

Dr. Hal Beecher

Dr. Beecher summarized his letter, dated September 17, 1985. **131**

Representative Pete Kremen

State Rep. for 42nd District. Understands rules are being proposed in accordance with legislature's mandate. The Water Resources Act of 1971 directs department to manage and protect public waters. Aware of need for balance. Water has many uses in Whatcom County. Recognizes Ecology's role in balancing uses. Questions the need for administrative rules. Not like eastern Washington; lots of water in Northwest Washington. Rarely have low water year. This year was exception. When low water is a problem, department can restrict use administratively without additional regulations. Proposed flows should be guidelines to use with current administrative authority. Responsibilities under RCW 90.54 already being met. Not required to adopt rules; should modify existing regulations and adopt new when necessary (RCW 90.54.040). RCW 90.54.050 says adopt rules when it appears necessary to assure compliance with law. New rules not necessary, since there is no significant problem with low water. **132** **133**

Mr. Bernie Schuyleman

Represent farmers; local irrigation expert. Takes issue with a suggestion that farmers could get alternate water supply. In some areas, ground water will not supply enough gpm. In some places stream overpumped, but need it for farming, as well as fish. He has 36 years experience. **134**

Mr. Duane Phinney, WDF, Chief of Habitat Management Division

Appreciate opportunity to work with Ecology staff, and agree with many aspects of program. Flows appear based on 50 percent exceedence flow which is lower than WDF;s recommendations. If AG's or in-house staff opinion available, requesting copy. Generally support closures; some need to be longer to protect fishery; a list of streams needing extended closures will be included in their written comments. Some hydrographs are considered questionable, would like to know analysis done by staff. Written comments contain detailed list. **135**

Err on conservative side in setting instream flows when using suspect hydrograph; limiting flows to the 50 percent exceedence line in not conservative. Remove the lower South Fork Nooksack stretch from measurement at the Deming control station; set flow for lower reaches of South Fork using Brad Caldwell's IFIM study results, and locate control point around river mile 5.0. Ecology has used IFIM results to propose flows with control stations located too far away. Recommend Ecology monitor flows in stream reach represented by IFIM study. Support proposed flows for Middle, South, and North forks and request summer/fall closure for North Fork, as well as South Fork. Include tributaries in table listing stream status in 173-501-040(1). Lack of enforcement is a problem, meaningful enforcement needs to be part of program. Disagrees with previous commenters that there is no significant problem. If we wait will be too late to remedy.

James Johnston, WDG biologist, concerned with cutthroat and steelhead. Often said in public meetings that fishery resource will do away with agriculture, which is confusing. Need to have a minimum flow left in streams so fishery resource can continue. Has been to date little restriction an amount of flow withdrawn, also very little enforcement on rights issued or on use without water rights. In winter and fall lots of fish spawn; in summer stream are dry and filled with dead fish. People take too much, need balance. Neither agriculture nor fisheries want to ruin the other, but fisheries are in jeopardy and need to have minimum flow, to maintain a few fish. Use other methods to control and use water. **136**

Ecology must enforce water rights. Farmers with valid water rights need to know they are being protected. Jobs in Whatcom County need to be based on a diversified industry of fishing, farming, and forestry. **137**

Peter Willing, Manager of Whatcom County Water District 10

Thanks for opportunity to speak. Will follow oral comments with a letter by October 4. Whatcom County Water District 10 supports proposed closure of Lake Whatcom basin as long as problems identified on page 63 of draft IRPP document are resolved concurrently. Water district requests that Ecology certify surface water right applications Nos. 21362, 21470, 21471. **138**

Mr. Marty Maberry

Represents Jake Maberry Packing, family farm.

Berry growers for 40 years. Do not have an alternative ground water source, due to substructure. Farmers are having a hard time in this country; proposed regulation may drive farmers out of business. Many farmers won't take it. Has impression people think more water will be pulled out of stream. Think most farmers bordering streams have irrigation system in, doubts much more water withdrawal will occur. Disagrees that valid water right holders will be without water. Seeing maximum withdrawal now. Letter from Jake Maberry read into record. See written comments and response No. 9. **139**

Mr. George Brenner

Introduced himself as old-timer. Father arrived in 1880. Told about the fishtrap in Fishtrap Creek. Interested in seeing enough water in these creeks to have some fish. Not necessary to pump creeks down till fish cannot survive. Water can be obtained in some other way or limited, so we have fish. Works with high schools on salmon planting program ; Lynden Christian School has had program for three years. Fish have a right also, won't mean death of agriculture. **140**

Mr. Dale Bedlington

Potato grower representing father and brother. Dependent on Fishtrap and Bertrand creeks. Oppose Ecology minimum flow regulation on Fishtrap and Bertrand creeks. Minimal availability of alternate ground water; capped some of their wells. **141**

Mr. Richard Clark

President Northwest Steelhead and Trout Unlimited, see written testimony. **142**

Mr. Frank DeVries

Raspberry farmer on Bertrand Creek. Documents have miscalculated flow. **143**

Mr. Terry DeValois

Dairy and pea farmer along Bertrand Creek; concerned about Fishtrap and Bertrand creeks. Main problem is with Canadians and dam across border. Worked with agencies, talked to other affected Canadian farmers to no avail. Bertrand Creek dry when it comes across border. Suggest forming a PUD to work together to solve problems of fish and water. **144**

Mr. Aloys Ebey

Farms with brother. Seed potatoes on 700 acres. Father began in 1919. Pumped as much water as anyone, cannot understand problem. Farmers not wasteful, county's biggest asset. Farmers trade off water use, do not dry up streams. Has not seen stream pumped dry. Wells are not good in their area. Farmers need water. When industry came into area, got a tax break and water pipeline to Intalco. Farmers got nothing but higher taxes; leave as is. **145**

Mr. Harlan Kredit

Teacher at Lynden Christian High School salmon enhancement program for last three years. Student project hatched 100,000 silver salmon eggs this year, then fed 5 times per day and released later. Stream dried up in many places. Not necessarily for or against program, but we do have to admit we have a problem at least on Fishtrap Creek. Has printout of **146**

Fishtrap Creek water rights; Darigold earliest, Kelley latest; Curt Maberry is on list. Has to be illegal use going on, adding up water rights and looking at what is left in creek. We have a problem with agriculture dependent on water. Not qualified to comment on study. If substantial illegal use occurred on Fishtrap Creek this summer and Ecology did nothing about it, then Ecology should either work out a plan of sharing water or taking enforcement action. Will not do any good unless enforced. Establishing higher stream flow where none exists now will do no good. Should maybe defer program till cooperative effort can be worked out, or at least establish enforcement policy. If Ecology does nothing about enforcement, other illegal users will start. If unsolved, will be wasting our time.

147

Dr. Susan Cook

Spent summer on water quality work in county streams. Problem is very bad; no water and not enough oxygen and temperature is too high to support fish. Problem being documented through SCS, Lummi Tribe, grant from Ecology. Solutions need to be sought, since fish cannot survive. Can sympathize with farmers, but look at other solutions. Streambanks are a problem with animals tearing them down and without shading vegetation. Some tradeoffs could be made to improve existing conditions. Retain more water in wet season through ponds, would continue to summer stream flow. Needs to be give and take on both sides; need integrated plan. Cannot stay as bad as it is or get much worse.

148

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Mail Stop PV-11 o Olympia Washington 98504 o (206) 459-6000

M E M O R A N D U M

TO: Ecological Commission Members

FROM: Andrea Beatty Riniker, Director

RE: Request for Advice and Guidance No. 15-85 Due Date 10-11

In accordance with RCW 43.21A.190 and RCW 43.21A.200, I request advice and guidance on the subject matter below. Background information is set forth in Attachment A; the proposal itself is in Attachment B. Please submit your views to me in writing. If you need further information, the contact person is Cynthia Nelson telephone (206) 459-6116 .

Chapter 173-501 – – Nooksack Instream Resource Protection Program
Draft Regulation

TO: Andrea Beatty Riniker, Director

FROM: Donna M. Simmons

In accordance with your request, I submit the following views:

I recommend adoption of Chapter 173-501, since I understand that disagreements between fisheries agencies and the department are relatively minor. However, I remain concerned about the issue of water quality in this drainage. I strongly recommend that future water rights be conditioned by provisions which protect water quality. Also, future monitoring should be undertaken to identify any possible increased degradation of water quality due to water withdrawals or continued contamination from farming, industry, or sewage treatment plants. Finally, while enforcement is not popular – neither is polluted water.

Donna Mdimmons 10-8-85
Signature Date

149

_____ Please send me the approved or adopted document

_____ Other

cc: Dave Schuett-Hames, Lummi Fisheries
Mark Schuller, WDF
Jim Johnston, WDG
Art Stendal, WDG
Bill Kinney, WDF
Dick Dearsley, SO

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Mail Stop PV-11 o Olympia Washington 98504 o (206) 459-6000

M E M O R A N D U M

TO: Ecological Commission Members

FROM: Andrea Beatty Riniker, Director

RE: Request for Advice and Guidance No. 15-85 Due Date 10-11

In accordance with RCW 43.21A.190 and RCW 43.21A.200, I request advice and guidance on the subject matter below. Background information is set forth in Attachment A; the proposal itself is in Attachment B. Please submit your views to me in writing. If you need further information, the contact person is Cynthia Nelson telephone (206) 459-6116 .

Chapter 173-501 – – Nooksack Instream Resource Protection Program
Draft Regulation

TO: Andrea Beatty Riniker, Director

FROM: Fred A. Shiosaki

In accordance with your request, I submit the following views:

150

I concur.

Signature 10/4/85 Date

_____ Please send me the approved or adopted document

_____ Other

STATE OF WASHINGTON

DEPARTMENT OF FISHERIES

333 E. Blackburn Road o Mount Vernon, Washington 98273 o (206) 336-9538

September 23, 1985

TO: Gordy Zillges
Habitat Management – Olympia

FROM: Russ Orrell
Skagit Lab – Mount Vernon

SUBJECT: NOOKSACK INSTREAM RESOURCES PROTECTION PROGRAM

I have reviewed the DOE program for the Nooksack River and Mark suggested that I forward my comments to you. My overall reaction to the text of the report that relates to salmon resources is that the author did not do a good job of documentation. In particular, the fish use description of the three forks is poorly illustrated. As we have previously discussed, "enforcement" is missing completely and a program such as this has little or no credibility without improved enforcement. There are some real problems in Whatcom County and they will not be alleviated by more restrictions -- DOE needs a good enforcement program!

151

My comments are as follows:

P.29 Fisheries

The Lummis also operated salmon rearing facilities in Lummi Bay and the Nooksack Tribe has an egg-box program on Rutzadt Slough. WDG raises steelhead (anadromous) at the Whatcom Falls Hatchery.

Nooksack salmon production also contributes to Alaska fisheries.

P.29 Anadromous Fish

The South Fork contributes more fish than the Middle Fork; however, the North Fork is by far the best producer of all species of salmon. While the South Fork is not glacial, it has been severely impacted by logging activities. Sedimentation has reduced spawning and rearing potential. "Independent drainages and lower elevation tributaries" -- are these the same?

P.31 There are two columns for fall chinook

P.32 There is only one major tributary that has a sizeable run of chinook (spring) -- Canyon Creek on the North Fork. Observed spawning of summer/fall or spring chinook is infrequent in all other tributaries to the three forks. Even Canyon Creek is somewhat sporadic and chinook use may be dependent upon flow and water quality in the North Fork.

If the reference to independent drainages includes Dakota Creek, it should be noted that there is a small run of-summer/fall chinook. Independent drainages should be separated.

P.32 - Par. 2 We feel that the North Fork has the best run of spring chinook, not the South Fork. Obviously spawning is not limited to the South Fork.

In order to restore spring chinook runs, WDF and the Lummi Tribe have been collecting native brood stock for hatcheries on the North and South Forks. This program is already producing adult hatchery returns and where straying occurs, supplementing natural spawning.

P.32 - Par. 3 The description of coho spawning applies more to mainstem areas. Our surveys of the main Sumas River showed no spawning areas (heavy siltation). The report should discuss each drainage in order and not mix in the Sumas River or tributaries. WRIA-wide comments should be first and then one by one a discussion of each basin. While coho spawn in small tributaries, they rear virtually everywhere. In the Nooksack, a higher proportion of the chum spawn in the mainstem (North Fork) or in sloughs and side channels. Chum do not use all accessible streams; however, coho do. Chum do not occur in all independent drainages. Pinks spawn mainly in the North Fork and its tributaries.

P.32 - Par. 4 Sockeye spawn in the main North Fork (at least, according to the catalog).

P.32 - Par. 5 Steelhead use of ponds is minimal if any use occurs.

P.34 Marine Fish

Par. 2 There is sometimes a significant herring fishery.

P.45 - Par. 5 We made a brief physical survey of Middle Fork tributaries and felt that Clearwater Creek had the best potential for salmon. Small hydro proposals should be evaluated in light of a fish passage facility at the City of Bellingham diversion.

P.48 - Par. 2 A poor description. The agricultural section extends upstream to Saxon and I would doubt if the valley is two miles across. The remaining valley is relatively narrow. The catalog shows 12 miles from the mouth to Saxon and 27 miles to the headwaters.

P.48 - Par. 3 It is stated that "Tributaries of the South Fork are small except for Skookum Creek." Following this, the report states "Hutchinson, Cavanaugh and Howard Creeks, also large tributaries" . . . A bit confusing.

P.48 - Par. 4 The South Fork is an important spring chinook spawning area, but it is not "the principal spawning area".

SUBJECT: NOOKSACK INSTREAM RESOURCES PROTECTION PROGRAM

P. 61 – Par. 3 A cooperative salmon enhancement program uses the old city of Blaine water reservoir, releasing fall chinook, coho and chum into the Dakota Creek drainage.

STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

Mail Stop PV-11 o Olympia Washington 98504 o (206) 459-6000

M E M O R A N D U M

TO: Ecological Commission Members

FROM: Andrea Beatty Riniker, Director

RE: Request for Advice and Guidance No. 15-85 Due Date 10-11

In accordance with RCW 43.21A.190 and RCW 43.21A.200, I request advice and guidance on the subject matter below. Background information is set forth in Attachment A; the proposal itself is in Attachment B. Please submit your views to me in writing. If you need further information, the contact person is Cynthia Nelson telephone (206) 459-6116 .

Chapter 173-501 – – Nooksack Instream Resource Protection Program
Draft Regulation

TO: Andrea Beatty Riniker, Director

FROM: C.C. Pittack

In accordance with your request, I submit the following views:

152

I concur with above, although I am still concerned with the method of establishing min. Flows. I believe that Wild spawning Salmon & Steelhead are more valuable than they are given credit for. I believe we should lean heavier towards protecting fish & Wildlife, than new development. Signature 10-11-85 Date

_____ Please send me the approved or adopted document

_____ Other

APPENDIX E

RESPONSES TO COMMENTS

Mr. Marv Enfield

1. Your letter does not state whether you have a valid water right for your irrigation. If you do, your use of water would not be subject to the minimum flows because this program does not affect existing water rights.

2. The legislature has directed that "Perennial rivers and streams of the state shall be protected with base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic and other environmental values, and navigational values." (RCW 90.54.020(3)(a)). We view this program and the establishment of instream flows as being consistent with this direction. Again, any existing water uses with valid water rights will not be affected by this program.

Department of Game

3. Noted. The recommendations of WDG exceeded the one-in-ten-year exceedance flow over much of the year. Ecology feels that this level of flow is not justifiable as a minimum flow. However, we received several comments that the hydrographs for these streams are inaccurate and Ecology has reevaluated the hydrographs for Porter, Cornell and Gallop creeks.

4. We have reviewed the data and are now proposing a partial year closure on the North Fork, extending from September 1 through October 31.

5. Noted, but Ecology felt that these recommended flows were too high to serve as "minimum" flows. See response #67.

6. As explained at the public meeting and the hearing, the department has not had adequate staff resources to be able to effectively enforce water rights laws in the Nooksack WRIA. Due to recent staff increases by the legislature, the NWRO will be able to reassign some of its existing staff to water rights enforcement activities and Ecology does anticipate a more aggressive enforcement program. The enforcement of existing water rights and water rights laws is a separate issue from adoption of the proposed regulation because such enforcement can occur whether or not the regulation is adopted. In any event, the department is willing to work with people within the bounds of state water rights laws to try to minimize any adverse impacts that might occur as a result of any enforcement activities.

7. This was an oversight on our part and has been corrected. Stream status will apply to the streams listed as well as the tributaries.

8. Noted. See response #6.

Mr. Jake Maberry

9. This is incorrect. Ecology staff were aware of Double Ditch but it was not specifically included in the draft proposal because no specific recommendations or data ware presented and because it is a tributary to Fishtrap Creek (see comment #7, above).

10. This concept was discussed at the public meeting and the public hearing: The idea is to provide for offstream storage of water in holding ponds by diverting water during the high-flow winter and spring months. Such diversions can be beneficial in two ways. First, they provide water for use later in the year during the low flow period and; second, they help to reduce potential flood flows. Of course, this is not always feasible, but is a potential source of water where topography and other considerations would allow such storage to be utilized.

11. Noted. The fact that these streams flow through prime agricultural land is not, in our view, a sufficient reason for these streams to be excluded from the proposed regulation. In fact, the instream resources of such streams are typically subject to more competition for water than in streams in other areas because of the desire for consumptive use for agriculture.

12. Your comment that farmers have been led to believe that irrigation out of these streams is alright is interesting. State law is very clear on this subject. Irrigation from these and any other streams is alright if the water user has a valid water right and is diverting the water in compliance with any terms and conditions on the water right. Diversion without a valid water right is not legal. The Department of Ecology has never encouraged any water diversions without valid water rights. While the department has not had the capability to fully patrol and enforce such violations, nothing in the department's actions should be construed as approval for such violations of state law. (See response #6 also)

Mr. William Devine

13. Noted, but we need more specific comments in order to respond. Obviously, we felt the information was sufficient but would welcome your specific criticisms.

14. Again, we need more specific comments to which we can respond.

15. Good point. We have included some explanation of how streams were selected in the program document. Basically, Ecology asked WDF, WDG, the Lummi Indian Tribe, and the Nooksack Tribe for their recommendations and priorities on what streams should be included. These recommendations were based an a consideration of the streams' importance for instream resources and the availability of data on which to make sound decisions. Therefore, if a given stream is not included, it is because Ecology received no recommendations and/or no delta were available.

16. Again, your comments are very general. Which two streams did you compare? You are critical of us for not substantiating our proposed decisions, yet your criticism give us no information to correct any problems. Please provide us with any pertinent and specific data you have along with your recommendations and your reasoning.

17. We do not intend to speak for other agencies, but are not aware of the "contradiction" to which you refer. Although we are not sure what is meant by your last two sentences dealing with pages 33 and 34, Ecology is the state water resources agency and has exclusive authority to establish minimum stream flows under RCW 90.03.247, but does so by seeking the recommendations of other entities.

18. The establishment of our minimum flows is based on the recommendations of the departments of Fisheries and Game and the affected Indian tribes. These recommendations may be based on Instream Flow Incremental Method (IFIM) studies or on toe-width measurements and involve the professional knowledge of the involved fishery biologists. Ecology then considers these recommendations and formulates its proposed flow levels. While we have been criticized for a process that varies somewhat according to the type of data available, etc., there is a need to treat streams individually with consideration of each stream's unique characteristics.

    Your comment regarding hydro-electric valuation is not clear. In considering a water right application Ecology looks at four "tests" to determine if a right should be issued. They are: is water available for appropriation; is it a beneficial use under the law; is it free of any conflict with existing water rights; and, is it in the public interest? If all four questions can be answered affirmatively, the water right permit would be issued. This is the process for all water right applications but does not really include a valuation of the proposed project.

19. We would be pleased to see such evidence. Please feel free to provide us with pertinent excerpts from any documents containing such information.

20. We need more specific information from you like what time of year the flows you cite are proposed, etc.

21. See WAC 173-501-030(5) in the proposed regulation. Hydropower project proponents do have an option of conducting separate flow studies in an attempt to convince the involved agencies that some other instream flow requirements are appropriate. Such studies are specifically tailored to the project's affected stream reach.

22. The falls are at river mile 1.1. The flows do have validity above the falls. Future diversions above the falls would be subject to maintaining the flows below the falls. Also, there may be resident fish above the falls that would benefit from such flows.

23. An IFIM study was conducted on Maple Creek. According to our hydrographs, the IFIM flow for much of the pear is below the 50 percent exceedance line. While there were problems with the preference curves, the flows were derived by WDF, WDG, and Ecology and we believe they are reasonable. Again, we would appreciate any data you have supporting other flow regimes.

24. The type of studies required varies from stream to stream depending on hydrology, resources present, etc. The determination of studies is best left to discussion by the affected agencies, as is the avoidance or resolution of conflicts. We disagree that such items must be identified and clarified in the regulation. The intent of the regulation is to provide a level of protection for instream resources. The purpose of this section is to allow proponents of hydropower projects involving a bypassed reach to have the flexibility of conducting studies on their own which are tailored specifically to the affected project reaches, rather than necessarily being subject to a flow requirement designed to protect a larger reach of the stream.

Curt Mayberry

25. Both Bertrand and Fishtrap creeks are already closed to further consumptive appropriation. As a result, no further water rights will be issued an these streams. The minimum flows proposed in this regulation would only apply to water rights issued in the future and, since these creeks are already closed, no such flow requirements would be applied to water uses from these creeks. In other words, the establishment of minimum instream flows for Bertrand and Fishtrap creeks will not affect any existing water rights or legal use of water from the streams. What it will do is provide Ecology with a single document (the regulation) with information on the status of streams, provisions on water rights, and other material needed to make decisions on future water right applications. (See also response #6 and 112, also).

26. See response #6.

27. Noted. See response #25, above. Also, the statutes clearly state that waters of the state are a public resource. They belong to everyone. It is not appropriate to allow any one user group to control a public resource even if that group has done a good job of managing the resource.

Dick Bedlington

28. Noted. See responses #25-27, above.

Dwight V. Chilton

29. See responses #1, 11, and 12.

30. See responses #6 and #25.

Stan Van Diest

31. This program is not a response to the low water year experienced this year. It was initiated in 1984. The low water year has heightened everyone's awareness of the importance of our state's water resources.

32. The alternative water supply that is encouraged in section 080(2) is not required. It is intended to allow for flexibility in cases where such developments are possible. (See also response #1, 2, 10, 25, 27, and 111.)

33. Stream hydrographs that are properly constructed reflect ground water inflow.

34. See responses #1, 2, 6, 11, 25, and 27.

Marty McPhail

35. See responses #1, 2, 11, 25, and 27.

City of Bellingham, Department of Public Works

36. The draft Nooksack program does refer to the final Environmental Impact Statement for the Western Washington Instream Resources Protection Program which was published in 1979. This document discusses in general terms the process by which the base or minimum flows are established. This includes Ecology's determination of flow needs independently of the determination of need by the departments of Fisheries and Game and assessment of the flow recommendations in an attempt to reach mutually agreeable instream flows. This process remains very similar to that described in 1979. What has changed is that new study techniques (such as instream flow incremental methodology (IFIM)) have been developed that have replaced the old base flow/stream rating system as depicted on page D-5 of the 1979 report. There are a number of reasons why Ecology prefers the use of more current methodologies than the old rating system. A major problem with the old system is that three of the criteria for rating streams were their value for scenic and aesthetic values, navigation values, and other environmental values. These criteria do not necessarily correlate to good fish and wildlife conditions. The result is that this classification system tended to be weighted against the small nonnavigable, nonswimmable, relatively less aesthetic small streams which are often important fish and wildlife producers.

    We disagree that no results are presented. The draft regulation clearly includes the department's flow recommendations. In addition, Appendix C of the Nooksack IRPP document details the flow recommendations of the departments of Fisheries and Game and the Lummi Indian Tribe. Comparison of these recommendations with those proposed by Ecology will verify testimony by representatives of both Fisheries and Game at the public hearing, that certain of Ecology's recommended minimum flows are lower than the flows recommended by those agencies.

37. See response #36. Also, see the hydrograph for the Middle Fork of the Nooksack River. Again, the process used in this program follows the general process of making independent flow recommendations and negotiating to try to achieve consensus but did not specifically use the old base flow setting process based tin the stream rating system.

38. See responses 36 and 37.

39. As stated above, Ecology's recommendations take into account the recommendations of Fisheries and Game, but they are not identical and, in several cases, both Fisheries and Game have testified on their concerns with the differences. Ecology does consider these recommendations, but they are treated as recommendations. We do not simply use their numbers unless sufficient justification exists.

40. We agree with the interpretation of legislative intent, but for the reasons discussed above, we disagree. We feel this program is consistent with the intent of the legislature and that the flows recommended by Ecology do constitute preservation flows.

41. We feel the flows contained in the draft regulation do exactly what you describe. We view them as preservation flows. In many cases, Ecology's flows are less than those recommended. The flows recommended by Ecology, Fisheries, Game, and the Lummi Tribe were included in the program document and were part of the total package of material that could be discussed at the public hearing on September 25.

Kimberly A. Weil

42. Thank you. We agree that it is essential that the various water users in this and any other basins work together to make use of the resources as efficiently and effectively as possible. We believe this program will help to achieve this kind of a unified approach. We would also add that we were pleased to see that there have been numerous cases of farmers and fisheries interests working together in the Nooksack Basin. If anything, we hope this regulation encourages even more of this kind of cooperation.

John & Karen Steensma

43. The requested information has been provided.

44. Both Bertrand and Fishtrap creeks have been closed to further consumptive appro-priations for several years. This program will do nothing to change that. We apologize for problems in reading any of the material. We did mail out a better copy of the draft regulation because the one in the report did not prove to be very legible.

45. This is an excellent idea but would be very time consuming and difficult to achieve. Ecology has been involved in negotiations with Canada on the Okanogan River and has found that such actions take a great deal of time and effort.

46. This sounds good on paper but would likely run into problems due to conflicts with state water law. The legislature would probably have to amend statutes to accomplish such changes.

47. See responses #6, and 25. The idea of temporary help has been considered. There are two problems. First, the department's budget often will not allow such expenditures to occur and, second, enforcement personnel need to have some familiarity with water rights laws. Such people are difficult to find for temporary positions.

48. We could not agree more. The kind of balance to which you refer is what Ecology wants to see, too.

49. Noted. See responses #6, 12, and 27. The fact that there has not been enforcement does not preclude the possibility of enforcement in the future.

50. Such conditions should be brought to the attention of Ecology's NWRO staff as soon as possible after they occur.

51. We agree that some type of regulation is needed and Ecology hopes to be able to increase its enforcement efforts in the near future. (See response #6).

52. See responses #45, 46, 47, and 48.

Jake Maberry

53. The same letter was received as written testimony. See responses #9-12.

Dick Clark

54. We agree. See response #6 re: enforcement.

Linda Zander, Whatcom County Farm Bureau

55. The quotation in the second paragraph is not technically accurate although it does paraphrase RCW 90.54.020(1) accurately. However, the act goes on to state that "Perennial rivers and streams of the state shall be retained with base flows necessary to provide for preservation of wildlife, fish, scenic, aesthetic, and other environmental values, and navigational values." (Underlining added). The department interprets the act as requiring that flows be established to preserve instream values and that any subsequent appropriations of water be subject to a maximum net benefits test. Such appropriations could be future consumptive water rights or could be instream flows above the preservation level.

56. This is not true. The Department of Ecology relied heavily on the flow measurements provided by the U.S. Geological Survey gaging stations. In fact, Ecology and the USGS participate in a cooperative agreement which is designed to provide funds and staff for data collection and installation and maintenance of the gaging station network. Therefore, we do have up-to-date information on stream flows in the area. See response #57, also.

57. This is not true. While some of the descriptions of the basin's hydrology are not new information, we have no reason not to use it because overall drainage patterns etc. have not changed. The flow data is up to date because, as stated above, the department used information from the USGS gaging stations, many of which are still in operation. In addition, while this data is current, the department also intends to initiate a review of this program at least once in every five years and would incorporate any new data at that time. The flow studies that were done on several streams also utilized current measurements and provided considerable amounts of new and current data.

58. We would like to see the context in which this was said. Ecology agrees with not gambling where good data does not exist. However, as stated in response #55, we have no choice but to establish minimum instream flows. The Water Resources Act specifically states that such flows shall be established. Given the legislature's priority to establish such flows, the department would, if anything, try to set flows that do not constitute gambling with the state's fishery resources. The department is certainly not afraid of data, but we do not feel justified in delaying a program several years when a lot of good data does exist, especially when such delays could result in further declines in the fishery resources of the area.

    In any event, the department's proposals have also been criticized by WDF and WDG because they feel our flows are too low and may jeopardize the instream resources.

59. The program will not adversely impact any existing water rights or the activities carried out as a result of such water rights. Most of the prime farmland in the basin is already being utilized. The restrictions of instream flows on future uses cannot reasonably be expected to have a major impact on prime farmlands. The limits that may be placed on future hydroelectric production are unclear. The regulation allows hydropower proponents to conduct studies if they feel Ecology's minimum flows are not appropriate. Also, at this time, the entire Pacific Northwest region has an energy surplus of 2,300 megawatts according to the Northwest Power Planning Council. This surplus is expected to last anywhere from 5 to 20 years and it is not clear how many hydro projects will actually be constructed. Again, Ecology feels that such concerns can be addressed during the periodic program reviews.

60. For the reasons stated above, Ecology disagrees that such an EIS is required. Its proposals are based on sound and current data and we will incorporate any new data when available for the periodic review process.

61. We have. No existing water rights are affected. Uses other than instream uses have been granted water rights for many years. There is relatively little prime agricultural land in the basin that remains undeveloped. Much of this development has occurred with little regard for the instream resources which the legislature required be protected by establishing instream flows. While individual water users have often worked to try to retain instream flows, others have not. In any event, most water rights have not been issued with any instream flow or other use restrictions. The result has been considerable development of activities requiring consumptive appropriations of water with corresponding declines in the quality and quantity of water remaining in the stream for the instream resources such as fish and wildlife.

62. For the record, Ecology is proposing to establish minimum instream flows in the Nooksack area streams for the first time. Your statement that we are setting "higher minimum instream flows" implies that we are proposing to raise the flow requirements over some existing requirements. In fact, we are proposing to establish a level of protection for the instream resources where none exists. In addition, we feel confident that we have relied on sound data, we have considered other uses, and that the proposed program strikes a balance between the competing uses for water.

Sylvia A. Thorpe

63. Thank you. We agree. (See response #6 re: enforcement).

64. This program will not affect existing water rights but is designed to create the kind of balance between competing uses to which you refer.

65. We agree that these alternative supply ideas may not be feasible or practical in many cases but feel they are worthwhile additions to the program because there may be some cases where they can be employed. Apparently, there is still some confusion regarding storage water. You refer to holding ponds. That is precisely the kind of thing that this language would make possible and we feel this may be feasible in some areas.

Bonnie Strode

66. Noted. The department has begun action to process Water District No. 10's water right applications.

Nooksack Indian Tribe

67. Flows recommended by WDF and WDG are often designed to protect 100 percent of habitat. Establishment of flows at the 50 percent exceedance level represents flow which will be there one out of two years and represents average stream flow. Ecology recognizes the importance of high flow years in maintaining fishery resources but does not feel it is

appropriate to preserve that level of flow because to do so would result in virtually a total closure of the area's streams to future consumptive use. Also, in streams not now fully appropriated it is very unlikely that water rights will be issued that will be of large enough quantity to eliminate the peak flows when they do occur. This is due in part to the quantity of water present at high flows and to the fact that future water rights subjects to these flows will not provide firm water supplies but instead can be expected to provide water about 1 out of 2 years. In many cases, such restrictions cause the water user to seek alternate supplies of water. Streams already fully appropriated are being closed to further consumptive appropriation, at least seasonally.

Also, it should be noted that in numerous cases although flows were proposed at the 50 percent exceedance line, there is also a seasonal closure to future consumptive uses during the most critical summer low flow period. This closure is based on fisheries considerations.

68. Ecology staff are reevaluating a number of the hydrographs for which specific comments have been received.

69. Note the proposed changes in closures on the creeks mentioned in your letter. See section WAC 173-501-040(1).

70. The Department of Ecology has made changes to the proposed regulation to establish the control point near the IFIM study site at RM 5 on the South Fork Nooksack.

71. Note that a two-month closure of the North Fork Nooksack is proposed for September and October. The department does not feel a year round closure is justifiable or necessary.

72. Ecology is reviewing hydrographs and recommendations for Gallop and Cornell creeks. Since no data or recommendations on several of the streams listed in your letter were provided during the planning process, Ecology will accept data for use in the five-year review of this program.

73. The flows set on Maple Creek were discussed among agency and tribal biologists and were based on IFIM results. Chum spawning flows lasted in the IFIM results show significantly less weighted usable area of flows of 30 cfs compared to habitat at 20 cfs.

74. See response #6.

75. The Middle Fork gaging station (control point) will be at the Mosquito Lake Bridge at river mile 5.0. Several discussions among biologists have occurred regarding results of the two IFIM studies. The department has examined flow records to analyze inflow.

76. Changes have been made. See response #7.

77. Noted. We have asked for data and done more in this basin then many others.

Cascades Environmental Services

78. The submittal by Cascades Environmental Services supports the oral testimony submitted by Mr. Robert Shipp. The Summary of Consultation refers to a meeting attended by Ecology and other agencies' personnel related to hydropower projects proposed (or being considered) by Mr. Shipp. Ecology's position is that consideration of hydropower project proposals is a separate issue to be addressed in the FERC licensing/state water rights process. It is not appropriate to design the Nooksack IRPP to accommodate a particular project but, rather, to allow separate consideration for such projects after a program such as this is adopted. Ecology is proposing some of the specific changes suggested by Mr. Shipp and others with respect to the Middle Fork Nooksack River, but does not feel it is appropriate to respond to the individual points in this summary because the primary purpose of the meeting was not to discuss the IRPP and there was not full agreement on all of the conclusions reached. The letter speaks more specifically to recommendations to be included in the IRPP and is addressed in response #79-84.

79. Noted.

80. The department does consider IFIM to be a superior methodology for modeling the relationship between habitat and flow.

81. It would be more correct to state that results of the study performed by the consultant for the hydro developer indicated optimal flows at river mile 5.3 to be those listed.

82. We agree that the species and life stage requiring the greatest flow in October is chinook spawning. The species discussed during flow negotiations for the months of November through January were coho, chum, and chinook.

83. In the vast majority of cases we propose flows that are lower than those requested by WDF and WDG. Ecology takes into consideration the recommendations from WDF and WDG in setting flows with which we feel comfortable.

84. The department establishes flows that it feels are consistent with the intent of the legislation.

85. Noted.

86. Streams listed will be included in the five-year review of the program if adequate data is available at that time.

87. The hydrographs listed are being reviewed.

88. See comment #67.

89. The department is sympathetic to tribal concerns regarding low flows in late summer and early fall, and to complaints regarding water quality. It is beyond the scope of the program and state water law to gut more water back in the stream. We are proposing a combination of flows and seasonal closures on the Nooksack forks and tributaries which emphasizes that on many streams there is no mare water available for appropriation during the low flow months. The minimum flows set on the mainstem at Deming and Ferndale are closes to the 50 percent exceedance flow line in late summer and early fall, which may indicate that little or no water is available to be appropriated for year round use. In regard to water quality, several efforts are ongoing to improve water quality. We understand that the vegetable processor may be looking into land application of processing wastes. The City of Ferndale is working on improvements to its secondary treatment plant. The extent to which the IRPP can directly address solutions to water quality problems is still unclear, but in any event will most likely be somewhat limited.

90. Applications for future appropriations will be considered for potential impacts on the immediate stream reach and any other affected waters. Future water rights are subject to nearest control stations and all downstream stations, so that low flows on the mainstem will affect upstream water rights issued subject to the program. Your opposition to out of basin transfer is noted. We encourage you to comment on such projects as they are proposed.

91. Noted. Please see responses #89 and 90.

92. In regard to your comments on closures, for the South Fork Nooksack, the beginning date of July 1 is located on the descending arm of the spring runoff on the hydrograph at what we feel is a reasonable point. We are proposing an extension of the Racehorse Creek closure, which would be from July 1-October 31. For the North Fork, we are proposing a seasonal closure during the months of September and October. We do not feel that a year round closure of the North Fork is necessary or justifiable. Your request for a partial year closure on the mainstem is noted.

93. We realize that enforcement is crucial. The department has not had adequate staff to effectively enforce water rights in the Nooksack WRIA. The NWRO will soon be able to reassign staff to enforcement activities. We understand that illegal diversion took place. We would like to point out that some water rights are subject to low flow provisions while others are not. If a water right holder is legitimately entitled to the amount of water left in a stream, then technically it can be taken.

94. See response #93 re: enforcement. Ecology's procedure for evaluating the legality of diversions is to identify the water right holder and the amount and timing of diversion specified in the water right, including low flow provisos.

The seasonal closures during low flow periods, which you generally support, are designed to inform future applicants that a reliable water supply is unavailable, and to encourage or force the development of alternate means of supplying water, be it winter storage, ground water, or acquisition of existing rights. A trend in this direction would not be likely to increase enforcement problems.

95. Noted. We agree that some streams are over-appropriated but it is beyond the department's authority to change existing water rights. This program is partly in response to the over-appropriation, which is why several streams are proposed for closure. Several years ago a bill was passed which allowed relinquished water rights to be counted towards satisfaction of the minimum instream flows. This bill was subsequently overturned and relinquished water is now available for reappropriation, or to satisfy existing rights, including any established instream flows.

96. The department realizes that this is an imperfect attempt to solve all the problems addressed but feels that it makes important improvements. If you really wish the program to be delayed, please realize that even the amount of protection proposed in this document will be lacking.

97. The department has reconsidered closure periods on the streams listed in your letter, as well as on other streams. The Canyon Creek closure is now proposed July 1 to October 31, as are Racehorse, Skookum, Hutchinson, and Porter creeks. The reasons for these changes are to respond to fisheries concerns, to be consistent among streams with similar hydrologic patterns, for instance rain-fed and snow and rain-fed. We have also been somewhat conservative when the hydrograph had been questioned. Saar Creek is proposed for year round closure, since, as a WDF employee has pointed out, it is tributary to the Sumas River. We do not feel that the need for a year round closure on Skookum Creek has been adequately documented. Please note that other changes have been made for consistency in addition to those listed here.

98. The department has reviewed the hydrographs for Cornell, Gallop, and Porter creeks. We realize that there is a margin of error associated with correlations, but are not convinced that the amount of work required to reconstruct all those hydrographs which have been questioned is justified at this point in light of the proposed flows and closures on these streams. The department would welcome additional data on these streams for incorporation into the five-year review.

99. The South Fork flows were proposed using recommendations from WDF and WDG based on Brad Caldwell's IFIM results. The control point has been moved downstream to river mile 5.0.

100. The IFIM site on the Middle Fork at river mile 1.4 is inappropriate for gaging. The control station has been moved to river mile 5.0, at the Mosquito Lake bridge. The department has taken flow measurements recently, and has analyzed inflow. Flows have been adjusted and set at river mile 5.0 to result in minimum flown being met at river mile 1.4. Flows will be monitored at river mile 1.4 as staff time permits.

101. The department has reconsidered its proposal for the North Fork and is proposing a seasonal closure for the months of September and October, in response to concerns over fisheries habitat and water quality.

102. We realize that waters quality in the mainstem is in violation of state standards. Ecology has monitored the mainstem at river miles 30 and 5 for several years. We are looking into ways in which water rights might include some water quality-related conditions.

103. Noted. Language specifically addressing the tributaries has been added: to WAC 173-501-040(1).

104. Ecology believes that establishing minimum flows greater than the 50 percent exceedance level is inconsistent with the intent of the legislation. In some cases the Nooksack program's proposed flows do exceed the 50 percent line and we feel justified that, in those specific instances, such flow levels are warranted. We do not yet have AGs opinion on this issue. If WDF has such an opinion indicating that their flow recommendations are consistent with the statutes, we would be equally, interested in seeing that opinion. (See comment #67 also)

105. We realize that enforcement is very important. The department has not had adequate staff to effectively enforce water rights in the Nooksack WRIA. The NWRO will soon be able to reassign staff to enforcement activities. (See response #6)

Robert D. Timm

106. Thank you for your support.

Whatcom County Water District No. 10

107. Noted. See response #66.

Whatcom County Conservation District

108. We have looked into the irrigated agriculture figures and have found what we think is more accurate data. According to a summary of irrigation in Washington in 1983 prepared by the Cooperative Extension of Washington State University, a total of 32,100 acres were irritated in Whatcom County. Of that, 40 percent or 12,840 acres utilized ground water while 60 percent or 19,260 acres were irrigated using surface waters. The text will be revised accordingly.

109. See response #6 on enforcement. The department is willing to work with individual landowners/water users within the bounds of state water law to minimize the impacts of any regulatory activities.

However, illegal uses of water (e.g. diversion without a valid water right or use of quantities greater than legally permitted) are contrary to state law and any enforcement actions should be designed to correct such conditions. The closures of the streams were based on a consideration of water use and flow records, and it is unlikely that a reevaluation such as you suggest would result in a different conclusion. In any event, the statutes are clear on this subject. Since 1917, water has been appropriated through a very specific process. Use of water inconsistent with this process is not legal, regardless of how long it has gone undetected or unenforced.

110. Thank you. We agree with your number and will incorporate it in the final document.

111. We are pleased to see this "Special Practice" and the related draft "Resolution." They appear to be consistent with proposed WAC 173-501-080(2) regarding storage water as an alternate source of supply.

Winfred E. Maberry

112. Prior to the adoption of a regulation such as that proposed for the Nooksack area, water rights that are issued do not have minimum flow requirements on them. As a result, Ecology does not, in fact, have the ability to regulate to protect instream flows.

113. It is true that we have no control over flows from Canada. However, the effect of this regulation is minimal with respect to water right holders on Fishtrap and Bertrand creeks. Both of these creeks are already closed to further consumptive appropriations. No water rights have or will be issued from them as a result of these closures. The minimum flows proposed would only apply to future water rights and, since the streams are closed, there won't be any of those. The regulation is designed to do two things. First, it confirms the existing closure, adopts it as part of a regulation, and identifies that flows are important in these creeks even though no rights will be subject to these flows. Second, and perhaps the most important from Ecology's perspective, it creates a single document (the regulation) that can be used by Ecology staff to evaluate and make decisions on future water right applications and should be instrumental in ensuring consistency in the decisions that are made. See response #25, also.

114. See response #113. We recognize these problems but also recognize that the fishery interests have identified these streams as a concern for fish and wildlife.

115. See responses #6 and #109.

116. See response #109. Anyone with an existing water right will not be adversely affected by this proposal. Those without water rights could be regulated with or without the proposed regulation.

117. Ecology believes they should be included and continues to maintain that the program will have no negative impact on legal water users on these or any other creeks in the area.

Charles H. Weston

118. Thank you. See also response #6.

Puget Power

119. Noted. Thank you for your information.

120. Noted. The definitions of what constitutes "small" hydro are debatable.

121. Noted. Thank you for the information. We would like to point out that any water right application approved after adoption of this program will be subject to the regulations instream flows and closures.

Wayne J. Beech

122. No document of this type can ever capture all the conditions of the environment perfectly. We disagree that this program was put together with a lack of knowledge or consideration for existing or future development in the area. Proposed WAC 173-501-070(1) clearly exempts existing water rights from the provisions of this program. We fail to see why there should be concerns about existing development provided that they are using water consistent with state laws. If they are not, such users would be subject to enforcement regardless of whether this program is adopted. With respects to your claim of a lack of knowledge, the reason we conduct a public involvement effort is to let people know what we are proposing and to solicit ideas on the proposal and to increase our total base of information.

123. The hydrograph for Maple Creek was correlated because of a lack of data for Maple Creek. We appreciate your comments. Maple Creek is now proposed to be closed from July 1 through October 31. Your statement on the stream drying up fairly often supports our decision to close the stream during those months.

124. We have abundant evidence of problems and concerns with instream resources in the Nooksack area. Ecology believes the possible curtailment of future water rights to protect these instream resources is justified and is well documented in the program document. With respect to ground water, only ground water withdrawals which do significantly affect the stream will be subject to minimum instream flow restrictions. Those with no significant impact would not be restricted.

125. We agree. We feel that this program does strike a balance between instream values and other uses. See responses #2, 42, 59, 61.

Mr. Bernard Smith, U.S. Forest Service

126. Thank you for your support of the program's goals. The department does take into consideration anadromous and resident fish habitat, wildlife use, aesthetic and scenic values, and water quality. We infrequently have situations where hydraulic integrity is raised as an issue. However, if you have information you wish to submit, we would be happy to include it in the five-year review.

127. The department realizes that Table 2 "Land Use in Whatcom County" did not list acreages for state and private forest lands. The numbers included in Table 2 were obtained from records provided by the Whatcom County Planning Department and do contain a category covering state and private forest acreage. If you have more detailed information available, we would be happy to review it.

128. Many headwater streams are not specifically included in the regulation, as your letter points out. We realize that many of these have both significant anadromous and resident fish populations and hydroelectric potential. The streams which were specifically included in the regulation were those about which the departments of Fisheries and Game raised concerns and provided some data. Note, however, that tributaries to the named streams in the regulation are subject to the flows established in the regulation as well.

    A major reason for not specifically including headwater tributaries was lack of information on fisheries use and flow data. Some commenters have listed streams they wish added to the regulation. These will be addressed in the five-year review if more information is gathered. If your agency can provide input on fish use in upper basin streams and/or flow measurements, we would be pleased to include it in our review considerations. We do realize that these high elevation streams have value both for fish and hydro and agree that these streams need minimum instream flows. The means by which this will occur are FERC consultations required for hydro projects and the state water rights process. Project-specific flows can be set for hydro projects which are located on streams with or without minimum instream flows regulated by Chapter 173-501 WAC.

Ms. Linda Zander

129. See written testimony and comments #55-62.

Mr. Bob Shipp

130. See comments #78-84.

Dr. Hal Beecher, WDG

131. See comments #3-8.

Representative Pete Kremen

132. This is incorrect. The vast majority of water rights that have been issued to date in the Nooksack area do not have minimum flow restrictions on them. The result is that Ecology has no way to curtail such uses in a low water year. In a low water year, this can mean that streams are dried up completely by diversions which are legal and which cannot be curtailed. The establishment of minimum flows in this program does not correct the problem on streams that are already over-appropriated, but it is intended to prevent such problems from occurring on streams in the future.

133. We feel there is ample evidence that there are problems associated with low water in the Nooksack area and that a program such as this is the only real way for Ecology to address the problems.

Mr. Bernie Schuyleman

134. See comment #10. The department realizes that ground water is not a feasible alternate source in all cases, but also feels that more can and should be done to develop other means of water supply.

Mr. Duane :Phinney, WDF

135. See comments #97-105.

Mr. Jim Johnston

136. The department agrees that minimum flows need to be set for protection of instream resources. With the combination of the regulation and increased enforcement we hope to be able to protect the instream resources.

137. See responses #93 and 105.

Mr. Peter Willing Water District #10

138. See response 107.

Mr. Curt Maberry and Mr. Marty Maberry

139. See responses 9-12.

Mr. George Bremner

140. The department agrees with the desirability of having enough water in the creeks to protect the fish.

Mr. Dale Bedlington

141. Noted. See response #28..

Mr. Richard Clark

142. See response #54.

Mr. Frank DeVries

143. Noted.

Mr. Terry DeValois

144. See response #45.

Mr. Aloys Ebey

145. Noted.

Mr. Harlan Kredit

146. The department is pleased to hear that the Lynden school's fisheries program is continuing. We realize that illegal water diversions have occurred on Fishtrap Creek. Please see comment #6 on enforcement.

147. It is beyond the department's authority to arrange water use among farmers. However, we are planning on increasing our enforcement action, and agree that it is crucial to the success of the program.

Ms. Susan Cook

148. We agree that solutions can and should be found to the problems related to water quality and quantity, and expect this program to help. We will be interested to see the results of these watershed studies.

Ms. Donna Simmons, Ecological Commission

149. Thank you for your support. We share your concern over water quality and are pursuing avenues of strengthening control with advice from the Attorney General's Office. Water quality monitoring will continue at the historically used stations at North Cedarville and Brennan.

Mr. Fred Shiosaki, Ecological Commission

150. Thank you for your support.

Russ Orell, WDF

151. Please see comment #6 regarding enforcement. Many of your comments have been incorporated into the text. Please see text for changes. Thank you for your input.

C. C. Pittack, Ecological Commission

152. Thank you for your support. We feel that the Nooksack IRPP and regulation as amended will do much for protection of fisheries and other stream resources.