No. 67, Original

In the Supreme Court of the United States

October Term, 1982

STATE OF IDAHO ex rel. CECIL D. ANDRUS,
Governor, WAYNE L. KIDWELL, Attorney General,
JOSEPH C. GREENLEY, Director, Department of Fish and Game,
Plaintiff,

vs.

STATE OF OREGON and STATE OF WASHINGTON,
Defendants.

FINAL REPORT ON MERITS

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FINAL REPORT ON THE MERITS

EXPLANATORY STATEMENT

On April 30, 1982, the Master submitted a Preliminary Report to the States and gave them opportunity to present exceptions. Idaho and Washington each filed exceptions. Oregon did not. On June 28, 1982, the exceptions were argued orally. The Master has made some changes, which he considers insubstantial, in the Preliminary Report and submits herewith both his Preliminary Report as revised and his Final Report.

PRELIMINARY REPORT

I. INTRODUCTION

In this original jurisdiction interstate suit the State of Idaho claims that the States of Oregon and Washington have deprived Idaho of its fair share of various runs of anadromous fish occurring in the Columbia River System. The claim relates to fish which migrate from Idaho spawning grounds through Oregon and Washington to the Pacific Ocean and return to their spawning areas for reproduction of the species. Oregon and Washington deny that they have taken more than their fair shares of the fish.

In granting leave to file the Court limited the issues to the equitable apportionment claim and the indispensability of the United States as a party to the action. 429 U.S. 163 (1976). The action was referred to a Special Master, 431 U.S. 952 (1977), who recommended dismissal because of the indispensability of the United States. The Court reversed, held the United States was not indispensable, and remanded the case to the Master for further proceedings, 444 U.S. 380 (1980).

Extensive discovery followed the remand. The three States entered into a Pre-Trial Order which was approved by the Master on June 15, 1981. In that Order many of the facts were stipulated. Trial on the merits was held June 15-18, 1981. After briefing by each State, oral arguments were heard on December 16, 1981. Because of his dissatisfaction with the record produced, the Master, by a February 12, 1982, Order, required the States to present additional statements on specific points. These statements were filed in March, 1982.

II. THE ISSUES AND THE MASTER'S CONCLUSIONS

The issues are:

(1) Does the Idaho claim to an equitable apportionment of the anadromous fish present a justiciable controversy?

The Master concludes that it does.

(2) Have the actions of Oregon and Washington unconstitutionally deprived Idaho of its equitable apportionment of anadromous fish?

The Master concludes that they have not.

(3) Has Idaho sustained an injury of substantial magnitude entitling it to relief in this original jurisdiction interstate suit?

The Master concludes that it has not.

(4) To what relief, if any, is Idaho entitled?

The Master's conclusions on Issues (2) and (3) make it unnecessary to consider this point.

III. RECOMMENDATION

The Master recommends that the action be dismissed without prejudice to the right of Idaho to bring new proceedings whenever it shall appear that harvest of fish by nontreaty fisheries in Oregon and Washington deprives Idaho of its equitable share of anadromous fish.

IV. THE FACTS

A. General

The action involves three species of anadromous fish, spring chinook, summer chinook, and summer steelhead, which spawn in Idaho tributaries of the Snake River and as 1-2 year old juveniles pass down the Snake River to its confluence with the Columbia River in Washington. They then pass down the Columbia, which for many miles is the boundary between Washington and Oregon, to enter the Pacific Ocean where they spend 1–4 years. As adults the fish return to their spawning grounds to complete the life cycle.

Idaho claims that, as the State of origin, it is entitled to the return of the fish spawned in Idaho. Idaho states that Oregon and Washington have mismanaged the harvest of fish within their respective jurisdictions with the result that Idaho has been deprived of the returning adults to which it is entitled. Idaho recognizes three situations which affect the passage of the fish. The first is the loss of fish on both downstream and upstream runs by the operation of federally built and operated dams. Idaho does not attack the operation of the dams. Second is the ocean harvest. Again, Idaho makes no complaint. Third is the harvest of fish by Indians under treaty rights. Idaho recognizes the prior rights of the Indians and seeks an apportionment only of the fish remaining after the Indian harvest.

B. Historical Background

Settlement of the Columbia River Basin by non-Indians began in the early 1800's. In 1855 the United States entered into a series of treaties with the Indian Tribes of Washington and Oregon, including (1) Yakima, 12 Stat. 951; (2)

Tribes of Middle Oregon, 12 Stat. 963; (3) Umatilla, 12 Stat. 945; and (4) Nez Perce, 12 Stat. 957. The treaties recognize the fishing rights of the Indians and have resulted in extensive litigation. See e.g. Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n, 443 U.S. 658 (1979), Department of Game of Washington v. Puyallup Tribe, 414 U.S. 44 (1973), and Sohappy v. Smith, D.C.Ore., 302 F.Supp. 899, affirmed and remanded, 9 Cir., 529 F.2d 570 (1976). The Indian fishery occurs in what is known as Zone 6 located between Bonneville and McNary Dams on the Columbia main stem where the river is the boundary between Oregon and Washington.

In 1918, with the consent of Congress, Oregon and Washington entered into the Oregon-Washington Columbia River Fish Compact. 40 Stat. 515. In substance the Compact provides that the then existing laws and regulations of each State pertaining to Columbia River fish may not be changed, altered, or amended without the consent and approval of both States. Idaho was not a party to the Compact and its efforts to become a party have failed. In its complaint Idaho charged that the operation of the Compact has adversely affected the number of anadromous fish available for harvest in Idaho and sought to compel the defendant States to admit Idaho to the Compact. The Court eliminated the issue by taking jurisdiction only of the equitable apportionment claim.

Columbia River nontreaty commercial fisheries are jointly managed by the Oregon Department of Fish and Wildlife and the Washington Department of Fisheries. Idaho has no commercial fishery. Sport fishing regulations are established separately by the management agencies of Oregon, Washington, and Idaho. Ex. I-27, p. 1.

C. The River System

The Columbia River System is one of the world's most famous watersheds for the production of anadromous fish. Ex. W-4, p. A-1. The Columbia rises in British Columbia and meanders generally in a southerly direction through Washington until joined by its principal tributary, the Snake River. About 30 miles south of the confluence, the

Columbia turns westward and for about 270 miles forms the boundary between Washington and Oregon. Downstream from its confluence with the Snake, the Columbia is joined by the John Day, Deschutes, and Willamette Rivers which flow from Oregon, and the Cowlitz, Kalama, and Lewis Rivers which flow from Washington.

The Snake River rises in Wyoming, flows southerly to its crossing of the Wyoming-Idaho border, then westerly and northerly across Idaho to a point where it becomes the boundary between Idaho and Oregon for about 165 miles. The Snake then forms the boundary between Idaho and Washington for about 30 miles where it turns westerly and flows through Washington for about 100 miles to its confluence with the Columbia.

Eight federally constructed and operated dams obstruct the passage of fish between the estuary and the Washington-Idaho border. Four of these are on the main stem below the confluence of the Columbia and Snake. The dam furthest downstream is Bonneville. Four dams are on the Snake above the confluence. The highest of these is Lower Granite. Bonneville and Lower Granite are of prime importance in considering the fish runs.

Below McNary Dam, the highest upstream of the main stem dams, the Columbia is divided into six fishing zones. Zones One to Five cover 140 miles of river below Bonneville. In these zones Washington and Oregon have a regulated fishery on both the Columbia and entering tributaries. Zone Six covers 130 miles from Bonneville to McNary and is open to Indian treaty fishery, some of which is commercial. The fishery experts divide the fish appearing below Bonneville into lower river runs and upper river runs. Ex. I-27, p. 2, 7–10 and zone map at p. 3, Fig. 1.

Enclosed in the attached envelope is Fig. (1) a general map of the Columbia River System, and Fig. (2) a detailed map showing tributaries and dam locations.

D. The Dams

The June 15, 1981, Pre-Trial Order contains the following stipulation:

> "The most significant cause of decline of Idaho origin spring chinook, summer chinook and summer steelhead has been the construction and operation by the United States Government of hydro-electric projects on the Columbia River and Snake River together with the licensing by the Federal Energy Regulatory Commission of other projects on the Snake River constructed by non-federal utilities." (Admitted Fact No. 25)

The United States Corps of Engineers has built, and continuously operated, the dams listed by upstream order in the following two tables. Ex. I-27, p. 31, and Ex. W-5, at Exhibit IV thereof.

On the main stem of the Columbia where it is the boundary between Oregon and Washington:

Dam	River Miles Above Estuary	Completion Date
Bonneville	146	1938
The Dalles	192	1957
John Day	216	1968
McNary	292	1953

The gross head of these dams varies from 59 to 105 feet. The reservoir length varies from 31 to 76 miles.

The Corps of Engineers has also built and continuously operated the following dams, all located in Washington on the Snake River above its confluence with the Columbia:

Dam	River Miles Above Confluence	Completion Date
Ice Harbor	10	1961
Lower Monumental	42	1969
Little Goose	70	1970
Lower Granite	108	1975

The gross head of these dams varies from 97 to 100 feet. The reservoir length varies from 29 to 39 miles.

The purpose of all of the above dams is the generation of electric power by the passage of water through turbines. The number of turbines in the Snake River dams has increased from 3 in 1968 to 24 in 1979. Ex. O-24, p. 5.

Witness Gufler testified in a 1978 hearing that by 1980 the dams would control the river so that all water will be passed through the turbines. Tr. 127. The testimony is not controverted. This means that under present conditions, in the absence of spills, the fish migrating downstream will have to pass through the turbines. The mortality of downstream migrants may reach 95% in low water years. See Columbia Basin Salmon and Steelhead Analysis, Ex. W-3, p. 6, and Ex. W-4, p. A-15.

In addition to turbine mortalities, losses are caused by nitrogen supersaturation resulting from the plunge over the high dams, susceptibility to disease because of high water temperatures, Tr. 119 and Ex. W-4, p. A-15, and loss of orientation in slack water, Tr. 125. The mortality of adult fish returning upstream is about 15% at each dam. Ex. W-3, p. 7. Of the adults escaping over Bonneville, approximately 25% to 30% pass over Lower Granite Dam.

All of the above dams are equipped with fish ladders to facilitate the upstream passage of fish. Entrance to the ladders is stimulated by attraction water. The ladders have steps which the fish can jump. Water for the ladders is provided by spills from the reservoirs. Each ladder has provision for viewing and counting the fish. All parties accept the fish counts which are made under the supervision of the Corps of Engineers and involve observation, extrapolation and estimation. The accuracy of the counts is affected by fallback, particularly in times of high stream flow. Fallback results from disorientation in slack water, a return over the dam spillways, and double counting when the fish again pass up the ladders. As explained later, fallback was an important factor in the genesis of this lawsuit.

In addition to the Columbia River dams with their fish ladders, dams on the Snake River System also are important to the existence, size, and character of the anadromous fish runs. Of great significance are the Dworshak Dam of the Corps of Engineers on the North Fork of the Clearwater and three dams built by the Idaho Power Company on the Snake. All of these generate power and none have fish ladders.

The Idaho Power Company dams were built and are operated under licenses from the Federal Power Commission, now the Federal Energy Regulatory Commission. See 42 U.S.C. §§ 7171 and 7172. All are located on the Snake where it forms the boundary between Idaho and Oregon. In upstream order they are Hell's Canyon, Oxbow, and Brownlee. Hell's Canyon, completed in 1971, blocks all fish passage up and down the Snake.

Other dams in the Columbia River System affecting water storage and release are various projects of the United States Bureau of Reclamation and dams of public utility districts and of private enterprises licensed by the Federal Energy Regulatory Commission.

Storage and release of water in and from the federally operated and licensed dams are controlled by a federal agency. All the States can do is to request that the appropriate agency take action. At times the requests are honored and at other times they are not. Tr. 117–119 and 147-153.

E. The Habitat

The controversy relates to anadromous fish which spawn in the gravel bars of the Columbia River System. Cool, clear, and unpolluted water passing over riffles is desirable. Ex. W-4, p. A-1 says:

> "Prior to modern man's influence some 163,200 square miles of watershed [in the Columbia System] contained habitat ideal for salmon and trout. Today, less than 72,800 square miles remain accessible to anadromous fish and much of that has been transformed to aquatic environment adverse to salmon and steelhead."

During the past 50 years, adverse environmental changes have resulted from dams, pollution, water control, watershed management practices of forestry and agriculture, urbanization, industrialization, and highway construction. Id. A-1 and 6-36. Idaho has taken various measures to improve the habitat for anadromous fish. Because dams prevent anadromous fish from spawning in large areas of the Snake drainage, hatchery programs have been

developed to mitigate the effects of the dams.

F. The Hatcheries

Fish hatcheries are intended to compensate for fish losses caused by man's activities. The basic idea is that by placing an increased number of smolts in the streams above the dams an increased number will return from the ocean as adults.

The construction of the Hell's Canyon, Oxbow, and Brownlee dams by the Idaho Power Company effectively blocked the passage of fish in the Snake River. The Company, the three States, and federal agencies made a mitigation agreement approved by the Federal Energy Regulatory Commission. Pursuant to the agreement the Company finances various hatcheries located in Idaho. The Corps of Engineers also finances, sometimes with the help of other federal agencies, hatcheries in Idaho and Washington. In Idaho funds to support hatcheries are derived from the issuance of fishing licenses and not from state taxes. License funds constitute less than half of the expense for funding the hatcheries. Tr. 267.

G. The Indian Treaty Rights

The rights of the Indians under various treaties made in the mid-1800's have been discussed in several decisions of the Supreme Court. See e.g., Washington v. Washington State Commercial Passenger Fishing Vessel Ass'n, 443 U.S. 658, 664–669; Idaho v. Oregon, 444 U.S. 380, 389–390; and Puyallup Tribe v. Department of Game of Washington, 391 U.S. 392, 398, and 414 U.S. 44, 45.

Controversies among the Indian Tribes, Oregon and Washington resulted in a 1968 suit brought in the United States District Court for the District of Oregon by members of the Yakima Tribe against Oregon officials. The Indians sought protection of their fishing rights granted under the treaties. See Sohappy v. Smith, D.C.Ore., 302 F.Supp. 899. On behalf of various Tribes the United States sued Oregon. The Warm Springs Tribe of Central Oregon, the Yakimas, the Umatillas, and the Nez Perce were permitted to intervene, and United States v. Oregon was

consolidated with Sohappy v. Smith.

After trial without a jury, the court in 1969 ruled that Oregon was limited in its power to regulate the exercise of the Indian treaty rights in that the regulations must be necessary for the conservation of the fish, must not discriminate against the Indians, and must meet appropriate standards. Id. at 910–911. The court retained continuing jurisdiction.

In 1974 a dispute arose over the run of spring chinook. The State of Washington was permitted to intervene. The previously entered injunction was amended to provide that the Indians had the opportunity to take "up to 50% of the harvest" of spring chinook. On appeal the Ninth Circuit held that the States should have the opportunity "to make a record concerning the propriety of the district court's apportionment of spring Chinook Salmon runs yet to occur." Sohappy v. Smith, 9 Cir., 529 F.2d 570, 573.

On remand, and apparently without further trial, the district court on February 25, 1977, approved "A Plan for Managing Fisheries on Stocks Originating from the Columbia River and its Tributaries above Bonneville Dam." The Plan was signed by representatives of the United States, Oregon, Washington, and each of the intervening Indian Tribes. See Ex. 0-12 A, pp. 44–57. A copy of the Plan is attached as Appendix A, p. 13, to Oregon's motion to dismiss. Idaho is not a party to the Plan.

The purpose of the Plan is to maintain, perpetuate, and enhance fish stocks originating in the Columbia River System above Bonneville, to insure that the Indians have the opportunity to harvest their fair share of the fish, and to provide for a fair share of the harvest by nontreaty users. The Plan allocates fish between treaty and nontreaty fisheries. The Plan recognizes that "environmental factors totally unrelated to the treaty or nontreaty fisheries [have caused] a continual decline of some runs of anadromous fish." Id. at p. 47. Because run size cannot always be accurately calculated, provision is made for overall adjustments within a 5-year frame. Hatchery runs are shared.

With some variations for specific species, the Plan recognizes that 120,000-150,000 fish past Bonneville will produce 30,000-37,500 fish past Lower Granite.

The Plan contains the following termination provision, Id. at p. 50:

> "Upon thirty days written notice by any party, after five years from date [February 25, 1977], this comprehensive plan may be withdrawn or may be renegotiated to assure that the terms set forth represent current facts, court decisions, and laws."

The statement of Washington and Oregon filed pursuant to the Master's February 12, 1982, Order has attached copies of notices of withdrawal from the Five-Year Plan by the Yakima Tribal Council and by the Confederated Tribes of the Umatilla Indian Reservation. The withdrawal of two of the seven signatories would seem to end the Plan.

V. THE FISH RUNS

A. General

The Master's February 12, 1982, Order required the parties to submit tables showing separately for spring chinook, summer chinook, and summer steelhead during the 25-year period 1956-1980 the pertinent figures relating to the runs. The Master selected the 25-year period because the record contains no evidence that prior thereto, when only two dams, Bonneville and McNary, were completed, any substantial adverse effect on the runs was apparent. Since 1956 six additional dams have been added.

The attached tables, Appendices A, B and C, show the figures for each run and cover only upriver fish. The figures are given in thousands. The tables are taken from the Idaho presentation with minor and insignificant changes as noted. Washington and Oregon attack the numbers for the Idaho harvest on the ground that they are rounded downward and do not reflect the true harvest. In the absence of countervailing evidence, the Master accepts the Idaho figures.

The Master has prepared tables showing the average annual run sizes of the three species. These tables appear on the succeeding pages following descriptions of the runs of each of the three species. The tables show average run sizes for three historical periods: 1956–1970, 1971–1980, and 1976–1980. The organization of the tables represents the conclusion of the Master, explained in detail later, that allegations of injury must be assessed in terms of present, not historical, conditions.

B. Spring Chinook

The lower river spring chinook run occurs from February through early May and is primarily composed of stocks originating in the Willamette, Cowlitz, Lewis, and Kalama Rivers in Washington and Oregon. Lower river spring chinook are harvested mainly during the winter season but some are caught in April and May. The upper river runs occur mainly in April and May and are destined for areas above Bonneville both on the Columbia and its tributaries and on the Snake and its tributaries. Fishing below Bonneville includes both lower and upper river runs.

There appears to be no way of segregating the runs except on a variable and uncertain time basis. The number of fish entering the system from the ocean is computed by adding the catch below Bonneville to the Bonneville count. Although the 25-year table for spring chinook purports to cover only upriver fish, the Bonneville count includes both fish destined for Idaho and fish destined for other areas. Some of these fish get to Idaho and some do not.

Table 1 on the following page shows the pertinent spring chinook figures in terms of averages for the periods 1956–1970, 1971–1980, and 1976–1980.

TABLE 1
UPRIVER SPRING CHINOOK
(In Thousands)
(Yearly Average for Period Shown)

PERIOD	ENTERING COLUMBIA	BELOW BONNEVILLE HARVEST: COMMERCIAL	SPORT	BONNEVILLE COUNT	INDIAN HARVEST	ICE HARBOR COUNT	LOWER GRANITE COUNT	IDAHO**** HARVEST
1956–1970	176.00	70.21	22.64*	95.21	9.26	35.69**		7.33
1971–1980	135.60	17.07	10.25	108.30	12.76	32.19		3.15
1976–1980	92.66	1.86	2.98	87.82	4.08	27.54	22.03***	2.10

* – No Figures Available for 1956–1963

** – Count Begins 1962 — Figure Shown is a 9-Year Average

*** – Count Begins 1975 with 17.6

**** – Oregon and Washington Say Count is Understated Because of Rounding Figures

C. Summer Chinook

Summer chinook enter the lower river from late May through July. The June races are destined for the Snake River in Idaho and the July races for the upper Columbia and its tributaries in Washington. Ex. I-27, pp. 12–15. The numbers of summer chinook have declined greatly. The reasons given are these, Id. at 12:

> "Environmental problems associated with dams and logging practice [sic.] are considered responsible for the steady decline of this run. Former spawning areas are blocked and flooded. Remaining spawning-rearing areas have deteriorated as a result of siltation caused by road building and logging on unstable soils. High prespawning losses of adults due to upstream passage stress and high smolt mortalities during downstream passage have occurred as a result of these dams."

No commercial catch of summer chinook below Bonneville, no Indian catch, and no Idaho catch, have occurred since 1973.

With reference to summer chinook, the Five-Year Plan says, Ex. 0-12 A, p. 54:

> "Summer chinook salmon runs are precariously low and do not warrant any fishery at the present time, with the exception of a treaty subsistence, ceremonial, and incidental catch not to exceed 2,000 fish during the months of June and July."

Table 2 shows the pertinent summer chinook figures in terms of yearly averages for the periods 1956–1970, 1971–1980, and 1976–1980.

TABLE 2
UPRIVER SUMMER CHINOOK
(In Thousands)
(Yearly Average for Period Shown)

PERIOD	ENTERING COLUMBIA	BELOW BONNEVILLE HARVEST: COMMERCIAL	SPORT	BONNEVILLE COUNT	INDIAN HARVEST	ICE HARBOR COUNT	LOWER GRANITE COUNT	IDAHO**** HARVEST
1956–1970	124.16	35.79	4.41*	86.34	4.00	24.22**		6.80
1971–1980	49.00	0.89	1.37	46.39	1.22	11.68		0.0
1976–1980	38.44	0.0	.01	38.28	0.0	7.32	7.62***	0.0

* – No Figures Available for 1956–1963

** – Count Begins 1962 — Figure Shown is a 9-Year Average

*** – Count Begins 1975 with 8.6

**** – Oregon and Washington Say Count is Understated Because of Rounding Figures

D. Summer Steelhead

Summer steelhead runs enter the Lower Columbia from April through September. Those arriving in June and July are destined for tributaries throughout the watershed. Fish entering in August and September are destined particularly for the Snake River. Table 3 on the following page shows the pertinent figures on upriver summer steelhead in terms of yearly averages for the periods.

TABLE 3
UPRIVER SUMMER STEELHEAD
(In Thousands)
(Yearly Average for Period Shown)

PERIOD	ENTERING COLUMBIA	BELOW BONNEVILLE HARVEST: COMMERCIAL	SPORT	BONNEVILLE COUNT	INDIAN HARVEST	ICE HARBOR COUNT	LOWER GRANITE COUNT	IDAHO**** HARVEST
1956–1970	202.39	61.58	19.84*	131.55	8.02	69.13**		21.90
1971–1980	153.46	7.22	5.14	140.73	17.0	37.67		8.55
1976–1980	133.38	0.0	2.24	130.32	13.80	35.82	31.48***	8.20

* – No Figures Available for 1956–1963

** – Count Begins 1962

*** – Count Begins 1975 with 17.3

**** – Oregon and Washington Say Count is Understated Because of Rounding Figures

E. Escapement

Important to Idaho is the number of fish which escape over Lower Granite, the last of the dams located on the Snake before it becomes the boundary between Washington and Idaho. Consideration of this matter requires an understanding of how the escapement figures are reached.

The upstream returning adults are counted at observation windows in the fish ladders. The counting is under the control of the Corps of Engineers. The counts are based on observation, extrapolation, and estimation. All parties accept the counts as made by the Corps. Escapement goals were established by Oregon and Washington in 1963, Ex. W-1, pp. 6–7, and by the Five-Year Plan in 1975, Ex. 0-12 A.

The significant counts are those at Bonneville, Ice Harbor, and Lower Granite. Bonneville is the lowest downstream dam and was the first constructed (1938). Ice Harbor is the first dam on the Snake upstream of its confluence with the Columbia and was the first dam constructed on the Snake (1961). Lower Granite is the last dam on the Snake before it becomes the Idaho-Washington boundary and also was the last constructed.

The following tables show the pertinent annual escapement and harvest counts for each species during the period 1971–1980.

TABLE 4

Spring Chinook

(In Thousands)

Year	Oregon-Washington Comm'l	Harvest: Sport	Total	Bonneville Count	Ice Harbor Count	Lower Granite Count
1971	22.6	19.9	42.5	125.5	32.6	NA
1972	69.9	23.4	93.3	186.1	50.3	NA
1973	60.5	30.3	90.8	142.1	60.6	NA
1974	8.4	14.0	22.4	86.1	19.3	NA
1975	0.0	0.0	0.0	104.1	21.4	17.6
1976	0.0	0.0	0.0	78.3	25.1	20.5
1977	9.3	14.8	24.1	119.5	44.4	38.8
1978	0.0	0.1	0.1	128.9	49.3	41.0
1979	0.0	0.0	0.0	51.4	9.2	7.5
1980	0.0	0.0	0.0	61.0	9.7	6.8

The Bonneville escapement exceeded 120,000 fish in four of the ten years (1971, 1972, 1973, and 1978). It did not exceed 120,000 in six of the years (1974, 1975, 1976, 1977, 1979, and 1980). In only one of those years (1977), would it have exceeded 120,000 fish if there had been no Oregon-Washington harvest.

TABLE 5
Summer Chinook

Year	Oregon-Washington Harvest Comm'l	Sport	Total	Bonneville Count	Ice Harbor Count	Lower Granite Count
1971	4.5	7.1	11.6	77.9	26.6	NA
1972	3.2	3.5	6.7	70.8	22.8	NA
1973	1.2	2.3	3.5	45.4	12.8	NA
1974	0.0	0.0	0.0	34.0	10.3	NA
1975	0.0	0.0	0.0	44.4	7.7	8.6
1976	0.0	0.0	0.0	42.1	10.0	9.9
1977	0.0	0.2	0.2	41.0	10.3	8.4
1978	0.0	0.4	0.4	43.0	10.4	11.8
1979	0.0	0.2	0.2	34.2	2.6	3.6
1980	0.0	0.0	0.0	31.1	3.3	3.4

The Bonneville escapement exceeded 120,000 fish in none of the years and would not have exceeded that figure if there had been no Oregon-Washington harvest.

TABLE 6
Summer Steelhead

Year	Oregon-Washington Harvest Comm'l	Sport	Total	Bonneville Count	Ice Harbor Count	Lower Granite Count
1971	20.6	10.8	31.4	193.1	67.0	NA
1972	24.9	15.4	40.3	185.3	63.6	NA
1973	22.7	8.5	31.2	156.6	38.3	NA
1974	4.0	5.5	9.5	136.6	12.5	NA
1975	0.0	0.0	0.0	84.1	16.2	17.3
1976	0.0	0.0	0.0	122.4	23.9	23.0
1977	0.0	4.4	4.4	191.7	54.8	53.0
1978	0.0	2.7	2.7	102.3	27.1	30.1
1979	0.0	1.8	1.8	112.4	23.1	25.0
1980	0.0	2.3	2.3	122.8	50.2	40.5

The Bonneville escapement exceeded 120,000 fish in seven of the ten years. In three of the years (1975, 1978, and 1979), it did not exceed that number and would not have if there had been no Oregon-Washington harvest.

The harvests and escapements will be discussed in detail later. At this point the Master notes that both the harvests and escapements, and the relationship between the two, are greatly varied. Both the harvests of all three States and escapments during the 1971–1980 period are drastically less than those occurring in the 1956–1970 period.

VI. JUSTICIABLE CONTROVERSY

Idaho contends that it has the right to receive from the total number of fish entering the Columbia from the ocean a percentage equal to Idaho's contribution to that total. Idaho makes two qualifications. First, that the dam mortalities must be shared equally by the three States. Idaho accepts the operation of the dams by the pertinent federal agencies. Second, by reason of their treaty rights the Indians have the first call on the fish and the Indian share must be first deducted from the total returning fish.

Oregon and Washington argue that the Idaho complaint fails to state a claim on which relief can be granted. Their arguments are (1) fish are *ferae naturae,* not subject to ownership until reduced to possession, and (2) without a property right in the fish, loss of fishing opportunity is not an actual injury of serious magnitude justifying invocation of the Court's original jurisdiction.

In his February 2, 1979, Report the Master said, p.17:

> "The question of whether a state may maintain an original action for the apportionment of migratory fish is one of first impression and should be decided after trial on the merits, not on the pleadings. The complaint states a justiciable controversy proper for the Court to consider and determine in the exercise of its original jurisdiction."

In rejecting the Master's recommendation that the action be dismissed because of the inability to join the United States as a party, 444 U.S. 380, the Court implied that the controversy was constitutionally justiciable but did not discuss the problem. The Court said, 444 U.S. 392:

> "It [Idaho] now must shoulder the burden of proving that the nontreaty fisheries in those two States [Oregon and Washington] have adversely and unfairly affected the number of fish arriving in Idaho."

Because the defendant States persist in their contention that a justiciable controversy is not presented, the Master believes it is desirable to review that issue.

The specific question is one of first impression. The basis of the Idaho claim is that, as the State of origin, it is entitled to its equitable share of the returning fish. The essence of the defendants' claim is that the fish are *ferae naturae* within the borders of their States and and are subject to control of the States while within their borders. A brief review of Supreme Court decisions relating to wildlife is pertinent.

Geer v. Connecticut, 161 U.S. 519, rejected a Commerce Clause challenge against a state statute which prohibited the out-of-state transportation of game birds lawfully killed within the state. The Court held that wild game located within the territorial boundaries of a state are common property of its citizens and the state as a trustee may exercise and protect this right of ownership for the benefit of its citizens. 161 U.S. at 530.

In Missouri v. Holland, 252 U.S. 416, Missouri unsuccessfully attacked the Migratory Bird Treaty Act which implemented an international treaty. With reliance on Geer, Missouri said that it had full control of wild animals within its boundaries. The Court rejected the Missouri claim.

Lacoste v. Department of Conservation, 263 U.S. 545, upheld a Louisiana tax on the skins of wild furbearing animals taken in the State. The Court said that because

of the State's ownership of wild animals for the common benefit of all of its people, the State under its police power "may regulate and control the taking, subsequent use and property rights that may be acquired [in the wild animals]." Id. at 549.

Foster-Fountain Packing Co. v. Haydel, 278 U.S. 1, invalidated a Louisiana statute which forbade transporting beyond the State shrimp taken in Louisiana waters until the heads and shells had been removed. The Court said that by permitting the shrimp to be taken, shipped, and sold in interstate commerce, the State lost its control and "those taking the shrimp * * * [became] entitled to the rights of private ownership and the protection of the commerce clause." Id. at 13. See also Toomer v. Witsell, 334 U.S. 385, 402.

Douglas v. Seacoast Products, Inc., 431 U.S. 265, involved menhaden, a fish which migrates up and down the Atlantic coast and has important nurturing grounds in estuaries of Chesapeake Bay. Virginia by statute restricted the quantities which might be taken by nonresidents but imposed no similar restriction on Virginia residents. The Court invalidated the statute saying that the Geer ownership concept was "no more than a 19th-century legal fiction expressing 'the importance to its people that a State have power to preserve and regulate the exploitation of an important resource.'" Id. at 284.

Baldwin v. Fish and Game Commission of Montana, 436 U.S. 371, upheld a Montana statute which imposed higher license fees on out-of-state elk hunters than it did on resident hunters. The nonresident hunters argued that the statute violated the Privileges and Immunities Clause (Art. IV, § 2) and the Equal Protection Clause of the Fourteenth Amendment. The Court found no constitutional infirmity and upheld the statute.

Hughes v. Oklahoma, 441 U.S. 322, expressly overruled Geer. In Hughes the Court invalidated an Oklahoma statute which prohibited the transportation, for sale outside of the State, of minnows caught within the State. The Court held the statute repugnant to the Commerce Clause.

The Court rejected the State ownership concept and said that the statute overtly discriminated against interstate commerce.

The wildlife cases from Geer to Hughes recognize that wildlife is a resource which the States may preserve and protect against exploitation. Citing Toomer v. Witsell, 334 U.S. 385 at 402, Idaho argues that the permissible preservation and protection do not empower a State to discriminate against citizens of other States in violation of the Privileges and Immunities Clause, Art. IV, § 2, and the Commerce Clause, Art. I, § 8. Toomer involved shrimp which migrate through the coastal water of several states. In the course of migration the shrimp are temporarily off the coast of South Carolina. It imposed substantially higher fees and greater restrictions on nonresident commercial fishermen than it did on its residents. In invalidating the statute, the Court held that it violated both the Privileges and Immunities Clause of Art. IV, § 2, and the Commerce Clause, Art. I, § 8.

The instant case presents no comparable situation. Nothing in the record shows that in either commercial or sport fishing Oregon and Washington treat nonresidents any differently than residents. Individuals are subjected to no discrimination. Idaho argues that those who fish in its waters are unfairly treated because the actions of Oregon and Washington permit the taking of more than their share. The argument is not persuasive. The Idaho fishermen can harvest only the fish arriving in Idaho and the State in its *parens patriae* capacity represents all those who fish within its borders.

Neither the Privileges and Immunities Clause nor the Commerce Clause argument has any place in this litigation. In a state of nature the fish pass from State to State in the Columbia River System under the impetus of their instinct to go from their spawning grounds to the ocean and then return to the spawning area to complete the life cycle. The migration is impeded by the dams which have been constructed, and are operated, under federal authority. Idaho

and Washington do not prevent, or impose any conditions on, the interstate movement of the fish.

The Idaho claim is that the mismanagement of Oregon and Washington has permitted excessive harvests and thus unfairly reduced the number of fish returning to Idaho. Oregon and Washington claim that they are entitled to the fish while in Oregon and Washington waters. Each State must share its resources with the other States of the Union.

In West v. Kansas Natural Gas Co., 221 U.S. 229, the Court held invalid an Oklahoma statute designed to prohibit the out-of-state transportation of natural gas produced in Oklahoma. The Court said, Id. at 255, that the welfare of each State "is made the greater by a division of its resources, natural and created, with every other State, and those of every other State with it." This principle was followed in Pennsylvania v. West Virginia, 262 U.S. 553, 599–600; H.P. Hood & Sons, Inc. v. Dumond, 336 U.S. 525; and New England Power Co. v. New Hampshire, decided February 24, 1982, 102 S.Ct. 1096.

Idaho claims that actions of Oregon and Washington have wrongfully deprived it of its equitable share of a natural resource and draws an analogy with the interstate water apportionment cases such as Nebraska v. Wyoming, 325 U.S. 589; Colorado v. Kansas, 320 U.S. 383; Wyoming v. Colorado, 259 U.S. 419; and Kansas v. Colorado, 206 U.S. 46. These cases recognize that a downstream State is entitled to an equitable share of the water of an interstate stream. The upstream State may take and consume only its fair share of the water.

The water cases differ from the instant case. Under both the riparian and appropriation doctrines of water law, the right to use water is capable of private ownership which may be acquired in various ways. The water apportionment cases seek to harmonize and coordinate property interests in adjoining States.

Fish are not capable of ownership until reduced to possession. The Idaho claim of entitlement to all fish originating in that State is comparable to the claims of the upper States in the water cases that they are entitled to use and

consume all of the water produced in them. The Court has consistently rejected the claim.

The claim of Washington and Oregon that they are under no compulsion to see that fish return to Idaho is equally fallacious. Although Idaho may not regulate what Oregon and Washington do with regard to fish harvests, Idaho is entitled to its fair share of the fish. Of course, Oregon and Washington are entitled to their fair share. The fish are a natural resource which each State must share with the others.

The Master concludes that the case presents a justiciable controversy which must be decided on its merits.

VII. INJURY

A. General

The Supreme Court has determined the principles applicable to original jurisdiction, interstate controversies. Determination of the relative rights of contending States does not depend upon the rules of law applicable to private disputes. Connecticut v. Massachusetts, 282 U.S. 660, 670. The burden on the complaining State is much greater than that imposed on a private litigant. North Dakota v. Minnesota, 263 U.S. 365, 374. The complaining State must establish by clear and convincing evidence that the invasion of rights is of serious magnitude. New York v. New Jersey, 256 U.S. 296, 309.

In its remand of this case to the Master, the Court said, 444 U.S. 380, 392:

> "A trial on the merits may well demonstrate that the target fisheries have, in fact, had no effect upon the runs of anadromous fish at issue here. Alternatively, a trial may demonstrate that natural and man-made obstacles will prevent any additional fish allowed to pass out of Zone 5 from reaching Idaho in numbers justifying additional restrictions on nontreaty fisheries in Oregon and Washington."

In the discussion which follows, the Master applies two principles which should be noted. First, the decision should

be based on conditions now existing. Evidence of natural conditions before the activities of man produced the dams which have depressed the fish runs is of no materiality. Idaho accepts both the construction and operation of the dams by the United States. It is in no position to base its claim on pristine conditions. Before 1957 only two dams, Bonneville completed in 1938, and McNary completed in 1953, affected the fish runs. The two other main stem dams, The Dalles and John Day, were completed in 1957 and 1968 respectively. The first Snake River dam, Ice Harbor, was completed in 1961, and the last, Lower Granite, in 1975. Lower Monumental and Little Goose were completed in 1969 and 1970 respectively. The number of turbines in the Snake River dams increased from three in 1968 to 24 in 1979.

Figures representing conditions during the 15-year period, 1956 to 1970 inclusive, are material only from an historical standpoint. Figures for the 10-year period, 1971–1980 inclusive, show deterioration in the runs and harvests. The present situation is represented by the 6-year figures for 1975–1980 inclusive with eight dams and 24 turbines in the Snake River dams.

Nebraska v. Wyoming, 325 U.S. 589, was a water apportionment case brought by Nebraska against Wyoming. Colorado was an impleaded defendant and the United States intervened. The court said, Id. at 620:

> "In recommending his apportionment the Special Master did not rest on the long-time average flow of the river. We have discussed the drought which has persisted in this river basin since 1930. No one knows whether it has run its course or whether it represents a new norm. There is no reliable basis for prediction. But a controversy exists; and *the decree which is entered must deal with conditions as they obtain today.* If they substantially change, the decree can be adjusted to meet the new conditions." [Emphasis supplied.]

Conditions did change and in 1953 a modified and supplemental decree was entered by consent. 345 U.S. 981.

The Master's second principle is that evidence of future conditions is not pertinent. Predictions of the rainfall which produces the stream flows are uncertain. The capabilities of the fish to adjust to passage through the turbines and up the fish ladders are unknown. Methods of alleviating downstream mortalities by gathering smolts above Lower Granite and transporting them for release below Bonneville are in an experimental stage. Additionally, the termination of the Five-Year Plan creates doubts as to the Indian treaty rights.

Consideration of the Idaho injury claim presents two main issues: (1) the Idaho entitlement; and (2) the effect of the Oregon-Washington management of harvests on the return of fish to Idaho.

B. Idaho Entitlement

Idaho says that it is entitled to the return of Idaho origin fish in the proportion that the Idaho origin fish bears to the total of all fish entering the System. Idaho presents formulas for the determination of the proportions. The claim is based on both wild fish and hatchery fish. No way is shown of how the number of fish entering the System, either as fingerlings or smolts, can be ascertained. Hatchery egg counts are an inconclusive indication. Fingerling estimates are questionable because of higher mortality. The best indication is the number of smolts, but their number can only be estimated.

The downstream runs are produced by wild fish and by fish hatcheries. All parties recognize that fish hatcheries are essential to maintain the species. The record with regard to hatcheries is not clear. In response to interrogatories, Idaho presented as Ex. 14, a list of 16 hatcheries producing spring chinook, summer chinook, or summer steelhead. The list does not check with trial Ex. I-16a presented by Idaho witness Ortmann but the Master accepts it for the present discussion. The hatcheries mitigate the losses of wild fish caused by construction of the dams.

The construction of Hell's Canyon, Oxbow, and Brownlee dams on the Snake River by the Idaho Power Company closed the upper Snake River for fish passage. The Federal Energy Regulatory Commission approved a mitigation program agreed to by the Power Company, the United States, Idaho, Oregon, and Washington. All hatcheries financed by the Power Company are located in Idaho. Oregon says, without contradiction, that many of the Snake River tributaries entering above Brownlee Dam originate in Oregon and produced substantial numbers of fish before the construction of the Power Company dams. Oregon says that it agreed to the Idaho locations because of the absence of acceptable locations in Oregon.

The Idaho response to interrogatories gives the financing of 15 of the 16 hatcheries. Five are funded by the Idaho Power Company, two by the National Marine Fisheries Service, three by the United States Fish and Wildlife Service, and five in whole or part by Idaho out of proceeds from sale of fishing licenses. Hatchery production of fish varies greatly from year to year.

The Washington response to interrogatories lists nine hatcheries. Two are financed by public utility districts, five by State Game Funds, and two by "Lower Columbia Development" funds. As in the case of Idaho, production varies from year to year. Oregon lists only one hatchery, which is state financed except for occasional contributions from the Pacific Northwest Regional Commission. Production is variable.

The Idaho claim to all hatchery fish produced in Idaho cannot be accepted. The hatcheries in large part are supported by the mitigation programs of federal agencies and the Idaho Power Company. These programs are for the benefit of the entire system, not Idaho alone. An example is the Idaho Power Company program. It was intended to mitigate the loss of fish whose progress was completely blocked by the Idaho Power Company dams on the Snake River. Before those dams, many fish entered the Snake from Oregon tributaries. The mitigation hatcheries were located in Idaho because of more favorable conditions.

Geographic considerations should not entitle Idaho to all the benefit of the mitigation programs and deny Oregon of any benefit. Idaho is entitled to its fair share of the fish but that share does not include all the hatchery fish produced by funding from non-Idaho sources.

The Idaho expert witnesses, Ortmann, Tr. 646–808, and Bjornn, Tr. 861–967, emphasize the Idaho spawning potential and through the use of percentages, largely based on their views of the numbers of Idaho origin fish, seek to show the numbers of additional fish which would have returned to Idaho had there been no Washington-Oregon harvest from the main stem Columbia River. See Idaho exhibits, I-33 and I-34. Their testimony and exhibits must be evaluated on the basis of the assumptions which they make and the percentages which they use. The Idaho evidence shows "a potential that is there, an ideal." Tr. 893. Bjornn testified that he calculated optimum spawning escapements by using data from the period 1940 to 1954. He stated he did not use later data because "they reflect too much the influence of additional dams and don't reflect the production potential." Tr. 891. See also Bjornn testimony at Tr. 882. The data points Dr. Bjornn did not use reflect the present day increased numbers of dams and resulting high mortalities. Tr. 898.

Idaho witness Ortmann attempted to determine additional numbers of fish which would have returned to Idaho if they had not been harvested by Oregon and Washington. The Master considers the calculations to be necessarily inexact, for they result from adjustments of historical figures for mortality losses of later constructed dams and for variable river flow conditions. See Tr. 682–692. The Master holds to this view even after considering revisions for gross errors admittedly made in the calculations. Tr. 689–690, 803–804. The conclusions of and scientific bases for this opinion testimony are unpersuasive.

The Idaho habitat is well adapted for spawning of anadromous fish but that fact is not controlling. Idealism must yield to pragmatism. Idaho accepts the dams. Inconsistently it claims that it, as the State of origin, is entitled to a

high percentage of the annual fish production, but the fish loss on both downstream and upstream runs must, it says, be shared equally by the three States. To this illogical argument is added the Idaho claim to fish produced by hatcheries located in Idaho. An unestablished but high percentage of the hatchery costs are born by the Idaho Power Company and federal agencies. The Idaho contribution comes from fishing license proceeds, not from general taxes. Geographic location because of favorable conditions should not be the sole determining factor. Source of funds is an important consideration.

Determination of the Idaho entitlement presents several unknown variables. The number of new fish entering the System is capable of no definitive count. The number varies greatly from year to year. The time which the fish spend in the ocean varies from one to four years. In any year prediction of the Indian harvest is an unknown. The accuracy of management estimates cannot be known until the completion of the runs.

On the record presented the Master cannot determine the Idaho entitlement for any past or future year. Idaho, Oregon and Washington are each entitled to an equitable share of the returning fish. The remaining question is whether mismanagement of fish harvests in Zones 1–5 below Bonneville by Oregon and Washington has deprived Idaho of an equitable right.

C. Mismanagement

Idaho says that Oregon and Washington have mismanaged the fisheries, both commercial and sport, below Bonneville and thereby deprived Idaho of its fair share. Except for the year 1974, the claims of mismanagement are all of a general character.

Idaho argues that statements of various Washington and Oregon officials sustain Idaho's claim of mismanagement. Idaho does not discuss the legal basis for such claim. No elements of estoppel are presented. At the most the statements can be considered as admissions against interest. No

one of those making the mentioned statements was called as a witness. The circumstances under which the statements were made are not clearly defined. The authority to make the statements is not developed. The general reference in the statements is to over-fishing with no reference to where or by whom the fishing occurs. Random statements of public officials do not suffice to prove an injury of serious magnitude justifying equitable relief in an interstate controversy. The Master has considered all of the statements on which Idaho relies and concludes that they are of minor, if any, importance. The case must be decided on the facts, not on statements of public officials made for public consumption and not intended to bind or compromise the state or organization for which the speaker or writer purports to act.

The basic claim is that Oregon and Washington have managed for minimum rather than optimum escapements. Ex. W-1, pp. 6–7, shows that in 1963 optimum goals were established and were increased in 1974. "Studies have shown that the largest escapements do not necessarily produce the greatest return." Id. Idaho says that the failure to establish escapement goals before 1963 was an act of mismanagement. In 1963 there were three dams on the main stem, Bonneville, McNary, and The Dalles; on the Snake only one, Ice Harbor, was in operation. The Master can find nothing in the record to show that at any time before the bringing of this lawsuit Idaho requested Oregon and Washington to increase the escapement goals. The Idaho evidence that an increase in escapement goals would have increased the return of fish to Idaho is speculative.

The testimony and exhibits of Idaho witness Bjornn based on wild fish do not impress the Master. No way exists of telling whether a fish appearing below Bonneville is wild or hatchery. The use of figures of runs before 1963 is not satisfactory because then only four out of the eight dams were operative. The eight dams which now effectively control the Snake and Lower Columbia runs preclude a return to a state of nature.

Idaho emphasizes the Oregon and Washington mismanagement in 1974. The situation was described by Oregon witness Bohn whose testimony is controverted in no important aspects. See Tr. 1034–1038. The advisors to the Oregon and Washington officials recommended that no harvest be permitted. A limited harvest was permitted. In allowing the harvest the officials made two major judgmental mistakes.

First, they overestimated the Bonneville count by failing to take fallback into consideration. Fallback results from fish, after ladder passage, returning over the spillways and on return upstream being counted twice. Oregon witness Bohn estimated, Tr. 1036, that more than 30% of the fish were counted twice. The phenomenon was first recognized in 1974.

Second, the officials underestimated the Indian treaty catch which in that year was 17,500 spring chinook, and 12,900 summer steelhead. The Oregon-Washington harvest of spring chinook for 1974 was 8,400 commercial catch and 14,000 sport catch. For summer steelhead the figures were 4,000 and 5,500 respectively. The Idaho catch was 1,500 spring chinook and 3,000 steelhead. There was no harvest of summer chinook that year. In spite of the low 1974 escapements, 1977 and 1978 produced a modest increase in the runs. Tr. 1038.

The 1974 situation alone does not suffice to support the Idaho claims. Oregon and Washington admit a mistake. The record shows no repetition or threatened repetition of that mistake.

An analysis of the harvests and escapements since the 1975 completion of Lower Granite shows the present conditions. Table 7 covers spring chinook for that period.

TABLE 7
Upriver Spring Chinook
1975–1980
(Lower Granite Dam Completed in 1975)
(Numbers in Thousands)

	Harvest Oregon-Washington Commercial	Sport	Total	Bonneville Escapement	Lower Granite Escapement	Idaho Harvest
1975	0.0	0.0	0.0	104.1	17.6	0.0
1976	0.0	0.0	0.0	78.3	20.5	0.0
1977	9.3	14.8	24.1	119.5	38.8	3.5
1978	0.0	0.1	0.1	128.9	41.0	7.0
1979	0.0	0.0	0.0	51.4	7.5	0.0
1980	0.0	0.0	0.0	61.0	6.8	0.0

In four of the years, 1975, 1976, 1979, and 1980 no harvest occurred in any one of the three States. In 1977 when the Lower Granite escapement was 38,800, more than the 37,500 escapement goal, Oregon and Washington had a harvest of 24,100 and Idaho 3,500. In 1978, when the Lower Granite escapement was again in excess of the goal, Washington and Oregon harvested 100 and Idaho 7,000.

Table 8 covers summer chinook.

TABLE 8
Upriver Summer Chinook
1975–1980
(Lower Granite Dam Completed in 1975)
(Numbers in Thousands)

	Harvest Oregon-Washington Commercial	Sport	Total	Bonneville Escapement	Lower Granite Escapement	Idaho Harvest
1975	0.0	0.0	0.0	44.4	8.6	0.0
1976	0.0	0.0	0.0	42.1	9.9	0.0
1977	0.0	0.2	0.2	41.0	8.4	0.0
1978	0.0	0.4	0.4	43.0	11.8	0.0
1979	0.0	0.2	0.2	34.2	3.6	0.0
1980	0.0	0.0	0.0	31.1	3.4	0.0

In no year did the Bonneville escapement amount to 120,000 fish. Oregon and Washington had an insignificant sport harvest in three years and Idaho had no harvest.

Table 9 covers summer steelhead.

TABLE 9
Upriver Summer Steelhead
1975–1980
(Lower Granite Dam Completed in 1975)
(Numbers in Thousands)

	Harvest-Oregon-Washington Commercial	Sport	Total	Bonneville Escapement	Lower Granite Escapement	Idaho Harvest
1975	0.0	0.0	0.0	84.1	17.3	0.0
1976	0.0	0.0	0.0	122.4	23.0	2.0
1977	0.0	4.4	4.4	191.7	53.0	13.0
1978	0.0	2.7	2.7	102.3	30.1	11.5
1979	0.0	1.8	1.8	112.4	25.0	5.5
1980	0.0	2.3	2.3	122.8	40.5	9.0

In three years the Lower Granite escapement exceeded 30,000 fish. Oregon and Washington had harvests in four years for a total of 11,200. Idaho had harvests in five years for a total of 41,000.

A summary of the harvests for the 1975–1980 period, with all dams completed and in operation, shows:

Oregon-Washington Total Harvest	36,200
Idaho Total Harvest	51,500
Grand Total	87,700

The Idaho harvest has exceeded the Oregon-Washington harvest by 15,300 fish. The Master is convinced that from a statistical standpoint Idaho has not established a present injury. This leads the Master to consider other than statistical matters.

First, the depressed runs are caused by the construction and operation of the dams and the consequent mortalities in both downstream runs of smolts and the upstream runs of adult fish returning from the ocean. The States have no control over the operation of the dams.

Second, in addition to the dams, man's activities have caused environmental changes adverse to the propagation and survival of anadromous fish. These changes include pollution, watershed management practices of forestry and agriculture, urbanization, industrialization, and highway construction. See Ex. W-4, p. A-1 and pp. A-6 through 36.

Third, the general claims of mismanagement are indistinct and vague. Idaho has not convinced the Master that an increase in Bonneville escapements will solve the problem. The record shows that some years of low escapements produce increased return runs. The claim that increased escapements will produce increased Idaho opportunities for harvest is speculative and impossible of direct proof. If no harvest were permitted below Bonneville, the benefit would accrue to Idaho and the Indians and the detriment would be borne entirely by Oregon and Washington. Benefits and detriments must each be shared.

Fourth, the escapement goals sought by Idaho are incapable of reasonable enforcement. The below Bonneville runs are of mixed stocks. Some fish are destined for Oregon and Washington tributaries entering the Columbia below Bonneville. Other fish are destined for Columbia tributaries entering from both Oregon and Washington above Bonneville. The timing of the various runs overlaps. The Bonneville count is not completed until after the runs. The Indian count is not known until after the runs. Idaho seeks to substitute hindsight for foresight. After-the-fact determinations may not be substituted for good faith before-the-fact predictions. Nothing in the record suggests that Oregon and Washington have acted in bad faith.

In remanding the case to the Master the Court said, 444 U.S. at 392: "A trial on the merits may well demonstrate that the target fisheries have, in fact, had no effect upon the runs of anadromous fish at issue here." On the record presented it would be speculation to say that the below Bonneville fisheries have had no effect but the Master is convinced that the effect is *de minimis*. It is not an injury of serious magnitude, shown by clear and convincing evidence, which entitles Idaho to relief. See New York v.

New Jersey, 256 U.S. 296, 309, and Missouri v. Illinois, 200 U.S. 496, 521. See also Maryland v. Louisiana, 451 U.S. 725 and cases there cited at 737 and 739.

In its remand, the Court also said, 444 U.S. at 392:

> "* * * a trial may demonstrate that natural and man-made obstables will prevent any additional fish allowed to pass out of Zone 5 from reaching Idaho in numbers justifying additional restrictions on nontreaty fisheries in Oregon and Washington."

Idaho has not convinced the Master that the imposition of any restrictions beyond those now self-imposed by Oregon and Washington will substantially increase the return of fish to it. Idaho has failed to show "the high equity that moves the conscience of the Court in giving judgment between states." Washington v. Oregon, 297 U.S. 517, 523.

VIII. GENERAL CONCLUSIONS

For the reasons given the Master concludes that Idaho has not proved an injury entitling it to any relief. Additionally, the Master is convinced that the record and the contentions of Idaho are insufficient for the formulation of any workable decree. The Master has examined the equations submitted by Idaho in its Supplemental Memorandum. The difficulty is that the Idaho approach requires the use of many unknown variables. These include, (1) the number of fish produced annually in each State, (2) the mortalities in both downstream and upstream runs which are variably affected by stream flows and dam operations, (3) the annual number of fish entering the Columbia from the ocean, (4) the mixed runs below Bonneville of fish destined for various areas, and (5) the annual uncertainty of the Indian harvest particularly since the end of the Five-Year Plan.

The Master realizes that on the record presented the likelihood that all interested parties, including the United States in both its proprietary and trustee capacities, will agree on what should be done to preserve and protect the anadromous fish is remote. It may be that future actions

by the downstream States of Oregon and Washington will adversely deprive Idaho of its equitable share of the fish. Accordingly, the dismissal of the action should be without prejudice to the right of Idaho to bring new proceedings asserting injury under then existing conditions.

Denver, Colorado, April 30, 1982.

Jean S. Breitenstein
Special Master

C-446 U.S. Courthouse
1929 Stout Street
Denver, Colorado 80294

FINAL REPORT

Oregon has filed no exceptions to the Master's Preliminary Report. Washington and Idaho have each filed exceptions. The issues presented by their exceptions were argued orally on June 28, 1982.

EXCEPTIONS OF WASHINGTON

Washington excepts to the Master's treatment of the justiciable controversy issue and denies that Idaho has a legal entitlement to migratory fish. The basic concept is that fish and other wildlife are "property common to all but owned by none until reduced to possession." See Vaughan, Federal Nonreserved Water Rights, 45 U. of Chi. Law Rev. 758, 770. The ownership idea is not controlling. While in Oregon and Washington, the migratory fish are a natural resource.

The Master's reference to New England Power Company v. New Hampshire, U.S. , 102, S.Ct. 1096, is criticized as inapt because that case involved a natural resource to which private ownership had attached. That is true, but the Court said, Id. at 1100:

> "Our cases consistently have held that the Commerce Clause of the Constitution, Art. I, § 8, cl. 3, precludes a State from mandating that its residents be given a preferred right of access, over out-of-state consumers, to natural resources located within its borders or to the products derived therefrom."

See also Hughes v. Oklahoma, 441 U.S. 322, 335. In Toomer v.Witsell, 334 U.S. 385, 402, the Court recognized that a state's power over wild animals and other natural resources is based on the state's police power and subject to the applicable constitutional limitations.

While the migrating fish are in Oregon and Washington, those States have the legal power to control, preserve, protect, and use that natural resource. In the exercise of that power they may neither discriminate nor burden interstate commerce.

In Sporhase v. Nebraska, decided July 2, 1982, U.S. , 50 LW 5115, the Court rejected a Nebraska statute regulating the withdrawal, transportation and use out-of-state of subsurface water produced by wells in Nebraska. In so ruling, the Court held that ground water is an article of commerce subject to congressional regulation.

Water differs from fish. A landowner may acquire a property right in the use of water, both surface and subsurface. With regard to fish, the only right is attainment of possession. Neither Oregon nor Washington has any constitutional, statutory, or regulatory inhibition against the interstate passage of migratory fish. In the Sporhase case, Nebraska regulated by statute the interstate transportation of subsurface water.

The conflict here is between a legal right and an equitable right. Oregon and Washington have the legal right to control the resource within their borders. Idaho has the equitable right to a return of a fair share of the migrating fish. The federal government has not exercised whatever power it may have over the migrating resource. The question is whether the actions of Oregon and Washington officials in permitting the harvest of fish within their borders has impaired Oregon's equitable right to the extent that judicial relief is required.

In oral argument counsel for Washington called attention to the Master's mention of ¶ 27 of the Pre-Trial Order, Tr. 1186–1187. With regard to spring chinook that paragraph says that, depending on passage conditions, it requires 2.5–4 fish to return one fish to Idaho's portion of the Snake River. In the June 15, 1981, hearing, counsel for Washington said that additional information furnished by Idaho indicated that the figure "may well jump considerably in excess of 4 to 1, to return one fish to Idaho." Tr. 644–645. No party contested this statement.

Except as noted the Washington exceptions and objections are overruled.

EXCEPTIONS OF IDAHO

The Idaho exceptions will be treated as they pertain to the subjects discussed in the Master's Preliminary Report. Those are (1) the Idaho entitlement to fish, and (2) the injury to Idaho.

Idaho Entitlement.

Idaho objects to the Master's statement that Idaho claims entitlement to the return of Idaho origin fish in the proportion that the Idaho origin fish bears to the total of all fish entering the System. The Master believes that his statement conformed with the Idaho contention appearing in Paragraph V A 1 (a) of the Pre-Trial Order which is:

> "A state of origin of migratory anadromous fish to which those fish will return to spawn has rights in those fish to conserve the species and to an equitable share in any harvestable surplus above escapement figures. *Those rights depend on equitable factors, including the numbers and percentages of fish produced."* [Emphasis supplied.]

In its exceptions, pp. 24–25, Idaho says: "A state's contribution is based on the number of adult fish in a returning run and not on the smolts released to make the outmigration." This clarification of position convinces the Master that Idaho now relies on its contribution to the return run of each species, not to the Idaho production of each species. The procedure which Idaho says should be followed in determining the Idaho contribution is found on pp.10–30 of its Supplemental Memorandum. A typical formula is that for the 1976 run of spring chinook, Id. 21–34. The basic equation and the Master's comments follow:

(1) – Take the jack count at Ice Harbor.

(2) – Multiply that by the Idaho contribution to the Snake River run.

(3) – Divide the result by the dam passage survival from Bonneville to Ice Harbor.

(4) – Take the jack count at Bonneville less the Zone 6 jack harvest.

(5) – Divide (3) by (4).

(6) – The result is the percentage of Idaho contribution which is applied to the advance estimate of the total upriver run to determine the Idaho contribution.

Comments.

Jack fish are precocious males that return one year before their age group. Tr. 143. The jack count is only an indication. Id. The Master has been unable to find in the record the jack counts at either Ice Harbor or Bonneville or the jack harvest in Zone 6.

Supplemental Memorandum, p. 16, says that dam mortalities "shall be calculated according to the methodology set out in Ex. I-2." The Master has examined the mentioned exhibit. He does not understand it and no witness has explained it to him satisfactorily.

Supplemental Memorandum, p. 16, says that: "Calculation of the advance run estimate shall be by the linear regression technique described in Attachment A." With regard to "Run Prediction" Attachment A says: "Several relationships between age components of the upriver spring chinook run have been developed to *predict run size using the linear least square regression method.*" [Emphasis supplied.] No testimony has been presented to explain the mentioned method. In an effort to understand it, the Master has examined text books on statistics and mathematics explaining the regression and least squares methods. The Master believes that those methods may be of practical use in presenting past conditions but of little value in making predictions. The many unknown variables make any prophecy uncertain.

On the record presented, the Master cannot determine either "the total upriver run of the species" or the Idaho contribution to that run. He cannot quantify the Idaho contribution for the past, present, or future.

The Master realizes that Idaho has an excellent habitat for anadromous fish which is not fully used. He recognizes

that the Pre-Trial Order, ¶ 16, says:

> "All three states are interested in protecting and enhancing the upriver spring chinook, summer chinook and summer steelhead runs originating in the Snake River and its tributaries."

Whatever the Idaho contribution may be, it is entitled to an equitable division of the fish. The question is whether Oregon and Washington have deprived Idaho of its fair share.

INJURY

The Idaho claim of mismanagement is grounded on the assertion that Oregon and Washington permitted excessive harvest of anadromous fish. The Idaho emphasis on past harvest is of historical, but not present, interest. The Master adheres to his conclusion that the case must be decided on present conditions. No court decree can restore the fish runs. The Master also adheres to his conclusion that present conditions are best presented by figures for the years 1975–1980 inclusive, with eight dams in operation and the turbines in the Snake River dams increased from 3 to 24.

Idaho objects to the Master's example based on an Idaho claim of an 80% entitlement. The figure used was derived from Idaho's Supplemental Memorandum, pp.10–13, where Idaho states that its contribution to the Snake River run of each species is: spring chinook 82%, summer chinook 82%, and summer steelhead 71%. The Master accepts Idaho's explanation that the mentioned figures only apply to fish returning to the Snake River and is deleting the objectionable paragraph from his Preliminary Report.

Because the Idaho entitlement cannot be quantified, the claim of injury must be analyzed on the basis of Idaho's claim of mismanagement permitting excessive harvests. The first consideration in such an analysis is escapement goals.

At the oral argument on its objections, Idaho counsel said, Tr. 1179:

> "At the present time, Your Honor, given the state of the runs, we are willing to work with the spawning escapements that the defendants have currently established under the Columbia River Five Year Plan, which are, for spring chinook, 120,000 fish at Bonneville."

With regard to spring chinook, the Plan says, Ex. I–12A, p. 52:

> "Spawning escapement goals shall be a minimum of 120,000 fish and 30,000 fish above Bonneville and Lower Granite Dams respectively."

Table 7, p. 33 of the Master's Preliminary Report gives the escapement and harvest figures for spring chinook yearly for the 1975–1980 period. During the four years in which the escapement goals were not reached, none of the States harvested any fish. The 1977 situation was this [figures in thousands]:

Oregon-Washington Harvest	24.1
Bonneville Escapement	119.5
Lower Granite Escapement	38.8
Idaho Harvest	3.5

Although the Bonneville escapement was .5 short of the goal, the Lower Granite escapement was 8.8 over the goal.

The 1978 situation was:

Oregon-Washington Harvest	0.1
Bonneville Escapement	128.9
Lower Granite Escapement	41.0
Idaho Harvest	7.0

Both the Bonneville and Lower Granite escapements were in excess of the respective goal.

Table 8, p. 33 of the same Report gives the escapement and harvest figures for summer chinook during the same period. Both the Bonneville and Lower Granite escapements were below their respective goals in each year. The highest Bonneville escapement was 44.4 in 1975 and the highest for Lower Granite was 11.8 in 1978. Idaho had no harvest. Oregon and Washington had harvests of 0.2 in 1977, 0.4 in 1978, and 0.2 in 1979, for a total of 0.8 for the six-year period.

Table 9, p. 34, of the same Report gives the escapement and harvest figures for summer steelhead during the same period. The Bonneville and Lower Granite escapement goals were exceeded in three of the years but not the same years for each. A Washington-Oregon harvest occurred in all years but 1975 and 1976 for a total of 11.2 fish. An Idaho harvest occurred in five of the years for a total of 41.0 fish.

The claim of mismanagement resulting from over-fishing may be considered, from a statistical standpoint, on the basis of the foregoing figures. The Oregon-Washington harvest of spring chinook occurred only in 1977 and 1978. Despite that harvest the Lower Granite escapement goal was exceeded in 1977 by 8.8 fish and in 1978 by 11.0. In 1979 the Oregon-Washington harvest was 0.1. Nothing in the record shows that this harvest resulted from any official action. It is a reasonable inference that the harvest resulted from an incidental sport catch. In 1978 and 1979, both the Bonneville and Lower Granite escapements exceeded the stated goals.

With regard to summer chinook, the only harvest was by Oregon-Washington in 1977 0.2 fish, 1978 0.4 fish, and 1979 0.2 fish. Nothing in the record shows that this harvest resulted from any official action by either Oregon or Washington. It is a reasonable inference that the harvest resulted from an incidental sport catch.

The summer steelhead figures show that the Bonneville and Lower Granite escapements exceeded the respective goals in three, but not the same, years. Oregon-Washington had harvests in 4 years and Idaho in 5. In only one of the years when an Oregon-Washington harvest occurred, 1979, did the Lower Granite escapement fall below 30.0. In that year the Oregon-Washington harvest was 1.8 and the Idaho harvest 5.5.

A total of 87.7 fish, all three species, was harvested by the three States during the 1975–1980 period. Of that total Idaho received 58.72% and Oregon-Washington 41.28%. On the basis of the statistics, to which the parties agree with insignificant differences, Idaho has not shown that

under present conditions it has suffered an injury of serious magnitude entitling it to any relief.

Idaho excepts to the Master's conclusion that Oregon-Washington have not violated either the Privileges and Immunities or the Commerce Clauses of the federal Constitution. The Master has considered the Idaho arguments and adheres to the position taken in his Preliminary Report.

Idaho mentions the possibility of future improvement in the runs. Reference is made to the experimental project of the Corps of Engineers for the gathering of smolts above Lower Granite and transfer by truck or barge for release below Bonneville. The success of the project has not been established. Ex. W-4, p. D-8, Ex. W-3, p. 41, and Tr. 140, 244.

Idaho calls attention to the 1980 Pacific Northwest Electric Power Planning and Conservation Act. One of the Act's declared purposes is, 16 U.S.C. § 839 (6), the protection, mitigation, and enhancement of anadromous fish "which are dependent on suitable environmental conditions substantially obtainable from the management and operation of the Federal Columbia River Power System and other power generating facilities on the Columbia River and its tributaries." The record does not show what, if anything, has been done to accomplish the declared congressional purpose.

Except as noted, the Idaho exceptions and objections are overruled.

The Master adheres to the recommendation made in his April 30, 1982, Report.

Denver, Colorado, July 15, 1982.

Jean S. Breitenstein
Special Master

C-446 U.S. Courthouse
1929 Stout Street
Denver, Colorado 80294

APPENDIX A

SUMMARY OF SPRING CHINOOK DATA

The numbers are stated in thousands

(The figures are taken from the Idaho Table except as noted. The only differences between the Idaho Table and the Oregon-Washington Table which the Master deems significant are mentioned in the foot note)

Year	Number of Fish Entering Columbia River	Commercial Harvest Below Bonneville Dam	Sports Fishery Harvest Below Bonneville Dam	Bonneville Dam Escapement	Indian Harvest	Escapement at Ice Harbor Dam	Escapement at Lower Granite Dam	Idaho Harvest
1956	216.9	153.5	N.A.	63.4	10.5			8.4
1957	253.0	116.6	N.A.	136.4	1.2			15.6
1958	198.5	123.3	N.A.	75.2	3.5			9.6
1959	137.5	76.4	N.A.	61.1	0.6			8.0
1960	133.9	64.3	N.A.	69.6	0.5			8.4
1961	161.5	62.8	N.A.	98.7	1.6			5.2
1962	199.8	108.7	N.A.	91.1	3.7	33.6		4.8
1963	147.3	71.8	N.A.	75.5	9.2	26.8		4.8
1964	168.5	55.9	21.2	91.4	11.3	24.3		3.2
1965	175.5	73.4	17.8	84.3	19.7	12.2		0.0
1966	175.2	38.3	24.2	112.7	2.3	43.9		8.5
1967	151.0	33.0	33.1	84.9	11.8	35.6		6.5
1968	133.5	13.1	21.2	99.2	16.0	44.8		10.0
1969	216.5	30.7	12.2	173.6	33.0	52.1		11.5
1970	171.2	31.4	28.8	111.0	14.0	47.9		5.5

APPENDIX A

SUMMARY OF SPRING CHINOOK DATA (continued)

The numbers are stated in thousands

(The figures are taken from the Idaho Table except as noted. The only differences between the Idaho Table and the Oregon-Washington Table which the Master deems significant are mentioned in the foot note)

Year	Number of Fish Entering Columbia River	Commercial Harvest Below Bonneville Dam	Sports Fishery Harvest Below Bonneville Dam	Bonneville Dam Escapement	Indian Harvest	Escapement at Ice Harbor Dam	Escapement at Lower Granite Dam	Idaho Harvest
1971	168.0	22.6	19.9	125.5	12.7	32.6		3.5
1972	279.4	69.9	23.4	186.1	42.8	50.3		6.5
1973	232.9	60.5	30.3	142.1	34.2	60.6		9.5
1974	108.5	8.4	14.0	86.1	17.5	19.3		1.5
1975	104.1*	0.0	0.0	104.1*	0.0	21.4	17.6	0.0
1976	78.3	0.0	0.0	78.3	0.4	25.1	20.5	0.0
1977	143.6	9.3	14.8	119.5	17.2	44.4	38.8	3.5
1978	129.0	0.0	0.1	128.9	2.3	49.3	41.0	7.0
1979	51.4	0.0	0.0	51.4	0.5	9.2	7.5	0.0
1980	61.0	0.0	0.0	61.0	0.0	9.7	6.8	0.0

* Idaho says that the figures are not available. The Master has used the figures appearing in the Oregon-Washington Table.

APPENDIX B
SUMMARY OF SUMMER CHINOOK DATA
The numbers are stated in thousands
(The figures are taken from the Idaho Table)

Year	Number of Fish Entering Columbia River	Commercial Harvest Below Bonneville Dam	Sport Fishery Harvest Below Bonneville Dam	Bonneville Dam Escapement	Indian Harvest	Escapement at Ice Harbor Dam	Escapement at Lower Granite Dam	Idaho Harvest
1956	195.2	94.0	N.A.	101.2	9.0			12.6
1957	207.0	72.5	N.A.	135.0	0.3			23.4
1958	187.5	85.6	N.A.	101.9	4.7			14.4
1959	169.8	80.8	N.A.	89.0	0.4			12.0
1960	142.6	57.4	N.A.	85.2	0.3			12.6
1961	129.2	62.7	N.A.	66.5	0.2			7.8
1962	108.0	30.5	N.A.	77.5	1.2	30.6		7.2
1963	100.0	36.0	N.A.	64.0	4.1	20.9		7.2
1964	97.0	10.6	5.9	80.5	6.9	24.7		4.8
1965	82.1	0.0	6.1	76.0	6.9	14.7		0.0
1966	74.8	0.0	2.8	72.0	1.1	17.0		0.0
1967	100.7	0.7	4.3	95.7	9.5	30.3		0.0
1968	89.4	1.4	5.1	82.9	2.1	29.5		0.0
1969	106.2	1.6	2.4	102.2	9.4	30.9		0.0
1970	72.9	3.1	4.3	65.5	4.0	19.4		0.0

APPENDIX B

SUMMARY OF SUMMER CHINOOK DATA (continued)

The numbers are stated in thousands

(The figures are taken from the Idaho Table)

Year	Number of Fish Entering Columbia River	Commercial Harvest Below Bonneville Dam	Sport Fishery Harvest Below Bonneville Dam	Bonneville Dam Escapement	Indian Harvest	Escapement at Ice Harbor Dam	Escapement at Lower Granite Dam	Idaho Harvest
1971	89.5	4.5	7.1	77.9	5.8	26.6		0.0
1972	77.5	3.2	3.5	70.8	4.4	22.8		0.0
1973	52.4	1.2	2.3	45.4	2.0	12.8		0.0
1974	34.0	0.0	0.0	34.0	0.0	10.3		0.0
1975	44.4	0.0	0.0	44.4	0.0	7.7	8.6	0.0
1976	42.1	0.0	0.0	42.1	0.0	10.0	9.9	0.0
1977	41.2	0.0	0.2	41.0	0.0	10.3	8.4	0.0
1978	43.4	0.0	0.4	43.0	0.0	10.4	11.8	0.0
1979	34.4	0.0	0.2	34.2	0.0	2.6	3.6	0.0
1980	31.1	0.0	0.0*	31.1	0.0	3.3	3.4	0.0

* Idaho says that the figure is not available. The Master has used the figure appearing in the Oregon-Washington Table

APPENDIX C

SUMMARY OF SUMMER STEELHEAD DATA

The numbers are stated in thousands

(The figures are taken from the Idaho Table except as noted. The only difference between the Idaho Table and the Oregon-Washington Table which the Master deems significant is mentioned in the footnote)

Year	Number of Fish Entering Columbia River	Commercial Harvest Below Bonneville Dam	Sport Fishery Harvest Below Bonneville Dam	Bonneville Dam Escapement	Indian Harvest	Escapement at Ice Harbor Dam	Escapement at Lower Granite Dam	Idaho Harvest
1956	200.7	71.6	N.A.	129.1	27.9			8.0
1957	229.6	91.6	N.A.	138.0	0.2			20.0
1958	211.2	80.5	N.A.	130.7	4.1			30.0
1959	231.6	103.0	N.A.	128.6	0.8			31.0
1960	199.8	86.7	N.A.	113.1	1.3			30.0
1961	227.9	89.2	N.A.	138.7	1.5			25.0
1962	251.7	88.7	N.A.	163.0	0.5	115.8		19.0
1963	228.8	100.4	N.A.	128.4	8.5	74.5		26.0
1964	178.6	43.7	18.7	116.2	6.7	58.8		18.0
1965	227.3	41.6	20.1	165.6	13.2	62.9		20.0
1966	209.2	36.3	30.0	142.9	3.1	65.8		20.0
1967	167.3	25.9	21.4	120.0	15.8	44.2		22.5
1968	161.6	27.1	28.0	106.5	9.4	82.4		23.0
1969	171.9	21.3	11.3	139.3	14.1	63.9		15.5
1970	138.7	16.1	9.4	113.2	13.2	53.9		20.5

APPENDIX C

SUMMARY OF SUMMER STEELHEAD DATA (continued)

The numbers are stated in thousands

(The figures are taken from the Idaho Table except as noted. The only difference between the Idaho Table and the Oregon-Washington Table which the Master deems significant is mentioned in the footnote)

Year	Number of Fish Entering Columbia River	Commercial Harvest Below Bonneville Dam	Sport Fishery Harvest Below Bonneville Dam	Bonneville Dam Escapement	Indian Harvest	Escapement at Ice Harbor Dam	Escapement at Lower Granite Dam	Idaho Harvest
1971	224.1	20.6	10.8	193.1	25.7	67.0		17.5
1972	225.6	24.9	15.4	185.3	28.8	63.6		13.5
1973	187.8	22.7	8.5	156.6	26.8	38.3		10.5
1974	146.1	4.0	5.5	136.6	12.9	12.5		3.0
1975	84.1	0.0	0.0	84.1	7.0	16.2	17.3	0.0
1976	122.4	0.0	0.0	122.4	8.8	23.9	23.0	2.0
1977	196.1	0.0	4.4	191.7	31.4	54.8	53.0	13.0
1978	105.0	0.0	2.7	102.3	15.8	27.1	30.1	11.5
1979	114.2	0.0	1.8	112.4	5.9	23.1	25.0	5.5
1980	129.2	0.0	2.3	122.8	7.1*	50.2	40.5	9.0

* Idaho says that the figure is not available. The Master has used the figure appearing in the Oregon-Washington Table

tana, 48 in Idaho, 33 in Washington, 45 in Oregon, and 16 in Canada with capacities greater than 5,000 acre-feet. Thousands of miles of canals transport water for irrigation and other uses.

GEOLOGIC SETTING: Basin includes parts of British Columbia, Canada and of five U.S. physiographic provinces: Pacific Border, Cascade Range, Columbia Plateau, Northern Rocky Mountains, and Middle Rocky Mountains. Bounded by Rocky Mountains on east and Cascade and Coast Ranges on west, 100,000 square miles of the Columbia Plateau are underlain by lava flows and are semi-arid. Northern and western sections are rugged, mountainous areas with steep ridges and narrow valleys. Basin is made up chiefly of sedimentary and metamorphic rocks in north and east, and volcanic igneous rocks in west, south, and central parts. Stands of Douglas fir, hemlock, and pine cover about 80 percent of mountainous regions.

DRAINAGE AREA: Basin is 259,000 square miles: 39,500 in British Columbia and 219,500 in the United States, including parts of Washington, Idaho, Montana, Oregon, Wyoming, Nevada, and Utah.

AVERAGE RAINFALL: From 10 to 20 inches annually in central Washington, eastern Oregon, and southern Idaho; 40 to 140 inches annually between mouth and Columbia River Gorge.

FIRST SETTLEMENT: Basin originally inhabited by many Indian tribes: among them Yakima Indians west of the river in what is now Washington and Clatsop Indians on the banks of the Columbia River near present-day Astoria, where, in 1805, Lewis and Clark established Fort Clatsop. In 1811, Astoria was established by John Jacob Astor's fur trading company.

MAJOR CITIES: Spokane, Yakima, Vancouver, Walla Walla, and Wenatchee, Washington; Portland, Astoria, Eugene, Salem, Corvallis, and Pendleton, Oregon; Boise, Pocatello, Idaho Falls, and Twin Falls, Idaho; Butte and Missoula, Montana; and Penticton, Kelowna, and Trail, British Columbia.

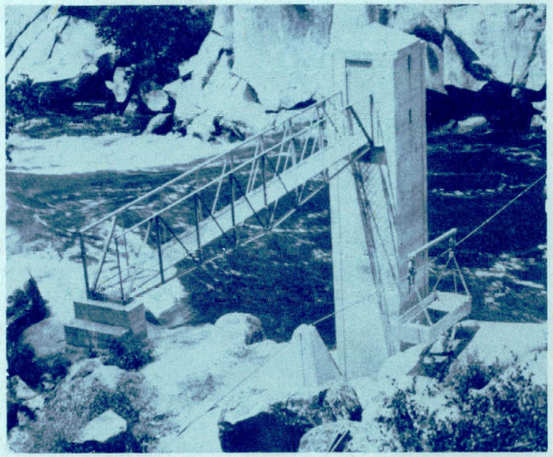
MUNICIPAL AND INDUSTRIAL WATER USE: About 3½ million people use about 3 billion gallons of surface and ground water daily. During irrigation season nearly 54 billion gallons of water are withdrawn or diverted each day to irrigate 5½ million acres of land.

COMMERCIAL WATER USE: Shipping on the Columbia River as far as Pasco, Washington, and on Snake River to Lewiston, Idaho; salmon fishing; and nuclear and hydroelectric power generation.

AGRICULTURE: Fruits (largest apple producing area in U.S.), berries, nuts, vegetables, general farming, wheat and small grains, dairy farming, cattle, and forests.

INDUSTRY: Aluminum, chemicals, lumber and wood products, pulp and paper, fabricated metals, machinery, food processing, fishing, tourist and resorts, and transportation.

MINERALS: Sand and gravel, silver, gold, copper, zinc, lead, and coal.



BASIC WATER DATA

The Hydrologic Data Network, maintained by the U.S. Geological Survey in cooperation with the individual States, is the chief source of basic data on water in this country. In cooperation with other agencies, the U.S. Geological Survey maintains a surface-water network of more than 18,000 stations, a ground-water network of more than 28,000 observation wells, and a water-quality network of some 4,900 stations.

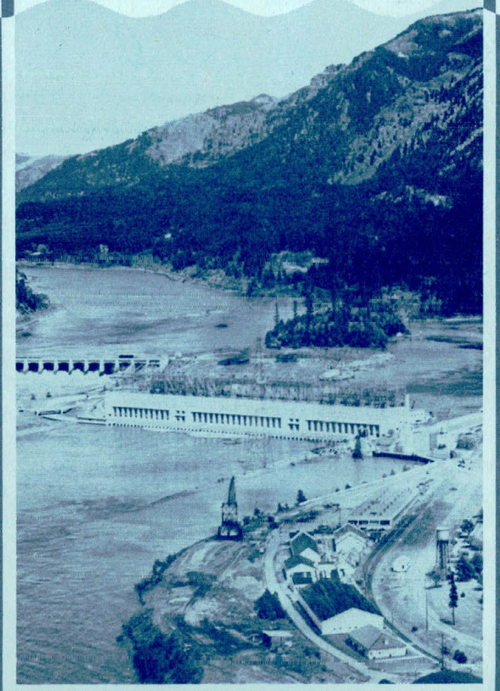
*U.S. GOVERNMENT PRINTING OFFICE: 1975-211-345/23

For sale by the Superintendent of Documents, U.S. Government Printing Office Washington, D.C. 20402 - Price 25 cents

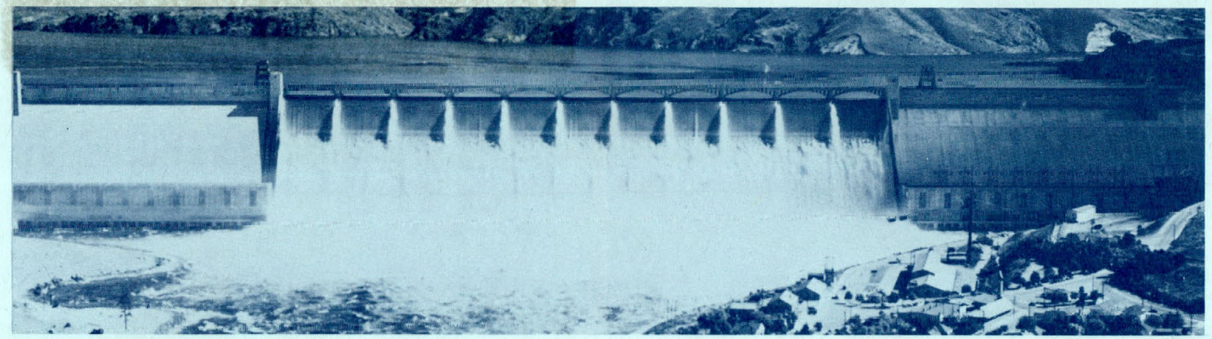
As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

RIVER BASINS of the UNITED STATES:

The COLUMBIA



UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
USGS: INF-74-16 (R.1)



EARLY EXPLORATION: In 1792 by Captain Robert Gray, Boston trader who named the river after his boat. Lewis and Clark reached the river overland in 1805.

HEADWATERS: Columbia Lake in British Columbia, between Canadian Rockies and Selkirk Mountains; 2,650 feet above sea level.

MOUTH: Pacific Ocean near Astoria, Oregon, at latitude 46°15′ N., and longitude 124°05′ W.

MAJOR TRIBUTARIES: Kootenai, Pend Oreille, Spokane, Okanogan, Wenatchee, Yakima, Snake, Lewis, Cowlitz, John Day, Deschutes, and Willamette Rivers.

COURSE: River flows northwest 218 miles; then south for 280 miles; crosses United States-Canadian border into northeastern Washington; and flows south, then west, and again south across central Washington in a sweeping curve called Big Bend. A series of coulees or dry canyons have been cut by the river; biggest is Grand Coulee. Just below mouth of Snake River, Columbia turns west for 210 miles and cuts across Cascade Range through scenic Columbia River Gorge, forming boundary between Washington and Oregon. At Vancouver, Washington, it turns briefly north for 50 miles, then west for final 55 miles to Pacific Ocean.

LENGTH: Approximately 1,243 miles. Largest North American river flowing into Pacific Ocean; ranks 7th among 135 U.S. rivers more than 100 miles long.

WIDTH: From 1½ miles below Cascade Range, river widens to a maximum of 6 miles near its mouth, and discharges into ocean between jetties 2 miles apart.

DEPTH: Navigable channel depth is kept at 40 feet as far as Portland and at 27 feet between Portland and Bonneville Locks. Depths to 300 feet have been measured near The Dalles, Oregon, and to 200 feet in lower river and estuary.

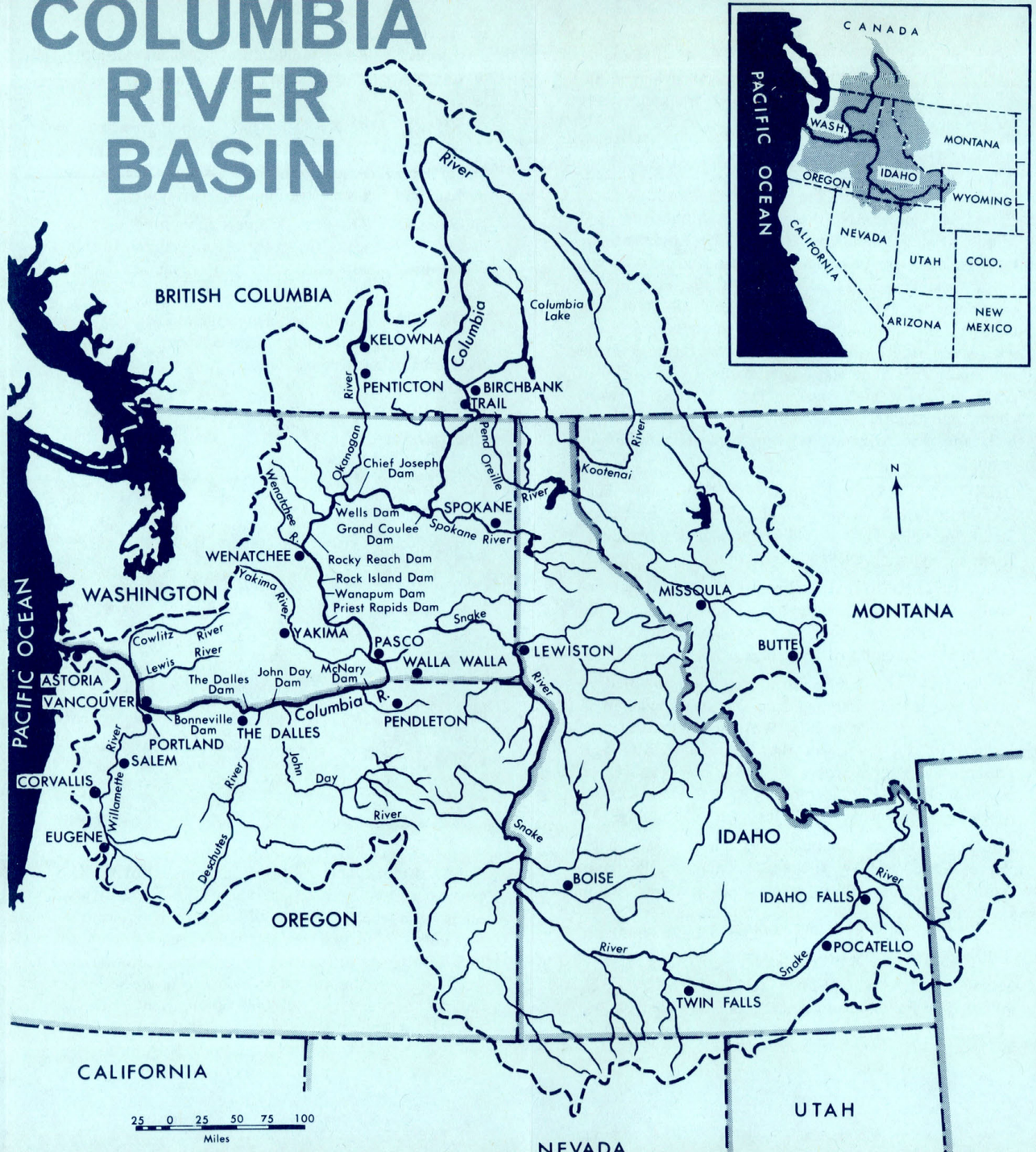
RATE OF FLOW: Near Birchbank, British Columbia—32 million gallons per minute (gpm); at The Dalles Dam—88 million gpm; and at mouth—123 million gpm. Ocean tides affect flow as far upstream as Bonneville Dam, 145 miles above the mouth. Unusual problems in gaging the river flow above Bonneville Dam are caused in part by variable backwater effect from the Dam and in part by flatness of the water surface profile.

HIGHEST AND LOWEST FLOWS: At The Dalles, Oregon—highest unregulated flow, 555 million gpm in June 1894; lowest unregulated flow, 16 million gpm in January 1937.

QUALITY: In estuary near Astoria, water is brackish. Sediment load is low for a stream of this size, ranging from 3 to 2,660 parts per million (ppm) at Vancouver. Water requires treatment for some uses, but is of good quality except for localized pollution from industrial and municipal wastes. Water is relatively hard, averaging 70 ppm. Dissolved solids at The Dalles range from 57 to 163 ppm and water temperature ranges from 32° to 81° F. Excellent ground water, where available, can be used without treatment.

DAMS, RESERVOIRS, AND CANALS: Bonneville, The Dalles, John Day, McNary, Priest Rapids, Wanapum, Rock Island, Rocky Reach, Wells, Chief Joseph, and Grand Coulee Dams. There are 20 dams in Mon-

COLUMBIA RIVER BASIN



ENCLOSURE II