

**A REVIEW OF DWORSHAK NATIONAL FISH
HATCHERY MITIGATION RECORD**

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Introduction

Dworshak National Fish Hatchery (DNFH) was constructed by the Corps of Engineers (COE) to mitigate fish losses associated with the construction and operation of Dworshak Dam. The fish hatchery started operation in April 1969. A Memorandum of Understanding (MOU) was signed by the COE and the Fish and Wildlife Service (FWS) in 1969 authorizing the FWS to operate DNFH with reimbursable funding from the COE. Since 1969, FWS has operated DNFH and has endeavored to meet the "mitigation goal" of maintaining the North Fork of the Clearwater River "B" run steelhead and producing resident fish for stocking Dworshak Reservoir.

Dworshak Dam, constructed by the COE, was authorized in 1962 under the "Rivers and Harbor Act of 1962 - Flood Control Act of 1962". This act directed the Secretary of the Army and Chief of Engineers to make plans and recommendations for various projects throughout the United States. Dworshak Dam was listed in this legislation as "Bruces Eddy Dam and Reservoir". The name was changed in 1963 to Dworshak Dam in honor of Idaho Senator Henry C. Dworshak who was instrumental in getting the project through Congress.

The FWS and Idaho Department of Fish and Game (IDFG) did studies before authorization to determine impacts on fish and wildlife and develop mitigation techniques. In 1960, these studies culminated in the official FWS's report on the impact of the Bruces Eddy Dam and Reservoir Project. In the 1960 report, FWS opposed construction of the project because of impacts on fish and wildlife. One of the big concerns, at this time, was whether a means could be found for downstream passage of anadromous fish, primarily steelhead, by Bruces Eddy Dam. In their mitigation recommendations for fish, the FWS called for fish passage facilities - the type and design to be developed cooperatively by FWS, IDFG and COE; artificial propagation facilities for anadromous fish to replace those lost from reservoir inundation and from inefficient passage; a resident fish propagation facilities to produce 500,000 catchable size fish; stream improvement upstream of Bruces Eddy Reservoir and a minimum flow of 2,000 cfs with temperature between 45° and 65°F downstream of Bruces Eddy Dam.

The Dworshak project originally called for fish passage at Dworshak Dam. A March 31, 1961 letter by the Chief of Engineers to the Secretary of Army, stated that, "All planning by the Corps of Engineers, to date, has included fish passage facilities and range replacement as a part of the project. Should the project be authorized and undertaken prior to development of a means for downstream passage of young fish, alternative hatcheries and artificial spawning areas may be substituted to compensate for the natural run of fish".

In Design Memorandum No. 3 on Bruces Eddy Dam and Reservoir, September 15, 1961, the COE cite a FWS recommendation that they plan for facilities capable of assuring passage of downstream migrants through the reservoir. It was suggested that migrants be trapped on tributary streams and barged through the reservoir. The COE Chief of Engineers thought this was not only a dubious operation but that the cost was excessive. The FWS also recommended that fish propagation facilities for anadromous fish be constructed in addition to passage. The FWS believed that with inefficient fish passage facilities, additional fish would be needed to compensate for the North Fork steelhead run. In the 1961 Design Memorandum No. 3, the COE stated that they were planning studies to establish the most feasible artificial propagation facilities if passage through the reservoir did not work.

In August 1963, fishery agencies (FWS and IDFG) stated that steelhead could not be sustained if subjected to passage through a long reservoir and through turbines such as Dworshak. Planning for facilities for passing adult migrants through the dam were discontinued. Alternative means of propagating the North Fork steelhead run were considered. In June 1966, Design Memorandum No. 14, the Corps stated that the first alternative considered, at the request of the FWS, was the construction of low-head dams on reservoir tributaries which would be equipped with fish ladders and downstream screening facilities. This proposal was rejected by COE as being impracticable because of excessive construction costs and problems connected with access, operation, and maintenance. However, a second alternative suggested by the FWS was a hatchery at the mouth of the North Fork Clearwater River. This alternative was accepted by the COE. Together, the COE and the fishery agencies initiated planning on a fish hatchery to mitigate the impacts of Dworshak Dam.

Steelhead Mitigation Goals

In Table 1, I have presented a general chronology of events that set the size and program of Dworshak National Fish Hatchery (DNFH). One of the problems encountered in setting a mitigation goal for DNFH was not having any numerical escapement numbers for the steelhead run into the North Fork River. In a supplement to an earlier 1962 report on impacts of the Dworshak Project, the FWS in 1964 recommended an original goal of 12,000 adult steelhead were needed back to a hatchery.

The hatchery would need the capability of rearing the young of 6,000 adults to smolt size (at that time considered to be 8/lb).

What was the annual steelhead run into the North Fork of the Clearwater River?

This was a difficult question since there were no actual counting facilities on the North Fork. Estimates of the steelhead run into the North Fork were based on a percentage of the number entering the main stem Clearwater River. Numbers of steelhead entering the Clearwater River were determined from counting at the fish ladder on the Lewiston Dam. (For Lewiston Dam counts between 1949-1973, see Table 2. It was estimated that 50 to 60 percent of the steelhead entering the Clearwater River went up the North Fork to spawn. Some of the early estimates by the fishery agencies set a number of 20,000 steelhead entering the North Fork. However, this was probably derived from the 1962-63 run where 43,196 fish were counted across Lewiston Dam.

This was the largest run recorded between 1959-1973 (Table 2). The annual run into the North Fork was, on the average, probably closer to the 12,000 first estimated by FWS in 1964 if 50 to 60 percent of steelhead entering the Clearwater River spawned in the North Fork. Based upon the Lewiston Dam counts of 1959-73 and 50 percent going into the North Fork, I calculated that

12,000-15,000 adult steelhead, on the average, would have entered the North Fork of the Clearwater River.

Since no one was sure of the North Fork run and the adults would be trapped at the Dworshak Dam site starting in 1967, it was suggested that actual numbers trapped in the North Fork for the first few years would be a good way to set the size of the hatchery. The 1969 Memorandum of Understanding (MOU) between the COE and FWS stated that the initial sizing of the hatchery was for 6,000 adult steelhead annually and that final hatchery size would depend on annual actual counts for 1967 through 1971 and specific evaluation studies. The counts at Dworshak Dam for 1967-1971 averaged 4,448 and represented 17-33 percent of the Lewiston Dam counts. However, it is uncertain as to how complete these Dworshak Dam counts are for these years and what effect construction activity had on steelhead entering the North Fork. We would have to assume that these Dworshak Dam counts would be minimum figures and that generally it would be safe to estimate that at least a third of the run passing Lewiston Dam entered the North Fork and perhaps as many as 50 percent entered the North Fork.

When the COE, in the Design Memorandum 14.1 on Dworshak Fish Hatchery, calculated the normal run into the Clearwater River and, in turn, the North Fork Clearwater River, they cited the years from 1959-65 and estimated that an average annual run of 27,000 passed over Lewiston Dam. They also quoted that fishery biologist estimated that 3,000 were taken or intercepted between Lewiston Dam and the confluence of the North Fork. They went on to say that 50 percent or 12,000 of those that get to the North Fork go on to spawn there ($\frac{27,000-3,000}{2} = 12,000$).

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The FWS in their 1960 report on impacts of Bruce's Eddy Dam stated that between 1950 and 1957 there had been an estimated 30,000 steelhead produced annually in the North Fork Clearwater system for the combined sport and commercial fishery catches in the Columbia drainage.

It seems that hatchery production and design got intermeshed with steelhead mitigation goals in the planning phases of the Dworshak Project. Very little discussion occurred on steelhead harvest and location of mitigation for steelhead. The adult steelhead mitigation goal discussed during the planning stages ranged from 12,000 adults back to a hatchery (tied to smolt production), to 20,000 adults back to the North Fork (included recommendation to outplant extra adults above 12,000 needed for hatchery), to 30,000 adults produced by North Fork (for the Columbia and Clearwater River sport and commercial harvest).

Based upon recent coded-wire tagging (CWT) information, a significant proportion of steelhead produced by DNFH are harvested downstream of the Clearwater River. The primary area of harvest is in the Zone 6 Indian Fishery. Generally, looking at limited CWTing information from 1977-86, 10-50 percent of Dworshak hatchery steelhead are taken in the Zone 6 Indian fishery on the Columbia River. In recent years, the Zone 6 take of Dworshak fish, as shown by CWT information, has been closer to the 30-50 percent end of the spectrum.

So what number should the mitigation goal be and where should it be measured?

The number of steelhead adults returning to the hatchery has incorporated into it all the losses along the way. It seems that a mitigation goal for Dworshak should include all adults back to the Columbia River. Because the commercial and sport fishery of the Columbia River varies from year to year and the sport fishery harvest in the Columbia, Snake and Clearwater Rivers

varies from year to year, any measurement of mitigation as fish reaching the hatchery would be a misconception. However, numbers of Dworshak fish entering the Clearwater River is difficult to determine accurately each year. But if one-third to one-half of the North Fork produced fish were being harvested downstream of the Clearwater River prior to construction of Dworshak Dam and up to 20,000 steelhead destined for the North Fork entered the Clearwater River (based upon early Lewiston Dam counts), then a total North Fork contribution of adults to the Columbia River would be 30,000 to 40,000 fish.

Based upon the above and what can be interpreted from the planning documents for the Dworshak Project, I conclude that the intent of the steelhead mitigation at DNFH was to perpetuate and maintain the North Fork "B" run steelhead. In the early 60s, this run was estimated to be as many as 20,000 steelhead entering the Clearwater River. Based upon recent CWTing information and regulation of the Zone 6 fishery, as many as one-third to one-half the North Fork steelhead are harvested downstream. In the early 60s, the lower number of one-third or 33 percent harvest in the Columbia is probably closer.

This 33 percent figure is also close to the present 32 percent harvest of wild "B" steelhead that, for the past two years, has been the agreed restriction on the Zone 6 Indian Fishery.

Based upon the above information, I believe that the mitigation goal of DNFH should be 30,000 fish into the Columbia River and 20,000 fish into the Clearwater River. If the Zone 6 fishery remains at the 32 percent harvest of wild "B" steelhead, (assuming that Dworshak "B" steelhead will be harvested at the same rate) then the mitigation goal of 20,000 fish to the Clearwater River is probably in the ball park of the original intent of mitigation for the Dworshak Project.

Steelhead Hatchery Production

The steelhead mitigation planning for Dworshak Dam started out in 1964 with the FWS recommendation of a hatchery for 12,000 adults, with the capability of rearing the young of 6,000 adults to smolt size of 8/lb. It was originally planned that a 2-year rearing cycle would be needed and that each female would produce 3,000 eggs. The young of the remaining 6,000 adults were to be reared as long as space was available and then released in the river or elsewhere in the basin. In 1966, IDFG recommended that initial sizing of the hatchery should be for rearing the progeny of 3,000 females (same as FWS 6,000 adults) but that final hatchery sizing should be based on number passing Lewiston Dam and entering the North Fork in future years. IDFG also stated that if the North Fork received more than 6,000 adults in the next few years, that the hatchery should be expanded to rear the progeny of 12,000 adults. As stated before, the 1967-1971 average count at Dworshak Dam site was 4,448 adult steelhead. With less than 6,000 adults recorded in the North Fork during these first test years, the COE Phase One production goal of a hatchery for 6,000 adults was used. If there had been more than 6,000 adults, the COE was to go to Phase Two of construction and basically double the size of DNFH.

Therefore, original hatchery production was based on adults to North Fork of Clearwater River with a hatchery capable of handling 6,000 adults and eggs from one-half of the 3,000 females producing 3,360,000 smolts at 8/lb. There was a caveat in this mitigation which stated that if in the next few years (1967-71) more adult steelhead than 6,000 were trapped at the Dworshak Dam site or if special evaluation studies found that fish were needed to mitigate for the dam the final sizing would change. In the COE Design Memorandum 14.1, it was planned to double the size of the hatchery in that case and go from 84 rearing ponds to 140 rearing ponds and go from producing 3,360,000 smolts at

8/lb to 6,720,000 smolts at 8/lb.

Analysis of Steelhead Mitigation Record

Based upon the recommendation goal of 12,000 adults back to a hatchery under Phase One of the mitigation planning, it was calculated that 6,000 adults would be needed for the hatchery to produce 3,360,000 smolts at 8/lb. This 6,000 adult need was calculated using 3,000 eggs/female and a female/male ratio of 50:50. However, it was later discovered that each female had approximately 6,000 eggs and the female/male ratio was nearer to 70:30. Thus, to produce 3,360,000 smolts at 8/lb. required less than half the adult fish as first estimated. It should be noted that to get 12,000 adults back from a 3,360,000 smolt release would require a survival rate back to the hatchery of 0.36 percent.

Has Dworshak met its production goal of 3,360,000 smolts at 8/lb.? Table 3 presents the smolt production of DNFH since it first started. As noted in the Table, only in two years - 1971 and 1974 did the hatchery come close to releasing the production goal at the hatchery. However, the pre-1976 smolt numbers should be used cautiously since detailed pond inventories prior to release were not done extensively until after this date. Therefore, DNFH probably has never met its original production goal of releasing 3,360,000 smolts at 8/lb.

In 1977, DNFH started releasing smolts away from the hatchery in other Clearwater tributaries. This was done to: (1) adjust the adult numbers coming back to Dworshak since it was found that less than 3,000 adults were required to get the green eggs for filling the hatchery production, (2) spread out the sport harvest further up the river and (3) seed underutilized habitat of the Clearwater drainage. DNFH is now operating under the general smolt production goal of 2,300,000 smolts at about 6.0/lb. (200 mm length). The release directly from the hatchery has been set at 1,200,000 smolts to bring back a minimal number of adults for spawning estimated at 3-4,000. Extra adults are included in this 3-4,000 to supply eggs for the new Clearwater Hatchery. A release of 1,200,000 smolts that returns, 3,000 adults back to the hatchery has a return rate to the hatchery of 0.25 percent. In recent years, the return has been at least twice this rate which may require a further adjustment in number of smolts released at the hatchery.

All the preceding discussion on DNFH production has centered on smolts, size of release, numbers, and place of release; but mitigation is based on adults. How many adults has DNFH returned? Table 4 presents estimates of the numbers of adults DNFH has returned to the Clearwater River and an estimate of hatchery fish harvested. DNFH ladder counts are included to show return back to the hatchery. As seen from Table 4, in 3 of the last 5 years 20,000 or more adult hatchery fish have returned to the Clearwater River.

Hatchery fish returning to the DNFH rack have generally been about half or less of the total hatchery run to the Clearwater River. This is partly because of the FWS and IDFG program of outplanting smolts since 1977 which brings fish back to other areas of the Clearwater River. Also, there has been an increase in harvest because of increases in fishing pressure, both sport and indian, over the past few years. Levels of harvest are approaching the 80 percent level that IDFG has set as a management goal for its hatchery run steelhead. Recent levels of harvest, 1984-87, show 60-68 percent sport and tribal harvest of hatchery fish in the Clearwater River.

Since 1972-73, when the first hatchery fish started returning from DNFH releases, the hatchery has met a mitigation goal of returning 20,000 adults to the Clearwater River in 4 of 15 years. It should be noted that in 3 of the last 5 years, 1982-87, the hatchery has met the goal and returned a minimum of 20,000 adults to the Clearwater River. The better hatchery return rates in recent years are attributable in part to: (1) smolt collection and transportation at the dams, (2) better quality smolts produced, (3) larger smolts on average being released, and (4) better timing and coordination on smolt releases. The benefits that increased the return rates these past few years should remain and with increased knowledge may in fact improve. Therefore, unless we see major changes in downstream harvest or smolt survival, I expect that DNFH will in most years be able to meet its mitigation goal of returning 20,000 adults back to the Clearwater River. Of course, this is contingent upon the Columbia River Zone 6 harvest being limited to 33 percent or less of the "B" run coming in to the Columbia River and to water conditions in the Snake and Columbia Rivers remaining conducive to downstream passage of smolts and upstream passage of adults.

Resident Fish Mitigation Goals

Mitigation for resident fish for the Dworshak Dam project was considered from the initial project planning. In 1960, the FWS recommended a resident fish mitigation of 500,000 catchable-size fish. This was considerably larger than the 12,600 fish estimated to be harvested annually from the North Fork River in the reservoir area. However, FWS recommended this larger numbers to compensate for some of the steelhead fishing to be lost in the reservoir basin area. In 1960, the COE was still planning on passing adult steelhead by the dam and having the upper North Fork River still available for steelhead spawning. The FWS updated report of 1962 had a recommendation for a reduced size resident fish hatchery to produce 300,000 catchable size fish.

Between 1961 and 1970, most of the fishery mitigation planning and negotiation was concerned with steelhead. In 1970, the COE in Supplement 1 of 14.1, Design Memorandum Fish Hatchery, stated the resident mitigation goal as 100,000 pounds. The 100,000 pounds probably comes from the conversion of 300,000 catchable to a hatchery design figure in pounds. Thus, a three per pound fish is 9 to 10 inches - considered a catchable. With a reservoir as large as Dworshak, it was believed that it would take a significant number of planted fish to produce a good fishery.

In the 1969 MOU between COE and FWS, the 100,000 pounds of resident fish annually was given as the mitigation requirement.

Although FWS recommended in 1960 that a separate resident fish hatchery be built to mitigate resident fish losses, this was not done. In 1970 with conversion of the Dworshak steelhead facilities to all reuse to increase production, 14 ponds were identified as being available for rearing the 100,000 pounds of resident fish production.

DNFH, up until 1985, reared all the resident fish to be stocked in Dworshak Reservoir. In 1984, resident rainbow at the hatchery were found to have Infectious Hematopoietic Necrosis (IHN) and some lots were destroyed. Since 1985, resident fish for the reservoir have come from Hagerman NFH and IDFG hatcheries. Exchange production with DNFH has been used to offset costs of production with state hatcheries. It is hoped that IHN will be controlled and that DNFH in the near future can again produce the resident fish for Dworshak Reservoir.

Resident Fish Hatchery Production

Has the resident fish production goal been met? The 100,000 pounds of resident fish production has only been met in 3 years out of 16 years of operation. (See Table 5.) In 3 of the first 4 years of operation, this goal was met. In recent years with more concern on disease-free fish and managing for reservoir production, rather than planting catchable-sized fish, the total pounds of fish stocked has decreased.

Analysis of Resident Fish Mitigation

There is now a cooperative Dworshak Reservoir study underway by the IDFG and Nez Perce Tribe to determine present fish status of the reservoir and to gather management data on the fishery. What has developed in Dworshak Reservoir is a highly popular kokanee salmon fishery, followed by a rainbow trout fishery. There is still some smallmouth bass fishing but not to the same degree as the kokanee or rainbow fishery. Based upon the findings of this study, the resident fish stocking will be adjusted. In the interim, FWS will continue making minimal plantings of rainbow trout, approximately 20,000 pounds per year.

The original mitigation was based on catchable size because of the projected poor fish production in the Dworshak Reservoir. However, kokanee are producing good catches in the reservoir and plants of small rainbow are growing well at this time (16 years after reservoir closure). Fish management, in general, over the past 20 years has also progressed away from planting catchables and relying more on natural production where possible. Therefore, the original 100,000 pounds of catchable resident fish production will probably need to be modified. Upon completion of the reservoir study, which started this year, a management plan will be put together which should contain recommendations for resident fish stocking.

Table 1. Chronology of events leading to fishery mitigation goal for Dworshak Project.

Jun. 1960 - FWS report of Bruce's Eddy Dam and reservoir. Recommended project not be constructed because of severe impact on fish and wildlife. But if authorized anyway, that COE

should plan for fish passage, an anadromous fish hatchery (no numbers given) a resident fish hatchery to produce 500,000 catchable size fish, habitat improvement upstream of reservoir, and minimum flow releases of 2,000 cfs at 45° to 65°F.

Aug. 1962 - FWS updated report on Bruce's Eddy Dam and reservoir. Included report on impact of the COE higher dam proposal. Between 1960 and this report, the COE designed the dam height 61 feet higher. In this report, FWS did not state an opposition to construction of project.

Oct. 1962 - Bruce's Eddy Dam authorized Under River Harbor Act of 1962. (name later changed to Dworshak.)

Nov. 1964 - FWS recommended a hatchery for 12,000 adults. This was second alternative. FWS was pushing for passage on low-head dams on North Fork tributaries with fish passage. Twelve thousand adults to hatchery and raise young of 6,000 to smolts for release (considered a smolt 8/lb. size). Young of the other 6,000 were to be raised as long as possible, then released in the river at the hatchery or elsewhere in the basin.

FWS, also, stated that recent run estimates averaged about 20,000 adults in the North Fork and, therefore, recommended that adults over 12,000 captured at the hatchery should be transported and released above the dam, experimentally, or in other tributaries of the Clearwater River.

Table 1 (Continued)

July 1965 - COE incorporated most of 1964 FWS recommendations. Facilities to accommodate 6,000 adult females and a sufficient number of adult males to assure adequate fertilization.

Rearing facility designed to rear the offspring of 3,000 females to migratory size and the young from the other 3,000 as long as possible.

Jan. 1966 - IDFG letter to COE stated that between 1958 through 1962 that if 60 percent of fish over Lewiston Dam went to North Fork, then 20,000 fish went to North Fork. Recommended that COE initially construct a hatchery to rear progeny of 3,000 females requiring 84 17'x75' circulating ponds. Final sizing should be based on analysis of number of steelhead passing Lewiston Dam and the number entering the North Fork in future years. (It looks like they were saying with trapping at the dam lets see what comes the first few years in the North Fork to get a better number.) IDFG recommended that the COE should expand the facilities to 12,000 adults and propagate 840,000 pounds of smolts if any of the runs entering the North Fork in future years equals or exceed 6,000 adults. (**NOTE:** this is a lot of smolts - 840,000 pounds of smolts at 8/lb. comes to 6,720,000 smolts!)

Jul. 1966 - COE (in their Design Memorandum No. 14) presented information on Lewiston Dam counts from 1959 to 1965 showing an average of 27,228 fish passed up the Clearwater River. Estimated the harvest or interception of 3,000 steelhead. Estimated that 12,000 or 50 percent of the remaining steelhead will spawn normally in the North Fork upstream of Dworshak Dam site.

Presented design for a two stage hatchery with first stage of 84 ponds using 6,000 adults to take 9,600,000 eggs to produce 3,360,000 smolts at 8/lb. (Stage two was double stage one.) Only first stage construction proposed at this time. Hold 6,000 adults and rear one-half their young to migrant size. Using their 3,000 eggs per female and 70 percent survival of egg, this comes to about the 3,360,000 smolts.

Mar. 1969 - MOU between COE and FWS on operation of Dworshak Fish Hatchery. Stated initial size of hatchery as 6,000 adults annually. Final hatchery size (project mitigation) will depend on annual actual counts for 1967 through 1971. (This referred to North Fork counts and fish trapped at the Dworshak Dam.)

Counts were: 1967 - 7,657, 1968 - 4,686, 1969 - 4,233, 1970 - 2,847, 1971 - 2,416. Average - 4,448.

Resident fish mitigation was 100,000 pounds of fish annually for stocking Dworshak Reservoir.

Nov. 1970 - COE, in their Supplement 1 to Design Memorandum No. 14.1, provided for modifying hatchery so it could attain its goal of 12,000 returning adults and resident mitigation of 100,000 pounds. Restated an annual production goal of 3.36 million steelhead smolts to meet 12,000 adult returns to the hatchery. Stated needs to alter production facilities to meet goals. Restated 100,000 pounds of resident fish mitigation. Memo called for converting all ponds to reuse similar to the initial 25 reuse pond. (i.e., converting 59 ponds to reuse.)

Oct. 1973 - Construction complete on changing all ponds to reuse.

Table 2. Lewiston Dam monthly steelhead counts by fish year (July 1 to June 30).

Year	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Totals
1949-50							39	1,219	1,757	152	3,167		
1950-51	28	2	5	390	43	58	1	5	279	1,981	1,289	121	4,202
1951-52	58	0	160	810	52	14	0	7	413	3,244	1,229	350	6,337
1952-53	15	5	9	318	26	7	94	165	4,337	3,774	1,757	99	10,606
1953-54	16	18	214	889	102	55	4	97	947	2,776	1,813	118	7,049
1954-55	12	5	800	1,954	361	23	1	47	577	6,191	3,823	382	14,176
1955-56	26	15	659	2,116	81	53	2	14	383	3,120	1,414	77	7,960
1956-57	0	3	128	301	14	17	0	0	933	2,425	141	31	3,993
1957-58	36	27	2,091	4,322	96	10	7	1,183	8,809	3,439	905	19	20,944
1958-59	2	2	4,803	13,266	1,018	284	61	418	6,008	6,460	808	86	33,216
1959-60	4	109	3,707	8,017	24	31	0	72	1,172	8,869	484	25	22,514
1960-61	0	15	3,817	6,533	516	2	96	521	9,990	3,489	174	9	25,162
1961-62	0	0	2,434	6,864	15	12	14	236	4,115	12,031	2,204	91	28,016
1962-63	9	136	9,423	15,194	1,665	533	59	462	8,013	6,963	708	31	43,196
1963-64	4	59	1,759	8,995	1,440	1	1	73	3,621	4,787	821	75	21,636
1964-65	12	184	4,751	4,846	541	8	3	482	3,214	2,027	1,252	10	17,330
1965-66	26	71	4,152	11,013	1,289	10	0	154	2,604	1,867	699	14	21,899
1966-67	9	0	4,042	8,503	1,928	503	178	1,223	3,905	2,616	373	25	23,305
1967-68	14	16	2,308	9,146	2,175	0	28	243	3,340	1,397	945	15	19,627
1968-69	4	108	5,963	7,972	406	16	0	668	1,543	7,106	1,473	19	25,278
1969-70	28	119	4,182	4,576	616	1	68	1,221	2,910	2,125	266	19	16,131
1970-71	43	191	4,463	3,897	254	28	203	496	2,533	2,190	274	28	14,600
1971-72	20	28	3,246	4,043	225	39	0	438	4,281	3,168	176	27	15,691
1972-73	72	830	1,971	7,984									
1973-74													
1974-75													
1975-76													

Table 3. Smolts production and adults released from Dworshak National Fish Hatchery.

Release Year	Adults Released	Adult Release Location	Smolts Released at Hatchery ¹	Smolts Released Other Tributaries	Total Smolts Released
1970	0		1,371,543		1,371,543
1971	0		3,143,571 ²		3,143,571
1972	0		943,659		943,659
1973	0		2,628,719 ³		2,628,719
1974	189	Dwor. Res.	3,474,957 ²		3,474,957
1975	0		1,761,878		1,761,878
1976	0		1,753,278		1,753,278
1977	113	Dwor. Res.	1,613,667	233,192	1,846,859
1978	569	Dwor. Res.	1,119,636	320,220	1,439,856
	5,762	Clear. Trib.			
1979	860	Clear. Trib.	1,227,312		1,227,312
1980	0		2,666,085		2,666,085
1981	0		1,930,047	73,213	2,003,260
1982	0		1,765,266	381,811	2,147,077
1983	302	Clear. Trib.	1,397,988	746,899	2,144,887
	962	Other areas			
1984	0		1,208,319	753,053	1,961,372
1985	7,646	Clear. Trib.	1,035,573	566,122	1,601,695
1986	515	Clear. Trib.	1,239,541	1,722,543	2,962,084
1987	616	Clear. Trib.	1,206,580	899,168	2,105,748

¹Eggs, fry and subsmolts >15/lb (150 mm) were also released in various years when extra were available, these not included in this table.

²These were reported as mostly 7-9/lb. However, it is questionable whether DNFH hatchery could produce this many smolts during these years.

³Small fish, most smaller than 12/lb.

Table 4. Number of steelhead trout returning to Dworshak National Fish Hatchery and estimates of hatchery fish harvested and total hatchery returns to the Clearwater River. (1972-73 to 1983-84 data based on report from Pettit, 1985, IDFG Federal Aid Report, Project F-73-R-6, January, 1985.)

Return ¹	Estimated Sport Fisherman Back To DNFH	Estimated Harvest Clearwater R.	Estimated Hatchery Fish		Total Hatchery Fish Returning to Clearwater R.
			Tribal Harvest Clearwater R.	Return Upriver of North Fork (unharvested) ⁷	
1972-73	9,938	2,068	-	0	12,006
1973-74	7,910	2,320	-	0	10,230
1974-75	1,698	N.S. ³	290	0	1,988
1975-76	1,858	N.S.	430	0	2,288
1974-77	3,100	N.S.	410	0	3,510
1977-78	12,727	14,000	(1,000) ⁵	0	27,727
1978-79	4,939	4,610	(500)	0	10,049
1979-80	2,519	N.S.	1,250	300	4,069
1980-81	1,968	4,510	(1,000)	500	7,978
1981-82	3,054	1,665	(1,000)	0	5,719
1982-83	7,672	13,967 ⁴	(1,500)	0	23,139
1983-84	3,284	6,500	(1,500)	100	11,384
1984-85	14,018	19,410	(1,500)	2,700	37,628
1985-86	4,462	7,240	1,500	1,800	15,002
1986-87	5,286 ²	15,800 ⁸	4,210 ⁶	3,000	28,296

¹Return year is from October through May.

²Actual number returned, ladder closed not a complete return figure.

³N.S., no sport fishing season.

⁴Pettit included an additional 2,000 fish in harvest from Snake River for a total of 15,967.

⁵() guesstimate on tribal harvest by author.

⁶Personal communication from Dave Statler, 9/24/87.

⁷Based on return percentage back to hatchery to calculate returning of 2-salts from upstream releases.

⁸Preliminary estimate.

Table 5. Mitigation stocking of resident fish into Dworshak Reservoir by year, 1972 to 1987.

Year	Fish Species	Number	Size Range	Weight	Total Weight Fish Stocked
1972	Kokanee salmon	1,012,745	2.5"-3.5"	10,176	110,093
	Rainbow trout	1,043,506	Fry-12"	99,917	
1973	Kokanee salmon	591,192	Fry	393	135,201
	Rainbow trout	2,554,170	Fry-12"	134,808	
1974	Cutthroat trout	45,463	5"	2,285	23,359
	Kokanee salmon	217,288	2.5"	1,999	
	Rainbow trout	1,070,260	2.5"-12"	19,075	
1975	Cutthroat trout	111,010	2-6.5"	797	115,285
	Dolly Varden trout	122,789	Fry	107	
	Kokanee salmon	2,898,417	Fry-2"	2,368	
	Rainbow trout	917,856	Fry-12"	114,301	
	Smallmouth bass	100,253	Fry-9"	Unknown	
1976	Rainbow trout	763,286	2"-10"	64,133	64,133
1977	Kokanee salmon	2,450,000	Fry	1,113	35,345
	Rainbow trout	1,162,670	2"-11"	34,217	
	Small mouth bass	50,000	Fry	15	
1978	Rainbow trout	25,936	10"-12"	13,412	13,412
1979	Kokanee salmon	1,177,464	Fry	985	93,546
	Rainbow trout	1,313,524	2"-10"	92,541	
	Smallmouth bass	100,000	Fry	20	
1980	Rainbow trout	1,616,245	2"-10"	36,052	36,052
1981	Rainbow trout	861,429	2"-10"	87,049	87,049
1982	Rainbow trout	153,956	3"-11"	34,940	34,940
1983	Rainbow trout	574,255	3"-9"	58,503	58,503
1984	Rainbow trout	67,561	9"-11"	27,285	27,285
1985	Rainbow trout	120,000	9"	40,000	40,000
1986	Rainbow trout	156,773	6"	14,388	14,388
1987	Rainbow trout	174,256	3.5"-4.5"	5,095	5,095

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