Mailing Address
P. O. Box 3503
Portland, Oregon 972

STATE OF OREGON
OREGON STATE GAME COMMISSION
1634 S W ALDER STREET
PORTLAND

December 27, 1966

Colonel William J. Talbott
District Engineer
Portland District
U. S. Army Corps of Engineers
628 Pittock Block
Portland, Oregon 97205

Dear Colonel Talbott:

Reference is made to your letter of May 24, 1966 and our individual replies on June 8 and June 20, 1966, all concerning your request for reconsideration of the need to construct fish passage facilities at the Applegate and Elk Creek Dams of your Rogue River Project. Additionally, we refer to our joint statement presented at your district's hearing in Grants Pass on September 25, 1961; the Game Commission letter of January 25, 1965, and its appended report, "Rogue River Spring Chinook Salmon Spawning Ground Surveys, Upper Rogue River, 1964"; the Fish Commission letter of February 24, 1965, concurring with that report; and our joint letter of May 19, 1965 pertaining to the Rogue River Project fish propagational facility requirements.

We have reconsidered the authorized requirement to provide fish passage facilities at Applegate and Elk Creek Dams and have concluded that at this time it is more reasonable to expect the project to adequately accommodate these stocks if all fish reaching the dams are propagated in a hatchery. Previously, we had discussed artificial propagation for the segments of the anadromous fish populations that would lose their natural reproduction and rearing areas through inundation while passing the portion of fish which spawn in the river sections upstream from the reservoir areas. Our concurrence with your request, of course, will require larger hatchery facilities to accommodate on a proportional basis all fish reaching these dams. Even so, there will be a substantial reduction in construction cost since the Corps will be relieved of the need to provide downstream migrant passage facilities.

In our May 19, 1965 letter, we pointed out there was good reason to believe that significant population increases of spring chinook salmon would continue. We added that all must recognize the greater numbers which could occur prior to the imposition of project effects and that mitigation of project damages on the larger populations would be required. In 1965 the run of spring chinook salmon at Gold Ray Dam totalled 49,420 fish. This was 11,000 fish more than experienced in 1964, which was used as the basis for determining the mitigation level in our earlier letter. Although the 1966 run fell short, we must point out again that Rogue River spring chinook have been demonstrating a marked increase. If this con-

tinues prior to completion of Lost Creek Dam, we have no alternative but to request the project to mitigate its damages to the natural production. Enclosure Nos. 1 and 2 tabulate and graphically present these data.

By joint effort of our two departments with the Bureau of Sport Fisheries and Wildlife, another spawning distribution inventory was made in 1965 to determine the proportion of that run which used the area above the project. We found the distribution to be the same as that in 1964, differing only in the greater number of fish available. In both years 31.4 percent of the spawning effort above Gold Ray Dam was above your Lost Creek B-1 site. Since your project is now planned to prevent migration above the fish velocity barrier we must also consider the population between that point and the dam site. In 1965, 33.1 percent of all spring chinook salmon redds located above Gold Ray Dam were found above the fish velocity barrier site. Enclosure No. 3 shows the spring chinook salmon spawning distribution in 1965.

In calculating the numbers of fish above the velocity barrier site in 1965, we have used the same means described in the 1964 spawning distribution report. That is, we started with the Gold Ray spring chinook tally and subtracted the numbers which entered Big Butte Creek, those caught by sportsmen, and an arbitrary 7.5 percent assumed pre-spawning mortality, to arrive at the number of fish spawning above Gold Ray Dam. To this we applied the 33.1 percent which was the proportion of spawning effort above the fish velocity barrier, to give a total of 13,020 spring chinook salmon. Our computations are shown in Enclosure No. 4.

In our earlier letter we reduced the number of spring chinook which spawned above Lost Creek Dam site by the proportion of precocious males (commonly called jacks) that had been determined at the Gold Ray counting station, and further indicated that your project would not need to mitigate for that segment of the run. That conclusion was in error.

Hatchery production will result in a proportion of jacks as will the natural production. There are no means available to us to do otherwise. In fact, some of our previous experiences have shown that a greater portion of some hatchery broods returned as jacks than did the natural reproduction. If we size the hatchery to produce a return of adults, a proportion of them will inevitably return as jacks, thus decreasing the number of adults. Consequently, if we have determined the number to be returned on a basis of only the adult fish, our effort will fall short of producing the desired number.

We are sorry if our error has inconvenienced your planning, but cannot at this time justify to ourselves or to the public anything less than requiring the project to mitigate its impacts on the fish stocks on the basis of the total population. This letter is phrased accordingly.

When we consider there would not be passage at Applegate and Elk Creek Dams and use the 1965 population of spring chinook salmon in the Rogue River, we find that your project will block 20,180 fish from the spawning and nursery areas. This figure is composed of 13,020 spring chinook salmon and 500 summer steelhead trout at Lost Creek, 500 coho and 2,000 winter steelhead at Applegate, and 1,560 coho and 2,600 winter steelhead at Elk Creek. We have tabulated these data in Enclosure No. 5.

Previously we stated that it will not be necessary to artificially propagate all salmon and steelhead which will be displaced from their natural spawning areas to maintain the populations. We continued by indicating proportions of the totals, which varied by species and race, that should be handled to maintain runs at these levels. We still believe this to be true and have followed the same scheme in determining the proportions of the new figures that should be handled, with one exception. The exception is in the case of spring chinook salmon at Lost Creek.

While there is some difference of opinion by hatchery experts as to the proper size which spring chinook salmon fingerlings should be reared prior to release, it has been our experience on the Rogue River that the best proportionate returns occur when we release the immature fish as smolts at about 7.5 fish per pound. Previously, we had advised you that the chinook would be reared to only 15 fish per pound. By rearing to the larger size, we believe there will be better returns as adults, therefore we can significantly reduce the number of immature fish to be reared and consequently the number of adult fish to be taken to provide the eggs for this effort. In either event, the final number of pounds of spring chinook smolts would be about the same; consequently the rearing facilities at the hatchery would not be changed, but there would be lesser adult holding and egg incubation facilities involved. Our computations for determining the numbers of fish and eggs necessary to hold in the hatchery are tabulated in Enclosure No. 6. This table was developed specifically for the Rogue Basin and may not be appropriate for other areas.

When considering these things we believe the anadromous fish mitigation effort will need to take 4,470 adult fish for egg production purposes. This is the sum of the 2,920 spring chinook, 240 coho, 280 summer steelhead, and 1,030 winter steelhead computed in Enclosure No. 6.

Our May 1965 letter tentatively indicated that about 50,000 pounds of resident fish should be reared for reservoir stocking. Subsequently, it has been determined there should be some increase in this production if suitable fisheries are to be provided in the three impoundments. It is our consensus this effort should include rainbow trout and kokanee to take full advantage of the reservoirs' productivity.

Currently an important fishery on juvenile steelhead exists in the California portion of the Applegate drainage. The decision not to pass anadromous fish over Applegate Dam will result in a loss to that area, but we understand the California Department of Fish and Game considers this can be mitigated through stocking hatchery-reared resident trout.

Because of these changes, the resident fish production at the project hatchery should be 70,000 pounds annually. Enclosure No. 7 gives our basis for developing this figure. We have employed standards used at some existing reservoirs for determining the fish stocking allocations. Post construction studies of the biological productivity may indicate some need for altering these rates, but since it is necessary to determine the hatchery size now, we have only general standards to use. Our figures do not consider the needs for California stream stocking, but we anticipate these needs can be accommodated from this production without seriously interfering with the reservoir management. Our enumeration of hatchery facilities includes this production along with the requirements for anadromous fish.

The project fish hatchery will have to be adjusted in size to accommodate the larger numbers of fish which result from not providing passage at Applegate and Elk Creek Dams, and our recalculation of the existing spring chinook population in the Rogue River. We have worked with your staff to develop the proper numbers of holding, starting, and rearing ponds; egg incubators; and water supply requirements. This effort indicated the total for anadromous and resident fish will be eight rectangular adult holding ponds 20 x 100 feet, fifty-eight incubator stacks, six circular inside starting ponds 6 feet in diameter, seven circular inside starting ponds 10 feet in diameter, twenty-six circular outside starting ponds 25 feet in diameter, and eighty-seven rectangular rearing ponds 20 x 100 feet. All of these facilities will require 233 cfs water supply when at maximum operation.

We recommend that all of these facilities be located at the principal hatchery site unless there are distinct advantages to constructing the adult holding and egg incubation facilities for the Applegate River fish at that dam. In either event, the smolt production of Applegate stocks must be returned to that stream and released as close to the dam as conveniently possible. Contrarily, production from Elk Creek stocks may be released directly from the hatchery if that facility is located near Lost Creek Dam as is now being discussed with your staff.

One problem remaining unanswered is the destiny of the mature fish arriving at the three collection facilities which will not be taken to the hatchery for brood purposes. Recent successes in the operation of some hatcheries indicate these may total more than 15,700 for all species. Since the project will prevent them from reaching their natural spawning areas, we must make it eminently clear that the Corps is responsible for all fish which will arrive at the dams. As the state is responsible for management, our two departments principally will determine what should be done. There are a number of things that can be offered as possibilities, and each will have to be judged on its merits in keeping with the best management practices of the time. In any event, some physical movement of these fish will be required; consequently project equipment must be available to accomplish the needed transportation. Basically this would be the same transportation equipment provided for the hatchery. Enclosure No. 8 shows the total numbers of fish that should be involved.

We appreciate your patience during the period we required to make a complete review of these several matters. Further, we greatly appreciate the excellent cooperation from your staff throughout the course of these and earlier deliberations.

Sincerely yours,

P. W. Schneider

P. W. Schneider, Director
Oregon State Game Commission

Robert W. Schoning

Robert W. Schoning, Director
Fish Commission of Oregon

cc:
North Pacific Division, Corps of Engineers - Attn: Ed Mains
California Dept. of Fish & Game
California Dept. of Fish & Game, Region 1, Redding
Bureau of Sport Fisheries & Wildlife
Portland Area Office, River Basin Studies, BSF&W
Columbia Fisheries Program Office, BCF
Oregon State Game Commissioners
Fish Commission of Oregon Commissioners

Enclosure No. 1

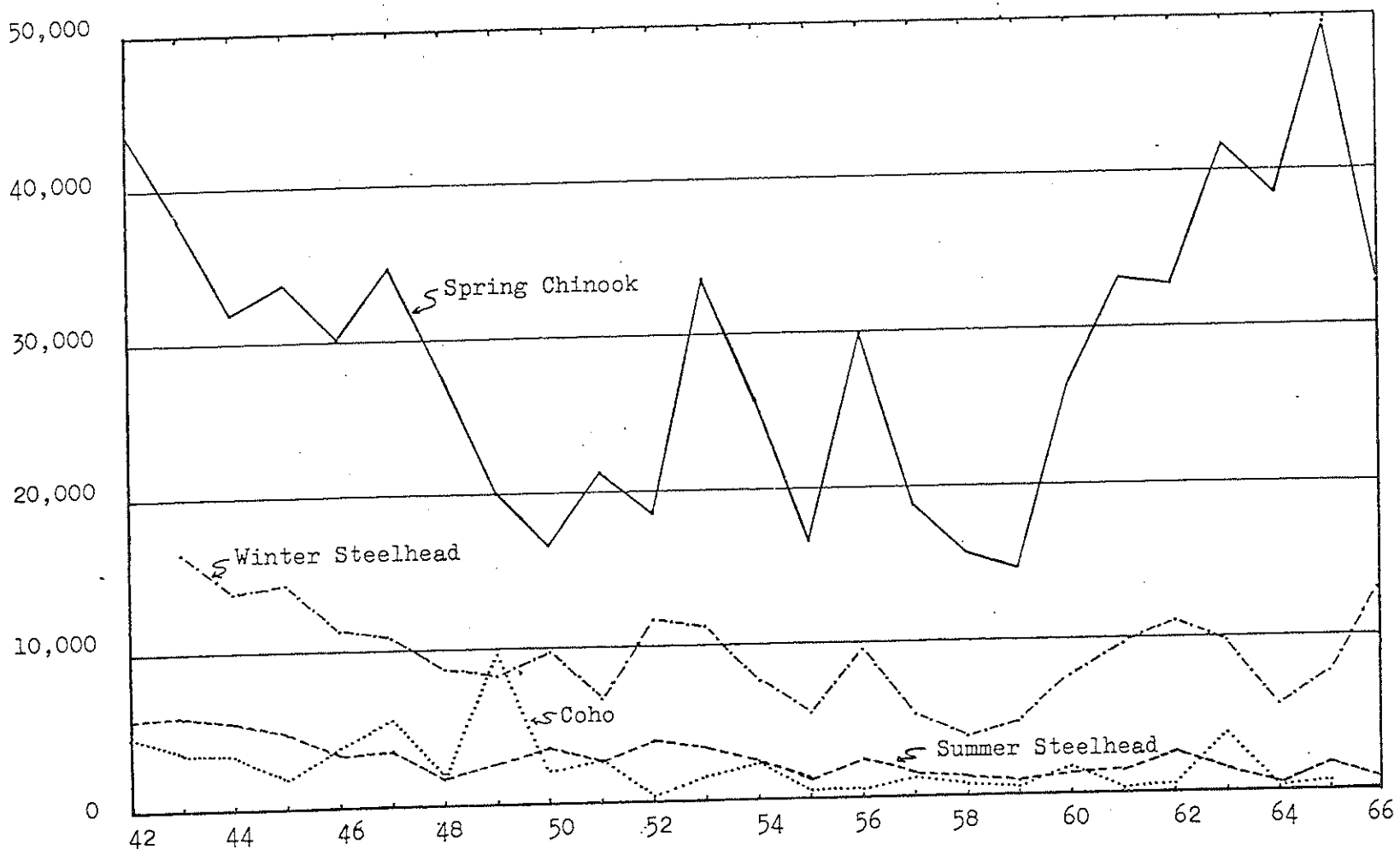
ROGUE RIVER PROJECT
Corps of Engineers

COUNTS OF ANADROMOUS FISH OVER GOLD RAY DAM
1942 - 1966

| | Spring Chinook | | Coho | | Steelhead | |
|---|---|---|---|---|---|---|
| Year | Number | Percentage of Jacks | Number | Percentage of Jacks | Summer Run | Winter Run |
| 1942 | 43,429 | 15.6 | 4,608 | 4.7 | 5,725 | No count |
| 1943 | 38,052 | 11.0 | 3,290 | 6.1 | 5,768 | 16,534 |
| 1944 | 31,940 | 13.1 | 3,230 | 10.4 | 5,282 | 13,855 |
| 1945 | 33,718 | 17.8 | 1,907 | 4.4 | 4,804 | 14,196 |
| 1946 | 30,065 | 16.5 | 3,840 | 5.5 | 3,266 | 11,185 |
| 1947 | 34,740 | 9.5 | 5,340 | 3.1 | 3,431 | 10,754 |
| 1948 | 27,742 | 10.8 | 1,764 | 4.8 | 1,995 | 8,707 |
| 1949 | 20,028 | 10.5 | 9,440 | 4.3 | 2,761 | 8,073 |
| 1950 | 16,767 | 18.8 | 2,007 | 11.8 | 3,570 | 9,667 |
| 1951 | 21,111 | 25.0 | 2,738 | 8.4 | 2,630 | 6,608 |
| 1952 | 18,488 | 23.0 | 320 | 2.2 | 3,954 | 11,550 |
| 1953 | 33,558 | 13.8 | 1,453 | 9.2 | 3,266 | 11,143 |
| 1954 | 25,785 | 21.6 | 2,138 | 10.8 | 2,352 | 7,599 |
| 1955 | 16,550 | 17.7 | 480 | 9.6 | 1,123 | 5,251 |
| 1956 | 29,952 | 13.7 | 421 | 5.4 | 2,358 | 9,370 |
| 1957 | 18,770 | 16.9 | 1,075 | 7.2 | 1,316 | 5,045 |
| 1958 | 15,716 | 13.1 | 732 | 11.5 | 1,099 | 3,888 |
| 1959 | 14,707 | 19.9 | 371 | 4.8 | 905 | 4,755 |
| 1960 | 26,217 | 23.8 | 1,851 | 5.1 | 1,223 | 7,535 |
| 1961 | 33,035 | 17.2 | 232 | 0.8 | 1,391 | 9,607 |
| 1962 | 32,651 | 17.1 | 457 | 0.0 | 2,702 | 11,005 |
| 1963 | 41,527 | 17.5 | 3,831 | 8.3 | 1,336 | 9,801 |
| 1964 | 38,464 | 16.2 | 168 | 0.0 | 555 | 6,579 |
| 1965 | 49,424 | 17.0 | 482 | 2.5 | 1,841 | 7,571 |
| 1966 | 32,588 | 10.7 | Incomplete | | 900 | 12,980 |

Enclosure No. 2

ROGUE RIVER PROJECT
Corps of Engineers
ANADROMOUS FISH COUNTS - GOLD RAY DAM
1942-1966



Enclosure No. 3

ROGUE RIVER PROJECT
Corps of Engineers

SPRING CHINOOK SALMON SPAWNING DISTRIBUTION
1965

| Area | Maximum No. of Redds | |
|---|---|---|
| Below Gold Ray Dam | 40 | |
| Gold Ray Dam to Project Fish Barrier | 4,118 | |
| Sub-Total between Gold Ray and barrier | | 4,118 |
| Project barrier to Lost Creek dam site | 105 | |
| Lost Creek dam site to Laurelhurst Bridge | 1,311 | |
| Laurelhurst Bridge to South Fork | 200 | |
| In South Fork | 420 | |
| Sub-Total above Project Fish Barrier | | 2,036 |
| Total above Gold Ray Dam | | 6,154 |
| Proportion of redds above Gold Ray Dam that occurred above the Project Fish Barrier | | 33.1% |

Enclosure No. 4

ROGUE RIVER PROJECT
Corps of Engineers

SPRING CHINOOK SALMON AFFECTED BY THE PROJECT
On basis of the 1965 population

| | |
|---|---|
| Gold Ray Dam count | 49,420 |
| Sport Catch above Gold Ray Dam | 5,000 |
| | 44,420 |
| Big Butte Creek run | 1,900 |
| | 42,520 |
| Assumed pre-spawning mortality - 7.5% | 3,190 |
| | 39,330 |
| Proportion above Project Fish Barrier - 33.1% | 13,020 |

Enclosure No. 5

ROGUE RIVER PROJECT
Corps of Engineers

TOTAL ANADROMOUS FISH AFFECTED BY THE PROJECT
Based on 1965 population of spring chinook and no passage

| Species | Lost Creek | Elk Creek | Applegate | Total |
|---|---|---|---|---|
| Spring Chinook | 13,020 | | | 13,020 |
| Coho | | 1,560 | 500 | 2,060 |
| Summer Steelhead | 500 | | | 500 |
| Winter Steelhead | | 2,600 | 2,000 | 4,600 |
| Total | 13,520 | 4,160 | 2,500 | 20,180 |

Enclosure No. 6

ROGUE RIVER PROJECT
Corps of Engineers

HATCHERY PRODUCTION REQUIRED TO PROVIDE MITIGATION

| | Spring Chinook | Coho | Summer Steelhead | Winter Steelhead | Total |
|---|---|---|---|---|---|
| No. of adults to be returned | 13,020 | 2,060 | 500 | 4,600 | 20,180 |
| Est. Survival - Smolt to adult | 0.66% | 1.0% | 0.5% | 1.0% | |
| No. of smolts to be released | 1,973,000 | 206,000 | 100,000 | 460,000 | 2,739,000 |
| Est. Survival - Egg to smolt | 60% | 80% | 40% | 50% | |
| Eggs required | 3,288,000 | 258,000 | 250,000 | 920,000 | 4,716,000 |
| Average eggs per female | 3,000 | 2,800 | 2,400 | 2,400 | |
| No. adults to spawn (Including 50% males) | 2,190 | 180 | 210 | 770 | 3,350 |
| Est. adult holding mortality | 25% | 25% | 25% | 25% | |
| No. adults to hold (including 50% males) | 2,920 | 240 | 280 | 1,030 | 4,470 |
| No. smolts to release | 1,973,000 | 206,000 | 100,000 | 460,000 | 2,739,000 |
| No. per pound | 7.5 | 18 | 7 | 7 | |
| Pounds of smolts to produce | 263,000 | 11,500 | 14,300 | 65,700 | 354,500 |

Enclosure No. 7

ROGUE RIVER PROJECT
Corps of Engineers

RESERVOIR RESIDENT FISH STOCKING REQUIREMENTS

Reservoir Surface Areas (CE data)

| | Full Pool Area | Minimum Flood Control Pool Area |
|---|---|---|
| Lost Creek | 3,430 acres | 2,580 acres |
| Elk Creek | 1,275 " | 520 " |
| Applegate | 915 " | 360 " |
| | 5,620 acres | 3,460 acres |

Stocking rates (general standards)

Legal trout - 30 fish per surface acre at 3 fish per pound
Fingerling trout - 500 fish per surface acre at 150 fish per pound
Kokanee - 200 fish per surface acre at 200 fish per pound

Production requirement

Legal trout to all reservoirs at full pool area
5,620 acres x 30 fish/acre ÷ 3 fish/pound = 56,200 pounds

Fingerling trout to all reservoirs at flood control pool area
3,460 acres x 500 fish/acre ÷ 150 fish/pound = 11,500 pounds

Kokanee to Lost Creek and Applegate at flood control pool area
2,940 acres x 200 fish/acre ÷ 200 fish/pound = 2,900 pounds

Total 70,600 pounds

Enclosure No. 8

ROGUE RIVER PROJECT
Corps of Engineers

FISH HANDLING NEEDS

| | Sp. Chinook | Coho | Sum. Stlhd. | Wint. Stlhd. | Total |
|---|---|---|---|---|---|
| Total affected population | 13,020 | 2,060 | 500 | 4,600 | 20,180 |
| Hatchery brood needs | 2,920 | 240 | 280 | 1,030 | 4,470 |
| Number requiring other handling | 10,100 | 1,820 | 220 | 3,570 | 15,710 |