

RECRUITMENT OF JUVENILE SALMONIDS  
TO BROWNLEE RESERVOIR (SUMMARY)

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## SUMMARY AND CONCLUSIONS

Data on fingerling recruitment to Brownlee Reservoir were obtained with floating fingerling traps (migrant dippers and floating louver extensions) in the Snake River and with a stationary louver facility in Eagle Creek (Powder River system). Progeny of native runs of spring-run chinook salmon and steelhead trout were present through 1964 in both areas, but few fall-run chinook progeny were present in the Snake River in 1964, since only a token number of adults were passed during the previous fall.

### Snake River

Supplementary plants of approximately 250,000 0-age chinook and 375,000 yearling cohoes were made in the Snake River in the late winter and early spring of 1964. These fish were the progeny of lower Columbia River stocks.

Fall-run chinook progeny have predominated in the Snake River system. The following are estimates of the annual recruitment from the principal populations in the Snake River above Brownlee Reservoir with brood years in parentheses:

Migration Period	Snake River fall chinook	Weiser River spring chinook	Rainbow- steelhead all sources	Hatchery Plants	
				Chinook	Coho
1962	529,000 ( '61)	122,000 ( '60)			
1963	390,000 ( '62)	34,000 ( '61)	22,000		
1964	1,000 ( '63)			175,000 ( '63)	92,500 ( '62)

Peaks of migrations from the Snake River system have occurred in mid-May for all species. A second movement of chinook, falling within the general size range of spring-run progeny, has been observed in late June and early July. The origin of this run has not been fully established. Of interest here is the fact that catches during this late period have included marked fish from Eagle Creek. These fish apparently migrated up the reservoir, entered & ascended the Snake River, and were captured as they returned downstream.

Daily peaks of migration have occurred from 7:00 to 11:00 a. m. and from 3:00 to 7:00 p. m. Lowest catches were made from 10:00 p. m. to 4:00 a. m.

Fall-run chinook salmon progeny migrate downstream in the Snake River as 0-age fish, and the spring-run progeny move out primarily as yearlings (age-group I). Rainbow-steelhead are comprised of five age groups.

Lengths of 0-age chinook have ranged from 30 to 103 mm., whereas the yearlings have ranged from 106 to 142 mm. In late April 1964, the size ranges of natural spring-run salmon progeny merged with the size ranges of the planted fall-run chinook salmon. Rainbow-steelhead have fallen within a range of 90 to 480 mm.

Average collection efficiency of the floating fingerling traps in 1963 was 11.5 percent for fish over 103 mm. and 8.1 percent for fish under this size. In 1964, efficiencies averaged 15.7 percent and 7.9 percent respectively for the large and small size groups.

### Eagle Creek

Migrations from Eagle Creek of the Powder River system have consisted of spring-run chinook salmon and rainbow-steelhead trout progeny.

Progeny of chinook salmon begin migration out of Eagle Creek with the first increase in runoff during the fall. This run is comprised of 0-age fish (55 to 120 mm. fork length) and continues until freezeup in early winter. Peak migrations have occurred in October and November. A second, smaller migration begins during warmup in late winter or early spring and continues until June. Fish in this migration are nearly all age-group I (70 to 135 mm. fork length).

Rainbow-steelhead trout migrate out of Eagle Creek in the spring. Peak catches of migrants have occurred in May, but high water levels during the spring have handicapped trapping efforts, making it difficult to fully assess the extent of this migration. Five age groups are indicated and lengths range from 70 to 283 mm.

The following estimates of recruitment from Eagle Creek (brood years in parentheses) were obtained during the 1962-63 and 1963-64 runs:

Migration period	Chinook	Rainbow-steelhead
1962 fall	117,000	22,000
1963 spring	<u>16,500</u>	
Total:	133,500 ('61)	
1963 fall	24,000 <sup>1/</sup>	
1964 spring	<u>7,000</u> <sup>2/</sup>	2,800
Total:	31,000 ('62)	

1/ Includes 3,000 0-age fish taken in spring of 1963.

2/ Estimate to May 17, 1964.

The efficiency of the louver trap in the 1962-63 period was 10.2 percent, with selectivity toward larger fish. In 1963-64, the efficiency of the louver facility was improved. Average efficiency was 55.2 percent (range, 37-65 percent), and there was no evidence of selectivity on the basis of fish size.