

THE EFFECT OF MULTIPLE HYDROELECTRIC PROJECTS ON
IMPORTANT FISH RUNS OF THE COLUMBIA AND SNAKE RIVERS
(FOREWORD)

by

Clifford W. Long

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The future of salmon runs extending to the upper reaches of the Columbia and Snake Rivers may hinge in part upon the development of safe passage for fingerling salmonids at low-head dams. Research by Holmes (1952)^{1/} and Schoeneman, et al., (1961) indicated that Kaplan turbines in dams similar to Bonneville and McNary may kill 9 to 15 percent of the fingerling salmonids passing through them, whereas mortality in spillways may be expected to range from 1 to 3 percent. Because some of our most important fish runs will eventually pass through eight to ten low-head dams (fig. 1), the cumulative mortality may well be substantial.

In the future other factors will increase this problem. At present, a majority of the young migrant salmon enjoy relatively safe passage during the spring owing to the operation of spillways to pass flood waters. With the advent of increased storage through the addition of headwater reservoirs, the floodwater runoff now coinciding with fingerling runs will be spread over a longer period of time. As a result, less water will be spilled, and increasing volumes will go through the turbines. Under these conditions, a greater portion of the young fish will be forced to pass through the turbines, thus increasing the potential losses at each dam.

The purpose of this report series is to present the progress of a research program leading to the development of methods for protecting young salmonids that otherwise would be killed in the Kaplan turbines of low-head dams. This report is arranged in five sections covering: (1) The concepts of the research program currently underway, (2) equipment developed for this research, (3) the results of research to date, (4) orientation of future research, and (5) a summary of current research.

Experiments at Bonneville, The Dalles, and McNary Dams have been made possible through the cooperation of the U. S. Army Corps of Engineers at these hydroelectric projects.

^{1/} Holmes, H. B. 1952. Loss of salmon fingerlings in passing Bonneville Dam as determined by marking experiments. U. S. Fish and Wildlife Service. Unpublished.

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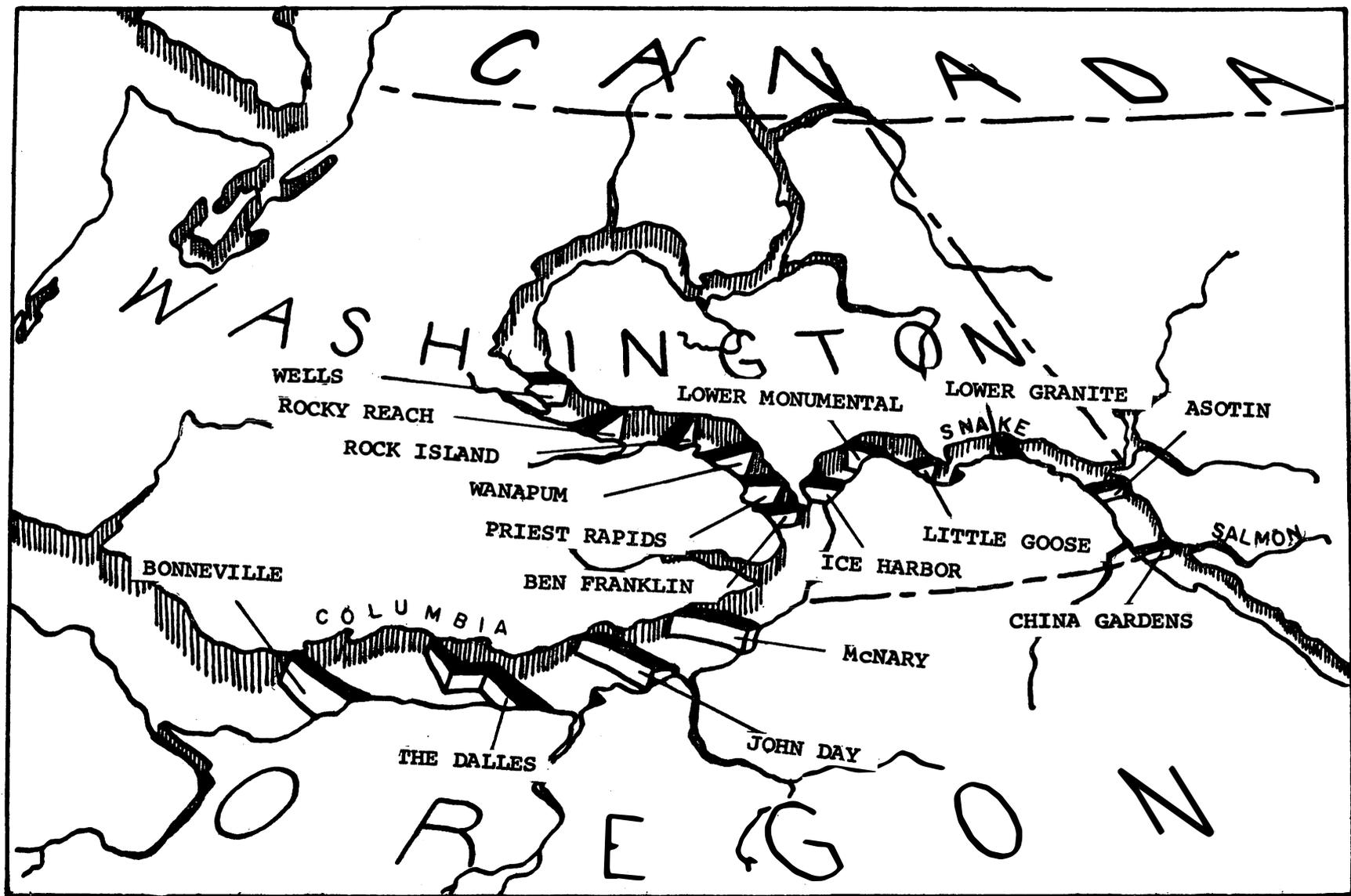


Figure 1.--Location of present and future low-head hydroelectric installations in Columbia and Snake Rivers.

LITERATURE CITED

- Schoeneman, D. E., R. T. Pressey, and C. O. Junge, Jr.
1961. Mortalities of downstream migrant salmon at McNary
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