IMPROVEMENT OF SPAWNING STOCK SURVEYS*

by

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To do the best possible job of managing salmon or any other fish or mammals it is necessary to know the number of breeding adults as accurately as possible. In California, surveys are made each year to assess the number of spawning salmon. The work could be improved both by the refinement of methods and in the extent of coverage.

In the Central Valley the coverage is reasonably complete. It would be highly desirable if we could work out more precise methods of estimation especially in the main stem of the Sacramento River itself.

A study should be made in some one of the larger tributaries of the river in which the size of the salmon run was estimated by several of the standard methods now in use, and by new methods. For example, if a fish ladder count, tag and recovery experiment, and aerial redd count could all be made on the same stream in the same season, we would have a much better idea of the errors involved in the latter two methods. This has not been done primarily because of lack of funds and personnel.

A study of the main stem of the Sacramento River should also be included, but it could not include any fish ladder counts, so the comparison would have to be between the various indirect methods. A full-scale tagging experiment on the Sacramento should give

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considerably more accurate results than we have been able to obtain this far and should help point up ways in which a staff of the present size could expect to get better results. Such studies could be done either as a federal aid project or as a project of the U.S. Fish and Wildlife Service.

In the coastal streams the problem is considerably more difficult, and at present the coverage is confined to counts at fish ladders in a few widely scattered places. Many of the coastal streams have their headwaters in places which are practically inaccessible during the winter.

The flows are subject to extreme fluctuation and the fish often enter during periods of high run-off and muddy water. Counting weirs are almost sure to be flooded out just when needed. The tag and recovery method of population estimation is difficult here and is apt to be inaccurate because the fish are scattered through so many miles of muddy inaccessible streams that the numbers recovered are apt to be far too small to give a trustworthy answer.

Aerial surveys could only be used in the larger and more open coastal rivers. Many of the streams are in narrow canyons or are so overhung with trees that salmon nests could not be seen from the air even during periods of relatively clear water. Methods of counting fish in these coastal streams may have to include techniques that have not been given a thoroughtrial in California or anyplace else. Electronic counters set to cover an entire stream are a possibility that might be considered. Developing entirely new methods is expensive and would require a well-trained staff.

If the work were to involve electric counters it is probable that the U.S. Fish and Wildlife Service would be better able to

supply a staff than would the State.

Whatever methods were developed, and wherever they were developed, it would be necessary to make it clear to the people doing the work that what was needed was a practical management tool, not a scientific curiosity. Conversely it would also have to be understood by the State that a timetable would not be practical until the project had continued <u>at least</u> 2 or 3 seasons to determine what methods showed enough promise for further development work.

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