Marine, Keith R.; Cech, Joseph J., Jr. "Effects of High Water Temperature on Growth, Smoltification, and Predator Avoidance in Juvenile Sacramento River Chinook Salmon." *North American Journal of Fisheries Management* **24:198–210, 2004.** (Reviewed by Charles Bosse)

This report details an experiment on the effects of three different water temperature brackets, 13–16 C, 17–20 C, and 21–24 C, on juvenile Chinook salmon, with the conclusion that fish raised under the higher temperature brackets can survive to adulthood, but show lower growth rates and are less adept at performing basic functions such as predator evasion. The report also covers a number of general issues concerning the environmental impact of warmer water and factors that have made warming an issue in recent years. The report details other useful information such as sodium and potassium levels in the bloodstream, and comparisons between freshwater and saltwater groups of fish. The report also discusses possible variances in sample stocks from similar experiments

Critique

This report was instigated in California, and was not done with fish from the Willamette River watershed, but it deals with a species important to the Willamette and to fish and game management in the Willamette Valley. This report is a good example of the type of research both local and national land use institutions use when setting policy on streams. It is from a widely available journal with a number of articles in electronic format, and so easily accessible on a large scale. The study contains very accessible data analysis and easy to read charts and graphs. The data are well analyzed and conclusive, and the study provides an extensive list of further resources and references on the topic. The study is clear about the methods used and the quality of the data, and provides good references for past studies, the uses of the data, and the impact of the findings. In addition, the study is recent, so the information and references are up to date and useful.

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