

## Some Effects of Logging and Associated Road Construction on Northern California Streams<sup>1</sup>

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### ABSTRACT

The effects of logging and associated road construction on four California trout and salmon streams were investigated from 1966 through 1969. This study included measurements of streambed sedimentation, water quality, fish food abundance, and stream nursery capacity. Logging was found to be compatible with anadromous fish production when adequate attention was given to stream protection and channel clearance. The carrying capacities for juvenile salmonids of some stream sections were increased when high temperatures, low dissolved oxygen concentrations, and adverse sedimentation did not accompany the logging. Extensive use of bulldozers on steep slopes for road building and in stream channels during debris removal caused excessive streambed sedimentation in narrow streams. Sustained logging prolonged adverse conditions in one stream and delayed stream recovery. Other aspects of logging on anadromous fish production on the Pacific Coast are discussed.

### INTRODUCTION

A major concern of resource managers on the Pacific Coast of the United States and British Columbia has been the effect of timber harvest and associated road construction on salmon and trout. At first interest focused on log jams blocking salmon (*Oncorhynchus* spp.) and steelhead trout (*Salmo gairdneri*) from their spawning grounds. California resolved this problem by a law requiring clear passage for fish and by a log jam removal program (Mongold, 1964). Then interest shifted to damage caused by bulldozers working in streambeds and along stream banks (Calhoun, 1962, 1966) and to erosion resulting from improper road and skid trail construction on steep terrains (Cordone and Kelley, 1961; Calhoun, 1967). In July 1966, the

California Department of Fish and Game initiated a study in northern California watersheds to determine the effects of logging and associated road building on stream salmonids. This report describes the study from 1966 through 1969 and summarizes the resulting conclusions about streambed sedimentation, water quality, fish food abundance, and stream nursery capacity.

### STUDY AREA

Four small streams on the northern California coast were chosen for study (Figure 1): Bummer Lake Creek, South Fork Yager Creek, Little North Fork Noyo River, and South Fork Caspar Creek. They are located within 40 km of the ocean and drain watersheds ranging from 425 to 2,514 ha (Table 1). The watersheds are relatively steep, with canyon sides having mean slopes ranging from 36 to 49%. The coastal climate is characterized by heavy winter rainfall and dry summers. Mean annual precipitation varies from

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