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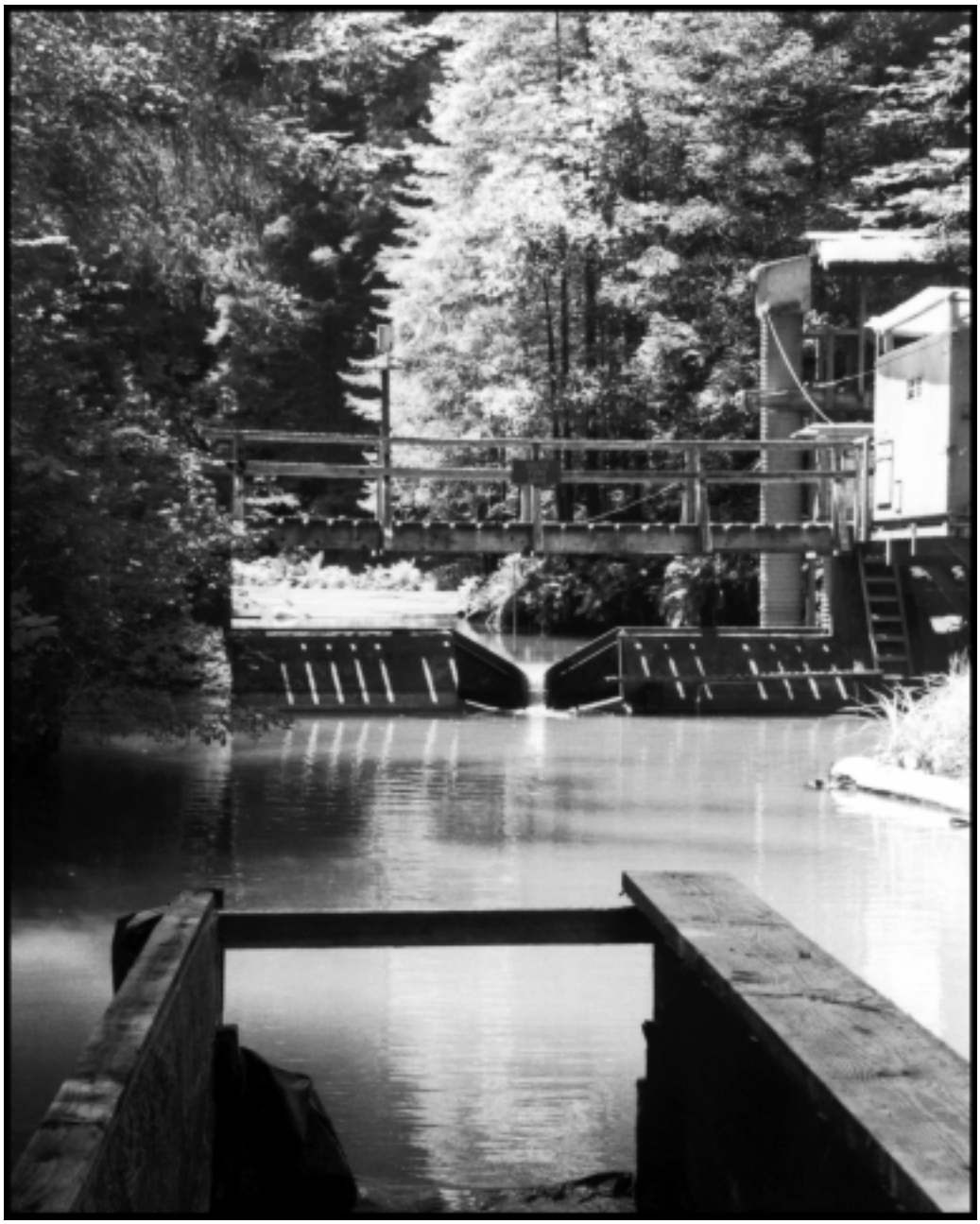
General Technical Report
PSW-GTR-168

Proceedings of the Conference on Coastal Watersheds: The Caspar Creek Story

May 6, 1998 Ukiah, California



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Abstract

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These proceedings report on 36 years of research at the Caspar Creek Experimental Watershed, Jackson Demonstration State Forest in northwestern California. The 16 papers include discussions of streamflow, sediment production and routing, stream channel condition, soil moisture and subsurface water, nutrient cycling, aquatic and riparian habitat, streamside buffers, cumulative effects, monitoring. A detailed annotated bibliography of 107 papers from Caspar Creek is included.

Retrieval Terms: cumulative effects, nutrient, paired-watersheds, riparian, sediment, soil moisture, streamflow

Technical Coordinator

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Acknowledgments

Since 1961, research at the Caspar Creek Experimental Watersheds, located on the Jackson Demonstration State Forest, has been a cooperative venture between the California Department of Forestry and Fire Protection and the USDA Forest Service's Pacific Southwest Research Station (Agreement 12-11-0215-19).

Front cover: A view of the South Fork Caspar Creek gaging station (SFC), looking upstream from the fish ladder toward the weir. Photo by Norm Henry, California Department of Forestry and Fire Protection.

Back cover: A view of the tributary Dollard gaging station (DOL) in the North Fork of Caspar Creek, looking upstream at the Parshall flume. Photo by Norm Henry, California Department of Forestry and Fire Protection.

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Preface

A program for watershed research in California's coniferous forests below the snow zone was proposed in 1960 by Henry W. Anderson (Anderson 1960). On July 1, 1961, cooperative watershed management research in this lower conifer zone was started by the USDA Forest Service's Pacific Southwest Forest and Range Experiment Station (now Pacific Southwest Research Station [PSW]), with formal cooperation of the State of California's Division of Forestry (now Department of Forestry and Fire Protection [CDF]) and the Department of Water Resources. The Caspar Creek study, formally described as "Study 2-1, a study of logging effects upon streamflow, sedimentation, fish life and fish habitat in the north coast redwood-Douglas-fir forest type Jackson State Forest, Fort Bragg, California," was one of the first studies undertaken by PSW's new Lower Conifer Research Unit. By October 1, 1961, bedrock stream gaging sites had been located in two tributaries of Caspar Creek, maximum (peak) stage and staff gages and five standard raingages had been installed, and weekly suspended sediment samples and stage heights had been collected (Hopkins and Bowden 1962). The California Department of Water Resources, working with PSW, CDF, and State of California Department of Fish and Game, designed the streamgaging weirs and fish ladders. Cement, reinforcing steel, and aggregate were purchased by PSW, and the weirs were built by CDF in summer 1962. The North and South Fork weirs began operation on October 1, 1962.

The first agreement between PSW and CDF "providing for cooperation in the conduct of a program of watershed management to determine the effect of forest management upon streamflow, sedimentation, fish, fish habitat, timber and other vegetative growth" became effective January 12, 1962. This agreement (12-11-0215-19) was amended with an annual work plan each year from 1962 to 1997. In 1998, a new agreement was approved.

The Caspar Creek Experimental Watersheds, as they were designated in 1962, consist of the 424-ha South Fork and 473-ha North Fork. These two tributary basins are located in the headwaters of the 2,167-ha Caspar Creek watershed, which discharges into the Pacific Ocean near the community of Caspar (*fig. 1*). Logging roads were built into the South Fork in 1967. The entire South Fork watershed was selectively harvested and tractor yarded; about one third in 1971, 1972, and 1973, respectively (Henry, these proceedings). In 1985, 13 additional streamgaging stations were

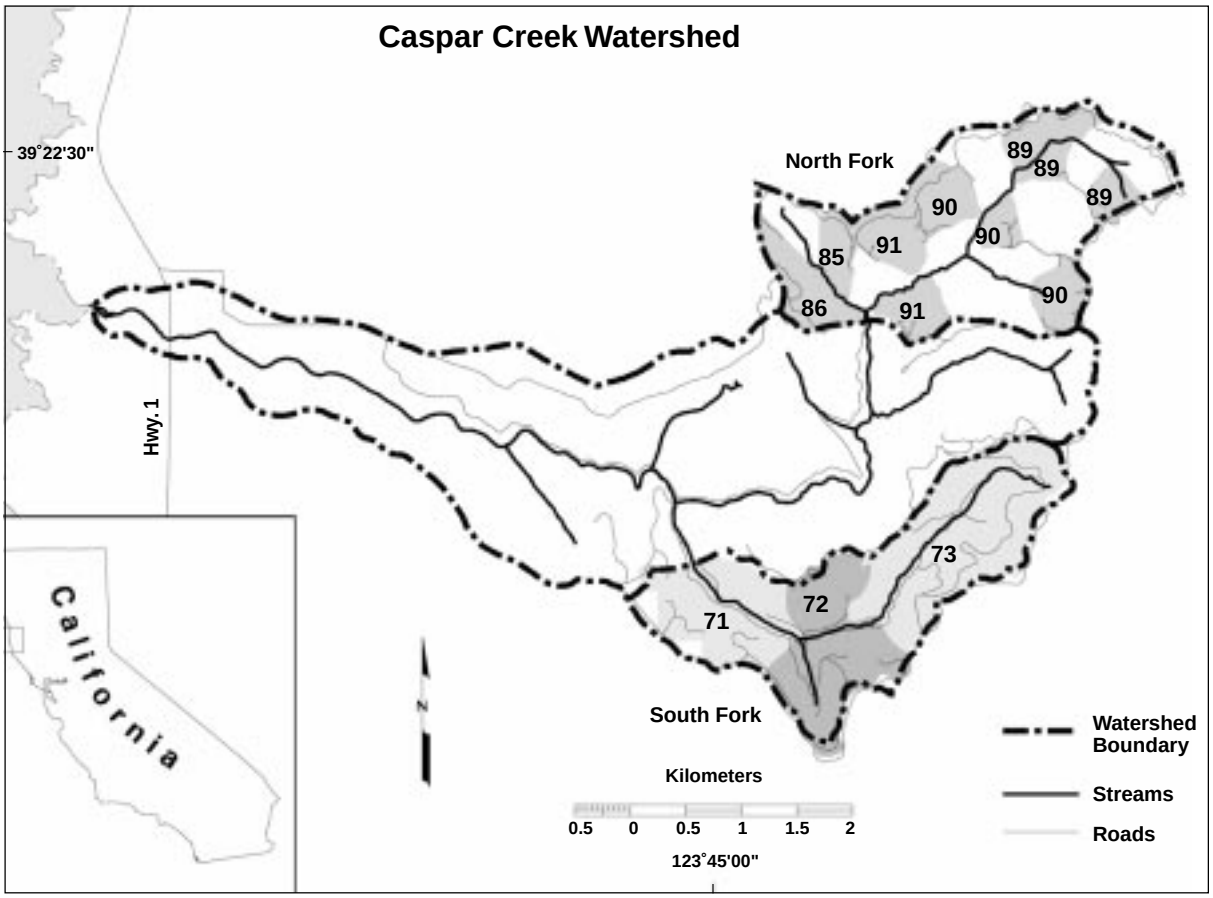

Figure 1 — The Caspar Creek Experimental Watershed is located in northern California.

constructed in the North Fork. The North Fork was clearcut logged in large patches in 1985, 1986, 1989, 1990, and 1991 (*figs. 1, 2*). The subwatersheds of the North Fork and the 14 gaging stations, raingages, subsurface and piping sites, solar radiometer, and splash dam (*fig. 2*) are described in the papers that follow.

Much of the data collected during this study's 37 years are available on CD-ROM from PSW's Redwood Sciences Laboratory, at Arcata, California (Ziemer 1998). This data set and its earlier release are a valuable resource to researchers, educators, and students around the world and are unique in detail and resolution.

These Proceedings are the written product of the **Conference on Coastal Watersheds: The Caspar Creek Story**, organized by Bill Baxter (California Department of Forestry and Fire Protection), Liz Keppeler (Pacific Southwest Research Station), and Greg Giusti (University of California Extension). The Conference was held May 6, 1998 at the Mendocino Community College in Ukiah, California and was attended by about 400 persons. The next day, 75 individuals participated in a field trip through the North Fork of Caspar Creek. Attendance at both the Conference and the field trip was limited by seating capacity, and a number of potential registrants were turned away because of lack of space. The number of attendees attests to the keen interest in the effects of forest practices on the hydrologic responses of forested watersheds.

These Proceedings summarize 36 years of watershed research at Caspar Creek and include an annotated bibliography of the 107 papers that report the details of studies conducted during this cooperative venture. Further information concerning the Caspar Creek study can be found at the Redwood Sciences Laboratory Internet site at **http://www.rsl.psw.fs.fed.us**

References

Anderson, H.W. 1960. **Proposed program for watershed management research in the lower conifer zone of California.** Tech. Paper 46. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 21 p.

Hopkins, Walt; Bowden, Kenneth L. 1962. **First progress report, 1961-1962, cooperative watershed management in the lower conifer zone of California.** Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 10 p.

Ziemer, R. 1998. **Caspar Creek hydrologic and climatic data: 1963-1997.** CD-ROM, 545 MB. 1998 May. Arcata, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture, and Fort Bragg, CA: California Department of Forestry and Fire Protection.

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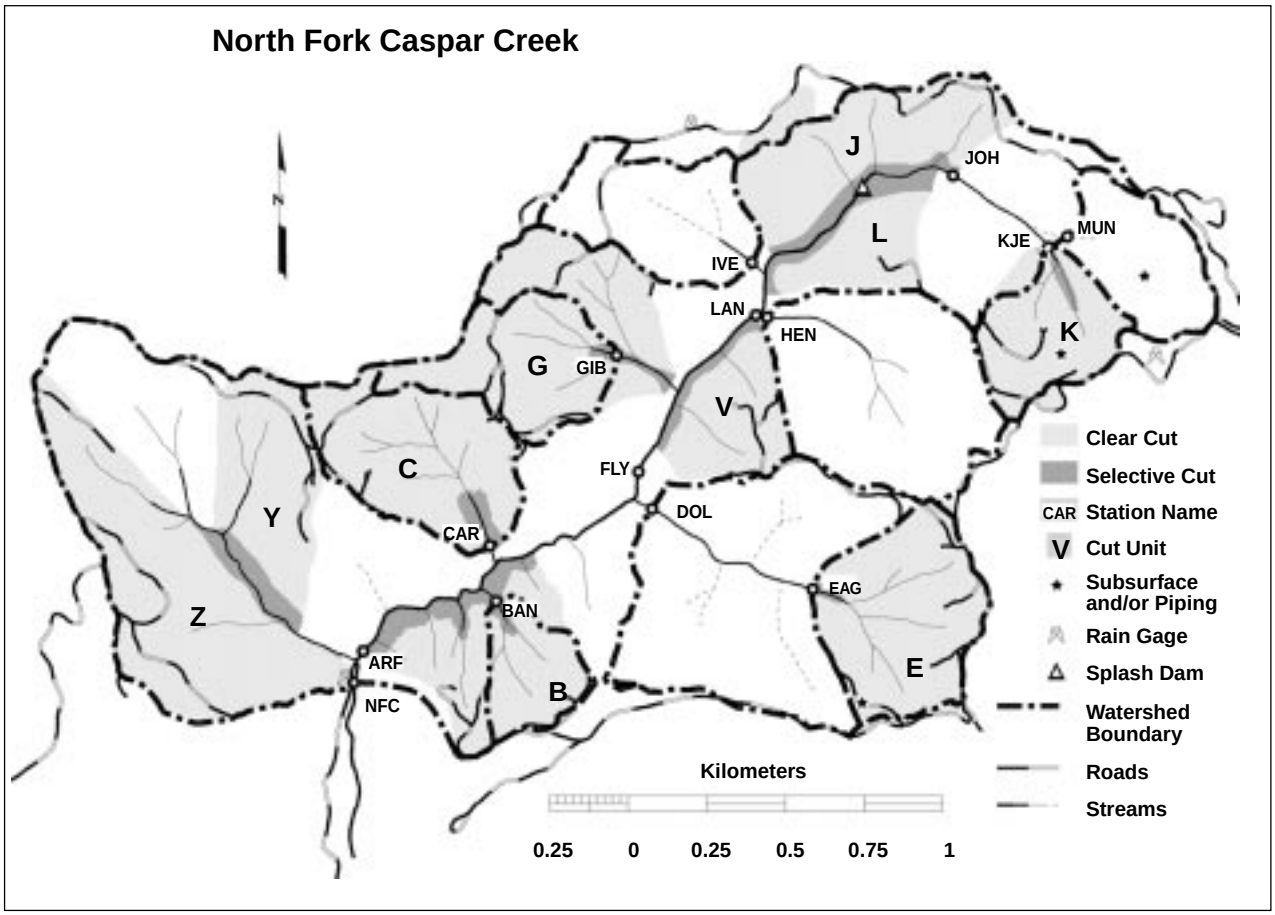

Figure 2 — North Fork Caspar Creek watershed.