

Where Do We Go from Here?¹

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You may have noticed that, in spite of this being a Caspar Creek conference, I spent a lot of time this morning talking about things other than watershed management research conducted at Caspar Creek. That is because, in spite of my enthusiastic support for a continued active research program at Caspar Creek, I think that it can achieve maximum benefit to society only if other aspects of the environment change. Owing, in part, to my employment since retiring from the Forest Service, I have come to see environmental problems as conflicts between the two value systems I discussed this morning. In those conflicts it seems that both industry and environmentalists rely too much on lawyers and propaganda. That is one of the things that ought to change in the future. But, before getting into such as that I would like to talk about Caspar Creek.

Things may have to be relatively quiet there for a few years while the effects of the recent logging in the North Fork diminish. That does not mean that nothing will be going on. You have heard about some of the ongoing studies today. During the rainy season six stream gaging stations will be in operation in addition to the main gages on the North and South Forks, which will operate year round. These stations will monitor both streamflow and suspended sediment. In addition, there will be three precipitation stations and one station each recording solar radiation, air temperature, water temperature, subsurface pipe flow, and soil moisture tension. Bedload transport will be recorded when any flows occur that are larger than those previously measured. Annually, the sediment accumulation in the North and South Fork weir ponds will be surveyed, as will changes in channel morphology in selected reaches of the streams. These measurements will provide the continuity that makes experimental watershed data increasingly valuable as the lengths of their records increase. But length of records is not the primary virtue of these data. It is their high quality and the wealth of ancillary data that sets them apart.

My candidate for the main goal of future research in the North and South forks of Caspar Creek is to make of them a continuing study of the two main opposing silvicultural systems: even- and uneven-aged management. If this proposed study were undertaken, things might not be quiet in Caspar Creek very long. The South Fork has had one partial cut more than 25 years ago and is ready for another. The North Fork already has no adjacency problems; therefore, additional clearcuts could be made at any time. Although it is true that the previous cut in the South Fork was not a selection

cut, future cuts could converge on that ideal. While additional selection harvesting in the South Fork is occurring, comparable volumes could be clearcut in the North Fork. There would be periodic analyses using all the data to date to see how the two systems stack up. I hope that these analyses would include biological concerns as well as hydrologic effects. My reason for this proposal is that the past paired-watershed approach leaves too much wiggle room for people inferring the effects of the two silvicultural systems in the real world. One side says that the repeated entries of uneven-aged management result in greater disturbance. The other side counters that even-aged management does not really mean only one entry per rotation; actually there are thinnings and other intermediate cuts. In time, the program I propose would test the validity of these arguments.

I have heard some grumbling about this plan based on the fact that the South Fork was logged before the modern forest practice rules and that the old roads in the South Fork are now falling apart. Consequently, the concern is that these conditions would make uneven-aged management look bad, because of past practices that are no longer considered acceptable. I would like to respond to those misgivings in four ways. First, where were such concerns 20 years ago when Forest Tilley and I proposed a study of even- and uneven-aged management on Parlin Creek? Second, there are hundreds of areas on the north coast with histories just like the South Fork's. Consequently, the information gained will be relevant to current conditions on a substantial portion of lands previously logged. Third, the new gages contemplated on the tributaries in the South Fork can be used to estimate the effects of uneven-aged management uncontaminated by the South Fork's history. Lastly, as the years pass and repeated entries are made, it will become clearer which silvicultural system adapts most easily to new environmental and production requirements that will likely arise in the future.

It is in our interest to not limit our concerns about the future to Caspar Creek. At a minimum we should support the continuation of research at other experimental watersheds in the Pacific Northwest. It is not just comforting when Caspar Creek findings are supported elsewhere. It gives assurance that what we have measured at Caspar Creek is not a fluke of the site or the weather.

The U.S. Geological Survey (USGS) collects almost all streamflow and sediment data in the United States. The USGS, by the nature of its mission, is collecting its data from natural stream channels draining large watersheds. As a consequence, they are unable to attain the accuracy of the weirs and flumes in Caspar Creek. Scientists using USGS data *do* have the opportunity study complex watersheds on a scale impossible in Caspar Creek. The two data sources are, therefore, complementary. Although Caspar Creek data have increased in quantity and quality since the study began in 1963, the quantity of USGS data has been shrinking. That is

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especially true with respect to estimates of sediment discharge. In 1963, streamflow was measured by the USGS on 97 coastal streams in northwestern California. Suspended sediment was measured at 10 of them. Of the 10, estimates of total annual sediment discharge were made at seven gaging stations, the 6 winter months were monitored at two stations, and 57 samples were collected at another. By 1974, the number of stations where streamflow was measured had dropped to 70, but sediment was measured at 19 stations. Of these, 15 produced total annual sediment estimates and 60 samples were divided among the remaining four stations. In 1996, 52 streams were being monitored, and annual sediment load was computed at only one: Grass Valley Creek. Throughout the remainder of the California coast, from Oregon to San Francisco, there were only 19 daily estimates of suspended sediment discharge scattered among six gaging stations. When considering “where do we go from here,” I wonder if this is a trend that will or should continue? I think it should not. With the impact of watershed disturbances on anadromous fisheries being hotly debated, we should be collecting more data, not less. Small experimental watersheds cannot help much here. Most of what affects anadromous fisheries occurs elsewhere. Information on large watersheds is necessary to answer those and other questions that cannot be resolved in a couple of 500-ha watersheds.

In this era of shrinking government budgets, we should be considering from where needed large watershed data might come. The USGS is not the only possible source of data on large watersheds. In the past, two timber companies on the north coast launched their own watershed-monitoring programs. One, in particular, was a well-designed paired-watershed study. Both companies invested a lot of time and resources collecting calibration data but, as far as I know, both have abandoned their studies without completing their experiments. That was a consequence, I suspect, of the “quarterly report” mentality of much of American industry. I have no way of knowing whether the completion of those studies would have been cost-effective for those companies, but my bias is that they would have been — especially for one of them. Certainly, aborting the studies after making substantial investments in them was not cost-effective. If companies are reluctant to make the necessary long-term commitment to do their own watershed monitoring, I think they would be well advised to use their considerable political muscle to reverse the decline in USGS stream gaging.

Timber companies may not have suitable watersheds within their properties. That does not mean that they cannot attempt to measure sediment risks associated with their management—if only to estimate their future legal fees. Erosion studies can yield them considerable insight into possible sediment problems—or lack thereof. All companies make a lot of decisions—in road maintenance, in particular—based on likely sedimentation effects. By having their own well-designed erosion studies they can gain insight into the cost-effectiveness of what they are doing. Another way that the industry could foster more fact-based analyses of hydrologic problems would be to measure precipitation. Practically all of the rain gages in the Pacific Northwest are in valleys or on the coast. Industry owns the hills. It would be helpful to *know* what is happening up there rather than having to assume high-elevation rainfall amounts.

And now, my most outrageous “where do we go from here.” The Sierra Club or any like-minded environmental group could resort to their own studies. Wouldn’t data be more effective than scare tactics supported by photos of the operation of Murphy’s Law? These groups certainly have the smarts and the manpower for such an undertaking. Because environmental groups are concerned about the need for more environmental protection, they should be eager to try to collect *valid* data demonstrating that need. And, if their fears are not borne out by the data, imagine their relief. To be sure, I doubt that timber companies would allow environmentalists access to their properties to collect data, but I doubt whether the Forest Service, or Bureau of Land Management, or State agencies could deny access to public lands in their jurisdiction.

I am sure that much of the foregoing is wishful thinking, which stems from my fondness for quantitative analyses of problems. And it is possible that even if my proposals were implemented, they would do little to reduce the rancor of environmental debates. Basic value systems do not change that readily, and even the best data will not be without some uncertainty and room for alternative interpretations. Granting all that, it still seems to me that “where do we go from here” ought to be in the direction of more factually based debates about forest and environmental protection.