Subcommittee on Forest and Forest Health

Recovering from the fires: restoring and protecting communities, water, wildlife, and forests in Southern California

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Lake Arrowhead Resort
Lake Arrowhead, California

Testimony of Hamlet J. Barry, III, Manager, Denver Water Department

Members of the Committee:

I. Introduction

My name is Chips Barry, and I am Manager of the Denver Water Department. Denver Water is a municipal corporation that supplies water to 1.2 million people in and around Denver, Colorado. About one quarter of the population of Colorado is supplied by water from us. Our water supply is dependent on water generated in watersheds located primarily on Forest Service and other public lands west of Denver. We gather water in three watersheds west of Denver on both sides of the Continental Divide, and move it by canal and conduit as much as 80 miles to treatment facilities located near the city.

Denver Water has had several large fires in our watershed in the last seven years. This testimony will describe how Denver Water dealt with our watershed before, during, and after those fires, and attempt to distill the lessons we have learned about forest fires, erosion, sediment control, water quality, and the various levels of governmental ownership, control, or oversight that influence our action.

I make no claim that our experience is fully relevant to the recent wild fires here in California. I suspect that differences in vegetation type, soil conditions, topography, and settlement patterns mean that the lessons from our experience will be only partially helpful here in California. Nevertheless, I will try to distill our experience for whatever it may be worth.

II. Watershed Described

Denver draws water from the Blue River, the Fraser River, and the Williams Fork River, all of which are tributaries of the Colorado River west of the Continental Divide. We also draw water from the South Platte River, on the East Slope of the Continental Divide. Much of the water on the West Slope is delivered to Denver by tunnel through the upper reaches of the South Platte. Hence, more than 80% of the water supplied to Denver is delivered via the South Platte River. Thus, the South Platte watershed is of vital importance to us. Since 1996, there have been six forest fires in the upper South Platte watershed. Two of these have had or will have devastating consequences for us. (Slides 1-4)

III. Buffalo Creek Fire

The Buffalo Creek Fire began on May 8, 1996. It burned swiftly and was a very hot fire, burning 12,000 acres in a day. The intensity of the fire made the underlying soil hydrophobic, meaning it would not absorb water. While Denver Water knew that a forest fire could create erosion problems, we had in fact no real idea of what would happen. In July we had a persistent rainstorm on top of the Buffalo Creek Area, and received two inches of rain in a short period of time. The decomposed granite “soil” moved like ball bearings when hit with that volume of water, and this destructive erosion load flowed directly down Spring Creek and dammed the South Platte River. After a few hours, the river broke the dam and the resulting mess ended up in our Strontia Springs Reservoir a mile further down stream. In three hours we received as much sediment in Strontia Springs Reservoir as had accumulated in the prior eleven years. We received something like 400,000 cubic yards of material. We also received fifteen or more surface acres of floating debris, and 5,000 tons of driftwood, port-a-potties, tires, and other flotsam brought down by the flood.

Looking back on the Buffalo Creek Fire and Flood, I think it's fair to say that we did not know how severe the erosion would be if we got a severe rainstorm on top of the area that had been burned. We did not anticipate the damage, but with only 60 days between the fire and the rain, there was little time to do anything had we known.

For this relatively small fire, the water quality and clean-up costs were nearly a million dollars, and the estimated future cost is 15 to 20 million dollars to dredge our reservoir. We estimate the after affects of erosion will negatively affect water quality, and cost us $250,000 per year for at least ten years. (Slides 5-7)

IV. The Hayman Fire

The Hayman Fire began on June 8, 2002. This fire began during times of drought, and was fueled by an overgrown, under-managed forest, and high winds. The fire burned for six weeks, and at the end of it, 138,000 acres of our South Platte watershed had been consumed.

Prior to the fire, based partially on our experience at Buffalo Creek, we had begun a program of forest thinning and treatment to reduce the fuel loads in the forest on lands we own. However, Denver Water owns only 8,000 acres of the 138,000 burned, and even for our 8,000 we had only completed about one quarter of the thinning. The lesson is that the area that was thinned or treated did not burn or did not burn severely.

Following the Hayman Fire, and continuing until today, Denver Water has had a crew of up to 40 people working on our land around Cheesman Reservoir, in order to prevent or limit the kind of sedimentation seen after the Buffalo Creek Fire. Fortunately, we have not yet seen the kind of rainfall over this burned area that was seen in the summer of 1996. However, even a ¼-inch rain has been sufficient to move tons of debris down the hill toward the river and our reservoir.

Since July of last year, the following restorative efforts have taken place at the Cheesman Reservoir property:

• Denver Water crews and aerial contractors have applied more than 210,000 pounds of grass seed over 4,550 acres, and have sprayed hydromulch over an additional 450 acres.
• Nearly 30,000 straw bales have been placed, creating nearly 2,000 sediment dams in gullies in the burn area in order to slow the flow of rain runoff.
• Crews have cut dead timber on steep slopes in the burn area using a process called "contour felling," in which trees are cut and aligned perpendicular to the slopes, again to prevent erosion.
• Denver Water also hired contractors with Hydroax machines to mulch standing dead trees on about 2,100 acres. This process helps break up the hydrophobic soils, removes the unsightly burned trees from the landscape, and returns organic materials to the soil, replacing those that were destroyed in the fire. Much of this was done in areas that were already seeded, providing mulch over the seed.
• Under private contract, 1,700 acres of burned land were logged by timber salvage companies. About 10 million board feet of lumber – the equivalent of 22,000 cords of firewood or 2,900 miles of 2-by-4 studs – were salvaged.
• Starting this year, Denver Water planted 25,000 ponderosa pine seedlings and will continue to do so for the next nine years to reforest the area with its native pine species.
• As a more immediate source of protection for the dam and the water supply, a 140-foot-long, 40-foot-high rock sediment dam was constructed to span the Goose Creek inlet, northwest of the dam. The structure contains about 14,000 tons of rock and is designed to be water permeable.
• Costs of the Cheesman reclamation have totaled nearly $5.5 million, with the U.S. Natural Resources Conservation Service and the U.S. Environmental Protection Agency reimbursing Denver Water about $2.8 million of that amount. Future dredging costs have not been estimated.

V. Lessons Learned and Observations.

I do not know whether the experience of Denver Water in the arid ponderosa pine forest of the foothills of the Rockies is relevant to the chaparral fires in coastal California. Nevertheless, my observations and final thoughts are as follows:

1. A great deal of the potential damage from the forest fire can be eliminated by careful, deliberate forest management in the years and decades before. We have too much fuel load in our forests, and our fire suppression policy exacerbates the problem. Our forests need to be treated and thinned regularly and scientifically. This problem has nothing to do with favors to the timber industry.

2. Our preliminary conclusion is that our sediment control measures, most of them on a very small scale, have helped, but they have not yet been severely tested by a large rain event. I am hopeful, but not particularly optimistic that we will succeed in preventing two million cubic yards of decomposed granite from moving downhill into our waterways.

3. The Federal Government Agencies, namely NRCS, The Forest Service, and BLM, are occasionally helpful and usually sympathetic. However, their budgets are limited and the acreage they deal with is vast compared with our own. Following the fire, we have out-spent the Feds nearly 10 to 1 on an acre-for-acre basis comparing our land to theirs. The point is that you cannot depend upon the Federal Government to do a great deal for you. No matter how big your problem is, it is only one among a million such problems for them.

4. Denver Water remains concerned about over-grown forests in the “red zone,” which is the urban/wild land interface west of Denver up and down the Front Range. We have not yet discovered the right mixture of carrot and stick that will motivate private landowners to treat and thin the forest on their property to help avoid catastrophic wildfire.

5. I think the above observations lead clearly to the conclusion that the local agencies know as much or more than anyone about the problems and what will help to alleviate future water quality, sediment, and erosion problems. Based on our experience, there is no guarantee that any of the measures will work, but we need to do what we can.