



## THE PACIFIC RIVERS COUNCIL

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### LOGGING AND STREAMFLOWS IN SIERRA NEVADA WATERSHEDS: THE PRICE OF MORE WATER

The theory of "forest treatment" as a mechanism for increasing water yield has received much attention of late in California. Under the auspices of CALFED and Prop. 204 upper watershed restoration is being proffered by some parties as a win-win solution for California's perpetual water crisis. Since there exists no long-term or experimental study showing that "thinning" can increase streamflows in the Sierra, to properly frame the issue one must ask whether logging of any kind can increase streamflows. The answer is interesting, if sobering.

An extensive body of scientific literature on logging and water yield reveals that logging can increase streamflows, but only if by "logging" you mean recurring deforestation of a large percentage of a target watershed. The literature suggests that on average to produce sustained, useful, and predictable increases in water yield roughly 30 percent of the watershed must be permanently deforested. This will result in increased total flows and increased baseflows.

The price of such yield, however, would be extraordinarily steep. In addition to yield, four other substantial increases would be expected. First, the increased base flows would be accompanied by increased peak flows – that is flood peaks would be higher. Second, such massive deforestation would also shift the timing of peak flows earlier in the season – the exact opposite of what might be useful to potential downstream beneficiaries. Third, logging at that intensity would result in dramatic increased erosion, many times higher than natural rates – in fact, a logging program extensive enough to be associated with increased streamflows would without question be accompanied by totally unacceptable and most probably illegal levels of erosion and sedimentation. Finally, the combination of increased peak flows and increased erosion would without question sharply decrease aquatic habitat quality with a resulting serious increase in local extinctions of sensitive aquatic species and the potential triggering of endangered species listings in a group that is already the most imperiled in the Sierra.

Following are some of the known negative watershed effects of logging and thinning:

- Logging and thinning can contribute to snowpack loss.
- Logging and thinning increase erosion and soil compaction.
- Logging roads contribute to harmful watershed effects such as flooding.
- Understory thinning is unlikely to increase stream volume.

However, much remains to be learned about thinning forested watersheds, and the claims that thinning can somehow produce economic and environmental benefits without adverse effect on watersheds should receive some legitimate but close scrutiny. Additionally, there are many other approaches at our disposal that can enhance watershed functions—such as restoring the natural hydrologic regime by eliminating multiple stressors on the system—that don't require such an outlay of cost.

For more information or to be placed on the mailing list to receive an upcoming report on this topic please contact Deanna Spooner, California Projects Director of the Pacific Rivers Council, at 510-548-3887 or <dsponer@igc.apc.org>.

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