

Dear Madam/Sir:

I read with great interest your article in the San Diego Union Tribune of Sept 9. However, I am afraid that several of the statements made by people you quoted as experts are not well supported by scientific evidence. The University of California has been conducting research in this area for more than 20 years, and the groups in Berkeley and Davis as well as colleagues in Cooperative Extension have found goats to be effective in fuel reduction. I am not aware of published research by Mr. or Ms. Fotheringham, whom you cite as a graduate student in ecology at UCLA. I'd like to address some of the points raised.

1. **What do goats eat?** Both live and dead plant material are fire fuels; obviously, dead plant material is alive before it dies. It is true that animals do not consume a whole lot of dead plant material, but they consume it before it dies, thus reducing fuel significantly. Goats are highly selective browsers, and knowledge about the content of nutrients and anti-nutritional compounds in plants can be used in designing stocking rates and browsing timings appropriate for specific management goals, for example maximizing pressure on certain plant species, or minimizing pressure on desired species.
2. **Site invasibility post treatment.** Any fuel management method causes a disturbance of the plant community, creating gaps and opportunities for the establishment of invasive species. Chaparral removed by fire, clearing or herbivory is typically followed by the establishment of herbaceous vegetation. This may include invasive species. Herbaceous vegetation can contribute to ignition hazard, obviously, and it has to be managed. The point is, it has to be managed regardless of the tool used for fuel reduction. One management possibility would be the creation of fire breaks that are seeded with CA native herbaceous vegetation, and have these fire-breaks maintained by sheep (following the brush reduction). This would reduce invasibility, ignition potential, and 1-hour fuels.
3. **Sediment mobilization.** Removal of plant cover increases the potential for sediment mobilization. The more cover is removed, the higher the site potential for erosion. Two years ago, huge amounts of sediment were moved in your area, during heavy rainfall after catastrophic fires. It appears that the cost of doing nothing should be considered. Further, the management of herbivory decides to a large degree the impact. First you need to decide your goals and priorities, then your management. If the goals include the establishment of desired herbaceous vegetation in fuel breaks, then simple restoration ecology and maintenance by sheep flocks will work. Bare ground does not have to be the end result of a management action, and it can be easily prevented. Again, it depends on the proper formulation of goals and management appropriate for these goals. Goals have to include the definition of vegetation density that constitutes the appropriate balance of fuel reduction and environmental impact.

There is no known system for fire fuel reduction that would be without environmental impact. The challenge is to combine tools such that optimum efficacy is achieved, and collateral damage minimized. However, the impact of all management tools should be

evaluated against the cost of *doing nothing*, i.e. allowing catastrophic fires to occur, with all its associate cost of lives, property, and enviornmental impact. Those costs, as I am sure San Diegans are well aware of, are staggering.

I would like to encourage the communities in your area to seek more science-based information in their commendable efforts to assume responsibility and leadership in fire prevention by establishing and expanding fire safe councils. There is a lot that can be done to make fire fuel management tools and programs more effective, and the California Agricultural Experiment Station, a key component of the UC system, is helping communities across the state to do just that. Thus, I encourage you to continue your exposure of the problem. It goes without question that this debate will be most helpful to the people in this state.

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