



Farmers and ranchers: Stewards of the land

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The same geographic and climatic factors that have led to California's agricultural bounty have for millennia fostered its rare biological diversity. Today, California by itself has roughly as many unique plants and animals as the rest of the continental states combined.

California also has more species listed as endangered, and the conflicts that go with them, than any other state except Hawaii. (There are 160 species listed statewide, and hundreds more are "candidate" and "proposed" species.) Human population growth today is driving a major episode of species' extinction. Worldwide, species are becoming extinct at a faster rate than at any time in the last 60 million years. Californians are projected to nearly double to 63 million by 2040. If that occurs, the growth will surely reduce open space and wildlife habitat, diminishing the current farmland base by as much as 17%.

Farmers and ranchers manage biological and physical resources, making them stewards of the land. The long-term success of agriculture and the health of the biosphere depend on their decisions. For example, high quality vegetation on watersheds is needed to protect water and soil quality. "Downstream" effects include favorable habitat for aquatic species and high quality water for human consumption, industrial use and irrigated agriculture.

As stewards of the land, farmers and ranchers have been and ultimately will remain the conservators of much of the state's biological diversity. A recent General Accounting Office report revealed that 78% of endangered species have some habitat on private lands.

Agriculture can help conserve California's biodiversity. Growers and ranchers can reduce habitat fragmentation by maintaining wildlife corridors. They can plant native species in hedgerows, use water efficiently and apply pesticides wisely. Growers have proven to be key conservationists in the rice production zone of the Sacramento Valley, for example, where scientific study and practical considerations have improved the habitat for migratory birds and headed off pesticide entry into the waterways.

Inevitably, however, human population growth will lead to increasing conflicts for scarce resources. UC scientists and Californians as a whole must develop sound scientific solutions to these conflicts, to meet human needs, protect biological resources and maintain agricultural vitality.

The university does not have regulatory authority over land use and natural resources, nor will we be advocates for particular policy solutions. UC is uniquely positioned to serve as the honest broker when scientific information is needed to resolve public policy issues. Research-based information is required by public policy makers, private landowners and the government agencies mandated to manage resources.

The University of California has a rich resource of faculty members who are advancing the field of conservation biology through curriculum development, research programs, and increased use of the 32 sites in the Natural Reserve System. The UC Centers for Water and Wildland Resources have identified 900 academic staff in 161 departments on 8 campuses and 44 county offices who are involved in some aspect of California's wildlands and natural resource conservation and management.

The UC Rangeland Watershed Program is one example of how UC faculty and specialists are serving traditional clientele in new ways. With help from a \$500,000 grant from the Environmental Protection Agency, Cooperative Extension advisors and specialists are developing new management practices to fill ranchers' needs and protect rangeland ecology. Another example is the Congressionally mandated Sierra Nevada Ecosystem Project, in which UC investigators are guiding detailed scientific assessment of that endangered ecosystem, integrating knowledge on the biological, physical and socioeconomic environments of the region.

UC faculty are playing an increasing role in providing the information needed to resolve environmental concerns. But much work remains to be done.

We need to increase the awareness of students about the needs of agriculture, the environment, and society — students in the sciences and those who will become communicators of the issues, those who will make policy in this arena and those who will teach the next generation about agricultural, ecological and social concepts.

We need to increase public understanding of how agricultural and urban systems can be managed to harmonize with natural ecosystems, and thereby foster interactions among the people who will develop management plans: growers, ranchers, environmentalists, public officials and urban dwellers.

We need to develop — and insist upon the use of — research-based information to support management ideas and policies. Such research must include examination of ecosystems and the multiple interactions of factors which have long-term effects. It should be directed by those who understand research processes and methodology. At the same time, however, research must be planned with the best advice of affected citizens and carried out with their understanding and cooperation.

This special issue of *California Agriculture* introduces a variety of issues related to biological diversity: all are provocative; many are controversial. We hope this volume may serve as a basis for discussion of these issues and that it will enhance the search for common ground.