

data will become available in the near future, permitting improved accuracy of estimates.

Discussion

Traditional methods of deriving multiplier estimates are input-output analysis and export-base analysis. Input-output analysis is a potentially costly procedure if accurate estimates are desired. Export-base analysis is less costly, but is of limited usefulness because it is not capable of deriving multipliers for individual sectors. The econometric method employed in this study appears to have strong advantages, in terms of cost and flexibility, when dealing with small areas such as counties.

As forests and other natural resources receive increasing use and as competition among alternative uses intensifies, it becomes necessary to develop analytical methods to assess the impacts of resource management activities on local economies. The multi-

pliers provided by this study are a useful means of measuring the impacts on local employment and income of altering timber harvest levels in northern California. For example, the multiplier for Humboldt County indicates that for every one dollar reduction in payrolls of the lumber and wood products industry, total regional income decreases by \$2.37. Furthermore, because of the close correspondence between income and employment effects, the multiplier indicates that for every job lost in the wood processing sector, total employment in the county will decrease by approximately 2.4 man-years. This type of information is particularly important in analyzing impacts on the economy of the North Coast counties because of their persistently high rates of unemployment.

William McKillop is Professor, Forestry, U.C., Berkeley, and Kent Connaughton is Economist, Forest Service, USDA, Portland, Oregon.

Wildlife research

Reginald H. Barrett □ Marshall White □ A. Starker Leopold



A long-term study of the California quail, the state bird, has recently been completed.

Wildlife management research is part of the research program in the University of California Department of Forestry and Conservation. Currently under study are methods for assessing the effects of land management practices on the entire vertebrate community and for analyzing habitat preferences and population dynamics of selected wildlife species. Field projects include:

- (1) Determining the value of oaks and other hardwoods to wildlife in a mixed conifer forest at Blodgett Research Station;
- (2) Determining the short- and long-term impacts of herbicides on vertebrate populations at Blodgett Forest and at Sagehen Field Stations;
- (3) Learning the importance of snags (dead trees) for maintaining forest birds in the Sierra;
- (4) Studying the impact of air pollution on small mammal communities in the San Bernardino Mountains; and
- (5) Determining the influence of water developments on livestock, pronghorn, mule deer, sage grouse, and waterfowl on the Modoc National Forest.

Considerable effort also has been spent assisting the

U.S. Forest Service in compiling Wildlife-Habitat Guidelines for the western slope of the Sierra.

Studies of individual species include a survey of the distribution and status of selected furbearers in California. A study of the black bear in Yosemite and Sequoia National parks is near completion, and an intensive study of pine marten is underway in the Tahoe National Forest. Long-term studies of mammals such as beavers, chipmunks, and deer mice continue at Sagehen. Long-term studies of California quail are now completed as are studies of the mountain lion and of the garter snake. A long-term study of wild pigs continues at Dye Creek Ranch in Tehama County, and a state-wide survey of wild pigs has begun in San Benito County. Finally, a study of the introduced fallow and axis deer at Point Reyes National Seashore is in progress in cooperation with the Department of Agronomy and Range Science at U.C., Davis.

Reginald H. Barrett is Assistant Professor, Marshall White is Associate Research Biologist, and A. Starker Leopold is Emeritus Professor, Department of Forestry and Resource Management, U.C., Berkeley.