

COMPLETED PROJECT REPORT

Project Title: Economic damage of non predator vertebrate pests.

Research Agency: University of California - Berkeley

Principal Investigator: Sunding and Zilberman

Budget: \$50,050.00

Summary:

Vertebrate pest damage in California agriculture is significant, and particularly severe in a few important crops, including alfalfa, many fruit and nut crops, and artichokes. The animals causing damage include primarily small rodents (e.g., pocket gophers, ground squirrels, mice, and rats), a variety of birds, and a few large mammals (e.g., coyote, and feral pig). This report estimates the economic impact of this damage for selected California commodities, and provides a qualitative assessment of rodent damage in California rangeland. Although the economic impacts of vertebrate pest damage have been assessed for a number of specific crops in California, this report is unique in its attempt to form an aggregate picture of damages (e.g., Salmon et al. 1984, 1986; and Gorenzel et al., 1986). Overall, we consider 19 crops valued at over \$8 billion, representing nearly 50 percent of total revenues generated in the agricultural sector of California.

The damage caused by vertebrate pests varies considerably from year to year, and across crops and regions. We therefore develop a model that disaggregates impacts for each crop, and across seven production regions: the Sacramento and San Joaquin Valleys, the North, Central and Southern Coasts, the Southern Desert, and the North. As a fraction of grower revenue in areas affected by vertebrate damage, average producer impacts are highest for alfalfa grown in the North at 19.39%, followed by pistachios and sugar beets in the North at 5.85% and 4.20%, respectively, and artichokes on the Central Coast at 3.49%. Although small in relation to their overall budget, aggregate losses to consumers represent the single largest component of the total economic impact from vertebrate damage.

Overall, for the commodities considered in this study, our analysis indicates total economic impacts of between \$43.2 million and \$155.7 million, with a mean estimated impact of \$95.9 million. Reduced employment occurring as a result of vertebrate damage is estimated at approximately 400 jobs annually. These results represent a lower bound on the total impacts of vertebrate damage in California because we only consider a subset of all agricultural activity in the state. Furthermore, there are many agriculture-related vertebrate-pest problems that we do not consider. For example, burrowing rodents create significant damage in irrigation canals, and

some agricultural pests serve as sources of disease transmission to urban areas. Also, aggregate impacts hide the often crop and location-specific nature of vertebrate damage.

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