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PRAIRIE DOG CONTROL: A COMPUTER MODEL FOR PRAIRIE DOG MANAGEMENT ON RANGELANDS

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Black-tailed prairie dogs (*Cynomys ludovicianus*) share rangeland with other wildlife and livestock. The use of public grasslands and private pastures continues to intensify because of multiple-use and economic concerns. Countless prairie dog control programs have been conducted to reduce potential conflicts between livestock grazing and black-tailed prairie dogs. There are many questions regarding prairie dog control on rangeland, such as how prairie dog complexes effect livestock grazing, how quickly or slowly complexes expand and contract, and the cost-effectiveness of prairie dog control when associated with livestock grazing.

An interactive computer model was written in BASIC for IBM-compatible personal computers to address many of these issues. The model will assist ranchers, extension personnel, and land resource managers in prairie dog management on rangelands intensively managed for livestock grazing. The model is based primarily on black-tailed prairie dogs in Nebraska but may be modified for use in prairie dog management throughout their range. The program is a series of subprograms that can be accessed through a main menu. A help screen displays program features and a listing of useful keystrokes for moving

throughout the program. Prairie dog life history and ecology is presented, along with precautions for reducing the spread of prairie dogs based on their ecology. Simple field techniques for estimating prairie dog density and complex area are described and illustrated. The user is asked to input data which may be discrete values determined from field surveys of the prairie dog colony or ranges of values provided by the model that are chosen by the user. Once the necessary data and information is entered into the model, uncontrolled prairie dog population and colony growth is predicted each year for a 10-year period. Predictions of growth or decline are based on finite rates of increase calculated each year and are dependent on a variety of parameters.

Prairie dog control can be simulated with the program using either a single control method or a combination of methods. Costs of the control effort and benefits realized from the control measured in Animal Unit Months (AUM) are presented. The user can simulate a control during any or all of the 10 years of predicted growth or decline. A cost/benefit ratio is calculated based on control costs and dollar values entered by the user for either AUM, livestock weight gain, or livestock forage. The cost/benefit ratio includes not only the

benefits to livestock grazing at the site where prairie dogs are controlled but also benefits to grazing on range surrounding this site that would have been colonized if the prairie dog control was not practiced. If the decision to control prairie dogs is made, the use of control methods and precautions are explained. Prairie dog control methods

should not be applied where it may cause a hazard to black-footed ferrets (*Mustela nigripes*). Benefits to livestock grazing from prairie dog control cannot be fully realized without the ability to restrict the intensity and seasonally of livestock grazing during the first few years after a prairie dog complex has been controlled.