Statewide Elk Monitoring Methodology

Proposed Start and Completion Date:

July 1, 2012 through June 20, 2013.

Executive Summary

The objective is to develop a comprehensive survey strategy for elk across their range in California. Elk herds around the state are divided into individual Elk Management Units (EMUs). A variety of techniques have been used throughout the state to survey elk populations, and not all survey efforts have yielded data adequate data to establish meaningful population estimates. This assessment will attempt to determine the method of survey most appropriate for each of California's EMUs.

Statement of Need

Helicopters, fixed-wing aircraft,, and ground surveys have all been used during efforts to survey elk populations in California. In some situations, survey techniques have proven to be unreliable or unfeasible as a result of rough terrain or densely vegetated habitat that limits visibility. Development and implementation of standardized survey methods will be beneficial to current and future management activities. This type of resource assessment information is critically important to the Department's efforts to conserve elk and provide hunting and viewing opportunities. This project will address the Department's Core Value of Stewardship of our wildlife resources to the betterment of management and conservation. At the same time it will address the Core Value of Science by establishing a systematic approach to collecting valuable natural resource data and enhancing the Department's ability to make informed management decisions.

Introduction

The California Department of Fish and Game, as the trustee agency for the wildlife resources belonging to the people of the State, is charged with the management of these resources to maintain diversified recreational uses that is consistent with the maintenance of healthy and thriving wildlife (Fish and Game Code sections 1801-1802). Consistent with that charge is the maintenance or enhancement of viable populations to provide for the consumptive and non-consumptive use by current and future generations of Californians. The maintenance and enhancement of viable populations of these species requires knowledge of population size and other demographic parameters, and the ability to forecast changes in population size, sex and age ratios, population trajectory, and the ability to assess the effects of harvest. Responsible tracking and forecasting is entirely dependent upon the collection of statistically meaningful data to support management actions and the outcomes of those decisions.

Reliable estimates for populations of animals such as elk are important for assessing their status (Klein 1972), understanding factors related to their persistence (Berger 1990), and developing strategies for their conservation (Bleich et al. 1990). Ground, helicopter, and fixed-wing surveys have been the primary techniques used to collect data for ungulates (Lovaas, Egan & Knight 1966, DeYoung 1985, Beasom, Leon & Synatzske 1986, Ericsson & Wallin 1999). Each technique used includes biases that potentially affect survey results (Caughley 1974, McCullough, Weckerly, Garcia and Evett 1994). For example, results obtained from simultaneous ground and aerial survey results can differ greatly for the same population of ungulates (Gilbert and Grieb 1957, Caughly 1974, Samuel Garton, Schlegel and Carson 1987).

Determining the most appropriate survey technique for individual elk EMU is critical for reliability, repeatability, and the utilization of limited resources. Helicopter surveys are typically preferred when compared to either fixed-wing or ground surveys (Hess 1997, Smith & Anderson 1998). Reasons for this include an enhanced ability to obtain larger sample sizes, identify and classify a larger proportion of animals that are encountered, and survey broad geographic areas that include a variety of habitats (e.g. surveys are not limited to areas near roads); all of these are the result of increased visibility of the target species. Not all areas lend themselves to helicopter surveys, however, and other methods must be examined and implemented where appropriate. Past survey methods should be re-examined as land use changes have the potential to alter elk use and the accuracy of existing survey methods. The Department works with the major public land agencies such as the U.S. Forest Service and the Bureau of Land Management on conservation issues regarding big game (including elk). Numerous conservation efforts in the form of easements, habitat enhancement projects, and research projects are conducted each year with these public land agencies. The Rocky Mountain Elk Foundation (a non-governmental organization) also works cooperatively with the Department and the public land agencies on these conservation efforts, including funding.

Habitat conditions and topography in California are diverse. Elk within California occupy emergent wetlands in the Central Valley, rolling oak woodlands in the coast range, dense conifer forests in the northwest, juniper grasslands in the northeast, and many other habitat types. Conditions vary by individual area as do the current habitat trends. Attempting to estimate wildlife population numbers is one of the most difficult and expensive aspects of wildlife management. Methods used by the Department vary by individual area and include, but are not limited to, aerial surveys employing fixed winged aircraft or helicopters, ground counts, and population reconstruction using age data. The elk program historically did not have the budget needed to intensively monitor all the elk herds on a yearly basis. Instead, helicopter surveys in some parts of the state are used in order to cover certain areas on a three year rotation. Aerial surveys in areas of northern California such as Humboldt, Del Norte, Trinity, and parts of Siskiyou County are not effective methods of counting elk because of dense vegetation and high topographic relief. Other areas with dedicated staff and the ability to monitor elk on a regular basis through the use of road routes or fixed-wing aerial surveys are completed on an annual basis. A sightability model for elk previously has been developed for one EMU (Bleich et al. 2001), but that model has not been consistently applied to survey results obtained in Inyo County.

Objectives

The objective is to develop a comprehensive survey strategy for elk throughout their range in California. Various techniques have been used throughout the state, but not all survey methods have resulted in data to establish meaningful estimates of population size and other demographic parameters. This assessment will develop recommendations to help determine the best survey and monitoring methods for each of the EMUs throughout the state.

Methods

The results of previous survey efforts in each EMU will be reviewed and, as necessary, a proposed monitoring plan will be developed. Literature applicable to the survey of large ungulates will be thoroughly reviewed, as will vegetation and topographic characteristics of each EMU. Survey polygons, routes, transects, etc. will be developed for the method deemed most appropriate for each EMU, based on habitat characteristics, accessibility, and management objectives. To ensure repeatability and enhance the probability of assessing population trends (Wehausen and Bleich 2005), an emphasis will be placed on standartization of techniques to be employed..

The Study duration will be one year (July 1, 2012 to June 30, 2012). Additional funding will be requested on separate LMAC requests for individual area monitoring evaluation and efforts.

Products

A summary of survey methodologies used in EMUs across California will be compiled and a literature review of past and current survey methodologies will be completed. Based on that information, recommendations for implementation of a standardized methodology will be provided for each EMU. This information will be made available for consideration by the Wildlife Branch in the form of a final report.

Collaborators

- Joe Hobbs, CDFG Statewide Elk Coordinator
- Vern Bleich, Staff Environmental Scientist and CDFG Retired Annuitant (RA)

Program Planning

- The Statewide Coordinator and Staff Environmental Scientist assigned to the project will meet every two months to discuss progress and coordinate efforts.

Other Resources requested from CDFG

- Regional Staff time to access previous survey data for EMU's.

Issues to be Resolved

- LMAC consideration and support.

Required Products

- Progress Report – January 1, 2013
- Final Report – June 30, 2013

Personnel Requirements and commitments from CDFG

Headquarter Staff
1 Staff Environmental Scientist - 5%

Budget Detail - per year budget detail by activity/task and broken down by:

$20,000 is requested for RA time to complete the project. It is anticipated that additional projects will be submitted for implementation and evaluation of the techniques developed for the individual EMUs.

References

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