



Owens Valley Elk Capture Prospectus

Proposed Start Date: January 10, 2011

Proposed Completion Date: January, 2013 (capture completed January 12, 2010)

Executive Summary

The project's objective is to capture up to 22 adult tule elk and equip them with both Global Positioning System (GPS) (8 total) and Very High Frequency (VHF) (8 total) telemetry collar units and release them on site. Any remaining flight time will then be utilized to capture up to 6 additional elk to apply ear tag transmitters. The planned primary capture method is net-gunning for cow elk and chemical immobilization for bull elk, however, the decision to net-gun or dart any elk will be made by the capture crew based on terrain as well as gender. This project will be beneficial to current and future management activities to describe and delineate areas of important use such as calving areas, general habitat use, and movement patterns. This type of resource assessment information is critical to the Department's efforts to conserve tule elk, provide public hunting and viewing opportunities, and potentially reduce depredation related damage in the Owens Valley Tule Elk Management Unit.

Statement of Need

The Owens Valley is the only elk herd in the state with a maximum population level (490) set in Fish and Game Code. There are seven hunt units within the Owens Valley, in order to effectively set hunting regulations the Department needs to assess which areas the subgroups are utilizing throughout the year.

A previously unknown group of elk, all bulls, were discovered by DFG personnel in July of 2009. There are no previous records of elk occupying this area and consequently nothing is known about the distribution of this additional sub-herd. Movement patterns are needed in order to effectively determine a harvest strategy for these animals in addition to general information from this new group.

VHF collars and ear tag transmitters will assist the Department in identifying elk group locations to correlate with summer population surveys as well as movement patterns from those groups.

Introduction

The Owens Valley tule elk herd was established by relocating a total of 56 elk to the Owens Valley near the town of Aberdeen during the period 1933-1934. These original translocated elk have since expanded their numbers and have formed six distinct tule elk subherds located throughout Owens Valley at present. Populations in all of the subherds began increasing with the largest population size of Owens Valley tule elk estimated at 609 in 1984 with the current total population estimated at 400-600 animals. In 1943 the California Fish and Game Commission authorized the first Owens Valley tule elk hunt in an effort to reduce elk damage to crops, fences, and pastures. In 1971 the California Fish and Game Commission established a maximum limit of 490 on the Owens Valley tule elk herd. In 1976 the Owens Valley Tule Elk Habitat Management Plan was created. This plan established maximum limits in addition to recommended bull elk to cow elk ratios on the six (now seven) distinct tule elk subherds located throughout Owens Valley.

A previously unknown group of elk, all bulls, were discovered by DFG personnel in July of 2009. This group of elk occupied high mountain summer range on Birch and Kidd Mountain in the Birch Creek and Little Pine Creek upper watersheds. A total of 40 bull elk located between 7,500 and 11,000 feet in elevation were counted on a one day ground survey. There is no previous record of elk occupying this area and consequently nothing is known about the behavioral patterns of this additional sub-herd. These bull elk are occupying habitat where Tinemaha zone elk hunters do not actively seek out elk to harvest.

The Department believes that elk movement patterns have changed over time within the various subgroups. In an effort to effectively manage harvest between groups the Department needs to determine movement patterns across zone boundaries. This will help the Department correlate summer surveys with fall and winter hunting opportunities.

Objectives

1. Determine distribution and movement patterns of the high elevation bull group in the Tinemaha zone.
2. Determine distribution and movement patterns of other subgroups within the valley floor.
3. Assist in population monitoring during the summer by having marked animals (radio collars and ear tag transmitters) to better locate subgroups prior to establishing surveys.
4. Better understand which subgroups are potentially causing depredation concerns.
5. Collect data on calving areas.

Methods

Study area

The Owens Valley is located in Inyo County, east-central California. The valley is oriented in a north-south direction, and is approximately 121 miles long and 16 miles wide. The elevation at the north end of the valley is 4,380 feet and at the south end is 3,806 feet (Bleich et al. 2001). The Sierra Nevada Mountains bound the Owens Valley to the west and the White and Inyo Mountains lie to the east; these ranges reach elevations of 13,780 feet. The Owens River flows south through the valley creating a riparian area of willow (*Salix* spp.), cottonwood (*Populus fremontii*), and cattail (*Typha domingensis*) marshes. Tule elk mainly inhabit the valley floor, which is owned by the Los Angeles Department of Water and Power (McCullough 1969). Tule elk bull herds have been observed occupying the fringes (foothills in the Tinnemaha herd) of the Sierra Nevada Mountain Range on the west side of the valley.

The management of tule elk in the Owens Valley requires understanding of population dynamics and spatial distribution. To gain this understanding active management of tule elk is required. Active management may require marking or tagging tule elk with VHF radiocollars (or ear tag transmitters), GPS collars, and ear tags. The Department has regularly captured, examined, and fit VHF and GPS collars as well as ear tags on tule elk for the purpose of data collection. A hand held net-gun fired from a helicopter has been used as one of the primary means of entrapment to provide for dispersal of radiocollared tule elk throughout their range.

Capture areas have been identified and mapped as polygons and prioritized as level 1, level 2, and level 3 (see Appendix in capture plan) with priority level 1 being the areas where the capture will begin on day 1.

Capture and Marking

The capture effort will be conducted by Department of Fish and Game personnel. Tule elk will be captured utilizing either helicopter net gun techniques or by darting with chemical immobilizing agents including Thiafentanil, Carfentanil or Etorphine in combination with sedative drugs (or other drugs deemed appropriate by veterinarian staff). Processing teams will be deployed (by ground or air) to capture sites for animal processing. Captured elk will be secured, examined and processed. Each processing team will have sufficient expertise to ensure that animal processing occurs safely and expeditiously. Processing teams will take biological samples, administer appropriate broad range antibiotics, and attach ear tags and GPS or VHF units before releasing each animal. The capture team will assist with these tasks as necessary. Dr. Deana Clifford, Wildlife Investigations Laboratory, is designated lead for veterinary issues. Co-leads for immobilization drug utilization and safety are Dr. Clifford and David Casady. For each captured elk, heart rate, respiration and body temperature will be monitored throughout the processing period.

The use of chemical immobilizing agents to capture tule elk will be in strict adherence to the "Department Policy on the Administration of Pharmaceuticals in Wildlife". This includes the training requirements for personnel handling and administering scheduled and prescription drugs, record keeping requirements and safety considerations concerning chemical immobilization agents.

Study Duration

The GPS collars and VHF transmitters have a lifespan of approximately two years (January 2011 – January 2013). The data obtained from the GPS collars are satellite downloadable and will be downloaded on a regular basis to avoid data loss in the event of a catastrophic failure.

Data management and anticipated databases

GPS data will be stored on two computers at the Wildlife Branch in Sacramento and on a portable drive at the Elk Coordinators home. Data will also be made available once complete on the shared drive.

Products (and estimated dates of completion)

Results of all capture and radiocollaring operations are reported by the Department in a detailed post-capture report. Information contained in these reports detail:

- Dates and locations of capture operations
- Participating personnel and assignments
- Number, age and sex of elk captured
- Types of collars fitted their respective sizing and that of the animal
- Processing locations and types of biological samples collected
- Health of captured elk, capture related injuries and/or mortalities
- Table summary of elk captured including date, location, sex, and age

A progress report will be completed in February 2012 to summarize results to date. A Final Project Report will be prepared by May 2013 after all data is recovered from the satellite and the collars themselves. This report will be provided to the Resource Assessment Program and to the CDFG regional offices and will address each of the stated goals.

GPS location data and corresponding map printouts will be available at Wildlife and Habitat Data Analysis Branch

Collaborators

Department of Fish and Game

Mr. Joe Hobbs (Wildlife Branch-Project leader.)

Mr. Mike Morrison (Project Co-leader)

Dr. Deana Clifford /(Wildlife Investigations Laboratory - Veterinary Coordinator, Drug Co-ordinator)

Mr. David Casady (Wildlife Branch - Drug Co-Coordinator, animal capture and handling)

Mr. Tim Glenner (Wildlife Investigations Laboratory – Helicopter Safety Coordinator, animal capture and handling)

Mrs. Julie Garcia (Wildlife Branch - animal capture and handling)

Other Organizations

Rocky Mountain Elk Foundation – Funding for project

Personnel and Animal Safety

A formal planning and safety meeting will be held prior to the initial capture effort. In addition, a safety review will be held prior to initiation of any capture effort. At these meetings, assignments, drug safety, animal handling protocols, helicopter safety and other pertinent aspects of the operation will be discussed. Presentations will be made by appropriate personnel, relative to their respective areas of expertise.

Only personnel that have been certified in advanced chemical immobilization will be permitted to conduct darting.

All decisions concerning capture operations will be made by the project leader, in consultation with the capture coordinator, the helicopter safety coordinator, veterinary coordinator and research coordinators. A list of local medical, fire, and law enforcement emergency notification numbers and other DFG resources is included in the Capture Plan.

The goal is to safely capture tule elk. As a secondary objective, telemetry collars will be placed on all animals that are handled. Every effort will be made to minimize potential hazards to animals and capture personnel. Safety and medical considerations listed on pages 3-1 and 9-1 through 9-3 of the DFG Wildlife Investigations Laboratory's Wildlife Restraint Handbook will be followed.

Standard methods of animal restraint will incorporate hobbles and head bandages. The captured animals' temperature, heart rate, and respiratory rate will be monitored to ensure that investigators are aware of the physical status of the animals as processing occurs. Ample water will be carried for cooling of animals and other needs.

All personnel participating onboard the helicopter as part of the capture crew (net-gunner and mugger) as appropriate be:

- Certified in the "Flying in the Wire and Obstruction Environment" seminar training
- Certified in the Department's Helicopter Safety Training
- Certified by Coda Enterprises, Inc. to conduct net-gun operations (netgunner only)

All personnel participating onboard the helicopter as part of a transport/processing crew will, as appropriate be:

- Certified in the "Flying in the Wire and Obstruction Environment" seminar training
- Certified in the Department's Helicopter Safety Training

Capture Considerations specific to Owens Valley Tule Elk

Capture activities shall be organized and managed to minimize disturbance to elk. All possible precautions shall be taken to avoid injuring elk during the capture process. The capture crew will make the decision onsite as to whether to net-gun or dart the target animal.

Net-gun capture operations shall minimize the probability of injuring or killing elk to the greatest extent practicable. Once an animal is successfully netted, the gun-ship shall dispatch the capture crew to attend the netted animal. The helicopter will bring a separate crew to process the animal and may at that time resume capture activities (only if a second processing crew is available to process another animal). Nets posing the potential for severe injury to an animal should be cut. At no time during the operation, are restrained elk to be left unattended.

Helicopter darting will only be performed by personnel trained in advanced chemical immobilization techniques and approved by the drug coordinators, helicopter safety coordinator and helicopter pilot. All precautions will be taken to safeguard personnel and animals from drug related as well as animal and aircraft related hazards.

If an animal is not captured within an allotted 3-10 minute pursuit time, or less if the animal appears unduly stressed, the attempted capture of that animal shall be abandoned. Animal body temperatures will be used as a gauge of the intensity of capture stress.

To minimize stress to netted elk during processing, they shall be blindfolded, hobbled, and retained in a position which allows the normal digestive processes and eructation to occur. As hobbling may restrict respiration in chemically immobilized elk, they should be blindfolded but hobbled only as necessary in the judgment of the capture or processing crews. Elk will be processed at the capture site by experienced and qualified personnel.

Vital signs (temperature, pulse, and respiration) shall be assessed immediately after capture and continuously monitored during processing. Water shall be available at the capture and processing sites and used as necessary to cool animals.

If an animal is determined to be excessively stressed, it shall be released as quickly as possible provided that it is in a stable condition. Prior to release, confirmation shall be received from the project leader or project veterinarian, unless extenuating circumstances prevent rapid communication.

In the event of significant injury or stress, qualified personnel and equipment shall be available to provide immediate care. In the event of an accidental personnel exposure to chemical immobilization agents, personnel will follow the Human Opiate Exposure Protocol (see Capture Plan). DFG will cease capture operations to care for and/or deliver patient to the closest medical facility. Emergency medical information including area hospitals are included (see Capture Plan for full list). In addition, hospital emergency room personnel will be advised beforehand that ultra-potent opiates are being used in a CDFG animal capture project.

In the event that personnel or elk health and safety are of concern, DFG will cease capture operations to discuss modifications to the capture operation with the capture crew. If concerns are not sufficiently addressed, DFG will terminate the capture effort.

Funding Sources

Funding for GPS collars and helicopter capture has been acquired from the Rocky Mountain Elk Foundation (\$51,000). Base funding for salary and travel is from the appropriate CDFG budgets.

Capture Budget and Costs

	Item	# needed	# hours	Cost/hour*/Unit	Total cost	RMEF cost
Capture						
	rotor time		16	900	14400	14400
	capture*		320	30	9600	
	Capture drugs and supplies				3,000	
	GPS collars	8		4400	35200	35200
	VHF collars	10		330	3300	1650

*includes costs for per diem

Expected Products

- Annual Progress Report - February 2012
- Final Report –May 2013

References

- BLEICH, V. C., C. S. Y. CHUN, R. W. ANTHES, T. E. EVANS, AND J. K. FISCHER. 2001. Visibility bias and development of a sightability model for tule elk. *Alces* 37:315-327.
- McCULLOUGH, D. R. 1969. The tule elk: its history, behavior, and ecology. University of California Publications in Zoology 88. Berkeley, California.