



Large Mammal Advisory Committee

Bighorn Sheep Management Unit Population Assessment

Proposed Start and Completion Date:

September 2013 - October 2014

Executive Summary

The California Department of Fish and Game (CDFG) maintains an inventory of the distribution and abundance of bighorn sheep in California. Range-wide assessments of bighorn sheep are part of a long-term assessment and inventory effort in California. Additionally, these surveys are part of a strategy to manage desert bighorn sheep in the 2012 Draft Statewide Conservation Plan for Desert Bighorn Sheep (CDFG 2012).

Introduction and Statement of Need

Helicopter surveys have been a key method of monitoring desert bighorn sheep populations in recent years and have proven to be an effective sampling tool. Populations are only surveyed as frequently as funds and time have allowed. Consequently populations that allow consumptive uses are more frequently monitored, as Fish and Game Code 4902 specifies that the Department may allow up to 15% harvest of mature, adult rams be taken per management unit. Management areas within hunt zones have typically been surveyed every other year to ensure that populations are healthy and can sustain a limited take of mature, adult rams. Such surveys also allow the populations to be evaluated as potential source stock for future translocations, though no translocations have been planned for the 12/13 fiscal year.

Currently, other methods to survey populations are being explored, and may have the potential to provide a reliable index that may track population trends similar to helicopter surveys (CDFG 2012). Data collected by the proposed project may be used to evaluate such methodologies for population assessment.

These methods include a radial waterhole count method. This was tested in the East Chocolate Mountains in June 2011 (CDFG 2011). The method involved flying directly to a water source and flying concentric transects, covering the surrounding area up to one mile. Unfortunately the survey did not collect a large enough sample size. The population in the East Chocolate Mountains, part of the Sonoran Desert, has suffered from chronic low rainfall as well as competition from burros, it is even possible that it has seen extinctions from time to time and recolonization from local populations. The efforts of this study have refocused attention to this population, but were inconclusive on testing methods of aerial survey. This method will be tested again in the future.

Ground surveys are a useful tool that may be able to provide detail into herd composition, while being fiscally efficient, minimizing risk associated with aerial surveys and being less invasive. The method involves a minimum count with experienced observers covering the management unit, and focusing on water sources. It should be done during a time of water need and while lambs and ewes can still be found in nursery groups. A pilot survey was conducted in the Marble Mountains, results will be released in a Memorandum in late June 2012.

The project proposes to survey hunt management units in San Bernardino, Imperial, Mono, Inyo and Riverside Counties. The peak of the rut offers the opportunity to record adult rams and ewes, yearlings and lambs all together. It is critical to survey hunt management units this year as only two units were surveyed in 2011; two in 2010 and the remaining have not been surveyed since 2009. Without a solid, up to date estimate of mature, adult rams CDFG may have to allocate tag quotas based on an old estimate, resulting in a possible decrease of tags. Conversely, if the surveys return greater numbers of mature rams in a management unit tag quotas may be increased to up to 15% of mature, adult rams per unit.

Once a large metapopulation, current conditions including major highways, have broken habitat into metapopulation fragments (CDFG 2012). The inventory maintained by CDFG records the distribution and abundance by population size class to monitor population trends (Torres et al 1994). The most recent assessment of population size classes suggested an upward trend in metapopulations, including Mojave metapopulations (Epps et al 2003). The proposed will aid in tracking changes in the respective bighorn populations.

Data may also be available to land management agencies for assessing the distribution of bighorn sheep as it may relate to other uses, such as compatibility with green energy projects or non-consumptive recreation.

Objectives

- Classify populations into size class categories to contribute to the range-wide metapopulation assessments (Epps et. al. 2003, Torres et. al. 1994)
- Evaluate count data to guide future tag quotas in hunt zones.
- Evaluate the potential of these populations to serve as source stock for potential translocation projects
- Collect and maintain data for use by comparison to other survey methods

Methods

The study will encompass survey polygons within selected hunt management unit areas using the simultaneous double count method described by Graham and Bell (1989). Three passengers will accompany the pilot on each flight to count and classify sheep, record data and to photograph groups to confirm counts and herd composition. Helicopter flight following via direct radio contact will be conducted in strict adherence to Departmental procedures including:

- DFG Helicopter Operations Manual Section 2487.8: Helicopter Air Operations Procedures
- Department Bulletin 2010-07: Helicopter Flight Crew Operational Requirements/Procedures

In addition, the helicopter will be monitored on the internet using the Automated Flight Following system (AFF). Survey crew will camp and meet at the first site, complete the polygons or set hours or days per range before moving on to the next range.

Further detail of the survey itinerary, personnel, and logistics will be identified in the survey plan.

Tag quotas will be set based upon the number of observed class III and IV rams within each management unit. Up to 15% of this number may be authorized for take in a hunt zone, though in past years only 5-6% have been allocated.

Products (and estimated dates of completion)

- Scientific publication of these surveys is not anticipated as a result of this effort, however this information will be included in Status Reports and Biennial Reports to the legislature
- Data collected will be added to management unit survey database and will identify numbers, composition, ram:ewe ratios, ewe:lamb ratios and hunt zone tag recommendations where appropriate

Collaborators

To be identified in the survey plan. May include, but not limited to Region 6 personnel, Wildlife Investigations Lab, Bureau of Land Management, Mojave National Preserve, Society for the Conservation of Bighorn Sheep, California Wild Sheep Foundation, volunteer observers

Program Planning

These surveys are part of a strategy to manage desert bighorn sheep in the 2012 Draft Statewide Conservation Plan for Desert Bighorn Sheep. The Bighorn Sheep Program will host annual meetings to discuss the status, management and progress of the program, including such surveys and their management implications.

Issues to be Resolved

- LMAC consideration and support
- Survey Plan development
- Wildlife Branch Chief and Regional Manager Approval of Survey Plan

- Helicopter Contracting – in the absence of a statewide contract, an individual project contract may be needed, the possibility of granting to an NGO is also being explored
- Increase of funding through Big Game Management Account
 - Original funding was to be split between the Bighorn Sheep Program (PR) and the Big Game Fund. PR funding for the program has been cut and will not be available to fund the project.

Required Products

- Flight Memorandum to Wildlife Branch, Region 6 and WIL – upon completion of survey

Personnel Requirements and commitments from CDFG

To be identified in survey plan.

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

This survey effort has been traditionally funded by the Bighorn Sheep Program through fund-raising tags, which in a single year have generated over \$190,000, and PR Grants. Fund-raising tag revenue is now deposited in the Big Game Management Account and PR funding is being redirected to other program functions. The concept form requested that half of the expense of the surveys be paid through the Big Game Fund and the other half would be paid for by the present PR Grant, however with both PR and fund-raising tag funds being re-directed I am requesting the full amount from the Big Game Fund.

In the absence of a statewide helicopter contract, a budget cannot be broken down as rotor hour costs and ferry and transportation fees will vary from vendor to vendor. In past contracts, rotor hour fees could be rounded out to approximately \$1000/ per hour, but may increase in the future (personal communication with Russ Mohr, statewide helicopter contract developer). Ferrying and transportation costs cannot be estimated because of the variation of location from vendor to vendor.

If CDFG is unable to contract a helicopter company for survey, the funds will be expended the following fiscal year in which a contract can be obtained.

References

California Department of Fish and Game. 2012. Statewide Conservation Plan for Desert Bighorn Sheep *DRAFT*

Epps, C.W., V.C. Bleich, J.D. Wehausen, S.G. Torres. 2003. Status of bighorn sheep in California. *Desert Bighorn Council Transactions* 47:20-35.

Graham, A., R. Bell. 1989. Investigating observer bias in aerial survey by simultaneous double-counts. *J. Wild. Manage.* 53(4) 1009-1016.

Torres, S.G., V.C. Bleich, and J.D. Wehausen. 1994. Status of bighorn sheep in California, 1993. Desert Bighorn Council Transactions 38:17-28.