

**ARIZONA GAME AND FISH DEPARTMENT
HABITAT PARTNERSHIP COMMITTEE
HABITAT ENHANCEMENT AND WILDLIFE MANAGEMENT PROPOSAL**

Game Branch / HPC Project Number: 14-403

PROJECT INFORMATION

Project Title: Causes of Mortality of Bighorn Sheep Lambs in Kofa Mountains

Region and Game Management Unit: Region 4, GMU 45A, 45B

Local Habitat Partnership Committee (LHPC):

Was the project presented to the LHPC?
YES[] NO[]

Has this project been submitted in previous years? YES[] NO[x]

If Yes, was it funded? YES[] NO[] → **Funded HPC Project #(s):**

Project Type: Wildlife Investigation

Brief Project Summary: The purpose of this project is to investigate the causes of mortality for bighorn sheep lambs in the Kofa Mountains. The Kofa bighorn sheep have exhibited chronic low lamb survival and recruitment for years. Determining the causes of mortality is critical to the evaluation and development of management actions that will aid in the recovery of the Kofa Mountain bighorn sheep population. This project will capture 10 adult female bighorn sheep and outfit them with satellite collars, in addition to Vaginal Implant Transmitters (VITs). Once the lamb has been captured, it will be outfitted with an expandable VHF collar to detect mortalities.

Big Game Wildlife Species to Benefit: desert bighorn sheep

Implementation Schedule (Month/Day/Year):

Project Start Date: October 2015

Project End Date: October 2016

Environmental Compliance:

NEPA Completed: Yes[] No[] N/A[x]

Projected Completion Date: _____

State Historic Preservation Office - Archaeological Clearance:

Yes[] No[] N/A[x]

Projected Completion Date: _____

Arizona Game and Fish Department EA Checklist: N/A[x]

To be Completed by: _____

Projected Completion Date: _____

PROJECT FUNDING

Special Big Game License Tag Funds Requested: \$ 35,000

Cost Share or Matching Funds: \$ 30,000

Total Project Costs: \$ 65,000

PARTICIPANT INFORMATION

Applicant (please print):

Brian Jansen

Address:

9140 E 28th St, Yuma, AZ 85365

E-mail:

bighorns101@yahoo.com

Telephone: 928-925-8189

Date: 8/6/2014

AGFD Contact and Phone No. (If applicant is not AGFD personnel):

Project has been coordinated with: John Hervert, Wildlife Program Manager, Region IV

NEED STATEMENT – PROBLEM ANALYSIS:

Bighorn sheep in the Kofa Mountains were the main source for transplant animals to repopulate historic ranges in Arizona, New Mexico, and Texas. This population has been one of the most important populations in the recovery of desert bighorn sheep and filled that role until 2005. At the turn of the century (2000), this population was around 800, which was the historic average since helicopter surveys began in the 1980's. However, in 2003, the population had declined to 600 and by 2006, the population was around 400. At that time, transplants from the Kofa Mountains ceased and a recovery plan was established to examine and address the need to increase the numbers of bighorn sheep back to historic numbers. This process revealed that water management had been occurring, while management of a major decimating factor was not. In 2007, the first mountain lions were captured and radiocollared. These mountain lions preyed on bighorn sheep in the Kofa Mountains and were lethally removed, in accordance with the Kofa Complex Adaptive Predation Management Plan. To date (Aug 2014), 16 mountain lions have been removed and the estimated population of mountain lions spending, at least some time within the Kofa Mountains is about 3 (2 male, 1 female). The number of mountain lions detected has decreased over time and has been between 1-4 animals for several years.

At the same time, helicopter surveys have revealed low lamb recruitment, with the last survey occurring in October 2012. The next survey is expected to occur in October 2014 and we are anxious to learn if lamb numbers have increased, as well as the adult segment of the population. This survey is critical in determining the effectiveness of mountain lion removals in increasing lamb survival because the past 2 years of fieldwork have shown only a few mountain lions remaining. We are in need of determining the causes of mortality to lambs, in order to understand what management actions might be taken, in addition to mountain lion monitoring and removal, that will aid in the increase of bighorn sheep lamb survival and recruitment. For example, there are vaccines available to address several diseases of ungulates and there is much work being done to develop a vaccine for pneumonia-causing *Mycoplasma* spp. that could be used to address disease-related lamb mortality.

PROJECT OBJECTIVES:

- Capture 10 adult female bighorn sheep in Kofa Mountains
- Deploy 10 satellite transmitting GPS collars on 10 adult female bighorn sheep
- Outfit adult female bighorn sheep with Vaginal Implant Transmitters, to detect birth events
- Detect 10 birth events within 1 day and capture 10 lambs within 3 days of birth.
- Deploy 10 expandable VHF collars on captured lambs
- Monitor the survival of lambs daily until October 1
- Detect mortality events and immediately investigate to determine cause of death
- Determine the effectiveness and feasibility of this new technology to conduct this investigation and expand the project to a more meaningful sample size to accurately determine the causes of lamb mortality in the greater population.

PROJECT DESCRIPTION AND STRATEGIES:

Desert bighorn sheep in Southwest Arizona exhibit a birth season that largely encompasses 6 months of the year. Because of this reproductive strategy, a study of lamb survival required enough personnel to monitor each female bighorn sheep daily over a long period of time. However, due to

the extra rugged nature and large home ranges, tracking each animal daily would require many persons, or the daily use of aircraft. Both are expensive and difficult to obtain/maintain for 6 months. In addition, once lambs were captured, it would be necessary to maintain daily monitoring to investigate each mortality event, in a timely manner. Thus, lamb survival has not been studied in desert bighorn sheep populations. Currently, new technology is being developed at Telonics (Mesa, AZ) to overcome these logistical barriers and make this type of study feasible to limited budgets.

The project would consist of the Arizona Game and Fish Department Regional Wildlife Program capturing 10 adult female bighorn sheep in October/November 2015. Each animal will be outfitted with a specially developed satellite tracking collar and a Vaginal Implant Transmitter (VIT). Each collar is designed to detect the pulse pattern of the paired VIT, as well as a paired expandable VHF collar (for the lamb). These collars are simultaneously addressing the major barriers of this type of study for desert bighorn sheep; personnel, aircraft, and time. Once each adult female has been outfitted, she will be monitored daily, via satellite communication. Once her collar has indicated a change in the pulse pattern of the VIT, an indication of a birth event; the Kofa Bighorn Sheep Recovery Specialist will investigate the signal and observe the female for presence of a newly born lamb. Once the lamb has been born, it is possible to hand-capture these animals until 3 days old; therefore the Specialist will make every effort to safely capture the lamb and outfit the animal with an expandable VHF collar. Once the lamb is radiocollared, the mother's collar will be cable of detecting and relaying the pulse pattern to monitor the survival of the lamb on a daily basis. If the lamb perishes, the Specialist will immediately investigate the signal to determine cause of death, as well as collect tissue samples necessary for diagnosing disease presence.

PROJECT LOCATION:

Kofa Mountains occur in Region IV, GMU 45A and B, and within the Kofa National Wildlife Refuge in Southwest Arizona.

LAND OWNERSHIP AT THE PROJECT SITE(S):

(if the project area is private property, please state specifically and provide the landowner's name)

- United States Fish and Wildlife Service (USFWS)

IF PRIVATE PROPERTY, IS THERE A COOPERATIVE BIG GAME STEWARDSHIP or LANDOWNER AGREEMENT BETWEEN THE LANDOWNER AND THE DEPARTMENT?
YES[] NO[] N/A[]

HABITAT DESCRIPTION:

Sonoran Desert

ITEMIZED USE OF FUNDS:

Special Big Game License Tag Funds

10 satellite, VIT, expandable VHF collars @ \$5,000 ea. = \$50,000

Satellite Airtime = \$4,900

4 hrs helicopter flight time @ \$1,500 per hour = \$6,000

Helicopter ferry, fuel truck, etc. = \$4,100

Cost Share or Matching Funds (for volunteer labor rates please refer to the worksheet below)

United States Fish and Wildlife Service will be contributing \$30,000 to this project.

LIST COOPERATORS AND DESCRIBE POTENTIAL PARTICIPATION:

United State Fish and Wildlife Service will potentially participate in lamb captures and mortality investigations.

WOULD IMPLEMENTATION OF THIS PROJECT ASSIST IN PROVIDING, MAINTAINING, OR FACILITATING RECREATIONAL ACCESS?

YES[] NO[] N/A[x]

PROJECT MONITORING PLAN:

Once study animals have been captured, daily monitoring will occur to detect birth events and mortality events until October 1 of the year following birth.

PROJECT MAINTENANCE:

Project to be maintained by Kofa Bighorn Sheep Recovery Specialist

PROJECT COMPLETION REPORT TO BE FILED BY:

Kofa Bighorn Sheep Recovery Specialist, Brian Jansen.

WATER DEVELOPMENT PROJECTS (please use the worksheet below):

TREE CLEARING/REMOVAL PROJECTS (please use the worksheet below):