

**SCIENTIFIC RESEARCH AND
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general and special conditions



**United States Department of the Interior
National Park Service**

Mojave N-PRES

Study#: MOJA-00199

Permit#: MOJA-2008-SCI-0002

Start Date: Jan 01, 2008

Expiration Date: Dec 31, 2008

Coop Agreement#: n/a

Optional Park Code: n/a

Name of principal investigator:

Name: Kelley Stewart **Phone:** 775-784-4314 **Email:** kstewart@cabnr.unr.edu

Name of institution represented:

University of Nevada - Reno

Co-Investigators:

| | | |
|--------------------------------|----------------------------|---------------------------------------|
| Name: Debra Hughson | Phone: 760-252-6105 | Email: Debra_Hughson@nps.gov |
| Name: James S. Sedinger | Phone: 775-784-6556 | Email: jsedinger@cabnr.unr.edu |
| Name: Jason Dungan | Phone: 760-252-6033 | Email: Jason_Dungan@nps.gov |
| Name: Neal Darby | Phone: 760-252-6146 | Email: Neal_Darby@nps.gov |
| Name: Vernon C. Bleich | Phone: 701-225-7834 | Email: vbleich@dfg.ca.gov |

Project title:

RESPONSES OF MULE DEER TO EXPERIMENTAL MANIPULATION OF WATER SOURCES IN MOJAVE NATIONAL PRESERVE

Purpose of study:

State and federal agencies in the western United States have used water developments as an integral component of management of wildlife habitats in arid regions since the 1940s (O'Brien et al. 2006). Where water was perceived to be limiting, considerable attention was focused by early resource managers on developing water sources for wildlife (Krausman et al. 2006). Ranchers and range managers have developed water sources for livestock, many of which also are used by wildlife. Water catchments remain a widely used management tool in the western United States (Krausman et al. 2006). Over the past several years, numerous water sources for livestock were deactivated within the Mojave National Preserve (MNP). Many of those water sources had been available to native wildlife in excess of 100 years.

The purpose of this investigation is to assess population characteristics and responses of mule deer inhabiting MNP to availability of water and vegetation characteristics around sources of water. We designed an experiment to compare demographic data, including survival, fecundity, and physical condition, of female mule deer in areas with and without permanent sources of water. We also will test hypotheses relating to movement patterns, habitat selection, and home ranges of deer in areas with and without permanent sources of water. Finally, we will examine vegetation characteristics surrounding water sources to random locations to determine differences in forage availability and quality in areas with and without permanent sources of water.

We propose a 2-phase experiment with a total duration of 10 years, which includes 2 experiments of 5-year duration on the Mojave National Preserve. For the initial 5 years of the experiment we will compare a large area with year-round available water including established wells and developed springs with a large area without year round water. The area around Cima Dome on MNP will function as a control and includes developed springs (Deer, Cut, Kessler, and White tank); water sources in this area will not be manipulated for the duration of the study. Our study area with year-around available water will include reestablished wells (Petit, Government Holes, Gold King, Eagle, and Vontrigger) and developed springs (Live Oak, Cottonwood, Clark, Cliff Canyon, and Silver Lead); these wells and springs will be monitored and maintained with permanent water. The study area without permanent water includes wells that had been deactivated (Watson, Payne, Caruthers Canyon, Lecyr, Barnwell, and Slaughterhouse). We will test hypotheses regarding habitat selection, movement patterns, survival, reproduction, and physical condition of mule deer by comparing deer in experimental areas with and without available water and the control.

For years 5 - 10 of the study, we propose to reinstate the wells in the no water available study area including: Watson, Payne, Caruthers Canyon, Lecyr, Barnwell and Slaughterhouse). Then we will compare responses of mule deer to availability of water in this study area. We will make comparisons of that study area before the wells are reinstated (years 1-5) with 5 years after water is made available. We will test hypotheses comparing the area that had permanent water available the first 5 years of the study and will continue as an area with available water during the second 5 years.

Subject/Discipline:

Animal Communities / Wildlife

Locations authorized:

Our control study area includes permanent water sources around Cima Dome (Deer, Cut, Kessler, and White tank). Mule deer will be monitored throughout the Cima Dome area for locations and random locations to obtain information on habitat selection by mule deer.

Our treatment area with permanently available water ranges from north of Cliff Canyon spring and south to below Granite well. This study area includes well sites Government Holes well, Petit well, and Gold King well. Developed springs included in this treatment area include, Cliff Canyon spring, Clark spring, Live Oak spring, and Cottonwood spring. In addition, another treatment area with permanent water ranges from north of Eagle well and south of Vontriger well.

The treatment area without permanently available water ranges from Bathtub spring in the north to Watson well in the south. Well sites without water in this treatment study area includes Watson well, Payne well, Caruthers Canyon well, Lecyr well, Barnwell, and Slaughterhouse well. The two springs in this study area include Bathtub spring and Matt spring. We also will sample random locations in this study area for vegetation and locations of mule deer.

Transportation method to research site(s):

When capturing mule deer for application of radio collars, personnel from California Department of Fish and Game will use a helicopter to access mule deer for capture with a netgun. Vehicles will be used to access locations of captured mule deer by CDFG personnel, graduate students, and technicians. Vehicles will be used to access well sites and springs in each study area for data collection and for obtaining locations of mule deer when possible. Other sites that are not accessible by vehicle will be accessed on foot by graduate students and technicians. Finally, airplanes or helicopters will be used to obtain monthly radio locations of mule deer.

Collection of the following specimens or materials, quantities, and any limitations on collecting:

n/a

Name of repository for specimens or sample materials if applicable:

Repository type: Temporarily captured or handled (may include marking) and then released undamaged in place

Objects collected:

Mule deer (*Odocoileus hemionus*), 40 individuals per year, will be captured and marked with ear tags and radio collars.

Mule deer will be captured annually with a helicopter and opportunistically with clover traps. Those deer will be released immediately after capture, marking, and handling.

Specific conditions or restrictions (also see attached conditions):

General conditions for research in units of the National Park Service and conditions specific to Mojave National Preserve are attached.

Data will be shared without restriction between University of Nevada, Reno, California Department of Fish and Game, and the National Park Service throughout the duration of this study.

Helicopter use is permitted to capture mule deer for the purpose of equipping with radio collars and ear tags and to conduct health assessments according to the approved Capture Plan. The base camp operations and helicopter staging area for the Jan. 18-22, 2008 capture will be at an old landing strip near the intersection of Ivanpah and Morningstar Mine roads. If the staging area needs to be moved during this operation it must remain outside of wilderness and in a previously disturbed area.

Helicopter capture operations in wilderness are permitted with a 'minimum tool' analysis. No other motorized or mechanized equipment is allowed in wilderness. Access to designated wilderness areas is by foot or pack animal only.

Contact the Aviation Officer, Chuck Heard, at Mojave National Preserve (760-252-6132) at least 48 hours prior to beginning helicopter operations.

Helicopter capture operations are restricted to the time period between January 1 and May 1 and again in the time period between November 1 and December 31 to reduce stress on animals late in pregnancy and during the summer heat. Trapping using Clover traps can be done opportunistically but will be concentrated in the months of November through early March and again in June. Capture operations will be refined as we gain more information to maximize success while minimizing stress or harm to animals, especially does and fawns. If, during capture, does are found to be in an advanced state of pregnancy, capture operations will cease.

An upper limit to the population of tagged and collared animals will be set at 80 in any given calendar year. Capture operations will be permitted annually to maintain this collared population size.

Mojave National Preserve, in cooperation with University of Nevada-Reno, California Department of Fish and Game, and with assistance from other partners will place water at Gold King (Valley), Petit, Government Holes, Eagle, and Vontrigger. Wells and water supply will be managed by the National Park Service. We expect that wells will be reactivated at Gold King, Petit, Government Holes, and Vontrigger and water will be hauled to Eagle. The permittees will monitor water availability at these sites in addition to natural water sources at springs and seeps in accordance with the study design.

Permittees must carry a copy of this permit while working in the Preserve and a researcher's placard, which can be obtained at the Kelso Depot Visitor Center, must be displayed on any vehicles left unattended.

An Investigator's Annual Report will be due for 2008 in January of 2009 and in subsequent years of this study. This permit will be renewed annually to allow us to review the research progress, improve the methods and modify conditions as needed.

Recommended by park staff (name and title):

Adina Hughes Science Advisor

Reviewed by Collections Manager:

Yes No

Approved by park official:

Henry G. ...

Date Approved:

1-9-08

Title:

Superintendent

I Agree To All Conditions And Restrictions Of this Permit As Specified

(Not valid unless signed and dated by the principal investigator)

Kelly Stewart
(Principal investigator's signature)

1/8/2008
(Date)

THIS PERMIT AND ATTACHED CONDITIONS AND RESTRICTIONS MUST BE CARRIED AT ALL TIMES WHILE CONDUCTING RESEARCH ACTIVITIES IN THE DESIGNATED PARK(S)