

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

PROJECT INFORMATION

Project Title: Desert Mule Deer Browse Condition and Trend Monitoring		Project No.
Region/GMU: 5/37B	HPC: Tucson	
Project Type: Forage Condition Assessment		
Project Description: Mule deer in game management unit 37B experienced low population numbers from 1995 through 2004. Moderating wide fluctuations in mule deer abundance in the desert is dependent on planning for drought, and ensuring that forage is available during critical times of the year. Anecdotal evidence suggests that browse plants in 37B have sustained heavy use in the past, but such use has not been adequately quantified. Therefore, we propose to evaluate the condition and trend of evergreen browse in desert mule deer habitat for 5 years to aid in landscape level planning of game management unit 37B.		
Wildlife Species to Benefit: desert mule deer		
Possible Funding Partners:		
Implementation Schedule: Beginning: May 2007 Completed: July 2008		

PROJECT FUNDING

SBG Funds Requested: \$27,771/year (\$138,885 for a 5-year project)
Cost Share Funds: \$6,900/year (\$34,500 for a 5-year project)
Total Project Costs: \$34,671/year (\$173,355 for a 5-year project)

PARTICIPANT INFORMATION

Applicant: John Windes, Jim Heffelfinger, Ben Brochu	Address: Arizona Game and Fish Department 555 N. Greasewood Road, Tucson, AZ 85745
Telephone: (520) 388-4448 or (520) 229-3222	
AGFD Contact and Phone No. (If applicant is not AGFD personnel)	
Coordinated with: Mikele Painter/Mike Ingraldi, Research Branch	Date: March 1, 2006
Applicant's signature:	Date:

**SEND COMPLETED APPLICATIONS TO:
 Game Branch**

2221 W. Greenway Rd.
Phoenix, AZ 85023
mdisney@azgfd.gov

NEED STATEMENT/PROBLEM ANALYSIS:

Mule deer populations range-wide have suffered declines. Desert mule deer in game management unit 37B began dramatic decline around 1995 and have not recovered since. Although the underlying causes for this phenomenon are likely related to drought, good forage management may mitigate declines. Moderating wide fluctuations in mule deer abundance in the desert is dependent on planning for drought, and ensuring that forage is available during critical dry periods. May and June are typically the driest months of the year, preceding annual monsoon weather. During this season when herbaceous growth is minimal or absent, deer depend on browse to meet their nutritional needs. Drought years amplify the effects of annual dry seasons, resulting in poor browse conditions. Lack of palatable and nutritious forage can cause direct mortality and reduced recruitment of deer during drought. Parturition occurs in conjunction with monsoon precipitation, and pre-monsoon browse conditions combined with drought may impact prenatal nutrition and female reproductive performance.

This study was initiated due to concerns of overuse of critical mule deer forage by livestock during drought years. Cattle prefer perennial grasses, but will use browse species important to mule deer when herbaceous forage is unavailable. Anecdotal evidence suggests that stands of important browse species in 37B have sustained heavy use in the recent past, but such use had not been quantified prior to initiation of this study that began in 2005. The year 2005 was the only wet year in an otherwise decade of drought. As such, it is very important to continue this browse monitoring project to document the effect that drought has on cattle use of browse species (i.e., Jojoba) critical to mule deer. Continuation of this project will build upon 2005's pilot project and give Arizona Game and Fish wildlife and habitat managers the appropriate information to advise the appropriate land management agencies (e.g., BLM) regarding the use by cattle of Jojoba, an essential browse species utilized within this historically prized game management unit by desert mule deer.

This project specifically addresses the following General Challenges and Strategies outlined within the Arizona Game and Fish Department's Wildlife 2006 Strategic Plan: General Challenge 1 - Public Service, Planning, and Funding: Strategies A and C; General Challenge 2 - Wildlife Information: Strategies B, D, E and G; General Challenge 3 - Wildlife Management: Strategy H, and; General Challenge 4 - Wildlife Habitat: Strategies A and E.

PROJECT OBJECTIVES:

- 1) Determine the current level of browse use on key species;
- 2) Describe the recent history of browse use;
- 3) Describe browse health and trend, and;
- 4) Determine if adequate browse forage is available to mule deer during critical dry periods.

PROJECT STRATEGIES:

KEY SPECIES

Jojoba (*Simmondsia chinensis*) was selected as the key browse species based on its importance as a highly preferred mule deer forage species. Jojoba is a mast-producing evergreen browse species that is especially important during dry periods when herbaceous forage is unavailable and when other species have dropped their leaves in response to drought.

PHOTO POINT AND SAMPLE PLOT ESTABLISHMENT

Within each of the six survey areas (Mineral Mountains, Grayback Hills, Tortilla Mountains, 96 Hills, Black Mountains, and Black Hills, we will establish up to 33 sites to measure jojoba. Sample sites will be selected from a list of potential plot coordinates produced by a Microsoft Excel random number generator. Sample sites will be considered suitable which are 1) located on public or State land, 2) more than 400 m from a discrete water source, 3) more than 1000 m from other sample sites, 4) less than 1000 m from a road and otherwise reasonably accessible (e.g., not on a precipice or blocked by private land), and 5) are inhabited by jojoba shrubs. Potential plots will be ground-truthed for suitability (i.e., contain jojoba plants), and selected sites will be permanently marked with a 6-ft tall metal T-post. Plot coordinates will be recorded with a global positioning system unit. Plots measured during the 2005 pilot field season will be revisited.

SAMPLE PROTOCOL AND DATA ANALYSIS

A sampling protocol was developed as part of the 2005 pilot project. A suite of methods for evaluating use, browse condition, and trend were chosen for their ease of use, repeatability, and applicability to management objectives. We will record plant sex, age, growth form, height, crown diameter, percent of twigs browsed, and assign each plant an overall use category. We will take digital pictures looking out toward the cardinal directions from the marker post, and of the first plant sampled at each plot. Observations are conducted in late June, or early July, prior to mid-summer monsoons.

PROJECT LOCATION:

The project will occur in game management unit 37B, located in Pinal County, Arizona, approximately 110 km southeast of Phoenix (see Figure 1 below). Sample sites will be divided into six survey areas (from north to south within 37B): Mineral Mountains, Grayback Hills, Tortilla Mountains, 96 Hills, Black Mountains, and Black Hills.

LAND OWNERSHIP AT PROJECT SITE (Please state specifically if PRIVATE PROPERTY and provide landowner's name):

Land ownership in each study area is a mix of private, State, and BLM lands. No sample sites will be located on private property or in areas accessible only by crossing private property. All sample sites will be located on public or state land accessible to the public.

IF PRIVATE PROPERTY, IS THERE A STEWARDSHIP AGREEMENT BETWEEN THE LANDOWNER AND THE DEPARTMENT? N/A

HABITAT DESCRIPTION:

The study area (i.e., Game management unit 37B) is located in Pinal County, Arizona, approximately 110 km southeast of Phoenix. The survey areas are located in a range of granitic mountains and hills, with elevations from 600 to 1800 m. Topography ranges from steep and broken to gently rolling. Water is generally available in sparsely distributed cattle stock tanks and wildlife drinkers. Two main biotic community types, Semidesert Grassland and Sonoran Desertscrub with Arizona Upland subdivision, comprise the bulk of the mule deer habitat in 37B.

ITEMIZED USE OF FUNDS:

Category	Cost	Matching Dollars
Personnel (includes ERE)		
Principal Investigator (\$1487/week x 1 week)	1487	
Project Biologist (\$1211/week x 6 weeks)	7266	
Wildlife Specialist (\$1124/week x 4 weeks)	4496	
Wildlife Technicians (\$831/week x 4 weeks X 2 Techs)	6648	
Administration / Secretarial (\$850/week x 1 week)	850	
Habitat Specialist (\$1124/week x 1 week)		1124
Game Specialist (\$1124/week x 1 week)		1124
Habitat Intern (\$414 x 6 weeks)		2484
Sub-total	20,747	4,732
Mileage		
AGFD vehicles (\$0.60/mile x 3500 miles)	2100	
AGFD vehicle (\$0.60/mile x 1800 miles)		1080
Sub-total	2,100	1,080
Per diem		
Principle Investigator (\$34/day x 2)	68	
Project Biologist (\$34/day x 24 days)	816	
Wildlife Specialist (\$34/day x 20 days)	680	
Wildlife Technicians (\$34/day x 20 days X 2 Techs)	1360	
Habitat Specialist (\$34/day x 4 days)		136
Game Specialist (\$34/day x 4 days)		136
Wildlife Manager (\$34/day x 4 days)		136
Habitat Intern (\$29.5/day x 20 days)		680
Sub-total	2,924	1088
Other Operating Expenses *		
Field and Office equipment ("T" posts, photocopies, binding, office space, GIS computer support, phones, etc.)	2,000	0
TOTAL	\$27,771	6,900

LIST COOPERATORS AND DESCRIBE POTENTIAL PARTICIPATION:

Region V Habitat Specialist – labor
Region V Game Specialist – labor
Region V Habitat Intern - labor
Region V Wildlife Manager 37B - labor

PROJECT MONITORING PLAN:

N/A – The project by default is a monitoring project, and results will be used by Region V Game and Habitat Specialists to advise the appropriate land management agencies (e.g., BLM) regarding the use by livestock of an essential browse species needed for wild ungulates.

PROJECT MAINTENANCE:

N/A

PROJECT COMPLETION REPORT TO BE FILED BY:

Michael Ingraldi, Research Branch

WATER DEVELOPMENT PROJECTS (see attached worksheet):

N/A

TREE SHEARING (AGRA-AXE, PUSH) PROJECTS (see attached worksheet):

N/A

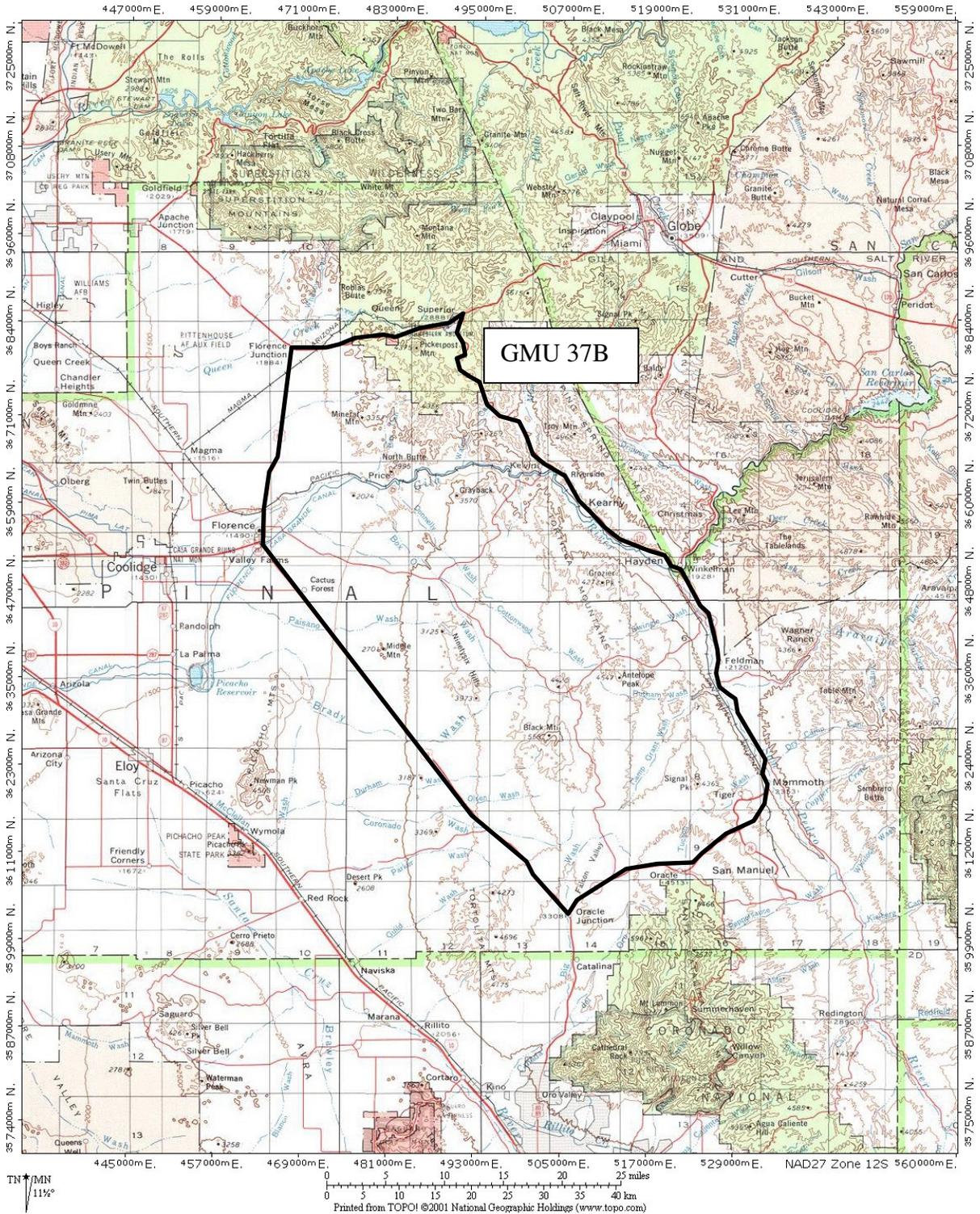


Figure 1. Game management unit 37B is approximately 1,181 square miles (756368 acres) and is comprised of a mixture of Bureau of Land Management, State Lands, and Private Land ownership.

ARIZONA GAME AND FISH DEPARTMENT
WATER DEVELOPMENT WORKSHEET

PROJECT NAME: _____

- 1) **Is the water development listed as a priority in the most recent “Wildlife Water Development Annual Implementation Schedule?”**
- 2) **Please list the Development Branch personnel and date coordinated with for this project.**
- 3) **What is the estimated annual inches of precipitation for the area? (mark one)**
___2-4 ___4-6 ___6-8 ___8-10 ___10-12 ___12-14 ___14-16 ___>16
- 4) **Is there a perennial water source available to big game within four miles of this project?**
___YES (please complete #5 below) ___NO (skip #5 below)
- 5) **For the accessible, perennial water source nearest this project:**
Name of water source:
Type of water source (catchment, spring, dirt tank, etc.):
Ownership of water source:
Distance in miles from project:
- 6) **Is the target wildlife species a result of transplant efforts?** ___YES ___NO
- 7) **Please list any special land management status for the project site (i.e. Wilderness, National Park, National Monument, etc). If private land, list landowner.**
- 8) **Please provide the following information about access to the proposed site:**
Type of access (mark one): ___2x4 vehicles ___4x4 only ___foot only**
**If foot access only: Distance in miles: Approx. hiking time:

-- Does access to this site require crossing private or tribal lands? ___YES ___NO

-- Please describe any restrictions to public access:
- 9) **Please list below (or on a separate sheet) the material type and dimensions of each component proposed to be added, modified, or repaired.**
- 10) **Was a site visit completed?** ___ Yes ___No
If Yes, please list personnel that attended and date.