

AN ANALYSIS OF COMPOSITION, DISTRIBUTION, AND HABITAT  
USE OF REINTRODUCED DESERT BIGHORN SHEEP  
IN ARCHES NATIONAL PARK, UTAH

C. Shirlene Haas  
Gar W. Workman  
Utah State University  
Logan

Objectives

The ecology of a reintroduced population of desert bighorn sheep (Ovis canadensis nelsoni) is being investigated in Arches National Park. National Park Service objectives are: (1) determine general ecological parameters, including population and social dynamics, seasonal distribution and habitat use patterns, and general health characteristics; and (2) develop a comprehensive program of habitat analysis and evaluation that can be used to determine habitat suitability and identify transplant sites in other National Park Service units.

The masters thesis research objectives are: (1) classify the study area in terms of potential desert bighorn sheep habitat, based on models in the literature; (2) compare predicted habitat use with actual habitat use; and (3) investigate the basis for differences in actual and predicted habitat use.

Methods

Field data collection began in May 1988 and was completed in June 1989. To classify the study area in terms of potential desert bighorn sheep habitat and determine areas of habitat use, seventeen habitat variables were quantified on 250 sites in 30 randomly chosen sampling units. The habitat variables are: habitat type, slope, elevation, aspect, topographical position, geological formation, bedrock class, ruggedness index, distance to escape terrain, distance to cliff face, distance to water, total and up slope visibility, coverage of perennial vegetation, coverage of potential forage species, site classification (used or unused), and type and amount of sign present.

Ecological parameters such as population and social dynamics, health characteristics, home ranges, etc. will be determined

based on observations of desert bighorn sheep. Mule deer and desert bighorn sheep are present in the park, and observations of sheep are expected to be low. Pellet samples were collected during field work in an attempt to differentiate between the pellets of the two species. Differentiation of pellet groups, in addition to field observations, will delineate habitat use of the two species.

### Results

All habitat data collected is in the process of being statistically analyzed. No conclusions or inferences will be drawn from the data until analysis has been completed. Analysis will include comparison of habitat actually used with habitat predicted to be used by the models being tested. Parameters such as visitor use and the presence of mule deer have been quantified and will be incorporated into the models. Each sampling unit will be ranked according to levels of visitor, deer, and sheep use, and suitability for desert bighorn sheep use as predicted by the models.

Three months of laboratory analysis has not yet yielded a successful method of differentiating between mule deer and desert bighorn sheep pellets. Habitat use will be delineated based solely on observations if an accurate laboratory procedure is not derived.

Observations of desert bighorn sheep made since the reintroduction into the park and observations of mule deer have been compiled and plotted on 15 minute USGS topographical maps. Locations of perennial water sources available in the park have also been plotted on 15 minute maps. A minimum of 26 different desert bighorn sheep have been observed in the park. Based on the sex ratio of sheep reintroduced and subsequent observations, the population is estimated to be approximately 38 animals.

Observations of desert bighorn sheep response to human disturbance have been documented to assist in analyzing the influence of a significant human presence in the park.

### Future Direction

Data analysis will be finalized during the first few months of 1990. Conclusions and inferences drawn from that analysis will be submitted in the final report to the National Park Service.