

D-30

16 mm only



WITHDRAWN

# Cooperative National Park

## RESOURCES STUDIES UNIT



University of Nevada  
Las Vegas, Nevada 89154

Western Region  
National Park Service  
Dept. of the Interior  
San Francisco, CA 94102

NATIONAL PARK SERVICE  
LIBRARY  
Denver, Colorado

DEC 11 1987

WITHDRAWN

COOPERATIVE NATIONAL PARK RESOURCES STUDIES UNIT  
UNIVERSITY OF NEVADA, LAS VEGAS  
Department of Biological Sciences  
Las Vegas, Nevada 89154

13 January 1981

MANAGEMENT SIGNIFICANCE OF  
HOME RANGES AND DIETS OF COYOTES  
IN JOSHUA TREE NATIONAL MONUMENT  
IN RELATION TO PREY DENSITIES

by

John Cornely

Prepared by:

Dr. Charles L. Douglas  
Unit Leader, CPSU/UNLV

National Park Service/University of Nevada, Las Vegas

CPSU/UNLV Contribution No. 009/16

MANAGEMENT SIGNIFICANCE OF  
HOME RANGES AND DIETS OF COYOTES  
IN JOSHUA TREE NATIONAL MONUMENT  
IN RELATION TO PREY DENSITIES

by John Cornely

1980

National Park Service/Univ. Nevada, Las Vegas

This study was undertaken in response to the need of Park Managers to have a better understanding of the coyotes of JOIR. It was funded jointly by the Cooperative Resources Study Unit at UNLV and by Joshua Tree National Monument. The study was begun in 1966 and ended in 1980. The final report also represents Dr. Cornely's Ph.D. Dissertation.

The coyote (Canis latrans) is the most abundant and widely distributed mammalian predator in Joshua Tree National Monument, and is seen frequently by tourists during daylight and evening hours. There are few locations in the country where coyotes have not been subjected to some measure of "population control." Thus, little information is available on unexploited coyote populations. The high density of coyotes in the Monument, and their intrinsic interest to laymen and biologists alike led to the development of this study.

The high density of coyotes in JOIR is sustained by availability of natural prey species. The density of prey species is influenced in turn by precipitation and the resultant plant growth. The purpose of this study was to investigate the home ranges and diet of coyotes and to examine the relationships between those parameters and prey densities and biomass. This study provides information on the role of coyotes in the park ecosystem, and also provides managers with data on which to base resource management decisions.

The study area was located in the western half of the Monument. It included part of Lost Horse Valley, most of Queen and Pleasant Valleys, the area between them, and the area of Pleasant Valley south to the

southern boundary of the Monument. Precise limits of the area are given in the report.

Eleven coyotes were captured by means of padded leg-hold traps. No more than 10 sets were out at a given time; traps were checked early each morning and again in the late afternoon or evening. Trapped individuals were tranquilized with a combination of ketamine hydrochloride and xylazine (Cornely, 1979). Nine adult coyotes were fitted with radio-telemetry collars. Radio signals were monitored from the ground and from the air.

Diets of coyotes were determined by means of scat analysis, on a seasonal basis. Prey species were evaluated by means of road censuses for leporids (rabbits and jackrabbits), and live trapping for small rodents. More than 30 coyote diet studies have been reported since 1935. During only six of these, including this study, were prey censused to relate to coyote diets.

The data indicate that adult coyotes have an average home range of about 202ha (499 acres). This home range is the smallest reported in the literature, and reflects the density of coyotes in the Monument. The average coyote home range contained a standing crop biomass of 381.84 kg (842 pounds) of small mammals. This biomass would provide the annual minimum energy requirements for 4 coyotes. Assuming that free-ranging coyotes require approximately three times the energy of the standard metabolic rate, the prey base per home range could support about 1.5 coyotes annually.

Management considerations to which information in this report can be applied include the following items (taken from the report):

### Interpretation

Joshua Tree National Monument includes nearly 234,000 ha of fascinating southern California desert country. The coyote is an important member of this desert community. Coyotes were present in southern California as early as Pleistocene times (Nowak, 1978) and were there to greet the first aboriginal humans (Gill, 1970). Coyotes are abundant in Joshua Tree National Monument where they find a good prey base and are protected from the control activities practiced widely in the western

United States. The information provided in this report provides a resource of information for park interpreters to inform Monument visitors of the natural role of coyotes in desert ecosystems. There are few remaining areas where coyotes can live out their lives unexploited by traps and guns.

#### Coyotes and Desert bighorns

Coyotes are apparently capable of killing mature bighorn sheep, but coyote predation on desert bighorns is seemingly uncommon. During a waterhole survey in Joshua Tree National Monument, Welles (1965) observed the following scene: "Five coyotes were also seen, one of which was in deadly pursuit of an adult ewe, being about 50 feet behind her when they appeared on the ridge above the spring and only 10 feet behind her when they disappeared in the canyon 0.5 miles to the west. Subsequent search of the area disclosed no carcass. We draw no conclusions from this. We saw one coyote trying to catch a ewe who knew that that was what he was trying to do."

Analysis of coyote scats from areas inhabited by desert bighorn has revealed a low occurrence of bighorn remains. Only 16 of 1464 (1.1 %) coyote scats contained bighorn remains (Browning and Leach, 1955; Russo, 1956; Simmons, 1969). There is no way of knowing whether these remains represent bighorns killed by coyotes or were carrion. No remains of bighorn sheep were found in scats examined during this study. Although the evidence is skimpy, it appears that coyote predation is not a problem with desert bighorn populations in Joshua Tree National Monument.

#### Coyotes and Campgrounds

Between August and November, 1977, an unusual number of coyotes was observed in Hidden Valley Campground. The number increased from three in August to more than 12 in November (Cornell and Cornely, 1979). Large concentrations of coyotes near campgrounds are unusual in Joshua Tree National Monument. The coyotes at Hidden Valley Campground approached humans more closely than coyotes encountered in areas away from campgrounds. This apparent lack of fear of humans posed a potential threat to Monument visitors and their pets. An experimental program of

aversive conditioning was apparently successful in dispersing this concentration of coyotes. The details of this program were reported by Cornell and Cornely (1979). The hypothesis was that coyotes that had been fed dog food for a period of time by park volunteers living at Keys' Ranch formed the nucleus of the campground coyotes. These coyotes, already conditioned to being fed by humans, had this behavior reinforced by visitors tossing them handouts.

The feeding of coyotes and other wildlife species should be strongly discouraged. This practice modifies the natural behavior of these animals and could lead to serious conflict between coyotes and visitors. Feeding of wildlife should be discouraged through the use of signs at campgrounds and should be discussed during interpretive programs. Coyotes are undoubtedly much better off living on natural prey than on garbage.

Aversive conditioning should be attempted again if future campground coyote problems arise. It may only provide a temporary solution, but it is far more attractive than other alternatives such as trapping and relocation, or the killing of problem animals.

With the exception of problems such as the one described above, coyotes pose no problems that would justify any sort of predator management in Joshua Tree National Monument. They are an important component of desert ecosystems and should be left to pursue their natural role so that future generations will be afforded the opportunity to observe them and enjoy their nightly serenades.

prepared by:

Dr. Charles Douglas, Unit Leader  
CPSU/UNLV