

" A Study of Social Interactions in Cynomys parvidens in
Southern Utah"

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February, 1976

BACKGROUND

Populations of the Utah prairie dog (*Cynomys parvidens*) have reached alarmingly low levels in recent years. Beginning around 1910, eradication programs were conducted to control their numbers on farm and range land. This practice reduced their numbers so severely that in 1968 the species was placed on the Endangered Species List. The Utah prairie dog was removed from the endangered list in 1970, but a 36% decline in population was reported for the year following ^{removal} (Collier and Spillet, 1972). By 1972, their numbers had been further reduced, to an estimated total population of 3000 (Crocker-Bedford, 1974). In 1973, the U. S. Department of the Interior again placed them on the Endangered Species List, where they remain.

There are two complementary management strategies that can be pursued when a species is reduced to a critically low population level. The species can be protected from human interference where it already exists, and if the existing colonies are not too severely stressed, additional colonies can be established by the transplantation of some animals to other suitable habitats.

Colonies of Utah prairie dogs were transplanted to areas of Bryce Canyon National Park in 1974. The transplants apparently were unsuccessful (Crocker-Bedford, 1975). Further transplants were made in the summer of 1975 to two well studied locations in Bryce Canyon National Park (Elmore, 1975). It is hoped that the prairie dog's exposure to the public there will facilitate a bet-

ter understanding of the role of small mammals in natural ecosystems.

The Utah Prairie dog is one of five species in the white-tailed subgenus. It occupies a restricted range in south-central Utah (Hollister, 1916; Pizzimenti and Collier 1975). The species has been studied by other investigators: Collier (1975) correlated the abundance and density of the prairie dogs with biotic and abiotic factors, and Crocker-Bedford (1975) studied the range relationships of the prairie dogs with cattle. No quantitative work on the behavior of the species has been published, and to the best of my knowledge little had been collected previous to my own work in the summer of 1975.

The intent of my previous research was 1) to begin a behavioral study of the species and 2) to utilize the behavioral data in a comparison of the social structure of C. parvidens with C. ludovicianus and C. leucurus. A knowledge of the behavior of the Utah prairie dog could be incorporated as an important dimension in the management of the species. Behavioral knowledge of the species could prove^{as} useful as a knowledge of the soil and vegetation of a transplant site in determining the probability of successful transplantation.

Studies of the black-tailed species (C. ludovicianus) have discovered a well developed social structure. Their basic social unit is headed by a single male, they defend a well defined social and feeding area, groom cooperatively and are active on the surface year round (King 1955; Smith 1958).

C. leucurus studies have demonstrated that a more loosely knit social structure is in effect in this white-tailed species. Isolated clans headed by females, no obvious adult cooperation or competition, shared feeding areas and a 3-4 month surface activity pattern characterize this species' social organization (Tileston and Lechleitner 1966; Clark, Hoffman, and Nadler 1971; and Clark 1973).

Data was collected on C. parvidens in a baseline study at a single well established dog town. The study began with the first day the pups emerged from their burrows at approximately age six weeks and continued until the adult males had begun their winter hibernation in mid-July. Activity patterns, social structure and dispersal mechanisms were assessed by a measure of time spent in various activities. The dog town under study was gridded, the burrow entrances were mapped, and the vegetation was sampled. There are over fifty animals for which sex, age, weight, home range, familial relationship and fecundity data were collected. Time budgets on adults and litters of young are presently being evaluated from the standpoint of their roles as males, lactating and nonlactating females, newly emerged young, and dispersing young.

It is imperative that behavioral research continue on Cynomys parvidens in order to maximize the effectiveness of the present management strategies. Such a notion as the transplanting of whole social units could emerge from the research as an important tactic to be incorporated into the procedure.

Further research will enable the specific components of the social unit to be clearly defined. Additionally, reports on trapping success of adult males, adult females, and young would indicate the probability of collecting an intact social unit for transplantation.

PRESENT PROPOSAL

This proposed research will 1) continue data collection of time budgets on the previously-studied dog town and 2) conduct a comparable study on one of the two recent (July, 1975) transplant colonies in Bryce Canyon National Park. The two sites for study are four miles apart. A comparative analysis of the behavior at the two dog towns will serve to pinpoint the differences between pioneer and established colonies. With time as the unit of measurement, the transplanted prairie dogs' budgeting of activity can be compared to the norm of two seasons of data at the established site. The activities for which energy expenditure is of prime consideration could then be ascertained. This study could thus result in a refinement of present management techniques.

Using the ten-meter grid system again, prairie dogs will be observed from a blind with binoculars and a scope. A set of mounted stop watches and data sheets will be used to assess individual time budgets and execute activity scans of the entire dog town. Examples of the data sheets are given in Appendix I. Data type 3 is used for the activity scans of the dog town at two-hour intervals in the day. Data type 4 contains the set of codes which are employed for the individual time budgets. Activity during the time spent below the surface simply cannot be known by present methods and so it is assumed, as was by other researchers, that above ground activity will serve as an adequate guage of time budgeting of prairie dogs.

Twenty 6" x 6" x 19" National live traps will be used in a random system over the dog towns. The prairie dogs will be aged, sexed, tagged

with numbered ear tags and dye-marked for easy field identification.

King (1955) showed no incidence of mortality during his study which employed similar methods.

The three month study will begin at the end of the spring semester in early May. An observation time period from May 15 to August 1 assures that all members of the dog town will be engaged in surface activity.

Personal contact in August with Superintendent Charles Budge of Bryce Canyon National Park was made in regard in these plans. Permission will be secured again from the Dixie National Forest Office in Panguitch to continue a study at that site. An application for a trapping permit has been submitted to the State of Utah Division of Wildlife Resources. A Federal trapping permit application is presently being submitted in compliance with the Endangered Species Act of 1973.

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APPENDIX I

Samples of data sheets

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[illegible]

APPENDIX II

Vita

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Mary Ann Wright-Smith

EDUCATION: St. Mary's College, Notre Dame, Indiana. B.A. 1972. Sociology major.

Utah State University, Logan, Utah. 1973-74. Science courses.

Indiana University, Bloomington, Indiana. 1974-75. Special Graduate student in Zoology.

Present status: Indiana University. Zoology Graduate Student. M.S. program in Ecology.

COURSE WORK: Notre Dame:

Natural Resources GEOL 459

Utah State University:

Discovering Nature LS 105
Gen. Ecology Lab WLSCI 385
Animal Behavior WLSCI 415
Animal Behavior Lab WLSCI 416
Animal Communication Seminar PHYSL 686
Quantitative Chemistry C121, 122
Science Colloquium BIOL 589

Indiana University:

Chemistry C106
Quantitative Chemistry Lab C125
Ecology L473
Cell Physiology L267
Genetics L364
Terrestrial Ecosystems L575
Advanced Ornithology Z508
Evolution Z465
Research Z850

Present enrollment:

Biostatistics L576
Adv. Population Biology L57
Physiological Ecology L560
Social Behavior and
Use of Space Seminar Z620

WORK EXPERIENCE: 1976 Indiana University, Associate Instructor, L100.

1975 Ecology Lab, Indiana University. Neotoma and Sigmodon characterization of estrus cycles, breeding, food consumption, O₂-CO₂ analyzation, programming.

1975 School of Public and Environmental Affairs. Editing of Lake Monroe Land Suitability Study.

1974 Teaching Assistant, Ecology Lab (L474), Indiana University.

1974 Assistant to Zoology graduate student, Utah State University. Behavioral data collection.

1973-74 Desert Biome, Utah State University. Lab Assistant

1973-74 Range Dept., Utah State University. Preparation of land use study on Richmond, Utah.