Technical Report No. 277

SMALL MAMMAL STUDIES ON JORNADA AND PANTEX SITES, 1972

Robert L. Packard

Department of Biology

Texas Tech University

Lubbock, Texas 79409

GRASSLAND BIOME

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ABSTRACT

Small mammal population studies were continued on the Jornada and Pantex Sites using sampling methods identical to those used in 1971. Rodent populations at Pantex overwintered at rather high densities, but gradually declined throughout the summer and autumn. Cotton rats, *Sigmodon hispidus*, appeared in significant numbers in the ungrazed sampling plot in spring 1972. This appearance followed the preceding autumn of good aboveground live and dead vegetation resulting from increased precipitation in the summer and autumn of 1971; this was also coupled to a mild winter for 1971-1972. Lagomorph populations at Pantex remained about the same whereas at the Jornada black-tailed jackrabbits, *Lepus californicus*, were fewer in number than in 1971. Rodent population density at the Jornada remained low although there was some indication of a late autumn increase following increased precipitation in late summer and autumn of 1972.

Rodent population density fluctuations seem closely correlated to fluctuations in precipitation on both sites.

INTRODUCTION

Population dynamics of small mammals (rodents and lagomorphs) were studied and biomass estimates made for 1972. The design of the studies on rodents is in French (1971), whereas the lagomorph density and biomass estimates are in Packard (1972). The data reported herein were collected from the Comprehensive Network Sites at Pantex and Jornada. The objectives of the 1972 studies were: (1) estimate population densities (crude) of rodents and lagomorphs using techniques developed in 1970 and 1971; (2) convert population density estimates into biomass estimates; (3) continue studies of reproductive conditions of small mammals; (4) collect stomach materials from sacrificed specimens for food studies; and (5) analyze functional impact of key species of rodents on intensive study sites.

Sampling was conducted as in 1971 with four periods (early May, late June to early July, mid-August, and late November) on both sites simultaneously. All live-trap data were collected from 1970-1971 live-trap plots (see Packard 1971, 1972). Similar habitat to the live-trap plots were snap-trapped to obtain specimens for purposes of weight, reproductive tract study, and the collection of stomachs. All sacrificed specimens were preserved as museum study skins or as whole specimens in Formalin. The specimens are deposited at The Museum, Texas Tech University, Lubbock, Texas. Graduate students assisting me in the field and laboratory were K. G. Matocha, T. R. Mollhagen, R. W. Wiley, and D. R. Womochel.

MATERIALS AND METHODS

All procedures for the 1972 studies at Jornada and Pantex were identical to those in 1971 (Packard 1971, 1972). The only additional technique utilized in the 1972 studies was the addition of assessment

lines. These were placed in such a way that the trap lines extended well beyond the margins of the regular grid pattern (for design of assessment line patterns see Fig. 1 and Smith et al. 1971). It was hoped that data collected from the assessment lines would reflect more accuracy than previous data on the density of the small mammal population.

Seed selection preference studies were conducted in the laboratory. Spotted ground squirrels, *Spermophilus spilosoma*, and Ord's kangaroo rats, *Dipodomys ordii*, were live-trapped at the Jornada and brought to the laboratory for use in these studies. The laboratory was maintained at 22°C with a constant 55% relative humidity. Incident light was monitored to correspond with the known cycle of the Jornada. The enclosure or pen used in the laboratory was 8' × 8' × 3' (depth). Soil from the Jornada was used as a base. Water was provided *ad libatum*. A total of 10 g of seeds were provided the animal every 48 hours. Two trays of equal size and access were placed on the soil surface; each tray contained 5 g of seed. At the conclusion of each 48 hour period the remaining seeds (if any) were weighed. Scattered seeds were gathered and weighed also. Different combinations of seeds were presented to each animal.

METHODS OF ANALYSIS

Population density of rodents were made using a modified Zippin (1956, 1958) method adjusted to the use of live-trap data. Density estimates were converted into biomass estimates by multiplying the average density by species times the average weight for that species based on sacrificed specimens. Conversion of wet body weight to dry body weight was accomplished by multiplying weight wet times 0.3 (see

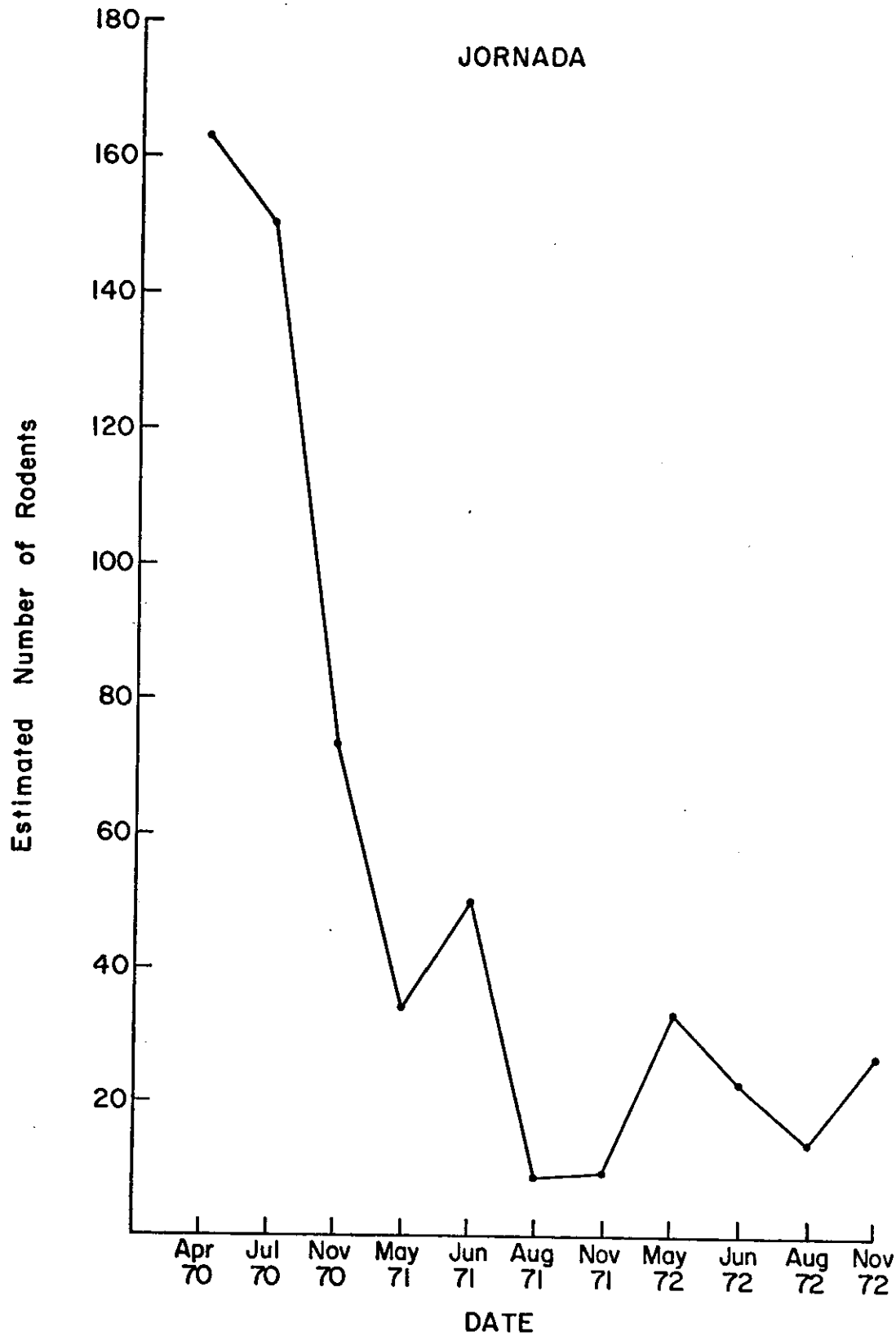

Fig. 1. Changes in density of the rodent population over a 3-year period at the Jornada. Numbers on the ordinate represent the estimated (using a modified Zippin analysis) number of rodents, all species, present on the study plot.

Golley 1960). Lagomorphs were censused along the same routes as in 1971 (Packard 1971, 1972). Densities of lagomorphs were estimated using the same procedures as in 1971.

STUDY AREAS

Jornada Site

The live-trap study plot was in the same position as in the 1970-1971 studies. Vegetation for that area has been previously described (see Packard 1971, Herbel and Pieper 1971). Principal change on the live-trap plot took place in August 1972 through autumn when precipitation increased to a point to permit a good growth of black grama, dropseed, and other grasses. Aboveground live vegetation seemed to grow more than at any time since the onset of small mammal studies in 1970. This year as in 1971, specimens were snap-trapped from areas peripheral to the live-trap area (in Jornada pasture no. 2, 4, 5, 8, 9, and 12). Some limited mammal collecting was conducted in areas adjacent to the Jornada Site.

Pantex Site

The live-trap plot was in the same position as the 1970-1971 studies. Vegetation on the live-trap plot increased in ground cover and density owing to increased precipitation and cessation of grazing. The vegetation was particularly luxuriant in the spring of 1972, but waned through the summer as precipitation decreased. There was less small mammal cover in the late summer of 1972 than in the spring of that year. Specimens were collected with snap traps in sites adjacent to the live-trap plot as well as in the area of the on-site IBP laboratory.

RESULTS OF CENSUS SAMPLING

Jornada Site

Sampling dates for live-trapping and assessment lines were May 9 to 19, June 27 to July 6, August 14 to 24, and November 18 to 28. The following species were collected in the four sampling periods by (i) live-trapping: *Dipodomys ordii, D. merriami, D. spectabilis, Perognathus merriami, P. apache, P. penicillatus,* and *Spermophilus spilosoma*; and (ii) snap-trapping for the collecting program: *Lepus californicus, Sylvilagus auduboni, Dipodomys ordii, D. merriami, D. spectabilis, Perognathus apache, P. penicillatus, P. flavus, Spermophilus spilosoma, Onychomys leucogaster,* and *Neotoma micropus.*

The most abundant species on the live-trap plat were *Dipodomys ordii, D. spectabilis,* and *Perognathus apache* (See Tables 1 and 2). *Spermophilus spilosoma* was probably present in greater numbers than our data show. The night trapping schedule did not lend itself to the estimation of density of diurnal species such as the spotted ground squirrel. There was a significant increase of *D. merriami* in the mesquite-sand hills in pastures 4 and 8. This increase was noted particularly in May 1972.

Pantex Site

Sampling dates were the same as those at Jornada. Species collected in the four sampling periods by (i) live-trapping: *Peromyscus maniculatus, Reithrondontomys montanus, R. megalotis, Sigmodon hispidus, Perognathus flavescens, P. merriami, P. hispidus, Spermophilus tridecemlineatus,* and *Mus musculus*; and (ii) snap-trapping and collecting program *Peromyscus maniculatus, Reithrodontomys montanus, R. megalotis, Onychomys leucogaster, Sigmodon hispidus, Perognathus hispidus, P. flavus,* and *Mus musculus.*

Table 1. Biomass of rodents based on densities estimated from live-trap data, Jornada Site, 1972.

Species	May					June				
		Biomass					Biomass			
		g/study area		g/ha			g/study area		g/ha	
	Population	wet	dry	wet	dry	Population	wet	dry	wet	dry
Dipodomys ordii	12.6	588.2	176.4	215.2	64.6	12.3	675.2	202.5	245.9	73.7
D. spectabilis	3.0	360.0	108.0	130.8	39.2	5.1	612.5	183.6	224.5	67.3
Spermophilus spilosoma	2.2	251.5	75.4	91.5	27.4	--	--	--	--	--
Perognathus apache	6.8	116.2	34.8	42.4	12.7	5.1	87.2	26.1	37.4	11.2
P. merriami	1.0	9.0	3.0	3.2	1.0	--	--	--	--	--
P. penicillatus	--	--	--	--	--	--	--	--	--	--

Species	August					November				
		Biomass					Biomass			
		g/study area		g/ha			g/study area		g/ha	
	Population	wet	dry	wet	dry	Population	wet	dry	wet	dry
Dipodomys ordii	5.1	278.5	83.5	100.5	30.1	4.0	179.2	53.7	64.9	19.4
D. spectabilis	2.1	252.0	75.6	92.4	27.7	5.5	660.0	198.0	239.1	71.7
Spermophilus spilosoma	--	--	--	--	--	4.0	404.6	121.4	146.5	43.9
Perognathus apache	7.8	133.3	40.0	48.6	14.6	1.0	17.1	5.1	6.1	1.8
P. merriami	--	--	--	--	--	11.0	110.0	33.0	39.8	11.9
P. penicillatus	--	--	--	--	--	1.0	10.4	3.1	3.7	1.1

Table 2. Average small mammal (rodent) standing crop biomass, 1972

Sampling Period	Biomass		
	Wet wt (g/ha)	Dry wt (g/ha)	Dry wt (g/m^2)
Jornada			
May 9-13	760.1	228.0	0.022
June 27 - July 1	415.8	124.7	0.012
August	441.8	132.5	0.013
November	730.6	219.1	0.021
Pantex			
May 9-13	1252.4	375.7	0.037
June 26-30	1153.3	346.0	0.034
August 14-18	1128.2	338.4	0.033
November 18-22	401.3	120.3	0.012

The increase in density of the vegetation may have accounted for the changes in abundance of various species of small mammals. The cotton rat, *Sigmodon hispidus*, was the most abundant in numbers in the spring as well as being the most important in biomass (see Tables 2 and 3). Cotton rats continued as the most important species until autumn when *Peromyscus maniculatus* became the most abundant in numbers and most important in biomass. *Reithrodontomys megalotis* was the most abundant of all species numerically in the spring, but by autumn their numbers had waned and *R. montanus* had become second only to *Peromyscus* in numbers.

RESULTS OF LAGOMORPH CENSUS

Jornada Site

Lagomorphs were censused in May, July, August, and November. Populations of jackrabbits and cottontails and resulting biomass on a g/ha basis were somewhat less than in 1971 (see Table 4). Although vegetation sustained good growth in late summer and autumn, this seemed to have little impact on the jackrabbit population. However, cottontails were more abundant in the autumn than at any previous census time (see Table 4).

Pantex Site

The principal difference detected at Pantex in the jackrabbit population was an increase in the late summer sample. Perhaps this increase could be correlated to the luxuriant growth of vegetation in the preceding spring. Otherwise, populations of jackrabbits and cottontails remained about the same as in 1971 (see Table 4).

Table 3. Biomass of rodents based on densities estimated from live-trap data, Pantex Site, 1972.

Species	May					June				
		Biomass					Biomass			
		g/study area		g/ha			g/study area		g/ha	
	Population	wet	dry	wet	dry	Population	wet	dry	wet	dry
Peromyscus maniculatus	18.2	469.7	140.9	171.6	51.5	17.4	398.6	119.5	145.5	43.6
Sigmodon hispidus	15.8	1088.1	326.4	397.4	119.2	45.4	3331.4	999.4	1215.9	364.8
Reithrodontomys megalotis	39.0	762.0	228.6	278.0	83.4	16.0	243.0	72.9	88.7	26.6
R. montanus	10.4	108.1	32.4	39.5	11.8	--	--	--	--	--
Mus musculus	3.8	88.2	26.4	32.7	9.7	--	--	--	--	--
Perognathus flavescens	--	--	--	--	--	1.0	8.0	2.4	2.9	0.9
P. hispidus	--	--	--	--	--	--	--	--	--	--
P. merriami	--	--	--	--	--	--	--	--	--	--
Spermophilus spilosoma	--	--	--	--	--	--	--	--	--	--

Species	August					November				
		Biomass					Biomass			
		g/study area		g/ha			g/study area		g/ha	
	Population	wet	dry	wet	dry	Population	wet	dry	wet	dry
Peromyscus maniculatus	39.0	930.5	279.1	339.5	101.8	34.6	598.2	179.4	216.7	65.0
Sigmodon hispidus	18.0	1184.7	--	432.4	129.7	6.2	358.3	107.5	129.8	38.9
Reithrodontomys megalotis	14.4	281.3	84.4	102.8	30.8	3.2	34.2	10.2	12.3	3.7
R. montanus	2.0	20.8	6.2	7.6	2.3	20.0	165.0	49.5	59.7	17.9
Mus musculus	--	--	--	--	--	--	--	--	--	--
Perognathus flavescens	2.0	18.8	5.6	6.9	2.1	--	--	--	--	--
P. hispidus	3.4	112.3	33.7	41.0	12.3	--	--	--	--	--
P. merriami	4.0	40.0	12.0	14.6	4.3	--	--	--	--	--
Spermophilus spilosoma	1.0	80.0	24.0	28.8	8.6	--	--	--	--	--

Table 4. Seasonal estimates of biomass of lagomorphs on the Jornada and Pantex Sites.

	Biomass (g/ha)			
	Lepus		*Sylvilagus*	
Sample Period	1971	1972	1971	1972
		Jornada		
May	43.8	30.1	5.0	2.1
July	29.7	26.2	4.0	--
August	69.5	35.0	3.4	3.7
November	60.8	40.3	2.6	4.9
		Pantex		
June	48.1	40.2	6.39	4.3
August	42.6	45.0	2.32	1.1
October	44.59	40.9	4.88	3.5
	42.10	42.83	4.53	2.37

POPULATION DYNAMICS AND BIOMASS ASSAY

Jornada Site

Based on live-trapping results, estimates of density of the rodent population showed a slight increase from the low points reached in August and November 1971. Populations reached highs in May 1972 when an estimated 32 individuals resided on the live-trap plot and again in November with 27 on the plot (see Fig. 1 for 3-year trends in populations). Similar patterns to 1971 of higher densities in spring and early summer after recruitment (particularly of heteromyids) followed by lows in late summer were detected in 1972. The most notable aspect of the population was the appearance of some numbers of *Perognathus apache* in the spring that persisted into late summer.

In the November sample, most adult female *D. ordii* and *D. spectabilis* captured on the live-trap grid were either in breeding condition or pregnant. This late recruitment may have been in response to increased precipitation in late summer and early autumn and the subsequent accelerated growth of vegetation. The possibility of a marked increase in 1973 in the population was good.

Pantex Site

Populations of rodents on the live-trap plot continued at high density following the November 1971 increase. A total of 93 rodents were estimated to be present in the area in May 1972. This number decreased throughout the year with 64 estimated as residing in the area in November 1972 (see Fig. 2).

The most notable change of composition of the rodent fauna was the large increase in numbers of cotton rats, *Sigmodon hispidus*. The late summer and autumn rains in 1971 coupled with a moist and mild winter in

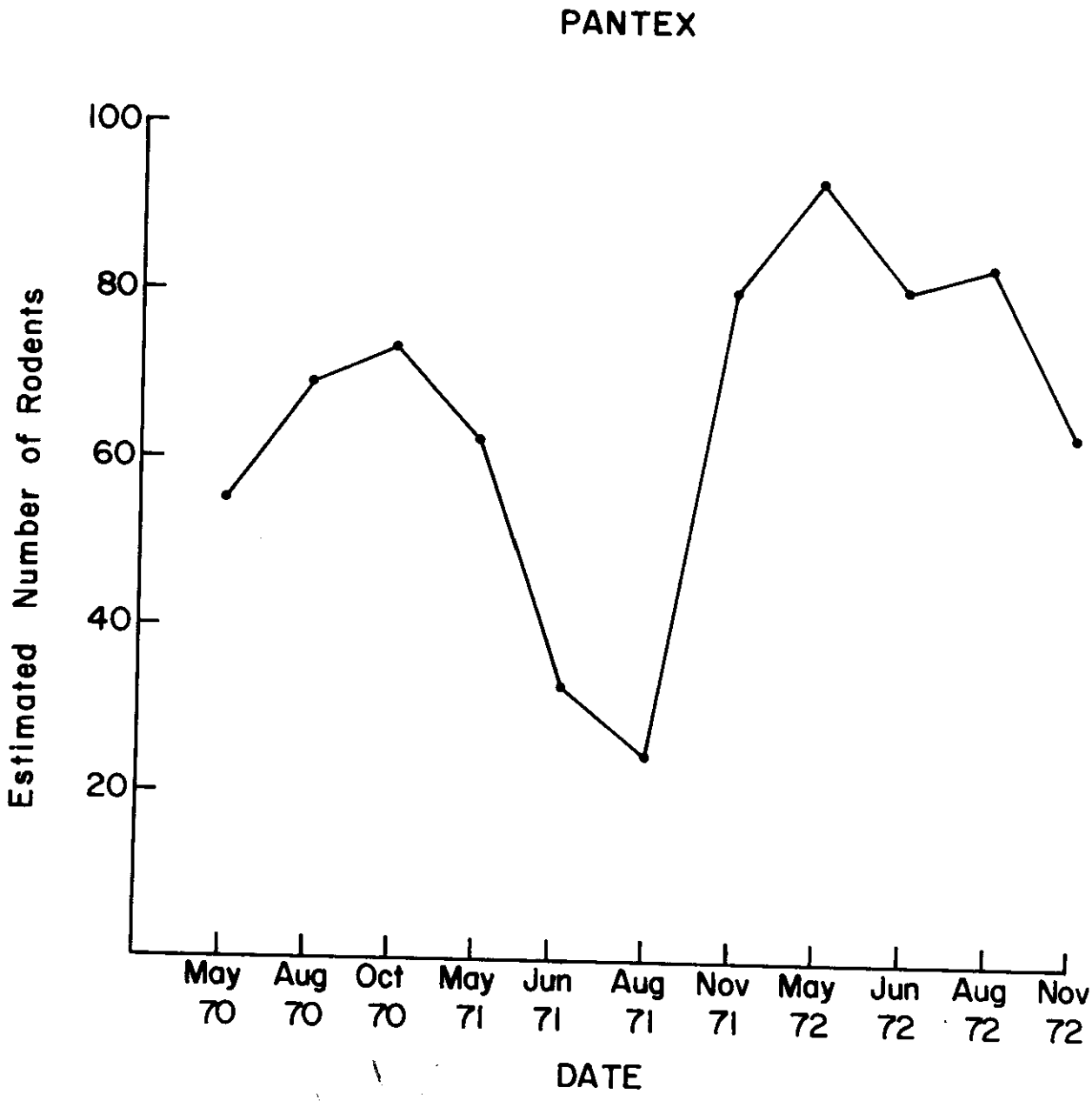

Fig. 2. Changes in density of the rodent population over a 3-year period at Pantex. Numbers on the ordinate represent the estimated (using a modified Zippin analysis) number of rodents, all species, present on the study plot.

1971-1972 produced dense vegetation and cover on the study plot. Cotton rats became the most important species, in terms of biomass, in the spring and summer of 1972. Runways of cotton rats were in evidence over the entire study plot. However, by autumn the number of cotton rats had decreased considerably. The vegetation had also undergone considerable drying in this period which was seemingly coupled with decreased precipitation.

The compositional changes in the rodent fauna as detected by our live-trapping results seem to be correlated with changes in vegetation density (as a result of precipitation patterns) and cessation of grazing, permitting plant successional stages to proceed. The rodent fauna species shifts could be those predictable on the basis of ecological succession. Precipitation seems the most important driving variable to the rodent population.

SACRIFICE TRAPPING PROGRAM

Small mammals (rodents and lagomorphs) were collected by snap-trapping and shooting on both sites. No lagomorphs were collected from the Pantex Site owing to the problems created by free-ranging cattle and the use of guns. The results of the collecting program are found in Table 5. Materials collected were preserved mostly as entire specimens in Formalin. All measurements, weights, and reproductive data were recorded on forms previously used in the 1970-1971 studies. All stomachs were forwarded to the food analysis laboratory at the Natural Resource Ecology Laboratory. A total of 125 mammals were collected from the Jornada and 205 were taken from the Pantex Site.

Table 5. Numbers of animals taken by sacrifice trapping and shooting.

Species	May	June	July	November
	Jornada Site			
Dipodomys merriami	19	8	1	1
D. ordii	23	4	8	4
D. spectabilis	3	--	--	--
Perognathus penicillatus	8	--	--	6
P. apache	--	1	--	--
P. flavus	--	--	--	3
Onychomys leucogaster	5	1	--	--
Neotoma micropus	--	--	1	2
Spermophilus spilosoma	3	4	--	3
Lepus californicus	6	4	--	5
Sylvilagus auduboni	--	--	1	1
Totals	67	22	11	25
	Pantex Site			
Mus musculus	15	--	7	--
Onychomys leucogaster	--	1	2	--
Perognathus flavus	--	--	1	--
P. hispidus	2	--	--	--
P. maniculatus	25	20	28	14
Reithrodontomys megalotis	13	10	--	1
R. montanus	--	1	--	4
Sigmodon hispidus	22	18	20	1
Totals	77	50	58	20

SUMMARY

The late autumn 1971 increase in population density and biomass of rodents on the Pantex Site was carried over into the spring of 1972 when biomass reached a peak for the 3-year study. A gradual decline occurred from August 1972 until the sampling period in November. This decline seemed correlated with a late summer-early autumn period of reduced precipitation.

Populations of rodents at the Jornada remained at low densities throughout the 1972 sampling times. Late summer and early autumn rains produced good growth in vegetation, and most adult small mammals live-trapped in November 1972 were in breeding condition portending an increase in the population for 1973.

Lagomorph populations, particularly jackrabbits, were somewhat fewer in numbers at the Jornada whereas they remained about the same at Pantex.

LITERATURE CITED

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APPENDIX I

FIELD DATA

Small Mammal Live Trapping, Grids

Small mammal live trapping data collected on the grids at the Jornada and Pantex Sites were recorded on form NREL-10. Jornada data are stored as a part of Grassland Biome Data Set A2U10B8. Pantex data are stored as a part of Grassland Biome Data Set A2U10BA. A sample data form and an example of the data are attached.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET - VERTEBRATE - LIVE TRAPPING

DATA TYPE	SITE	INITIALS	DATE			TREATMENT	REPLICATE	PLOT SIZE	GENUS	SPECIES	SUBSPECIES	CONDITION	MARK	NUMBER	MALE	FEMALE	WEIGHT	MOLT	LOCATION		PREVIOUS NO.
			Day	Mo	Yr														Row	Col	
1-2	3-4	5-7	8-9	10-11	12-13	14	15	16-19	21-22	23-24	25	27	29	31-34	36	38	40-44	46	48-49	51-52	54-57

DATA TYPE
- 01 Aboveground Biomass
- 02 Litter
- 03 Belowground Biomass
- 10 Vertebrate - Live Trapping
- 11 Vertebrate - Snap Trapping
- 12 Vertebrate - Collection
- 20 Avian Flush Census
- 21 Avian Road Count
- 22 Avian Road Count Summary
- 23 Avian Collection - Internal
- 24 Avian Collection - External
- 25 Avian Collection - Plumage
- 30 Invertebrate
- 40 Microbiology - Decomposition
- 41 Microbiology - Nitrogen
- 42 Microbiology - Biomass
- 43 Microbiology - Root Decomposition
- Microbiology - Respiration

SITE
- 01 Ale
- 02 Bison
- 03 Bridger
- 04 Cottonwood
- 05 Dickinson
- 06 Hays
- 07 Hopland
- 08 Jornada
- 09 Osage
- 10 Pantex
- 11 Pawnee

TREATMENT
- 1 Ungrazed
- 2 Lightly grazed
- 3 Moderately grazed
- 4 Heavily grazed
- 5 Grazed 1969, ungrazed 1970
- 6
- 7
- 8
- 9

MALE
- 0 Adult, non-breeding
- 1 Subadult, non-breeding
- ? Juvenile, non-breeding
- Adult breeding ?
- 4 Subadult breeding ?
- 5 Juvenile breeding ?
- 6 Adult breeding
- 7 Subadult breeding
- 8 Juvenile breeding
- 9 Undetermined

FEMALE
- 0 Adult, vulva inactive
- 1 Subadult, vuvla inactive
- 2 Juvenile, vulva inactive
- 3 Adult, vulva turgid
- 4 Subadult, vulva turgid
- 5 Juvenile, vulva turgid
- 6 Adult, vulva cornified
- 7 Subadult, vulva cornified
- 8 Juvenile, vulva cornified
- 9 Pregnant

CONDITION
- 0 Normal
- 1 Escaped
- 2 Torpid
- 3 Dead

MOLT
- 0 No evidence
- 1 Post-juvenile
- 2 Post-subadult
- 3 Adult (vernal)
- 4 Adult (autumnal)
- 5 Molt of unknown stage
- 6 Undetermined

MARK
- 0 Normal
- 1 Unmarked
- 2 Ear tag
- 3 Toe Clip
- 4 Ear tag and toe clip
- 5 Natural amputation

NREL-10 NATURAL RESOURCE ECOLOGY LABORATORY - COLORADO STATE UNIVERSITY - PHONE (303) 491-5571 - FORT COLLINS, COLORADO 80521

+++ EXAMPLE OF DATA +++

```
         1         2         3         4         5         6
1234567890123456789012345678901234567890123456789012345678901
1010TRM1811725      PEMA  0    2111 0         0  5  4
1010TRM1811725      PEMA  0    2112    0      0 12  3
1010TRM1811725      PEMA  0    1352 0         0 12  3
1010TRM1811725      PEMA  2    2113 1         1 12  5
1010TRM1911725      PEMA  0 3  2114 0         0 12  3
1010TRM1911725      PEMA  0 3  1352    0      0 12  3
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1010TRM1911725      REMO  3 1             0   0  5 10
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1010TRM2011725      SIHI  0 3  2133    0      0  7 11
1010TRM2011725      PEMA  0 3  2001    0      0  9 11
1010TRM2111725      PEMA  3 3  1352    0      0 12  4
1010TRM2111725      PEMA  3 1       0         0  2  4
1010TRM2111725      REMO  0 3  2023 0         0  8  3
1010TRM2111725      PEMA  3 1             0   0 12  4
1010TRM2111725      PEMA  0 3  2121    1      0 12  3
1010TRM2111725      PEMA  3 3  2031 0         0 12  6
1010TRM2111725      PEMA  3 1       0         0 12  6
1010TRM2111725      PEMA  3 3  2114    0      0  8  6
1010TRM2111725      REMO  2 3  2135 0         0  8  5
1010TRM2111725      PEMA  0 3  1424 0         0  3  6
1010TRM2111725      REME  3 3  2129    0      0  2  6
1010TRM2111725      PEMA  3 1             0   0  3  6
1010TRM2111725      REMO  0 3  2140 0         0  8  7
1010TRM2111725      PEMA  0 3  2013 0         0  8  6
```

1010TRM2111725	PEMA	3	3	2125	0		0	8	8
1010TRM2111725	REMO	3	1		0		0	9	8
1010TRM2111725	REMO	2	3	2141		0	0	9	8
1010TRM2111725	REMO	0	3	2142	0		0	12	10
1010TRM2111725	REMO	0	3	2143	0		2	12	10
1010TRM2111725	REMO	0	3	2144	0		0	8	10
1010TRM2111725	SIHI	0	3	2145	0		0	7	10
1010TRM2111725	PEMA	3	3	2034	0		0	7	10
1010TRM2111725	REMO	0	3	2150	0		0	6	9
1010TRM2111725	PEMA	0	3	2151		9	0	3	9
1010TRM2111725	REMO	0	3	2152		0	0	1	9
1010TRM2111725	PEMA	3	3	2004		0	0	3	11
1010TRM2111725	PEMA	3	1			0	0	3	12
1010TRM2111725	REMO	3	1			0	0	6	12
1010TRM2111725	REME	0	3	2153	0		0	6	12
1010TRM2111725	SIHI	0	3	2154	0		0	7	11
1010TRM2111725	SIHI	0	3	2155	0		0	7	11
1010TRM2111725	PEMA	3	3	2001		0	0	9	11
1010TRM2111725	REMO	0	3	2200		0	0	10	11
1010TRM2211725	REMO	0	3	2023	0		0	8	3
1010TRM2211725	PEMA	2	3	2112		0	0	12	3
1010TRM2211725	PEMA	2	3	2134	0		2	12	3
1010TRM2211725	SIHI	3	1			0	0	12	4
1010TRM2211725	REMO	0	3	2201	0		0	8	5
1010TRM2211725	REMO	0	3	2202		0	0	6	7
1010TRM2211725	REMO	1	3				0	6	7
1010TRM2211725	REMO	0	3	2203		0	0	8	9
1010TRM2211725	SIHI	0	3	2154	0		0	7	10
1010TRM2211725	REMO	0	3	2150	0		0	6	9
1010TRM2211725	REMO	0	3	2130	0		0	5	9
1010TRM2211725	REMO	0	3	2204	0		0	3	9
1010TRM2211725	REMO	0	3	2205	0		0	3	9
1010TRM2211725	SIHI	0	3	2132	0		0	7	11
1010TRM2211725	REMO	0	3	2200	0		0	10	11

Small Mammal Live Trapping, Assessment Lines

Small mammal live trapping data collected on assessment lines at the Jornada and Pantex Sites were recorded on form NREL-17. Jornada data are stored as a part of Grassland Biome Data set A2U10B8. Pantex data are stored as a part of Grassland Biome Data set A2U10BA. A sample data form and an example of the data are attached.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET--VERTEBRATE - ASSESSMENT LINES

Data Type	Site	Initials	Date			Treatment	Replicate	Genus	Species	Subspecies	Condition	Mark	Number	Male	Female	Weight	Molt	Line Number	Trap Number	Previous Number
			Day	Month	Year															
1-2	3-4	5-7	8-9	10-11	12-13	14	15	21-22	23-24	25	27	29	31-34	36	38	40-44	46	49	51-52	54-57
17																				

Data Type
17 Vertebrate - assessment lines

Site
01 ALE
02 Bison
03 Bridger
04 Cottonwood
05 Dickinson
06 Hays
07 Annual
08 Jornada
09 Osage
10 Pantex
11 Pawnee
12

Treatment
1 Ungrazed
2 Lightly grazed
3 Moderately grazed
4 Heavily grazed
5 Ungrazed current year only
A Diet light
B Diet moderate
C Diet heavy
D ESA - O
E ESA - W
F ESA - N
G ESA - WN

Male
0 Adult, non-breeding
1 Subadult, non-breeding
2 Juvenile, non-breeding
3 Adult breeding?
4 Subadult breeding?
5 Juvenile breeding?
6 Adult breeding
7 Subadult breeding
8 Juvenile breeding
9 Undetermined

Female
0 Adult, vulva inactive
1 Subadult, vulva inactive
2 Juvenile, vulva inactive
3 Adult, vulva turgid
4 Subadult, vulva turgid
5 Juvenile, vulva turgid
6 Adult, vulva cornified
7 Subadult, vulva cornified
8 Juvenile, vulva cornified
9 Pregnant

Condition
0 Normal
1 Escaped
2 Torpid
3 Dead

Molt
0 No evidence
1 Post-juvenile
2 Post-subadult
3 Adult (vernal)
4 Adult (autumnal)
5 Molt of unknown stage
6 Undetermined

Mark
0 Normal
1 Unmarked
2 Ear tag
3 Toe clip
4 Ear tag and toe clip
5 Natural amputation

+++ EXAMPLE OF DATA +++

```
         1         2         3         4         5         6
1234567890123456789012345678901234567890123456789012345678901
1710TRM231172
1710TRM241172      REMO  0 1       0         0  5 11
1710TRM241172      SIHI  0 1         0       0  6 10
1710TRM241172      SIHI  0 1       0         0  6 10
1710TRM241172      SIHI  0 1       0         0  6 10
1710TRM251172      REMO  0 1       0         0  3 11
1710TRM251172      PEMA  0 1       0         2  3 10
1710TRM251172      SIHI  0 1       0         0  6 10
1710TRM251172      SIHI  0 1       0         0  6 10
1710TRM251172      SIHI  0 1       0         0  7 12
1710TRM251172      REMO  0 1       0         0  8 12
1710TRM261172      SIHI  0 1         0       0  5 11
1710TRM261172      REMO  0 1         0       0  3 10
1710TRM261172      PEMA  0 1         0       0  4 12
1710TRM261172      PEMA  0 1       0         0  5 10
1710TRM261172      SIHI  0 1         0       0  6 10
1710TRM261172      SIHI  2 1         0       0  6 10
1710TRM261172      PEMA  0 1         0       0  7 10
1710TRM261172      REMO  0 1         0       0  8 12
1710TRM271172      SIHI  0 1         0       0  6 10
1710TRM271172      PEMA  0 1       0         0  3 10
1710TRM271172      SIHI  0 1         0       0  6 10
1710TRM271172      SIHI  0 1         0       0  6 10
1710TRM271172      SIHI  1                       6 10
1710TRM271172      REME  0 1         0       0  7 12
1710TRM271172      PEMA  0 1         0       0  7 10
1710TRM271172      PEMA  0 3 2120    0       0  7 10
1710TRM271172      REMO  0 1         0       0  8 12
```