Technical Report No. 258

SUMMARY REPORT OF SMALL MAMMAL

PROJECT GRID LIVE-TRAPPING DATA

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GRASSLAND BIOME

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ABSTRACT

This report summarizes the US/IBP Grassland Biome small mammal project data obtained from grid live-trapping. Data on 33 species sampled at eight research sites over a 4-year period (1970-1973) are included.

INTRODUCTION

The primary objective of the US/IBP Grassland Biome small mammal project, as it relates to the grassland ecosystem modelling effort, has been to provide estimates of small mammal density (g/ha) and reproductive status of the populations at different times during the year. The density estimates, which represent measurements of a state variable, provide information necessary in the construction and validation of the consumer section of the grassland ecosystem model. They also provide a broad data base which is valuable in comparing various aspects of small mammal demography in different types of grasslands.

This report includes density estimates based on grid live-trapping data for each research site, treatment, sampling date, and species for which data have been received and processed as of January 1, 1974. Evaluation of small mammal energetics, food habits, and impact upon their resource base will be considered in a later report.

Data have been collected on 33 species of small mammals from eight research sites (Table 1) which encompass six grassland types and a wide range of climatic conditions (Figure 1). They represent 4 years of field sampling on several different grazing intensity and abiotic stress treatments (Table 2). Detailed descriptions of the research sites and treatments are available elsewhere (Jameson 1969; Morris 1970; Collins 1970; Lewis 1970; Whitman 1970; Herbel and Pieper 1970; Risser 1970; Huddleston 1970; Rickard, Gilbert, and Cline 1972; Lauenroth and Sims 1973).

The field sampling procedure consisted of mark-release-recapture live-trapping for ten (1970) or five (1971, 1972, 1973) nights on 12 × 12 station grids with 15 m spacing between trap stations (based on the IBP standard minimum design of Grodzinski, Pucek, and Ryszkowski (1966)). Trapping on the

Table 1.   Checklist of small mammals occurring at US/IBP Grassland Biome research sites.   (See Appendix I for treatment codes.)

Site	Treatment	Species
ALE	1	*Lagurus curtatus* *Onychomys leucogaster* *Peromyscus maniculatus* *Perognathus parvus* *Reithrodontomys megalotis* *Spermophilus townsendii*
ALE	3	*Lagurus curtatus* *Onychomys leucogaster* *Peromyscus maniculatus* *Perognathus parvus* *Reithrodontomys megalotis* *Spermophilus townsendii*
Bridger	1	*Clethrionomys gapperi* *Microtus montanus* *Thomomys talpoides* *Zapus princeps*
Cottonwood	2	*Microtus ochrogaster* *Perognathus hispidus* *Peromyscus leucopus* *Peromyscus maniculatus* *Spermophilus tridecemlineatus*
Cottonwood	3	*Microtus ochrogaster* *Microtus pennsylvanicus* *Peromyscus maniculatus* *Reithrodontomys montanus* *Spermophilus tridecemlineatus*
Dickinson	1	*Microtus pennsylvanicus* *Onychomys leucogaster* *Perognathus fasciatus* *Peromyscus maniculatus* *Spermophilus tridecemlineatus*
Jornada	2	*Dipodomys merriami* *Dipodomys ordii* *Dipodomys spectabilis* *Neotoma albigula* *Neotoma micropus* *Onychomys leucogaster* *Perognathus apache* *Perognathus flavus* *Peromyscus maniculatus* *Perognathus merriami* *Perognathus penicillatus* *Spermophilus spilosoma*

Table 1. (Continued).

Site	Treatment	Species
Osage	1	*Blarina brevicauda* *Cryptotis parva* *Microtus ochrogaster* *Mus musculus* *Perognathus hispidus* *Peromyscus leucopus* *Peromyscus maniculatus* *Reithrodontomys fulvescens* *Reithrodontomys montanus* *Sigmodon hispidus*
Osage	3	*Cryptotis parva* *Microtus ochrogaster* *Perognathus hispidus* *Peromyscus maniculatus* *Reithrodontomys montanus* *Sigmodon hispidus* *Spermophilus tridecemlineatus*
Pantex	1	*Neotoma micropus* *Onychomys leucogaster* *Perognathus flavus* *Perognathus flavescens* *Perognathus hispidus* *Peromyscus maniculatus* *Reithrodontomys megalotis* *Reithrodontomys montanus* *Sigmodon hispidus*
Pantex	5	*Mus musculus* *Onychomys leucogaster* *Perognathus flavus* *Perognathus flavescens* *Perognathus hispidus* *Peromyscus maniculatus* *Perognathus merriami* *Reithrodontomys megalotis* *Reithrodontomys montanus* *Sigmodon hispidus* *Spermophilus tridecemlineatus*
Pawnee	2,4	*Dipodomys ordii* *Onychomys leucogaster* *Peromyscus maniculatus* *Spermophilus tridecemlineatus*
Pawnee	ESA	*Dipodomys ordii* *Microtus ochrogaster* *Onychomys leucogaster* *Peromyscus maniculatus* *Spermophilus tridecemlineatus*

SITE GRASSLAND TYPE
ALE - Palouse
Bridger - mountain
Cottonwood - mixed prairie
Dickinson - mixed prairie
Jornada - desert
Osage - tallgrass
Pantex - shortgrass
Pawnee - shortgrass
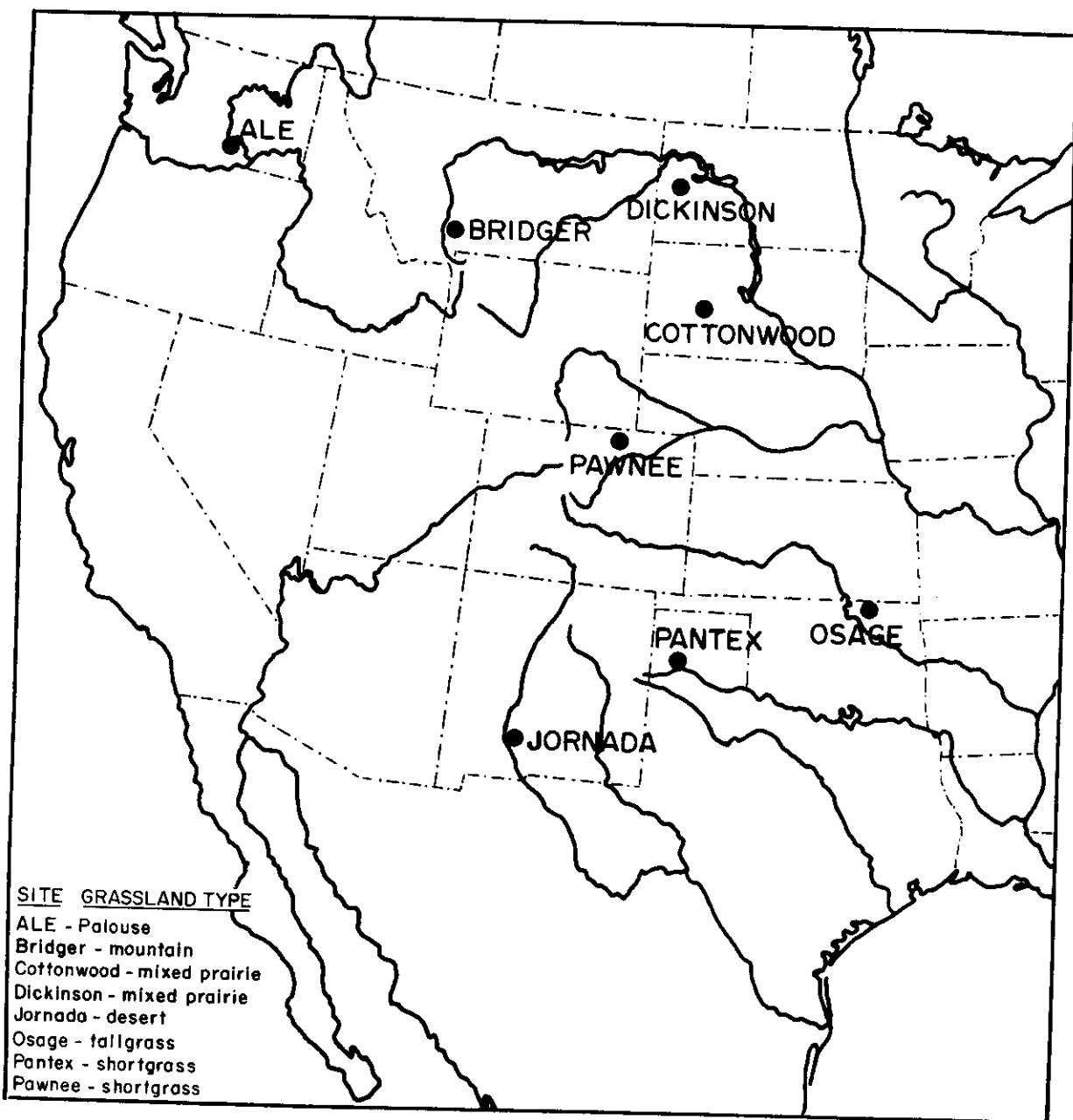
Figure 1. US/IBP Grassland Biome research site locations and grassland types.

Table 2.   Locations and dates of small mammal live-trapping in the
US/IBP Grassland Biome program.   (See Appendix I for treatment
codes.)

Site	Treatment	Date
ALE	1,3	3/22-3/26/71
		4/17-4/21/71
		5/13-5/17/71
		6/21-6/25/71
		7/19-7/23/71
		9/13-9/17/71
		3/21-3/23/72
		4/18-4/21/72
		5/23-5/26/72
		6/20-6/23/72
		7/18-7/21/72
		9/19-9/22/72
		11/14-11/15/72
		2/21-2/22/73
		3/20-3/23/73
		4/17-4/20/73
		5/22-5/25/73
		6/19-6/21/73
		7/24-7/27/73
		9/18-9/20/73
		10/30-11/1/73
Bridger	1	7/17-7/28/70
		7/12-7/16/72
		8/6 -8/10/72
		8/21-8/25/72
Bridger	3	7/ 5-7/ 9/72
		8/ 1-8/ 5/72
		8/16-8/20/72
Cottonwood	2	6/15-6/24/70
		8/14-8/23/70
		6/ 5-6/ 9/71
		7/22-7/26/71
Cottonwood	3	9/13-9/17/71
		6/13-6/20/72
		7/22-7/29/72
		9/10-9/16/72
Dickinson	1	6/13-6/23/70
		8/ 2-8/11/70
Jornada	2	4/ 8-4/17/70
		7/ 6-7/15/70
		10/30-11/8/70
		5/18-5/22/71
		6/22-6/26/71

Table 2. (Continued.)

Site	Treatment	Date
Jornada	2	8/16-8/20/71
		11/25-11/29/71
		5/ 9-5/13/72
		6/27-7/ 1/72
		8/15-8/24/72
		11/18-11/22/72
Osage	1	5/26-6/ 1/70
		8/23-9/ 1/70
		5/16-5/20/71
		8/16-8/20/71
		10/15-10/19/71
		5/18-5/24/72
		8/ 1-8/ 7/72
		10/13-10/18/72
Osage	3	5/23-5/27/72
		8/ 1-8/ 7/72
		10/13-10/18/72
Pantex	1	10/14-10/23/70
		6/23-6/27/71
		8/16-8/20/71
		11/19-11/23/71
		6/26-6/30/72
Pantex	5	5/12-5/21/70
		8/ 3-8/12/70
		5/18-5/22/71
		5/ 9-5/13/72
		8/14-8/18/72
		11/18-11/22/72
Pawnee	2,4	3/18-3/22/71
		4/30-5/ 4/71
		6/26-6/30/71
		8/20-8/24/71
		10/19-10/23/71
		4/10-4/14/72
		6/14-6/18/72
		8/ 1-8/ 5/72
		9/12-9/16/72
		10/19-10/23/72
Pawnee	ESA	7/29-8/ 3/71
		8/25-8/29/71
		10/24-10/28/71
		4/19-4/23/72
		6/20-6/24/72
		8/ 6-8/10/72
		9/18-9/22/72

Table 2. (Continued.)

Site	Treatment	Date
Pawnee		10/19-10/23/72
		4/25-4/29/73
		6/ 4-6/ 8/73
		7/10-7/14/73
		9/ 5-9/ 9/73
		10/ 6-10/ 9/73

Table 2. (Continued.)

environmental stress area treatments at Pawnee Site employed 6 × 7 station grids with 8 m spacing due to the small area of individual treatments. Exceptions to this general scheme may be noted in Table 2.

For purposes of comparison among the different grassland types, a standard sampling design was adopted. A standard procedure for estimation of population densities was adopted for the same reason. Estimates of numbers were made separately for each species, site, and sampling period by the following procedure. The Jolly stochastic model (Jolly 1965) was used, if (1) more than 10 individuals were marked and (2) the estimate from the model which includes recruitment and mortality was less than or equal to the total number of individuals marked (since the Jolly model corrects for immigration). The highest daily estimate, excluding the first and last days, was used. If these conditions were not met, the Zippin regression model (Zippin 1956) was used, in which only newly captured animals were considered, when (1) the R^2 for regression was greater than or equal to 0.70 and (2) the estimate of total number was greater than or equal to the total number of individuals marked (since a smaller number is obviously an underestimate). If neither of these sets of conditions was met, the total number of marked individuals was used as an estimate of numbers. This procedure is based on the findings of French (1971) with regard to the accuracy of the various population estimation models, in a study which tested the model results in an area of known population density.

Estimates of numbers were converted to densities by dividing each total number by the effective area of the trap grid influence. This was determined separately for each species, and was a function of the range of movements by individuals. All grid locations where an individual was captured during one sampling period were plotted and the greatest distance

between any two of these locations measured. These distances were averaged for the individuals of each species to yield a mean maximum distance moved (MMM). The effective area of grid influence was then considered to be circumscribed by a line one half the mean maximum distance moved beyond the outermost traps on the grid (Figure 2, Table 3). Our ordination of the species based on mean maximum distance moved is consistent both with independent data on movements obtained at our sites using assessment lines (Smith et al. 1971, Swift and Steinhorst, in press) and with literature values on home range sites in the extensive review by French, Stoddart and Bobek (in press).

A listing of our numbers and density estimates, along with pertinent information on total captures and Jolly and Zippin estimates are presented in Table 4.
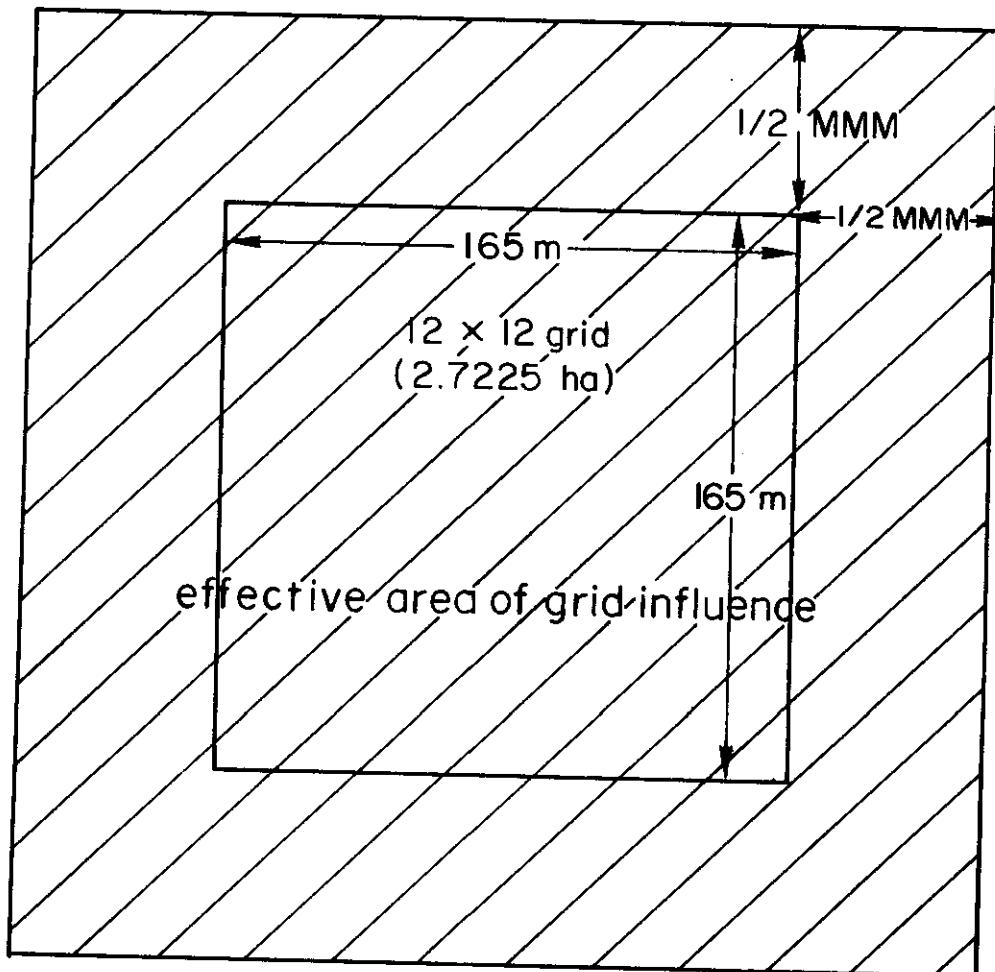
Figure 2.   Determination of the species specific effective
area of grid influence. MMM = mean maximum
distance moved as explained in the text.

Table 3.   Mean maximum distances moved (MMM) by 27 grassland small mammal species (calculated as explained in text).

Species[a]	Mean Maximum Distance Moved (m)	Number of Individuals (n)
Spermophilus spilosoma	97.70	14
Cryptotis parva	80.85	2
Microtus pennsylvanicus	69.80	6
Onychomys leucogaster	64.53	202
Spermophilus townsendii	57.85	48
Perognathus hispidus	49.15	6
Peromyscus leucopus	48.02	2
Peromyscus maniculatus	43.99	491
Spermophilus tridecemlineatus	40.68	115
Blarina brevicauda	39.49	26
Dipodomys ordii	39.46	215
Neotoma micropus	39.37	4
Dipodomys spectabilis	39.17	53
Sigmodon hispidus	35.41	123
Reithrodontomys montanus	30.87	28
Dipodomys merriami	30.00	1
Perognathus flavus	28.94	30
Perognathus parvus	27.55	445
Microtus montanus	27.39	25
Microtus ochrogaster	26.90	712
Lagurus curtatus	20.81	3
Perognathus apache	18.74	6
Neotoma albigula	15.00	1
Reithrodontomys megalotis	14.90	16
Perognathus penicillatus	7.50	2
Mus musculus	0.00	1
Perognathus fasciatus	0.00	1

[a] In the case of six species which were rarely caught, insufficient data were available to determine a mean maximum distance moved. In these instances mean maximum distances moved were assumed as follows:

PEFLC[b] and PEME = 28.944 (like PEFL), REFU = 30.870 (like REMO), CLGA = 26.903 (like MIOC), ZAPR = 43.989 (like PEMA), and THTA = 0.000 (because of its mode of living).

[b] See Appendix I for species codes.

Table 4. Estimates of numbers and densities of small mammals for US/IBP Grassland Biome sites. Also included are Jolly and Zippin estimates and total caputres. Appendix I contains a list of the four letter species codes used in this table.

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
ALE	1	7103	LACU	2.0	0.0	7.0	.010		
ALE	1	7103	ONLE	2.0	0.0	2.0	.167	2.00	.58
ALE	1	7103	PEMA	21.0	17.7	46.1	.411	2.00	.38
ALE	1	7103	PEPA	26.0	25.4	28.6	.694	17.70	4.05
ALE	1	7103	REME	2.0	0.0	0.0	0.000	25.40	6.85
ALE	1	7103	SPTO	2.0	0.0	7.0	.010	2.00	.62
ALE	1	7104	PEMA	24.0	17.4	20.9	.780	2.00	.40
ALE	1	7104	PEPA	63.0	55.3	62.6	.849	17.40	3.98
ALE	1	7104	REME	1.0	0.0	1.0	.063	55.30	14.92
ALE	1	7105	ONLE	1.0	0.0	0.0	0.000	1.00	.31
ALE	1	7105	PEMA	4.0	3.0	-9.0	.038	1.00	.19
ALE	1	7105	PEPA	60.0	58.4	58.4	.978	4.00	.92
ALE	1	7105	SPTO	10.0	0.0	-14.7	.055	58.40	15.75
ALE	1	7106	ONLE	1.0	1.0	1.0	1.000	10.00	2.01
ALE	1	7106	PEPA	45.0	42.4	46.8	.939	1.00	.19
ALE	1	7107	ONLE	1.0	0.0	1.0	.167	42.40	11.44
ALE	1	7107	PEMA	2.0	0.0	2.1	.844	1.00	.19
ALE	1	7107	PEPA	33.0	29.0	33.0	.996	2.10	.48
ALE	1	7109	ONLE	1.0	0.0	1.0	.375	29.00	7.82
ALE	1	7109	PEMA	5.0	4.0	5.6	.851	1.00	.19
ALE	1	7109	PEPA	10.0	9.0	9.9	.992	5.60	1.28
ALE	1	7203	ONLE	1.0	0.0	0.0	0.000	9.00	2.43
ALE	1	7203	PEMA	9.0	8.4	9.4	.997	1.00	.19
ALE	1	7203	PEPA	23.0	22.0	23.2	1.000	9.40	2.15
ALE	1	7203	SPTO	7.0	0.0	10.0	.750	22.00	5.93
ALE	1	7204	LACU	1.0	0.0	0.0	0.000	10.00	2.01
ALE	1	7204	PEMA	8.0	6.0	8.7	.776	1.00	.29
ALE	1	7204	PEPA	48.0	34.4	62.2	.390	8.70	1.99
ALE	1	7204	SPTO	11.0	12.0	47.0	.152	34.40	9.28
ALE	1	7205	ONLE	2.0	0.0	2.0	.111	11.00	2.22
ALE	1	7205	PEMA	3.0	3.0	3.0	1.000	2.00	.38
ALE	1	7205	PEPA	29.0	26.2	28.9	.994	3.00	.69
ALE	1	7205	SPTO	31.0	26.3	33.6	.955	26.20	7.07
ALE	1	7206	ONLE	2.0	0.0	2.0	.111	26.30	5.30
ALE	1	7206	PEMA	3.0	3.0	3.3	.569	2.00	.38
ALE	1	7206	PEPA	23.0	21.3	24.7	.977	3.00	.69
ALE	1	7206	SPTO	4.0	3.0	4.0	1.000	21.30	5.75
ALE	1	7207	ONLE	2.0	1.0	1.5	.333	4.00	.81
ALE	1	7207	PEMA	1.0	1.0	1.0	1.000	2.00	.38
ALE	1	7207	PEPA	26.0	23.4	25.5	.992	1.00	.23
ALE	1	7210	ONLE	1.0	1.0	1.0	1.000	23.40	6.31
ALE	1	7210	PEMA	1.0	1.0	1.0	1.000	1.00	.19
ALE	1	7210	PEPA	19.0	18.0	19.1	.988	1.00	.23
ALE	1	7303	LACU	2.0	0.0	2.0	1.000	18.00	4.86
ALE	1	7303	ONLE	3.0	3.0	3.3	.569	2.00	.58
ALE	1	7303	PEMA	10.0	9.0	13.0	.390	3.00	.57
ALE	1	7303	PEPA	31.0	22.0	91.3	.178	9.00	2.06
ALE	1	7303	SPTO	16.0	48.0	19.5	.629	22.00	5.93
ALE	1	7304	LACU	1.0	0.0	1.0	.111	16.00	3.22
ALE	1	7304	ONLE	2.0	0.0	0.0	0.000	1.00	.29
ALE	1	7304	PEMA	4.0	3.0	4.0	1.000	2.00	.38
ALE	1	7304	PEPA	28.0	25.2	26.4	.968	4.00	.92
ALE	1	7304	SPTO	27.0	71.5	33.1	.970	25.20	6.80
ALE	1	7305	ONLE	2.0	2.0	2.0	1.000	33.10	6.67
ALE	1	7305	PEMA	2.0	2.0	2.2	.818	2.00	.38
ALE	1	7305	PEPA	20.0	17.5	21.4	.949	2.20	.50
ALE	1	7305	SPTO	25.0	36.0	28.0	.983	17.50	4.72
ALE	1	7306	ONLE	3.0	0.0	2.7	.750	28.00	5.64
								3.00	.57

Table 4. (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
ALE	1	7306	PEMA	1.0	1.0	1.0	1.000		
ALE	1	7306	PEPA	15.0	10.0	24.5	.465	1.00	.23
ALE	1	7306	SPTO	2.0	1.0	2.0	.250	10.00	2.70
ALE	1	7307	ONLE	1.0	1.0	1.0	1.000	2.00	.40
ALE	1	7307	PEMA	1.0	1.0	1.0	1.000	1.00	.19
ALE	1	7307	PEPA	16.0	15.0	16.6	.960	1.00	.23
ALE	1	7310	ONLE	3.0	1.0	0.0	0.000	15.00	4.05
ALE	1	7310	PEMA	1.0	0.0	1.0	.250	3.00	.57
ALE	1	7310	PEPA	7.0	7.0	7.1	.999	1.00	.23
ALE	1	7311	ONLE	3.0	3.0	3.0	1.000	7.10	1.92
ALE	3	7103	LACU	1.0	1.0	1.0	.375	3.00	.57
ALE	3	7103	ONLE	3.0	2.0	3.1	.340	1.00	.29
ALE	3	7103	PEMA	18.0	18.1	25.1	.174	3.00	.57
ALE	3	7103	PEPA	33.0	33.3	39.6	.354	18.00	4.12
ALE	3	7103	SPTO	2.0	0.0	-.3	.375	33.00	8.90
ALE	3	7104	ONLE	2.0	2.0	1.8	.417	2.00	.40
ALE	3	7104	PEMA	13.0	11.0	13.7	.988	2.00	.38
ALE	3	7104	PEPA	64.0	59.0	64.1	.902	11.00	2.52
ALE	3	7104	SPTO	15.0	16.6	29.5	.106	59.00	15.91
ALE	3	7105	ONLE	3.0	2.0	4.0	.107	15.00	3.02
ALE	3	7105	PEMA	10.0	7.0	9.9	.739	3.00	.57
ALE	3	7105	PEPA	75.0	68.2	72.3	.974	7.00	1.60
ALE	3	7105	REME	1.0	0.0	0.0	0.000	68.20	18.40
ALE	3	7105	SPTO	21.0	17.1	20.2	.981	1.00	.31
ALE	3	7106	ONLE	3.0	3.0	3.1	.972	17.10	3.44
ALE	3	7106	PEMA	1.0	0.0	1.0	.167	3.10	.59
ALE	3	7106	PEPA	49.0	36.0	48.1	.860	1.00	.23
ALE	3	7106	SPTO	2.0	2.0	2.6	.208	36.00	9.71
ALE	3	7107	PEMA	1.0	0.0	1.0	.375	2.00	.40
ALE	3	7107	PEPA	33.0	28.1	33.7	.992	1.00	.23
ALE	3	7109	ONLE	1.0	1.0	1.0	.375	28.10	7.58
ALE	3	7109	PEMA	3.0	2.0	3.0	.167	1.00	.19
ALE	3	7109	PEPA	22.0	21.0	22.3	.964	3.00	.69
ALE	3	7203	LACU	4.0	2.0	2.0	.333	21.00	5.66
ALE	3	7203	ONLE	3.0	-0.0	3.3	.569	4.00	1.16
ALE	3	7203	PEMA	11.0	10.0	8.8	.471	3.00	.57
ALE	3	7203	PEPA	33.0	25.0	34.2	.916	10.00	2.29
ALE	3	7203	SPTO	12.0	9.8	15.7	.768	25.00	6.74
ALE	3	7204	ONLE	2.0	1.0	1.5	.333	9.80	1.97
ALE	3	7204	PEMA	9.0	5.0	172.0	.001	2.00	.38
ALE	3	7204	PEPA	49.0	38.2	44.4	.835	9.00	2.06
ALE	3	7204	SPTO	38.0	34.0	39.1	.989	38.20	10.30
ALE	3	7205	PEMA	2.0	1.0	2.0	.500	34.00	6.85
ALE	3	7205	PEPA	42.0	35.2	40.9	.945	2.00	.46
ALE	3	7205	SPTO	21.0	21.4	22.3	.987	35.20	9.49
ALE	3	7206	ONLE	1.0	0.0	1.0	1.000	22.30	4.49
ALE	3	7206	PEMA	2.0	1.0	0.0	0.000	1.00	.19
ALE	3	7206	PEPA	44.0	36.9	44.2	.839	2.00	.46
ALE	3	7206	SPTO	3.0	3.0	3.0	1.000	36.90	9.95
ALE	3	7207	PEPA	35.0	32.0	36.7	.991	3.00	.60
ALE	3	7210	ONLE	1.0	0.0	0.0	0.000	32.00	8.63
ALE	3	7210	PEMA	1.0	0.0	0.0	0.000	1.00	.19
ALE	3	7210	PEPA	30.0	27.0	31.7	.988	1.00	.23
ALE	3	7303	LACU	2.0	1.0	2.0	.333	27.00	7.28
ALE	3	7303	ONLE	3.0	3.0	3.3	.569	2.00	.58
ALE	3	7303	PEMA	8.0	8.0	8.8	.471	3.00	.57
ALE	3	7303	PEPA	24.0	21.0	34.2	.916	8.00	1.83
ALE	3	7303	SPTO	14.0	15.3	15.7	.768	21.00	5.66
								15.70	3.16

Table 4. (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
ALE	3	7304	ONLE	3.0	3.0	4.0	.600		
ALE	3	7304	PEMA	8.0	5.0	20.3	.058	3.00	.57
ALE	3	7304	PEPA	35.0	32.4	34.1	.993	8.00	1.83
ALE	3	7304	SPTO	21.0	20.8	19.8	.952	32.40	8.74
ALE	3	7305	ONLE	6.0	8.0	6.2	.475	20.80	4.19
ALE	3	7305	PEMA	3.0	1.0	3.0	1.000	6.00	1.14
ALE	3	7305	PEPA	28.0	23.3	25.2	.943	3.00	.69
ALE	3	7305	SPTO	17.0	20.0	17.5	.881	23.30	6.28
ALE	3	7306	ONLE	2.0	0.0	2.0	.250	17.50	3.52
ALE	3	7306	PEMA	1.0	0.0	1.0	1.000	2.00	.38
ALE	3	7306	PEPA	23.0	17.0	24.5	.910	1.00	.23
ALE	3	7306	SPTO	1.0	1.0	1.0	1.000	17.00	4.59
ALE	3	7307	ONLE	2.0	2.0	2.2	.818	1.00	.20
ALE	3	7307	PEPA	20.0	16.8	18.6	.957	2.20	.42
ALE	3	7310	ONLE	2.0	0.0	2.0	.250	16.80	4.53
ALE	3	7310	PEMA	1.0	0.0	1.0	1.000	2.00	.38
ALE	3	7310	PEPA	8.0	8.0	8.3	.992	1.00	.23
ALE	3	7311	ONLE	1.0	1.0	1.0	1.000	8.30	2.24
ALE	3	7311	PEMA	1.0	1.0	1.0	1.000	1.00	.19
ALE	3	7311	PEPA	5.0	4.0	5.1	.997	1.00	.23
BRI	1	7007	CLGA	2.0	0.0	2.8	.024	5.10	1.38
BRI	1	7007	MIMO	32.0	38.3	39.2	.801	2.00	.54
BRI	1	7007	THTA	4.0	0.0	4.6	.161	39.20	10.59
BRI	1	7007	ZAPR	1.0	1.0	1.0	1.000	4.00	1.47
BRI	1	7207	MIMO	3.0	0.0	0.0	0.000	1.00	.23
BRI	1	7207	PEMA	15.0	13.6	16.2	.860	3.00	.81
BRI	1	7207	ZAPR	2.0	0.0	0.0	0.000	13.60	3.11
BRI	1	7208	MIMO	8.0	0.0	7.5	.937	2.00	.46
BRI	1	7208	MIMO	11.0	0.0	18.9	.175	8.00	2.16
BRI	1	7208	PEMA	13.0	12.0	13.7	.944	11.00	2.97
BRI	1	7208	PEMA	14.0	0.0	14.4	.992	12.00	2.75
BRI	1	7208	ZAPR	1.0	0.0	1.0	.167	14.40	3.30
BRI	3	7207	MIMO	1.0	0.0	1.0	1.000	1.00	.23
BRI	3	7207	PEMA	20.0	13.7	22.3	.604	1.00	.27
BRI	3	7208	MIMO	1.0	0.0	1.0	.063	13.70	3.14
BRI	3	7208	PEMA	14.0	14.4	13.0	.955	1.00	.27
BRI	3	7208	PEMA	15.0	15.0	14.9	.839	14.00	3.21
COT	2	7006	MIOC	3.0	4.0	3.0	.977	15.00	3.43
COT	2	7006	PELE	1.0	0.0	1.0	.111	3.00	.81
COT	2	7006	PEMA	2.0	0.0	-.3	.141	1.00	.22
COT	2	7008	MIOC	3.0	1.0	3.2	.331	2.00	.46
COT	2	7008	PEMA	8.0	4.0	-22.6	.004	3.00	.81
COT	2	7008	SPTR	1.0	1.0	1.0	.111	8.00	1.83
COT	2	7106	PEMA	4.0	1.0	0.0	0.000	1.00	.24
COT	2	7107	MIOC	4.0	3.0	5.0	.196	4.00	.92
COT	2	7107	PEHI	2.0	0.0	2.0	.167	4.00	1.09
COT	2	7107	PEMA	3.0	3.0	3.1	.340	2.00	.44
COT	2	7107	SPTR	6.0	0.0	11.6	.039	3.00	.69
COT	3	7109	MIOC	7.0	0.0	11.7	.226	6.00	1.42
COT	3	7109	MIPE	1.0	0.0	1.0	.167	7.00	1.90
COT	3	7109	PEMA	8.0	8.3	8.5	.940	1.00	.18
COT	3	7206	MIOC	7.0	5.2	16.8	.055	8.50	1.95
COT	3	7206	PEMA	1.0	1.0	2.1	.865	7.00	1.90
COT	3	7206	SPTR	2.0	0.0	2.3	.318	2.10	.48
COT	3	7207	MIOC	10.0	12.0	-148.0	.003	2.00	.47
COT	3	7207	SPTR	5.0	0.0	-1.1	.090	10.00	2.72
COT	3	7209	MIOC	5.0	5.2	5.3	.891	5.00	1.18
COT	3	7209	PEMA	2.0	2.0	2.1	.865	5.30	1.44
								2.10	.48

Table 4.   (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
COT	3	7209	REMO	4.0	0.0	-.8	.039		
COT	3	7209	SPTR	1.0	0.0	1.0	.028	4.00	1.04
DIC	1	7006	MIPE	10.0	10.0	14.6	.773	1.00	.24
DIC	1	7006	ONLE	1.0	0.0	1.0	.167	10.00	1.81
DIC	1	7006	PEFA	2.0	0.0	1.1	.444	1.00	.19
DIC	1	7006	PEMA	8.0	6.0	9.9	.124	2.00	.73
DIC	1	7006	SPTR	7.0	6.0	6.2	.534	8.00	1.83
DIC	1	7008	PEFA	1.0	0.0	1.0	.259	7.00	1.65
DIC	1	7008	PEMA	8.0	8.0	7.9	.830	1.00	.37
DIC	1	7008	SPTR	-7.0	9.3	8.2	.343	8.00	1.83
JOR	2	7004	DIOR	109.0	103.8	103.7	.856	7.00	1.65
JOR	2	7004	DISP	15.0	13.5	15.5	.932	103.80	24.83
JOR	2	7004	NEAL	3.0	0.0	3.5	.082	13.50	3.24
JOR	2	7004	ONLE	6.0	2.0	6.6	.179	3.00	.93
JOR	2	7004	PEFL	17.0	28.0	17.2	.659	6.00	1.14
JOR	2	7004	SPSP	11.0	12.0	10.7	.789	17.00	4.52
JOR	2	7007	DIOR	55.0	55.6	53.7	.900	11.00	1.59
JOR	2	7007	DISP	20.0	29.3	19.1	.838	55.00	13.16
JOR	2	7007	NEAL	2.0	0.0	7.0	.004	20.00	4.80
JOR	2	7007	NEMI	6.0	0.0	5.4	.921	2.00	.62
JOR	2	7007	ONLE	8.0	4.3	8.0	.667	6.00	1.44
JOR	2	7007	PEPE	4.0	1.0	4.1	.240	8.00	1.52
JOR	2	7007	SPSP	12.0	16.0	11.7	.964	4.00	1.34
JOR	2	7011	DIME	1.0	0.0	1.0	.048	12.00	1.74
JOR	2	7011	DIOR	31.0	75.0	29.1	.601	1.00	.26
JOR	2	7011	DISP	12.0	42.5	12.3	.338	31.00	7.42
JOR	2	7011	NEAL	1.0	0.0	1.0	.167	12.00	2.88
JOR	2	7011	NEMI	1.0	0.0	1.0	.028	1.00	.31
JOR	2	7011	ONLE	7.0	6.0	8.3	.285	1.00	.24
JOR	2	7011	PEMA	1.0	0.0	1.0	.444	7.00	1.33
JOR	2	7011	SPSP	6.0	4.5	9.7	.070	1.00	.23
JOR	2	7105	DIME	2.0	1.0	1.3	.375	6.00	.87
JOR	2	7105	DIOR	20.0	15.0	19.4	.973	2.00	.53
JOR	2	7105	DISP	4.0	6.0	4.3	.930	15.00	3.59
JOR	2	7105	NEMI	1.0	0.0	1.0	.063	4.30	1.03
JOR	2	7105	ONLE	4.0	0.0	13.7	.014	1.00	.24
JOR	2	7105	SPSP	1.0	0.0	1.0	.063	4.00	.76
JOR	2	7106	DIOR	23.0	24.9	23.2	.975	1.00	.14
JOR	2	7106	DISP	6.0	4.0	5.1	.600	23.20	5.55
JOR	2	7106	NFMI	1.0	0.0	1.0	.167	6.00	1.44
JOR	2	7106	PEFL	1.0	1.0	1.0	1.000	1.00	.24
JOR	2	7106	PEPE	1.0	0.0	1.0	.063	1.00	.27
JOR	2	7106	SPSP	7.0	0.0	-2.9	.252	1.00	.34
JOR	2	7108	DIOR	2.0	2.0	2.1	.844	7.00	1.01
JOR	2	7108	DISP	1.0	0.0	2.1	.844	2.10	.50
JOR	2	7108	PFAP	1.0	0.0	1.0	.063	2.10	.50
JOR	2	7108	PEFL	1.0	0.0	1.0	.167	1.00	.30
JOR	2	7108	PEPE	1.0	0.0	1.0	.063	1.00	.27
JOR	2	7111	DIOR	1.0	0.0	1.0	1.000	1.00	.34
JOR	2	7111	DISP	4.0	7.5	4.0	.583	1.00	.24
JOR	2	7111	SPSP	3.0	0.0	8.0	.044	4.00	.96
JOR	2	7205	DIOR	12.0	23.8	12.6	.904	3.00	.43
JOR	2	7205	DISP	3.0	1.0	3.0	.167	12.60	3.01
JOR	2	7205	PEAP	6.0	3.0	0.0	0.000	3.00	.72
JOR	2	7205	PEME	1.0	0.0	1.0	1.000	6.00	1.78
JOR	2	7206	SPSP	2.0	0.0	3.0	.028	1.00	.27
JOR	2	7207	DIOR	12.0	10.1	12.3	.930	2.00	.29
JOR	2	7207	DISP	5.0	0.0	5.1	.969	10.10	2.42
								5.10	1.22

Table 4.   (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
JOR	2	7207	PEAP	6.0	1.0	5.1	.600	6.00	1.78
JOR	2	7208	DIOR	5.0	10.0	5.1	.997	5.10	1.22
JOR	2	7208	DISP	2.0	2.0	2.1	.844	2.10	.50
JOR	2	7208	PEAP	7.0	0.0	7.8	.141	7.00	2.07
JOR	2	7211	DIOR	4.0	0.0	-9.0	.007	4.00	.96
JOR	2	7211	DISP	5.0	2.0	5.5	.434	5.00	1.20
JOR	2	7211	PEAP	1.0	0.0	0.0	0.000	1.00	.30
JOR	2	7211	PEME	11.0	0.0	-1.0	.938	11.00	2.92
JOR	2	7211	PEPE	1.0	0.0	1.0	.063	1.00	.34
JOR	2	7211	SPSP	4.0	3.0	-2.2	.170	4.00	.58
OSA	1	7006	BLBR	3.0	1.0	3.9	.878	3.90	.93
OSA	1	7006	MIOC	140.0	107.7	134.5	.795	107.70	29.25
OSA	1	7006	REMO	3.0	2.0	2.6	.654	3.00	.78
OSA	1	7006	SIHI	6.0	9.0	6.0	.999	6.00	1.49
OSA	1	7008	BLBR	2.0	0.0	1.0	1.000	2.00	.48
OSA	1	7008	MIOC	95.0	78.0	90.4	.675	78.00	21.18
OSA	1	7008	REMO	13.0	12.0	12.5	.630	12.00	3.13
OSA	1	7008	SIHI	2.0	2.0	1.6	.310	2.00	.50
OSA	1	7105	BLBR	1.0	0.0	0.0	0.000	1.00	.24
OSA	1	7105	MIOC	2.0	0.0	-.3	.375	2.00	.54
OSA	1	7105	MUMU	1.0	0.0	1.0	.375	1.00	.37
OSA	1	7105	PELE	2.0	0.0	1.0	.167	2.00	.44
OSA	1	7105	PEMA	1.0	0.0	1.0	.167	1.00	.23
OSA	1	7105	REMO	1.0	0.0	1.0	.167	1.00	.26
OSA	1	7108	BLBR	2.0	0.0	2.0	.063	2.00	.48
OSA	1	7108	CRPA	5.0	0.0	-.3	.240	5.00	.83
OSA	1	7108	MIOC	9.0	5.0	-43.8	.004	9.00	2.44
OSA	1	7108	MUMU	1.0	0.0	0.0	0.000	1.00	.37
OSA	1	7108	PEHI	2.0	0.0	3.0	.028	2.00	.44
OSA	1	7108	PEMA	1.0	0.0	1.0	.167	1.00	.23
OSA	1	7108	SIHI	7.0	12.0	-3.6	.730	7.00	1.74
OSA	1	7110	BLBR	8.0	20.0	12.0	.278	8.00	1.91
OSA	1	7110	CRPA	6.0	0.0	13.7	.053	6.00	.99
OSA	1	7110	MIOC	8.0	9.3	16.0	.194	8.00	2.17
OSA	1	7110	MUMU	1.0	0.0	1.0	.063	1.00	.37
OSA	1	7110	PELE	1.0	0.0	1.0	.063	1.00	.22
OSA	1	7110	PEMA	3.0	2.0	2.6	.753	3.00	.69
OSA	1	7110	REMO	1.0	0.0	0.0	0.000	1.00	.26
OSA	1	7110	SIHI	26.0	18.7	106.6	.057	18.70	4.66
OSA	1	7205	BLBR	18.0	30.0	-14.1	.199	18.00	4.30
OSA	1	7205	MIOC	257.0	229.4	999.9	.005	229.40	62.29
OSA	1	7205	PEMA	17.0	29.2	31.4	.089	17.00	3.89
OSA	1	7205	REFU	1.0	0.0	1.0	.222	1.00	.26
OSA	1	7205	SIHI	18.0	26.7	-104.0	.003	18.00	4.48
OSA	1	7208	BLBR	17.0	12.0	22.0	.343	12.00	2.87
OSA	1	7208	MIOC	163.0	125.3	178.9	.935	125.30	34.02
OSA	1	7208	MUMU	1.0	0.0	1.0	.067	1.00	.37
OSA	1	7208	PEMA	9.0	11.2	8.5	.599	9.00	2.06
OSA	1	7208	REMO	2.0	0.0	-7.0	.004	2.00	.52
OSA	1	7208	SIHI	47.0	37.2	63.1	.442	37.20	9.26
OSA	1	7210	BLBR	30.0	40.0	37.8	.583	30.00	7.17
OSA	1	7210	MIOC	13.0	11.9	20.6	.311	11.90	3.23
OSA	1	7210	MUMU	1.0	0.0	1.0	.200	1.00	.37
OSA	1	7210	PEMA	4.0	2.0	7.0	.062	4.00	.92
OSA	1	7210	REFU	1.0	0.0	1.0	.200	1.00	.26
OSA	1	7210	REMO	1.0	0.0	0.0	0.000	1.00	.26
OSA	1	7210	SIHI	62.0	192.0	196.0	.105	62.00	15.44
OSA	3	7205	PEHI	3.0	1.0	4.8	.059	3.00	.65

Table 4. (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSU	NUMBER EST.	DENSITY EST.
OSA	3	7205	PEMA	13.0	17.5	13.8	.897	13.80	3.16
OSA	3	7205	REMO	4.0	0.0	-1.7	.375	4.00	1.04
OSA	3	7208	CRPA	5.0	0.0	100.0	0.000	5.00	.83
OSA	3	7208	MIOC	13.0	9.6	-31.3	.306	9.60	2.61
OSA	3	7208	PEHI	3.0	0.0	3.3	.435	3.00	.65
OSA	3	7208	PEMA	13.0	16.3	13.9	.764	13.90	3.18
OSA	3	7208	REMO	1.0	0.0	0.0	0.000	1.00	.26
OSA	3	7208	SIHI	8.0	6.6	8.2	.751	8.20	2.04
OSA	3	7208	SPTR	7.0	4.0	11.4	.091	7.00	1.65
OSA	3	7210	CRPA	7.0	0.0	-3.6	.275	7.00	1.16
OSA	3	7210	MIOC	30.0	22.4	221.4	.132	22.40	6.08
OSA	3	7210	PEHI	1.0	0.0	1.0	.200	1.00	.22
OSA	3	7210	PEMA	14.0	14.0	36.9	.053	14.00	3.21
OSA	3	7210	SIHI	20.0	17.6	19.3	.742	17.60	4.38
OSA	3	7210	SPTR	2.0	0.0	2.0	.625	2.00	.47
PAN	1	7010	NEMI	1.0	0.0	1.0	.074	1.00	.24
PAN	1	7010	ONLE	3.0	0.0	3.1	.808	3.10	.59
PAN	1	7010	PEFL	3.0	0.0	3.0	1.000	3.00	.80
PAN	1	7010	PEFLC	1.0	0.0	1.0	.444	1.00	.27
PAN	1	7010	PEHI	1.0	0.0	1.0	1.000	1.00	.22
PAN	1	7010	PEMA	42.0	32.8	38.4	.902	32.80	7.51
PAN	1	7010	REME	2.0	0.0	2.0	.167	2.00	.62
PAN	1	7010	REMO	24.0	12.0	23.8	.502	12.00	3.13
PAN	1	7010	SIHI	1.0	1.0	1.0	.444	1.00	.25
PAN	1	7106	ONLE	3.0	0.0	4.6	.052	3.00	.57
PAN	1	7106	PFFL	2.0	0.0	2.1	.844	2.10	.56
PAN	1	7106	PEHI	1.0	0.0	1.0	.167	1.00	.22
PAN	1	7106	PEMA	8.0	13.3	24.6	.138	8.00	1.83
PAN	1	7108	ONLE	1.0	0.0	1.0	.375	1.00	.19
PAN	1	7108	PEFL	3.0	0.0	3.0	.167	3.00	.80
PAN	1	7108	PEMA	18.0	24.2	20.9	.622	18.00	4.12
PAN	1	7111	ONLE	1.0	0.0	1.0	.063	1.00	.19
PAN	1	7111	PEMA	31.0	26.0	212.9	.003	26.00	5.95
PAN	1	7111	REME	1.0	0.0	1.0	.063	1.00	.31
PAN	1	7111	REMO	12.0	0.0	-68.7	.002	12.00	3.13
PAN	1	7206	PEFL	1.0	0.0	1.0	.167	1.00	.27
PAN	1	7206	PEMA	14.0	13.3	33.9	.175	13.30	3.05
PAN	1	7206	REME	15.0	0.0	-25.1	.039	15.00	4.63
PAN	1	7206	SIHI	36.0	51.3	71.5	.618	36.00	8.96
PAN	5	7005	ONLE	1.0	0.0	1.0	1.000	1.00	.19
PAN	5	7005	PEFLC	19.0	20.0	27.2	.122	19.00	5.05
PAN	5	7005	PEMA	4.0	10.0	4.0	.993	4.00	.92
PAN	5	7005	REMO	16.0	12.0	27.9	.082	12.00	3.13
PAN	5	7005	SPTR	2.0	0.0	-.7	.048	2.00	.47
PAN	5	7008	ONLE	1.0	1.0	1.0	.028	1.00	.19
PAN	5	7008	PEFL	16.0	3.0	22.3	.125	3.00	.80
PAN	5	7008	PEHI	1.0	1.0	1.0	.259	1.00	.22
PAN	5	7008	PEMA	19.0	34.0	18.8	.798	19.00	4.35
PAN	5	7008	REME	3.0	0.0	4.1	.040	3.00	.93
PAN	5	7008	REMO	9.0	3.0	61.6	.005	9.00	2.35
PAN	5	7008	SPTR	6.0	6.0	5.3	.759	6.00	1.42
PAN	5	7105	PEFL	15.0	18.7	18.2	.283	15.00	3.99
PAN	5	7105	PEMA	40.0	34.2	41.9	.892	34.20	7.83
PAN	5	7105	REMO	3.0	0.0	2.6	.753	3.00	.78
PAN	5	7105	SPTR	1.0	0.0	1.0	.167	1.00	.24
PAN	5	7205	MUMU	1.0	0.0	0.0	0.000	1.00	.37
PAN	5	7205	PEMA	17.0	16.6	18.2	.600	16.60	3.80
PAN	5	7205	REME	39.0	30.0	-.7	.950	30.00	9.27

Table 4. (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
PAN	5	7205	REMO	9.0	0.0	-382.0	0.000	9.00	2.35
PAN	5	7205	SIHI	15.0	14.4	15.8	.937	14.40	3.59
PAN.	5	7208	PEFL	2.0	0.0	0.0	0.000	2.00	.53
PAN	5	7208	PEHI	3.0	2.0	999.9	0.000	3.00	.65
PAN	5	7208	PEMA	33.0	30.3	858.5	.001	30.30	6.94
PAN	5	7208	PEME	4.0	0.0	0.0	0.000	4.00	1.06
PAN	5	7208	REME	13.0	0.0	-12.9	.081	13.00	4.02
PAN	5	7208	RFMO	2.0	0.0	-2.0	.028	2.00	.52
PAN	5	7208	SIHI	15.0	12.0	39.7	.044	12.00	2.99
PAN	5	7208	SPTR	1.0	0.0	1.0	.063	1.00	.24
PAN	5	7211	PEMA	24.0	19.3	66.2	.122	19.30	4.42
PAN	5	7211	REME	3.0	0.0	11.0	.007	3.00	.93
PAN	5	7211	REMO	18.0	29.3	-11.4	.143	18.00	4.69
PAN	5	7211	SIHI	6.0	0.0	-7.5	.052	6.00	1.49
PAW.	2	7103	DIOR	1.0	0.0	0.0	0.000	1.00	.24
PAW	2	7103	ONLE	9.0	36.0	9.1	.443	9.00	1.71
PAW	2	7103	PEMA	4.0	0.0	4.1	.586	4.00	.92
PAW	2	7105	ONLE	5.0	0.0	0.0	0.000	5.00	.95
PAW	2	7105	PEMA	3.0	0.0	2.3	.766	3.00	.69
PAW	2	7105	SPTR	4.0	0.0	5.7	.097	4.00	.95
PAW	2	7106	DIOR	2.0	0.0	2.0	.167	2.00	.48
PAW	2	7106	ONLE	9.0	9.2	10.7	.634	9.00	1.71
PAW	2	7106	SPTR	6.0	12.0	9.2	.123	6.00	1.42
PAW	2	7108	DIOR	3.0	2.0	3.1	.972	3.10	.74
PAW	2	7108	ONLE	14.0	13.3	14.5	.888	13.30	2.52
PAW	2	7108	PEMA	1.0	0.0	1.0	.167	1.00	.23
PAW	2	7108	SPTR	12.0	10.8	21.2	.122	10.80	2.55
PAW	2	7110	DIOR	3.0	3.0	3.0	1.000	3.00	.72
PAW	2	7110	ONLE	6.0	6.0	6.0	1.000	6.00	1.14
PAW	2	7110	PEMA	3.0	1.0	2.3	.766	3.00	.69
PAW	2	7204	DIOR	3.0	2.0	3.0	.375	3.00	.72
PAW	2	7204	ONLE	2.0	2.0	2.0	.583	2.00	.38
PAW	2	7204	PEMA	3.0	0.0	11.0	.007	3.00	.69
PAW	2	7204	SPTR	4.0	4.0	5.0	.154	4.00	.95
PAW	2	7206	DIOR	2.0	0.0	2.0	1.000	2.00	.48
PAW	2	7206	ONLE	5.0	2.0	5.3	.929	5.30	1.01
PAW	2	7206	SPTR	3.0	0.0	4.0	.273	3.00	.71
PAW	2	7208	DIOR	2.0	1.0	1.3	.375	2.00	.48
PAW	2	7208	ONLE	7.0	9.8	7.0	.929	7.00	1.33
PAW	2	7208	PEMA	1.0	0.0	1.0	.063	1.00	.23
PAW	2	7208	SPTR	5.0	2.0	5.3	.484	5.00	1.18
PAW	2	7209	DIOR	2.0	2.0	1.8	.417	2.00	.48
PAW	2	7209	ONLE	7.0	30.0	7.2	.891	7.20	1.37
PAW	2	7209	PEMA	1.0	0.0	1.0	.063	1.00	.23
PAW	2	7209	SPTR	1.0	0.0	1.0	.063	1.00	.24
PAW	2	7210	DIOR	2.0	0.0	2.0	1.000	2.00	.48
PAW	2	7210	ONLE	9.0	0.0	-18.7	.064	9.00	1.71
PAW	2	7210	PEMA	1.0	0.0	1.0	.375	1.00	.23
PAW	4	7103	ONLE	12.0	0.0	33.4	.042	12.00	2.28
PAW	4	7103	PEMA	4.0	1.0	2.7	.375	4.00	.92
PAW	4	7105	ONLE	7.0	4.0	17.0	.167	7.00	1.33
PAW	4	7105	PEMA	12.0	5.0	-40.0	.054	5.00	1.14
PAW	4	7105	SPTR	2.0	0.0	1.3	.375	2.00	.47
PAW	4	7106	ONLE	10.0	13.2	11.2	.825	11.20	2.13
PAW	4	7106	PEMA	5.0	0.0	18.8	.010	5.00	1.14
PAW	4	7106	SPTR	7.0	4.0	22.0	.014	7.00	1.65
PAW	4	7108	DIOR	2.0	1.0	4.0	.107	2.00	.48
PAW	4	7108	ONLE	6.0	6.0	5.8	.861	6.00	1.14

Table 4.   (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
PAW	4	7108	PEMA	3.0	0.0	3.2	.625	3.00	.69
PAW	4	7108	SPTR	7.0	5.0	31.3	.009	7.00	1.65
PAW	4	7110	DIOR	7.0	9.0	7.7	.960	7.70	1.84
PAW	4	7110	ONLE	12.0	11.0	10.8	.964	11.00	2.09
PAW	4	7110	PEMA	8.0	6.0	7.4	.765	8.00	1.83
PAW	4	7204	DIOR	2.0	1.0	2.1	.844	2.10	.50
PAW	4	7204	ONLE	3.0	3.0	2.9	.833	3.00	.57
PAW	4	7204	PEMA	11.0	7.8	14.6	.428	7.80	1.79
PAW	4	7204	SPTR	1.0	0.0	1.0	1.000	1.00	.24
PAW	4	7206	DIOR	2.0	0.0	2.6	.208	2.00	.48
PAW	4	7206	ONLE	2.0	1.0	2.0	.583	2.00	.38
PAW	4	7206	PEMA	6.0	8.0	6.0	.980	6.00	1.37
PAW	4	7208	DIOR	3.0	3.0	3.3	.519	3.00	.72
PAW	4	7208	ONLE	5.0	5.2	4.3	.756	5.00	.95
PAW	4	7208	PEMA	7.0	6.0	7.2	.986	7.20	1.65
PAW	4	7208	SPTR	4.0	4.0	4.0	1.000	4.00	.95
PAW	4	7209	DIOR	1.0	1.0	1.0	1.000	1.00	.24
PAW	4	7209	MIOC	1.0	0.0	1.0	.375	1.00	.27
PAW	4	7209	ONLE	4.0	5.2	4.1	.993	4.10	.78
PAW	4	7209	PEMA	15.0	13.2	17.4	.476	13.20	3.02
PAW	4	7209	SPTR	1.0	0.0	1.0	.375	1.00	.24
PAW	4	7210	DIOR	1.0	0.0	1.0	1.000	1.00	.24
PAW	4	7210	ONLE	7.0	5.8	6.6	.909	7.00	1.33
PAW	4	7210	PEMA	10.0	2.0	9.9	.615	2.00	.46
PAW	D1	7107	ONLE	4.0	2.0	5.3	.195	4.00	.76
PAW	D1	7107	PEMA	2.0	0.0	0.0	0.000	2.00	.46
PAW	D1	7108	ONLE	8.0	9.3	8.4	.729	8.40	1.59
PAW	D1	7108	SPTR	4.0	4.0	4.9	.403	4.00	.95
PAW	D1	7110	ONLE	5.0	4.0	4.3	.937	5.00	.95
PAW	D1	7110	SPTR	2.0	0.0	2.0	.167	2.00	.47
PAW	D1	7204	SPTR	3.0	0.0	-.5	.167	3.00	.71
PAW	D1	7206	ONLE	3.0	0.0	2.6	.753	3.00	.57
PAW	D1	7206	SPTR	5.0	2.0	5.6	.851	5.60	1.32
PAW	D1	7208	ONLE	5.0	2.0	5.5	.311	5.00	.95
PAW	D1	7208	SPTR	5.0	4.0	5.6	.411	5.00	1.18
PAW	D1	7209	ONLE	1.0	0.0	1.0	1.000	1.00	.19
PAW	D1	7209	PEMA	1.0	0.0	1.0	.375	1.00	.23
PAW	D1	7209	SPTR	3.0	0.0	3.5	.706	3.50	.83
PAW	D1	7210	ONLE	2.0	2.0	2.0	.167	2.00	.38
PAW	D1	7210	SPTR	1.0	1.0	1.0	.375	1.00	.24
PAW	D1	7304	MIOC	1.0	0.0	0.0	0.000	1.00	.27
PAW	D1	7304	ONLE	4.0	3.0	4.1	.586	4.00	.76
PAW	D1	7304	PEMA	8.0	4.0	10.6	.257	8.00	1.83
PAW	D1	7306	MIOC	1.0	0.0	1.0	1.000	1.00	.27
PAW	D1	7306	ONLE	2.0	0.0	2.1	.844	2.10	.40
PAW	D1	7306	PEMA	9.0	10.6	9.9	.942	9.90	2.27
PAW	D1	7306	SPTR	2.0	1.0	2.1	.844	2.10	.50
PAW	D1	7307	ONLE	3.0	0.0	0.0	0.000	3.00	.57
PAW	D1	7307	PEMA	4.0	4.0	4.3	.930	4.30	.98
PAW	D1	7307	SPTR	10.0	10.5	13.9	.272	10.00	2.36
PAW	D1	7309	ONLE	6.0	12.0	6.5	.656	6.00	1.14
PAW	D1	7309	PEMA	5.0	0.0	-1.1	.662	5.00	1.14
PAW	D1	7309	SPTR	5.0	3.0	5.3	.713	5.30	1.25
PAW	D1	7310	ONLE	4.0	2.0	3.4	.889	4.00	.76
PAW	D1	7310	PEMA	1.0	0.0	1.0	.333	1.00	.23
PAW	D1	7310	SPTR	2.0	1.0	1.5	.333	2.00	.47
PAW	D2	7107	ONLE	10.0	5.0	26.8	.224	5.00	.95
PAW	D2	7107	PEMA	7.0	0.0	8.8	.157	7.00	1.60

Table 4. (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
PAW	D2	7107	SPTR	3.0	0.0	3.3	.273	3.00	.71
PAW	D2	7108	ONLE	5.0	5.3	5.0	1.000	5.00	.95
PAW	D2	7108	PEMA	3.0	2.0	2.9	.833	3.00	.69
PAW	D2	7108	SPTR	3.0	0.0	3.5	.706	3.50	.83
PAW	D2	7110	ONLE	3.0	2.0	2.6	.753	3.00	.57
PAW	D2	7110	PEMA	4.0	0.0	6.0	.044	4.00	.92
PAW	D2	7110	SPTR	1.0	0.0	1.0	.167	1.00	.24
PAW	D2	7204	ONLE	1.0	0.0	1.0	1.000	1.00	.19
PAW	D2	7204	SPTR	2.0	0.0	7.0	.010	2.00	.47
PAW	D2	7206	ONLE	3.0	2.0	4.0	.231	3.00	.57
PAW	D2	7206	PEMA	1.0	0.0	1.0	.167	1.00	.23
PAW	D2	7206	SPTR	6.0	6.0	6.8	.730	6.80	1.61
PAW	D2	7208	DIOR	1.0	1.0	1.0	1.000	1.00	.24
PAW	D2	7208	ONLE	4.0	0.0	-9.0	.038	4.00	.76
PAW	D2	7208	SPTR	1.0	0.0	1.0	1.000	1.00	.24
PAW	D2	7209	ONLE	2.0	0.0	2.0	1.000	2.00	.38
PAW	D2	7209	PEMA	2.0	2.0	2.1	.844	2.10	.48
PAW	D2	7209	SPTR	1.0	0.0	1.0	.063	1.00	.24
PAW	D2	7210	ONLE	3.0	2.0	4.0	.107	3.00	.57
PAW	D2	7210	PEMA	5.0	2.0	4.9	.744	5.00	1.14
PAW	D2	7304	ONLE	4.0	0.0	16.3	.011	4.00	.76
PAW	D2	7304	PEMA	7.0	3.0	6.8	.735	7.00	1.60
PAW	D2	7304	SPTR	3.0	0.0	8.0	.044	3.00	.71
PAW	D2	7306	ONLE	5.0	0.0	0.0	0.000	5.00	.95
PAW	D2	7306	PEMA	11.0	9.0	16.7	.288	9.00	2.06
PAW	D2	7306	SPTR	4.0	0.0	14.0	.010	4.00	.95
PAW	D2	7307	DIOR	1.0	0.0	1.0	.167	1.00	.24
PAW	D2	7307	ONLE	2.0	2.0	2.0	1.000	2.00	.38
PAW	D2	7307	PEMA	7.0	3.0	7.8	.141	7.00	1.60
PAW	D2	7307	SPTR	8.0	5.8	9.4	.575	8.00	1.89
PAW	D2	7309	ONLE	4.0	2.0	2.7	.375	4.00	.76
PAW	D2	7309	PEMA	3.0	0.0	4.0	.107	3.00	.69
PAW	D2	7309	SPTR	2.0	1.0	2.0	.375	2.00	.47
PAW	D2	7310	ONLE	5.0	3.0	9.7	.043	5.00	.95
PAW	D2	7310	PEMA	4.0	3.0	6.1	.229	4.00	.92
PAW	D2	7310	SPTR	4.0	2.0	3.4	.889	4.00	.95
PAW	E1	7107	PEMA	4.0	1.0	3.9	.295	4.00	.92
PAW	E1	7108	PEMA	4.0	0.0	4.2	.844	4.20	.96
PAW	E1	7108	SPTR	1.0	0.0	1.0	.375	1.00	.24
PAW	E1	7110	ONLE	1.0	0.0	1.0	.063	1.00	.19
PAW	E1	7110	PEMA	5.0	1.0	6.6	.227	5.00	1.14
PAW	E1	7206	SPTR	4.0	1.0	-1.0	.044	4.00	.95
PAW	E1	7208	MIOC	1.0	0.0	1.0	.375	1.00	.27
PAW	E1	7208	PEMA	6.0	0.0	7.8	.216	6.00	1.37
PAW	E1	7208	SPTR	4.0	0.0	4.2	.844	4.20	.99
PAW	E1	7209	PEMA	5.0	3.0	8.6	.156	5.00	1.14
PAW	E1	7209	SPTR	2.0	0.0	-2.0	.028	2.00	.47
PAW	E1	7210	MIOC	2.0	0.0	7.0	.010	2.00	.54
PAW	E1	7210	PEMA	7.0	0.0	7.2	.986	7.20	1.65
PAW	E1	7304	MIOC	3.0	0.0	-.1	.766	3.00	.81
PAW	E1	7304	PEMA	13.0	4.0	13.3	.098	4.00	.92
PAW	E1	7306	MIOC	1.0	0.0	1.0	1.000	1.00	.27
PAW	E1	7306	PEMA	16.0	24.0	23.9	.449	16.00	3.66
PAW	E1	7306	SPTR	5.0	4.0	5.3	.766	5.30	1.25
PAW	E1	7307	MIOC	3.0	0.0	0.0	0.000	3.00	.81
PAW	E1	7307	ONLE	1.0	0.0	1.0	.167	1.00	.19
PAW	E1	7307	PEMA	24.0	60.0	0.0	0.000	24.00	5.49
PAW	E1	7307	SPTR	14.0	24.0	16.2	.396	14.00	3.31

Table 4. (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
PAW	E1	7309	PEMA	9.0	12.0	9.0	.943		
PAW	E1	7309	SPTR	1.0	0.0	1.0	.063	9.00	2.06
PAW	E1	7310	ONLE	1.0	0.0	1.0	1.000	1.00	.24
PAW	E1	7310	PEMA	9.0	14.0	7.9	.637	1.00	.19
PAW	E1	7310	SPTR	1.0	0.0	1.0	.111	9.00	2.06
PAW	E2	7107	PEMA	6.0	4.0	14.8	.030	1.00	.24
PAW	E2	7107	SPTR	3.0	0.0	0.0	0.000	6.00	1.37
PAW	E2	7108	ONLE	2.0	0.0	1.8	.417	3.00	.71
PAW	E2	7108	PEMA	5.0	0.0	6.0	.125	2.00	.38
PAW	E2	7108	SPTR	1.0	0.0	1.0	1.000	5.00	1.14
PAW	E2	7110	MIOC	1.0	0.0	0.0	0.000	1.00	.24
PAW	E2	7110	ONLE	2.0	0.0	-.3	.375	1.00	.27
PAW	E2	7110	PEMA	9.0	2.0	-2.1	.693	2.00	.38
PAW	E2	7206	PEMA	2.0	2.0	2.0	1.000	9.00	2.06
PAW	E2	7206	SPTR	3.0	0.0	-3.0	.010	2.00	.46
PAW	E2	7208	PEMA	5.0	0.0	5.8	.845	3.00	.71
PAW	E2	7208	SPTR	2.0	0.0	2.0	.583	5.80	1.33
PAW	E2	7209	ONLE	1.0	0.0	1.0	.375	2.00	.47
PAW	E2	7209	PEMA	2.0	0.0	0.0	0.000	1.00	.19
PAW	E2	7209	SPTR	1.0	0.0	1.0	.375	2.00	.46
PAW	E2	7210	PEMA	2.0	1.0	2.0	1.000	1.00	.24
PAW	E2	7304	MIOC	2.0	0.0	2.0	1.000	2.00	.46
PAW	E2	7304	PEMA	11.0	6.0	-15.2	.216	2.00	.54
PAW	E2	7304	SPTR	1.0	0.0	1.0	.167	6.00	1.37
PAW	E2	7306	PEMA	10.0	24.0	10.7	.588	1.00	.24
PAW	E2	7307	MIOC	1.0	0.0	1.0	.167	10.00	2.29
PAW	E2	7307	PEMA	16.0	0.0	-29.9	.086	1.00	.27
PAW	E2	7307	SPTR	7.0	4.0	-29.3	.017	16.00	3.66
PAW	E2	7309	MIOC	8.0	0.0	-.8	.754	7.00	1.65
PAW	E2	7309	ONLE	1.0	0.0	1.0	1.000	8.00	2.17
PAW	E2	7309	PEMA	2.0	1.0	1.3	.375	1.00	.19
PAW	E2	7309	SPTR	3.0	0.0	-.5	.167	2.00	.46
PAW	E2	7310	MIOC	6.0	2.0	-1.0	.600	3.00	.71
PAW	E2	7310	PEMA	6.0	3.0	-18.5	.007	6.00	1.63
PAW	E2	7310	SPTR	1.0	0.0	1.0	.111	6.00	1.37
PAW	F1	7107	ONLE	10.0	13.3	12.3	.499	1.00	.24
PAW	F1	7107	PEMA	2.0	0.0	0.0	0.000	10.00	1.90
PAW	F1	7107	SPTR	5.0	4.0	12.5	.052	2.00	.46
PAW	F1	7108	DIOR	1.0	0.0	1.0	1.000	5.00	1.18
PAW	F1	7108	ONLE	10.0	7.0	11.4	.303	1.00	.24
PAW	F1	7108	SPTR	4.0	2.0	-.4	.413	7.00	1.33
PAW	F1	7110	ONLE	3.0	3.0	2.9	.833	4.00	.95
PAW	F1	7110	PEMA	1.0	0.0	1.0	.375	3.00	.57
PAW	F1	7204	ONLE	3.0	3.0	3.1	.972	1.00	.23
PAW	F1	7204	SPTR	4.0	0.0	-.7	.375	3.10	.59
PAW	F1	7206	ONLE	3.0	2.0	3.2	.625	4.00	.95
PAW	F1	7206	PEMA	2.0	2.0	2.0	1.000	3.00	.57
PAW	F1	7206	SPTR	4.0	0.0	-10.0	.005	2.00	.46
PAW	F1	7208	ONLE	3.0	2.0	4.0	.107	4.00	.95
PAW	F1	7208	SPTR	5.0	2.0	6.6	.227	3.00	.57
PAW	F1	7209	ONLE	5.0	2.0	9.6	.135	5.00	1.18
PAW	F1	7209	PEMA	1.0	0.0	0.0	0.000	5.00	.95
PAW	F1	7209	SPTR	4.0	3.0	-3.8	.060	1.00	.23
PAW	F1	7210	ONLE	4.0	4.0	3.9	.916	4.00	.95
PAW	F1	7210	PEMA	4.0	0.0	6.0	.044	4.00	.76
PAW	F1	7210	SPTR	3.0	0.0	-2.0	.107	4.00	.92
PAW	F1	7304	ONLE	1.0	0.0	1.0	.375	3.00	.71
PAW	F1	7304	PEMA	13.0	7.5	13.3	.390	1.00	.19
								7.50	1.72

Table 4. (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
PAW	F1	7304	SPTR	5.0	1.0	5.7	.303	5.00	1.18
PAW	F1	7306	ONLE	4.0	0.0	6.3	.265	4.00	.76
PAW	F1	7306	PEMA	14.0	9.0	12.9	.395	9.00	2.06
PAW	F1	7306	SPTR	2.0	2.0	2.6	.208	2.00	.47
PAW	F1	7307	ONLE	5.0	2.0	5.3	.713	5.30	1.01
PAW	F1	7307	PEMA	9.0	12.0	9.0	.943	9.00	2.06
PAW	F1	7307	SPTR	11.0	8.2	15.3	.554	8.20	1.94
PAW	F1	7309	ONLE	5.0	2.0	4.8	.762	5.00	.95
PAW	F1	7309	PEMA	7.0	11.2	9.0	.342	7.00	1.60
PAW	F1	7309	SPTR	4.0	2.0	6.3	.265	4.00	.95
PAW	F1	7310	ONLE	3.0	2.0	2.4	.758	3.00	.57
PAW	F1	7310	PEMA	7.0	8.0	9.0	.641	7.00	1.60
PAW	F1	7310	SPTR	3.0	0.0	2.4	.758	3.00	.71
PAW	F2	7107	ONLE	4.0	3.0	3.8	.003	4.00	.76
PAW	F2	7107	SPTR	1.0	0.0	0.0	0.000	1.00	.24
PAW	F2	7108	ONLE	6.0	3.0	5.8	.861	6.00	1.14
PAW	F2	7108	SPTR	2.0	1.0	1.3	.375	2.00	.47
PAW	F2	7110	ONLE	5.0	14.0	5.6	.851	5.60	1.06
PAW	F2	7204	ONLE	1.0	1.0	1.0	1.000	1.00	.19
PAW	F2	7204	PEMA	2.0	1.0	2.1	.844	2.10	.48
PAW	F2	7204	SPTR	4.0	0.0	4.0	.007	4.00	.95
PAW	F2	7206	ONLE	1.0	1.0	1.0	1.000	1.00	.19
PAW	F2	7206	SPTR	2.0	0.0	0.0	0.000	2.00	.47
PAW	F2	7208	PEMA	3.0	0.0	2.9	.833	3.00	.69
PAW	F2	7208	SPTR	2.0	0.0	1.3	.375	2.00	.47
PAW	F2	7209	ONLE	1.0	0.0	1.0	.167	1.00	.19
PAW	F2	7209	PEMA	3.0	0.0	3.1	.340	3.00	.69
PAW	F2	7209	SPTR	1.0	0.0	1.0	.375	1.00	.24
PAW	F2	7210	ONLE	1.0	0.0	1.0	1.000	1.00	.19
PAW	F2	7210	PEMA	3.0	0.0	3.3	.519	3.00	.69
PAW	F2	7210	SPTR	1.0	0.0	1.0	.063	1.00	.24
PAW	F2	7304	ONLE	3.0	0.0	3.2	.625	3.00	.57
PAW	F2	7304	PEMA	17.0	9.8	38.0	.179	9.80	2.24
PAW	F2	7306	ONLE	2.0	2.0	2.0	.583	2.00	.38
PAW	F2	7306	PEMA	8.0	10.0	8.3	.402	8.00	1.83
PAW	F2	7306	SPTR	2.0	0.0	1.8	.417	2.00	.47
PAW	F2	7307	ONLE	3.0	2.0	3.0	1.000	3.00	.57
PAW	F2	7307	PEMA	8.0	7.5	10.5	.478	8.00	1.83
PAW	F2	7307	SPTR	7.0	4.0	13.6	.184	7.00	1.65
PAW	F2	7309	ONLE	4.0	0.0	4.0	.821	4.00	.76
PAW	F2	7309	PEMA	3.0	0.0	3.0	.375	3.00	.69
PAW	F2	7309	SPTR	5.0	3.0	0.0	0.000	5.00	1.18
PAW	F2	7310	ONLE	3.0	2.0	2.4	.758	3.00	.57
PAW	F2	7310	PEMA	6.0	4.0	0.0	0.000	6.00	1.37
PAW	F2	7310	SPTR	4.0	0.0	-.6	.727	4.00	.95
PAW	G1	7107	MIOC	5.0	6.0	17.0	.020	5.00	1.36
PAW	G1	7107	PEMA	6.0	7.5	9.2	.506	6.00	1.37
PAW	G1	7108	MIOC	18.0	18.0	17.4	.552	18.00	4.89
PAW	G1	7110	MIOC	27.0	30.0	-18.6	.410	27.00	7.33
PAW	G1	7110	PEMA	13.0	0.0	22.2	.066	13.00	2.98
PAW	G1	7204	MIOC	1.0	0.0	0.0	0.000	1.00	.27
PAW	G1	7206	MIOC	4.0	0.0	-.4	.413	4.00	1.09
PAW	G1	7206	SPTR	1.0	0.0	0.0	0.000	1.00	.24
PAW	G1	7208	DIOR	1.0	0.0	1.0	1.000	1.00	.24
PAW	G1	7208	MIOC	7.0	0.0	-8.3	.079	7.00	1.90
PAW	G1	7209	DIOR	1.0	0.0	1.0	.063	1.00	.24
PAW	G1	7209	MIOC	25.0	21.0	-291.0	.033	21.00	5.70
PAW	G1	7209	PEMA	2.0	0.0	-.3	.375	2.00	.46

Table 4. (Continued.)

SITE	TRT	DATE	SPECIES	TOTAL	JOLLY	ZIPPIN	RSQ	NUMBER EST.	DENSITY EST.
PAW	G1	7210	MIOC	31.0	34.3	69.9	.167	31.00	8.42
PAW	G1	7210	PEMA	9.0	2.0	10.3	.736	10.30	2.36
PAW	G1	7304	MIOC	9.0	9.0	25.0	.020	9.00	2.44
PAW	G1	7304	PEMA	31.0	76.5	98.1	.068	31.00	7.10
PAW	G1	7306	MIOC	14.0	12.0	33.9	.175	12.00	3.26
PAW	G1	7306	PEMA	28.0	71.5	69.0	.098	28.00	6.41
PAW	G1	7306	SPTR	2.0	0.0	7.0	.010	2.00	.47
PAW	G1	7307	MIOC	19.0	36.4	20.0	.893	20.00	5.43
PAW	G1	7307	PEMA	13.0	30.0	111.6	.005	13.00	2.98
PAW	G1	7307	SPTR	4.0	0.0	4.2	.530	4.00	.95
PAW	G1	7309	MIOC	43.0	74.7	-114.0	.092	43.00	11.68
PAW	G1	7309	PEMA	2.0	0.0	2.0	.375	2.00	.46
PAW	G1	7310	MIOC	35.0	127.5	-108.0	.116	35.00	9.50
PAW	G1	7310	ONLE	2.0	0.0	2.0	1.000	2.00	.38
PAW	G1	7310	PEMA	16.0	30.0	-19.8	.880	16.00	3.66
PAW	G1	7310	SPTR	1.0	0.0	0.0	0.000	1.00	.24
PAW	G2	7107	MIOC	2.0	1.0	-1.0	.063	2.00	.54
PAW	G2	7107	PEMA	11.0	16.5	-55.8	.014	11.00	2.52
PAW	G2	7108	MIOC	22.0	18.7	28.7	.810	18.70	5.08
PAW	G2	7108	PEMA	9.0	4.0	12.8	.336	9.00	2.06
PAW	G2	7110	MIOC	22.0	27.2	-29.5	.129	22.00	5.97
PAW	G2	7110	PEMA	20.0	80.0	23.7	.843	23.70	5.43
PAW	G2	7204	MIOC	1.0	0.0	0.0	0.000	1.00	.27
PAW.	G2	7206	MIOC	3.0	0.0	0.0	0.000	3.00	.81
PAW	G2	7208	MIOC	11.0	0.0	34.8	.014	11.00	2.99
PAW	G2	7209	MIOC	19.0	17.6	51.5	.109	17.60	4.78
PAW	G2	7209	PEMA	5.0	0.0	-5.2	.078	5.00	1.14
PAW	G2	7210	DIOR	1.0	1.0	1.0	1.000	1.00	.24
PAW	G2	7210	MIOC	16.0	12.5	29.4	.146	12.50	3.39
PAW	G2	7210	PEMA	8.0	8.0	7.9	.969	8.00	1.83
PAW	G2	7304	MIOC	5.0	0.0	-.1	.938	5.00	1.36
PAW	G2	7304	ONLE	2.0	0.0	0.0	0.000	2.00	.38
PAW	G2	7304	PEMA	29.0	14.7	-11.3	.111	14.70	3.37
PAW	G2	7306	MIOC	17.0	21.0	34.3	.747	34.30	9.31
PAW	G2	7306	PEMA	26.0	39.7	35.0	.426	26.00	5.95
PAW	G2	7306	SPTR	1.0	0.0	1.0	1.000	1.00	.24
PAW	G2	7307	MIOC	23.0	8.0	24.2	.986	8.00	2.17
PAW	G2	7307	PEMA	23.0	20.8	-97.4	.013	20.80	4.76
PAW	G2	7307	SPTR	10.0	9.8	12.1	.305	9.80	2.32
PAW	G2	7309	MIOC	42.0	91.7	-52.4	.440	42.00	11.40
PAW	G2	7309	PEMA	11.0	6.0	14.0	.687	6.00	1.37
PAW	G2	7309	SPTR	1.0	0.0	1.0	.375	1.00	.24
PAW	G2	7310	MIOC	30.0	0.0	-9.3	.994	30.00	8.15
PAW	G2	7310	PEMA	44.0	80.0	85.7	.780	85.70	19.62

ACKNOWLEDGMENTS

LITERATURE CITED

Collins, D. 1970. Comprehensive Network Site description, BRIDGER. US/IBP Grassland Biome Tech. Rep. No. 38. Colorado State Univ., Fort Collins. 10 p.

French, N. R. 1971. Small mammal studies in the US/IBP Grassland Biome. Ann. Zool. Fennici 8:48-53.

French, N. R., D. M. Stoddart, and B. Bobek. (In press). Patterns of demography in small mammal populations. *In* Petrusewicz, Golley, and Ryszkowski [ed.] Small mammals: Productivity and dynamics of populations. Cambridge Univ. Press, England.

Grodzinski, W., Z. Pucek, and L. Ryszkowski. 1966. Estimation of rodent numbers by means of prebaiting and intensive removal. Acta Theriologica 11:297-314.

Herbel, C. H., and R. D. Pieper. 1970. Comprehensive Network Site description, JORNADA. US/IBP Grassland Biome Tech. Rep. No. 43. Colorado State Univ., Fort Collins, 21 p.

Huddleston, E. W. 1970. Comprehensive Network Site description, PANTEX. US/IBP Grassland Biome Tech. Rep. No. 45. Colorado State Univ., Fort Collins. 12 p.

Jameson, D. A. [Coordinator]. 1969. General description of the Pawnee Site. US/IBP Grassland Biome Tech. Rep. No. 1. Colorado State Univ., Fort Collins. 32 p.

Jolly, G. M. 1965. Explicit estimates from capture-recapture data with both death and immigration--stochastic model. Biometrics 52:225-247.

Lauenroth, W. K., and P. L. Sims. 1973. Effects of water and nitrogen stresses on a shortgrass prairie ecosystem. US/IBP Grassland Biome Tech. Rep. No. 232. Colorado State Univ., Fort Collins. 117 p.

Lewis, J. K. 1970. Comprehensive Network Site description, COTTONWOOD. US/IBP Grassland Biome Tech. Rep. No. 39. Colorado State Univ., Fort Collins. 26 p.

Morris, M. S. 1970. Comprehensive Network Site description, BISON. US/IBP Grassland Biome Tech. Rep. No. 37. Colorado State Univ., Fort Collins. 23 p.

Rickard, W. H., R. O. Gilbert, and J. F. Cline. 1972. Vegetational studies on the ALE Reserve, 1971. US/IBP Grassland Biome Tech. Rep. No. 191. Colorado State Univ., Fort Collins. 56 p.

Risser, P. G. 1970. Comprehensive Network Site description, OSAGE, US/IBP Grassland Biome Tech. Rep. No. 44. Colorado State Univ., Fort Collins. 5 p.

Smith, M. H., R. Blessing. J. G. Chelton, J. B. Gentry, F. B. Golley, and J. T. McGinnis. 1971. Determining density for small mammal populations using a grid and assessment lines. Acta Theriologica 16(8):105-125.

Swift and Steinhorst. (In press). A technique for estimating small mammal population densities using a grid and assessment lines. (Submitted to J. Mammal.).

Whitman, W. C. 1970. Comprehensive Network Site description, DICKINSON. US/IBP Grassland Biome Tech. Rep. No. 40. Colorado State Univ., Fort Collins. 15 p.

Zippin, C. 1956. An evaluation of the removal method of estimating animal populations. Biometrics 12:163-189.

APPENDIX I

FOUR LETTER SPECIES CODES AND TREATMENT CODES

Species Codes:

BLBR	*Blarina brevicauda*
CLGA	*Clethrionomys gapperi*
CRPA	*Cryptotis parva*
DIME	*Dipodomys merriami*
DIOR	*Dipodomys ordii*
DISP	*Dipodomys spectabilis*
LACU	*Lagurus curtatus*
MIMO	*Microtus montanus*
MIOC	*Microtus ochrogaster*
MIPE	*Microtus pennsylvanicus*
MUMU	*Mus musculus*
NEAL	*Neotoma albigula*
NEMI	*Neotoma micropus*
ONLE	*Onychomys leucogaster*
PEAP	*Perognathus apache*
PEFA	*Perognathus fasciatus*
PEFL	*Perognathus flavus*
PEFLC	*Perognathus flavescens*
PEHI	*Perognathus hispidus*
PELE	*Peromyscus leucopus*
PEMA	*Peromyscus maniculatus*
PEME	*Perognathus merriami*
PEPA	*Perognathus parvus*
PEPE	*Perognathus penicillatus*
REFU	*Reithrodontomys fulvescens*
REME	*Reithrodontomys megalotis*
REMO	*Reithrodontomys montanus*
SIHI	*Sigmodon hispidus*
SPSP	*Spermophilus spilosoma*
SPRO	*Spermophilus townsendii*
SPTR	*Spermophilus tridecemlineatus*
THTA	*Thomomys talpoides*
ZAPR	*Zapus princeps*

Treatment Codes:

1 = ungrazed
2 = lightly grazed
3 = moderately grazed
4 = heavily grazed
5 = grazed 1969, ungrazed 1970
ESA = Environmental stress area