Technical Report No. 67

PROGRESS REPORT,
WORK ON BIRD FEEDING AND NESTING BEHAVIOR
AT THE PAWNEE SITE

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GRASSLAND BIOME

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ABSTRACT

The research scope during the summer of 1970 was changed from a specific study of the lark bunting (*Calamospiza melanocorys*) to a multispecies approach involving, in addition, McCown's longspurs (*Rhynchophanes mccownii*), chestnut-collared longspurs (*Calcarius ornatus*) and horned larks (*Eremophila alpestris*). The inter-relationships of these species were investigated in the field along two lines: (a) are there temporal segregations of breeding cycles, and (b) is there a spatial distribution of these songbirds?

Laboratory studies were initiated with young of each of the four species to determine daily growth rates, amount of foods consumed, and selection of food sizes.

RESULTS FOR SUMMER 1970

Locations within Sections 23W and 28W (T10N, R66W) were selected as permanent, principal study areas. Within these two areas, efforts were made to locate all nests, capture the adults, and color band them for individual recognition. The most successful capture technique was a slightly modified method of Martin (1969), consisting of placing a 12 m mist net in a "V" arrangement around the nest site, approaching the nest from the open end of the mist net "V" (once an adult was at the nest) and flushing it toward the vortex of the net. Birds became entangled or could be trapped against the net as they tried to escape. Only one bird escaped from this arrangement in over 50 times of use, and no associated nest abandonment occurred.

The color banding was based on the section of capture (red bands for Section 28, orange for Section 23), and the nest number of the individual. Thirty-four adults in Section 23W and ten in Section 28W were captured and color marked.

Although all species nested in the two study areas, lark buntings' nests were by far the most abundant. The nesting summary, using information from nests within and outside the principal study areas, is shown in Table 1. To reduce ground squirrel predation on nestlings, eight-inch tall, hardware-cloth fences were placed around those nests containing young. This fact should be considered when comparing nestling predation of 1969 (averaging 0.5 young/nest) with that of 1970. Nesting sequences were referenced by initiation date of egg laying (in some instances, it was necessary to approximate initiation of laying by allowing an incubation period of 12 days and a nestling period of eight days for the lark bunting), and initiation of egg

Table 1. Lark bunting nesting summary, 1970.

	Eggs Laid	Eggs Hatched	Eggs not Hatched	Eggs Preyed on	Fledglings	Young Preyed on
Number	130	86	2	42	54	0
% Total	-	66.2	1.5	32.3	41.2	0
Ave./nest	3.42	2.26	0.05	1.10	1.42	0
S.D.	0.75	1.68	0.22	1.65	1.04	0

laying by lark buntings in 1969 and 1970 is shown in Fig. 1. (Nesting data of the other species are combined with Dr. Ryder's data in his progress report).

The timing of reproductive cycles, which are closely correlated with maximum food demands (Lack, 1954), was measured by taking time budgets with a procedure of behavioral schedules which was modified from Orians (1961), Emlen (1966), Verner (1965) and S.G. Martin (personal communications). These schedules, coded for behavioral components and activity sites, lend insight not only into how each species spends its time, but also where. These codes are summarized in Table 2.

As Wiens et al. (1969) emphasized, a standardized frequency analysis of behavior is essential; and to partition activities into meaningful components, a timed sequence base is necessary. Such a base was supplied by a variable-frequency metronome built from information from Wiens et al. (1969). The frequency used in this study was one metronome pulse every ten seconds.

All behavioral observations were made from a 15 foot tower bolted to the bed of a pickup truck. The schedules, consisting of a consecutive 20 minute observational period, recorded the birds' activities and position. For each sequence, a color banded bird was randomly selected for observation. Only those schedules lasting for the entire 20 minutes were included, and these now await computer analysis.

Spatial distribution of the four species of songbirds was studied by censusing random areas on the CPER. This technique consisted of recording the locations of all birds seen, the vegetational type, and the height above

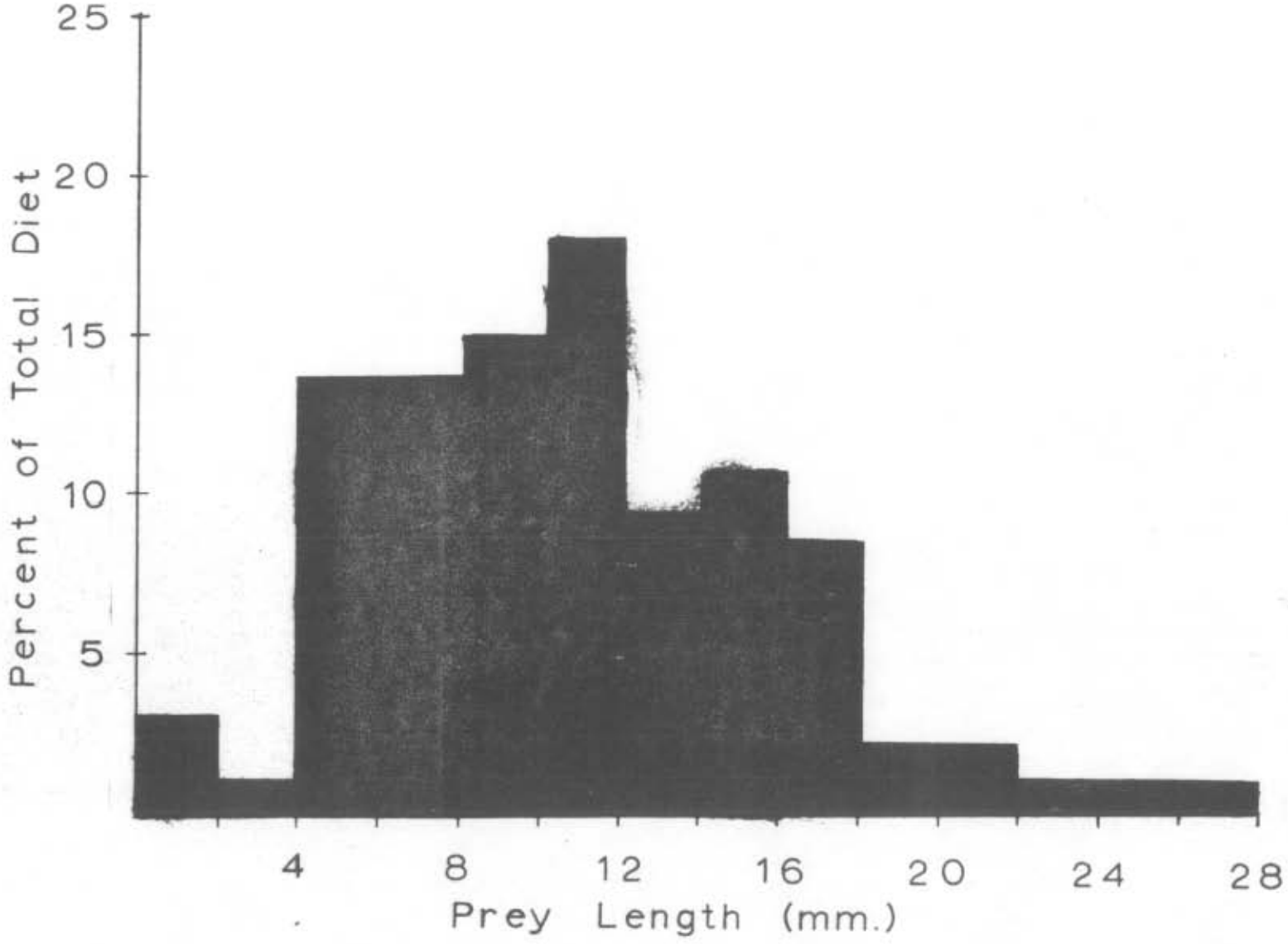

Fig. 1. Size distribution of intact prey fed to nestling lark buntings.

Table 2. Symbols used in activity coding.

F	FLIGHT, DIRECT
FS	FLIGHT SONG
S	STATIONARY SONG
A	ABBREVIATED SONG
...n	NUMBER OF NOTES IN SONG
P	PREEN
PC	PREY CAPTURE
C	CHASE
BW	BILL WIPE
TF	TAIL FLICK
M_A	ATTEMPTED MOUNT
FO	FACE OFF, ♂ FACES ♀
WF	WING FLICK
Cp	COPULATION
Cpd	POST-COPULATORY DISPLAY
MF	MOTH FLIGHT, SLOW WING BEATS
MFn	MOTH FLIGHT, JOINED BY (n) OTHER
NA	INACTIVE
I	INCUBATION
E ⓝ	ENTER NEST
W	WALK
h	HOP
f	FORAGE
sat	STATIONARY
j	JOIN
ws	WING SPREAD
s	SHAKE
wd	WING DROP
sF	SHORT FLIGHT
ff	FEATHER FLUFF
sup	SUPPLANT INTRUDER
sc	SCRATCH
cc	NEST RELIEF SONG (CHITTER CALL)
sh	SHRUB
gd	GROUND
p	POLE
fn	FENCE
SB	SALTBUSH
RB	RABBITBRUSH
st	STAKE
ⓝ	NEST AREA
/	METRONOME PULSE
~~HH~~	CONTINUING BEHAVIOR

ground the bird was positioned in a 1/16th square mile area. This area was referenced by marked flags, positioned every 100 feet. A compass and tape measure were used to position the grids at least the day before sampling. The observations were divided into 30-minute time intervals, consisting of six, five-minute tallies, during which symbols of each species were positioned on a reference grid; the height aboveground where they occurred and the vegetational type associated with each position were noted. The vegetational types were identified by the procedure of Kuchler (1955). Four replications of this 30-minute observational interval were made for each plot. Thirty plots were censused, and although computer analysis of these data is not completed, it should show specific correlations, if they exist, of each species and represented vegetational types.

Two young of each of the four species were taken from nests when all were four days old and were raised in a laboratory situation. Methods recommended by Lanyon and Lanyon (1969) were followed in caring for the young. Grasshoppers were used as the primary food source, supplemented by the diet recommended by the Lanyons. Sizes of the grasshoppers were measured, and the semi-liquid diet solution weighed, before feeding. The lengths of grasshoppers were then correlated with the weights of oven-dried samples of the same size. The young were weighed in the morning and evening of each day. The growth data and weight of food consumed are summarized in Tables 3 to 6. All birds were kept at ambient temperature in cages protected from direct sunlight. At each feeding time, food was offered to each of the young until it was refused. It was necessary to force-feed horned larks and McCown's longspurs the first two days of the test, and this probably accounts for the initially small daily weight gain.

Table 3. Growth of horned larks in captivity.

Day	Mean Weight	Avg Daily Gain (g)	Dry Wt Food Consumed (g)
4	12.36	---	---
5	12.70	0.34	1.35
6	14.50	1.80	3.51
7	18.95	4.45	5.62
8	19.25	1.30	3.20
9	20.21	0.96	2.81
10	20.93	0.72	2.70
11	21.56	0.65	2.75
12	22.14	0.56	2.11
13	22.61	0.47	2.05
14	22.96	0.35	2.38
15	23.35	0.39	2.20

Table 4. Growth of McCown's longspurs in captivity.

Day	Mean Weight	Avg Daily Gain (g)	Dry Wt Food Consumed (g)
4	12.35	---	---
5	14.00	1.65	2.30
6	15.78	1.78	2.81
7	18.28	2.50	3.15
8	19.78	1.50	2.67
9	20.30	0.52	1.57
10	20.65	0.35	1.49
11	20.93	0.28	1.40
12	21.19	0.26	1.40
13	21.37	0.18	1.42
14	21.50	0.13	1.35
15	21.55	0.05	1.37

Table 5. Growth of chestnut-collared longspurs in captivity.

Day	Mean Weight	Avg Daily Gain (g)	Dry Wt Food Consumed (g)
4	9.37	---	---
5	11.02	1.65	2.35
6	12.87	1.85	2.85
7	14.92	2.05	3.05
8	15.87	0.95	1.90
9	16.80	0.93	1.78
10	17.34	0.54	1.63
11	17.59	0.25	1.37
12	17.96	0.37	1.54
13	18.18	0.22	1.40
14	18.45	0.27	1.43
15	18.68	0.23	1.37

Table 6. Growth of lark buntings in captivity.

Day	Mean Weight	Avg Daily Gain (g)	Dry Wt Food Consumed (g)
4	14.40	---	---
5	16.75	2.35	3.05
6	18.05	1.30	2.43
7	21.80	1.30	2.43
8	23.22	1.42	2.49
9	24.37	1.15	2.10
10	25.30	0.93	1.83
11	26.15	0.85	1.45
12	27.02	0.87	1.41
13	27.58	0.56	1.47
14	28.01	0.43	1.49
15	28.46	0.45	1.42

Fig. 2 shows the positions of nests found in Section 23W. The locations were fixed with use of a compass and tape measure and scaled to a Central Basin Watershed Map prepared by M&I Inc. This study area is approximately 10.4 ha, and a total of 17 nests were found (13 lark buntings = LB, 3 McCown's longspurs nests = ML, and one western meadowlark = WML).

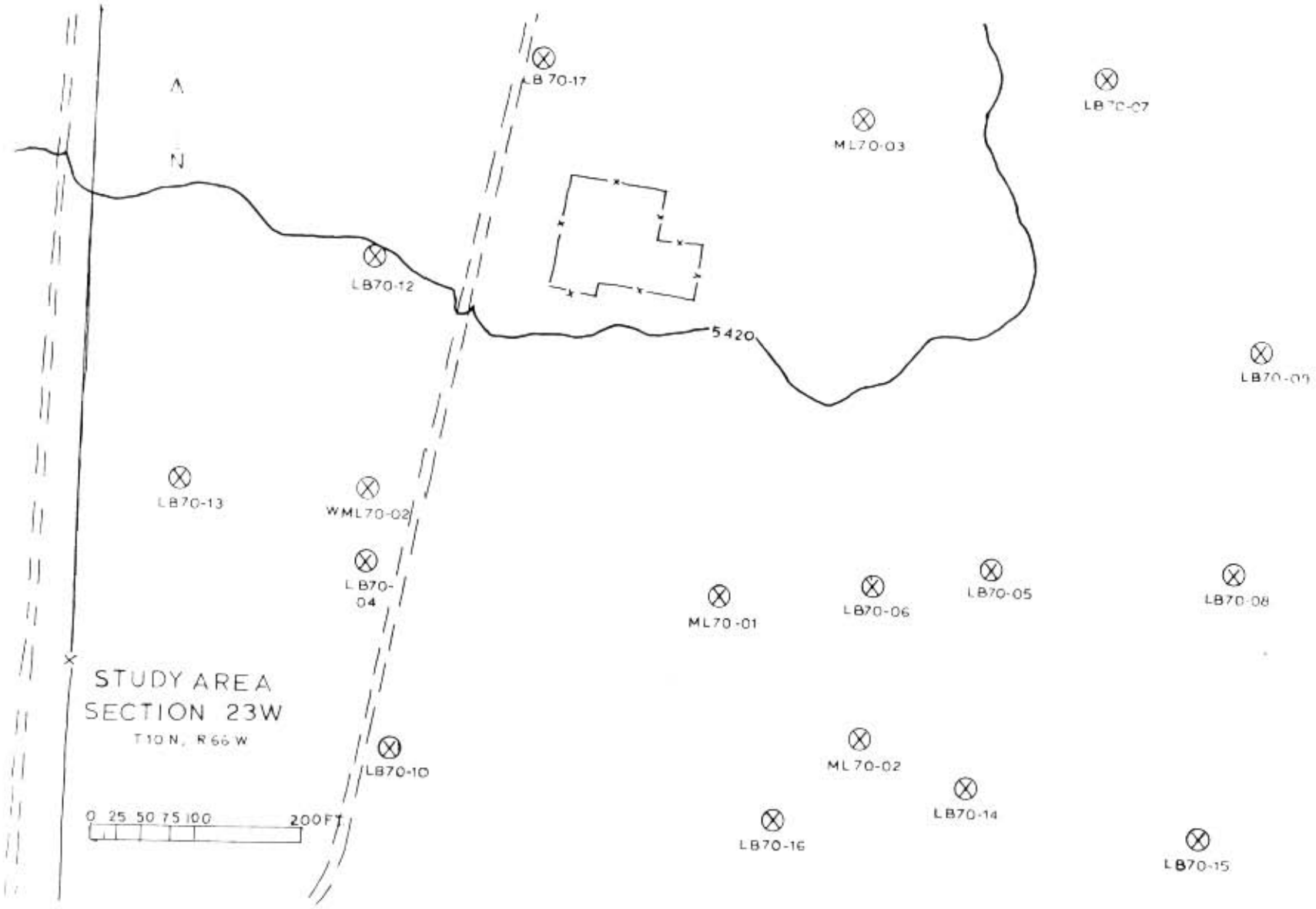
N
LB70-17
ML70-03
LB70-07
LB70-12
5420
LB70-09
LB70-13
WML70-02
LB70-04
ML70-01
LB70-06
LB70-05
LB70-08
STUDY AREA
SECTION 23W
T10N, R66W
LB70-10
ML70-02
LB70-14
LB70-16
LB70-15
0 25 50 75 100 200FT

Fig. 2.

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APPENDIX I

FIELD DATA

Avian Diet Data

Avian diet data collected in 1970 at the Pawnee Site is Grassland Biome Data Set A2U205B. The data set consists of three different types of cards, each in its own format. An explanation of the three different types of cards follows, followed by a listing of an example of the data.

Card Type I - Bird Card

Columns	Contents
1-5	The letters IDENT
7-12	Abbreviation of birds, common name and a sequence number for that species, e.g., LB2166.
14-19	Genus and species code of the bird.
19-25	Collector's number for this bird.
27-28	Activity - 2 digit code.
30-31	Type of sample - 2 digit code.
33-34	State of sample - 2 digit code.
36-37	Number of pieces of graft $\geq$0.5 mm in length.
39-41	First estimate of proportion of animal food, percent.
43-45	First estimate of proportion of plant food, percent.
47-49	Number of animal items present.
51-53	Number of seeds present.

Card Type II - Animal Food Card

Columns	Contents
1-5	The letters INVER
7-25	Same thing as Type I cards.
27-28	Class - 2 digit code.
30-31	Order
33-35	Suborder
37-39	Family
41-43	Subfamily
45-47	Genus
49-50	Species
52-53	Ecological function - 2 digit code
55-56	Stage of development - 2 digit code
58-62	Length (mm)
64-66	Number of individuals
68-73	Day weight/individual (g)
75-79	Caloric valve (Kcal/g dry wt)

Card Type III - Plant Food Card

Columns	Contents
1-5	The letters FRUT
7-25	Same as type I cards
27-29	Family
31-33	Subfamily
35-37	Genus
39-40	Species
42-43	Type of fruit - 2 digit code
45-49	Length (mm)
51-53	Estimate of proportion contributed to plant remains, (%).
55-57	Number of fruits
59-64	Dry weight/individual (g)
66-70	Caloric valve (Kcal/g dry wt)

Codes for BIRD FOODS PROGRAM

Species of Bird Sampled

OO	Not determined	OO	OO
LB	Lark bunting *Calamospiza melanocorys*	CA	ME
HL	Horned lark *Eremophila alpestris*	ER	AL
CS	Chipping sparrow *Spizella passerina*	SP	PA
ML	McCown's longspur *Rhynchophanes mccownii*	RH	MC
BS	Brewer's sparrow *Spizella breweri*	SP	BR
CL	Chestnut-collared longspur *Calcarius ornatus*	CA	OR
LL	Lapland longspur *Calcarius lapponicus*	CA	LA
WS	White-crowned sparrow *Zonotrichia leucophrys*	ZO	LE
CCS	Clay-colored sparrow *Spizella pallida*	SP	PL
VS	Vesper sparrow *Pooecetes gramineus*	PO	GR
GS	Grasshopper sparrow *Ammodramus savannarum*	AM	SA
BAS	Baird's sparrow *Ammodramus bairdii*	AM	BA
LS	Lark sparrow *Chordestes grammacus*	CH	GR
SS	Savannah sparrow *Passerculus sandwichensis*	PA	SA
WM	Western meadowlark *Sturnella neglecta*	ST	NE
BC	Brown-headed cowbird *Molothrus ater*	MO	AT
LOS	Loggerhead shrike *Lanius ludovicianus*	LA	LU
ST	Sage thrasher *Oreoscoptes montanus*	OR	MO
WK	Western kingbird *Tyrannus verticalis*	TY	VE
EK	Eastern kingbird *Tyrannus tyrannus*	TY	TY
SP	Say's phoebe *Sayornis saya*	SA	SA
CN	Common nighthawk *Chordeiles minor*	CH	MI
PW	Poor-will *Phalaenoptilus nuttallii*	PH	NU
MD	Mourning dove *Zenaidura macroura*	ZE	MA
CSW	Cliff swallow *Petrochelidan pyrrhonota*	PE	PY
BSW	Barn swallow *Hirundo rustica*	HI	RU
KD	Killdeer *Charadrius vociferus*	CH	VO
MP	Mountain plover *Eupoda montana*	EU	MO

Ecological Function

00	Unknown
PC	Primary consumer
SC	Secondary consumer
TC	Tertiary or higher order consumer
PI	Parasite of insects
PR	Producer
DS	Decomposer-scavenger of plants and animal matter

Stage of Development

00	Unknown
AD	Adult (imago)
LA	Larva
NY	Nymph
PU	Pupa
EG	Egg
TE	Teneral

Activity Code

00	No record		
FG	Feeding on ground	PF	Perching on fence
FF	Feeding in forb	PP	Perching on plant
FS	Feeding in shrub	EN	Just flew in from another area
FT	Feeding in tree	FH	Feeding in *Helianthus*
FA	Feeding in grass	FF	Feeding in field
FN	Feeding at harvester ant hill	FW	Feeding at fence row
FR	Feeding at roadside		
AF	Aerial feeding		
01	FD + FG		
02	FD + FS		
03	FF + FS		
04	FP + FG + FR		
05	FD + FF		
06	FR + FH		

Type of Sample

00	Not specified
01	Stomach
02	Crop
03	Crop and stomach
04	02 + intestinal contents
05	03 + intestinal contents
06	Item in mouth or esophagus

State of Sample (Crop/Stomach)

0	Not noted
1	Empty or < 1/4
2	1/4 to < 1/2
3	1/2 to < 3/4
4	3/4 to < full
5	Full

Classes of Animals

00	Unknown or not determined
IN	Insecta
AR	Arachnida
CH	Chilopoda
MA	Mammalia
AV	Aves
RE	Reptilia
OS	Osteichthyes
GA	Gastropoda
OL	Oligochaeta
AM	Amphibia

Orders of Animals

00	Unknown or not determined
AR	Araneida
CO	Coleoptera
HY	Hymenoptera
DI	Diptera
LE	Lepidoptera
HE	Hemiptera
HO	Homoptera
OD	Odonata
OR	Orthoptera
NE	Neuroptera
DE	Dermaptera
PS	Psocoptera

Families of Animals

000	Unknown or not determined
CUR	Curculionidae
SCO	Scolytidae
CHR	Chrysomelidae
CER	Cerambycidae
SCA	Scarabaeidae
TEN	Tenebrionidae
DER	Dermestidae
CAR	Carabidae
HIS	Histeridae
MEL	Meloidae
PHL	Phalacridae
BRU	Bruchidae
BUP	Buprestidae
CLE	Cleridae
AND	Andrenidae
ICH	Ichneumonidae
FOR	Formicidae
HAL	Halictidae
VES	Vespidae
LYG	Lygaeidae
PEN	Pentatomidae
NAB	Nabidae
CYD	Cydnidae
CIC	Cicadellidae
SAL	Salticidae
ACR	Acrididae
LYC	Lycosidae
THO	Thomisidae
ELA	Elateridae
PHA	Phalaenidae
PYR	Pyralidae
SCU	Scutellaridae
COR	Corimelaenidae
ASI	Asilidae
TIP	Tipulidae
EMP	Empididae
BOM	Bombyliidae
MUS	Muscidae
TEP	Tephritidae
CRZ	Corizidae
CEC	Cecidomyiidae

Subfamilies of Animals

000 Not determined

CYR Cyrtacanthacrinae

ACR Acridinae

OED Oedipodinae

FOR Formicinae

MYR Myrmicinae

DOL Dolichoderinae

CUR Curculioninae

HAL Halictinae

CAL Calendrinae

Genera of Animals (with species)

Pogonomyrmex occidentalis	POG	OC
Dorymyrmex pyramicus	DOR	PY
Formica	FOR	
Sphenophorus	SPH	
Pangaeus	PAN	

000 00 unknown

01 New species

02 Sp. not determined. Sample may contain one or more spp.

03 (Combinations of known species may be designated.)

Families of Plants

000	Not known
POL	Polygonaceae
COM	Compositae
GRA	Graminae
MAL	Malvaceae
BOR	Boraginaceae
LEG	Leguminosae
VER	Verbenaceae
CYP	Cyperaceae
AMA	Amaranthaceae
SOL	Solanaceae
LIL	Liliaceae
CMM	Commelinaceae

Genus and Species of Plants

Helianthus annuus	HEL AN
Amarantus graecizans	AMA GR
Amarantus retroflexus	AMA RE
Avena sativa	AVE SA
Buchloe dactyloides	BUC DA
Lithospermum incisum	LIT SP
Oryzopsis hymenoides	ORY HY
Polygonum aviculare	POL AV
Polygonum convolvulus	POL CO
Physalis longifolia	PHY LO
Schedonnardus paniculatus	SCH PA
***Scirpus* (large-seeded)**	SCI 04
Scirpus (small-seeded)	SCI 05
Sphaeralcea coccinea	SPH CO
Tradescantia virginiana	TRA VI
Verbena bracteata	VER BR
Allium	ALL 00

To be added in species code:

00 Not identified

01 Not distinguished. May contain one or more spp.

02 (Can specify which species are included)

03

04 Large-seeded

05 Small-seeded

Type of Fruit

00 Unknown

01 Seed (general)

02 Achene (Polyg., Compositae, Ranune., Cyperaceae, Composit.)

03 Kernel only

04 Mericarp (Schizocarp) (Nalvac., Umbellif.)

05 Nut or nutlet (Boraq., Verben.)

06 Seed from berry (grape, Solanaceae, Liliaceae)

07 Drupe or drupelet (cherry, plum, blackberry)

08 Utricle (Amaranth.)

09 Capsule (Commelin., Liliaceae)

10 Caryopsis (Graminae, Solanaceae.)

+++ EXAMPLE OF DATA +++

```
         1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

IDENT LB1     CAME PHR2097 FF  1  3 45  90  10  11   4
IDENT LB2     CAME PHR2098 FF  1  2 25  40  60  23  10
IDENT LB3     CAME PHR2099 FF  1  4 23  20  80  43   9
IDENT LB4     CAME PHR2100 FF  1  2 04  85  15  14  11
IDENT LB5     CAME PHR2101 FR  1  1 24  90  10  08  05
IDENT LB6     CAME PHR2102 FR  1  2 22  75  25  06  12
IDENT LB7     CAME PHR2103 FA  1  2 17  88  12  05  25
IDENT LB8     CAME PHR2104 FG  1  2 13  85  15  26  19
IDENT LB9     CAME PHR2105 FF  1  1 01  95  05  44  02
IDENT LB10    CAME PHR2106 FF  1  1 09  65  35  11  27
IDENT LB11    CAME RSS1    PF  1  3 43  60  40  27  34
IDENT LB12    CAME PHR2112 FG  1  2 04  05  95  05  63
IDENT LB13    CAME RSS2    FG  1  2 07  95  05  14  06
IDENT LB14    CAME RSS3    FA  1  3 06  60  40  32  41
IDENT LB15    CAME RSS4    FF  1  3 39  30  70  08  47
IDENT LB16    CAME RSS5 .  FG  1  1 08  90  10  17  14
IDENT LB17    CAME RSS6    FW  1  1 13  80  20  06  28
IDENT LB18    CAME RSS7    FR  1  3 22  40  60  14 123
IDENT LB19    CAME RSS8    PF  1  4 11  60  40  28  15
IDENT LB20    CAME RSS9    FG  1  3 08  15  85  08 147
IDENT LB21    CAME RSS10   FG  1  2 05  50  50  18  69
INVFR LB1     CAME PHR2097 IN CO     SCA                PC AD    7.0    3   .007  6.000
INVFR LB1     CAME PHR2097 IN CO     CUR                PC AD   08.0    1   .014  6.000
INVFR LB1     CAME PHR2097 IN CO     CUR                PC AD   03.5    2   .003  6.000
INVFR LB1     CAME PHR2097 IN CO     000                00 AD   06.0    1   .005  6.000
INVFR LB1     CAME PHR2097 IN HY     000                PI AD   03.0    1   .001  6.000
INVFR LB1     CAME PHR2097 IN HY     FOR MYR POG OC     PC AD   06.0    1   .003  6.000
INVFR LB1     CAME PHR2097 AR AR     000                SC 00   04.0    1   .002  6.000
INVFR LB1     CAME PHR2097 IN LF     000                PC LA   10.0    1   .003  6.000
INVFR LB2     CAME PHR2098 IN CO     CUR                PC AD   12.0    1   .020  6.000
INVFR LB2     CAME PHR2098 IN CO     CUR                PC AD   06.5    7   .006  6.000
INVFR LB2     CAME PHR2098 IN CO     CUR                PC AD   04.0    3   .003  6.000
INVFR LB2     CAME PHR2098 IN CO     SCA                PC AD   07.0    3   .006  6.000
INVFR LB2     CAME PHR2098 IN CO     SCA                PC AD   05.0    4   .004  6.000
INVFR LB2     CAME PHR2098 IN CO     SCA                PC AD   04.0    3   .001  6.000
INVFR LB2     CAME PHR2098 IN OR     ACR                PC AD   16.0    1   .024  6.000
INVFR LB2     CAME PHR2098 IN HY     FOR MYR POG OC     PC AD   06.0    1   .003  6.000
INVFR LB3     CAME PHR2099 IN CO     SCA                PC AD   05.0   12   .003  6.000
INVFR LB3     CAME PHR2099 IN CO     CUR                PC AD   05.0   20   .003  6.000
INVFR LB3     CAME PHR2099 IN CO     CUR                PC AD   05.5    2   .003  6.000
INVFR LB3     CAME PHR2099 IN LF     000                PC LA   11.0    1   .004  6.000
INVFR LB3     CAME PHR2099 AR AR     000                SC 00    3.0    1   .002  6.000
INVFR LB3     CAME PHR2099 IN HY     FOR MYR POG OC     PC AD   05.0    7   .002  6.000
INVFR LB4     CAME PHR2100 IN CO     CUR                PC AD   05.0    1   .005  6.000
INVFR LB4     CAME PHR2100 IN CO     CUR                PC AD   05.5    1   .005  6.000
INVFR LB4     CAME PHR2100 IN CO     SCA                PC AD    5.0    1   .003  6.000
```

INVER	LB4	CAME	PHB2100	IN	CO	SCA		PC AD	3.5	1	.002	6.000
INVER	LB4	CAME	PHB2100	IN	OR	ACR		PC AD	19.0	3	.035	6.000
INVER	LB4	CAME	PHB2100	IN	OR	ACR		PC AD	22.0	1	.045	6.000
INVER	LB4	CAME	PHB2100	IN	LE	000		PC LA	9.0	2	.002	6.000
INVER	LB4	CAME	PHB2100	IN	CO	CAR		SC AD	5.0	4	.002	6.000
INVER	LB5	CAME	PHB2101	IN	CO	CUR	CAL SPH	PC AD	11.0	1	.018	6.000
INVER	LB5	CAME	PHB2101	IN	CO	CUR		PC AD	10.0	1	.016	6.000
INVER	LB5	CAME	PHB2101	IN	CO	CUR		PC AD	7.0	1	.008	6.000
INVER	LB5	CAME	PHB2101	IN	CO	000		SC AD	12.0	1	.016	6.000
INVER	LB5	CAME	PHB2101	IN	OR	ACR		PC AD	18.0	1	.031	6.000
INVER	LB5	CAME	PHB2101	IN	HY	FOR	FOR FOR 00	SC AD	7.0	1	.004	6.000
INVER	LB5	CAME	PHB2101	IN	HY	FOR	MYR POG OC	PC AD	5.0	1	.002	6.000
INVER	LB5	CAME	PHB2101	IN	LE	000		PC LA	6.0	1	.001	6.000
INVER	LB6	CAME	PHB2102	IN	CO	CUR		PC AD	10.0	4	.016	6.000
INVER	LB6	CAME	PHB2102	IN	CO	CUR		PC AD	3.0	1	.002	6.000
INVER	LB6	CAME	PHB2102	IN	HY	000		00 AD	7.0	1	.003	6.000
INVER	LB7	CAME	PHB2103	IN	CO	CUR		PC AD	5.0	3	.005	6.000
INVER	LB7	CAME	PHB2103	IN	HY	FOR	DOL DOR PY	00 AD	3.0	1	.001	6.000
INVER	LB7	CAME	PHB2103	IN	HY	TCH		PI AD	8.0	1	.005	6.000
INVER	LB8	CAME	PHB2104	IN	CO	SCA		PC AD	6.0	6	.004	6.000
INVER	LB8	CAME	PHB2104	IN	CO	CUR		PC AD	4.0	2	.002	6.000
INVER	LB8	CAME	PHB2104	IN	HY	FOR	MYR POG OC	PC AD	6.0	13	.003	6.000
INVER	LB8	CAME	PHB2104	IN	LE	PHA		PC LA	15.0	1	.008	6.000
INVER	LB8	CAME	PHB2104	IN	OR	ACR		PC AD	16.0	1	.024	6.000
INVER	LB8	CAME	PHB2104	IN	OR	ACR		PC AD	19.0	1	.034	6.000
INVER	LB8	CAME	PHB2104	AR	AR	000		SC 00	5.0	2	.003	6.000
INVER	LB9	CAME	PHB2105	IN	CO	CUR		PC AD	10.0	1	.016	6.000
INVER	LB9	CAME	PHB2105	IN	CO	CUR		PC AD	4.0	1	.002	6.000
INVER	LB9	CAME	PHB2105	IN	CO	SCA		PC AD	5.0	2	.003	6.000
INVER	LB9	CAME	PHB2105	IN	OR	ACR		PC AD	16.0	1	.024	6.000
INVER	LB9	CAME	PHB2105	IN	HY	FOR	MYR POG OC	PC AD	6.0	38	.003	6.000
INVER	LB9	CAME	PHB2105	IN	LE	000		PC LA	11.0	1	.003	6.000
INVER	LB10	CAME	PHB2106	IN	CO	CUR		PC AD	10.0	2	.016	6.000
INVER	LB10	CAME	PHB2106	IN	CO	CUR		PC AD	06.0	1	.005	6.000
INVER	LB10	CAME	PHB2106	IN	HY	FOR	MYR POG OC	PC AD	6.0	6	.003	6.000
INVER	LB10	CAME	PHB2106	IN	CO	CAR		SC AD	7.0	1	.004	6.000
INVER	LB10	CAME	PHB2106	IN	OR	ACR		PC AD	16.0	1	.024	6.000
INVER	LB11	CAME	RSS1	IN	HY	FOR	MYR POG OC	PC AD	6.0	19	.003	6.000
INVER	LB11	CAME	RSS1	IN	CO	CAR		SC AD	5.0	1	.002	6.000
INVER	LB11	CAME	RSS1	IN	CO	CUR		PC AD	5.0	2	.003	6.000
INVER	LB11	CAME	RSS1	IN	LE	000		PC LA	10.0	1	.003	6.000
INVER	LB11	CAME	RSS1	IN	OR	ACR		PC AD	16.0	3	.024	6.000
INVER	LB11	CAME	RSS1	IN	HY	000		00 AD	10.0	1	.010	6.000
INVER	LB12	CAME	PHB2112	IN	CO	CUR		PC AD	7.0	1	.007	6.000
INVER	LB12	CAME	PHB2112	IN	CO	CUR		PC AD	3.0	1	.002	6.000
INVER	LB12	CAME	PHB2112	IN	CO	CAR		SC AD	7.0	1	.004	6.000
INVER	LB12	CAME	PHB2112	IN	HY	FOR	MYR POG OC	PC AD	6.0	1	.003	6.000
INVER	LB12	CAME	PHB2112	IN	HE	LYG		PC AD	3.5	1	.001	6.000
INVER	LB13	CAME	RSS2	IN	CO	CUR		PC AD	10.0	1	.016	6.000
INVER	LB13	CAME	RSS2	IN	CO	CUR		PC AD	5.0	2	.003	6.000
INVER	LB13	CAME	RSS2	IN	CO	CAR		SC AD	12.0	1	.031	6.000
INVER	LB13	CAME	RSS2	IN	CO	CAR		SC AD	6.0	1	.003	6.000
INVER	LB13	CAME	RSS2	IN	HY	FOR		PC AD	7.0	6	.004	6.000
INVER	LB13	CAME	RSS2	IN	HY	000		00 AD	8.0	1	.005	6.000

INVER LB13	CAME RSS2	IN HY	000		00 AD	12.0	1	.015	6.000
INVER LB13	CAME RSS2	IN OR	ACR		PC NY	22.0	1	.044	6.000
INVER LB14	CAME RSS3	IN OR	ACR		PC AD	18.0	2	.030	6.000
INVER LB14	CAME RSS3	IN HY	FOR MYR POG OC		PC AD	5.0	16	.002	6.000
INVER LB14	CAME RSS3	IN HY	TCH		PI AD	12.0	1	.018	6.000
INVER LB14	CAME RSS3	IN HE	IYG		PC AD	7.0	1	.004	6.000
INVER LB14	CAME RSS3	IN HO	CIC		PC AD	3.5	1	.001	6.000
INVER LB14	CAME RSS3	IN CO	SCA		PC AD	5.0	2	.003	6.000
INVER LB14	CAME RSS3	IN CO	SCA		PC AD	6.0	1	.004	6.000
INVER LB14	CAME RSS3	IN CO	CUR		PC AD	8.0	1	.013	6.000
INVER LB14	CAME RSS3	IN CO	CUR		PC AD	5.0	1	.003	6.000
INVER LB14	CAME RSS3	IN CO	CUR		PC AD	10.0	1	.016	6.000
INVER LB14	CAME RSS3	AR AR	000		SC 00	6.0	1	.004	6.000
INVER LB15	CAME RSS4	IN CO	CUR		PC AD	10.0	1	.016	6.000
INVER LB15	CAME RSS4	IN CO	CUR CAL SPH		PC AD	11.0	1	.020	6.000
INVER LB15	CAME RSS4	IN CO	SCA		PC AD	4.0	3	.001	6.000
INVER LB15	CAME RSS4	IN HE	PEN		PC AD	8.0	1	.010	6.000
INVER LB15	CAME RSS4	IN IF	000		PC LA	7.0	1	.001	6.000
INVER LB15	CAME RSS4	IN HY	000		PI AD	2.0	1	.001	6.000
INVER LB16	CAME RSS5	IN CO	CUR		PC AD	10.0	1	.016	6.000
INVER LB16	CAME RSS5	IN CO	CUR		PC AD	8.0	1	.013	6.000
INVER LB16	CAME RSS5	IN CO	CUR		PC AD	5.0	1	.003	6.000
INVER LB16	CAME RSS5	IN CO	CAR		SC AD	6.0	4	.003	6.000
INVER LB16	CAME RSS5	IN CO	HIS		SC AD	4.0	2	.001	6.000
INVER LB16	CAME RSS5	IN CO	SCA		PC AD	12.0	1	.016	6.000
INVER LB16	CAME RSS5	IN CO	SCA		PC AD	6.0	1	.004	6.000
INVER LB16	CAME RSS5	IN HY	AND		PC AD	8.5	2	.006	6.000
INVER LB16	CAME RSS5	IN CO	CUR CAL SPH		PC AD	11.0	1	.020	6.000
INVER LB16	CAME RSS5	IN CO	CHR		PC LA	3.0	1	.001	6.000
INVER LB16	CAME RSS5	AR AR	000		SC AD	8.0	1	.011	6.000
INVER LB16	CAME RSS5	IN OR	ACR		PC AD	16.0	1	.024	6.000
INVER LB17	CAME RSS6	IN HE	CYD PAN		PC AD	5.0	1	.005	6.000
INVER LB17	CAME RSS6	IN CO	CUR		PC AD	3.5	1	.005	6.000
INVER LB17	CAME RSS6	IN CO	CUR		PC AD	11.0	1	.020	6.000
INVER LB17	CAME RSS6	IN CO	CAR		SC AD	5.0	1	.002	6.000
INVER LB17	CAME RSS6	IN IF	PYR		PC LA	12.0	1	.004	6.000
INVER LB17	CAME RSS6	IN HY	TCH		PI AD	13.0	1	.020	6.000
INVER LB18	CAME RSS7	IN CO	PHI		PC AD	2.5	1	.003	6.000
INVER LB18	CAME RSS7	IN CO	CUR		PC AD	10.0	3	.016	6.000
INVER LB18	CAME RSS7	IN CO	CUR		PC AD	3.0	1	.002	6.000
INVER LB18	CAME RSS7	IN HY	FOR FOR FOR 00		SC AD	4.0	5	.001	6.000
INVER LB18	CAME RSS7	IN CO	TEN		PC AD	12.0	1	.028	6.000
INVER LB18	CAME RSS7	IN CO	CAR		SC AD	4.5	1	.001	6.000
INVER LB18	CAME RSS7	IN CO	HIS		SC AD	4.0	1	.001	6.000
INVER LB18	CAME RSS7	IN HE	CYD PAN		PC AD	5.0	1	.005	6.000
INVER LB19	CAME RSS8	IN CO	CUR		PC AD	5.0	1	.003	6.000
INVER LB19	CAME RSS8	IN CO	CUR		PC AD	6.5	2	.012	6.000
INVER LB19	CAME RSS8	IN CO	CAR		SC AD	6.0	1	.003	6.000
INVER LB19	CAME RSS8	IN CO	CUR		PC AD	10.0	1	.016	6.000
INVER LB19	CAME RSS8	IN CO	CUR		PC AD	5.0	1	.003	6.000
INVER LB19	CAME RSS8	IN CO	HIS		SC AD	7.0	1	.006	6.000
INVER LB19	CAME RSS8	IN HY	FOR DOL DOR PY		00 AD	4.0	2	.001	6.000
INVER LB19	CAME RSS8	IN HY	FOR FOR FOR 00		SC AD	8.0	3	.005	6.000
INVER LB19	CAME RSS8	IN HY	FOR FOR FOR 00		SC AD	12.0	1	.013	6.000
INVER LB19	CAME RSS8	IN HY	000		00 AD	10.0	1	.010	6.000

INVER LB19	CAME RSS8	AR AR	000				SC AD	8.0	1	.011	6.000
INVER LB19	CAME RSS8	IN OR	ACR				PC AD	17.0	1	.027	6.000
INVER LB19	CAME RSS8	IN HF	LYG				PC AD	7.0	1	.004	6.000
INVER LB20	CAME RSS9	IN CO	CUR				PC AD	4.5	1	.003	6.000
INVER LB20	CAME RSS9	IN CO	CUR				PC AD	5.5	1	.004	6.000
INVER LB20	CAME RSS9	IN CO	CUR				PC AD	12.0	1	.022	6.000
INVER LB20	CAME RSS9	IN CO	CUR				PC AD	3.5	1	.002	6.000
INVER LB20	CAME RSS9	IN CO	HTS				SC AD	7.5	1	.008	6.000
INVER LB20	CAME RSS9	IN OR	ACR				PC AD	16.0	1	.024	6.000
INVER LB20	CAME RSS9	IN HY	FOR	FOR	FOR	00	SC AD	3.5	1	.001	6.000
INVER LB20	CAME RSS9	IN CO	FOR	FOR	FOR	00	SC AD	5.0	1	.002	6.000
INVER LB21	CAME RSS10	IN CO	CUR				PC AD	10.0	1	.016	6.000
INVER LB21	CAME RSS10	IN CO	CUR				PC AD	3.5	1	.002	6.000
INVER LB21	CAME RSS10	IN CO	CUR				PC AD	6.0	1	.005	6.000
INVER LB21	CAME RSS10	IN CO	CHR				PC AD	3.5	1	.001	6.000
INVER LB21	CAME RSS10	IN CO	SCA				PC AD	14.0	1	.019	6.000
INVER LB21	CAME RSS10	IN HY	SCA				PC AD	4.0	1	.001	6.000
INVER LB21	CAME RSS10	IN HY	FOR	DOL	DOR	PY 00	AD	3.0	1	.001	6.000
INVER LB21	CAME RSS10	IN OR	FOR	MYR	POG	OC PC	AD	5.5	1	.002	6.000
INVER LB21	CAME RSS10	IN OR	ACR				PC AD	18.0	2	.030	6.000
INVER LB21	CAME RSS10	IN OR	ACR				PC AD	20.0	3	.038	6.000
INVER LB21	CAME RSS10	IN CO	ACR				PC AD	28.0	1	.100	6.000
INVER LB21	CAME RSS10	AR AR	CAR				SC AD	6.0	1	.003	6.000
INVER LB21	CAME RSS10	IN LF	SAL				SC AD	5.0	1	.003	6.000
INVER LB21	CAME RSS10	IN CO	PYR				PC LA	12.0	1	.004	6.000
FRUTS LB1	CAME PHB2097	POL	CAR				SC AD	4.0	1	.001	6.000
FRUTS LB1	CAME PHB2097	COM	POI	01	02	3.1	10	1	.0034	4.700	
FRUTS LB2	CAME PHB2098	GRA	HEI	AN	02	5.3	90	3	.0085	5.400	
FRUTS LB2	CAME PHB2098	COM	AVE	SA	10	8.4	95	9	.0237	4.600	
FRUTS LB3	CAME PHB2099	GRA	HEI	AN	02	5.3	5	1	.0085	5.400	
FRUTS LB3	CAME PHB2099	COM	AVE	SA	10	8.4	60	3	.0237	4.600	
FRUTS LB3	CAME PHB2099	POL	HEI	AN	02	5.3	30	3	.0085	5.400	
FRUTS LB4	CAME PHB2100	GRA	POI	01	02	3.1	10	3	.0034	4.700	
FRUTS LB5	CAME PHB2101	POI	BUC	DA	10	2.5	20	3	.0015	4.600	
FRUTS LB5	CAME PHB2101	COM	POL	01	02	3.1	85	4	.0034	4.700	
FRUTS LB6	CAME PHB2102	GRA	HEI	AN	02	5.3	5	1	.0085	5.400	
FRUTS LB6	CAME PHB2102	POL	BUC	DA	10	2.5	65	6	.0015	4.600	
FRUTS LB6	CAME PHB2102	MAI	POL	01	02	3.1	20	2	.0034	4.700	
FRUTS LB6	CAME PHB2102	CYP	SPH	CO	04	2.0	5	1	.0017	5.000	
FRUTS LB6	CAME PHB2102	VER	SCT	04	02	2.0	5	1	.0008	5.000	
FRUTS LB7	CAME PHB2103	MAL	VER	BR	05	2.5	5	2	.0005	5.500	
FRUTS LB7	CAME PHB2103	GRA	SPH	CO	04	2.0	15	3	.0017	5.000	
FRUTS LB7	CAME PHB2103	CYP	BUC	DA	10	2.5	50	15	.0015	4.600	
FRUTS LB7	CAME PHB2103	AMA	SCT	04	02	2.0	22	4	.0008	5.000	
FRUTS LB7	CAME PHB2103	VER	AMA	GR	08	1.6	5	1	.0008	5.200	
FRUTS LB8	CAME PHB2104	BOR	VER	BR	05	2.5	8	2	.0005	5.500	
FRUTS LB8	CAME PHB2104	GRA	ITT	IN	05	3.8	10	1	.0085	5.200	
FRUTS LB8	CAME PHB2104	SOL	BUC	DA	10	2.5	30	10	.0015	4.600	
FRUTS LB8	CAME PHB2104	AMA	PHY	LO	06	2.3	30	3	.0001	5.800	
FRUTS LB8	CAME PHB2104	GRA	AMA	GR	08	1.6	10	1	.0008	5.200	
FRUTS LB9	CAME PHB2105	POI	000	00	10	2.0	20	4	.0002	4.600	
FRUTS LB9	CAME PHB2105	GRA	POI	01	02	3.1	25	1	.0034	4.700	
FRUTS LB10	CAME PHB2106	POI	BUC	DA	10	2.5	25	1	.0015	4.600	
FRUTS LB10	CAME PHB2106	GRA	POI	01	02	3.1	45	11	.0034	4.700	
			BUC	DA	10	2.5	29	15	.0015	4.600	

FRUTS	LB10	CAME	PHB2106	BOR	LIT	IN	05	3.8	3	1	.0085	5.200
FRUTS	LB10	CAME	PHB2106	GRA	ORY	HY	10	2.5	13	6	.0020	4.600
FRUTS	LB10	CAME	PHB2106	GRA	SCH	PA	10	2.0	2	1	.0001	4.600
FRUTS	LB10	CAME	PHB2106	CYP	SCI	04	02	2.0	2	2	.0008	5.000
FRUTS	LB11	CAME	RSS1	COM	HEL	AN	02	5.3	16	2	.0085	5.400
FRUTS	LB11	CAME	RSS1	BOR	LIT	IN	05	3.8	16	3	.0085	5.200
FRUTS	LB11	CAME	RSS1	AMA	AMA	GR	08	1.6	10	7	.0008	5.200
FRUTS	LB11	CAME	RSS1	POL	POL	01	02	3.1	32	10	.0034	4.700
FRUTS	LB11	CAME	RSS1	LIL	ALI	00	09	2.3	10	1	.0007	4.600
FRUTS	LB11	CAME	RSS1	AMA	AMA	RE	08	1.2	6	7	.0004	5.200
FRUTS	LB11	CAME	RSS1	GRA	BUC	DA	10	2.5	5	2	.0015	4.600
FRUTS	LB11	CAME	RSS1	CYP	SCI	04	02	2.0	5	2	.0008	5.000
FRUTS	LB12	CAME	PHB2112	AMA	AMA	GR	08	1.6	5	3	.0008	5.200
FRUTS	LB12	CAME	PHB2112	POL	POL	01	02	3.1	5	2	.0034	4.700
FRUTS	LB12	CAME	PHB2112	BOR	LIT	IN	05	3.8	5	1	.0085	5.200
FRUTS	LB12	CAME	PHB2112	AMA	AMA	RE	08	1.2	45	57	.0004	5.200
FRUTS	LB13	CAME	RSS2	AMA	AMA	RE	08	1.2	25	3	.0004	5.200
FRUTS	LB13	CAME	RSS2	BOR	LIT	IN	05	3.8	30	1	.0085	5.200
FRUTS	LB13	CAME	RSS2	COM	HEL	AN	02	5.3	20	1	.0085	5.400
FRUTS	LB13	CAME	RSS2	POL	POL	01	02	3.1	25	1	.0034	4.700
FRUTS	LB14	CAME	RSS3	COM	HEL	AN	02	5.3	40	10	.0085	5.400
FRUTS	LB14	CAME	RSS3	CYP	SCI	04	02	2.0	3	2	.0008	5.000
FRUTS	LB14	CAME	RSS3	GRA	BUC	DA	10	2.5	50	26	.0015	4.600
FRUTS	LB14	CAME	RSS3	POL	POL	01	02	3.1	7	3	.0034	4.700
FRUTS	LB15	CAME	RSS4	GRA	BUC	DA	10	2.5	65	26	.0015	4.600
FRUTS	LB15	CAME	RSS4	POL	POL	01	02	3.1	10	2	.0034	4.700
FRUTS	LB15	CAME	RSS4	CYP	SCI	05	02	1.5	10	7	.0005	5.000
FRUTS	LB15	CAME	RSS4	CYP	SCI	04	02	2.0	20	11	.0008	5.000
FRUTS	LB16	CAME	RSS5	CYP	SCI	04	02	2.0	10	2	.0008	5.000
FRUTS	LB16	CAME	RSS5	GRA	BUC	DA	10	1.8	30	5	.0015	4.600
FRUTS	LB16	CAME	RSS5	POL	POL	01	02	3.1	10	1	.0034	4.700
FRUTS	LB16	CAME	RSS5	BOR	LIT	IN	05	3.8	10	1	.0085	5.200
FRUTS	LB16	CAME	RSS5	VER	VER	BR	05	2.0	15	5	.0005	5.500
FRUTS	LB17	CAME	RSS6	AMA	AMA	RE	08	1.2	45	19	.0004	5.200
FRUTS	LB17	CAME	RSS6	AMA	AMA	GR	08	1.6	35	8	.0004	5.200
FRUTS	LB17	CAME	RSS6	POL	POL	01	02	3.1	20	1	.0034	4.700
FRUTS	LB18	CAME	RSS7	AMA	AMA	RE	08	1.2	45	100	.0004	5.200
FRUTS	LB18	CAME	RSS7	AMA	AMA	GR	08	1.6	5	2	.0004	5.200
FRUTS	LB18	CAME	RSS7	GRA	BUC	DA	10	2.5	48	20	.0015	4.600
FRUTS	LB18	CAME	RSS7	POL	POL	01	02	3.1	2	1	.0034	4.700
FRUTS	LB19	CAME	RSS8	COM	HEL	AN	02	5.3	20	3	.0085	5.400
FRUTS	LB19	CAME	RSS8	POL	POL	01	02	3.1	30	10	.0034	4.700
FRUTS	LB19	CAME	RSS8	GRA	ORY	HY	10	2.1	10	2	.0020	4.600
FRUTS	LB19	CAME	RSS8	BOR	LIT	IN	05	3.8	10	3	.0085	5.200
FRUTS	LB20	CAME	RSS9	VER	VER	BR	05	3.0	8	40	.0005	5.500
FRUTS	LB20	CAME	RSS9	GRA	BUC	DA	10	2.5	83	98	.0015	4.600
FRUTS	LB20	CAME	RSS9	AMA	AMA	RE	08	1.2	1	1	.0004	5.200
FRUTS	LB20	CAME	RSS9	COM	HEL	AN	02	5.3	1	1	.0085	5.400
FRUTS	LB20	CAME	RSS9	POL	POL	01	02	3.1	4	6	.0034	4.700
FRUTS	LB20	CAME	RSS9	AMA	AMA	GR	08	1.6	1	1	.0008	5.200
FRUTS	LB21	CAME	RSS10	POL	POL	01	02	3.1	42	15	.0034	4.700
FRUTS	LB21	CAME	RSS10	GRA	BUC	DA	10	2.5	50	50	.0015	4.600
FRUTS	LB21	CAME	RSS10	AMA	AMA	GR	08	1.6	1	1	.0008	5.200
FRUTS	LB21	CAME	RSS10	COM	TRA	VT	09	3.0	2	1	.0033	5.200
FRUTS	LB21	CAME	RSS10	BOR	LIT	IN	05	3.8	2	1	.0085	5.200

Avian Collection - Internal

Avian collection - internal data collected in 1970 at the Pawnee Site is Grassland Biome Data Set A2U201B. Data were collected on Form NREL-23. A sample data form and an example of the data follow. These data are not discussed in this report but were collected as part of the present project.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET - AVIAN COLLECTION - INTERNAL

DATA TYPE	SITE	INITIALS	DATE			TREATMENT	REPLICATE	PLOT SIZE	GROUP	GENUS	SPECIES	SUBSPECIES	SPEC. NO.	TIME	STATE	COUNTY	TWNSHP	RANGE	SECTION	HABITAT	CAPTURE	SEX	BROOD PATCH	GONAD		FOLLICLE	OVIDUCT	SKULL OSS.	CROP	STOMACH	BURSA	FAT			SPECIMEN
			Day	Mo	Yr																			LENGTH	WIDTH							Subcut-Ant	SubcutPost	Visceral	
1-2	3-4	5-7	8-9	10-11	12-13	14	15	16-19	21	22-23	24-25	26	27-30	32-35	36-37	38-41	42-44	45-47	48-49	51-52	53	55	56	57-60	61-64	65-68	69-70	71	72	73	74-75	76	77	78	79

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
- 44 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

CAPTURE
- 0 Not noted
- 1 Gun
- 2 Mist net
- 3 Trap
- 4 Found dead

BROOD PATCH
- 0 Not noted
- 1 Feathers dropped
- 2 Vascular
- 3 Edematous
- 4 Regressing
- 5 No evidence

STATE
- AK Alaska
- AZ Arizona
- CT Connecticut
- MD Maryland
- ME Maine
- MN Minnesota
- MS Mississippi
- MR Missouri
- NV Nevada
- TN Tennessee

FAT
- 0 Not noted
- 1 None
- 2 Little
- 3 Moderate
- 4 Much
- 5 Extreme

SKULL
- 0 Not noted
- 1 Quarter or less
- 2 Half or less
- 3 Three-quarters or less
- 4 Up to fully oss.

SPECIMEN
- 0 Not saved
- 1 Skin
- 2 Skeleton
- 3 Skin & skeleton

HABITAT
- 0 Not noted
- 1 Grassland
- 2 Grass-forb
- 3 Savannah
- 4 Shrub-steppe
- 5 Deciduous
- 6 Coniferous
- 7 Riparian

CROP/STOMACH
- 0 Not noted
- 1 Empty
- 2 Quarter
- 3 Half
- 4 Three-quarters
- 5 Full

GROUP
- 0 Waterfowl
- 1 Falconiform
- 2 Galli- and Gruiform
- 3 Charadriiform
- 4 Doves, owls, nighthawks, woodpeckers
- 5 Flycatchers, swallows, jays, titmice, wrens
- 6 Thrashers, bluebirds, gnatcatchers, pipits
- 7 Shrikes, starlings, vireos
- 8 Icterids
- 9 Fringillids

SEX
- 0 Unknown
- 1 Male
- 2 Female

+++ EXAMPLE OF DATA +++

```
        1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

2311PHB030569      9CAMF 2097 1000COWFLD10N65W 6  21 1010.1                414 4331
2311PHB030569      9CAMF 2098 1005COWFLD10N65W 6  21 1010.5                413 4331
2311PHB030569      9CAMF 2099 1005COWFLD10N65W 6  21 1011.5                415 4331
2311PHB030569      9CAMF 2100 1030COWFLD10N65W15  21 1012.5                413 4431
2311PHB030569      9CAMF 2101 1120COWFLD10N65W30  21 1010.0                412 5341
2311PHB030569      9CAMF 2102 1130COWFLD10N66W36  21 1013.5                413 5341
2311PHB030569      9POGR 2107 0900COWFLD11N65W31 022 10 6.5                  13 5550
2311PHB030569      9SPPA 2108 0900COWFLD11N65W31  22 10 4.0                  11 3441
2311PHB040569      9CAMF 2103 0810COWFLD10N66W36  21 1011.0                413 4331
2311PHB040569      9CAMF 2104 0815COWFLD10N66W36  21 20          2.31A413 4331
2311PHB040569      9CAMF 2105 0935COWFLD10N66W36  21 1011.5                412 4431
2311PHB040569      9CAMF 2106 0925COWFLD10N66W36  21 1011.5                412 3221
2311RSS090569      9CAMF    1 0955COWFLD10N65W25  21 1011.0                414 4431
2311RSS090569      9CAMF    2 1020COWFLD10N64W19  21 1013.0                413 4441
2311RSS090569      9CAMF    3 1045COWFLD10N64W28  21 1011.0                414 4441
2311PHB090569      9CAMF 2112 1005COWFLD10N65W25  21 1010.1                413 4441
2311RSS100569      9CAMF    4 1445COWFLD10N65W31  21 1012.0 7.0            414 3231
2311RSS100569      9CAMF    5 1505COWFLD10N65W30  21 1014.5 7.0            412 2221
2311RSS100569      9CAMF    6 1550COWFLD10N65W25  21 1012.0 7.0            412 5551
2311RSS100569      9CAMF    7 1552COWFLD10N64W19  21 1013.5 7.5            414 3331
2311RSS100569      9CAMF    8 1610COWFLD10N65W12  21 1011.5 6.5            415 4341
2311RSS100569      9CAMF    9 1700COWFLD10N65W30  21 1012.5 7.5            414 2231
2311RSS100569      9CAMF   10 1700COWFLD10N66W25  21 1011.5 7.0            413 2121
2311RSS100569      5SASA   11 1630COWFLD10N65W26  21 10 5.5 2.5            413 4451
2311RSS180569      9CAMF   12 0920COWFLD10N65W30  21 1011.5 8.0            414 2221
2311RSS180569      9CAMF   14 0925COWFLD10N66W25  21 1014.5 8.0            414 2221
2311RSS180569      9CAMF   15 0947COWFLD10N65W35  21 1012.0 7.0            412 2221
2311RSS170569      9CAMF   16 0950COWFLD10N65W 2  21 1013.5 7.5             41 2201
2311RSS170569      9CAMF   17 1020COWFLD10N65W 1  21 1012.5 7.5             41 2221
2311RSS170569      9CAMF   18 1025COWFLD10N65W 1  21 1012.0 8.0             41 2221
2311RSS170569      9CAMF   19 1025COWFLD10N65W 1  21 1012.5 7.0             41 2221
2311RSS170569      9CAMF   20 1040COWFLD10N64W 6  21 1012.0 8.0             41 2221
2311RSS170569      9CAMF   22 1100COWFLD10N65W 1  21 1011.0 6.5             41 5551
2311RSS170569      9CAMF   23 1030COWFLD10N65W20  21 2111.0 6.5 3.82A41     3331
2311RSS170569      5ERAL   13 0915COWFLD10N65W30  21 1010.0 6.5            413 2231
2311RSS170569      8MOAT   21 1044COWFLD10N64W 6  21 10 5.0 3.5            410 5551
2311RSS220569      9CAMF   24 0710COWFLD10N65W31  21 1013.5 7.5            412 2221
2311RSS220569      9CAMF   31 0845COWFLD10N65W 5  21 20 9.0 5.0 1.51A413    5441
2311RSS220569      9CAMF   32 0845COWFLD10N65W 5  21 1010.0 7.0            412 2221
2311RSS220569      9CAMF   33 0900COWFLD10N65W 5  21 1013.0 8.0            414 2221
2311RSS220569      9CAMF   34 0915COWFLD10N65W 4  21 1013.5 7.5            413 3321
2311RSS220569      9CAMF   35 0930COWFLD10N65W 4  21 1013.5 7.0            411 3231
2311RSS220569      9CAMF   36 0950COWFLD11N65W34  21 20 7.5 5.0 1.31R413    4311
2311RSS230569      9CAMF   25 0715COWFLD10N66W36  21 1012.5 9.0            413 2221
2311RSS230569      9CAMF   29 0750COWFLD10N66W12  21 1012.5 8.0            412 2221
2311RSS230569      9CAMF   30 0830COWFLD11N66W36  21 1014.5 8.5            414 2231
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2311RSS230569  9POGR  26 0730COWELD10N66W12  21 20          1.0  013  2220
2311RSS230569  8STNF  28 0740COWELD10N66W12  21 1018.5 7.5      411  2221
2311RSS230569  5TYVE  27 0735COWELD10N65W 7  21 25 8.0 5.0 1.0  013  4431
2311RSS300569  9CAMF  37 1325COWELD10N66W25  21 1012.5 8.0      412  1111
2311RSS300569  9CAMF  38 1345COWELD10N66W25  21 22          7.010413  2211
2311RSS300569  9CAMF  39 1350COWELD10N66W25  21 1014.0 6.5      413  2221
2311RSS300569  9CAMF  40 1351COWELD10N66W25  21 1013.0 7.0      414  2221
2311RSS300569  9CAMF  41 1400COWELD10N66W25  21 1012.5 7.5      414  2221
2311RSS300569  9CAMF  42 1410COWELD10N66W27  21 2312.0 6.0 4.0 4414  2201
2311RSS300569  9CAMF  43 1425COWELD10N66W22  21 1011.5 7.0      414  2221
2311RSS300569  9CAMF  44 1430COWELD10N66W22  21 1013.0 7.0      413  2021
2311RSS300569  9CAMF  45 1445COWELD10N66W22  21 2311.0 7.0 2.0 2413  3221
2311RSS300569  9CAMF  46 1510COWELD10N66W 4  21 23            7.05A413  3221
2311RSS070669  9CAMF  47 1225COWELD11N66W31 021 1013.0 7.0      414  1111
2311RSS070669  9CAMF  48 1230COWELD10N66W 6 021 1013.5 7.5      415  2111
2311RSS070669  9CAMF  49 1240COWELD10N66W 6 021 23 9.0 5.0 3.0  414  2221
2311RSS070669  9CAMF  50 1255COWELD11N66W31 021 1012.0 7.0      411  3321
2311RSS070669  9CAMF  51 1305COWELD10N66W 4 021 1013.5 7.5      413  1111
2311RSS070669  9CAMF  52 1315COWELD11N64W32 021 1013.0 7.5      415  2221
2311RSS070669  9CAMF  53 1340COWELD10N64W26 021 1012.0 7.0      413  3321
2311RSS070669  9CAMF  54 1350COWELD10N64W26 021 23 7.0 4.0 2.0 3413  2221
2311RSS070669  9CAMF  55 1355COWELD10N64W25 021 1012.0 7.0      413  2221
2311RSS070669  9CAMF  56 1420COWELD 9N64W10 021 1012.5 8.5      412  2221
2311RSS130669  9CAMF  57 0800COWELD 9N65W 6 021 1012.0 8.5      413  1121
2311RSS130669  9CAMF  58 0840COWELD10N65W26 021 23 9.0 5.0 1.01A414  1221
2311RSS130669  9CAMF  59 0910COWELD10N64W29 021 23 9.0 7.0 4.0 9412  2221
2311RSS130669  9CAMF  60 0910COWELD10N64W29 021 1014.5 8.0      412  1111
2311RSS130669  9CAMF  61 0924COWELD10N64W29 021 2310.5 6.5 1.01A413  2221
2311RSS130669  9CAMF  62 0935COWELD10N64W29 021 2310.0 6.0 2.0 7413  2121
2311RSS130669  9CAMF  63 0937COWELD10N64W28 021 1014.0 9.0      413  2231
2311RSS130669  9CAMF  64 1000COWELD10N64W30 021 2016.0 8.5 8.5 7412  2111
2311RSS130669  9CAMF  65 1003COWELD10N64W19 021 1012.5 7.5      413  2111
2311RSS130669  9CAMF  66 1045COWELD10N64W24 021 2313.010.0 8.84A413  3221
```

Avian Collection - External

Avian collection - external data collected in 1970 at the Pawnee Site is Grassland Biome Data Set A2U202B. Data were collected on Form NREL-24. A sample data form and an example of the data follow. These data are not discussed in this report but were collected as part of the present project.

IBP

GRASSLAND BIOME

U.S. INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET - AVIAN COLLECTION - EXTERNAL

DATA TYPE	SITE	INITIALS	DATE			TREATMENT	REPLICATE	PLOT SIZE	GROUP	GENUS	SPECIES	SUBSPECIES	SPECIMEN NUMBER	SEX	DEVELOPMENT	AGE	AGE UNITS	WEIGHT	WING LENGTH	TAIL LENGTH	BILL			TARSUS	MIDDLE TOE	
			Day	Mo	Yr																Length	Height	Width			
1-2	3-4	5-7	8-9	10-11	12-13	14	15	16-19	21	22-23	24-25	26	28-31	32	34	35-36	37	39-43	45-49	51-55	57-60	61-64	65-68	70-74	76-79	

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
- 44 Microbiology - Respiration

SEX
- 0 Unknown
- 1 Male
- 2 Female

DEVELOPMENT
- 0 Not noted
- 1 Nestling
- 2 Juv. or imm.
- 3 Subadult
- 4 Adult

AGE UNITS
- 0 No observation
- 1 Hour
- 2 Days
- 3 Weeks
- 4 Months
- 5 3 months
- 6 Years

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

GROUP
- 0 Waterfowl
- 1 Falconiform
- 2 Galli- and Gruiform
- 3 Charadriiform
- 4 Doves, owls, nighthawks, woodpeckers
- 5 Flycatchers, swallows, jays, titmice, wrens
- 6 Thrashers, bluebirds, gnatcatchers, pipits
- 7 Shrikes, starlings, vireos
- 8 Icterids
- 9 Fringillids

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

+++ EXAMPLE OF DATA +++

```
        1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

2411PHB030569          9CAMF   20971 4 16 041.4
2411PHB030569          9CAMF   20981 4 16  45.3
2411PHB030569          9CAMF   20991 4 16  42.9
2411PHB030569          9CAMF   21001 4 16  41.3
2411PHB030569          9CAMF   21011 4 16  40.2
2411PHB030569          9CAMF   21021 4 16  44.7
2411PHB030569          9POGR   21071 4 16  30.8
2411PHB030569          9SPPA   21081 4 16  13.3
2411PHB040569          9CAMF   21031 4 16  38.7
2411PHB040569          9CAMF   21042 4 16  39.2
2411PHB040569          9CAMF   21051 4 16  42.5
2411PHB040569          9CAMF   21061 4 16  33.7
2411RSS090569          9CAMF      11 4 16  42.9
2411RSS090569          9CAMF      21 4 16  42.8
2411RSS090569          9CAMF      31 4 16  40.3
2411PHB090569          9CAMF   21121 4 16  42.2
2411RSS100569          9CAMF      41 3113  35.8
2411RSS100569          9CAMF      51 4 16  38.2
2411RSS100569          9CAMF      61 4 16  45.5
2411RSS100569          9CAMF      71 4 16  41.4
2411RSS100569          9CAMF      81 4 16  46.0
2411RSS100569          9CAMF      91 4 16  40.5
2411RSS100569          9CAMF     101 4 16  39.0
2411RSS100569          5SASA     111 4 16  27.5
2411RSS180569          9CAMF     121 4 16  37.8
2411RSS180569          9CAMF     141 4 16  38.8
2411RSS180569          9CAMF     151 4 16  39.2
2411RSS170569          9CAMF     161 4 16  37.6
2411RSS170569          9CAMF     171 4 16  37.5
2411RSS170569          9CAMF     181 4 16  35.1
2411RSS170569          9CAMF     191 4 16  40.3
2411RSS170569          9CAMF     201 4 16  40.8
2411RSS170569          9CAMF     221 4 16  47.9
2411RSS170569          9CAMF     232 4 16  37.5
2411RSS170569          5FRAI     131 4 16  33.5
2411RSS170569          8MOAT     211 4 16  55.0
2411RSS220569          9CAMF     241 4 16  36.5
2411RSS220569          9CAMF     312 4 16  42.4
2411RSS220569          9CAMF     321 3113  36.9
2411RSS220569          9CAMF     331 4 16  43.3
2411RSS220569          9CAMF     341 4 16  39.8
2411RSS220569          9CAMF     351 4 16  34.9
2411RSS220569          9CAMF     362 4 16  37.4
2411RSS230569          9CAMF     251 4 16  37.1
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2411RSS230569	9CAMF	291	4	16	35.3
2411RSS230569	9CAMF	301	4	16	39.8
2411RSS230569	9POGR	262	4	16	24.0
2411RSS230569	BSTNF	281	4	16	100.5
2411RSS230569	5TYVE	272	4	16	40.5
2411RSS300569	9CAMF	371	4	16	36.2
2411RSS300569	9CAMF	382	4	16	41.8
2411RSS300569	9CAMF	391	4	16	37.5
2411RSS300569	9CAMF	401	4	16	37.7
2411RSS300569	9CAMF	411	4	16	36.6
2411RSS300569	9CAMF	422	4	16	39.4
2411RSS300569	9CAMF	431	3	13	35.9
2411RSS300569	9CAMF	441	4	16	38.2
2411RSS300569	9CAMF	452	4	16	39.0
2411RSS300569	9CAMF	462	4	16	38.2
2411RSS070669	9CAMF	471	4	16	38.7
2411RSS070669	9CAMF	481	4	16	38.6
2411RSS070669	9CAMF	492	4	16	36.0
2411RSS070669	9CAMF	501	3	16	39.2
2411RSS070669	9CAMF	511	4	16	35.9
2411RSS070669	9CAMF	521	3	16	39.9
2411RSS070669	9CAMF	531	3	16	41.9
2411RSS070669	9CAMF	542	4	16	37.4
2411RSS070669	9CAMF	551	3	16	37.2
2411RSS070669	9CAMF	561	4	16	35.0
2411RSS130669	9CAMF	571	3	16	35.7
2411RSS130669	9CAMF	582	4	16	35.9
2411RSS130669	9CAMF	592	4	16	40.9
2411RSS130669	9CAMF	601	4	16	35.7
2411RSS130669	9CAMF	612	4	16	34.7
2411RSS130669	9CAMF	622	4	16	38.3
2411RSS130669	9CAMF	631	4	16	40.9
2411RSS130669	9CAMF	642	4	16	34.4
2411RSS130669	9CAMF	651	4	16	38.0
2411RSS130669	9CAMF	662	4	16	39.6

Avian Collection - Plumage

Avian collection - plumage data collected in 1970 at the Pawnee Site is Grassland Biome Data Set A2U203B. Data were collected on Form NREL-25. A sample data form and an example of the data follow. These data are not discussed in this report but were collected as part of the present project.

IBP

GRASSLAND BIOME

US INTERNATIONAL BIOLOGICAL PROGRAM

FIELD DATA SHEET - AVIAN COLLECTION - PLUMAGE

DATA TYPE	SITE	INITIALS	DATE			TREATMENT	REPLICATE	GROUP	GENUS	SPECIES	SUBSPECIES	MOLT										GENERATION OF REMIGES & RECTRICES										BODY PLUMAGE													
												Prim,rt			Sec,rt				Rect,rt			Prim,rt			Sec,rt				Rect,rt			Crown	Nape	Auricular	Cervical	Int scap	Dorsal	Pelvic	Humeral	Sternal	Abdominal	Femoral	Crural	Marg cov	Sec cov	Prim cov
			Day	Mo	Yr							1	5	9	1	5	7	9	1	3	6	1	5	9	1	5	7	9	1	3	6														
1-2	3-4	5-7	8-9	10-11	12-13	14	15	17	18-19	20-21	22	24	25	26	28	29	30	31	33	34	35	37	38	39	41	42	43	44	46	47	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78

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
- 44 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

BODY PLUMAGE
- 0 No observation
- 1 No molt
- 2 Some follicles molting
- 3 Incomplete replacement

GROUP
- 0 Waterfowl
- 1 Falconiform
- 2 Galli- and Gruiform
- 3 Charadriiform
- 4 Doves, owls, nighthawks, woodpeckers
- 5 Flycatchers, swallows, jays, titmice, wrens
- 6 Thrashers, bluebirds, gnatcatchers, pipits
- 7 Shrikes, starlings, vireos
- 8 Icterids
- 9 Fringillids

GENERATION
- 0 No observation
- 1 Juvenal
- 2 1st basic (=1st winter)
- 3 2nd basic (=2nd winter)
- 4 Adult (generation unknown)

MOLT
- 0 No observation
- 1 Old
- 2 Dropped
- 3 Pin
- 4 Quarter grown
- 5 Half grown
- 6 Three-quarter grown
- 7 Full and unsheathing
- 8 New

+++ EXAMPLE OF DATA +++

```
        1         2         3         4         5         6         7         8
12345678901234567890123456789012345678901234567890123456789012345678901234567890

2511PHB030569   9CAME  111 1111 111 444 4444 444 1 1 2 1 1 3 1   1 3 1   1 1 1
2511PHB030569   9CAME  111 1111 111 444 4444 444 3 1 2 1 1 2 1 3 1 1 1 3 3 1 1
2511PHB030569   9CAME  111 1111 111 444 4444 444 1 1 1 1 1 3 1 3 1 3 1 3 3 1 1
2511PHB030569   9CAME  111 1111 111 444 4444 444 2 1 2 1 2 3 1 3 1 3 1 3 3 1 1
2511PHB030569   9CAME  111 1111 111 444 4444 444 3 1 2 1 1 3 1 1 1 3 1 3 1 1 1
2511PHB030569   9CAME  111 1111 111 444 4444 444 3 1 3 1 1 3 1 3 1 3 1 3 3 1 1
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