Technical Report No. 104

SOIL MACRO-ARTHROPODS OF THE PAWNEE SITE

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GRASSLAND BIOME

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ABSTRACT

The summer of 1970 was devoted to collection on a biweekly basis and identification of soil insects from the four differentially grazed pasture types. All organisms that were retained on a one millimeter sieve were considered macro-arthropods. Major insect groups collected and identified, in order of decreasing abundance were: Formicidae, Scarabaeidae, Staphylinidae, Rhinotermitidae, Tenebrionidae, Carabidae, Margarodidae, Curculionidae, Annelida, Asilidae, Elateridae, Lepidoptera, Lygaeidae, and Cerambycidae. Biomass and caloric values of the abundant groups will be determined.

SOIL MACRO-ARTHROPODS OF THE PAWNEE SITE

Little is known of the soil fauna of the shortgrass prairie. The presence of some adult insects in aboveground collections indicated that their immature stages should be present in the soil. Animals that inhabited the soil exclusively were completely unknown. The object of this study was therefore to collect, enumerate, and identify as far as practical, and then to determine insect biomass and caloric value.

Methods

The soil samples were collected from four differentially grazed pastures. The pasture treatments were ungrazed (exclosures in pastures 23 east and 15 west), lightly grazed (pasture 23 west), moderately grazed (pasture 15 east), and heavily grazed (pasture 23 east). Each pasture type was replicated twice. The replicates were called watersheds or plots. Each watershed was divided into 10 rows and 10 columns, totaling 100 sample areas (except study plots 2, 5, and 8), each containing a permanent study point or quadrat .25 m^2 for the purpose of estimating plant biomass changes.

All soil samples were taken between the permanent study points. Each sample was assigned the coordinate numbers of the nearest permanent study point to the right (facing the plot from the lower edge). Each set of coordinates was made up of a row number followed by a column number.

In the appendix are diagrams of eachstudy plot giving the important information concerning each individual plot. The points sampled on the first sampling date of 1970 are circled.

The biweekly samples were collected in conjunction with samples of aboveground insects and above- and belowground plant biomass. Sampling points for each study plot were selected at random on each sampling date. Once a

point was sampled, it was excluded from further sampling until all points on the plot were sampled. Five soil samples were removed from the two watersheds of each pasture type resulting in a total of 40 samples for each sample date.

The initial samples, taken in mid-April, consisted of 12.5 cm diameter cores 30.5 cm deep. Subsequent cores were only 15.25 cm deep, as no macro-arthropods were found in the 15-30 cm samples. However, additional 30.5 cm cores were taken at 3 month intervals. The bimonthly collections terminated with 30.5 cm samples in late October, with additional 30.5 cm samples being planned for mid-January, 1971. These 30.5 cm cores, except those of the first sampling date, were split in the field into two 15.25 cm cores, resulting in a 15.25 cm core and a 15.25-30.25 cm core. All soil cores were placed in plastic bags and refrigerated until they were sieved.

After the third sampling date, vegetation associated with the soil core sample was identified and recorded prior to taking the sample.

Extraction

Each core was soaked in a 10.6 liter pail of water, then gradually wet sieved through a series of three sieves: 4 mm on top; 2 mm in the middle; and 1 mm on the bottom. Three sieves permitted the use of high water pressure necessary to break the larger soil particles into smaller sievable sizes. Otherwise, the water pressure would have forced smaller organisms through the smallest sieve.

The larger roots were removed from the sieves and placed in plastic bags for later examination. The accumulated debris collected on the sieves was then rinsed into a pail containing a concentrated magnesium sulfate solution. The debris was thoroughly mixed, then allowed to settle. The mixture was

poured through fine mesh organdy cloth to collect the organisms from the surface for later separation. The sediment on the bottom of the pail was discarded, and the magnesium sulfate solution was saved for re-use. The organdy with the collected material was placed in the plastic bag with the roots. Organisms observed during extraction were removed and placed in a vial of 75% ethyl alcohol. No deliberate attempt was made, however, to find specimens during the extraction.

In Laramie, all the samples were again wet sieved, providing an additional washing of the roots. The roots were then removed and carefully, but quickly examined for organisms and then discarded. All material remaining on the sieves was rinsed into a pail and everything, including the sediment, was collected in the organdy cloth.

Final extraction was done in the laboratory by floating small portions of the collected material on water in a white porcelain tray. The material was observed carefully to find specimens both floating and submerged. An attempt was made to determine whether specimens were living by touching a few drops of alcohol to them. If no movement resulted, they were listed as in an unknown condition because they may have been killed by the extraction process. Insects were listed as dead if they were brittle or incomplete. All specimens were stored in 75% ethyl alcohol and identified as far as possible, which to this point has been primarily to family.

Dry weights were obtained on specimens for the first two sampling dates, but due to the destruction of the dried insects, estimated weights were taken on all subsequent samples until more complete identifications can be obtained.

The following data were recorded for each specimen where possible:

Data Type
33 Soil Macro-arthropods

Site
11 Pawnee

Initials

Date
Day
Month
Year

Time (hour)
00 Unknown

Treatment
1 Ungrazed
2 Lightly grazed
3 Moderately grazed
4 Heavily grazed
5 Grazed 1969; Ungrazed 1970

Replicate
1
2

Plot No.
1
2
3
4
5
6
7
8

Quadrat

Trophic
0 Unknown
1 Plant feeding (tissue)
2 Plant feeding (sap)
3 Root feeding
4 Predator
5 Scavenger
6 Non-feeding stage
7 Root feeding (tissue)
8 Root feeding (sap)

Level
1 15.25 cm
2 15.25 cm - 30.5 cm
3 0 - 30.5 cm
4 Unknown

Condition
1 Alive
2 Dead
3 Unknown

Class

Order

Family

Genus

Species

Subspecies

Life Stage
00 Undetermined
10 Adult
11 Adult male
12 Adult female
20 Pupa
30 Egg
31 Egg case
32 Egg case with eggs
33 Egg case with nymphs
40 Nymph or Larvae
41 Nymph or Larvae, early
42 Nymph or Larvae, middle
43 Nymph or Larvae, late
50 Instar
51 Instar, 1st
52 Instar, 2nd
53 Instar, 3rd
54 Instar, 4th
55 Instar, 5th
56 Instar, 6th
57 Instar, 7th

Total No.

Dry Weight (mg)

Host	
00	Unknown
01	*Agropyron smithii* Rydb.
02	*Artemisia frigida* Willd.
03	*Aristida longiseta* Steud.
04	*Bouteloua gracilis* (H.B.K.) Lag.
05	*Buchloe dactyloides* (Nutt.) Engelm.
06	*Carex filifolia* Nutt.
07	*Carex heliophila* MacKenz.
08	*Chrysothamnus nauseosus* (Pall.) Britt.
09	*Eriogonum effusum* Nutt.
10	*Muhlenbergia torreyi* (Kunth) Hitchc.
11	*Opuntia polyacantha* Haw.
12	*Psoralea tenuiflora* Pursh.
13	*Sphaeralcea coccinea* (Pursh.) Rydb.
14	*Stipa comata* Trin. and Rupr.

Estimate
E = estimate on weight

No. Weighed

Head Capsule Width (mm)

Table 1 represents the groups of soil organisms that have been identified thus far from the Pawnee Site. The major insect families represented in our collections are in the orders Coleoptera, Diptera, and Lepidoptera. The samples included obvious litter inhabitants as well as soil inhabitants.

Table 2 presents abundance and estimated biomass of the more common organisms. Cerambycidae, although few in number, were also included because of their large contribution to biomass. Ranking by biomass changes the order. The Formicidae were the most numerous because one sample included a large colony accounting for 911 individuals. The Scarabaeidae were also extremely abundant and responsible for one third of the biomass. The Annelida occurred in fewer numbers than the Scarabaeidae, but were responsible for over 15% of the biomass as they were individually much larger than the Scarabaeidae.

The numbers of certain organisms found in the four different pasture types are shown in Table 3. The Formicidae data confound the table, so we excluded this group in our final totals and came up with an interesting picture in regard to the heavy use pasture. This pasture has far fewer numbers of individuals than do the other three types. This is especially apparent in the Scarabaeidae, which is the group contributing the most to total biomass.

Table 1. Groups represented in soil Macro-Arthropod survey of the Pawnee Site. April 17-October 30, 1970

Insects		Non Insects
Anthicidae	Arctiidae	Araneida
Carabidae	Noctuidae	Acarina
Cerambycidae	Geometridae	ANNELIDA
Chrysomelidae		Oligochaeta
Cicindelidae		NEMATODA
Curculionidae		
Elateridae		
Endomychidae		
Meloidae		
Mycetophagidae		
Phalaeridae		
Scarabaeidae		
Scaphidiidae		
Staphylinidae		
Tenebrionidae		
Heteroceridae		
Hydrophilidae		
Formicidae		
Rhinotermitidae		
Lygaeidae		
Pentatomidae		
Corixidae		
Margarodidae		
Aphididae		

Table 2. Abundance and biomass of organisms collected from soil samples taken at Pawnee Site. April 17 - October 30, 1970.

Group	Rank	No.	Percent of Numbers	Biomass (mg)	Rank	Percent of Mass
Formicidae	1	1605	55.5	642.0	3	12.9
Scarabaeidae	2	577	20.0	1615.6	1	32.4
Staphylinidae	3	89	3.1	53.4	13	1.1
Rhinotermitidae	4	87	3.0	96.6	11	1.9
Tenebrionidae	5	66	2.3	182.4	8	3.7
Carabidae	6	65	2.2	422.5	4	8.5
Margarodidae	7	56	1.9	58.7	12	1.2
Curculionidae	8	56	1.9	142.8	9	2.9
Annelida	9	52	1.8	780	2	15.6
Asilidae	10	40	1.4	198.6	7	4.0
Elateridae	11	38	1.3	117.8	10	2.4
Lepidoptera	12	33	1.1	264.0	6	5.3
Lygaeidae	13	26	0.9	8.3	14	0.2
Cerambycidae	14	5	0.2	402.9	5	8.1

Table 3. Distribution of soil organisms among the four pasture types. April 17 - October 30, 1970.

Group	Grazing Intensity			
	Ungrazed	Light	Moderate	Heavy
Formicidae	340	911	126	228
Scarabaeidae	232	124	174	47
Staphylinidae	24	17	29	19
Rhinotermitidae	3	11	73	0
Tenebrionidae	16	19	20	11
Carabidae	10	29	12	14
Margarodidae	26	4	12	14
Curculionidae	20	18	10	8
Annelida	8	40	3	1
Asilidae	8	9	15	8
Elateridae	19	1	10	8
Lepidoptera	1	17	14	1
Lygaeidae	2	11	12	1
Cerambycidae	1	1	1	2
Others	12	44	24	17
Total	722	1256	535	379
Total[a/]	382	345	409	151

[a/] Excluding Formicidae

Table 4 presents seasonal abundance of organisms. The most interesting data are those of the Annelida which showed an almost complete absence of organisms after May. The larval Scarabaeidae displayed two peaks in their abundance, the first peak occurred during May and the second in August. The adult Scarabaeidae showed a more general distribution indicating a peak in abundance in mid September. Lepidoptera were most abundant during August and early September. Most groups were encountered in such small numbers, however, that it is difficult to discern any actual peaks in their occurrence.

A comparison of the frequency of occurrence of soil organisms at four different grazing intensities is shown in Table 5. This shows the difference between sample sites. Each replicate is a plot located adjacent to a watershed. Differences in insect abundance did occur among the plots. For example, heavy grazing treatment replicate 1, which was watershed 1, consistently had fewer insects than any other plot. Considerable variation also occurred between watersheds as to the number of samples containing organisms.

This year's study provided information on the abundance and estimated biomass of soil organisms collected on the four differentially grazed pasture types. Our sampling indicated that the Scarabaeidae were the most abundant and accounted for nearly a third of the biomass. Annelida were far fewer in number, but did contribute considerably to total biomass. The Annelida, however, were collected only in early spring and only two individuals were encountered after May. We also found that differences in insect abundance did occur among the plots, and also between the replicates themselves.

The attached tables present the information obtained on soil macroarthropods this far.

Table 4. Seasonal abundance of the more obvious soil organisms at the Pawnee Site.

Group	April 17	May 1	May 15	May 29	June 13	June 25	July 11	July 22	Aug. 4	Aug. 17	Sept. 1	Sept. 14	Oct. 1	Oct. 30
Formicidae	13	58	52	8	155	4	62	1117	45	44	4	15	16	12
Scarabaeidae (adult)	15	8	14	18	5	5	12	26	16	12	16	59	30	19
(larvae)	2	36	40	43	17	22	11	15	44	46	17	14	10	8
Staphylinidae	9	10	12	7	5	1	3	5	11	3	6	8	3	6
Annelida	9	18	24	0	2	0	0	0	0	0	0	0	0	0
Carabidae	7	4	5	0	7	3	4	2	9	8	4	4	1	7
Tenebrionidae (adult)	4	1	2	1	3	0	1	2	2	4	3	3	3	1
(larvae)	3	2	5	1	1	1	2	1	1	6	1	4	4	4
Curculionidae (adult)	1	1	2	4	0	3	2	0	1	1	3	7	1	2
(larvae)	0	1	4	0	0	1	2	2	5	7	0	2	0	4
Elateridae (larvae)	3	0	1	5	4	1	4	3	1	2	0	7	1	6
Margarodidae	0	0	0	12	5	2	0	2	1	0	15	6	12	2
Lepidoptera (larvae)	0	1	0	0	0	1	1	2	9	7	8	0	1	1
Asilidae	1	3	1	3	4	4	1	2	5	2	3	5	3	3
Cerambycidae (larvae)	0	0	0	0	2	0	0	1	0	1	0	0	0	1
Lygaeidae	0	3	4	6	1	7	0	1	0	0	1	1	2	0

Table 5. Comparison of the frequency of occurrence of soil organisms at four different grazing intensities. 1970.

Sample Date	Grazing Intensity	No. Samples Containing Arthropods		Avg. No. Organisms per Sample	
		Rep. 1	Rep. 2	Rep. 1	Rep. 2
April 17	Zero	5	1	4.2	0.4
	Light	5	3	2.4	2.8
	Moderate	5	4	4.4	1.6
	Heavy	3	3	0.8	2.0
May 1	0	4	4	5.2	12.2
	L	3	3	4.0	2.8
	M	5	4	2.6	2.4
	H	1	2	0.6	0.4
May 15	0	4	4	2.0	7.0
	L	5	4	4.0	7.4
	M	5	5	6.4	4.2
	H	2	4	0.4	6.2
May 29	0	5	4	6.2	4.4
	L	4	4	1.6	3.8
	M	4	4	1.4	1.6
	H	2	3	0.4	2.0
June 13	0	3	4	0.8	1.0
	L	4	4	2.0	2.0
	M	2	5	0.4	4.2
	H	1	5	0.2	31.8
June 25	0	2	3	0.4	3.4
	L	2	3	0.6	0.6
	M	3	4	2.2	2.2
	H	2	2	0.4	0.6
July 11	0	2	5	2.6	3.4
	L	4	2	5.0	4.8
	M	4	2	1.8	0.8
	H	2	4	0.4	1.4
July 22	0	3	5	45.2	3.8
	L	5	4	15.4	152.8
	M	5	5	4.6	5.2
	H	3	4	0.6	3.4
Aug. 4	0	1	3	2.0	6.0
	L	4	4	7.8	3.2
	M	5	4	4.2	6.0
	H	4	5	1.4	2.0

Table 5. (Continued)

Sample Date	Grazing Intensity	No. Samples Containing Arthropods		Avg. No. Organisms per Sample	
		Rep. 1	Rep. 2	Rep. 1	Rep. 2
Aug. 18	0	2	5	0.6	7.0
	L	3	3	1.8	2.4
	M	5	4	11.8	4.8
	H	3	3	1.8	2.0
Sept. 1	0	5	5	3.8	4.2
	L	3	4	2.0	3.0
	M	3	3	1.2	1.6
	H	3	2	1.4	1.4
Sept. 14	0	5	4	5.4	4.2
	L	4	3	2.6	1.4
	M	4	4	6.0	6.2
	H	3	3	1.6	1.6
Oct. 1	0	3	5	1.8	1.2
	L	4	5	2.0	2.2
	M	3	2	2.0	4.6
	H	4	2	1.8	0.8
Oct. 29	0	4	4	1.0	2.6
	L	5	3	5.2	1.6
	M	2	2	0.6	2.0
	H	3	4	1.6	1.4

APPENDIX I

FIELD DATA

Soil Macro-arthropod Data

Soil macro-arthropod data collected in 1970 at the Pawnee Site is Grassland Biome data set A2U302B. Data were collected on form NREL-33. A sample data form and a sample of the data follow.

IBP

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FIELD DATA SHEET - SOIL MACROARTHROPODS

Data Type	Site	Initials	Date			Time	Treatment	Replicate	Plot No.	Quadrat	Trophic	Host	Level	Condition	Class	Order	Family	Genus	Species	Subspecies	Life Stage	Total No.	Dry Weight (mg)	Estimate	No. Weighed	Head Capsule Size-width (mm)
			Day	Month	Year																					
1-2	3-4	5-7	8-9	10-11	12-13	14-15	16	17	18	19-20	21	22-27	28	29	31-33	35-37	39-41	42-44	45-47	48-51	52-53	54-56	57-62	63	64-66	68-72
33																										

Treatment

1 Ungrazed
2 Lightly grazed
3 Moderately grazed
4 Heavily grazed
5 Grazed 1969; Ungrazed 1970
A Diet light
B Diet moderate
C Diet heavy
D ESA - O
E ESA - W
F ESA - N
G ESA - WN

Life Stage

00 Undetermined
10 Adult
11 Adult male
12 Adult female
20 [illegible]
30
31 Egg case
32 Egg case, with eggs
33 Egg case, with nymphs
40 Nymph or larvae
41 Nymph or larvae, early
42 Nymph or larvae, middle
43 Nymph or larvae, late
50 Instar
51 Instar, 1st
52 Instar, 2nd
53 Instar, 3rd
54 Instar, 4th
55 Instar, 5th
56 Instar, 6th
57 Instar, 7th

Host

00 Unknown
01 *Agropyron smithii* Rydb.
02 *Artemisia frigida* Willd.
03 *Aristida longiseta* Steud.
04 *Bouteloua gracilis* (H.B.K.) Lag.
05 *Buchloe dactyloides* (Nutt.) Engelm.
06 *Carex filifolia* Nutt.
07 *Carex heliophila* MacKenz.
08 *Chrysothamnus nauseosus* (Pall.) Britt.
09 *Eriogonum effusum* Nutt.
10 *Muhlenbergia torreyi* (Kunth) Hitche.
11 *O[illegible]ia polyacantha* Haw.
12 *Psoralea tenuiflora* Pursh.
13 *Sphaeralcea coccinea* (Pursh.) Rydb.
14 *Stipa comata* Trin. and Rupr.

Data Type

33 Soil macro-arthropods

Genus

0 Tentative ID

Site

11 Pawnee

Time (hour)

00 Unknown

Level

1 0" - 6"
2 6" - 12"
3 0" - 12" (entire)
4 Unknown

Condition

1 Alive
2 Dead
3 Unknown

Trophic

0 Unknown
1 Plant feeding (tissue)
2 Plant feeding (sap)
3 Root feeding
4 Predator
5 Scavenger
6 Non-feeding stage
7 Root feeding (tissue)
8 Root feeding (sap)

Estimate

E = Estimate on weight

+++ EXAMPLE OF DATA +++

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

      2207701322523   0412 INS COL SCA          10 01
      2207701322523   0411 INS HEM COR  0       10 01
      2207701322523   0411 INS COL HET  0       10 01
      2207701322523   0411 INS COL HYD  0       10 01
      2207701331623   0413 INS HYM FOR          10 01
      2207701331684   0421 INS HYM FOR          10 01
      2207701331682   0423 INS HYM FOR          10 05
      2207701331638   0313 INS HYM FOR          10 01
      2207701331638   0312 INS COL STA          10 01
      2207701331682   0413 INS HYM FOR          10 03
      2207701331623   0413 INS COL STA          10 02
      2207701331633   0433 INS ORT              32 04
      2207701331638   0313 INS COL SCA  0       40 01
      2207701331638   0313 INS COL CUR  0       40 01
      2207701331682   0412 INS DIP      0       40 01
      2207701331638   0311 INS COL SCA  0       40 03
      2207701331684   0413 INS COL SCA  0       40 01
      2207701331623   0423 INS COL MEL  0       40 01
      2207701331684   0423 INS COL ANT  0       10 01
      2207701432736   0413 INS HYM FOR          10 02
      2207701432721   0413 INS HYM FOR          10 01
      2207701432791   0413 INS HYM FOR          10 03
      2207701432736   0413 INS COL ELA          41 01
3311 JWL2207701432782   0412 INS COL SCA          10 03
      2207701432791   0422 INS HYM FOR          10 02
      2207701432791   0411 INS HYM FOR          10 02
      2207701432791   0413 INS HYM FOR          10 09
      2207701432798   0413 INS COL SCA  0       10 01
      2207701432782   0413 INS HEM LYG  0       43 01
      2207701432721   0413 INS DIP      0       40 01
      2207700841132   0412 INS HYM FOR          10 01
      2207700841162   0413 INS COL STA          10 01
      2207700841146   043                       00
      2207700841156   043                       00
      2207700841106   0433 INS COL      0       10 01
      2207701042359   0412 INS COL SCA          10 01
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      2207701042386   0413 INS HYM FOR          10 04
      2207701042359   0413 INS HYM FOR          10 21
      2207701042320   0413 INS HYM FOR          10 01
      2207701042359   0411 INS HYM FOR          10 11
      2207701042380   0412 INS COL SCA          10 02
      2207701042309   043                       00
      2207701042320   0413 INS COL SCA  0       40 01
      2207701042386   0413 INS COL CUR  0       40 01
      2207701042380   0412 INS COL SCA  0       40 03
      0408701211241   0413 INS COL SCA          10 02
```

	0408701211241	0411	INS	HYM	FOR		10	01
	0408701211241	0413	INS	HYM	FOR		10	06
	0408701211214	041						00
	0408701211294	041						00
	0408701211274	041						00
	0408701211224	041						00
	0408701211241	0413	INS	COL	SCA	0	40	01
	0408701412832	0413	INS	HYM	FOR		10	01
	0408701412864	041						00
	0408701412834	0412	INS	COL	SCA	0	40	02
	0408701412833	041						00
	0408701412821	0413	INS	DIP		0	40	01
	0408701412832	0413	INS	COL	FLA		40	01
	0408701412832	0413	INS	COL	CUR		40	01
3311 IWL	0408701412834	0413	INS	COL	SCA	0	40	23
	0408701412821	0412	INS	COL	CUR	0	40	01
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	0408701321451	0212	INS	COL	SCA		10	01
	0408701321451	0212	INS	COL	CAR		10	01
	0408701321451	0211	INS	COL	CAR		10	03
	0408701321451	0211	INS	COL	SCA		10	01
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	0408701321492	031						00
	0408701321428	0313	INS	COL	CUR		10	01
	0408701321460	0413	INS	HYM	FOR		10	04
	0408701321428	0311	INS	LEP	ARC	0	40	02
	0408701321428	0313	INS	LEP	ARC	0	40	02
	0408701321428	0312	INS	COL	SCA	0	40	01
	0408701321460	0413	ARA	ACA		0	00	01
	0408701321460	0413	INS	COL	SCA	0	40	03
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	0408701321451	0211	INS	COL	CAR	0	10	01
	0408701321422	120413	INS	ISO	RHI	0	00	10
	0408701321492	0312	INS			0	20	01
	0408701321422	120413	INS	COL	SCA	0	40	01
	0408701321451	0212	INS	COL		0	20	01
	0408701321451	0212	INS	DIP		0	10	01
	0408701322504	0413	INS	HYM	FOR		10	10
	0408701322522	0412	INS	COL	STA		10	01
	0408701322562	0213	INS	COL	CUR		40	01
	0408701322573	0213	INS	COL	SCA		10	01
	0408701322593	041						00
	0408701322504	0413	INS	COL	SCA	0	40	01
	0408701322522	0413	INS	COL	SCA	0	40	02
	0408701431606	1013	INS	COL	STA		10	02
	0408701431609	0413	INS	COL	STA		10	02
	0408701431680	0511	INS	COL	STA		10	01
	0408701431698	0413	INS	COL	SCA		40	01
	0408701431603	0312	INS	HYM	FOR		10	01
	0408701431603	0312	INS	COL	SCA		10	01
	0408701431603	0313	INS	COL	SCA		10	04

3311 IWL	0408701431603	0313	INS	HYM	FOR		10	01
	0408701431680	0511	INS	COL	SCA	0	10	01
	0408701431606	1013	INS	COL	SCA	0	40	01
	0408701431603	0313	INS	COL	TEN	0	40	01
	0408701431698	0411	INS	COL	SCA	0	40	01
	0408701431603	0313	INS	LEP		0	40	03
	0408701431609	0413	INS	DIP		0	10	01
	0408701432745	0411	INS	HYM	FOR		10	01
	0408701432745	0411	INS	COL	STA		10	01
	0408701432745	0413	INS	HYM	FOR		10	07
	0408701432745	0413	INS	COL	STA		10	01
	0408701432711	0313	INS	COL	CAR		10	01
	0408701432711	0312	INS	COL	SCA		10	01
	0408701432748	090311	INS	COL	CAR		10	01
	0408701432790	0411	INS	COL	SCA		43	01
	0408701432711	0313	INS	COL	SCA		10	01
	0408701432711	0313	INS	HYM	FOR		10	01
	0408701432799	041						00
	0408701432790	0413	INS	HYM	FOR	0	10	02
	0408701432748	090312	INS			0	20	01
	0408701432799	0413	INS	HYM	FOR	0	10	07
	0408701432799	0412	INS	LEP	NOC	0	40	01
	0408701432790	0413	INS	COL	SCA	0	40	01
	0408701432711	0313	INS	COL	SCA	0	40	01
	0408701432711	0312	INS	COL	SCA	0	40	01
	0408701432748	090311	INS	LEP	ARC		40	02
	0408701041114	0412	INS	COL	STA		10	01
	0408701041177	0411	INS	COL	CAR		10	01
	0408701041121	0413	INS	COL	SCA		10	01
	0408701041144	041						00
	0408701041159	0413	INS	COL	CUR	0	40	01
	0408701041121	0413	INS	HYM	FOR	0	10	01
	0408701041121	0411	INS	DIP		0	40	01
	0408701041177	0413	INS	LEP		0	40	01
	0408701041177	0411	INS	DIP	ASI		40	01
	0408701342336	0413	INS	COL	STA		10	01
	0408701342348	0411	INS	COL	TEN		10	01
	0408701342377	0411	INS	HYM	FOR		10	01
3311 IWL	0408701342377	0413	INS	HYM	FOR		10	01
	0408701342324	0413	INS	COL	STA		10	01
	0408701342306	0412	INS	COL	CUR	0	40	01
	0408701342377	0413	INS	HOM	MAR	0	00	01
	0408701342336	0412	INS	COL	SCA	0	40	01
	0408701342336	0413	INS	COL	SCA	0	40	01
	0408701342336	0412	INS	COL	TEN	0	10	01
	1808701311201	0413	INS	COL	SCA		10	01
	1808701311293	11131						00
	1808701311272	11041						00
	1808701311261	0213	INS	COL	CUR	0	40	01
	1808701311222	041						00
	1808701311201	0413	INS	COL	TEN	0	40	01
	1708701512803	0413	INS	COL	CHR	0	10	01
	1708701512892	0413	INS	HYM	FOR		10	01
	1708701512882	0413	ARA	ARA			00	01
	1708701512861	0313	INS	COL	ELA		40	01
	1708701512914	0411	INS	DIP	AST	0	40	01
	1708701512892	0413	INS	COL	TEN		10	01

1708701512861	0313	INS	COL	SCA	0		40	04		
1708701512882	0413	INS	COL	CUR	0		40	01		
1708701512814	0412	INS	COL	TEN	0		40	01		
1708701512892	0413	INS	COL	CUR	0		40	03		
1708701512861	0311	INS	COL	ELA	0		40	01		
1708701512892	0413	INS	COL	SCA	0		40	01		
1708701512882	0413	INS	COL	SCA	0		40	16	3.9	10
1708701512882	0412	INS	RHI		0		00	01		
1708701512882	0412	INS	COL	SCA	0		40	01		