2010 Progress Report

FINAL UPDATE OF STATE WILDLIFE GRANT: November 15, 2010

PROJECT NUMBER: T-36-P-1

PROJECT TITLE: Interrelationships of grassland birds with sand prairie plants and insects.

PURPOSE: Grassland bird habitat is typically described only in structural terms such as height and density of vegetation, amount of bare ground, and extent of woody vegetation. At the same time, prairie restoration efforts, which often focus on high native plant species diversity, are in need of appropriate planting mixtures for grassland birds. In addition, little is known of links, if any, between grassland bird abundance and/or reproductive success and prairie insect diversity and abundance. This project collected data on grassland birds, plants, and insects at a large remnant sand prairie for use by land managers in developing management and restoration plans.

Update for progress to date:
Point counts, vegetation structure and composition, and insect composition were estimated at 24 study plots throughout the sand prairie at the former Savanna Army Depot (SAD) 2007-2009. No management plans have been developed for this site despite its great biological significance in terms of size of area and species diversity. This report presents data that may be helpful in understanding the biological diversity at (SAD).

Grassland Birds
Point counts were conducted at 24 study plots throughout the sand prairie. The results are listed in Table 1.

Plants
Vegetation structure and composition were estimated at 24 study plots throughout the sand prairie. The results are listed in Tables 2 and 3.

Insects
Insect composition was estimated at 24 study plots throughout the sand prairie. The results are listed in Table 4.

Table 1. Birds recorded at 24 unlimited distance point counts at Savanna Army Depot 2007-2009. For each year columns list the average number of individuals observed over three count periods and the average number of points at which each species was observed.

	2007		2008		2009	
	AVG	#PTS	AVG	#PTS	AVG	#PTS
AMCR	12.3	8.7	11.7	7.0	13.3	7.3
AMGO	5.3	4.0	6.7	4.7	10.3	6.7
MAKE	2.0	2.0	1.7	1.7	2.5	2.0
AMRO	3.0	3.5	3.0	3.0	4.0	3.7
AWPE	21.0	1.5	40.0	1.0	26.7	1.3
BAEA	1.0	1.0	1.0	1.0	1.0	1.0
BANS	4.0	1.0				
BAOR	4.0	3.3	4.0	3.3	12.0	5.0
BARS	6.0	5.7	7.7	6.0	18.3	4.0
BBCU					1.0	1.0
BCCH			1.0	1.0	4.5	3.5
BHCO	22.7	10.0	17.0	8.7	5.0	3.7
BGGN					1.0	1.0
BLGR	2.0	2.3	1.5	1.5	6.0	5.0
BLJA	6.3	4.7	3.7	2.7	8.0	5.3
BOBO	2.5	3.0	4.0	3.0	6.0	5.0
BRTH	6.7	6.7	3.7	3.0	18.3	4.3
CANG	21.0	5.0	31.0	4.0	3.0	2.5
CEDW	1.5	2.0	1.0	1.0	3.0	2.3
CHSP	4.7	4.0	3.3	3.3	4.5	3.5
CHSW	5.3	4.7	10.0	9.0	5.3	3.3
CLSW	1.0	2.0				
COGR	8.0	4.5	3.0	3.0	6.5	2.5
CONI	4.0	4.0	6.7	5.7	10.0	4.0
COYE	1.7	2.0	1.0	1.0	8.5	4.0
DCCO	2.0	2.0			1.0	1.0
DICK	37.7	17.3	27.3	14.3	21.0	9.3
DOWO	1.0	1.0	1.0	1.0	2.3	2.3
EABL	7.0	5.0	7.7	4.0	8.3	6.0
EAKI	4.0	3.7	4.3	3.7	19.7	11.3
EAME	36.7	17.7	31.3	18.3	24.3	9.7
EAPH			1.0	1.0	2.5	1.5
EATO	1.7	2.0	3.0	2.0	6.0	4.7
EAWP	1.0	1.5	1.0	1.0		
EUST	13.0	2.3	22.7	2.7	46.0	19.0
FISP	42.7	20.7	40.3	19.3	38.0	14.7

GBHE	2.0	2.0			1.5	1.5
GCFL	2.0	2.0	3.0	2.3	3.5	2.0
GRCA	3.5	2.5	2.0	2.0	29.0	10.0
GREG					1.0	1.0
GRSP	87.0	23.0	84.3	23.3	50.3	15.7
HAWO	1.0	1.0	1.0	1.0		
HESP	2.3	2.0	4.0	3.3	11.3	6.3
HOFI					1.0	1.0
HOLA	1.0	1.0				
HOWR	10.7	8.3	9.0	7.3	8.3	6.7
INBU	2.0	2.0	1.7	1.7	7.0	5.0
KILL	2.0	2.0			4.0	2.5
LASP	2.0	2.3	2.0	2.0	6.0	2.3
LOSH	1.0	1.0	1.0	1.0	3.5	3.0
MODO	33.0	18.7	25.7	17.0	20.0	10.0
NOBO	2.3	2.3	3.0	2.0	3.0	2.7
NOCA	2.7	3.0	1.5	1.5	2.7	2.7
NOFL	2.7	3.0	4.0	4.0	5.0	4.0
NOMO	11.3	9.7	7.0	6.3	7.3	5.7
NRWS	9.0	6.0	7.0	4.7		
OROR	5.3	5.0	2.7	2.3	3.0	1.7
PIWO	1.0	1.0	1.0	1.0	1.0	1.0
RBGR			1.0	1.0	2.5	2.0
RBWO	1.5	2.0	1.0	1.0	1.3	1.3
REVI					1.0	1.0
RHWO					9.0	5.0
RNPH			1.5	1.5	8.0	3.0
ROPI					5.0	2.0
RTHA	1.7	2.0	2.3	2.3	2.0	2.0
RTHU					1.0	1.0
RWBL	9.7	6.3	6.7	4.7	7.3	4.0
SACR	1.0	1.0	1.0	1.0		
SAVS	1.0	2.0				
SCTA					4.0	4.0
SOSP	2.0	2.3	3.3	3.0	4.0	3.3
SUTA	1.0	1.0	1.0	1.0		
TRES	1.0	1.3	1.0	1.0	12.7	3.7
TRUS					1.0	1.0
TUVU	2.0	2.0	3.0	2.0	5.5	4.5
UPSA	5.0	5.0	1.0	1.0	2.0	1.5
VESP	6.7	6.3	9.5	8.5	2.0	1.5
WAVI	1.0	1.5				
WBNU					27.0	12.0

WEME	47.3	18.7	33.0	15.3	25.7	8.3
WEVI	1.0	1.0				
WIFL					1.0	1.0
WITU	2.0	2.0	4.0	3.0	5.5	1.0
WODU					1.5	1.5
YBCH	1.0	1.0	1.0	1.0	1.0	1.0
YBCU	2.0	2.3	1.0	1.0	2.0	2.0
YBSA	2.0	2.0	2.3	2.3	3.3	2.3
YTVI	1.0	1.0	1.0	1.0	2.0	1.0

Table 2. Vegetation structure at the 24 points used to count birds and insects at the Savanna Army Depot. For each year, the columns list the average height/density index (Robel) and average leaf litter (Litter).

	2007		2008		2009	
Point	Robel	Litter	Robel	Litter	Robel	Litter
A5	2.50	3.94	2.19	2.50	1.50	3.63
B3	3.50	1.19	0.94	2.69	0.88	0.00
B5	2.50	1.50	0.44	0.19	0.50	0.25
B6	0.63	1.19	0.63	1.75	1.00	0.88
C1	1.19	1.38	1.38	0.94	1.00	1.38
D2	2.13	3.88	0.88	0.00	3.44	1.69
E1	1.88	2.44	2.25	2.06	0.88	0.25
E10	3.44	4.19	1.94	6.25	2.06	3.94
E11	2.94	0.75	1.06	0.94	1.13	1.00
E14	2.06	2.44	0.13	0.13	2.50	1.13
E15	4.06	4.38	0.00	0.00	1.81	1.06
E16	2.75	4.13	0.19	0.00	0.88	1.00
E2	0.88	1.38	1.38	4.38	1.19	0.25
E3	1.19	1.75	1.38	3.31	1.06	1.44
E6	3.00	1.38	2.19	2.25	1.44	2.75
E7	2.38	3.88	2.25	6.00	2.44	5.25
E8	1.38	2.19	1.88	6.25	2.38	5.50
E9	2.25	2.25	2.31	3.13	1.19	2.00
F0	1.38	1.63	1.06	2.13	0.63	1.56
F1	1.19	1.69	1.50	2.00	0.25	0.06
F11	1.56	0.88	1.31	0.00	2.13	1.19
F12	1.25	1.94	0.56	0.31	1.50	1.19
F6	0.19	1.00	0.56	1.06	0.44	0.31
J4	1.50	5.13	1.81	2.56	1.94	2.56

Table 3. Vegetation cover at the 24 points used to count birds and insects at the Savanna Army Depot. Values are average % cover for each category, except species richness, which is an estimate of the number of species in each sampling plot.

	2007	2008	2009
Bare Ground	7.45	7.78	20.03
Dead Plant	13.94	18.14	15.66
Cacti	3.57	2.31	3.00
Fern	4.06	1.40	3.01
Forb	12.23	18.46	13.57
Grass	36.76	37.27	26.01
Legume	6.90	10.06	12.23
Moss	0.77	0.67	2.14
Sedge	9.40	4.98	1.22
Shrub	6.66	4.64	2.88
Native Plant	67.77	52.60	37.12
Introduced Plant	14.87	28.27	28.12
Species Richness	25.26	31.85	26.19

Table 4. Invertebrate diversity at Savanna Army Depot 2007 – 2009. For each year the three columns list the average number and standard deviation of individuals in each invertebrate Order, and the number of transects on which each order was found (count).

	2007 - 45 transects			2008 - 68 transects			2009 - 84 transects		
	AVG	SD	count	AVG	SD	count	AVG	SD	count
Acari	0.44	1.36	7	0.28	1.36	6	5.58	20.65	35
Araneae	12.93	9.54	45	9.16	9.13	66	12.82	9.56	76
Coleoptera	34.93	27.69	45	27.82	23.12	67	29.20	18.88	78
Collembola	12.44	23.25	29	8.43	23.35	28	6.56	16.06	48
Diptera	55.96	47.69	44	66.03	71.84	66	52.34	35.51	79
Ephemeroptera	0.18	0.44	7	0.07	0.26	5	0.37	1.05	13
Hemiptera	260.58	214.51	44	129.59	164.17	68	145.61	122.87	79
Hymenoptera	43.40	23.63	44	31.49	23.36	68	35.67	17.46	79
Lepidoptera	7.89	6.13	44	4.96	4.98	63	5.92	5.33	72
Neuroptera	0.58	1.42	15	0.49	0.95	19	0.30	0.76	14
Odonata	0.33	0.67	11	0.65	1.50	19	0.24	0.84	11
Opiliones	0.02	0.15	1	0.03	0.17	2	0.05	0.22	4
Orthoptera	100.95	79.96	43	68.79	53.01	68	46.37	36.11	83
Phasmatodea	0.04	0.21	2	0.19	0.83	4	0.05	0.27	3
Psocoptera	1.49	2.50	19	0.31	1.14	8	0.37	0.82	16
Solifugae	0.00	0.00	0	0.00	0.00	0	0.01	0.11	1
Thysanoptera	5.27	5.49	39	4.01	7.85	40	10.89	24.73	69
Trichoptera	0.00	0.00	0	0.00	0.00	0	0.37	1.22	12