# WILDLIFE OCCURRENCE AND HABITAT CONDITIONS IN ROGER MILLS AND CUSTER COUNTIES, OKLAHOMA

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Wildlife occurrence and abundance of cover, food, and water were recorded on 136 10-acre sample plots in the Upper Washita Soil Conservation District in Roger Mills and Custer Counties, Oklahoma, during April and May, 1940. The principal data are presented here in order that they may be available for comparison with data from other localities where similar surveys are made.

#### METHODS

The methods used were those described in detail by Osborn (in press) in a report of a similar survey in Young County, Texas. Briefly, they involved: (a) mapping on a scale of 1 inch to the mile the original vegetation or biotic types (Osborn, 1942) of the entire district, and, on selected sample plots; (b) recording all species of birds and mammals for which any evidence of occurrence could be found; and (c) recording the percentage of each plot supplied with each of 10 habitat elements of "high", "medium", or "low" quality.

The biotic types were used as a basis for distinguishing "natural land types", each combining a distinctive biota and land form and therefore having characteristic ecological conditions and plant and animal populations.

The sample plots were selected at predetermined intervals along a reconnoissance route so as to reflect the relative prevalence of different land types, land uses, and other factors affecting habitat conditions.

The tallies were summarized for each land type, and the abundance of each wildlife species was expressed by means of a frequency index or percentage of the total number of plots in which the species occurred. Habitat conditions were measured in terms of the percentages of the total area of the sample plots supplied with each different habitat element of each quality, and by the percentage of the total number of plots on which each element occurred in medium or high quality. From these data it is possible to compare the abundance of different species of animals in the same land type or the same species in different types or in different localities from which similar data may be available. Likewise, habitat conditions can be compared, and abundance of certain wildlife species interpreted in relation to the abundance and interspersion of their known habitat requirements.

### DESCRIPTION OF AREA

The Upper Washita district includes all the land within Roger Mills and Custer Counties draining into the Washita river, a total area of approximately 1,175,000 acres. It lies at the western edge of the Central Lowland physiographic region as described by Fenneman (1938) and, according to Thornthwaite's (1931) classification, is in the subhumid, mesothermal climatic province characterized by moisture deficiency at all seasons.

<sup>&</sup>lt;sup>1</sup> Both authors were serving as biologists for the Soil Conservation Service at the time field work reported in this paper was performed.

Blair and Hubbell (1938) record these counties as in the Mixedgrass Plains biotic district wherein the climax biome is Mixed Prairie (Clements and Shelford, 1939; Carpenter, 1940).

Locally, the following natural land types were recognized:

1. Forest bottom lands—flood plains and stream banks originally covered with trees with an understory either of shrubs or grasses; Elm (Ulmus) Forest and Elm (Ulmus-Panicum) Savannah biotic types.

2. Tall-grass bottom lands—flood plains and draws originally dominated by tall grasses; Tall-Grass (Andropogon) Prairie biotic type.

3. Tall-grass uplands—uplands, usually of friable soils, originally dominated by tall grasses; Tall-Grass (Andropogon) Prairie biotic type.

4. Mized-grass uplands—uplands in which the original cover consisted of a mixture of tall and short grasses; Mixed-Grass (Andropogon-Bouteloug) Prairie blotic type.

5. Shinnery land—land (usually sandy) originally with a cover of scrub oak with or without sagebrush or other shrubs but with an intermixture of prairie grasses; Shinnery (Andropogon-Quercus) Savannah biotic type.

6. Sagebrush land—land originally with a cover of sand sagebrush (Artemisia filifolia Torr.) and prairie grasses without other important shrubs; Sand Sagebrush (Andropogon-Artemisia) Savannah biotic type.

7. Mixed scrub land—land originally supporting a cover consisting of a mixture of various shrubs, except shinnery oak, with prairie grasses; Mixed Scrub (Andropogon-Rhus trilobata) Savannah biotic type.

#### WILDLIFE AND HABITAT TALLIES

The data from the wildlife and habitat tallies are summarized in Tables I and II.

It is not considered that the 2 samples in the forest bottom land type are significant, except to show the relative unimportance of this type in the district.

Only the most common birds, other than game, were recorded, but all species of mammals were included in the tallies. Because of their effect on habitat and their possible influence on wild animal populations, domestic animals were recorded along with the native.

As an index to total wildlife abundance by land types, the separate frequency percentages of the species recorded in each are totaled. Likewise, the frequencies of occurrence of the ten habitat elements are totaled as a general index of habitat conditions.

### CONCLUSIONS

There is no apparent relationship between the total abundance of wildlife and the combined abundance of habitat elements in the different land types, as indicated by the total frequency indices.

There are, however, direct correlations between the frequency of certain species and particular habitat elements of importance to them.

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For example, the abundance of cottontail rabbits was in direct proportion to the amount of shrubby cover in the different land types, whereas the abundance of jackrabbits was in inverse ratio to this same habitat element.

The quail population was concentrated principally in the mixed scrub type at the season of the survey, where (excepting the two isolated plots in forest bottom land) the greatest abundance of shrubby cover, herbaceous cover, and seeds for food occurred.

The data suggest that the total of all habitat elements is not so significant in determining total wildlife abundance as is the presence or absence of certain critical elements for each particular species.

General wildlife abundance within a particular land type perhaps can best be measured with respect to the normal population of the climax biota for the type, rather than by comparing number of species or total frequencies of one land type with another. Determination of these normal population levels for different biotic types is suggested as a fertile field for investigation.

The significance of any conclusions drawn from the data presented herein is problematical because of the statistically small number of samples at hand. We believe, however, that the accumulation of a volume of comparable data from different localities, and from the same localities in different years, would give an insight into the relationships of animal populations to one another and to habitat conditions in the various major biotic communities.

The habitat tallies indicate also which habitat elements are least abundant in each land type or locality and suggest which ones need most to be increased to provide optimum conditions for particular wildlife species.

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LAND TYPES:	Forest bottom	Tall-grass bottom	Mired-	Shinnery	Sage- brush land	Mixed- scrub land	District Totals
Number of tallies	2	14	70	37	8	5	136
Birds	-	·	-	·	-		
Prairie-chicken (Tympanuchus							
pallidicinctus)	0%	0%	0%	300	00	000	1 100
Bobwhite (Colinus virginianus)	0	1 7		1 37	070		1%
Dove (Zenaidura macroura)		1	1.3	1.3	0	20	4
Crow (Corrue brachushunches)			13	111	0	80	15
Meedowlash (Sevenelly)	50	21	13	32	25	80	23
moadowiark (Sturneug)	0	14	14	0	0	0	9
MAMMALS-							1
Operation (Didelphus visciniana)	1100					1	
Mole (Sectory)	100	1 7	4	3	0	0	5
Boosting (D	100	79	24	51	38	20	39
Naccoon (Procyon lotor)	100	7	0	0	0	0	2
Mink (Mustella vison)	100	0	0	0	l ő	ň	ĩ
Skunks (Mephitis and Spilogale)	0	14	7	1 11	25	l ă	
Badger (Taxidea taxus)	l ñ	0	1 2	1	12		, y
Covote (Canis)	l õ		1 2		15		Z
Ground-aquirrel		1 '	3	1 1	U	0	3
(Citallus tridening lines and			1		1		
Drainia dan (Company)	0	04	49	6	50	20	37
France dog (Cynomys ludovicianus)	0	0	3	0	25	0	3
rox Squirrel (Sciurus niger)	50	14	0	0	Ó	Ó	2
Pocket-gopher (Geomys)	0	64	31	27	25	60	34
"Mice"	0	79	61	76	63	80	67
Cotton-rat (Sigmodon)	l ñ	Ó	Å	10			01
Wood-rat (Neotoma)	l ñ	7	12			~	~
Jackrabbit (Lenus orditornious)	Ň	70	10	1 22	100	20	23
Cottontail (Sylvilague floridanue)	50	10	90	33	100	40	74
			34	84	50	100	56
Total frequency	550	572	376	346	414	520	<u></u>
Tetel				<b>310</b>	21.4	520	411
10tal species	7	16	17	14	10	10	21
Domestic Animals-							
Cattle and horses	50	79	94	92	100	100	05
Dog	100	29	28	35	95	1	20
Cat	50	14	~	~	~		30
	~	**	v I	~	<b>v</b>	~	O

TABLE I

Relative abundance of principal wildlife species

44

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## TABLE II

Habitat conditions by kinds of land

Number of tallies         2         14         70         37         8         5         136           COVER         Trees         1         10%         T         1%         0%         20%         1%           Medium 4         10%         T         1%         1%         0%         20%         1%           Low 4         15         0         2         2         0         0         1           Strubs and Vines         0         0         1         3         1         30         2           High         0         0         1         3         1         30         2           High         0         0         1         2         1         26         2           High         0         0         1         2         1         26         2           High         0         0         1         2         1         26         2           Medium         50         10         13         18         13         34         15           Low         50         21         34         38         25         0         35           Low	LAND TYPES:	Forest bottom lands	Tall-grass bottom lands	Mixed- grass upland	Shinnery land	Sage- brush land	Mixed- scrub land	District Summary
COVER         Image: Cover and the second seco	Number of tallies	2	14	70	37	8	5	136
Trees       10%       T       1%       1%       0%       20%       20%       1%         High $4$ 40       4       1       1       0       4       2       0       0       1         Frequency $4$ 100       21       11       14       0       100       17         Shrubs and Vines	COVER							
High *       10%       T       1%       1%       0%       20%       1%         Medium *       40       4       1       1       0       4       2         Low *       15       0       2       2       0       1         Frequency *       100       21       11       14       0       100       17         Shrubs and Vines	Trees		1					
Medium *       40       4       1       1       0       4'       2'         Low *       15       0       2       2       0       0       1         Frequency *       100       21       11       14       0       4'       2'         Shrubs and Vines       0       0       1       3       1       30       2         High       0       0       0       1       3       1       30       2         Medium       55       3       2       24       39       8       12         Frequency       100       7       13       35       25       80       23         Crasses and Forbs       0       0       1       2       1       26       2         Medium       50       10       13       18       13       34       15         Low       50       37       25       42       19       0       30       55         Frequency       50       21       34       38       25       80       35         FOOD       Mast       0       0       1       10       0       31       10	High •	10%	Т	1%	1%	0%	20%	1%
Low *       15       0       2       2       0       0       1         Frequency *       100       21       11       14       0       100       17         Shrubs and Vines       -	Medium «	40	4	1	1	0	4	2
Frequency b       100       21       11       14       0       100       17         Shrubs and Vines       0       0       0       1       3       1       300       2         High       0       0       0       1       3       1       300       2         Medium       55       3       1       20       13       28       8         Low       5       3       224       39       8       12         Frequency       100       7       13       35       25       80       23         Grasses and Forbs	Low "	15	0	2	2	0	0	1
Shrubs and Vines       0       0       1       3       1       30       2         High       55       3       1       20       13       28       8         Low       5       3       2       24       39       8       12         Frequency       100       7       13       35       25       80       23         Crasses and Forbs       0       0       1       2       1       26       2         High       0       0       13       18       13       34       15         Low       50       10       13       18       13       34       15         Low       50       21       34       38       25       80       35         FOOD       0       0       7       2       0       0       7         Medium       0       0       1       10       0       34       5         Low       40       3       2       31       25       0       12         Frequency       0       0       1       32       0       60       12         Frequency       0 <td< td=""><td>Frequency b</td><td>100</td><td>21</td><td>11</td><td>14</td><td>0</td><td>100</td><td>17</td></td<>	Frequency b	100	21	11	14	0	100	17
High Medium       0 55       0 3       1 1       20 13       13 28       28 8         Low       5 5       3 1       2 24       39 25       8 12         Frequency       100       7       13       35 25       25       80 23         Grasses and Forbs       0       0       1       2 13       1       26 26       2 24         High Medium       50       10       13       18 13       13 34       15 15         Low       50       37 25       42 42       19 9       0 30         Frequency       50       21       34       38 38       25       80       35         FOOD	Shrubs and Vines							
Medium       55       3       1       20       13       28       8       12         Frequency       100       7       13       35       25       80       23         Grasses and Forbs       0       1       2       1       26       2         High       0       0       1       2       1       26       2         Medium       50       10       13       18       13       34       15         Low       50       37       25       42       19       0       30         Frequency       50       21       34       38       25       80       35         FOOD       Mast       0       0       T       2       0       0       34       5         Low       40       3       2       31       25       0       12         Frequency       0       0       1       10       0       7       13       34       5         Low       40       3       2       31       25       0       12         Frequency       0       0       0       1       10       0       2<	High	0	0	1	3	1	30	2
Low Frequency       5       3       2       24       39       8       12         Grasses and Forbs       100       7       13       35       25       80       23         Grasses and Forbs       0       0       1       2       1       26       2         High       0       0       1       2       1       26       2         Medium       50       37       25       42       19       0       30         Low       50       37       25       42       19       0       30         Frequency       50       21       34       38       25       80       35         FOOD	Medium	55	3	1	20	13	28	8
Frequency       100       7       13       35       25       80       23         Grasses and Forbs       0       0       1       2       1       26       2         Medium       50       10       13       18       13       34       15         Low       50       37       25       42       19       0       30         Frequency       50       21       34       38       25       80       35         FOOD       Mast       0       0       T       2       0       0       33       34       15         High       0       0       T       2       0       0       30       35         Frequency       0       0       T       2       0       0       30       35         Frequency       0       0       T       2       0       0       31       34       35         Frequency       0       0       T       2       0       0       T         High       0       0       0       1       1       0       26       2         Low       55       3       2	Low	5	3	2	24	39	8	12
Grasses and Forbs       0       0       1       2       1       26       2         High       50       10       13       18       13       34       15         Low       50       37       25       42       19       0       30         Frequency       50       21       34       38       25       80       35         FOOD       Image: Construct on the state on the	Frequency	100	7	13	35	25	80	23
High Medium Low0 500 101 	Grasses and Forbs							
Medium Low Frequency       50       10       13       18       13       34       15         Low Frequency       50       37       25       42       19       0       30         FOOD Mast       50       21       34       38       25       80       35         FOOD Mast       0       0       T       2       0       0       T         High Medium       0       0       1       10       0       34       5         Low       40       3       2       31       25       0       12         Frequency       0       0       1       32       0       60       12         Fruits       0       0       0       1       0       26       2         Low       55       3       2       1       0       0       2         Frequency       50       7       7       5       0       100       10         Seeds       0       40°       6       11       25       15       20       15         Low       0       47       56       40       29       52       48         Fr	High	0	0	1	2	11	26	2
Low Frequency       50       37       25       42       19       0       30         FOOD       Mast       50       21       34       38       25       80       35         FOOD       Mast       0       0       T       2       0       0       T         Medium       0       0       0       T       2       0       0       T         Low       40       3       2       31       25       0       12         Frequency       0       0       1       10       0       34       5         Low       40       3       2       31       25       0       12         Frequency       0       0       1       32       0       60       12         Frequency       0       0       0       1       0       0       7         Medium       55       3       2       1       0       0       2       2         Low       50       7       7       5       0       100       10       10       2       15         Low       60       0       1       1       1	Medium	50	10	13	18	13	34	15
Frequency       50       21       34       38       25       80       35         FOOD       Mast       Image: Constraint of the state of the	Low	50	37	25	42	19	0	30
FOOD       Mast       Image: scalar s	Frequency	50	21	34	38	25	80	35
Mast       0       0       0       T       2       0       0       T         High       0       0       0       1       10       0       34       5         Low       40       3       2       31       25       0       12         Frequency       0       0       1       32       0       60       12         Frequency       0       0       0       1       0       0       0       12         Frequency       0       0       0       1       0       0       12         Frequency       5       3       1       1       0       26       2         Low       55       3       2       1       0       0       2         Frequency       50       7       7       5       0       100       10         Seeds	FOOD							
High Medium0 00 0T T 22 00 00 34T 5 12Frequency001100345Frequency0013206012Fruits	Mast							
Medium Low0 400 31 2 3110 25 310 345 12 12Frequency00132 32060 6012Fruits High Medium Low00010012 32Frequency000100T 7Medium Low55 553 32210 00 2Frequency507 7750100Seeds High Frequency011 11 2828 3 3Medium High Low Frequency10021 3636 5425 25100 33Medium Low High Low Frequency10 9046 300 900 203 32Medium Low Frequency100 9046 3332 3213 3020 33	High	0	0	Т	2	0	0	T
Low Frequency40323125012Fruits0013206012Fruits0001001High000100TMedium5311026Low5532100Frequency507750100Seeds	Medium	0	0	1	10	0	34	5
Frequency       0       0       1       32       0       60       12         Fruits       0       0       0       1       32       0       60       12         High       0       0       0       1       0       0       1       0       0       T         Medium       5       3       1       1       0       26       2         Low       55       3       2       1       0       0       26       2         Frequency       50       7       7       5       0       100       10         Seeds $U$ $U$ $U$ $U$ $U$ $U$ $U$ $U$ $U$ Medium       40°       6       11       25       15       20       15         Low       0       47       56       40       29       52       48         Frequency       100       21       36       54       25       100       42         Grass $U$	Low	40	3	2	31	25	0	12
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Frequency	0	0	1	32	0	60	12
High       0       0       0       1       0       0       T         Medium       5       3       1       1       0       26       2         Low       55       3       2       1       0       0       26       2         Frequency       50       7       7       5       0       100       10         Seeds	Fruits							
Medium       5       3       1       1       0       26       2         Low       55       3       2       1       0       0       2         Frequency       50       7       7       5       0       100       10         Seeds	High	0	0	0	1	0	0	T
Low       55       3       2       1       0       0       2         Frequency       50       7       7       5       0       100       10         Seeds       Image: Constraint of the second	Medium	5	3		1	0	26	2
Frequency       50       7       7       5       0       100       10         Seeds       Image: High       60       0       1       1       1       28       3         Medium       40°       6       11       25       15       20       15         Low       0       47       56       40       29       52       48         Frequency       100       21       36       54       25       100       42         Grass       Image: High       10       4       3       0       0       20       3         High       10       4       3       0       0       20       3         Medium       90       46       10       19       10       24       18         Low       0       25       63       36       87       56       52         Frequency       100       50       33       32       13       20       34	Low	55	3		1	0	0	2
Seeds         60         0         1         1         1         28         3           Medium         40°         6         11         25         15         20         15           Low         0         47         56         40         29         52         48           Frequency         100         21         36         54         25         100         42           Grass	r requency	50	1	1	5	0	100	10
High Medium       60       0       1       1       1       28       3         Medium       40°       6       11       25       15       20       15         Low       0       47       56       40       29       52       48         Frequency       100       21       36       54       25       100       42         Grass	Seeds							
Medium       40°       6       11       25       15       20       15         Low       0       47       56       40       29       52       48         Frequency       100       21       36       54       25       100       42         Grass       10       4       3       0       0       20       3         High       10       4       3       0       0       20       3         Medium       90       46       10       19       10       24       18         Low       0       26       63       36       87       56       52         Frequency       100       50       33       32       13       20       34	High	60	0	1	1	1	28	3
Low     0     47     56     40     29     52     48       Frequency     100     21     36     54     25     100     42       Grass     -     -     -     -     -     -     -       High     10     4     3     0     0     20     3       Medium     90     46     10     19     10     24     18       Low     0     26     63     36     87     56     52       Frequency     100     50     33     32     13     20     34 <td>Medium</td> <td>40</td> <td>6</td> <td>11</td> <td>25</td> <td>15</td> <td>20</td> <td>15</td>	Medium	40	6	11	25	15	20	15
Frequency     100     21     36     54     25     100     42       Grass     Image: Constraint of the state of the	Low	0	47	56	40	29	52	48
Grass         I         4         3         0         0         20         3           High         10         4         3         0         0         20         3           Medium         90         46         10         19         10         24         18           Low         0         26         63         36         87         56         52           Frequency         100         50         33         32         13         20         34	Frequency	100	21	36	54	25	100	42
High Medium     10     4     3     0     0     20     3       Medium     90     46     10     19     10     24     18       Low     0     26     63     36     87     56     52       Frequency     100     50     33     32     13     20     34	Grass							
Medium         90         46         10         19         10         24         18           Low         0         26         63         36         87         56         52           Frequency         100         50         33         32         13         20         34	High	10	4	3	0	0	20	3
Low 0 26 63 36 87 56 52 Frequency 100 50 33 32 13 20 34	Medium	90	46	10	19	10	24	18
Frequency   100   50   33   32   13   20   34	Low	0	26	63	36	87	56	52
	Frequency	100	50	33	32	13	20	34

• Percent of the total area examined supplied with the element of the quality indicated. • Percent of the sample plots in which the element of high or medium quality occurred.

LAND TYPES:	Forest bottom lands	Tall-grass bottom lands	Mixed- grass upland	Shinnery land	Sage- brush land	Mixed- acrub land	District Summary
Forbs							
High Medium Low	10 50 40	0 16 47 36	2 12 56 37	2 24 40	1 18 64 25	26 36 36	3 17 50 43
Providency	100		31			100	~
High Medium Low Frequency	0 50 50 100	T 3 T 14	T T 4 3	0 22 21 32	0 13 38 13	12 28 26 100	T 9 12 18
WATER							
High Medium Low Frequency	5 0 50 50	0 0 4 0	0 T 2 0	0 1 3 T	0 0 0 0	0 0 22 0	T T 4 1
Total Frequency	750	177	175	301	126	740	235

TABLE II—Continued Habitat conditions by kinds of land