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

BEN OSBORN, U. S. Soil Conservation Service, Glen Rose, Texas,
and
W. H. KELLOGG, Texas Game, Fish, and Oyster Commission, Austin, Texas[1]

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.

[1] Both authors were serving as biologists for the Soil Conservation Service at the time the 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. *Mixed-grass uplands*—uplands in which the original cover consisted of a mixture of tall and short grasses; Mixed-Grass (*Andropogon-Bouteloua*) Prairie biotic 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.

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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TABLE I

Relative abundance of principal wildlife species

LAND TYPES:	Forest bottom lands	Tall-grass bottom lands	Mixed-grass upland	Shinnery land	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%	3%	0%	0%	1%
Bobwhite (*Colinus virginianus*)	0	7	4	3	0	20	4
Dove (*Zenaidura macroura*)	0	21	13	11	0	80	15
Crow (*Corvus brachyrhynchos*)	50	21	13	32	25	80	23
Meadowlark (*Sturnella*)	0	14	14	0	0	0	9
MAMMALS—							
Opossum (*Didelphus virginiana*)	100	7	4	3	0	0	5
Mole (*Scalopus*)	100	79	24	51	38	20	39
Raccoon (*Procyon lotor*)	100	7	0	0	0	0	2
Mink (*Mustella vison*)	100	0	0	0	0	0	1
Skunks (*Mephitis* and *Spilogale*)	0	14	7	11	25	0	9
Badger (*Taxidea taxus*)	0	0	3	0	13	0	2
Coyote (*Canis*)	0	7	3	1	0	0	3
Ground-squirrel (*Citellus tridecimlineatus*)	0	64	49	6	50	20	37
Prairie-dog (*Cynomys ludovicianus*)	0	0	3	0	25	0	3
Fox Squirrel (*Sciurus niger*)	50	14	0	0	0	0	2
Pocket-gopher (*Geomys*)	0	64	31	27	25	60	34
"Mice"	0	79	61	76	63	80	67
Cotton-rat (*Sigmodon*)	0	0	4	0	0	0	2
Wood-rat (*Neotoma*)	0	7	13	3	0	20	23
Jackrabbit (*Lepus californicus*)	0	78	96	35	100	40	74
Cottontail (*Sylvilagus floridanus*)	50	79	34	84	50	100	56
Total frequency	550	572	376	346	414	520	411
Total species	7	16	17	14	10	10	21
DOMESTIC ANIMALS—							
Cattle and horses	50	79	94	92	100	100	95
Dog	100	29	28	35	25	40	30
Cat	50	14	6	0	0	20	6

TABLE II

Habitat conditions by kinds of land

LAND TYPES:	Forest bottom lands	Tall-grass bottom lands	Mixed-grass upland	Shinnery land	Sage-brush land	Mixed-scrub land	District Summary
Number of tallies	2	14	70	37	8	5	136
COVER							
Trees							
High [a]	10%	T	1%	1%	0%	20%	1%
Medium [a]	40	4	1	1	0	4	2
Low [a]	15	0	2	2	0	0	1
Frequency [b]	100	21	11	14	0	100	17
Shrubs and Vines							
High	0	0	1	3	1	30	2
Medium	55	3	1	20	13	28	8
Low	5	3	2	24	39	8	12
Frequency	100	7	13	35	25	80	23
Grasses and Forbs							
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							
High	0	0	T	2	0	0	T
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							
High	0	0	0	1	0	0	T
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	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							
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

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

TABLE II—Continued
Habitat conditions by kinds of land

LAND TYPES:	Forest bottom lands	Tall-grass bottom lands	Mixed-grass upland	Shinnery land	Sage-brush land	Mixed-scrub land	District Summary
Forbs							
High	10	0	2	2	1	26	3
Medium	50	16	12	24	18	36	17
Low	40	47	56	40	64	36	50
Frequency	100	36	37	49	25	100	43
Browse							
High	0	T	T	0	0	12	T
Medium	50	3	T	22	13	28	9
Low	50	T	4	21	38	26	12
Frequency	100	14	3	32	13	100	18
WATER							
High	5	0	0	0	0	0	T
Medium	0	0	T	1	0	0	T
Low	50	4	2	3	0	22	4
Frequency	50	0	0	T	0	0	1
Total Frequency	750	177	175	301	126	740	235