The Life-Form Concept Applied to Prairie Chicken Habitat in Oklahoma

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Plant species can be classified not only as to taxonomy but also as to physiognomy. Many investigators have used a physiognomic approach in delineating the larger biotic communities. The first attempt to evolve a vegetal classification system upon a physiognomic basis was that of Alexander Von Humboldt in 1806. He described and named 16 "Hauptformen," which were named mostly after some characteristic plant genus or family. This system and others like it were used for almost a century without any notable change in conceptual basis.

In Warming's work of 1895 the term "life-form" was first used relative to physiognomic classification of vegetation types. He used the term simply as a synonym to express its "epharmonie" or accommodation to the environment.

Raunkiaer (1908), at the turn of the century, published a comprehensive account of a new life-form system destined to become the life-form system of many botanists to the present time. The system of Raunkiaer differed from the physiognomic systems of the previous authors by being based upon a single character-complex, namely "the adaptation of the plants to surviving the unfavorable season especially with regard to the protection of the surviving buds or shoot-apices."

In our own time ,there has been a swing back to the purely physiognomic life-form systems. Clements (1928), in our own country, proposed a system of classification based first on duration, but with most stress being placed on the form of the aerial plant body. More recently there have been several physiognomic classifications suggested. Kuchler (1949) reduced the plant community description to a letter formula in which the life-form plays an integral part. Dansereau (1951) utilized the same concepts of description but used a graphic portrayal to dramatize the concept of life-form.

A recent development has been to employ a physiognomic classification system as an approach to the problem of habitat description, evaluation, and management of wildlife species (Pitelka, 1941, Stebler and Schemnitz 1955, and Emlen 1956). According to Pitelka (1941) a constant correlation has been indicated between species of bird and the life-form of plant. Yet no relationship could be found between specific dominants or groups of dominants of vegetation and bird species. Stebler and Schemnitz (1955) attempted a definition of scaled quail habitat using a physiognomic life-form classification. Their data was concerned with the life-form at flush sites.

The system of Du Reitz (1931) appears to hold great promise for the needs of the habitat ecologist or wildlife biologist. He has defined life-form as a general designation for any classification of plants based upon any point of view other than those of idiobiological taxonomy. His main

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life-form system, which is employed in this discussion, is a designation for types based upon the general physiognomy of the plants during the height of their annual vegetation-period. The "main life-form system" is divided into 3 principal divisions: woody plants, half-shrubs, and herbs. These divisions then are subdivided according to height of vegetation.

In the present investigation, a methodology similar to that of Stebler and Schemnitz is being used. The investigator is studying areas where prairie chickens are known to be present. The life-form types at the sites from which prairie chickens are flushed are recorded. Addtional records are made concerning the life-form type at the site of escape or retreat.

Table I. Vegetational life-form characteristics of the habitat of the lesser prairie chicken in Beaver County.

	Flush site observations	Percent of total flushes	Escape cover No. observations
Shrub Life-form			
Skunkbrush (Rhus trilobata)	37	21	10
Plum (Prunus watsoni)	9	5	
Half-shrub Life-form			
Sagebrush (Artemisia filifolia)	36	20	9
TOTAL SHRUB LIKE FORMS	82	46	19
Herb Life-form			
Mid grasses	4	2	
Short grasses	70	39	2
Forbs	24	13	
TOTAL HERB FORMS	98	54	2

Table II. Vegetational life-form characteristics of the habitat of the greater prairie chicken in Osage County.

	Flush site observations	Percent of total flushes	Escape cover No. observations
Shrub Life-form			
Smooth Sumac (Rhus glabra)	2	1	
TOTAL SHRUB FORMS	2	1	
Herb Life-form			
Tall grasses	29	15	27
Mid grasses	87	45	1
Short grasses	10	5	2
Forbs	66	34	
TOTAL HERB FORMS	192	99	29

During the summer of 1959, the investigator collected information concerning use of life-form type in the range of the greater prairie chicken,

mostly on the K. S. Adams Ranch in Osage County and in the range of the lesser prairie chicken mostly on the Maple Ranch in Beaver County. The data collected are presented in Tables I and II with the components of the shrub life-form identified taxonomically for the sake of additional clarity.

From the data presented in the tables, it first of all is suggested that the lesser prairie chicken makes use of the shrub-like life-forms to a larger extent than does the greater prairie chicken. Despite the limited presence of skunkbrush on the study area, this life-form is one of the shrub forms that is heavily used. The short grass life-form receives a relatively heavy use, but this form is the predominant cover in this region.

It could be pointed out that the greater prairie chicken is present only within the region which Duck and Fletcher (1943) called the tall-grass prairie game type. The data which have been presented, however, in Table II indicate the birds prefer the scattered mid-grasses and forb life-forms which are present within the tall-grass prairie type. Tall grasses appear to be an important escape cover for the greater prairie chicken.

This is, as yet, only a bare beginning on the delineation of prairie chicken habitat. With additional data, these observations can be divided into a number of functional habitat niches: the food niche, the reproductive niche, and the shelter niche as these have been outlined by Stebler (1957). This in turn can lead to greater insight concerning the problem of management and to a more objective approach to improving conditions for these birds on any particular area.

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