Habitat Description and the Life-Form Concept

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The scaled quail (*Callipepla squamata pallida* Brewster) is found rather sparingly throughout the Oklahoma panhandle except in Cimarron County, where it is comparatively common. According to an investigation currently in progress, the bird appears to be most abundant in the "breaks" and the mesas of the Cimarron River valley. It is common, but less abundant, about the farmsteads on the shortgrass plain south of this valley, and in the sand-sage-covered sand dune areas of the region. The species, therefore, occurs in the three major "game types" (Duck and Fletcher, 1943, and *ca.* 1944) characteristic of this part of Oklahoma. Incidentally, and more properly, perhaps, these "game types" should be recognized as vegetal or habitat types.

This quail was observed not to be generally distributed throughout these three major habitat types, but rather to be restricted to certain kinds of situations within the broad types. This was noticeable in the "breaks" characteristic of the northwestern part of the county, and even more so in certain situations associated with the shortgrass plain. Among the "breaks," scaled quail were observed most commonly about the rocky, brushy slopes forming the walls of the mesas and the valley, and on the floors of the tributary canyons. On the plains they were commonly observed in two situations, or a combination of these. In the first place, they were seen about the rocky draws which are cutting their way into the plain. Skunkbush (*Rhus trilobata*) was the common woody perennial growing along these. In the second place, scaled quail were seen about the yards of farmsteads. Here there were usually implements about or heaps of scrap lumber, coils of wire, or junk heaps which provided some overhead shelter to the quail. Among the "breaks" and on the shortgrass plain where the scaled quail did occur, it was most frequently in association with plants or with artifacts that provided some degree of overhead cover, rather than upon bald prairie any distance from such cover.

This marked restriction in habitat use suggested the possibility that the three major habitat types occupied by the scaled quail in this region had some common denominator, some thread forming part of and binding the three named habitat types together. In other words, since the quail lived on areas in three distinct, yet contiguous, habitat types, it seemed likely that there was present some common element which provided an acceptable habitat to the scaled quail throughout these vegetal types.

At first sight it might appear that the combination of rocky slopes and draws on the one hand, and perennial vegetation of a height sufficient to provide some overhead cover on the other, comprised such a denominator. When it is recognized that scaled quail are prevalent about the farmsteads of the region regardless of the presence of rocky slopes or draws, topography assumes importance secondary to woody perennials and artifacts providing some degree of overhead cover throughout the year. Topography appears important only to the extent that it favors the growth of certain shrubby perennials like skunkbush. Such cover provides shelter from sun, storm or possible avian predation as well as relatively safe sites for nesting. Artifacts, like those named above, serve similar purposes.

In describing the habitat of a species, it is customary to do so in terms of plant taxonomic entities. Such a list, in part, is here provided (Table I). It is seen here that the most important plant components of the scaled

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quail's habitat in this region are perennial shrubs or plants of shrub-like character. Collectively, these plants can be grouped together in the shrub life-form (Raunkiaer, 1934), using the term life-form in the physiognomic sense rather than the spectural (Dansereau, 1951; Cain, 1952).

To get a measure of the validity of this deduction, the junior author, during each month of the period June 1954 to September 1955, accumulated 1233 "flush" observations of scaled quail. These observations, summarized in Table I, were made in each of the three major habitat types of the region. For each observation the character of the "flush" site was noted as to "shrub" species' identity and as to life-form type.

TABLE I.

Habitat Use by Scaled Quail Based on 1233 Observations, June, 1954-September, 1955, Cimarron County, Oklahoma.

Habitat Situation	Number of Observations	Percent of Total Observations
Shrub Life-Form		
Skunkbush (*Rhus trilobata*)	210	17.0
Soapweed (*Yucca glauca*)* and sandsage (*Artemisia filifolia*)	147	11.9
Soapweed and grassland	125	10.1
Orchard	49	4.0
Shelterbelt	38	3.1
Tree cactus (*Opuntia imbricata*)	34	2.8
Sandplum (*Prunus Watsoni*), currant (*Ribes* spp.), wild grape (*Vitis* spp.)	27	2.2
		51.1
Farmstead		
Buildings (not dwellings)	265	21.5
Machinery, board piles, post piles, junk heaps	126	10.2
		31.7
Other		
Forbs	80	6.5
Native grassland without shrubby cover	77	6.2
Cultivated fields (Alfalfa, sorghum, other crops and fallowed fields)	55	4.5
		17.2
Total		100.0

Twelve distinct habitat situations are recognized in this tabulation. The shrub life-form, considered as perennial woody growth which may vary in heighth from 3 to 20 feet, comprised about 51 per cent of the observations. Suitable artifacts around farmsteads accounted for about 32 per cent of these observations. Considered together, since they appear to satisfy similar shelter needs of the scaled quail, they represent 83 per cent of the "flush" site observations. By comparison, a relatively small percent of the "flush" site observations concerned areas of native grassland, stands of forbs, or cultivated fields.

* Clements (1949) considers soapweed to be a halfshrub, i.e., a perennial plant in which the stem is more or less woody especially at the base.)

It seems plain from these data that in western Oklahoma, the scaled quail favors habitat niches constituting the shrub life-form and also certain kinds of artifacts as found usually about farmsteads. Combined these habitat situations or niches may be regarded as comprising the regional habitat of this quail. It is suggested, moreover, that it is the general occurrence of one or more of these throughout the three major regional vegetal types that furnished suitable habitat to this quail.

Habitat niches, thus viewed, become the essential "place" components, the "kind of place" elements comprising the habitat of a species. These, then, may be considered the common denominators of a habitat transcending two or more habitat types. In the present study, habitat niches of the scaled quail are seen to be of two sorts, namely: natural and artificial. Those occurring naturally can be grouped together in the shrub life-form; the artificial, of course, occurs as suitable artifacts.

The term, "shrub life-form," as used here, seems to be of some merit. In the first place, it is less confusing to attempt evaluation of the natural habitat niches here recognized under the single collective head of shrub life-form than it is in terms of the several individual taxonomic entities. This emphasizes type of vegetation rather than taxonomic unit, a point already recognized by Dice, 1931. Also facilitated by this approach is the comparative study of the habitat of a species at different parts of more or less extensive geographic range where taxonomic units may very considerably yet remain the same in the sense of life-form physiognomy. A clearer understanding of bird and mammal distribution and habitat requirements can thereby follow. For birds this already has been shown by Peterson (1942) and by Brecher (1943), who point out inadequacies of "life zones" and "biomes" in this regard. A further merit of this approach, with its emphasis upon physiognomy, is that it is helpful in comparing the relative importance of naturally occurring as against artificial niches or components of a habitat. Such evaluation can be pursued on a basis of what the particular niche furnishes to the occupant of the habitat. Conversely it indicates more clearly what niches the occupant of the habitat seeks and uses as well as often the purpose for which each is used.

In the practice of wildlife conservation, employment of the life-form concept in the physiognomic sense as an intellectual tool appears promising. For example, it may offer a useful approach to the problem of habitat management, because of the synthetic implications which may derive as suggested by the work of Harris (1952). This ingenuous study showed by experiment that prairie and forest races of the deermouse (*Peromyscus maniculatus*) responded positively to synthetic representation of their respective habitats. The use of artifacts by the scaled quail suggests the practicability of using these in habitat management for this species. This is important in a region so drouthy as to make the use of nursery plants a precarious enterprise at best. The use of brush piles in the management of the cottontail rabbit is one example of the employment of this principle.

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