BIRD DISTRIBUTION AND ECOLOGICAL CONCEPTS

A SYMPOSIUM DIRECTED BY V. E. SHELFORD *

PART 2

BIRDS OF A DECIDUOUS FOREST AQUATIC SUCCESSION

BY JOHN W. ALDRICH

BETWEEN 1930 and 1936, I conducted ecological investigations of the bird populations of the swamps and bogs (hydrosere) of northeastern Ohio from the standpoint of the biotic communities as dynamic units. Birds of the various swamp habitats were considered to be a part of a series of plant and animal communities that are constantly changing steps in the development of the climax community of the region, which in northeastern Ohio is deciduous forest.

In the larger geographical sense, climate, in conjunction with genetic-evolutionary factors and physiographic barriers, controls the specific composition of plant and animal communities in any area. But this condition is modified locally,—in the hydrarch communities of northeastern Ohio, chiefly by the water content of the habitat. Certain factors, among them temperature and light intensity, are controlled by the organisms themselves. Chief of these organisms are the dominant plants which, by virtue of their life forms (such as reed, shrub, or broad-leafed tree) modify other factors. Certain combinations of factors in aquatic succession have permitted the partial survival in northeastern Ohio of boreal relic communities (developmental stages of the coniferous forest climax) similar to those that have elsewhere retreated far to the north in the wake of the Great Glacier. The presence of relic communities of typically boreal plants and animals is probably the chief reason that some investigators include northeastern Ohio and southern New England in the Transition life zone (Merriam, *et al.*, 1910).

I believe it is possible to bring together the life zone and biome concepts and unify the nomenclature, using the life zone names where applicable (Aldrich, 1943:357), and considering biomes rather than faunas as subdivisions of life zones. On this basis, northeastern Ohio is entirely within the eastern deciduous forest biome of the Upper Austral life zone, but still contains scattered post-glacial relics of the mixed coniferous and deciduous forest type which is found commonly farther north and in the Appalachian Mountains, and is characteristic

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of the Transition life zone.[1] In this investigation the communities (including birds) were studied in both the relic coniferous (bog) and the deciduous forest (swamp) succession (Aldrich, 1943).

Table 1 shows the succession of communities and their most abundant birds in a typical swamp sere of northeastern Ohio from the water to the climax forest; Table 2 shows the breeding bird populations per

TABLE 1

SELECTED SPECIES SHOWING THE SUCCESSION OF BIRDS IN NORTHEASTERN OHIO FROM WATER TO THE DECIDUOUS FOREST CLIMAX

	1	2	3	4	5
	Water Lily	Loose-strife-Cattail	Button-bush-Alder	Maple-Elm-Ash	Beech-Maple
Pied-billed Grebe	S	S			
Common Mallard	X	S			
Virginia Rail		S	X		
Long-billed Marsh Wren		S	X		
Eastern Red-wing		S	S		
Eastern Swamp Sparrow		S	S		
Eastern Kingbird			S		
Alder Flycatcher			S		
Eastern Yellow Warbler			S		
Catbird			S	X	
Eastern Goldfinch			S	X	
Northern Yellow-throat			S	S	
Mississippi Song Sparrow			S	S	
Northern Blue Jay				P	
Eastern Hairy Woodpecker				P	P
Northern Downy Woodpecker				P	P
Eastern Wood Pewee				S	S
Eastern White-breasted Nuthatch				P	P
Black-capped Chickadee				P	P
Tufted Titmouse				P	P
Red-eyed Vireo				S	S
Eastern Oven-bird				S	S

X = present at times; P = permanent resident; S = seasonal.
Column 5 is from Williams (1936:57–58), other columns from Aldrich (1943: 389–392).

100 acres (40 hectares) in three of these communities over a period of years. The great annual fluctuations in these populations are apparently characteristic of hydroseral communities. The differences, particularly in the case of the Red-wings, Marsh Wrens, Yellow-throats, Swamp Sparrows, and Song Sparrows, were correlated with fluctuations in water level and resulting modifications of plant life.

[1] It should be noted that my concept of the Transition life zone (Aldrich and Friedmann, 1943:101) is not entirely that of Merriam (1910:map) and his followers, but includes the ecotones between the northern conifer and subalpine forests on the one hand, and between the deciduous forests and grassland on the other. That is, the zone encompasses the various forest-climax communities that have been called Lake Forest, Pine-Hemlock-Northern Hardwood Forest, Montane Forest, and Aspen Parkland.

TABLE 2

ANNUAL FLUCTUATIONS OF BIRD POPULATIONS IN NORTHEASTERN OHIO SWAMP SERE

	1932	1933	1934	1936	1937	1938	1939	Aver.
Loosestrife-Cattail	343	352	267	124	171	476	428	323
Buttonbush-Alder	390	268	561	1073	536	555	400	526
Maple-Elm-Ash	—	88	175	75	165	127	174	121

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PART 3

BIRDS OF THE DECIDUOUS FOREST [1]

BY JOSEPH J. HICKEY

THE (broad-leafed) deciduous forest biome, as mapped by Pitelka (1941), approximates the forested region of Merriam's Carolinian zone, the humid eastern section of the Upper Austral zone. It includes, in addition, an oak-pine subclimax (made up of Carolinian and Austroriparian elements) and a pine subclimax (equivalent to the rest of the Austroriparian zone east of the Mississippi). The degree of control exercised on bird distribution by these types of vegetation has not yet been well studied. In *Florida Bird Life*, Howell follows the over-generalized bird communities of the life-zone scheme, while the specific communities of birds governed by water and vegetation are given by the

[1] Part of the author's remarks have been separately published in *A Guide to Bird Watching* (Oxford University Press, N. Y., 1943, pp. 106–118).