

THE BIRDER AND ECOLOGICAL NICHE

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Few birders think of themselves as ecologists, yet most gradually develop an awareness of some basic ecological principles. For example, the importance of learning the habitat requirements for various species is an obvious necessity if one is to locate particular species of birds effectively. Obviously, one would not search for a nesting Olive-sided Flycatcher on the marshes of New Jersey's Brigantine National Wildlife Refuge. But an excursion to the state's salt meadows would be appropriate to see nesting Laughing Gulls. Of course, most birders with a reasonable amount of field experience know the habitat requirements of common species. But what about ecological niche requirements? Within a given habitat, two species can live together only if they occupy different ecological niches. This, stated formally, is the principle of competitive exclusion. That is, two species living together do not carry out *exactly* the same activities in exactly the same habitat or direct competition would result, and one would be eliminated from that particular niche or habitat.

How, then, can a knowledge of niche requirements aid a birder in deriving more enjoyment from his hobby? One way is by allowing him to understand better the workings of food chains and food webs. Let's consider some examples, using first the foraging ranges of wood warblers (Parulidae). Not all warblers seek food in the same locations within their required breeding habitats. Some search for food close to the ground, others at medium heights and still others at the top of tall vegetation. In other words, the ecological niches of the various species are distributed in layers, or stratified, according to the various heights which vegetation attains. Examples of warblers with foraging ranges confined to the lower vegetation strata are: Canada, Kentucky, Prairie and Worm-eating. Species with medium foraging ranges include Black-and-white, Black-throated Blue, Golden-winged, Blue-winged and Magnolia. Some high foraging species are Blackburnian and Cerulean. However, not all warblers are rigidly restricted to specific strata in conducting their foraging activities. Chestnut-sided and Hooded Warblers, for example, range from low to medium levels; but Nashville and Yellow Warblers move from medium to low ranges. And the Black-throated Green Warbler ranges from medium to high levels in its food gathering efforts. The Cape May Warbler sometimes ranges from high to medium levels.

Other factors which also permit utilization of different ecological niches are differences in a species anatomy or morphology. Among herons and egrets, for example, the Great Blue Heron is able to exploit food sources in deep water because of its long legs. Common Egrets would seek food in shallower water, and Black-crowned Night Herons

would confine their feeding efforts to the shallowest water of all. Hence, in these examples, the physical size of the various species determines more or less where each can feed.

Similarly, on the Serengeti Plain in Tanzania as many as six species of vultures may feed upon a carcass. Although there seems to be chaos rather than organization as the birds attempt to feed, each species occupies is somewhat different ecological niche in terms of its food requirements and related physical adaptations for food gathering. For example, the largest species – Lappet-faced Vultures and White-headed Vultures – break open the skin of a dead animal and feed upon skin, sinew and flesh adhering to bones. In contrast, Ruppells Griffon Vultures and White-backed Vultures have unusually long necks which enable them to reach inside a carcass to eat soft internal organs. Additional anatomical adaptations further aid them in exploiting this niche. Finally, Hooded and Egyptian Vultures are smaller birds with slender beaks. They feed upon scraps of flesh clinging to bones or scattered on the ground near a carcass after the larger vultures and other scavengers have eaten. Additionally, some individual Egyptian Vultures have learned learned to use stones as tools by lifting them in their beaks and flinging them at Ostrich eggs After the shell is broken, the vulture eats the contents of the egg, thus exploiting still another food source not normally vulnerable to other birds. (This extraordinary stone throwing behavior of some Egyptian Vultures is an example of true tool use by an animal other than man.)

The woodpeckers (Picidae) of North America have evolved into two branches, each leading to increased specialization. The unspecialized flickers (*Colaptes*) form the base from which the two woodpecker branches are derived. On one side, the Pileated Woodpecker remains relatively primitive and more or less resorts to behavior and ecological niche affinities similar to flickers. But at the apex of this branch appears the rigidly specialized Ivory-billed Woodpecker whose niche requirements are so specific that the species has become nearly extinct due to loss of most of its required habitat (alternative habitats do not meet its niche requirements).

The other branch of the woodpeckers' evolutionary tree contains species such as the Hairy Woodpecker, whose niche centers upon tree trunks and large limbs, and the nearly identical but proportionally smaller Downy Woodpecker, which occupies a niche on smaller branches and twigs. The Yellow-bellied Sapsucker has a specialized tongue with a brush-like tip, thus enabling it to feed effectively on sap oozing from holes it drills in tree. Finally, at the top of this evolutionary branch, one finds the peculiar three-toed woodpeckers (*Picoides*). Of course, not all these woodpecker species occupy the same habitats. Some species are distributionally separated.

The fruit-eating behavior of tanagers in Trinidad's mountainous Northern Range offers additional examples of niche exploitation and its role in governing bird distribution within a given habitat. Of the island's three attractive *Tangara* species, the Speckled Tanager is mainly a forest dwelling bird. While remaining in a perched position, it picks fruit and eats it whole. The Bay-headed Tanager also eats fruit, but it pecks pieces and sometimes while airborne in manakin-fashion, takes fruit. Finally, the Turquoise Tanager often occurs in flocks. This species also perches to pick fruit and seems prone to pick pieces out of large fruits. Turquoise Tanagers also mandibulate fruit in an apparent effort to reduce its size or eliminate seeds before swallowing it. Mistletoe fruit forms a larger proportion of this tanager's diet than in other species.

These examples deal only with a few aspects of the complex subject of niche requirements of birds. Many important additional factors also can be involved in determining a bird's niche requirements. Nonetheless, even cursory observations of niche requirements offer curious birders an opportunity to derive added pleasure from their hobby. Why merely look at a bird when you can attempt to understand its ecological role? Of course, there are many instances when general birding activities will not enable you to gain insights into the fascinating world of ecological niche. But frequently cursory observations are adequate to hint at an animal's niche requirements. So sharpen your observational skills, and ask yourself probing question regarding the activities of the birds you see. You may discover something new to science as well as enhance the rewards from your birding activities.

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