The Eastern Bluebird in the Highlands of southeastern New York State

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An intensive survey reveals unexpected number of bluebirds "... practically on the doorstep of New York City"

THE Eastern Bluebird *Sialia sialis* in New York State is usually thought of as being more prevalent in the "upstate" area, i.e. north of Albany. South of the Catskill Mountains, bluebirds rapidly dwindle in number especially as one approaches the New York City area. Although a few pairs of bluebirds are expected to breed in the Highlands each season, new evidence uncovered through vigorous field work demonstrates that this species is not as rare in the area as formerly supposed.

STUDY AREA

The authors' survey encompassed the Hudson Highlands west of the Hudson River in New York and a small part of the Ramapo Mountains in northern New Jersey, for a total of some 660 square kilometers. This study area is situated approximately 50 kilometers north-northwest of Manhattan. The Highlands are basically an area of low, rugged, rolling hills with occasional plateau-like sections and some wide but relatively deep valleys. State and township parklands and private forestland make up the bulk of the Highlands. Urbanization and forest disruption are slight to moderate and restricted mostly to the valley areas. However, the lowlands flanking the Highlands are moderately to heavily urbanized.

Forest vegetation consists primarily of oak *Quercus* species which dominate the ridgetops and upper slopes, while northern hardwoods such as American beech *Fagus grandifolia* and sugar maple *Acer saccharum* dominate the richer soils of valleys and plateau areas. Red maple *Acer rubrum* is an important dominant in areas, such as swamps, which are wet throughout most of the year.

METHODS

Our survey was conducted between early May and early August 1980 with the majority of the field work accomplished between 0500-1400 EST from late May to late July. Approximately 41 half-days or 246 man-hours were devoted to the survey. Field

methods consisted of checking on foot known or speculated bluebird habitats. A few of these were checked twice or more. U.S.G.S. and hikers' regional maps were often useful, especially in pointing out swamps and cleared areas. Thirteen bluebird nesting boxes placed in likely habitats by the authors the preceding season were also checked. Battery-operated cassette tape players with 7-centimeter speakers were used by each author. We worked singly and together approximately equal amounts of time, playing bluebird songs at the speculated and known habitats and then observing and listening for a reasonable amount of time for a responding bluebird. Usually 10-15 minutes (depending on habitat size) were spent at each suspected habitat before moving on to another. If a bluebird was discovered, we moved a significant distance (at least 400-500 meters) away before commencing to play the tape recorder again. Caution was used so as not to double count individuals, and rechecking by backtracking was sometimes necessary. Our main purpose was to document the number of territorial males but we also noted females and juveniles whenever encountered.

RESULTS

Sixty-six adult male bluebirds were observed on territory, and at least 25 of these were paired to females. The total number of individuals detected (males, females, and immatures) equaled 155. This breaks down to one territorial adult male per 10 square kilometers. It must be emphasized that these are minimum totals. At least a dozen more areas of "probable" bluebird occurrence were not inspected due to the large size of the survey area and private landholdings within. Also, it must be expected that a few individuals were missed in some of the habitats which were inspected.

A large majority occurred in the Harriman-Bear Mountain State Park. Only one adult male was located in the Ramapo Mountain section. Also, the Sterling Forest section, annually a major bluebird breeding ground, contained only one adult male.

While a few males reacted rather passively to our tape recorded songs, the usual result was an immediate positive reaction, followed by a close inspection and approach. The aroused male would fly back and forth below the treetops uttering the song and occasionally fluffing up his plumage. Vigorous branch pecking, indicative of redirected aggression, was often observed. These behaviors left no doubt that such a male was indeed "on territory." Males had no trouble discerning our recordings (at full volume) from as far a distance as at least 125 meters. Juveniles, but seldom adult females, were attracted to the tape recorded songs readily.

Adult males were found divided almost equally between two main habitat types: swamps and recent fire-burned areas, both quite different ecologically. The former is somewhat cool, moist, and humid; the latter is relatively hot and dry. The swamp habitats are primarily the result of beaver dams, man-made impoundments and roads, or of natural occurrence. Burned areas are almost always located on mountaintops and upper slopes and result from careless campers. Virtually all bluebird habitats were characterized by a large percentage of standing dead wood. Also important are available nesting cavities and an open floor or adjacent grassy clearing to allow foraging.

Other avian species commonly sharing the swamp habitats with bluebirds were the Common Yellowthroat *Geothlypis trichas,* Red-winged Blackbird *Agelaius phoeniceus,* and Tree Swallow *Iridoprocne bicolor.* In fire-burned areas, the American Kestrel *Falco sparverius,* Common Flicker *Colaptes auratus,* and Field Sparrow *Spizella pusilla* often occurred.

DISCUSSION

Such a relatively large number of breeding bluebirds have not been known to occur in the Hudson Highlands since at least the early part of this century. The history of the bluebird here has been sketchy. Mearns (1878) noted the bluebird to be an "abundant summer resident;" however, Carr (1940), approximately a half-century later, considered it to be "uncommon." Furthermore, he stated that there were "three nest sites in the (Harriman-Bear Mtn.) Park." Such a low total suggests Carr may have been in error. The local bluebird population remained at a fair level, at least in the lowland surrounding the Highlands, until the late 1950's according to Bull (1964). The over-use of insecticides and rampant land and housing development — along with their concomitant Starling *Sturnus vulgaris* and House Sparrow *Passer domesticus* populations — finally caught up with the bluebirds at the start of the 1960's, according to Deed (1968), who stated its status as "rare and local." However, he was more properly referring to the bluebird's status in lowland Rockland County, N.Y., just east of and adjacent to the Highlands. In the 1970's, reported observations of breeding bluebirds in the Highlands were scarce and a later account by Deed (1976) mentioned no positive change in the bluebird's status.

The results of our 1980 survey show that the bluebird's status is more properly "very uncommon" or "uncommon" (at least one individual per day in favorable habitat per locality). Furthermore, we have no reason to believe that the Highlands bluebird population has been significantly different from the 1980 level for the past couple of seasons and possibly the last decade. This finding strongly suggests that field observations made by "sport birders" cannot be relied upon to reflect the true status of a widely dispersed and relatively passive, soft-singing bird, such as the bluebird.

The observation of only one male bluebird in the Sterling Forest area, previously mentioned as a main habitat area, warrants further discussion. Such a scarcity of bluebirds here was completely unexpected, since this area contains many superb bluebird habitats. Yet, at the Harriman-Bear Mountain State Park, just a couple of kilometers to the east, bluebirds were found in virtually every habitat available to them.

Only one major difference between these two ecologically almost identical areas was apparent. The 1980 late spring and summer seasons in the Highlands were marked by a tremendous outbreak of Gypsy Moth *Porthetria (Lymantria) dispar* larvae but this outbreak was not uniform in extent and effect. The Sterling Forest area was severely affected with thousands of hectares of forest totally or partially defoliated by teeming millions of hungry "caterpillars." With the canopy layers gone, along with much of the understory, air and ground temperatures in the forest soared. Indeed, the authors conducted their field work here with much difficulty, as virtually no shade existed. The Harriman-Bear Mountain State Park, however, experienced only a small outbreak of *Porthetria* larvae and heavy defoliation was confined to a few small areas.

The authors speculate that the Sterling Forest bluebird population dispersed to other places where habitat was less affected, thus abandoning their territories. The nearby Harriman-Bear Mountain State Park, with its lush forests still intact, served as the major refuge — which accounts for the abnormally high bluebird count in that area. During the height of the defoliation (in mid-June), young produced from the first clutch would have been old enough to care for themselves, thus they would not be instrumental in bonding adults to their territory. Furthermore, very few second clutches would have been initiated at this particular time.

Dispersal of the Sterling Forest bluebirds was probably prompted by the lack of any shade; possibly they suffered some other secondary effect such as the dispersal or loss of a favored insect prey, or may even have been influenced through some negative psychological factor. No other explanation can account for such gross differences in the number of bluebirds between these two areas of the Highlands. Unfortunately the Sterling Forest area was not surveyed in late March and early April when bluebirds would have been on territory initially. But we can hardly conceive how they would not have been there during that time. At least the one male found in Sterling Forest in May, before the defoliation was advanced, could not be located in a recheck during the height of the defoliation.

The authors know of no other published information concerning forest defoliation effects on the dispersal of the bluebird or any other avian species. Not surprisingly, in many areas of total defoliation we noted a general scarcity of avian species. The negative effects of *Porthetria* forest defoliation on various birds, particularly on their reproductive success, is a subject which merits further study.

Ecologically, the Highlands bluebird population has come full circle. Before the arrival of the colonists the only habitats available to bluebirds must have been the various Beaver *Castor canadensis* swamps and old meadows, patches of forest killed by insects and disease, areas of oak mortality caused by drought, and areas disturbed by fire — either natural fires or those deliberately set during the slash-and-burn clearing practiced by native Americans. After colonists settled the area, great tracts of Highlands forest were cleared and burned, with an agricultural community flourishing in the surrounding lowlands. Gradually the bluebird adapted to new and more widely available habitat in the lowlands, nesting in fenceposts and other suitable structures throughout the rural countryside. Meanwhile, the Beaver (along with several other animal species) was being extirpated from the area.

With the introduction of the Starling and House Sparrow, coupled with an increasing human population, bluebird numbers gradually diminished in the lowlands. Fortunately, soon after the beginning of the twentieth century, a great portion of the Highlands was secured as either state parkland or private forest preserves. Shortly thereafter, beaver were introduced and their swamps once again began to appear. Also during this period, blight exterminated the American chestnut *Castanea* from the region, resulting in many dead trees to serve as nest sites.

As the momentum of land development and housing reached a peak in the surrounding lowlands, an agricultural mode of life, along with the bluebird, gave way to a suburban-urban existence. However, a small "relict" population of bluebirds continued to find refuge among the still undeveloped, relatively "wild" Highlands. The state parkland particularly, while protecting wildlife, also attracted many recreationalists and campers. Less knowledgeable campers often found their camp fires going out of control, burning and killing portions of the monotonous forest. The bluebird, as a result, benefited immensely as many more nesting and foraging habitats were made available. This is further proof that the ecological effects of fires are not all adverse.

The deep woods of the Highlands serve as a buffer from the high numbers of Starlings, House Sparrows, housecats, and people in the surrounding lowlands and developed montane valleys. The sprawling forest, with its occasional openings, is the entire reason why bluebirds persist here in some numbers. Zeleny (1976), Pinkowski (1979), and others have reported similar occurrences for other areas of the eastern United States. In the near future, the bluebird should continue to do well in the

Highlands, providing land development is wisely controlled. Ecological forest succession is not a serious threat to bluebird habitats upon the mountain summits and upper slopes, since successional processes in those areas are comparatively slow.

SUMMARY

New evidence secured in 1980 shows that the Eastern Bluebird is not rare in the Hudson Highlands and that a fair number exist here, previously overlooked, almost on the doorstep of New York City. Their existence here is made possible by a sprawling forest which provides the necessary isolation from Starlings and House Sparrows. Interspersed throughout the Highlands forest are swamps and burned-over areas which provide nesting habitat which meets the bluebirds' specific needs. Available evidence points to the dispersal of bluebirds from areas completely defoliated by gypsy moth *Porthetria* larvae. The greatest danger facing the bluebird in the Highlands is unrestricted land development.

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