

ECOLOGICAL FACTORS CONTRIBUTING TO THE DECLINE OF BEWICK'S WREN AS A BREEDING SPECIES IN THE SOUTHERN BLUE RIDGE MOUNTAIN PROVINCE

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Through the latter part of the nineteenth century, the Bewick's Wren (*Thryomanes bewickii*) was a common to abundant summer resident in the North Carolina mountains; but the species has declined considerably during subsequent years and is now infrequently observed in the region.

STATUS IN WESTERN NORTH CAROLINA

In May and June 1885, Brewster (1886) described the Bewick's Wren as "Confined almost exclusively to the towns, where it was usually one of the most abundant and conspicuous birds. It is, in fact, the 'House Wren' of this region At Asheville it was breeding in such numbers that nearly every shed or other out-building harbored a pair" In his journal of the trip, Brewster (1885) listed the species as one of the four or five most characteristic birds in each town he visited during his foray through western North Carolina. From 1880 to 1894, Cairns (1889) found the species to be "Common in the mountains also in the towns. I found it abundant on Craggy Mountain where it ranges over the highest points." Oberholser (1905) apparently paraphrased Cairns' report: "Common in the mountains, chiefly in towns, but ranges also to the tops of the highest peaks."

By the 1930s, however, the Bewick's Wren had declined perceptibly. Thomas D. Burleigh (pers. com.) found the bird to be "rather scarce" around Asheville and noted breeding evidence only twice during the period 1930-1934, although he was in the field almost daily. Later in the same decade, Wetmore (1941) found the bird at only three sites in Ashe and Watauga Counties during July 1939.

In summarizing records from the Great Smoky Mountains, Stupka (1963) considered the species to be a "very uncommon summer resident" based on observations in the Park from 1935 to 1961. Johnston (1964) listed the bird as an uncommon summer resident at Highlands, Macon County, but gave no details. Charles Moore (pers. com.) informed me that the species nested rarely around Brevard, Transylvania County, until the late 1950s and that he had previously seen a pair on occasions at an old shed near Dry Branch, Haywood County, in what is now part of Shining Rock Wilderness Area. Robert C. Ruiz (pers. com.) has not found the species on any breeding bird surveys in Buncombe County during the 1960s and 1970s and considers the bird to be rather rare in the region. Walter Holland (pers. com.) reports no summer records from Transylvania County during the past two decades. Teulings (1973) observed a single bird at Long Hope Creek, Ashe County, on 20 July 1973.

My only observations of the Bewick's Wren during the period 1957-1975 are from four locales. In the late 1950s I found this species nesting during two consecutive summers in a small shed near a picnic grounds at 1220 m (4000 feet) along US 19 in the Plott Balsam Mountains, Haywood County, just E of Soco Gap. On one of these occasions, a nest held five eggs. I watched a single bird singing at the fire tower on Table Rock Mountain at 1190 m (3900 feet) in Linville Gorge, Burke County, on 12 September 1968, although I have never seen the species there on numerous other occasions. I observed a pair near Roaring Creek at 1340 m (4400 feet) just below Yellow Mountain Gap, Avery County, on 29 July 1970. On the NE slope of Steestache Bald at 1455 m (4780 feet) in the southern Great Balsam Mountains, Haywood County, I noted a singing male and a second adult carrying food in an open oak forest bordering the Blue Ridge Parkway on 7 June 1970.

Thus the Bewick's Wren was described as "breeding in such numbers," "common," "conspicuous," and "abundant" in the North Carolina mountains during the 1880s and 1890s; but the species has now become uncommon to rare and is seldom reported in the

region. Although the causes of this decline are not known, several possibilities merit analysis.

FACTORS CONTRIBUTING TO DECLINE

There appears to be no evidence that disease, predation, environmental change, or pollution have adversely affected the Bewick's Wren. Although much of the evidence is circumstantial, the commonly stated reason for the species' decline has been competition with the House Wren (*Troglodytes aedon*), a theory reviewed by Mengel (1965) and Bent (1948).

Some authors have claimed that the House Wren and Bewick's Wren do not occupy the same area without competitive friction and that the more aggressive House Wren often succeeds in extirpating the Bewick's Wren from the area where both occur. As Mengel (1965) has noted, however, there are several problems with documenting this as the sole reason for the decline of Bewick's Wren in many regions. In general, a cause and effect relationship between two events cannot be proven merely because they occur at approximately the same time. Furthermore, while the Bewick's Wren has been extending its range northward in recent decades, the House Wren has simultaneously been expanding southward, so that both species may occur in a broad zone of overlap in many areas of the eastern United States. Mengel further notes that the ecological requirements of the two species are not identical and that alleged incidents of competition usually are not very well documented. In this regard, it is interesting that the pair of Bewick's Wrens that I observed near Yellow Mountain Gap in 1970 were apparently nesting in a farmyard simultaneously occupied by a pair of House Wrens and a pair of Carolina Wrens.

Of greater significance in the southern Blue Ridge area is the evidence that the Bewick's Wren was disappearing from the mountains before the House Wren began to nest in the region. T.D. Burleigh's exhaustive studies in Buncombe County are central to this observation. In the period 1930-34, Burleigh (pers. com.) agreed with Cairns' (1887, 1889, 1891, 1894) earlier assessment that the House Wren occurred in western North Carolina only as an uncommon to rare migrant. In contrast to Cairns and Brewster, however, Burleigh found the Bewick's Wren had become "rather scarce." Burleigh found only two nests during five consecutive breeding seasons of 1930-34, contrasting sharply with Brewster's remark of "abundant" and "breeding in such numbers . . ." Brimley (1940) later stated that the House Wren had begun to nest around Asheville, presumably after Burleigh's departure from the region, and the species is now a regular but not common summer resident in the area. Based primarily on Burleigh's data, it would appear that the Bewick's Wren had decreased significantly in numbers prior to the time the House Wren began to nest at Asheville. Although Burleigh might have overlooked a few local pairs of House Wrens, it is most unlikely that a population small enough to have been missed by his extensive field work could have caused the Bewick's Wren to decline from "abundant" and "conspicuous" to "rather scarce."

Furthermore, the House Wren population in the mountains at the present time does not seem to be large enough to account for the almost total displacement of a bird once called "abundant" in the region. In Buncombe County, Robert C. Ruiz (pers. com.) found 0 to 6 House Wrens but 2 to 24 Carolina Wrens during breeding bird censuses between 1969 and 1975, while spring bird counts from western North Carolina in the past 10 years show approximately 3 to 10 times as many Carolina Wrens as House Wrens. As late as the 1960s, Stupka (1963) could find no positive evidence of breeding by the House Wren in the Smokies and was not entirely certain of its status during the summer months, although he regarded the Bewick's Wren as a "very uncommon" summer resident.

There is actually somewhat better evidence that the House Sparrow (*Passer domesticus*) and Starling (*Sturnus vulgaris*) might have contributed to the extirpation of the Bewick's Wren from the North Carolina mountains. Cairns (1889, 1894) and Brewster (1886) made no mention of the House Sparrow in western North Carolina, although Oberholser (1905) stated that a small group had been seen in Asheville in 1884. The Starling was successfully introduced into America in 1890 and was never recorded in the mountains by

Cairns (1894) or Oberholser (1905). Burleigh (pers. com.) informs me that by the 1930s both the House Sparrow and Starling were common to abundant around Asheville at the same time when Bewick's Wren had become scarce but the House Wren was still only a migrant. The Starling and House Sparrow use habitat similar to that of the Bewick's Wren, namely suburban and farm settings, where they nest in and around houses, barns, sheds, and various other out-buildings (Bent 1948, 1950, 1958). The Starling and House Sparrow are notoriously successful competitors against other species that occur in the same area, and Burleigh's data from Asheville show that the timing of the Bewick's Wren decline apparently correlates more closely with their influx than that of the House Wren.

Since most of my field work has been in the higher elevations, it may be purely coincidental that all my Bewick's Wren records have been at elevations above 1890 m (3900 feet), elevations where the House Sparrow, Starling, and House Wren become increasingly scarce. It is possible, however, that the higher elevations provide habitat where the Bewick's Wren can presently avoid or minimize competition with these more aggressive species.

In fact, all three species may have contributed to the disappearance of Bewick's Wren in western North Carolina. The invasion of English Sparrows and Starlings may have reduced the bird's numbers prior to the arrival of the House Wren in the late 1930s. The subsequent influx of House Wrens would have contributed further to the decline of Bewick's Wren if competition occurred between the two species. Mengel (1965) suggested that competition between the House and Bewick's Wrens most often occurs when the species are at the edge or periphery of their range or inhabiting marginal habitat. In such situations, the House Wren may extirpate the Bewick's Wren. The North Carolina mountains formed the southeastern edge of the Bewick's range, and the influx of House Sparrows and Starlings may have forced it to use suboptimal or marginal habitat by the time House Wrens began to nest in the region. The sequential invasion of all three species may have been sufficient to bring about the observed change in the status of Bewick's Wren in the mountain area. It is difficult to account for the species' changing from abundant to rare solely on the basis of the low density of House Wrens presently occupying the region.

The only other avian species that has invaded the region during this period is the Song Sparrow, but there is little reason to assume that there is any relationship between its arrival and the decline of the Bewick's Wren. These species are not food competitors, and their nesting sites are not similar.

Unfortunately, the lack of systematic field work during the period between Cairns' death in 1895 and Burleigh's studies in 1930 prevents any definitive conclusions about the causes for the disappearance of Bewick's Wren in most of the southern Blue Ridge. The only well-documented fact is the striking decline in relative abundance of the species during the past 75 years.

SUMMARY

Bewick's Wren was described as a conspicuous and abundant summer resident in the North Carolina mountains prior to the 1900s, but the species has subsequently become uncommon to rare in most of the region. While all evidence is circumstantial, the bird may have been adversely affected by the invasion of the House Sparrow, Starling, and House Wren as breeding species. Observers should report any records of this species from western North Carolina.

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