

Breeding Birds of the Unicoi Mountains

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During the last half of June in the years 1944 through 1946, Ganier and Clebsch (1944, 1946) studied the breeding-bird population of the Unicoi Mountain chain, which follows the North Carolina (Graham County) – Tennessee (Monroe County) line. They explored the 10 miles of ridge from Bob Bald on the north to Grassy Top on the south, at elevations ranging from 4,000 to 5,472 feet. They were the first ornithologists to work the area, and no further surveys of the birds of this area have been published, though a few random observations have been reported in *The Migrant*. The present paper records the results of censuses made in 1981 and 1982 in the same area studied by Ganier and Clebsch, and at the same time of year. Changes that occurred during the intervening 35 years are noted.¹

HABITAT

A rather unusual habitat is created by the numerous grass balds and clearings found close together on the gently rounded or almost level summits, ridges, and gaps of the Unicoi Mountains. These meadows lie in an area of approximately 5 x 2 air miles and are islands in a sea of forested mountains. East of the divide is the Nantahala National Forest, and west is the Cherokee National Forest. Another distinctive feature is the high elevation—up to 5,560 feet—of these balds at such a southern latitude. Farther south, the Appalachians are significantly lower.

Habitat, 1944-1946: Four long-existing balds were surveyed by Ganier and Clebsch (1944, 1946): Stratton Meadow (4,320 feet), Bob Bald (5,262 feet), Whigg Meadow (4,960 feet), and Haw Knob (5,472 feet). Stratton Meadow, several acres in a gap, was the site of Ganier's camp. Then, as now, it was accessible by Forest Service roads. All the other balds were, and still are, reached only by foot trail, or, in some cases, by very rough jeep trails (old logging roads). Bob Bald is an elongated meadow of 5 or 6 acres. It lies 3 air miles NE of Stratton Meadow. Whigg Meadow, 2 air miles S of Stratton Meadow, has 7 or 8 acres of quite open meadow, affording an outstanding view of the mountain ranges westward. One-half mile E of Whigg Meadow is Haw Knob, then about 1 or 2 acres of meadow, making it the smallest bald but highest summit along the ridge that Ganier explored.

After the Cherokees were removed in 1838, early white settlers grazed cattle, sheep, and horses on the balds and built cabins there. Cattle grazing was continuing there at the time of Ganier's study. The cattle kept the thick mountain grasses, wild strawberries, and other low growth neatly cropped. Ganier and Clebsch noted that the Veery, Black-throated Blue Warbler, and Chestnut-sided Warbler (three of the four most abundant species) often located their nests a few feet above ground in the cattle-cropped sprouts of beech and birch trees growing in thickets along the edges of the balds. In the 1944-1946 period, the Tennessee side of the Unicoi crest was young second-growth forest consisting of pines, hemlock, and hardwoods (between 1905 and 1930 Babcock Lumber Co. had cut every-

¹Members of Tennessee Ornithological Society conducted a breeding-bird foray in Monroe County, Tenn., 23-26 May 1980. They covered Stratton Meadows, Haw Knob, Whigg Meadow, and some other places mentioned in the present study. Unfortunately, the report has not yet been published and results are not available for comparison.

thing of value on the Tellico River and its tributaries). The forest adjacent to the crest on the North Carolina side was still virgin. Ganier and Clebsch (1944) wrote, "A virgin stand of massive hemlocks near Stratton Meadow, some five feet in diameter, may be the finest remaining grove of this beautiful tree left in the southern mountains."

Habitat, 1981-1982: The virgin forest was soon destined for the woodman's axe. Now second-growth forest of hemlock and deciduous trees cover both slopes. However, the trees have matured to the point where they are being cut again, but more selectively. About 3 years ago the U.S. Forest Service created several "balds" as part of a plan to improve the habitat for wildlife. They clear-cut areas of about 10 acres each on Huckleberry Knob, which at 5,560 feet is the highest point in Graham County, and on Oak Knob (5,440 feet), about a half mile S of Huckleberry. The charred stumps and trunks of the Northern Red Oak (*Quercus rubra*) now lie among the tall grasses, wildflowers, and thornless Blackberries creating a new type of bald. A similar field of about 3 or 4 acres was cleared adjacent to the old Bob Bald, and another larger field with some dead trees left standing was made northeast of Stratton Meadow. About a mile S of Oak Knob is the largest (about 15 acres) and one of the oldest balds in the area—Hooper Bald. Because Hooper Bald and all the newer clearings mentioned above are located in North Carolina close to the main divide studied by Ganier and Clebsch (1944, 1946) and are at high elevations, we decided to include them in the area we studied.

One of the most important changes is in the habitat of the older balds. Cattle no longer keep the balds neatly cropped like lawns. Grasses are a foot or more high by late June and tall Buttercups (*Ranunculus acris*), Common Cinquefoil (*Potentilla simplex*), and Bluets (*Houstonia caerulea*) bloom next to the ripe wild Strawberries (*Fragaria virginiana*). Constable's Blueberries (*Vaccinium constablaei*), Flame Azalea (*Rhododendron calendulaceum*), Mountain Laurel (*Kalmia latifolia*), hawthorns (*Crataegus* sp.), and Allegheny Serviceberry (*Amelanchier arborea*) not only have increased around the borders but also are intruding into the meadows. The beech and birch sprouts, once trimmed by cattle, are becoming trees and encroaching on the open spaces. Ganier saw no Fraser Firs (*Abies fraseri*), but now small stands up to 30 feet high are found on Bob Bald, Haw Knob, and Hooper Bald. The balds have changed from close-cropped pastures into lush mountain meadows interspersed with patches of shrubs and small trees.

METHODS

From 14 to 20 June 1981 and 15 to 20 June 1982 we hiked the trails along the Unicoi Mountain crest from Bob Bald to within a mile of Grassy Top and from Huckleberry Knob to Hooper Bald. (Ganier and Clebsch's studies were conducted from 18 to 25 June 1944, 15 to 23 June 1945, and 16 to 26 June 1946.) We visited all of the long-standing balds and newer clearings mentioned in the habitat section. Every bird clearly identified by sight or sound was recorded along with the date and place of sighting.

Although we found at the older balds a few rare species that were not seen at the more recent clearings, we observed no species at the newer balds that were not also seen at the older ones. Therefore, it seemed appropriate to combine the data for statistical purposes. We summed the total number of individuals of each species both for our data and for that of Ganier and Clebsch. Because total observation times for the two studies are unequal, we compare ranks rather than numbers of individuals. By rank-ordering the species on each list

from most to least frequent, comparisons can be made of the relative frequency of each species.

A note of caution: misinterpretations may result from taking the ranks too literally. Large differences in rank are probably reliable, but differences in frequency between species close in rank may not be significant. This is especially true for the rarer species, where ties tended to occur, and an individual or two might change a rank. (In the case of ties ranks were arbitrarily assigned.) Therefore, in the interpretation of the results, we will ignore small changes in rank and not regard ranking as meaningful for the least frequent species.

RESULTS AND DISCUSSION

The total species observed in the two studies are almost the same: Ganier and Clebsch's (1946) total was 44 species, ours was 45. Our list contains 11 species not observed in the earlier study, whereas Ganier and Clebsch (1946) recorded 10 species not seen by us. Table 1 presents the species observed in both studies in phylogenetic order followed by their comparative rankings. A zero in either column indicates the species was not recorded during the study period.

The 10 species (including their ranks) that were observed by Ganier and Clebsch (1946) but not by us are: Wood Thrush (6), Eastern Wood-Pewee (13), Yellow-bellied Sapsucker (26), Brown Thrasher (27), Black-throated Green Warbler (31), Common Raven (35), Barred Owl (36), Louisiana Waterthrush (41), Hooded Warbler (43), and Brown-headed Cowbird (44). All these birds except the Yellow-bellied Sapsucker and Common Raven are found regularly in the area at lower elevations. We might have missed some of these species because we did not work as extensively as did Ganier and Clebsch along the lower elevation limit. Only one Hooded Warbler and three Louisiana Waterthrushes were seen by Ganier and Clebsch, all at about 4,200 feet. The Black-throated Green Warbler was not seen by Ganier and Clebsch until their last survey, when they found a few in the "tops of the oldest hemlock stands," which have now been cut. The lone Brown-headed Cowbird was a juvenile that flew across Whigg Meadow where cattle were grazing. The absence of cattle probably accounts for the disappearance of this species around the balds. Barred Owls were heard only at Stratton Meadow where the ornithologists camped. We did not camp overnight or make a special effort to hear owls. Brown Thrashers were scarce during the 1940s but were found by Ganier and Clebsch at Stratton Meadow and Whigg Meadow. We covered these meadows more than once without finding any Brown Thrashers, and this species was uncommon even at lower elevations in the area.

Most astonishing is our failure to record a single Wood Thrush, whereas Ganier and Clebsch's (1946) count of 90 individuals placed this bird as the sixth most common species. Their only remark is about its loud and frequent song. We found the Veery to be common down to 4,000 feet. Has the Veery extended its range downward, causing the Wood Thrush to retreat to lower elevations? Also, a striking difference existed between the 35 Eastern Wood-Pewees they observed and our zero count. They noted that pewees were in open woods, being most abundant around Stratton Gap. This gap is considerably less open now than it was in the 1940s, but this change alone probably cannot explain such a large difference.

Ganier and Clebsch's (1946) finding of 12 Yellow-bellied Sapsuckers extended the known breeding range of this species southwestward from the Great Smoky Mountains.

TABLE 1. Comparative rankings of breeding birds found in the Unicoi Mountains by Ganier and Clebsch (1944-1946) and by McConnell and McConnell (1981-1982). Species are listed in phylogenetic order, with those that ranked in the top five in either study printed in boldface type. A zero ranking means that the bird was not found during the study period, though the species may be present in the area in small numbers or at slightly lower elevations than those covered by the two studies.

<i>Species</i>	<i>1981-1982</i>	<i>1944-1946</i>
Turkey Vulture	33	29
Sharp-shinned Hawk	44	0
Broad-winged Hawk	18	0
Red-tailed Hawk	39	37
Golden Eagle	45	0
Ruffed Grouse	20	30
Wild Turkey	40	40
Northern Bobwhite	12	39
Mourning Dove	43	0
Barred Owl	0	36
Chimney Swift	5	19
Ruby-throated Hummingbird	19	16
Yellow-bellied Sapsucker	0	26
Downy Woodpecker	22	23
Hairy Woodpecker	26	24
Northern Flicker	41	25
Pileated Woodpecker	29	33
Eastern Wood-Pewee	0	13
Least Flycatcher	27	0
Great Crested Flycatcher	35	42
Barn Swallow	42	0
Blue Jay	23	15
American Crow	14	0
Common Raven	0	35
Carolina Chickadee	13	20
Tufted Titmouse	37	14
Red-breasted Nuthatch	36	34
White-breasted Nuthatch	24	12
House Wren	34	0
Winter Wren	21	38
Veery	3	2
Wood Thrush	0	6
American Robin	25	8
Gray Catbird	10	7
Brown Thrasher	0	27
Cedar Waxwing	16	18
Solitary Vireo	6	5
Red-eyed Vireo	17	0

TABLE 1, continued

<i>Species</i>	1981-1982	1944-1946
Northern Parula	32	0
Chestnut-sided Warbler	2	4
Black-throated Blue Warbler	8	3
Black-throated Green Warbler	0	31
Blackburnian Warbler	30	28
Black-and-white Warbler	38	22
Ovenbird	11	10
Louisiana Waterthrush	0	41
Hooded Warbler	0	43
Canada Warbler	4	17
Scarlet Tanager	28	32
Rose-breasted Grosbeak	31	11
Indigo Bunting	9	0
Rufous-sided Towhee	7	9
Dark-eyed Junco	1	1
Brown-headed Cowbird	0	44
American Goldfinch	<u>15</u>	<u>21</u>
TOTAL SPECIES	45	44

They note that sapsuckers were nesting in dead chestnut trees. Is the apparent decline of the sapsucker as a breeding species in the Unicoi Mountains related to a decrease in suitable nesting sites? Ganier (1954) described a southern Appalachian race of the Yellow-bellied Sapsucker based in part on a specimen from the Unicoi Mountains. According to Peterson (1980), the status of the Yellow-bellied Sapsucker in the southern portion of the Appalachians is questionable, but Charles Nicholson (pers. comm.) says the species has been reported in the Unicois during the past few years in the breeding season.

The only other species seen by Ganier and Clebsch (1946) but not by us was the Common Raven. We saw four ravens at the Rock Quarry near Fontana Dam (about 12 miles from Bob Bald) on 17 June 1982. Also, four ravens were at Big Fat Gap in the Unicoi Mountains, only 4 miles from the survey area, on 17 August 1981. Therefore, ravens probably still breed nearby.

Of the birds we observed that were not seen earlier by Ganier and Clebsch (1946), the most remarkable species for abundance is the Indigo Bunting, our ninth most common bird. It has invaded all of the high grassy balds in the survey area. Apparently mated pairs were found on the highest summits: Huckleberry Knob (5,560 feet) and Haw Knob (5,472 feet). The sighting of 5 females along with 13 singing males strongly suggests breeding at these high altitudes. Except for Simpson (1977), previous records of Indigo Buntings above 5,000 feet during the breeding season consist of solitary males with no evidence of females, nests, or young.

Another interesting addition to the avifauna of the Unicoi Mountains were two male House Wrens singing at separate locations. One was present on 17 June 1981 at the upper end of Whigg Meadow (4,960 feet) where Mountain Laurel grew along the meadow border

and some split-rail fences had been erected. It responded to "pishing" calls with territorial investigative and alarm behaviors. The second House Wren was seen on 19 June 1981 at Bob Bald (5,341 feet) in the 3-acre clearing the Forest Service had recently made adjacent to the original bald. The male sang repeatedly from various perches around this clearing, which still had the trunks of the fallen Northern Red Oaks strewn about. Charles Nicholson (pers. comm.) reports that the House Wren was also found at high elevations during the 1980 TOS foray in Monroe County, Tenn. In recent years the House Wren has been extending its range southward (Stupka 1963). Although singing males have previously been observed during the summer at elevations from 4,500 to 5,300 feet in Virginia on Whitetop Mountain and on Mount Rogers (Stevenson and Stupka 1948), Stupka (1963) mentions no high-elevation records for the Great Smoky Mountains. Potter et al. (1980) state that in the North Carolina mountains the House Wren nests throughout the lower and middle elevations. Hence, the presence of these House Wrens may represent an upward extension of the breeding range in North Carolina.

Another newcomer not seen by Ganier and Clebsch (1946) was the Least Flycatcher. A pair was seen on successive years (17 June 1981 and 18 June 1982) along a tree-bordered creek at Whigg Meadow. The continuously repeated *che-bek* call was also heard. This elevation (4,960 feet) exceeds the usual breeding range of 3,000 to 4,500 feet cited in Potter et al. (1980).

Other species sighted by us but not by Ganier and Clebsch (1946) were Golden Eagle, Broad-winged Hawk, Sharp-shinned Hawk, American Crow, Red-eyed Vireo, Northern Parula, Barn Swallow, and Mourning Dove. The Golden Eagle was an adult with some white at the base of the primary flight feathers but not at the base of the tail. Seen from Whigg Meadow at 1215 EST on 18 June 1982, the eagle first circled above Little Haw Knob with a Broad-winged Hawk that was less than half its size. It then glided southwestward parallel to the meadow, coming within 450 feet of us. Jon E. DeVore (1973) saw an adult Golden Eagle from the same spot on 14 August 1971 and from a spot approximately 10 miles W in August 1968. Stupka (1963) lists five June records of the Golden Eagle between 1924 and 1961 in the nearby Great Smoky Mountains National Park.

Raptors appear to have increased in the high Unicois. Ganier and Clebsch (1946) observed only the Red-tailed Hawk, which was rare, whereas we found four species: Golden Eagle, Red-tailed Hawk, Broad-winged Hawk, and Sharp-shinned Hawk. The Broad-winged Hawk was fairly common. Because these hawks are known to range throughout all elevations, their absence during Ganier and Clebsch's census must be accounted for more than their presence now. The comeback is possibly related to the protection of hawks by law, education of hunters about their beneficial effects, habitat improvement, and a greater abundance of prey species.

Ganier and Clebsch (1946) failed to find the American Crow above 3,500 feet in the Unicois. We saw American Crows at Bob Bald, Stratton Meadow, Whigg Meadow, Hooper Bald, and Huckleberry Knob (5,560 feet). Stupka gives 3,000 feet as the usual upper limit for breeding in the Great Smoky Mountains. We have no evidence of crows breeding at these higher elevations, but their presence there in the breeding season is an interesting change.

Our sightings of Red-eyed Vireos and Northern Parulas may indicate upward extensions of their breeding ranges in the Unicois during the last 35 years. We saw six Red-eyed Vireos in the 4,500- to 4,800-foot range and Northern Parulas at 4,000 to 4,500 feet along

forested ridges. Other summer records at approximately this elevation exist for North Carolina outside the Unicoi Mountains (Stevenson and Stupka 1948).

The Barn Swallow was seen at Whigg Meadow. Barn Swallows have nested as high as 4,888 feet at Cataloochee Ranch (Stupka 1963), but it is likely that the swallow we saw was nesting at a lower site and merely feeding over the meadow. The Mourning Dove was flushed twice, the interval being about 4 hours, from the same tree in a dense woods on the side of John's Knob (4,300 feet). The occurrence was most likely accidental.

In addition to changes in species, some interesting differences in the relative abundance of species were noted. Species that significantly increased were Northern Bobwhite, moving from rank 39 to 12; Canada Warbler, from rank 17 to 4; and Winter Wren, from rank 38 to 21. Decreasing in numbers were American Robin, dropping from rank 8 to 25; Rose-breasted Grosbeak, from 11 to 32; White-breasted Nuthatch, from 12 to 23; and Northern Flicker, from 25 to 41. As with changes in species, habitat differences probably played a major role in these shifts in abundance. Grazing of cattle on the balds probably favored robins and flickers. Dead chestnut trees could have provided more nesting sites for flickers. The taller grasses and brushy growth in the balds today certainly provide better habitat for bobwhites. Canada Warblers and Winter Wrens were most often seen in the dense growths of rhododendron under hemlocks along the mountain streams, but it is not clear whether this habitat is more common now than before. Possibly, removal of the virgin timber encouraged rhododendron growth. The decrease in White-breasted Nuthatches might be associated with the removal of virgin timber as well. The decrease in Rose-breasted Grosbeaks is more puzzling, because they were usually seen around the edges of balds.

Ganier and Clebsch (1946) located a pair of Red-breasted Nuthatches in a grove of virgin hemlocks adjoining Stratton Gap. This finding extended the known breeding range of the species southward from its nearest outpost near Clingman's Dome. Although the old virgin hemlocks have been cut, there is still a stand of fairly large hemlocks just south of Stratton Gap. On 17 June 1981 we searched this hemlock grove and again discovered a pair of Red-breasted Nuthatches. Simpson (1976) reviewed the status of the Red-breasted Nuthatch in the southern Appalachians and urged that all evidence of breeding be reported. We are happy to report that after 35 years, the Red-breasted Nuthatch can still be seen in the Unicois during the breeding season.

CONCLUSIONS

The avifauna inhabiting the Unicois above 4,000 feet during late June has shown both stability and change during the past 35 years. Thirty-four species observed 35 years ago are still present, although the relative abundance of some species has changed. The number of new species (11) is almost the same as the number of "lost" species (10), suggesting constancy in the total number of species. Further study is needed, however, to determine if the missing species are totally absent above 4,000 feet. Two trends appear to describe the invasion by new species: (1) range expansion upward and/or southward, and (2) an increase in the raptor population. Range contractions downward and/or northward appear to characterize the absent or declining species.

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